

Agro-Economic Policy Briefs

Aiding the Future of India's Farmers and Agriculture



**On critical policy issues
in India's Agricultural
Economy**

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Contents

- | | |
|--|----|
| 1. Challenges of the Rubber Industry in Kerala | 2 |
| 2. An Evaluation of Government's Market Intervention Scheme for Non-MSP Crops | 5 |
| 3. Advantages of Using Neem Coated Urea | 8 |
| 4. The Adoption of Soil Testing and Recommended Doses of Fertilizers in Andhra Pradesh | 10 |
| 5. Evaluation of Kisan Call Centres in Maharashtra | 12 |

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For kind attention of:

The Hon'ble Prime Minister's Office,
the Ministry of Agriculture and Farmers Welfare,
and all others interested

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Challenges of the Rubber Industry in Kerala

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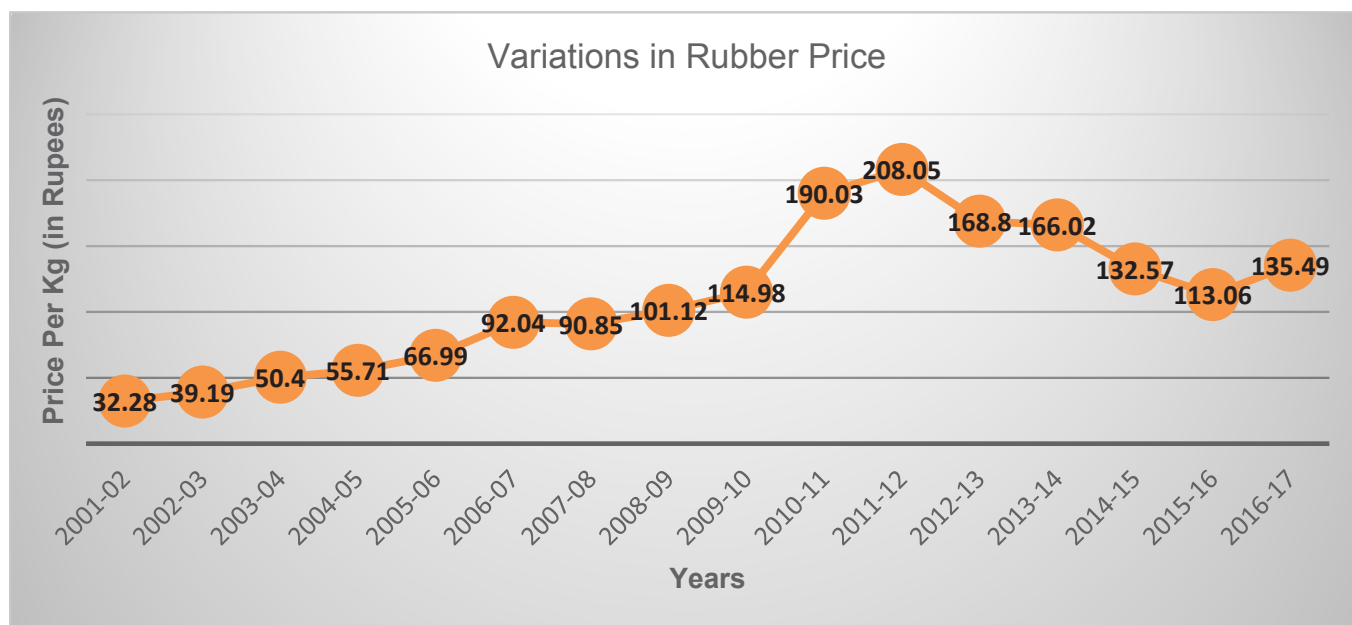
coconut have recovered; rubber industry is facing serious difficulty.

- Although rubber had been a remunerative crop in Kerala, there had been a tendency to switch from one crop to the other depending upon the relative prices. The expansion of the cultivation of Cocoa in the 1970s and Vanilla in the 2000s illustrates this phenomenon. Similarly, the price of natural rubber showed an increasing trend in 1994 and this trend continued up to 1997. After 1997, the price showed a decreasing trend which continued up to 2002. From the mid of 2002 the price of natural rubber started a recovery and reached its peak in 2012 (Figure 1). However, after that there was a sharp decline in the prices in all the consecutive years, except for 2016-17 (Figure 1).

Introduction

- India is among the top ten rubber producing nations in the world and Kerala is the leading rubber plantation state in India. Natural latex is one of the most important raw materials available for making various kinds of products in heavy industries such as motor and vehicle industry, kitchenware and houseware industry. A few years ago, many farmers in Kerala had shifted from coconut to rubber, eyeing a decline in coconut prices but now as the prices of

Figure 1: Price Variations of Rubber (RSS-4) for last 15 Years (2001-16)



Source: Calculated from Rubber Board (Ministry of Commerce and Industry, Government of India) Data

- Kerala's share in the national rubber production has come down to 69.7 percent from around 92 percent a decade ago. This decline has multiple reasons including cheap rubber imports to the country, climate change and price instability.

