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GNFC in the Service of Farmers

Gujarat Narmada Valley Fertilizers Company Limited (GNFC) is in the business of fertilisers. GNFC is marketing its fertilisers in the states of Gujarat, Madhya Pradesh, Rajasthan, Maharashtra Punjab, Haryana, Uttar Pradesh, Karnataka, Andhra Pradesh and Tamil Nadu. GNFC also market traded fertilisers such as Single Superphosphate, Imported fertIllserslike DAP, MOP and Urea (as handling agent for GOI) in addition to its own produced fertilisers. The company is also engaged In services of farmers through transfer of technology at their doorstep by implementing various need based sales promotional programmes.

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AGRICULTURE IS THE BACKBONE OF Indian economy and accounts for about 21% of GDP. Agriculture provides employment to 64% of the workforce and earns about 13% of the India's foreign exchange. Government of lndia always gives top priority to agriculture in order to attain self-sufficiency in foodgrnins production. Evolution of high yielding varieties in late 60s particularly of wheat and rice has certainly helped the country to make it self-sufficient in foodgrains production. The country will have to lay more emphasis on increasing agricultural production in the country to make food, fibre and fuel available for the increasing population in sufficient quantity on sustained basis. In general, the average yield of different crops in lndia is lower compared to developed countries. Therefore. every effort needs to be made to increase average yields of different crops in the country.

Agriculture is spread in large areas of the country and the farmers in general are poor. less educated and traditionally custom/culture bound. Therefore. it takes time for adoption of any kind of new technology developed at the research centre. Agricultural technology developed at the research centre is required to be taken to the farming community without loss of time by using simple method which can be easily understood, absorbed and implemented by the farmers. State Department of Agriculture, Extension Wing of the Agricultural Universities and ICAR in the form of Krishi Vigyan Kendra and Krishi Gyan Kendra are engaged in transfer of developed technology to the farming community. Fertiliser industry has always been on forefront in the services of farmers for transfer of such developed technology to them since they are the only and valuable customers of fertiliser companies.

COMPANY'S PROFILE

GNFC PROMOTED BY THE GOVERNMENT of Gujarat and Gujarat State Fertilisers and Chemicals Limited and was launched on 10th May, 1976. GNFC created history in 1981 by issuing a share capital of Rs 436.1 million to 4,89,000 shareholders, majority of them individual farmers from Gujarat. The Company established its fuel oil based ammonia and urea plant along with offsite facilities at Rharuch, a backward district of south Gujarat. GNFC has used the best available and the world renowned process technologies for all its plants.

The capacity of ammonia and urea plants is 4,45,500 tonnes and 6,36,000 tonnes, respectively. Subsequent to the commissioning of the ammonia-urea complex in early 80s. company has been active from 1985 onwards for a major diversification into industrial chemicals such as methanol, formic acid, acetic acid. weak nitric acid, concentrated nitric acid, etc.. The company also worked on the revamp or expansion of capacities for high demand chemicals like methanol, concentrated nitric acid and acetic acid. GNFC is the India's largest producers of methanol, formic acid and acetic acid. company also established production facility of additional fertilisers such as ammonium nitrophosphate (20:20:0) and calcium ammonium nitrite having capacity of 1,42,500 tonnes of each plant. The company has its own 50 MW captive power plant. GNFC also markets it intermediate products such as liquid ammonia (surplus when available). methyl format. ammonium nitrate and other products by best utilising the waste gaseous and liquid effluents. Company also diversified its activities in the field of information technology (IT).IT activities include VSAT services, international gateway, internet service provider, and complete infrastructure facility required by IT companies at GNFC Info tower. GNFC has recently started the activity of digital signature certificate (PKI) along with required application development for the secured business. Therefore, GNFC *is growth nucleus for the country.*

SOCIAL COMMITMENT

A TRUST FORMED AND OPERATED BY GNFC employees, "Narmadanagar Rural Development Society (NARDES)" works for the poor, under privileged and needy human beings of the society. The entire trust is funded by the GNFC management and the contribution by employees. It carries out various activities, some of them are organising or participating in eye camps, health camps for the disabled. supplies of tri-cycles or the artificial limbs. blood donation camps, book banks, self-employment programmes, relief and re-building operations after natural calamities/disasters such as earthquake or tsunami or flood, including village adoption. women empowerment programmes and senior citizens activity club. The company has also recently constructed several check dams to conserve rain water in Bhavnagar district where water was hardly available immediately after monsoon. This has helped not only in improvement in the subsoil water level but also the farmers are able to tap water through the well for a longer duration. GNFC has also

established and operate English and Gujarati medium school at Bharuch. GNFC as a social responsibility of the backward district established and operate two English medium colleges for science, commerce, BBA, MBA, MCA and short-term diploma courses for the students of Bharuch and Narmada district.

GNFC, in addition to marketing of its own three fertilisers Narmada urea, Narmada phos and Narmada CAN, is also engaged in marketing of traded fertilisers like single superphosphate (SSP), diammonium phosphate (DAP) and imported fertilisers like muriate of potash, DAP and urea through a network of 9 regional offices and 20 area offices spread all over the country. The location of the same has been depicted in Figure 1 and state-wise shares on sale of manufactured fertilisers in 2004-05 are given in Figure 2.

