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Letters

Informative and Educative

Sir, I am a regular reader of the magazines of Publications Division, especially Yojana in English. The articles included herein are highly informative and educative. The pictures are attractive and get up eye-catching.

The layout, reading material and pictures included in April 2002 issue of Yojana (English) are definitely better. The language is simple and presentation schematic and absorbing. Heartiest compliments!

The inclusion of three stories on Budget in the April issue entailed an excellent multi-dimensional perception of the matter. While the first write-up explains as to how the proposals are relevant to stimulate growth of national economy, the second and third make a threadbare analysis of various aspects of the proposals.

Further, the article on 'Heritage of Goa' transports one to the past of this one time Portuguese territory. The present environment of this wonderland is also well brought out.

And, while I was trying a second reading of the April issue of Yojana, my copy of May issue arrived. The contents herein too are marvelous. 'Health Problems and Health Care of Rural Elderly', 'Attempting Harmony of Livelihood and Conservation in Forests', being excellent developmental stories, interested me most.

I compliment you and your team for the finesse in production and quality reading and informative material made available in Yojana.

*K.L. Noatay,
Wellerton Estate,
Shimla-171002, H.P.*

Welcome New Format

Sir, I am from Dhanbad. I am a regular reader of your development monthly-Yojana. Your April issue in new format is at hand. The new-format journal has multi-dimensional character. It has a column-Competitors Corner-and it will help in brushing up general knowledge. Besides, there are a number of good photographs, a new feature. The e-mail address again will help in quicker interaction with readers and hopefully further improve the editorial content.

Satyendra Singh

E-mail : satyendrasinghthanbad@yahoo.co.in

Dear Readers

The Letters column is being reexcavated. The idea is to encourage the habit of reading between the lines and point out a missing link or two or emphasise an interesting aspect. About the letter: it has to be on the topics of the journal. In general, 100 words are ideal. The best correspondents will get an incentive of Rs. 100 and Rs. 80 per letter. One writer should try a letter on one subject only.

Editor

Letters for this column should be addressed to:

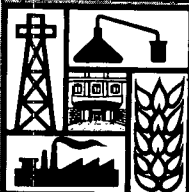
Editor,

Yojana,

Yojana Bhavan, Sansad Marg,
New Delhi-110 001

E-mail : yojana@techpilgrim.com

Fax Phone : 011-3717910



Chief Editor : Subhash Setia
Editor : Mahadev Pakrasi
Assistant Editor : Madhu R. Sekhar
Sub Editor : Manogyan R Pal

Joint Director (Prod): D.N. Gandhi
Circulation & Advertisement Manager:
P.C. Ahuja
Cover Design : Malkiat Singh
Photo : Courtesy-GSI
e-mail : Yojana@techpilgrim.com

- 4 PRODUCTIVITY IN THE AGE OF GLOBALIZATION
S A Khader
- 9 150 YEARS OF GSI: A PROFILE
Brijesh Barthwal
- 14 INDIA ADOPTS BICOTTON
E C Thomas
- 18 WHY FDI INFLOW NEEDS TO IMPROVE
Pulak Mishra & Ramakanta Prusty
- 22 E-GOVERNANCE : A CASE STUDY IN RURAL INFORMATICS
Anjali Dhingra & D C Misra
- 26 REGIONALISM IN INTERNATIONAL TRADE : ROLE OF WTO
Joseph Abraham
- 30 COMMUNITY PARTICIPATION AND MANAGEMENT OF MARINE
ECO-SYSTEM
Jeyanth K Newport
- 33 BIOTECHNOLOGY IN DEVELOPING COUNTRIES : PERSPECTIVES
G Ravikumar, Ranjith Kumar & V B Patel
- 37 STEM CELL RESEARCH
Narottam Sahoo
- 40 COMMONWEALTH GAMES
D K Bharadwaj
- 44 WELCOME STRESS ON AGRICULTURE IN BUDGET
A B Bhuleshker
- 46 THE DISINVESTMENT SCENARIO
Raghunath Rau
- 48 BOOK REVIEW

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About the issue

Productivity is the mantra in the age of globalisation. In case of India this is even more necessary to be able to compete in the global market. The changing aspirations of the people and fast growing domestic market too make it imperative.

Though a number of steps were taken to improve the inflow of foreign direct investment, very little headway has been made. In the last decade ending 2000, it amounted to about 1 percent of the country's national income. In global context, it declined sharply from 0.75 percent in 1997 to 0.24 percent (estimated) in 2000. The four major factors found responsible for this slowdown have been: adverse economic environment, poor and inefficient infrastructure, decelerating corporate profitability and imperfections in the policy framework. There is urgent need for fine tuning to garner resources for an economy in transition as ours.

In its long history spanning a century and a half, Geological Survey of India has been doing pioneering work in nation building activities. Be it in the realm of ecological, metallogenic, exploration of deposits of minerals, sea-bed survey in exclusive economic zones, Antarctica expedition, global atmospheric change, earthquake and glacial studies... the list appears endless.

The Health Notes column gives a glimpse of an exciting new approach poised to revolutionize the treatment of patients who need vital structures: the creation of man-made tissues or organs, known as neo-organs.

The Competitors Corner features the Commonwealth Games which is round the corner. How India has been faring in it and what the prospects of the game are, will be of interest to our young readers.