Figure 2: Rubber sheets under process in Kerala

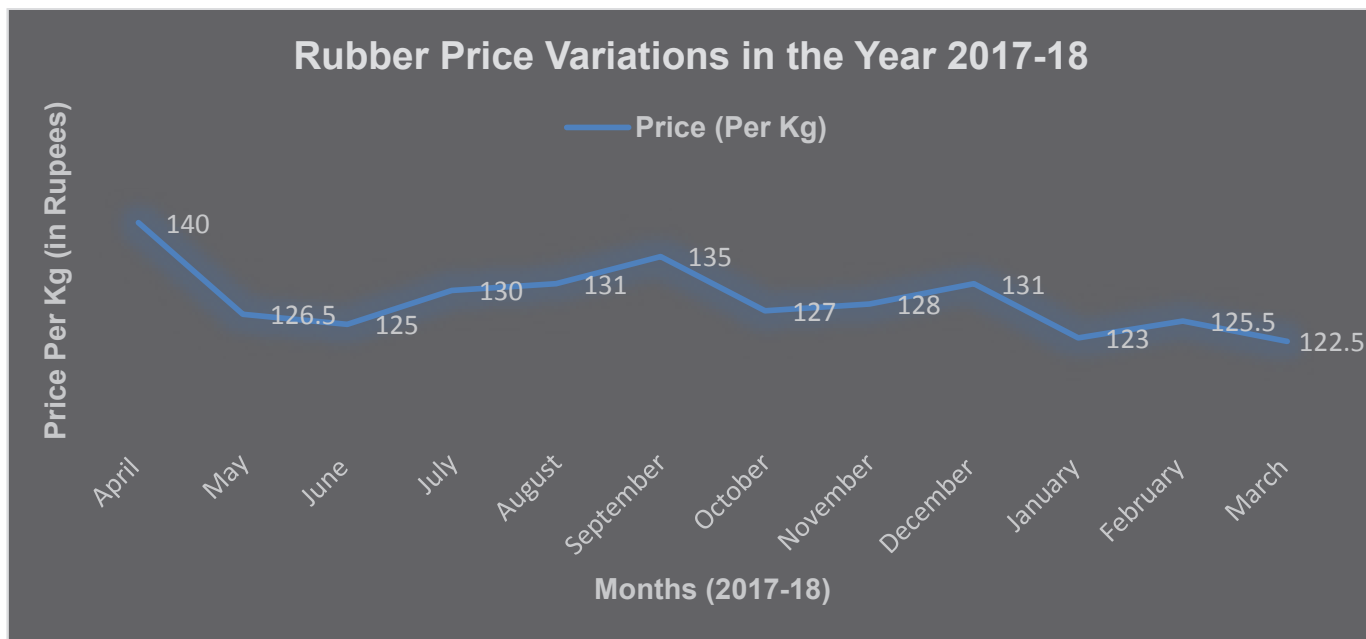


Source: www.thenewsminute.com

Findings

- The rubber plantations form the backbone of hill stations of the State. Rubber has lost its sheen due to continuous price declines. But on the other side, the cost of production is showing an increasing trend. The tapping charges are still the same as when rubber had attractive prices. There are a lot of plantations left without tapping because the farmers are finding it difficult to even meet the cost of tapping. There are so many farmers who leave the latex uncollected and sell as residue rather sheets.
 - The challenges that the sector is facing may have implications on the state's employment and the trade and transport sector may also get affected adversely. The employment scenario will get affected as many farmers are not hiring labourers for tapping. Consequently, if there is no production or less production, the trade and transport associated with the industry would suffer losses.
- During March 2017, the price of rubber was Rs. 160 while in March 2018, the price fell down to Rs. 125. The residue latex rate has also come down to Rs. 80 per kg from Rs. 90 per kg last year. As shown in Figure 3, the price of rubber in the market has been declining in general, except for some insignificant improvements in some months. For instance, the farmers never received the price that they received in the beginning of the economic year 2017-18, which was Rs. 140 per kg. There were sharp declines in the months of May and June and a slow pick up in September. The other half of the year (October-March) marked declining price throughout, affirming farmers' loss. A lot of plantations have been given up for clearing by cutting the trees on a contract basis. However, even this practice fetches less money for the owner because rubber wood is considered a residue wood which has a low commercial value.