The company has 236 agricultural graduates and post graduates to market the fertilisers. They also develop and conduct need based promotional programmes for the farmers. A glimpse of the GNFC in *the service of farmers* is as under:

YOUNG FARMERS TRAINING PROGRAMME

IT WAS OBSERVED DURING THE promotional programme in the villages that the young farmers are not taking interest in the farming activities. Such young farmers take up a small job or put up small store in the same village or nearby cities and establish there by deserting their traditional business of farming. The parents are not happy with such ideas of their sons. The young farmers are of the opinion that the traditional family business does not give enough earning for their expected luxurious life. They never want to get involved in hard laborious life like their parents. Therefore, for overall development of agriculture and involve the young farmers in their traditional business and thereby serve farming community, GNFC has come forward with a novel programme to impart both practical and theoretical knowledge of recent advances in agriculture to young farmers of Gujarat. This is 7 days residential training programme. This enables young farmers to consider agriculture as a commercial business and accept as a part of their life instead of migrating to urban area and taking up low value services due to poor educational qualifications. They are also educated that if a proper method and technology is used along with the proper care of soil health, farming can give better earnings compared to what they earn by accepting low value services. This exercise was initiated in 2003. Fourteen young farmers training programmes involving 321 young farmers have been organised till date covering all the districts of Gujarat. The next programme which is 15th in the series is planned for the young farmers of Vadodara district during 6th to 12th March, 2006.

Special focus during such training is through expert lectures on various issues related to advances in agriculture such as essential plant nutrients . their role and deficiency symptoms in different crops. fertilisers and their properties, their efficient use, role of soil testing, fertiliser recommendations for various crops. general fertiliser recommendations in crops, conversion of nutrient recommendations to fertiliser doses. hi-tech agriculture inclusive of green/net house technology, Drip and sprinkler irrigation. package of practices of different crops inclusive of field, vegetable and fruit grown in the respective area, importance of aromatic and medicinal plants, increasingly importance of crop diversification. Importance and advantages of Kisan credit card and crsdit procedures, merhod of agriculture in Israel, proper plant care through optimum concentration of herbicides. insecticides and fungicides through imparting practical knowledge. use of various agricultural machinery and their practical training. integrated plant nutrient supply system and also integrated pest management system, practical training on

Figure 1 - Marketing network

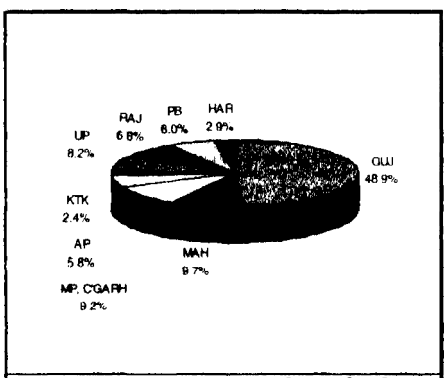


Figure 2 - State-wise share of sale of manufactured fertilisers

Sales of different fertilisers by GNFC for the last three years

Year	Narmada urea	Narmada phos	Narmada CAN	Imported urea	SSP	MOP	Imported DAP
2002-03	653502	121875	119390	2233	21894	59878	148
2003-04	651795	136183	77383	7268	24926	58875	10444
2004.05	634205	179301	169934	283584	14058	76496	6455

Young farmers training programme

in-house development of vermi compost/ compost technology and dairy farming, etc. The in-house faculties are developed for majority of the area. However, special training from outside' specialists of agricultural universities. department of agriculture, government of Gujarat and NABARD etc. is also organised. Some of the practical and theoretical training is also arranged by taking them to agricultural universities. The feedback received from the old age fanners as well as the young farmers is quite encouraging and positive. The old age farmers and young farmers are now not only work together but also sometime adopt both their traditional procedure in pan of the farm and the young trained farmer new procedure in the remaining part of the farm to evaluate the same. Therefore, Young Farmers Training Programme is organised regularly with an objective that farmers of Gujarat will consider agriculture as a commercial business. It is hoped that the concept of agriculture as a business will become farmers' slogan and the same is possible in Gujarat in view of better farmer's orientation and capability of accepting the same in the state. The young fanners, who participate in the programme, are being enrolled as members of Narmada Kisan Parivar (NKP) scheme. These members are regularly sent NKP magazines to keep them informed of the latest development in farm technology. It is now planned to establish club of these young farmers and update their knowledge and skills time to time on recent advances in agriculture so that they can play a vital role in transfer of technology to other farmers. This will be a unique service to the farming community.

SERVICE TO FARMERS

IT IS A UNIQUE SERVICE OFFERED BY GNFC for the farming community. The company continues to upgrade the professional skills of the farmers, cooperative and trade personnel and NGOs by organising their visits to GNFC fertiliser plant. The farmers are explained various scientific activities undertaken at demonstration farm and soil testing laboratory. They are also taken to urea, calcium ammonium nitrate and ammonium nitrophosphate plants. They are explained the method of production of fertilisers and bagging of end products. They witness the actual analysis of the fertilisers produce and also the actual weighment procedure on the automatic weighing system. They get satisfied about quality and quantity of the products that they are using at their field. Many issues related to both these areas are almost get clarified during such visit. Expert's lectures and slide shows on 'Agriculture in Israel of effectively using the scare water resources and efficient use of fertilisers and water management' are also conducted during the visit. They are also explained the need of proper dosage of fertilisers and evaluate the farm output with reference to the nutrient input so that the farming becomes commercially viable. During the open session, there is exchange of ideas thereby establishing a two way communication to get the feedback of the farmers about their changing requirements. This is a regular schedule of the GNFC. In the the years 2004-05, 42 trips consisting of 4.325 farmers, dealers and cooperative personnel from different parts of Gujarat, Maharashtra, MP and Rajasthan were organised. In the last three years, 141 visits consisting of 10,544 farmers were organised and expert lectures held. The feedback of the visitors about the service is quite encouraging.