Productivity in the Age of Globalization

S A Khader

India being the fast and rapidly growing market can provide a sustained domestic market only when the fast changing aspirations of the domestic customer are effectively met, lest countries like China should take over the Indian market once WTO regime comes up fully. However, the dynamic management of the enterprise has to focus on continuous renewal of its skills, introduce competitive compensation-cum-remunerations to the work force and promotion of innovation which would not only ensure success in the domestic market but also in the global environment.

INDIA HAS been able to beat its traditional Hindu rate of GDP growth lingering around 3.5% during 50s to 80s, to a reasonably good performance of 6% during 90's; thanks to the efforts of the nation builders since early 90's, when the formal process of liberalization had set in although the seeds for the same were sown during 80's itself. Though commendable, however, this had not been impressive compared to that of China, the comparable economy registering a growth of 11% during nineties. Many other Asian counterparts like Thailand, Malaysia, Indonesia too have recorded higher growth rates during the same period with more or less of the same level of investment rate as that of India. It is all the more necessary for Indian economy as well the enterprises to be as competitive as possible with

the emergence of new tigers in the Asian region. In the words of Prof. Michael Porter, the competitiveness of a national economy is determined by how competitive its constituent enterprises are in the international market and hence productivity at the enterprise level is more important because, in the final analysis, it is not the country, but the firms that compete in the market place. In a recent survey by Mckinsey (2001) it is vividly brought out through empirical evidence that accomplishing a 10% GDP growth rate in India is not a distant dream for India and it is possible considering the potentials that exist. It went on to add, the Indian economy is under-performing for a number of reasons and there is a considerable scope for it to plan and accomplish a 10% growth by suitable reforms,

policy guidelines and support. The report, further goes on to rightly identify productivity as one of the four inter-connected drivers of competitiveness at the enterprise level; the others being quality, customer responsiveness and innovation. All these four are inter-connected because improvement in one leads to, more or less, automatic improvement in the others as well.

As per a recent study undertaken by NPC, the labour productivity growth is found to hover around less than 3% per annum (2.88%) whereas capital productivity is around 0.80% with a total factor productivity growth of 1.85% during the period 1990-99. Asian Productivity Organisation in its latest report places India's labour productivity growth rate (90-99) to be around

Mr S A Khader is Deputy Director General (Management Services), National Productivity Council, New Delhi.

3%, while Korea, Taiwan, ranged around 5% with Malaysia and Thailand falling slightly below at about 4.5%. In fact, the report clearly established that high labour productivity of the Asian tigers had enabled them to steer through the economic/financial crisis of the recent past. On the other hand, the latest ILO report (2001) explains China's spectacular economic growth of 11% is due to the highest productivity growth ranging around 5.5% per annum, with an investment rate of 32.9% clearly demonstrating the soundness of the economy from the productivity front. Further, the investment rate per one percentage GDP growth is the lowest with China at 3.00% and Malaysia too is comparable to China in this regard. But, India needs to invest 4.2% for getting 1% growth in GDP, substantiating the oft quoted statement by the Planning Commission that ICOR is highest in India. From all these, we are in a position to clearly establish that productivity growth not only directly influence economic development, but also investments needed for enhancing economic growth is again influenced by the productivity performance, thus strengthening a virtuous link between investments, productivity, economic growth and quality of life.

Wide Gap

Mckinsey, in its recent analysis of 13 sub sectors across the economy, covering about 25% of the total employment estimated that the Indian labour productivity stands only at 5.8% of the US level, clearly pointing out the wide gap that exists for the economy and its enterprises to catch up with global competition. The labour productivity in Indian agriculture is the lowest at US\$501 per capita

Table 1 : India in relation to its Asian Competitors (Period 1990-99)

Country	GDP Growth	Investment Rate%	Investment per%GDP	Productivity Growth	FDI
India	6.0 US\$	24.5	4.2	3.0	3.0 Bln
China	11.0	32.9	3.0	5.5	40.0
Thailand	5.2 (7.0)	24.5	3.5	4.5	-
Indonesia	5 (7.5)*	22.8	3.6	5.0	-
Korea	6.2 (7.5)	25.5	3.5	5.0	-
Malaysia	8.0 (9.5)	24.0	3.1	4.5	-

** Figures in parenthesis are the average growth before the Asian financial crisis.*

(at PPP terms US\$2696), with industry, showing better performance of US\$2110 (at PPP terms US\$11,267) and services being better than industry at US\$ 2210 (at PPP terms US\$11,833). Even in the frontier area like software, the GDP per person employed is estimated to be around US\$ 1033 (in PPP terms US\$5452) during the year 2001. All the above clearly demonstrate the wide gap and the scope that exists for Indian industry in its strides to catch up with the global market in the fast changing techno-economic scenario. A similar comparison of capital productivity in some of the industrial sectors does not inspire much as well. For instance, in power transmission and distribution, it is 12% of the US standard, whereas in respect of power generation, it is about 65% that which one could probably a bit satisfied with. As against this, the steel industry is only 39% and the Telecom with 59% of the US level of capital productivity. The Mckinsey survey of 1998 identifies the return on capital in Indian private sector a low and even below the cost of capital. It is much lower in the public sector undertakings clearly destroying the value rather adding to it. This should be the cause for concern to captains of industry as well to the

nation builders in their pursuit to improve the quality of life of the billion mass. In other words, it goes to prove that there is a wide gap as well scope for Indian management to work towards enhancing the productivity at the shop floor level as well as the macro-economic performance. The domestic companies are yet to match the world class manufacturing productivity standards. As such innovative approaches to result quantum jumps in performance are essential, if we are to remain in business.

