

Final Report

On

FERTILIZER DISTRIBUTION

AT

ANGUL, GAJAPATI & PURI

For



**P&C DEPARTMENT, GOVT. OF ODISHA
ODISHA SECRETARIAT**

by



NATIONAL PRODUCTIVITY COUNCIL

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1.0 INTRODUCTION:

Chemical fertilizers play a significant role in improving agricultural productivity. Over the years, the use of fertilizer has considerably increased, but the level of fertilizer use in the state still remains much lower than national average. The use of fertilizer in the state was only 41.00kg per hectare in 2001-02 and increased to a level of 62.19kg per hectare during 2011-12. But the fertilizer use per hectare during 2001-02 to 2011-13 has been increased from 90kg per hectare to more than 167kg per hectare at the national level.

The use of fertilizer per hectare varies widely across the districts of Odisha. The high fertilizer consuming districts are, Baragarh, Baleswar, Bhadrak, Nawrangpur, and Sambalpur, while the low consuming districts are Dhenkanal, Gajapati, Keonjhar, Nuapada, Rayagada, and Sundargada. The per hectare consumption of fertilizer in Gajapati district is only 33.71 kg per hectare during 2011-12 which is about 50% of the level of fertilizer use of the state. The fertilizer use per hectare Angul district (23.16 KG per hectare) is still less as compared to the use of fertilizer in Gajapati. The farmers of Puri district use much more fertilizer as compared to Angul and Gajapati i.e. 69.34 KG per hectare during 2011-12. Keeping this in view an attempt is made to study the quality in service in fertilizer distribution both from the service delivery system of fertilizer and satisfaction level of the beneficiary farmers. In three selected revenue districts of Odisha, which includes Angul, Gajapati and Puri.

In the present study an attempt is made to study the existing fertilizer delivery practices, fertilizer use in crops, SWOT of the system, fertilizer demand and supply gap, critical factors constraining fertilizer delivery and its use and policy options for improving the quality of the fertilizer delivery system.

2.0 TERMS OF REFERENCE:

The study is based on the specific terms and reference as mentioned in the proposal

- To study the existing service delivery system of fertilizer distribution.

- To understand the level of satisfaction of the farmers in receiving fertilizers by conducting a field survey among different stake holders.
- To identify the various gaps in the system from the beginning to end use with respect to standard operating system.
- To identify the critical factors responsible in causing inefficiency in the system.

3.0 DATA AND METHODOLOGY:

In this study three revenue districts namely Angul, Gajapati, and Puri have been selected by the state government to study the quality in service delivery system in distributing fertilizers to the farmers of Odisha for use in crop production. In each revenue district, one block is selected namely, Chhendipada block for Angul, Gumma block for Gajapati and Nimapara block of Puri district. A field study is conducted in each block to study the level of satisfaction of the farmers in receiving fertilizers. A cluster of villages in each block is selected in consultation with Assistant Agricultural Officer (AAO) of the selected blocks.

Name of the district	Blocks selected for study	Villages selected for study
Angul	Chhendipada	Chandiguda
		Tangiri
		Balinali
Gajapati	Gumma	Brusav
		Seramga
		Baojhal
Puri	Nimapara	Kapileswar
		Vhodar
		Ateihuda

The villages selected in different blocks for the study are mentioned below.

The name of farmers received fertilizers in the selected clusters is enlisted. More than ten percent of the farmers are selected on random from each cluster of villages selected in three blocks for detail study.

The data relating to the fertilizer requirement and its indenting pattern and distribution system are collected from the government officials of selected districts and blocks. Besides the agencies involved in the system of fertilizer distribution are contacted to study the quality of present delivery system of fertilizer to the farmers including, use of fertilizer, timely availability of fertilizer, training on fertilizer use and technical support both in pre and post sowing/plantation period.

4.0 EXISTING FERTILIZER SUPPLY PRACTICES/ METHODS:

4.1 Fertilizer requirement planning:

Fertilizer requirement for different villages initially estimated by the Village Agricultural Worker (VAW) at GP level through conducting Palli Sabha and Grama Sabha. Then the Assistant Agricultural Officer (AAO) compiles and prepares the total requirement of fertilizer for the block and sends it to the Deputy Director Agriculture (DDA), who compiles the total requirement of the district.

The total requirement of the fertilizer estimated by the Deputy Director of Agriculture for the district is placed in the Agriculture Strategy Committee (ASC) meeting, where collector is the chairman. After the total requirement of the fertilizer for the district is approved by the ASC, it is sent to the Director of Agriculture Food Production (DAFP), who compiles the requirement of the fertilizer for the state both for Khariff, and Rabi season.