Efforts in e-Farming through Model NKSK - Kiosk

GNFC has developed a model Narmada Khedut Sahay Kendra (NKSK) at Kamrej, Surat District of Gujarat where facility of information kiosk is provided. In order to serve the needs of rural people of Gujarat, the entire information is designed in Gujarati language and it provides intuitive graphic oriented interface to encourage easy navigation. This caters the need of farming community of Gujarat and transfer of technology at the grass root level with higher speed and accuracy. Model NKSK has the following vital information to access :

- It provides information about recent advances in agriculture in cultivation of crops like field crops (wheat. rice, bajra, sorghum, pigeon pea, cotton, sugarcane), vegetables (brinjal, chilli. tomato, ladies finger) and fruits (banana, mango, chickoo, guava, pomegranate, lemon, aonla) and high tech agriculture (green house, drip irrigation system, tissue culture plants) with relevant photographs of insects/diseases/weeds, wherever possible. The software is designed to give the interactive information.
- It also provides information on various agricultural implements and their characteristics along with photographs to support the given information.
- It promotes use of fertilisers as per specific recommendations in terms of the fertilisers and simple methods to increase fertiliser use efficiency.
- It reveals importance of soil testing and method of collecting soil samples, etc.
- A registration facility is provided for the farmers to register themselves as and when they visit the model NKSK. It contains name, address (village, taluka, and district), phone no., land area. crops generally raised. etc. This information is stored in the database so as to access it from time to time for the use by the farmer as well as GNFC.
- Farmers queries are handled either through e-mail or visiting farmer's queries stored in the database and replies are sent at the appropriate time.
- Details on various developmental programmes of' Government of Gujarat. National Horticulture Board, Agricultural and Processed Food Products Export

Farmers plant visits

2002-03		2003-04		2004-05		Total	
No. of visits	No. of farmers	No. of visits	No. of farmers	No. of visits	No. of farmers	No. of visits	No. of farmers
62	3,170	37	3,049	42	4.325	141	10,544

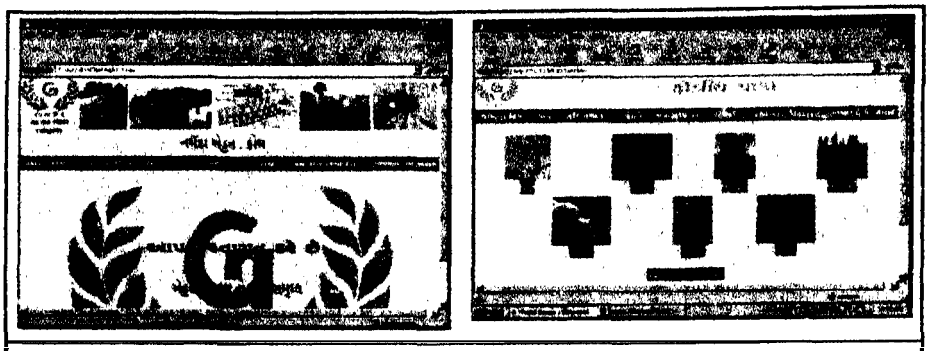
Development Authority, cold chain product, Sardar Patel Farmer's award instituted by State Government, etc., have been provided in the model NKSK. This helps the farmers in updating their knowledge as well as future crops to be considered for receiving the maximum benefits from the market.

♦ Weather information is provided by linking the model NKSK through internet to the site of Indian Meteorology Department, Pune. In addition, relevant information is also made available for obtaining the specific information for Gujarat districts. districr-wise weather information such as temperature. rainfall and forecast related to agriculture. This information is inserted daily in this computer at the model NKSK. This is carried out either by accessing the information through internet or by collecting the information from the mass communication media like TV. telephones, newspapers, etc.

User friendly touch screen facility to access agricultural information

♦ The market prices of agricultural produce are very volatile. There is wide variation in the market price of the end product from region to region, hour to hour. and day to day. The information on prices and demand-supply balances of agricultural produce is also made available by linking the model NKSK with local markets (*mandis*) and remote sensing application through internet.

♦ GNFC soil testing laboratory has developed Oracle based software. On the basis of soil test report and soil fertility status. fertiliser recommendations for various crops are retrieved through this software.



Website for farmers

♦ Model NKSK at Kamrej. being a one-stop shop in which all inputs will be made available under one roof and therefore setting up of the kiosk is beneficial to the farmers and also to the company for the promotion and extension services. The pilot project is setup with Internet facility which helps the farmers in accessing the latest information. Printer facility is also provided so as to help farmers in getting the information as hard copy.

There exists a scope of improvement in providing a large number of applications (software) at the kiosk. This will be determined as and when the need arises. Development of applications shall be based on the problems faced by farmers at ground level. Feedback from the farmers regarding what information they require/desire from the model NKSK will help in developing useful and efficient applications for the farmers. In future, few applications that can be incorporated such as multimedia based education clips, literacy promotion drives. e-quizzes and business application packages to make the model NKSK more interesting and useful. Two officers remain in constant contact with the farming community. They collect the soil samples and feed the information of soil analysis report in the computer and maintain database. The visiting farmer's database is also maintained in the model NKSK about the soil types, crops, change in cropping system, economic conditions, irrigation facilities, yield of different crops, use of different resources, etc. The model NKSK was made available to the farming community on 23rd October, 2004. About 1.200 farmers have visited till date to the model NKSK and collected the valuable information related to agriculture. A conference1 discussion room having capacity to accommodate 12 farmers at a time is also provided for the farmers to discuss their problem with the staff of NKSK. Interactive sessions are held in the room. Important agricultural magazines in Gujarati are also displayed in the conference room.