Infrastructure Productivity

One of the oft quoted reasons for low performance of Indian economy and in particular the industry is the inadequacy of infrastructure and its productivity. Power being the key infrastructure for development is characterized by 11% average shortage with a peak hour shortage of 20%. It is considered as one of the highly inefficient industries with lowest efficiency ranging from 20-35% adding to additional burden and cost. While the roads and the railways put up a better performance, they too are not in a position to meet the requirements of a fast developing country and the aspirations of growing population. On Tele-

communication front, telephone density is very low and even the cost of international telephony is much too high. Of late, the domestic competition in this sector is likely to bring down the rates substantially. IMD's world competitiveness survey and Global Competitiveness analysis of World Economic Forum (WEF) have rated India at the bottom of the list of 50 prominent world economies as far as its infrastructure performance is concerned. Because of such low level of infrastructure (both hard and soft) in furthering the productivity and competitiveness of the enterprise, the inflow of foreign direct investment (FDI) is very sluggish to India as widely acknowledged in the media. It ranges around 3 billion US\$ as against 40 billion US\$ to China during the same period, clearly signifying that there is something amiss in our policy and facilitative infrastructure for attracting foreign investment whether in the area of infrastructure development or industry or service sector development.

Regulated

India, once a nation known for its goods globally, whether its spices, handicrafts, muslin cloth is relegated to a position of having a miniscule share of global trade in 2000 of 0.6% with the China's share of about 4%. Further the global trade had been shrinking from above 2% during fifties to 0.5% in eighties. The competitiveness and productivity of the modern industry and agriculture and service sector have to be focussed in perspective.

The McKinsey Report put forth two sets of factors that need attention for enhancing the productivity of the Indian

enterprise. The first being labour related issues consisting of excessive deployment of labour, low work attitude, inadequacy of technical skills and low relative productivity, (measured in terms of unit output or value added per rupee of wages). It would be interesting to know that India ranks 31st out of 50 prominent economies in relative productivity. Contrary to the popular belief that labour legislation related framework in India to be the great impediment, it was found by BERI (Business Environment Risk Intelligence) an international agency, that it is much better compared to many other countries, as its rank is 14 out of 50 countries. Further the myth that labour is a great hindrance to productivity is dispelled by the McKinsey Report, pointing out that poor organization function and task (OFT) as well as absence of scales of economy are the primary factors for low productivity and competitiveness in the Indian enterprises. These factors are purely under the control of the management and the macro management of the economy. The IMD's world competitiveness yearbook (latest) places the quality of Indian management at the 39th position out of 49 industrialized economies compared. Resistance to change is a vital issue, to be tackled in the globalized economy. This appears to be the dominating factor with the Indian management which is yet to adapt the changed paradigms of running business i.e deriving competitive advantage through the policy and strategy driven management to its fullest extent. Indian managements, far too long have basked under the strategy of resources based comparative advantage, which is not very

relevant in the changed context. Most economies who have embarked upon the development path more or less at the same time as India, have been able to go much further in comparison to India mainly due to more dynamic micro and macro management of the enterprise and the economy.

The hourly compensation rate of manufacturing worker in India is 0.56 US\$ as against 1.77 US\$ in Philippines; 1.96 US\$ in Malaysia and 2.14 US\$ in Mexico. This no doubt is a comparative advantage provided the output per hour remains the same. But it is not the case due to reason of skill inadequacy, work attitude, work ethics and culture resulting in low relative productivity and also absence of state-of-the-art technology and economies of scale. Hence, India is in the "Low Productivity – Low Compensation Syndrome".

Cultural Impediments

Agriculture and related unorganised sectors continue to be the mainstay in the vast rural sector where not less than three fourth of the population still depend. Although, around two thirds of the labour force derives its livelihood from this sector, it accounts for only a little more than one fourth of the national output thus leading to an ever widening difference between labour productivity in rural and urban sectors. Further, the technology in the farm sector being by and large traditional, yield rates are extremely low by world standards.

Efficiency in the delivery system includes quality in the public services provided to the citizens, paying continuous attention to productivity, quality, reliability and professionalism. In a way government systems and practices

are so pervasive that they continue to frame the mind-set and work culture in the entire nation. Hence, interweaving productivity concepts with governance assumes vital relevance.

Being the second largest country in terms of population, India is indeed rich in labour resources. The problem, largely, is related to value orientations. This arises partly out of the transformation process of an essentially traditional society into a modern one and partly out of the failure of the educational system to cope with the swift changes that take place in technologies. As custodians of the rights and privileges of the working class, trade unions will also have to broaden their base mainly to orient the mindsets of the work force to continuously learn and upgrade their skills & knowledge at the same time and alter their sights to national, social, environmental and quality of life issues.

