

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. Global supply-demand situation will remain tight for all the fertiliser nutrients in the near future, as demand has expanded more rapidly than was expected a few years ago. Though urea supply is projected to grow rapidly, surplus is likely to emerge only after 2010 as there continues to be growth in demand also.

2. Global phosphoric acid market will remain very tight, as no new merchant capacity is under construction. The DAP, TSP and MAP markets will remain balanced, as very few producers have available swing capacity for exports. Potash supplies would increase in most exporting countries but no significant potash surplus will develop before 2011 due to faster growth in demand caused by increasing emphasis on more balanced use of fertilizers. The increased emphasis on balanced fertilization will increase the consumption of phosphate and potash in India too.

3. India will remain a net importer of most fertilizer raw materials in the near future and may significantly increase imports of urea and DAP. Only the urea sector could see some capacity additions as a result of expected conducive government policy and feedstock supply. Meeting the gap through higher imports is the most undesirable alternative in terms of subsidy bill, employment and even national food security in the longer-term.

4. The problems of soil health and

long-term food security are complex and there is no single magical solution. It needs an integrated and holistic approach for all sectors and sub-sectors having forward and backward linkages like fertiliser, agriculture, energy, etc. However, the policy changes must be effected in a phased manner without losing sight of the ultimate objective.

5. Agricultural Subsidies are essential. However options of delivering subsidy needs to be explored to make the input supplying industries globally competitive. A move towards market forces, even if gradual and carried out in a phased manner could be helpful in leading to ultimate decontrol.

6. Concessional price of gas (say capping at \$ 4.5-5.0 / mmbtu) with assured supply for fertiliser sector to make Indian fertiliser industry globally competitive would, in the long term, be preferable to the current system of 'fertiliser subsidy'.

7. Strong partnership between industry and Government is required and some pain may have to be shared by both during the period of transition. The industry has a crucial role to play but can do so only if it is healthy and vibrant. The domestic fertiliser industry needs better returns if it has to play a partnership role in the development of Indian agriculture and rural economy.

8. In a world of scarce and declining resources, rising prices, growing population and increased uncertainty due to climate change, it is essential to strive for achieving the dual objectives

of farm intensification and resource conservation. This would require increased use of improved farm-management techniques like fertilizer deep placement, fertilizer banding, drip irrigation, fertigation and other similar measures designed to increase nutrient use efficiency. It would also call for research to develop more efficient products such as controlled-release and smart-release fertilisers (nanotechnology).

9. Additional research is needed in developing high-yielding variety crops more narrowly suited to local soil, climate and market conditions.

10. Apart from energy security, employment generation, economical gain and social security, the bio-fuels have enormous environmental benefits being superior in many aspects than conventional source of energy i.e. petrol and diesel. The worldwide study including India reveals the superiority of the bio-fuel over conventional fuels. But promotion of biofuels has serious implications on demand and supply of food, feed and fertilisers which needs to be appropriately examined.

11. Declining fertiliser use efficiency is not unique to India alone. China also has witnessed a similar trend. The fertiliser consumption in China increased with a growth rate of one million tonnes per year since 1950's reaching to 56 million tonnes in 2006. However, with over use and misuse, there has been gradual decrease in fertiliser use efficiency. Particularly nitrogen use efficiency in China decreased from 35% in 1990s to 27.5%

currently. There is an urgent need for improving nutrient use efficiency.

12. Improved farm management practices supported by effective extension services can help in improving nutrient use efficiency. A national level project on Fertiliser Best Management Practices (FBMPs) in China on an average saved N by 20 - 40%, increased crop yield by 2-12%, improved N recovery rate by 10-15%, and decreased N loss by 10-50% over 9 cropping systems.

13. Among micronutrients, zinc deficiency is the most widespread and 50% of world cereal production is potentially zinc deficient. Zinc deficiency ranks among the leading 10 risk factors of death and diseases in human beings. Low zinc content in soil, high soil pH, high phosphate application, high salinity, water logging and low manure application are the main causes of zinc deficiency. Widespread Zinc deficiency has been found in rice-wheat cropping system in Indo-Gangetic plains. Application of 25 kg zinc sulphate per hectare helps to increase wheat and rice yield by 500 to 1000 kg/ha. Zinc fertilisers also help in fighting zinc deficiency in humans by enhancing zinc content in crops.