Interactive sessions are held with the help of model NKSK utilising GNFC's transportable VSAT facility. Experts at GNFC have interactive sessions with the invited farmers at model NKSK to solve their problems. The transportable VSAT van of GNFC was utilised in Andhra Pradesh by National Institute of Agriculture Extension Management for transfer of agriculture technology related information to many villages of the state. The scientists available at Hyderabad used to interact with farmers in remote areas with the help of the transportable VSAT van. The transportable VSAT van facility was also used in New Delhi at India International Trade Fair for the benefits of the visiting farmers when the experts interacted with the farmers from Bharuch. Even the hon'hle Chief Minister of Gujarat had a discussion in the fair with the farmers with the help of transportable VSAT van who assembled at model NKSK, Kamrej. Facility of modem 'touch screen' kiosks is provided to encourage less educated farmers to use the facilities without any problem. This was just a beginning in the form of a pilot project. The pilot project has succeeded in fulfilling the desired objective of transfer of improved farm technology

and use of modem facility for the better earnings of the farmers. The facility is being replicated at 5 other places to cover entire Gujarat.

RURAL DEVELOPMENT PROGRAMMES

GNFC UNDERTAKES VARIOUS INTEGRATED rural development programmes like fertilisers demonstration, farmers meetings, crop seminars, veterinary camps, distribution of fruit - tree grafts. women welfare programmes, school children motivational programmes and distribution of sports items to them. These educational programmes help the farmers in their day-to-day activities. These activities are carried out in 18 villages of Bharuch districts every year.

Need based agricultural programmes organised by the regional offices of the GNFC

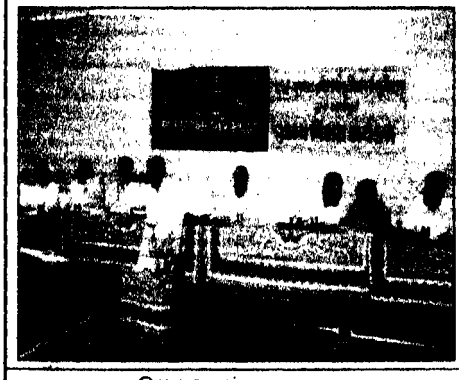
Sr.	Programme	2002-03	2003-04	2004-05	Total
1	Fertillser demonstrations	455	358	338	1151
2	Field/night meeting	418	286	226	930
3	Farmers meets	127	72	91	290
4	Retailers meets	49	26	18	93
5	Dealers/co-op. meets	109	69	50	228
6	Crop seminar	18	9	13	40
7	Wall/shop painting	1,481	1,204	1,317	4002
8	Trolley painting	1,226	754	839	2819
9	Exhibitions (Kisan Mela)	32	25	18	75
10	Crash campaign	330	432	552	1314

Narmada Khedut Sahay Kendra

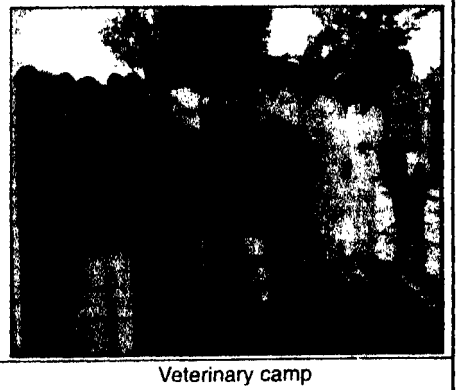
The company has 57 Narmado Khedut Sahay Kendra (NKSKs) spread all over the Gujarat manned by agricultural graduates. The in-charges of NKSKs are engaged in educating the farmers on various issues related to recent advances in agriculture. They maintained close liaison with the farmers and are engaged in carrying out various need based programmes for improving socio-economic conditions of the farmers. The programmes are crop demonstrations, crop seminars. farmers meetings, conduct of slide shows on efficient use of fertilisers and water and recent advances in agriculture. They also organise visits of fanners to agricultural universities1 research stations/GNFC plant, collection of soil samples. educating and advising the farmers to use fertiliser as per soil test data, advising farmers for remedial measures to improve soil productivity, encouraging farmers to adopt scientific farming inclusive of drip irrigation system, net houses. green houses. hi tech agriculture, distribution of crop literatures and ensuring receipt of NKP magazines. They collect the feed back from the farmers for their emerging needs in the changing environment. The NKSKs of GNFC are providing valuable services to the farming community.

GNFC rural development programmes

Sr.	Programme	2002-03	2003-04	2004-05
1	Fertiliser demonstrations	34	36	28
2	Demonstration/farmers meetings	9	9	6
3	Crop seminar	2	1	2
4	Farmers visit to GAU/GNFC/agri. fair	3	2	4
5	Gobar gas plants/compost pits on subsidy/ vermicompost	12	1	
6	Fruit tree grafts on subsidy	620	1,877	2.323
7	Tree guards	64	48	89
8	Sprayer pumps on subsidy			32
9	Veterinary camps	4	4	4
10	Women welfare programs	3	3	2
11	School children motivational program	5	5	2
12	Educational aids/sports items to schools	8	8	8
13	School/wall /trolley painting	8	18	18
14	Office furniture to co-op. society			8
15	Puppet show			8
16	School bags to primary students	-	-	400
17	Seeds for green manuring	20	4	4
18	Distribution of pheroman traps	2.000		



Crop seminars



Veterinary camp

Mobile Van

Mobile vans are well-equipped with crop and product literatures for distribution among the farmers. The night shows are screened in the villages on various issues related to recent advances in agriculture and the problems of the field. Therefore, the farmers are properly educated with this unique media and farmers are taking interest in its operations.