Organizational Culture

Unlike western or oriental management styles like that of Japan, India has not been able to evolve a specific Indian management style based on its own ethos and culture, suiting to the needs of the customer, the employee and the stake holders. This is possibly and primarily due to the first generation nature of the trader turned entrepreneur and agricultural labour turned industrial employee. Further, the protected economic environment did not compel the enterprise to adopt and change to the fast changing environment ethos of the market-oriented economy. However, the things are fast changing now.

Indian society, deep rooted in its tradition, social and cultural values

and having strong belief in the destiny, has its mind-set and work ethics evolved over centuries. In spite of the belief in Karma philosophy, the class-ridden society with centuries of domination by foreign rule and resultant feudal culture had been a major stumbling block to the development of modern industrial culture and ethics. Though considerable "Unity in Diversity" exists, still a strong sense of nation building on a sustainable basis is lacking due to regional and local orientations and the vested political interests. These are major hurdles to developing effective team work, partnerships and cooperation as well interdependence which are vital to current business environment to leverage human innovation and synergy.

Mindset required for identifying waste and its elimination is yet to be developed in the Indian society. In general, living methods, work habits, extravagant lifestyle which are symbolic to high quality of life etc. as perceived by an average Indian are basic hindrance to productivity. A country like Singapore having embarked upon development at the same time as India had been able to build a mindset of eliminating waste by disciplining the society through a variety of promotional and pecuniary measures. For example, indiscriminate fining of the citizens causing inconveniences in the public place; over a period of few decades; has made the citizens to realize the potential of total productivity aspects in fully eliminating backward and forward operations needed to set right the damage caused in the public places. Further, being Orientals in nature and belonging to so-called

better informed society, average Indian suffers from "absence of recognition & importance and thus dissatisfaction" syndrome. This has made the employees move away from the service culture and a vicious circle of delays in decision making and resultant petty corruption which has become a major economic malady of the economy. Unless these macro social issues are addressed squarely by the leadership at all levels, environment conducive for change and betterment does not get evolved.

Productivity Vision

Considering that the population growth is showing a declining trend (below 2%) and HDI being 0.63 (rank 115 in 2000) and unemployment rate at 9.15% (IMD - 2001), the need to focus on productivity growth and thus faster economic development becomes imperative. If the current one fourth population living in abject poverty are to be ameliorated, enhancing competitiveness through productivity is vital to result employment creation. Another major initiative in this regard would be to utilize the full human potential available in the work force not only in terms of numbers but also by tapping the creative and innovative abilities of the people to bring about continuous improvements. Enhancing the share of women in labour force by suitable measures would go a long way not only in the per capita value addition but also social uplift of the women and thus of households.

It should be possible to move forward to take India on the road to the second or third largest economy in the world by 2020 by targeting 5% annual growth in productivity and to result 2%

increase in employment growth and finally to realize 8 to 10% growth in GDP.

Harnessing the Fruits of Globalization

Globalization is characterized by highly mobile capital, faster movement of technologies across borders and flexibility to manufacture goods in low cost countries. Only those enterprises which have the capacity to exploit their capabilities to harness these new paradigms of business can be competitive when they can make available the goods and services of such a quality and delivery that no competitor can match. To derive the benefits of such an open economy it is essential that the enterprise management develops a global mindset and equips itself to become world class in terms of meeting the fast changing expectations of the global customer. Further, the enterprise is required to focus on its core and become world-scale in its core area (core competence) by hiving off non-core and support functions. That, this presupposes: there exists the ability in the organization for networking and developing partnerships, managing joint ventures and relying on those which perform in a world-class manner in non-core areas. In this process the enterprises tend to become both world-scale and world-class supporting each other for the mutual benefit and for the global customer. This further calls for "Thinking Big" by the enterprise management to become both world-class and world-scale. It is a well-known fact, as discussed earlier, this cannot be accomplished without harnessing effectively the knowledge acquired within the organization and develop knowledge intensive services.

Table 2 : Innovation Lags in Indian Bicycle Industry

Innovation Abroad	Year First Introduced India	
3-speed internal gear hub	1925	1965
Narrow spring saddles	1960	1975
Narrow tires	1962	1974
Downward bent handlebars	1962	1988
5-10 speed derailleurs	1966	1980
Rat trap pedals with reflectors	1967	1987
Light alloys	1969	1985
Flat handles	1973	1987
Caliper brakes	1981	1989

The common denominator in all the these initiatives is Innovation. The enterprise and its capability to harness the innovative abilities of its human system is central to organizational excellence in the global environment. The enterprise has to equip itself with such management structure & style and empowerment of human resource to meet with the requirements of the innovation driven market. For instance, Indian industries and in general Indian economy had been shy of innovations in almost all aspects, due to the protective environment created by the policy in the past and also non-demanding customer/beneficiaries or the public. For instance, Table-2 provides the lag in introduction of innovations in a traditional-cum-historic industry such as bicycle manufacturing.

This is an ample proof as to how an Indian consumer is deprived of better quality product or service. On the contrary, till recently it had been the prerogative of a limited few to enjoy the fruits of development, technology and innovations. In a globalized economic situation innovation drives the business in all its entirety.