Figure 3: Price Variations of Rubber (RSS-4) for last 12 Months (2017-18)

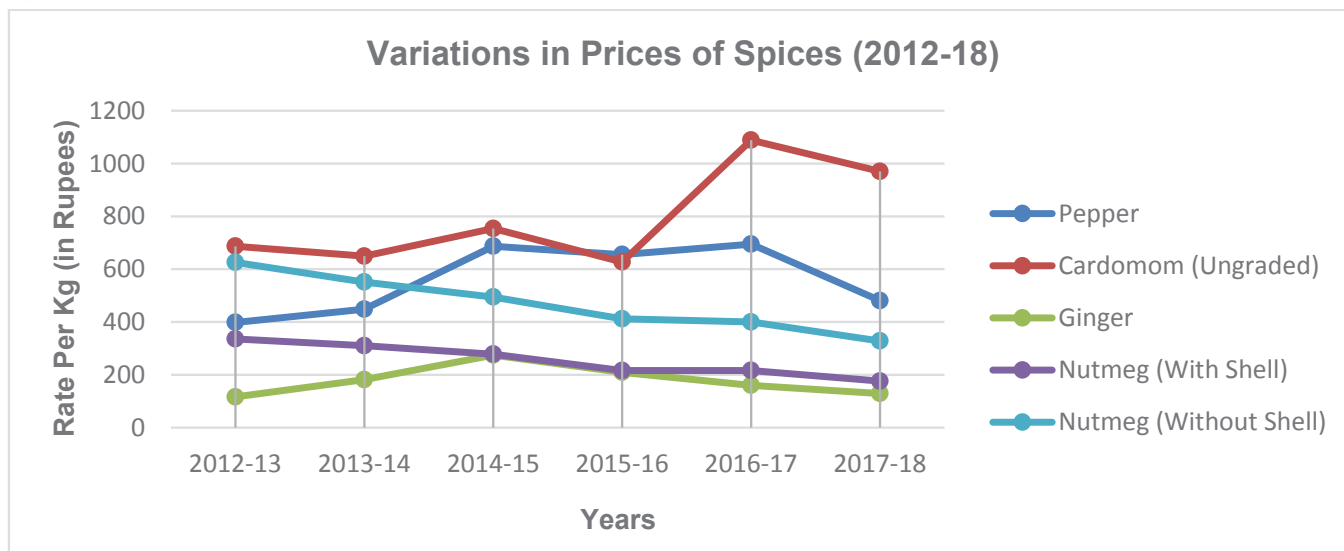


Note: Calculations are made on provisional data, by taking each month closing price as the rate of the month.

Source: Calculated from Rubber Board (Ministry of Commerce and Industry, Government of India) Data

- Further, farmers tried to incorporate mixed farming and intercropping in their fields to improve the economics. Coconut and pepper are popular intercrops in rubber fields now. Cocoa, pineapple, banana, tapioca and nutmeg have also been intercropped by the farmers, but none of them marked a positive change in the prices for this year (Figure 4). Farmers now believe that rubber has become a 'very unattractive venture' in Kerala. They believe that the unrestricted massive imports of natural rubber by tyre companies have resulted in a decline in the domestic demand.

Figure 4: Price Variations of Spices for Last 6 Years (2012-18)



Source: Calculated from Spices Board (Ministry of Commerce and Industry, Government of India) Data

- Among the crops, banana used to help (as an intercrop) the farmers whenever they incurred losses from major crops. But now the adverse climatic conditions have also led to a decline in the prices of banana. The price for banana was around Rs. 40-50 per kg in August 2017 and in March 2018, the price had reduced to Rs. 30-35 per kg. At the same time, the cost of cultivation remained the same for some of the farmers while increased for others. According to a rough calculation, cost of banana cultivation is around Rs. 170 per plant and the yield is around 8-10 kg (at Rs.30-35 kg), leading to no profit or loss scenario. Besides this, banana plantations are highly vulnerable to pests and drought which impose additional burden on farmers.
 - Among the many spices of Kerala, pepper used to acquire the top spot. However, the prices have been declining in pepper too. As shown in Figure 4, price of pepper in the market has fallen drastically in 2018 after a relatively consistent price in the past 3 years. As shown in figure 4, all the other spices in the market are also marking a negative trend for the year. The fall in cardamom price is only exceptional because the price is relatively high and the price decline is relatively small. Nutmeg and ginger, two other major intercrops have also lost their market value in the past few years, distressing the farmers even more.
- Recommendations**
- The Government should curb imports or increase the import duty of rubber.
 - Low-frequency tapping can bring down cost of production substantially without a reduction in the yield, and also enhance the economic life of rubber plantations. This will reduce the number of tappers required per unit area. The government should take initiatives in this direction.
 - The Rubber Board should take up the initiatives to promote a rubber grower-centric approach to enhance net income from all possible means (such as intercropping, integrated or mixed farming), rather than focussing on rubber cultivation alone.
 - The concerned authorities should focus on formulation of State-specific plans for overall development of the rubber industry.
 - The Kudumbashree scheme and MGNREGA can immediately be integrated with agricultural sector to overcome the issue of labour scarcity in Kerala, and in the rubber tapping and processing sector.
 - The authorities should support farmers with Minimum Support Price (MSP) like schemes, since the Rubber and Spices market in Kerala is highly prone to bulk agricultural imports from other countries.
 - Necessary actions should be taken to avoid the mismatch of actual price given to farmers and the official price declared.
 - The Rubber Board should provide a subsidy on tapping wage, in order to improve the situation of stagnated tapping in the state.