Mobile van in operation

Enhancing Dealers Professional Skill through Study Tour

In the marketing of agricultural inputs, a dealer is a vital link between manufacturers and farmers. The dealer is a philosopher as well as a guide to the farming community and continues to provide valuable feedback/information to the manufacturers/suppliers of agricultural inputs. An Agritech - 2003 (15th International Agricultural Exhibition) was organised during September 15-18, 2003 at Israel Trade Fairs and Convention Centre Ltd., Tel Aviv - Israel. Considering the importance and to enhance the professional skills of dealers, 14 dealers along with 2 regional managers of GNFC were deputed to participate in Agritech-2003. The dealers were taken to Agritech-2003, Kibbutz a unique Israeli style of living together, dairy farm and milk processing units, green houses, manufacturing units of irrigation system and agricultural institutes during their visit. This was a unique exposure to the dealers and GNFC came forward in sponsoring the Trade Channel Personnel to a country which is at number one in the world for effective utilisation of latest technology with scarce resources. The dealers based on the experience are providing valuable services for adopting scientific farming to the farming community. Dealers training programmes are also organised by GNFC from time to time in all the states of its operation to update their knowledge skills on farm technology enabling them to educate the farmers.

Activities Undertaken in Narmada Command Area (NCA)

A national level workshop on "Issues and strategies for achieving the maximum farmers prosperity on their receiving imgation water from Narmada Dam" was organised by GNFC in July, 2002 at Bharuch to make the fanners aware about different issues related to use of water for irrigation purpose in the Narmada Command Area. The Sardar Sarovar Project is the largest water resources development project in the country and probably in the world. In order to discuss various issues related to change in cropping pattern in the Narmada Command Area, GNFC organised one day workshop on the topical subject; 110 agricultural scientists and representatives of water users associations of Narmada Command Area of Gujarat participated.

GNFC in collaboration with district panchayat (Department of Agriculture) of Bharuch organised a meeting of farmers of NCA of Bharuch and Narmada districts to educate them on various issues related to irrigated agriculture. 130 cooperative personnel, village level workers. extension officers, engineers from Sardar Sarovar Narmada Nigam Ltd., horticultural officers and farmers participated.

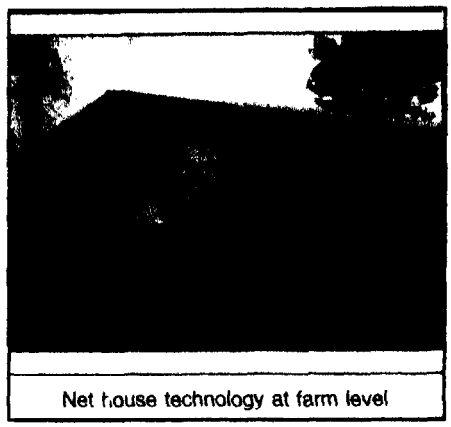
Different programmes are being undertaken in NCA for change in cropping pattern as per availability of irrigation water, judicious use of irrigation water, adoption of improved farm practices and high tech agriculture.

Sixteen GNFC officers noniinated in spearhead group of NCA are disseminating information on proper land and water management techniques for their optimum use efficiency by organising farmers meetings.

Two Mobile vans operated in NCA and officers were nominated by GNFC to educate the farmers on various issues related to water management.

Demonstrations on multiple cropping patterns were sponsored by GNFC in NCA; 104 demonstrations in the districts of Bharuch and Narmada were conducted in 2004-05 and 33 demonstrations are being conducted in 2005-06.

Forty five net houses are developed in the districts of Bharuch, Narmada, Panchmahal and Vadodara for raising seedlings of high value crops for better utilisation of land in NCA.



Net house technology at farm level

NKP Scheme

A unique Narmada Kisan Parivar Yojna was initiated by GNFC in Gujarat in 1984 and this scheme is in operation since then. The basic objective of the scheme is to:

- Upgrade the knowledge base of the farmers. Monthly magazines (Gujarati and Hindi) are made available to them for such purpose.
- Maintain close liaison with the farmers, cooperative societies, dealers, scientists of agricultural universities, ICAR institutes, and state department of agriculture, NGOs, fertiliser industries and other concerned by inviting them to contribute articles in the magazines on recent advances in agriculture.
- Carry out the analysis of soil and water regularly at the STL and suggest the NKP members to use fertilisers based on analysis report for better returns and maintain the soil fertility.
- Advise the farmers for effective use of water.

Under the scheme monthly magazines, *Narmada Kisan Parivar Patra* in Gujarati and *Narmada Krishi Parivar* in Hindi are brought out. The magazines are mailed to the farmers of Gujarat, Maharashtra, MP,

Narmada Kisan Parivar members					
2002-03		2003-04		2004-05	
Gujarati	Hindi	Gujarati	Hindi	Gujarati	Hindi
47,963	8.110	60,850	38,050	60,200	35,500
55.473		98,900		95,700	

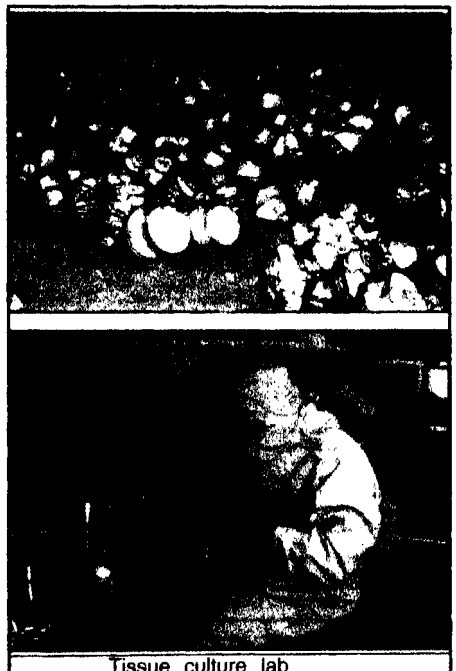
Rajasthan, Uttar Pradesh, Punjab and Haryana. These magazines are becoming very papular among the farming community and considered to be the one of the best informative media. About one thousand queries every year are received from the farmers and the same are attended satisfactorily without delay. The year-wise number of NKP members is given above.