4.2 Fertilizer indenting pattern:

The Director of Agriculture and Food Production, finally send the State's total fertilizer requirement to the different Fertilizer Manufacturing Company as indent for the state. Then the fertilizer manufacturers supply the fertilizers to the state to different distributors. Finally the primary Agriculture cooperative society (PACS), the Large Sized Agriculture Multipurpose Society (LAMPS), and private dealers receive the fertilizer from the distributors and distribute to the beneficiaries.

4.3 Fertilizer Distribution Channel:

Fertilizer Distribution Channel discussed above is presented through a chart given below.

CHART SHOWING FERTILISER SUPPLY CHAIN



4.4 Stake Holder/Institutions Involved In Fertilizer Distribution:

The following stake holders/institutions involved for distribution of fertilizer in the state, which includes.

- MARKFED
- PPL
- Nagarjun Fertilizer
- IFFCO
- Coromondal Fertilizer
- Fertilizer manufacturer
- Fertilizer distributor
- LAMPS
- PACS
- Private dealers
- Village Agriculture Workers(VAW)
- Assistant Agriculture Officer(AAO)

- Deputy Director of Agriculture(DDA)
- District Collector
- Director Of Agriculture And Food Production(DAFP)

5.0 SWOT ANALYSIS

In this study an attempt has been made to study the strength weakness, opportunities and threat of the fertilizer distribution system with an idea to take policy decisions to strengthen the system and also to convert weakness to opportunities. While executing the distribution system proper watch to be given on the factors concerning for success of the distribution system.

5.1 Strength:

- Fertilizer requirement for different villages is estimated at GP level by the Village Agriculture Worker through Palli Sabha/Grama Sabha.
- Fertilizer requirement for the district is estimated by the Deputy Director of Agriculture by compiling the total requirement estimated for different blocks by the Assistant Agriculture Officer.
- The Agriculture Strategy Committee at district level is involved in estimating fertilizer requirement for the district and approves the total requirement.
- In the existing fertilizer distribution system includes Corromandal fertilizer, PPL, IFFCO, Nagarjuna fertilizer which are the major fertilizer companies facilitate fertilizer distribution to the farmers. Through their agencies, Cooperatives societies, LAMPS and private dealers
- The government officials including District Agriculture Officer, Deputy Director Agriculture, Director of Agriculture and food production and District Collector keep close watch to the fertilizer distribution in the district.
- Technical personnel of the agriculture department visit farmer's field twice in a month, and monitor the use of fertilizer in the crops.

5.2 Weakness:

- The present distribution system does not provide fertilizer to the farmers in time.
- Sufficient quantity of fertilizer is not made available to the farmers, as result farmers do not able to meet their fertilizer requirement.
- Many of the beneficiary farmers have not undergone any training on fertilizer use on different crops.
- All the farmers even pay 10 to 14% more cost over the minimum retail price (MRP) fixed for different type of fertilizer which affects the poor and marginal farmers for use of proper quantity of fertilizer.

5.3 Opportunities:

- National food security mission and the project on success of Second Green Revolution in Eastern India are operating in Odisha the farmers should take the advantage of such programme.
- 75% of the beneficiary farmers know the use of fertilizer in the crops
- Qualified technical graduates are now working in the department of agriculture; the farmers should take the advantage of them.

5.4 Threats:

- Due to non availability of different types of fertilizer (Nitrogenous, Phosphatic and potassium) in time with the farmers, the fertilizer used in crops becomes unbalanced which affects productivity.
- Fertilizer is applied to the plant at a particular stage of growth, due to non availability of fertilizer in time; the farmers miss the stage when fertilizer is to be applied as a result total use of fertilizer per hectare becomes less than requirement which reduces productivity.
- Many farmers are not satisfied on the services provided by the agriculture department on fertilizer distribution.

6.0 SUPPLY - DEMAND GAP IN FERTILIZER DISTRIBUTION:

As per practice, the Deputy Director Agriculture of the district estimate the total requirement of fertilizer for the whole district and send it to the Director of Agriculture who finally place it as indent to different manufacturing industry. The manufacturing industry supplies the fertilizer through their agencies to different blocks. The farmers purchase it for use in the crops. In this study, the total indent is treated as demand for fertilizer and the fertilizer used by the farmers is considered as supply of the fertilizer. Based on this concept total demand and supply gap of fertilizer has been analyzed for three selected districts and presented in Table-1 for Angul, Table-2 for Gajapati and Table-3 for Puri district.