The solid route to mastering the global competition is only through enhancing the operational effectiveness of the business. Some of the tried and tested approaches to enhancing operational effectiveness include : (i) Rationalization of facilities, (ii) Re-designing processes and (iii) Developing and installing information system and knowledge management etc. apart from human centered approaches like HRD, motivation and promotion of innovation, empowerment and so on. Some of the typical management methods that lead to enhancing operational effectiveness include - a) Business Process Re-engineering (BPR), (b) Total Quality Management (TQM), (c) Total Productive Maintenance (TPM) (d) Supply Chain Management (SCM), and (e) Benchmarking. In addition, introducing world-class management system standards and demonstrating commitment to standards like ISO 9000, ISO 14000, ISO 18000, SA 8000; HACCP etc. would go a long way in sustaining the world-class level of the enterprise.

(Contd. on page 32)

150 Years of GSI : A Profile

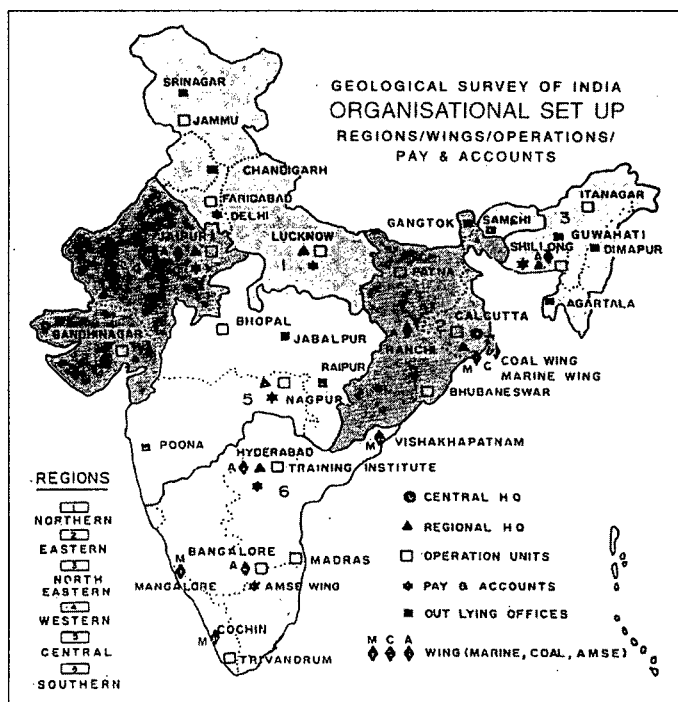
Brijesh Barthwal

Geological Survey of India has done a pioneering work in the realm of mineral economics and made India a formidable mineral power of the world. Its activities include regional geological studies, glaciological study encompassing global changes, palaeoclimate, palaeoglacial and ice dynamics and provide logistic assistance to National Antarctic Programme.

E VOLUTION OF geology in British India took place in three phases between 1780-1836, 1836-1856 and 1856 onwards. Naturalists and enthusiastic officers of East India Company initiated geological work during first phase. They had collected rock and fossil from respective place of work. Few undertook rigorous fieldwork and prepared a geological map of the area. Dr Henry Westly Voysey, a surgeon to the Great Trigonometrical Survey and Army officers on deputation to Survey of India had also prepared geological map on various scales. Governor of Madras and a surgeon by profession Dr V.H. Benza had prepared the geological map of Nilgiri Hills and published the same in Journal of Asiatic Society. Governor of Bengal, Fort William had ordered drilling upto 500 m in the Bengal basin to ascertain the subsurface geology. Sir Promby Thomas Kolley and Dr Faqlyonar in the Siwalik Hills collected vertebrate fossils.

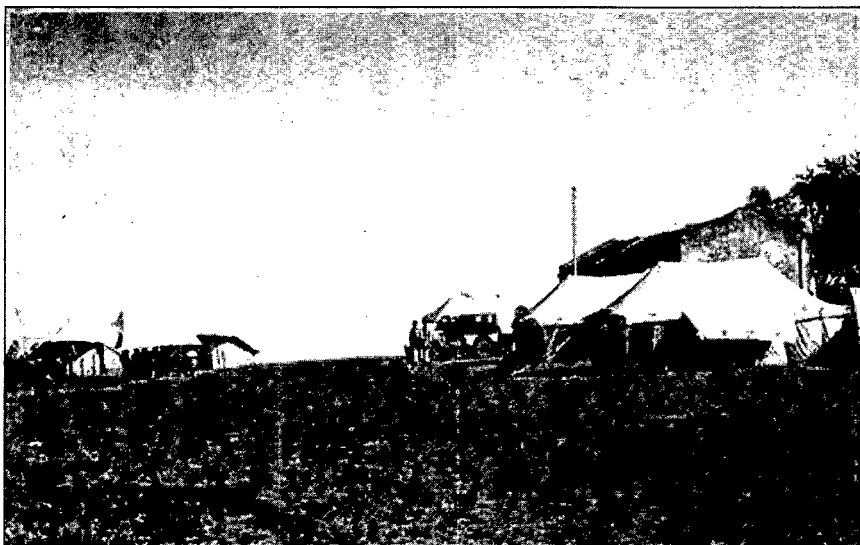
McClelland had persuaded the then Governor of Bengal on need of establishment of a geological organization. Committee for investigation of coal and mineral resources of India for supply of coal to steamer for inland navigation (popularly known as Coal Committee) was set up in December, 1836 by East India Company with McClelland as Member Secretary during 1837-45. Due to his persistent efforts, Courts of Directors of East India Company, David Hiram William was appointed as the Geological Surveyor. He had evaluated the coal reserve of

Raniganj, Jharia and Karanpura coalfields. Unfortunately, William died due to cerebral fever on February 4th, 1846. Mc Clelland volunteered his service and remained in charge of geological



establishment. He was designated as Officiating Surveyor. At last East India company established

Mr Brijesh Barthwal is Geologist, Geological Survey of India, Lucknow.