Soil Analysis and Soil Health Card

Soil testing is one of the vital tools to know the soil fertility status and recommend fertiliser doses in various crops as per soil test analysis. It helps to economise on cost of fertilisers. GNFC established a static soil testing laboratory (STL) in 1982. Since inception, the laboratory has analysed 3, 65.157 soil samples and 12,720 water samples. To supplement the efforts of Government of Gujarat in issuing soil health cards to farmers of Gujarat, 32.553 soil samples from the districts of Bharuch, Narmada, Surat, Jamnagar and Rhavnagar in 2003-04 and, 36,065 soil samples from the districts of Bharuch, Narmada, Panchmahal and Jamnagar in 2004-05 were analysed at the STL and report submitted to the Government of Gujarat. In the current year. the analysis of soil samples for soil health card is in progress and 19,312 soil samples have been analysed so far.

Development of Tissue Culture Plants

GNFC has initiated a project of development of tissue culture plants particularly of banana at Bharuch linking to the facilities of green house and net house to cater to the need of the farming community. The step is towards supply of high quality tissue culture plants to the farming community enabling them to get better returns.



Tissue culture lab

Micro propagation has the tremendous potential in agriculture for ensuring high level of uniformity in raising plants of various species.

Number of soil and water samples analysed				
Sample snalysed	2003-04	2004-05	2005-06 (so far)	Total
Soil sample	9,243	11,122	12,937	33,302
Water sample	314	288	928	1,530
Sol health card samples	32,553	36,065	19,312	87,930
Total	42,110	47,475	33,177	1,22,762

Realising the importance, GNFC initiated this new exercise to develop 50 lakh tissue culture plants of Banana and other plants in subsequent years. The original characters of the plants are replicated in the plants which are grown with the help of micro propagation techniques.

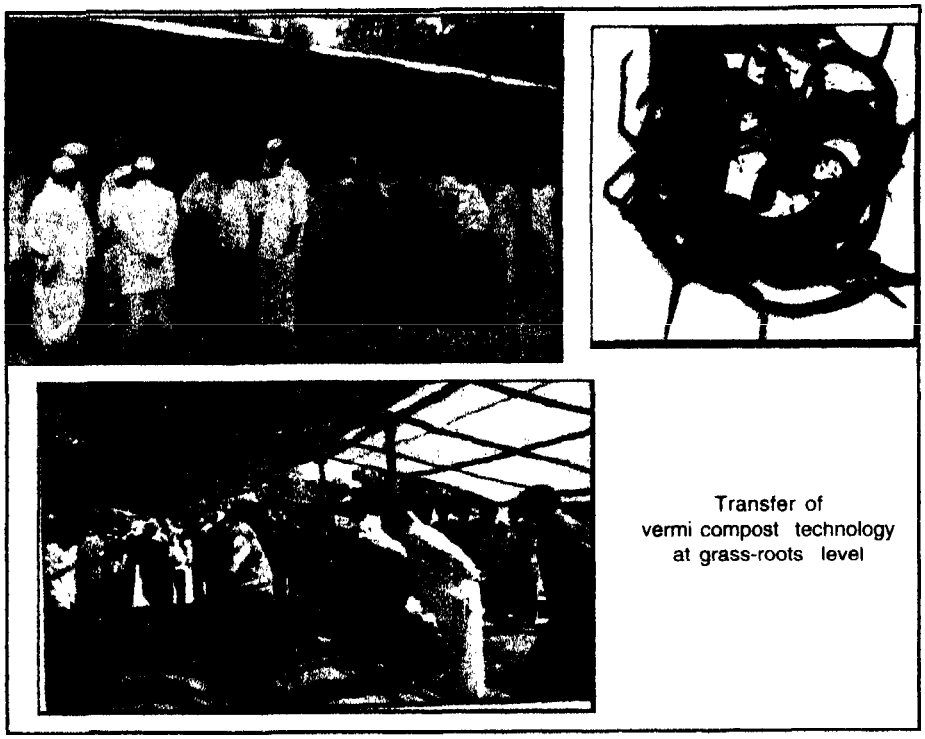
PROJECTS AT DEMONSTRATION FARM

DEMONSTRATION FARM IS NECESSARY TO demonstrate the use of modern technology in agriculture to the farmers and all concerned in agriculture. GNFC has a demonstration farm in an area of 50 acres for this purpose. Different projects at demonstration farm are given below:

(i) Vermi *compost:* A small scale experiment (3 mt per cycle) of using farm wastes for rich organic fertilisers through vermi compost technology was commissioned in 1996. The earth worms are dedicated workers which convert the grasses, leaves, branches and roots of field crops into nutritive plant manures which if used with the fertilisers increases crop yields significantly.

This is for the first time in Gujarat that a fertiliser company (GNFC) is engaged in educating and training the farmers for development of vermi compost technology at the village level enabling to generate income themselves and use the vermi compost at their farm. The step helps in maintenance of soil health and crop productivity. The technology is a low cost technology for the farmers. This is a step towards propagation of integrated plant nutrient supply system among the farming community for sustainable agriculture, improving soil productivity and farm income. The project is being extended to double the capacity.