6.1 Demand- Supply gap for fertilizer in Kharif season:

The total demand and supply gap of fertilizer for Kharif season has been analyzed for three selected districts and presented in Table-1 for Angul, Table-2 for Gajapati and Table-3 for puri district.

Table 1: Demand and supply of gap in Kharif 2014-15 in Angul district

Sl. No	Name of the Nutrient	Programme for Kharif -2014	Consumption during Kharif - 14	Deficit in %
1	N(Nitrogen)	4,776.40	2566.10	46.275
2	P(Phosphates)	2,246.20	476.48	78.78
3	K(Potash)	1,197.20	408.40	65.87
4	Total =	8,219.80	4,450.98	45.85
Fertilizers use in KGs per hectares		38.95	21.09	

Source: Report of the Agriculture strategy committee meeting for Angul District in 2014-15
Kharif

Table 2 : Demand and supply gap in Kharif 2013-14 in Gajapati district

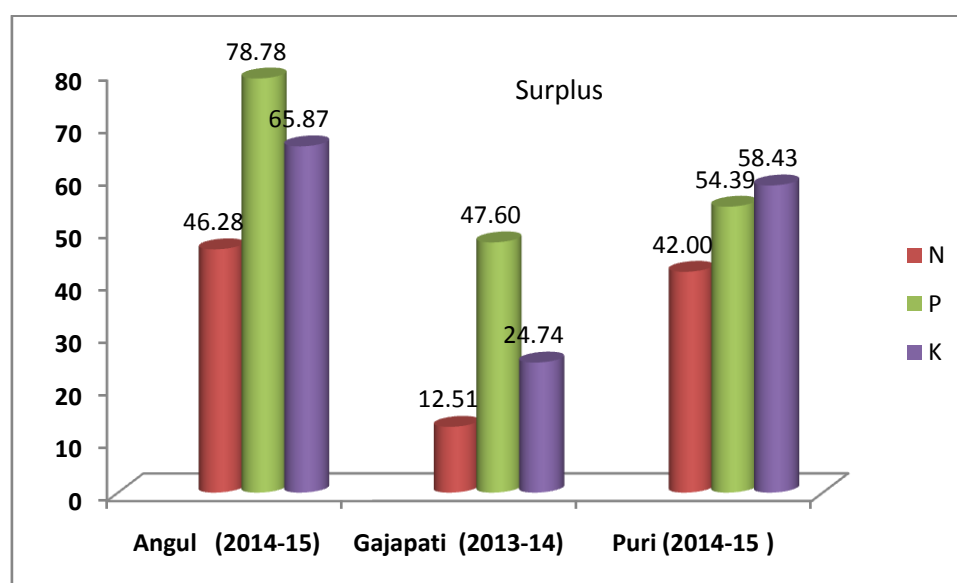
SI No	Name of the Nutrient	Programme	Consumption	Deficit in %
1	N(Nitrogen)	3070.14	2685.94	12.51
2	P(Phosphates)	1472.14	771.3	47.60
3	K(Potas)	331.2	413.02	24.74(surplus)
4	Total =	4873.48	3870.26	20.58
Fertilizers use in KGs per hectares		55.26	43.74	

Table 3 : Demand and supply of gap Kharif 2014-15 in Puri district

SI No	Name of the Nutrient	Programme for Kharif -2014	Consumption during Kharif -14	Deficit in %
1	N(Nitrogen)	7,778	4,536.848	42%
2	P(Phosphates)	2,537	1157.058	54.39%
3	K(Potash)	1,390	577.716	58.43%
4	Total =	11,705	6,272	46.41%
Consumption kg/ha		72.43	38.8	

Source: Report of the Agriculture strategy committee meeting for Puri District in 2014-15
Kharif

Figure 1 : Comparison of Deficit (%) in Demand and supply gap in Kharif for 3 Districts



*All figures is in Deficit except Figure of K (24.74) is in surplus in Gajapati.