14. The results of extensive research conducted the world over have established that sulphur (S) deficiency is limiting crop production, affecting crop yield, quality of produce and economic returns. The problem of S deficiency and availability is more critical in India compared to other countries. In India the production of S containing fertilisers was 4.3 million tonnes in 2005-06 providing only 0.66 million tonnes of S i.e. less than 4 kg/ha. Sulphur application, therefore, needs special attention to improve crop productivity in India.

15. There is a need for substantial capacity additions in India to meet the emerging supply-demand gaps.

Technological options are available for substantial increase in capacity of existing ammonia and urea plants. Although, these options require some additional investment, these are most cost effective way of enhancing production capacity. More importantly, this can be achieved without disruption of the production in the operating plants.

16. The problem of handling, producing and storing hazardous chemicals in acid and complex fertiliser plants along with the problem of pollution control and waste disposal could be tackled effectively without affecting production through timely technological and management initiatives, as was proved by one of the world's largest complex fertiliser plant in India.

17. Kyoto Protocol under Clean Development Mechanism (CDM) offers a great prospect for Indian fertiliser industry to improve efficiency as well as profitability by way of carbon credits. A number of projects which have been implemented or one under implementation could qualify as CDM projects such as energy efficiency projects, fuel or feed switch projects, CO₂ recovery projects, process gas recovery projects, N₂O abatement projects etc. It has been estimated that there would be a demand of carbon credits equivalents (CER) to reduction of about 4842 million tonnes CO₂ by developed countries during 2008-12. This offers a great opportunity to Indian fertiliser industry with estimated potential of about 33.8 million tonnes CERs per year. Investment in such projects can be paid back in short time.

18. One of the challenges in fertiliser marketing is that of ensuring delivery of fertilisers in adequate quantities in remote and inaccessible areas. This needs strengthening of the entire distribution system. The Government of India has introduced an online

Fertiliser Monitoring System (FMS) to achieve this objective. FMS is expected to generate a powerful data base which could be utilised appropriately to incentivise fertiliser distribution throughout the country including the remote and inaccessible areas.

19. Lack of infrastructure is another bottleneck in effective fertiliser distribution. The Government has already initiated a number of schemes to expand capacities at ports, road and rail transportation. Storage and marketing infrastructure also needs to be developed to improve fertiliser distribution and farm economy.

20. Fertiliser industry would now have to put more emphasis on value added marketing.

21. The lack of effective public extension services is another bottleneck in promoting balanced fertilisation, improving fertiliser use efficiency, improving crop yields and finally increasing the net farm income of the farmers. There is an urgent need for strengthening public extension services. The basic thrust of new extension activity is on public-private partnership with stronger Krishi Vigyan Kendra (KVK) under the Indian Council of Agricultural Research (IARI) and Agriculture Technology Management Agency (ATMA) concept. A synergistic functioning of these two institutions will bring about necessary motivational support system for increasing agricultural productivity in the country.

22. Indian fertiliser industry has already been providing a number of extension services like village adoption, farmers' field days, crop seminars, demonstration and film shows, distribution of literature etc. However, these needs to be strengthened further and appropriately dovetailed with the public extension services to supplement the Government's efforts.

RECOMMENDATIONS

1. Agricultural policies should be integrated and dovetailed into the policies of other related sectors, particularly input supplying industries and energy sectors for deriving quick results in terms of improved agricultural productivity and farm incomes which is essential for achieving 4% growth in agriculture. Overall economic policies particularly those related to reforms, pricing and subsidy on fertilisers, energy and agricultural produces have serious implications and should be in coherence with each other. These policies should not be formulated in isolation. A holistic approach is needed.

2. The sustainable agricultural development underlines the need to improve the resource use efficiency, protect environment and guarantee the grain supply.

3. The supply-demand gap in fertilisers is likely to widen significantly by 2011-12. Urgent measures are needed on the part of Government to spur investment in the sector for substantial capacity additions and to improve the infrastructure in procurement, storage and distribution of fertilisers.

4. Investment decisions require clarity on the policy front. The Indian fertiliser industry today carries a very negative connotation in the minds of investors and will find it difficult to raise capital. Therefore, signals of change are urgently required. Even if the initiatives are taken now, new capacities cannot come up before another 3-4 years. The longer we delay the situation will only worsen further.

5. A time bound plan must now be made to move away from cost-plus pricing of fertilisers to international benchmark like Import Parity Price (IPP). There is an urgent need for narrowing / eliminating the gap

between international and farm-gate prices of fertilisers, particularly urea, over (say) the next three to five years and for incentivising creation of additional capacities and change-over of non-gas based older vintage urea plants to gas based ones. Long term certainty regarding gas pricing (say for 20 years) and priority usage of gas for fertilizer industry are required for capacity additions, improving fertiliser availability and reducing cost.