An Evaluation of Government's Market Intervention Scheme for Non-MSP Crops

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Introduction

- The Market Intervention Scheme (MIS) is an ad-hoc decision where state governments invite the Central Government for intervention, if either of the price or production related condition for a commodity prevails. The first condition is about production exceeding more than 10 percent from the preceding year and price is about to depress due to extra production. The second condition requires that price of a commodity falls below 10 percent from the preceding year's price irrespective of the production.
- MIS is a price support scheme and it is for commodities other than the 24 listed for the Minimum Support Price (MSP). Some of the commodities covered in MIS during earlier years are - onion, potato, chilly, cumin, coriander, *isabgol*, fenugreek, *saunf*, *ajwain*, turmeric, garlic, *moth* and *guar*. There is limited market information for these commodities, and prices tend to fluctuate over years.
- The present evaluation is a coordinated study with three Agro-Economic Research Centres (AERCs) located in Vishakhapatnam, Vallabh Vidyanagar

and Shimla. The commodities included are fruit (C-grade apple) in Himachal Pradesh, spice (garlic) in Rajasthan and oil palm in Andhra Pradesh. The farmers surveyed were from Shimla and Kullu districts in Himachal Pradesh, Kota and Baran districts in Rajasthan, and West Godavari and Khammam districts in Andhra Pradesh. The objectives for covering these commodities seem to vary. The micro-level concerns like distress sale dominates garlic in Rajasthan, while macro-level concern as that of deficiency in edible oil in the country dominates the case of palm oil in Andhra Pradesh.

Findings

- The analysis shows that procurement was higher in districts with greater concentration of production. However, requirement for procurement decreased if facilities for market-related post-harvest infrastructures (density of roads and regulated markets) in a region increased. In fact, with the improvement of market related infrastructure, particularly of private players and the requirement for government procurement reduced. Inclusion of farmers in government procurement depended upon the regularity of MIS operation. For example, resource-poor small farmers growing apple and palm-oil did not complain about their exclusion, while farmers growing garlic complained, even though the small farmers required cash immediately after the harvest.

Table 1: MIS in different districts of Rajasthan in the selected years

Sr. no.	Year	Crops	Covering districts	Major Procurement Agencies
1	2004-05	Onion	Jodhpur, Nagore, Sikar, Jhunjhunu, Jaipur	Rajasthan State Cooperative Marketing Federation (RAJFED)
2	2004-05	Coriander	Kota, Baran, Jhalawar	RAJFED and National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED)
3	2012-13	Garlic	Kota, Baran, Jhalawar and Bundi	RAJFED, Tilam Sangh

Source: AERC Vallabh Vidyanagar Report 149

Table 2: Coverage of districts for different fruits in Himachal Pradesh till 2013

Apple	Kinnow, Malta and Orange	Mango	Apple	Kinnow, Malta and Orange	Mango
Shimla	Una	Una	Kinnaur	Bilaspur	Bilaspur
Kullu	Solan	Solan	Chamba	Hamirpur	Hamirpur
Mandi	Mandi	Mandi	L/Spiti	Chamba	Chamba
Sirmour	Sirmour	Sirmour	Solan		
Kangra	Kangra	Kangra			

Source: AERC Shimla Report on MIS

Table 3: District-wise Procurement of Oil Palm under MIS in Andhra Pradesh in April 2011

AP Districts	Quantity (MTs)	Share of Quantity to Total Quantity	Quantity (MTs)	Share of Quantity to Total Quantity
Srikakulam	45.805	0.34	106.404	0.45
Vizianagaram	479.364	3.60	736.646	3.14
Vishakhapatnam	220.612	1.66	320.782	1.37
East Godavari	3544.034	26.62	5689.0493	24.23
West Godavari	6798.572	51.07	12866.432	54.80
Krishna	1212.825	9.11	1957.171	8.34
Khammam	877.051	6.59	1624.154	6.92
Nellore	133.35	1.00	180.24	0.77
	13311.61		23480.87	

Source: AERC Report No 149, Vishakhapatnam

- The price paid to farmers in MIS operations is called intervention price and it is supposed to be higher than the price of commodity in the farmers' market, if there has been no MIS operation. This was also higher than the explicit cost of production but unlike MSP in the most cases of MIS (barring oil palm), there is no system to arrive at an intervention price. The intervention price is significantly lower than the price of such commodity in consumer market.
- Dearth of involvement of a procurement agency with a pan-India network which can timely dispose procured commodity to a desired place could be one of the many reasons for the losses.
- It was noted that distress sales of resource poor farmers were not reported in oil palm. In C grade apples, in spite of the regularity in MIS operation, it was not sought after since farmers' payments were delayed by a considerable time (about a year) in most cases.
- The study also found that farmers' produce was at times rejected in procurement, while traders continued to sell their produce through MIS. This was found to be more frequent in garlic where supply of produce for procurement is large but period of MIS operation is short. This also happens due to the problem in identification of farmers. Inadequate knowledge of farmers about Fair Average Quality (FAQ) of a produce is another reason for the rejection of farmers' produce.