6.2 Demand- Supply gap for fertilizer in Kharif season for three selected districts

Angul	Gajapati	Puri
<ul style="list-style-type: none"> Based on the demands for fertilizer, the use of fertilizer was planned 38.95 KG per hectare for Kharif 2014-15, due to deficit in supply, the actual use of fertilizers was reduced to 21.09 kg/ha. 	<ul style="list-style-type: none"> Based on the demand for fertilizer, the use of fertilizer was planned 55.26 KG per hectare for Kharif 2013-14, due to deficit in supply, the actual use of fertilizers was reduced to 43.74.09 kg/ha. 	<ul style="list-style-type: none"> Based on the demand for fertilizer, the use of fertilizer was planned 72.43 KG per hectare for Kharif 2014-15, due to deficit in supply, the actual use of fertilizers was reduced to 38.80 kg/ha.
<ul style="list-style-type: none"> The deficit in supply of fertilizer in terms of nutrients i.e. N,P and K are respectively 46.27%,78.78% and 65.87% 	<ul style="list-style-type: none"> The deficit in supply of fertilizer in terms of nutrients i.e. N, and P are respectively 12.51%, and 47.60%. But there is excess supply of potash to the extent of 20.58%. 	<ul style="list-style-type: none"> The deficit in supply of fertilizer in terms of nutrients i.e. N,P and K are respectively 42.00%, 54.39% and 46.41%
<ul style="list-style-type: none"> on a average in Kharif season, the deficit in supply of total fertilizer was 45.85% in the district 	<ul style="list-style-type: none"> on an average in Kharif season, the deficit in supply of total fertilizer was 20.58% in the district 	<ul style="list-style-type: none"> on a average in Kharif season, the deficit in supply of total fertilizer was 46.41% in the district

6.3 Demand- Supply gap of fertilizer in Rabi season for three selected districts.

The total demand and supply gap of fertilizer for Rabi season has been analyzed for three selected districts and presented in Table-4 for Angul, Table-5 for Gajapati and Table-6 for Puri district.

Table 4: Demand and supply gap in Rabi 2014-15 in Angul District.

SI No	Name of the Nutrient	Programme for Kharif -2014	Consumption during Kharif -14	Deficit in %
1	N(Nitrogen)	1671	1244	25%
2	P(Phosphates)	1103	678	38.53
3	K(Potash)	871	520	40.29%
4	Total =	3645	2442	33.00%
Consumption kg/ha		38.43	25.75	

Sources: Report of the Agriculture Strategy Committee meeting of Angul district for Kharif 2015

Table 5: Demand and supply gap in Rabi 2013-14 in Gajapati district

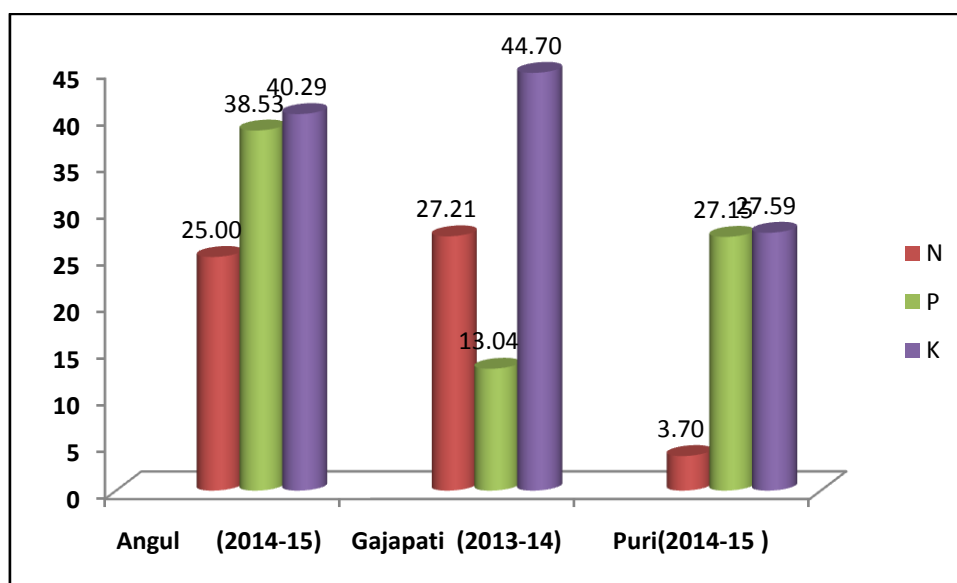
SI No	Name of the Nutrient	Programme for Kharif for 2013-14	Consumption in 2013-14	Deficit in %
01	N(Nitrogen)	2127	2705.94	27.21(surplus)
02	P(Phosphates)	887	771.3	13.04%
03	K(Potash)	747	413.02	44.70%
Total		3760	3890.26	3.46%(surplus)
Consumption (kg/ha.)		74.76	44.17	