GSI Camp in Tokpal Diamond Investigation area, Bastar (Chattisgarh)

Geological Survey of India on 4th March 1851 at Kolkata.

Sir Thomas Oldham was appointed first Geological Surveyor and headed the organization till 1876. He had a degree in geology. He was instrumental in diversification of GSI into academic and economic activities. Fundamentals of geology, systematic geological mapping, stratigraphy and paleontology were accorded top priority along with survey of large coalfields by GSI. Mr P. N. Bose and P.N. Datta were first two Indians to join GSI in a graded post. They were recruited in London. Both were bitter and prejudiced against the colonial officers and advocated their exclusion in Board for Selection of the Indian candidates. Both left GSI early in despair and disgust.

As facilities for advanced study in geology were lacking in India, Indian officers in the junior grade were encouraged to proceed to the Imperial College of Science & Technology for advanced training. They were promoted to senior grade afterwards.

Sir Thomas Oldham initiated the study of earthquake in India, in the

wake of Cachar earthquake of 10th January 1869. He prepared a catalogue titled "A catalogue of Indian Earthquake from earliest time to the end of 1860". Great Earthquake of Assam which struck on 12th June, 1897 was extensively studied by officers of GSI. R.D. Oldham, son of Thomas Oldham, led the team. It is still considered a classic document. Recent Earthquake of Kutch was extensively studied and monitored by a 30-member team comprising geologists and geophysicists. GSI has brought out special publications on recent

earthquakes of Uttarkashi, Latur and Chamoli in the last decade. Earthquake Studies Unit (ESU) has been set up in April 2000 at Faridabad, National Capital Region (NCR), Harayana to coordinate the post earthquake study in GSI and to collaborate with outside national agencies in the matter. The ESU is also proposed to be developed as a Seismotectonic Data Centre.

Sir Oldham rendered geotechnical advice for railway alignment dating back to 1859. GSI is actively involved in site selection to construction of major engineering projects like dam, tunnel and rail line alignment. Newer pilgrimage of modern India, prominent dams Bhakra, Hirakund, Rihind, Damodar Valley, Salal, and Tehri are living testimony of GSI contribution towards nation building. Systematic geological mapping on 1:50,000 scale covering 97% of land area was completed by 1989. GSI is a statutory member of the Commission for Geological Map of the World (CGMW) and is actively engaged in the compilation of various Geological, Metallogenic and Tectonic Maps of India and adjacent countries.



Excavation for Dinosaur Fossils



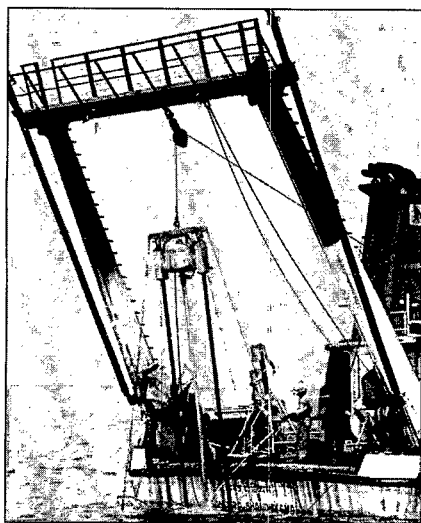
GSI is participating in Antarctica Expedition since 1981. A team of geologist at work in Sonstebynuter in the Antarctica

Great Himalayan Range, a permanent abode of snow and ice is home to 5243 glaciers and constitute the largest natural fresh water reservoir outside the polar region. Glacier mass constitutes an area of 37,959 sq. km, which encloses 142.88 cu. km. ice. GSI had initiated glacial studies since 1874 and published an inventory of Himalayan glaciers.

GSI has delineated 315 thermal springs in India and as many as 120 are confined to the Himalayas only. Wet stream and temperature ranges

of 120-160 are located in Puga & Chumathang in Ladakh and deeper well in Cambay basin (1500-2000m).

GSI has done a pioneering work in the realm of mineral economics and made India a formidable mineral power of the world. Officers of GSI had discovered and explored several deposits of coal, oil, iron, copper, zinc, manganese and mica. The discovery of iron ore deposit by P.N. Bose in 1904 heralded the industrial revolution in India. Sir J.R.D. Tata put the foundation of Tata Iron & Steel Company (TISCO) plant on the basis of the said deposit. The company erected a statue of Bose for his outstanding work.