Table 4: Procurement of commodities under MIS in different states and years

Year	Commodity	State	Quantity Procured (MT)
1999-2000	Oil palm	Andhra Pradesh	65000
		Karnataka	3189
	Onion	Maharashtra	65000
	Kinnow/Malta	Himachal Pradesh	148
2000-01	Apple(kinnaur)	Galgol	85
		Himachal Pradesh	1982
		Himachal Pradesh	44000
2001-02	Red chillies	Andhra Pradesh	602
	Oil palm	Andhra Pradesh	37824
		Karnataka	2489
	Arecanut	Goa	171
2002-03	Arecanut	Karnataka	3097
		A&N Island	204
	Potato	Uttar Pradesh	885
2003-04	Ginger	Mizoram	15000
	Potato	West Bengal	8275
	Chillies	Andhra Pradesh	27910

Year	Commodity	State	Quantity Procured (MT)
2004-05	Coriander seed	Rajasthan	594
	Ginger	Mizoram	5900
	Onion	Rajasthan	26
	Hatkora	Mizoram	1410
	Apple C grade	Himachal Pradesh	32500
2005-06	Ginger	Mizoram	6400
	Black Pepper	Kerala	4755
	Chillies	Andhra Pradesh	9581
	Apple C Grade	Himachal Pradesh	22362
	Hatkora	Mizoram	1700
2006-07	Chilli		1250
	No procurement		
2007-08	Ginger	Mizoram	20194
	Passion fruit		8000
	Chilli		4250
	Apple C grade	Himachal Pradesh	27000
		Uttarakhand	115
2008-09	Malta C grade		116
	Chilli	Mizoram	1810
	Passion Fruit		9000
	Apple C grade	Uttarakhand	17
		Himachal Pradesh	28541
	Malta C Grade	Uttarakhand	69
	Chow Chow	Mizoram	3180
	Oilpalm	Andhra Pradesh	30000
		Karnataka	800
	Orange	Nagaland	16000
2009-10	Areca nut	Karnataka	6000
	Potato	West Bengal	
		Uttar Pradesh	
	Oilpalm	Andhra Pradesh	
	Apple C grade	Himachal Pradesh	
2010-11	Potato	Uttar Pradesh	
	Areca nut	Karnataka	

Source: Ministry of Agriculture, Government of India

Recommendations

- An MIS operation based on defined conditions (price) will instil confidence in growers of those crops which are excluded in the list of MSP commodities. Since conditions for MIS are defined, automatic approval of the same will add certainty to such operations. A clear criterion for market interventions will benefit all stakeholders. This will help procurement agency to decide location of purchase centres and disseminate it properly.
- Certainty in the scheme would also strengthen state and ground-level collectives for participation in procurement. A regular MIS operation may encourage collectives to look for profitable distribution networks around consumer markets

since price difference between producer and consumer markets of a commodity is substantial. This will inculcate professionalism in procurement agencies and the MIS will not remain a loss making proposal.

- The MIS is for the farmers, and any procurement under MIS must be of farmers' produce only. In this context, the crop sowing report (Girdavri Report) of farmers is important. This must be issued by a district official, generated through an online system and should mention the purpose. This would prevent fraudulent sale (by non-farmers, resale by traders) of commodities in purchase centres.
- The study proposes that information about FAQ of a commodity should be disseminated properly so that

an average farmer is aware of FAQ for a commodity and chances of non-conformity of farmers' produce would be less. The study proposes procurement for a reasonable period (2 months) so that price in producers market remains higher than the explicit cost of production of the commodity.

- The certainty of MIS operation must be ensured to provide price insurance to farmers for many perishable agricultural commodities. In the long run improvement in roads, storage, warehouses, cold chains, market (e-market) and processing facilities remain important. Development of such facilities in a democratic, federal structure as that of India takes inordinate time, and market intervention becomes more important for that period.