(ii) Seedlings (Nursery Management): Nursery management is one of the agro-projects developed at the demonstration farm. Quality seedlings of vegetable crops are provided at reasonable rates to the farming



Transfer of vermi compost technology at grass-roots level

community of Gujarat state. About 10 lakh seedlings of various varieties of chilies, tomato, brinjal, cabbage, cauliflower etc. are raised scientifically and make available to the farmers. The farmers are also educated on nursery management and scientitic techniques of growing vegetable and fruit crops to generate more farm income. Demonstration farm is very popular among the farmers for raising quality seedlings.

(iii) The demonstration farm also covers agricultural implements. drip and sprinkler irrigation system and low cost net house technology, ground water recharge technology. etc., apart from demonstrating the trials on field and fruit crops. Farmers are also given practical training on use of agro shed net house in agriculture. suitability of drip/sprinkler/ rain gun irrigation system in different crops, etc.

IMPROVED FARM TECHNOLOGY THROUGH AV MEDIA

TV Programmes : GNFC has developed and released TV programmes for transfer of technology on 19 topics such as package of practices of all major crops grown in Gujarat, irrigation system inclusive of micro irrigation system, hio-control, green house and net house technology, vermi compost. importance of tissue culture plants in agriculture, animal husbandry, export avenues for agricultural produce, value addition for bcttcr marketing, integrated plant nutrient supply system, efficient use of irrigation and fertilisers, fertigation, different government schemes for farmers and need based promotional programmes etc. A film covering various issues related to advances in agriculture is also being shown to farmers of Gujarat.

Year	Programme
2002-03	Narmada Khatar Sukh Na Vavetar "-A Film
2003-04	Halo Khedu Khetre. GNFC Ne Sathware -7 programmes
2004-05	Halo Khedu Khetre, GNFC Ne Sathware -12 programmes
2005-06	Halo Khedu Khetre, GNFC Ne Sathware -12 programmes

Radio Programmes : A radio programme "Narmada Valley Khedut No Belly" was organised by GNFC in which farmers asked the questions on farm practices and scientists gave the solution at the spot through Radio. Most of the topics related to agriculture were covered and in all 54 programs were organised.

Year	Programme
2000-01	Narmada Valley Khedut No Belly - 13 programmes
2001-02	Narmada Valley Khedut No Belly - 23 programmes
2002-03	Narmada Valley Khedut No Belly - 18 programmes

PRODUCTION AND DISTRIBUTION OF CROP AND PRODUCT LEAFLETS

CROP AND PRODUCT LITERATURES ALSO play vital role in educating the farmers. Scientific and technical information is collected from the agricultural universities of the concerned state or concerned state department of agriculture (Gujarat, MP. AP, Maharashtra, Rajasthan, UP, Punjah, Haryana and Karnataka) for crop folders. Every year, 25 crops literatures are prepared in 6 regional languages and sent to the states for distribution among the farmers. dealers/retailers and cooperative personnel.

MICRO IRRIGATION SYSTEM

WITH THE HELP OF GOVERNMENT OF Gujarat. GNFC and GSFC tloated Gujarat Green Revolution Company Limited (GGRCL) to propagate the concept of Micro Irrigation System (MIS) i.e. drip/sprinkler/rain gun all over Gujarat state. GGRCL with innovative scheme of 5% contribution by farmers, 45% loan from the nationalised banks and 50% subsidy from Government of Gujarat has propagated MIS in Gujarat. The farmers from different parts of Gujarat are coming forward to get the system installed through GGRCL. Farmers are trained and educated on efficient use of water through MIS by the strong network of GNFC and GSFC.

100% Water Soluble Fertilisers

In view of sincere efforts of Government of Gujarat in popularising MIS in Gujarat, it would be necessary to use fertilisers with irrigation water through such MIS. Therefore, to adopt techniques of fertigation, fertilisers should be 100% water soluble. Government of lndia has also included 100% water soluble fertilisers in Fertiliser (Control) Order. Looking to the emerging need, GNFC is planning to import/manufacture 100% water soluble fertilisers to make them available for the farmers of Gujarat. Efficiency of fertilisers and irrigation water will be better and it will help in better returns to the farmers.

National Project to Increase Fertiliser Consumption in LOW Consuming Rainfed Areas

Government of lndia initiated the national project to increase fertiliser consumption in low consuming rainfed areas and same was given to different fertiliser companies in various part of the country. GNFC, being the lead fertiliser supplier in Gujarat, took-up this project in Bharuch, Valsad and Dang districts. In the project. block demonstrations consisting of 10 hectare were organised during 1991-92 to 1993-94. Mini-kits containing seeds, fcrtilisers and pesticides were issued free of cost up to a ceiling of Rs.1000 per hectare to the farmers of these demonstrations. Every year. two farmer's camps were also organised at each demonstration. Farmers were educated to adopt recent advances in rainfed farming. Regular slide shows were also organised on "Suitability of crops and increase in fertiliser consumption in rainfed areas."

Sulphur in Balanced Fertilisation

Realising the importance of sulphur, The Sulphur Institute (TSI), Fertiliser Association of lndia (FAI) and the International Fertiliser Industry Association (IFA) sponsored a 'TSI-FAI-IFA Research Project on Sulphur in Balanced Fertilisation'. In Gujarat. the project under reference was undertaken by GNFC to carry out the work in Bharuch district of Gujarat.

Sixty six villages around the sites of the experimental plots (Shahpura, Sodgam / Sengpur) of Bharuch district, Gujarat state were selected to delineate the sulphur deficient areas. In all 1525 surface soil samples (0-15 cm) comprising of 687 from Shahpura and 838 from Sodgam / Sengpur sites were collected and analysed for pH, EC, O.C., available P_2O_5, available K_2O and available sulphur. Analysis report showed the prevalence of sulphur deficiency and 50% soil samples had low to medium in sulphur content.