Vibrocoring operation from R.V. Samudra Shaudhikama

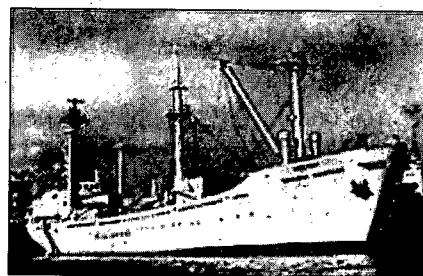
Table : Resources of Major Mineral in 2000 Estimated by GSI (In Million Tonnes)	
Coal	2,10448
Lignite	29,390
Tin (metal)	65,699 tonne
Tungsten Ore	53,68 tonne
Copper Ore	512,24
Lead-Zinc Ore	531,25
Gold Ore	58.38
Iron Ore	13,651
Manganese Ore	155.77
Chromite	146
Bauxite	2,631

GSI established a small unit of

marine Geology in August 1965. It took part in the International programme of Glomar Challenger in the Arabian Sea (1972). About 95% of the seabed within Exclusive Economic Zone (EEZ) has been surveyed and zones of lime mud, phosphate rich sediments, manganese nodules, calcareous sediments and indications of hydrocarbon identified.

Expedition to Antarctica was started in 1982 and GSI became the major participant in the multi organizational team. Antarctica offers a unique platform for conducting fundamental research in several fields of earth, atmosphere and biological sciences. GSI's activities include regional geological studies, glaciological study and encompassing global change, palaeoclimate, palaeoglacial and ice dynamics and provide logistic assistance to national Antarctic programme.

Elephant, bullock cart and camels in addition to horses and mule were the only mode of transportation available to the geologists till sixties. The elephants were trained to become original field collectors. Fermor, a noted geologist states, "Our elephant was an excellent one. When he did not take fits he would pick up pieces of stone when desired, and with a jerk of trunk throw them over his head for the rider to catch, thus saving the trouble of dismounting to the geologist." Another



R.V. Samudra Manthan



Routine field work in the Himalaya. A Geologist tracks more than 20 kms in a day

geologist noted, "To many of us, working in the Geological Survey was a drudgery and in moments of despair we simply hated it and really envied the civil servants sitting conformably in their well furnished offices, adequately paid, attending clubs in the evening and at the same time having a sway over our destiny." But he himself had decided his destiny. Further he added, "All is well that ends well and on return to headquarters, we used to feel, it was after all not that bad and could be put up with." Medicott served GSI for 33 years and took only 18 months leave in all. He lived more or like a hermit and gave all his time to the organization. It speaks the zeal and dedication of geologists, whether Indian or European:

Geologists used to spend six to nine months in field. In earlier days, malaria and cholera were considered as dreaded diseases. Average life of a geologist was little over nine years. Oldham recorded that Assurance officers declined to insure the lives of officers of survey stating that no premium whatever could cover the risk. In British days,

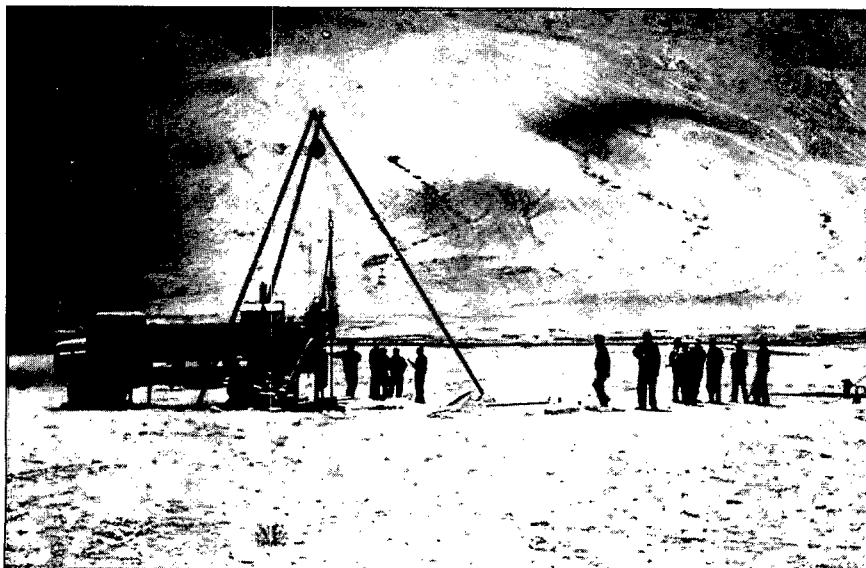
the district official received a geologist. District Collector was duty bound to inform the government about his welfare. He offered all possible help and provided logistic support. Thomas Oldham joined in 1851 with a five years contract at a monthly salary of Rs. 888. In 1856, the Dalhousie Government recommended renewal of contract on an increase salary of Rs. 1250/- per month. But Court of Directors renewed the contract with a monthly salary of Rs. 1100. Disheartened Oldham wrote to Secretary on 31st May, 1856, "I have steadily and zealously devoted myself for duties and have never scrupled to undertake any work or visit any district, however malarious. But I would also most respectfully but strongly express my belief that the excessive danger to which the officers of Geological Survey are exposed, the expenses to which they are subjected and total absence of any prospect of advancement for them in country, have not fully been considered in fixing the emoluments to the appointments". Members of professional service in government

are allowed to engage in private practice or draw allowance in lieu thereof. But it is strictly forbidden for officers of GSI. Former head of GSI observed, "there is no doubt that if our officers were permitted to accept private practice as in case of Indian Medical Service, their salaries would form a small fraction of their income". Second pay commission had withdrawn the special daily allowance provided to officials of GSI. Instead field officers and staff are given paltry a sum of Rs. 135 per month towards Field Establishment Allowance. It is deplorable and humiliating.