Advantages of Using Neem Coated Urea

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Introduction

- The use of mineral fertilizers has increased several folds in a quest to ensure food security globally. It is expected that the rates of fertilizer use would further increase over the years in order to meet the growing demand for food grains of the population and also due to the increasing access to fertilizers both in terms of cost per unit and availability of fertilizers across the world. In order to minimise the use of mineral fertilizers, after years of experimentation, it was found that by fortification of urea with Neem Oil at the concentration of 350 Parts Per Million (PPM), rate of solubility of urea can be reduced and resulted in slow release of urea in the field conditions. Reduced solubility enables plant to absorb higher amount of total nitrogen applied than the normal urea, ultimately increasing Nitrogen Use Efficiency (NUE) in crops.
- Even though Nitrogen (N), Phosphorous (P_2O_5), and Potash (K_2O) are essential for the healthy growth of plants, their presence in excess adversely affects some aspects of plant growth such as formation of flowers and other necessary reproductive organs. Plants cannot absorb all the excess nitrogen in the soil, leading to problems such as leaching of extra nitrogen in soil and subsequent contamination of groundwater with nitrates. Further, a portion of urea through de-nitrification gets converted into nitrous oxide, one of the Green House Gases (GHG). The Global Warming Potential (GWP) of Nitrous Oxide

(N_2O) is 265–298 times higher than that of Carbon-di-oxide over a 100-year timescale.

- It is the NUE of a plant which determines the ratio of actual uptake of nitrogen by plant and its losses to emission of nitrous oxide (N_2O), leaching of nitrate, and other reactive nitrogen. Due to limited NUE of crops, only 20–30 percent of the nitrogen inputs are being converted into food for human consumption and unless adequate attention is paid, there would be resource losses both economically and ecologically, such as loss of nitrogen fertilizer to leaching and volatilization, consequent N_2O emissions, nitrogen contamination of water sources and increasing water treatment costs globally.
- India by 2030 will become the most populated country and to feed the population it would need to produce an additional 100 million tonnes of food grains, invariably with increased use of urea (Table 5). Fertilizer subsidy in 2014-15 was around Rs. 6,797 billion. Out of this, subsidy for imported urea was Rs. 1,230 billion and domestic urea was Rs. 3,100 billion.
- During 2015-16, the government had set aside a budget of Rs 7,300 billion – about 0.5 percent of GDP – on fertilizer subsidies. Nearly 70 percent of this amount was allocated to urea, making it the largest subsidy after food subsidy. To counter the burgeoning fertilizer subsidy bill and also to increase Nitrogen Use Efficiency, Indian agricultural scientists have experimented with fortification of urea to reduce its solubility, leaching, volatility and thus help in better Nitrogen Use Efficiency (NUE). Hence, the use of Neem Oil for fortification of urea was recommended.

Table 5: Consumption of Fertilizers in India over the Years (in '000 Tonnes)

	N	P	K	Total
1950-51	58.7	6.9	-	65.6
1960-61	210.0	53.1	29.0	292.1
1970-71	1487.0	462.0	228.0	2177.0
1980-81	3678.1	1213.6	623.9	5515.6
1989-90	7386.0	3014.2	1168.0	11568.2
1995-96	9822.8	2897.5	1155.8	13876.1
1999-00	11592.7	4798.3	1678.7	18069.7
2005-06	12723.3	5203.7	2413.5	20340.5
2009-10	15580.0	7274.0	3632.4	26486.4
2014-15	16945.4	6098.4	2532.3	25576.1
2015-16	17372.3	6978.8	2401.5	26752.6

Source: Department of Agriculture, Cooperation & Farmers Welfare

- Neem Oil or Neem Seed Oil is a brownish yellow colour liquid, with a smell of garlic. It is used in manufacturing insecticide which affects over 600 species of pests including insects, nematodes, fungi and viruses and is completely safe to non-target organisms like beneficial predators, honey bees, pollinators, fish, birds, cattle and human beings. Azadirachtin of Neem oil is a famous natural antifeedant, growth regulator and ovipositional

repellent for insects, as a major active ingredient, which makes it a perfect alternative to chemical pesticides. Recognizing the potential benefits associated with NCU relative to NU, the Ministry of Agriculture and Farmers Welfare (MoA&FW), Government of India, included NCU in the Fertilizer Control Order (FCO) since July 2004 and subsequently made the production and distribution of NCU mandatory from 25th May, 2015.

Figure 5: Urea and Neem Coated Urea



Source: www.wotc.in, www.indiamart.com

Findings

- A study by Ramappa and Manjunath (2017) conducted in six districts covering irrigated and rain-fed areas, the farmers indicated that the quality of NCU available is good and it is available easily and in adequate quantities.
- Majority of the sample farmers reported improvement in the yield levels for all crops and their by-products with the application of NCU. Further, this study suggested that there was a decline of

about 10 percent (about 30 million tonnes) in the consumption of urea. The Government of India also decided to reduce the size of urea bags to 45 kg from 50 kg in view of better NUE of NCU in 2016-17.