6. Fertiliser and energy policies need to be announced well in advance to achieve the overall objective of agricultural growth. These should be transparent, stable and should never be amended with retrospective effect. The policies should be based on long-term considerations, easy to understand and less cumbersome.

7. The revised SSP policy needs to be put in place immediately before it is too late, as the industry is on the verge of closure. Long term policies for phosphate and potash fertilizers are required to avoid more severe shortages next year.

8. Nutrient-based pricing policy could address problems of unbalanced use of fertiliser nutrients, deteriorating soil health and stagnation in crop productivity.

9. Although Fertiliser Best Management Practices (FBMP) is a feasible solution to tackle the problem of unbalanced and inefficient use of fertilisers, there is still a long time lag between research on experimental plots and the technology being widely adopted by farmers. Regular interaction of researchers, extension workers and agricultural experts with farmers is needed to encourage the adoption of FBMPs at the field level.

10. There is increasing need for application of micronutrients particularly zinc along with other nutrients to maintain soil fertility, crop

productivity and human health. The methods and measures which can build zinc content in edible parts of plants need to be promoted to reduce the risk of malnutrition in human being. Efforts should also be made to develop zinc efficient varieties of crops using biotechnology.

11. Sulphur must be recognized as an essential fertiliser nutrient. Global sulphur fertiliser availability should be improved to correct sulphur deficiency and bridge the projected gap between demand and supply of sulphur. Emphasis should be given on promotion of sulphur through education and training of farmers by government extension agencies, fertiliser manufactures and dealers. Government policies should not impede production and use of sulphur bearing fertilisers. It should rather encourage use of sulphur as an essential plant nutrient and it should be included in state fertiliser recommendations.

12. In a situation where country is dependent on import of large quantities of fertilisers, all options for enhancing the domestic production capacity should be explored be it de-bottlenecking/revamping of existing plants or putting up new brownfield, Greenfield projects.

13. Enhancement of the production capacity of existing plants through debottlenecking/revamp is the most cost effective way of enhancing the domestic production. For achieving the objective, a range of technological options are available with process licensors. Selection of suitable technological option be made by each plant after a proper techno-economic study. Implementation of such projects should get encouragement by the Government with minimum restriction and controls.

14. Safety and environment should be given top priority in any operating fertiliser plants. It is applicable even

more to a phosphatic complex in which there are serious problems related to handling and storage of hazardous materials and disposal of waste. The plant owners should go beyond mere compliance with statutory requirement for making the plants safe and environment friendly.

15. There would be a demand for Certified Emission Reduction (CER) in short to medium term. Fertiliser industry being energy intensive has vast scope for improvement and hence earning carbon credits. Some of the units have already initiated the process and have registered their projects under CDM. Other units should also go for CDM projects to improve the viability of revamp and energy conservation projects.

16. Fertiliser Monitoring System is a powerful tool. However, its implementation has to be made practicable and user-friendly with the flexibility of necessary corrections and modifications. The speed of the package is also slow which needs to be

enhanced significantly to handle the massive data base.

17. Supply plans are worked out on the 20th of every month for the succeeding month. However, due to agro-climatic uncertainty, demand widely varies resulting in difference between envisaged supply plan and actual requirement at the field level. The system should provide for mid-course correction in supply plans to suit the actual requirement. Similarly, the 24 hours time allowed for uploading the import data is inadequate. The 5 days time allowed for uploading sales data is also inadequate to complete the process which requires at least 10 days.

18. There is a need to reorient fertiliser distribution policy with a view to augment adequate supplies in low consuming areas. This can be done by allowing free market forces to operate with appropriate incentive schemes rather than resorting to controlled distribution. Fertiliser companies also need to be passionate in creation and

delivery of consumer value through value added marketing of products and services to the farmers. Companies should strive to innovate new products and services more suitable to the farmers and the Government should encourage such innovations.

19. A number of governmental and non-governmental institutions including corporates are engaged in agricultural extension. Most important of them are the Krishi Vigyan Kendras (KVK) and Agriculture Technology Management Agency (ATMA) systems. KVKs and ATMA need to be expanded and strengthened to make them more farmer-friendly through major reforms.

20. A high degree of Public-Private and Cooperative partnership is needed to accelerate technology transfer in agriculture. Agricultural extension programmes also need to be closely linked to voluntary institutions like Self-Help Groups, Cooperatives and Farmers' organisations.