Table 6 : Demand and supply gap in Rabi 2014-15 in Puri District

SI No	Name of the Nutrient	Programme for Rabi 2014-15	Consumption in 2014-15	Deficit in %
01	N(Nitrogen)	4776	4599.55	3.70%
02	P(Phosphates)	2320	1690.12	27.15
03	K(Potash)	2040	1477.15	27.59
Total=		9136	7766.82	14.98
Consumption (kg/ha.)			60.23	

Source: Report of the Agriculture Strategy Committee Meeting, Puri for Kharif 2015

Figure 2 : Comparison of Deficit (%) in Demand and supply gap in Rabi for 3 Districts



**All figures is in Deficit except Figure of N (27.21%) is in surplus in Gajapati.*

Angul	Gajapati	Puri
<ul style="list-style-type: none"> Based on the demand for fertilizer, the use of fertilizer was planned to 38.45 KG per hectare for Rabi 2014-15, due to deficit in supply, the actual use of fertilizers was reduced to 25.75 in Rabi season kg/ha. 	<ul style="list-style-type: none"> Based on the demand for fertilizer, the use of fertilizer was planned to be 74.76 KG per hectare for Rabi 2013-14, due to deficit in supply, the actual use of fertilizers was reduced to 44.17 kg/ha. 	<ul style="list-style-type: none"> Based on the demand for fertilizer, the use of fertilizer was planned planned 70.85 KG per hectare for Rabi 2014-15, due to deficit in supply, the actual use of fertilizers was reduced to 60.23 kg/ha.
<ul style="list-style-type: none"> The deficit in supply of fertilizer in terms of nutrients i.e. N,P and K are respectively 25%, 38.53 % and 40.29% 	<ul style="list-style-type: none"> The deficit in supply of fertilizer in terms of nutrients i.e. P, and K are respectively 13.04%, and 44.70%. But there is excess supply of Nitrogenous fertilizer to the extent of 27.21%. 	<ul style="list-style-type: none"> The deficit in supply of fertilizer in terms of nutrients i.e. N,P and K are respectively 3.70%, 27.15% and 27.59%

<ul style="list-style-type: none"> On an average in Rabi season, the deficit in supply of total fertilizer was 33.00% in the district. 	<ul style="list-style-type: none"> On an average in Rabi season, the deficit in supply of total fertilizer was 3.46% in the district. 	<ul style="list-style-type: none"> On an average in Rabi season, the deficit in supply of total fertilizer was 14.98% in the district.
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7.0 FARMERS RESPONSE ON FERTILIZER DISTRIBUTION SYSTEM:

Farmer's response on fertilizer distribution has been studied by conducting a field survey among the beneficiaries in selected blocks of three districts.

Farmer's response in three selected blocks (Chhendipada of Angul district, Gumma block of Gajapati district and Nimapada of Puri district)

CHHENDIPADA	GUMMA	NIMAPADA
<ul style="list-style-type: none"> There is deficit in supply of fertilizer to the extent of 67.75%. 	<ul style="list-style-type: none"> 45% of the beneficiaries get their nitrogenous fertilizer 15 days after the day of requirement. Even 30% of the farmers do not get sufficient quantity of fertilizer to meet the requirement. More than 50% of the farmers reported that phosphate and potassium fertilizer are not made available to them as per the requirement. 	<ul style="list-style-type: none"> There is deficit in supply of fertilizer to the extent of 27.64%.
<ul style="list-style-type: none"> 70.00% farmers reported the fertilizer is not available in the cropping seasons 	<ul style="list-style-type: none"> 30.00% farmers reported the fertilizer is not available in the cropping seasons 	<ul style="list-style-type: none"> 20.00% farmers reported the fertilizer is not available in the cropping seasons
<ul style="list-style-type: none"> 70.00% farmers have not undergone any training on fertilizer use in crops. 	<ul style="list-style-type: none"> None of the beneficiary farmers have undergone any training on fertilizer use on different crops. The farmers only use the fertilizer on the crop by getting instruction on the pattern and quantity of application. 	<ul style="list-style-type: none"> 80.00% farmers have not undergone any training on fertilizer use in crops.