- Based on findings, an estimated 10 percent reduction due to neem coating of urea, guess estimates of financial benefits are computed and given in Table 6. It can be seen that approximately about Rs. 450 million were saved by the government due to Neem

Coated Urea in the initial years of introduction and it is bound to increase over the years. At micro level, each farmer will be reducing the use of urea, thus

reducing the input costs and increasing the farmers' profits.

Table 6: Financial Benefits of Neem Coated Urea

Detail	In Rs	In Rs Millions
Government Subsidy per Tonne	15000	0.015
Subsidy per 1 million tonnes	1500000000	1500
Subsidy saved per 0.3 million Tonnes		450

Source: AERC Bangalore.

Table 7: Benefits of NCU

Benefits to Farmers	Benefits to Government
Better Plant growth due to reduction in excessive urea application	Reduced demand for Urea to import and thus saving of foreign exchange
Better crop yield and consequently increased household income for farmers	Reduced Fertilizer Subsidy Bill
Prevention of urea to leaching, thus resulting in saving of farmer's money	Reduced demand for urea for agriculture
Reduced volatilization of Urea and reduced release of N ₂ O	Reduced agriculture emission and hence easier complying of Intended Nationally Determined Contribution of GHGs
Reduced nitrate content in runoff from agriculture	
Reduced nitrate contamination in groundwater	
Better soil microenvironment and improved soil fertility over the time	
Climate Change related Benefits	Environmental Benefits of NCU
Reduced emission of N ₂ O from N fertilizer application (both from leaching and volatilization of urea)	Neem oil acting as bio-pesticide
Reduced Green House Gases from process of urea manufacturing, packaging, transportation (life Cycle emissions)	Reduced incidence of pest attacks
Carbon emission from process emission	Reduced need for use of pesticides
Increased scope for some other carbon emission activity	Increase in soil microflora diversity

Recommendations

- For farmers, the benefits of Neem Coated Urea include lower input costs, ready availability of urea in the market and better soil environment. For Government, it results in the reduced need for urea. In this way, the government can avoid the need for investing in manufacturing or importing urea from the international market and reduce its subsidy bill.
- Fortification of urea with neem oil can be done with minor adjustments in the process of manufacturing of urea. Several tangible and non-tangible benefits can be achieved and therefore, it is suggested that all manufacturing units must consider adoption to urea manufacturing process to make Neem Coated Urea.

The Adoption of Soil Testing and Recommended Doses of Fertilizers in Andhra Pradesh

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Introduction

- Scientists have suggested soil testing and accordingly

adoption of recommended doses of fertilizers in the fields in order to make the most efficient use of the limited resource of land. Farmers must adopt these new methods to enhance yield of the crops so that the production gets a boost.

- Inorganic chemical fertilizers are a primary source of nutrients for a healthy plant growth, even though these have particular problems in the application.

To avoid all these problems, National Project on Management of Soil Health and Fertility (NPMSF) was started in 2008-09.

- A study was conducted to find the ground level utility of the scheme to the farming community and to know the efficacy and reach of the scheme to the farmers. The objectives of the study are - examining the level of adoption of the scheme and the constraints in the application of recommended doses of fertilizers based on soil test reports by the farmers, analysing the impact of adoption of recommended doses of fertilizers on crop productivity and the incomes of farmers.

Findings

- No sharp increase in the fertilizer consumption in the Combined Andhra Pradesh (1994-10) was found even though Muriate of Potash (MOP) showed a high increase. Residual Andhra Pradesh had 3 percent growth rate during the study period (1994-2015) for nitrogen, and this higher growth rate was derived from four districts viz. Kurnool (5 percent), Ananthpur (4.3 percent), SPS Nellore (4 percent) and Guntur (3.4 percent).
 - It was found that paddy farmers practised monoculture, while cotton farmers practised poly-culture.
 - The average distance from the soil testing laboratory ranged from 27 km to 30 km for the samples of paddy and cotton crops, those being the only source of a government laboratory.
 - Farmers lacked knowledge of chemical fertilizer input usage since a majority of the sample farmers of both paddy and cotton crops were using a low dosage of nitrogen and a high dosage of phosphorus and potash.
 - The adoption of recommended doses of fertilizers was greater in marginal and small sized groups than in the large and medium groups of sample farmers from cotton crop, while a higher number of large and medium farmers in paddy cultivation adopted the recommended doses. However, all the farmer groups from both selected crops strongly wished to adopt the recommended doses in the future.
 - The small farmer size groups had private fertilizer shops and were members of the co-operative societies as the societies were primary and exclusive sources for fertilizers for them, while the large and medium farmers bought the fertilizers from dealers and distributors in addition to the above two sources.
- The sample farmers of both paddy and cotton crops reported a rise in the yield due to soil testing, and they viewed the accrual of benefit through the reduction of other inputs and the achievement of the soil health due to soil testing for cultivation.