Field trials were laid out at farmers' fields at Shahpura during 2000-01 to 2002-03. The experimental soil belongs to clay in Shahpura and sandy loam in Sodgam and Sengpur in texture. Sorghum-wheat and Soybean–groundnut cropping systems were taken. The crops were raised up to maturity and after harvesting the crops, grain and straw (fodder) yields were recorded.

Considerable responses of sorghum and soybean to sulphur application were observed. Residual effects of sulphur in wheat and groundnut were also found. It is possible to arrest the decline in available sulphur status of soils due to cropping with annual additions of IS to 30 kg sulphur ha". Application of sulphur is quite profitable in terms of net returns and for sustaining soil productivity. There is greater need to delineate soil for available sulphur and conduct experiments at farmers' fields on responses of different crops to sulphur application.

Awards for Better Services to Farmers

♦ A Paper on "Possibility to grow groundnut in Zaid Season" published in March. 1995 issue of Khad *Patrika* was awarded 2nd best article by FAI.

Awards won in agricultural fairs

Year	No. of participation in fair/exhibition	Prizes won			
		Fair	Place	State	Rank
2002-03	19	1. Krishi mela	Jalgaon	Maharashtra	First
		2. Agri. fair	Hisar	Haryana	First
		3. Farmer's fair	Kanpur	UP	Second
		4. Ktsan mela	Ludhiana	Punjab	Second
		5. Agri. fair	Faizabad	UP	Second
		6. Agri. fair	Meerut	UP	Second
		7. Agri. fair	Pantnagar	UP	Second
2003-04	26	1. Krishi mela	Junagadh	Gujarat	First
		2. Kisan mela	Hisar	Haryana	First
		3. Krishi mela	Jaora	MP	First
		4. Agri exhibition	Pantnagar	UP	First
		5. Agri. fair	Kanpur	UP	Second
		6. Agri. fair	Kumarganj	UP	Third
		7. Krishi mela	Sailana	MP	Prasasvi Patra
2004-05	30	1. Kisan mela	Hisar	Haryana	First
		2. IITF 2004	New Delhi	Delhi	First
		3. Agri. fair	Ludhiana	Punjab	Second
		4. Agrotech	Pantnagar	UP	Second
		5. Agri. fair	Meerut	UP	Second

FAI Award for better services to farmers

♦ A Paper on "Implication of fertiliser policy changes on fertiliser consumption and farmers economy" published in March. 1999 issue of ***Fertiliser*** Marketing News was awarded 2nd best article by FAI.

♦ A Paper on "Reorientation of Fertiliser Promotion Strategy", published in March, 2002 issue of ***Fertiliser Marketing News*** 'was awarded 3rd best article by FAI.

♦ GNFC won The Fertiliser Association of lndia Golden Jubilee Award for best work done in the field of "Transfer of Improved Farm Technologies" to the farmers leading to higher income – 2005.

SUGGESTIONS AND FUTURE STRATEGY

THERE IS NEED TO INCULCATE A FEELING among the farmers that farming is a "Business" and not merely a "way of life" and prompt them to consider themselves as an entrepreneur. Fertiliser marketing is undergoing a sea change and has become very competitive in view of shift from sellers' market to buyers' market and adequate availability of all fertilisers. Many types (urea. DAP, MOP, etc.) and many brands (Narmada, Sardar, Ujjawala, IFFCO, KRIBHCO. etc.) within each type to choose from are available in the market. The expectation of the consumers has also increased due to their awareness and increase in education level. Therefore the fertiliser marketing will be more competitive in years to come. In view of uniqueness of market, fertiliser products and of end-users, i.e., farmers, reorientation programmes with utmost care in line with the emerging needs will have to be properly redefined and implemented. Innovative programmes to educate the farmers on different fertiliser use aspects and agricultural fronts with particular reference to better services need bc outlined in the changing market scenario.

It has been rightly stated that loyal customers are not necessarily satisfied customers but satisfied customers are always loyal customers. Value addition in the product and services rendered towards satisfied customers would go a long way in boosting up sales of fertilisers and realisation of better returns by farmers from every Rupee spent on fertilisers and thereby in improving their economic conditions and that is the better services for the farmers. Therefore, need based extension programmes on the basis of area, crop and water availability, resources available, economic conditions of the farmers and continuous involvement of improved farm technology have to be redefined and implemented for desired results. Video-cassettes/slides on application schedule (time, dose and method) keeping uptake / removal verses addition in mind need to be developed. Special projects which should be undertaken with more care and attention as per the need are –

- Rainfed agriculture and wasteland management.
- Agro forestry
- Aqua culture
- Tissue culture
- Crop diversification including horticulture, vegetables and flowers
- Soil reclamation
- Seed-cum-fertiliserdrill
- Integrated plant nutrient supply system
- Development of teaching aids
- Better linkage with research
- Catalytic role in arranging credits
- Computerisation of agricultural services and linkage with National Education Centre.

CONCLUSIONS

THE ARABLE LAND UNDER CULTIVATION IN China is less compared to India. Inspite of this. China produces about 1.7 times more foodgrains compared to India. No doubt, the country is progressing well but still lot has to be done. Concerted and collaborative efforts of government, private entrepreneurs and NGOs in transfer of improved farm technology at farm level would go a long way in increasing production of different crops in the country. Fertiliser industry is alive to this problem and engaged in carrying out various need based programmes for transfer of improved farm technology at the farm level. Gujarat Narmada Valley Fertilisers Company Ltd. has adopted innovative and unique measures for transfer of improved farm technology at the farm level looking to the need of the farmers on the basis of the feedback received from them from time to time with a view that when ***farmers prosper – we prosper.*** ●