8.0 SUMMARY, CONCLUSION:

The findings of the study have been summarized and conclusions drawn are presented below:

- Fertilizer requirement for different villages initially estimated by the Village Agricultural Worker (VAW) at GP level through conducting Palli sabha, and Grama sabha.
- The Assistant Agricultural Officer (AAO) compiles and prepares the total requirement of fertilizer for the block and sends it to the Deputy Director Agriculture (DDA), who compiles the total requirement for the district.
- After the total requirement of the fertilizer for the district is approved by the Agriculture Strategy Committee (ASC), it is sent to the Director of Agriculture Food Production (DAFP), who compiles the requirement of the fertilizer for the state both for Kharif, and Rabi season.
- The Director of Agriculture and Food Production, finally send the State's total fertilizer requirement to the different Fertilizer Manufacturing Company as indent for the state. Then the fertilizer manufacturers supply the fertilizer to the state to different distributors.
- Finally the Large sized Multipurpose cooperative society (LAMPS), primary agriculture cooperative society (PACS), and private dealers receive the fertilizer from the distributors and distribute to the beneficiaries of Gumma block
- 45% of the beneficiaries get their nitrogenous fertilizer 15 days after the day of requirement. Even 30% of the farmers do not get sufficient quantity of fertilizer to meet the requirement in Gajapati.
- More than 50% of the farmers reported that phosphate and potassium fertilizer is not made available to them as per the requirement in Gajapati.
- All the farmers even pay 10 to 14% more cost over the minimum retail price fixed for different type of fertilizer in Gajapati.
- The deficit in supply of fertilizer in terms of nutrients i.e. N, P and K are respectively 25%, 38.53 % and 40.29% in Anugul district and 12.51% and 47.60% deficit. in terms of nutrients i.e. N, and P in Gajapati

- The deficit in supply of fertilizer in terms of nutrients i.e. P, and K are respectively 13.04%, and 44.70% in Puri district But there is excess supply of Nitrogenous fertilizer to the extent of 27.21% in Puri.
- Few farmers have undergone any training on fertilizer use on different crops.
- The beneficiary farmers regularly need the support of the technical personnel for technical knowhow.
- The farmers want that the present pattern of contact of the technical personnel with the farmers still needs improvement.

9.0 CONSTRAINTS IN THE FERTILIZER DISTRIBUTION SYSTEM :

The existing fertilizers system have number of constraints in terms of timely supply, Quantity and availability in balanced manner which tends low and unbalanced use of fertilizer. Some of the constraints listed below

- The deficit in supply of fertilizer in terms of nutrients i.e. N, P and K are respectively 25%, 38.53 % and 40.29% in Angul district and 12.51% and 47.60% deficit. in terms of nutrients i.e. N, and P in Gajapati
- The deficit in supply of fertilizer in terms of nutrients i.e. P, and K are respectively 13.04%, and 44.70% in Puri district But there is excess supply of Nitrogenous fertilizer to the extent of 27.21% in Puri, which encourages unbalance use of fertilizer.
- 70 % farmers in Angul, 30 % in Gajapati and 20% farmers in Puri district reported that fertilizer is not available in the cropping season.
- 70% farmers in Angul and 80% farmers in Puri have not under gone for any training on fertilizer use in crops
- None of the beneficiary farmers in Gajapati district have not under gone any training on use of fertilizers in crops.

10.0 POLICY OPTIONS:

Based on the findings of the study and conclusion drawn, the following policy options are formulated not only for proper distribution of fertilizer to the beneficiaries but also for improvement in the use of fertilizer and its intake by the crops.

1. The non-availability of different types of fertilizer (Nitrogenous, Phosphoric and potassium) in time with the farmers, the fertilizer used in crops becomes unbalanced which affects productivity. The fertilizer manufacturers should be advised to supply the fertilizer before 15 days of the showing of the crops. (Para 6.2)
2. Fertilizer is applied to the plant at a particular stage of growth, due to non-availability of fertilizer in time, the farmers miss the stage of growth where fertilizer is to be applied, and as a result total use of fertilizer per hectare becomes less than requirement which reduces productivity. Keeping this in view, the government officials like Deputy Director of agriculture and collector of the district should take steps for adequate and timely supply of fertilizer, so that the farmers will not only use balance doses of fertilizer but also fertilizer can be applied at proper stages of crop growth, which will lead higher productivity.(Para 7.0).
3. Fertilizer inspectors should be vigilant for sale of the fertilizer not more than minimum retail price.(Para 7.0)
4. Farmers training on fertilizer use in agriculture should be increased. (Para 7.0)
5. Visit of the technical personnel to the farmer's field may be made in an organized way preferably a fixed date/day of a week/fortnight/ month may be fixed to a particular group of farmers so that farmers must meet with their field problems.
6. Supply of fertilizer may be increased to meet the requirement of the farmers in terms of quantity and type of fertilizer. (Para 7.0)