Recommendations

- Increasing proximity of Soil Testing Laboratories (STL): There is an urgent need of Soil Testing Laboratories (STLs) for every three to four blocks in Andhra Pradesh. One STL with one agricultural scientist will certainly be helpful not only for soil tests but also for land reclamation and organic-bio fertilizer training. The scientist would represent as the standing counsel for technical know-how to the farmers in the assigned area.
- Since the existing landholdings are more than 11 thousand per block in Andhra Pradesh (Agricultural Census 2011-12), having 51 STLs across the state would be highly useful. Proximity of soil test centres to the farmers would have better influence in generating the awareness and importance of soil testing for the proper cultivation. It will reduce the distance for access to laboratory and enable the farmers to attend the training programmes at the nearest place.
- The results could be made available to the farmer to the given mobile in his/her local language. This would further facilitate the farmer to interact with the testing laboratory for consultation in future for the change of crop. The Soil Health Card (SHC) and soil test results should be made available before May/June for every year.
- Intensive Soil Testing: Intensive testing of soil would enable the farmers to follow a proper fertilizer dosage at the right time, and it will facilitate better yields of the cultivated crops.
- Coverage of Marginal & Small Farmers: The marginal and small farmers would achieve the upper strata in yields and incomes through the proper coverage of the soil testing and the maintenance of the soil health in the long run. Hence, it is imperative to cover all farmers from these landholding sizes under 'Soil Testing Programme'. The soil testing grid could be 2 hectares to 2.5 hectares in the farms to cover all the landholding sizes.
- Availability of Organic Fertilizers: All the farmers expressed the need of availability of organic fertilizers. Hence, the prices of these inputs should be kept at a lower level.

Evaluation of Kisan Call Centres in Maharashtra

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Introduction

- The urgent need to improve the extension services to farmers is of great priority. Maharashtra has about 13.7 million landholdings spread over a gross cropped area of about 23 million hectares which explains the huge task involved in providing advisory services to farmers. However, Information and Communication Technology (ICT) is now one way to bridge the gap and meet location specific information needs of farmers. Accordingly, the government took a new initiative by launching a scheme entitled Kisan Call Centres (KCC) on 21st January 2004, with the main purpose of responding to queries of farmers on agriculture related information through telephone, in the farmers' own dialect.
- In view of the above, a study was conducted to observe the implementation and performance of the Kisan Call Centres in Maharashtra, located in Pune. A detailed questionnaire was addressed to all stakeholders in the scheme such as Farmer Tele Advisers (FTAs), supervisors and finally farmers who are the beneficiaries, in order to assess the functioning of KCCs.

Findings

- The study observed that the Farmer Tele Advisers (FTAs) who were instrumental in operating the KCCs were satisfied with the hardware as it was fast, reliable and well maintained. Even the supervisors were satisfied with the hardware as well as software, and by and large, all equipment installed in the KCC were efficient.
- It was observed that the most frequent source of knowledge for FTAs was self-knowledge and internet search. They did not have up to date information on schemes implemented by government and when farmers wanted information on details of schemes so as to avail of certain benefits/subsidies, the FTAs were unable to give accurate information.

- The activity area of the FTAs was insufficient and their remuneration was not satisfactory.
- While KCCs can serve as a useful source of extension to farmers, the farmers revealed that the most important source of information was fellow farmers. Other major sources were mobile phones and televisions, but there was a limited use of Krishi Vigyan Kendras (KVKs).
- Resorting to websites for information was not popular and Farmers' Portal was seldom visited. The toll free number of KCC was easy to reach and majority of the farmers in the sample felt that KCCs provided useful advice on disease control decisions. Farmers on the whole felt that there was scope to improve the quality of information provided by KCCs on several issues related to farming.
- Over the period 2013-14 to 2016-17, it was observed the average calls per year were 6.9 lakh which meant an average of 1900 calls per day. As there are about 60 FTAs functioning per day, it appears that one FTA answers about 32 calls per day. While not answering calls, FTAs normally update their skills so as to improve their performance.
- Looking at the farmers' side, there are approximately 13.7 million farmers in Maharashtra and considering that the average calls per year is 6.9 lakh, it appears that participation by farmers is low on an average.

Recommendations

- More training programmes, field visits and knowledge sharing from nodal officers and others is required so that FTAs are better informed in handling the queries of farmers.
- There is thus, a tremendous scope to capitalize on the potential of KCCs as a source of extension services to farmers. Farmers must be made more aware of the scheme and must be encouraged to use it, while FTAs must be very well equipped to answer the queries of farmers.
- When the KCC scheme scales up, farmers will get accurate advisory services which will avoid crop failure and lead to a rise in productivity. With the increased productivity, prices will stabilize and the agricultural sector will get the much required boost.

Figure 6: Kisan Call Centres in Maharashtra



Source: CMA, IIM Ahmedabad