Legendary footballers, Padamshree Sailen Manna, Crompton Dutta and Habib served GSI and represented India on several occasions. It had won the prestigious national soccer tournament DCM Trophy in 1954. It is an outstanding and rare achievement for government department and that too a scientific one. Noted geologist Padamshree C P Vohra, former Director General of GSI scaled the



Security Personnel accompany a geologist in the terrorist infested area



Drilling is essential for evaluation of mineral resources. Drilling rig at geothermal field Puga Valley, Ladakh (J&K)

highest peak of the world, Mt Everest in 1965. Mr Vohra Also led the second Indian Antarctica expedition in 1983.

Groundwater Division of GSI was responsible for exploration of groundwater. Study was confined to two domains viz. application and testing of general hydraulic parameter and analysis and interpretation of hydrogeochemical data. It was separated from GSI in 1972 and renamed as Central Ground Water Board (CGWB). Petroleum Geology Division was created in GSI in 1946. It was later renamed, as Directorate of Oil and Natural Gas in 1955. Subsequently it was raised to the status of Commission in 1956 Atomic Mineral Division was set up 1949 under the Atomic Energy Commission. Dr D N Wadia, veteran geologist of GSI, became the geological advisor to the Commission. These organizations collaborate with GSI for dissemination of geoscientific data and joint projects. Coal India Ltd., Neyveli Lignite Corporation, Hindustan Zinc Ltd., Hindustan Copper Ltd. and National

Aluminum Company (NALCO) had set up their plants on the deposits discovered by GSI.

Contribution of GSI towards development of geology teaching in country in general and the Presidency College in particular is well established. Noted geologist of GSI Mr H F Blanford began teaching the basic elements of physics, chemistry, geology and meteorology and physical

geography as Professor of Natural Science at the Presidency College. Sir Thomas Oldham continued to be Professor-in-Charge till 1896. The University of Calcutta was established in 1857. Sir Thomas Oldham was one of the founder fellows for life of the University. The University had also appointed Dr T H Holland of GSI, a Reader.

Asiatic Society, Indian Museum, Calcutta, Mining, Geological & Metallurgical Institute of India, Central Mine Planning and Design Institute & Mineral Exploration Corporation are derivatives of GSI only. Asia's premiere mining institute, Indian School of Mines, Dhanbad was also set up by Director of GSI, E.K.Pascoe in 1927.

Dr WD West was the last British Director of GSI and handed over the charge to Dr M S Krishnan. Dr West had made India his home. He was instrumental in the opening of postgraduate teaching of geology in Sagar University, later renamed as Hari Singh Gour University. □



Hot Water (66½°C) discharge from 728 m deep borehole in Tapovan, Chamoli (Uttaranchal)

India Adopts Bt Cotton

E C Thomas

Every technology has the potential to do both harm and good. It is for the ultimate user to weigh the benefits against the potential for harm and then take a decision based on sound economics.

INDIAN AGRICULTURE has entered the transgenic era with the government clearing the cultivation of Bt Cotton, genetically modified (GM) variety of cotton. The country also joins a group of countries, the USA, Mexico, Argentina, Australia, South Africa, China and Indonesia in adopting a new technology, which has the potential to revolutionize agriculture. India's entry into the age of agricultural bio-technology is a significant step to boost crop production.

The decision of the Genetic Engineering Approval Committee (GEAC) of the Environment Ministry for commercial use of Bt Cotton on March 26, 2002 has been welcomed by the farming community. However, environmentalists point out that the government has ignored the scientific and environmental concerns in approving the controversial transgenic cotton seeds.

Over the past four years, lab and field trials have been conducted by government agencies and Maharashtra Hybrid Seed Company (Mahyco) to determine

the environmental and agronomic performance of Bt Cotton. These trials have yielded evidence of improved yields, reduced use of pesticides and no adverse impact on the environment.

However, the GEAC took its time to give the clearance. What dictated urgency was the discovery that contraband Bt seed had entered the market. Farmers in Gujarat and Andhra Pradesh had actually planted it on their land and that large stocks of raw cotton had found their way into the ginning and weaving mills. Therefore, it was only an issue of regularizing the hitherto illegal as well as about making available beneficial technology to farmers. With the farmers, the ultimate users of this technology having already voted for it, the official seal of approval to Bt Cotton makes eminent sense.

Gene Revolution

The productivity jumps of the past in crops like wheat and rice have come about due to careful plant breeding. Genetic variation available from closely related organisms has been used to develop crops with more desirable

characteristics. The new method now offered to farmers is the use of genetically manipulated seeds.

The gene revolution that was ushered in the 1970's has turned traditional crop practice on its head. One no longer needs to select, breed and propagate the desired character (high yield, dwarf size) over a period of years, as was done to usher in the Green Revolution. It is easy now to identify the gene that imparts the desired trait (drought, tolerance, pest resistance) and insert it into the plant. More often than not, this gene comes from elsewhere, so that its insertion or transfer is from one organism to another. Such gene transfer is done in the lab in a matter of weeks, the effect on the plant monitored and confirmed and, once satisfied, the so genetically modified (GM) plant or its seeds is made available to the farmer. This is a short-cut and sure-fire way over the classical selective breeding technology.

This is what has happened with Bt Cotton.

The Bt Cotton seed is nothing more than the regular cotton seed, genetically modified by the

insertion of a soil bacterium. Bt stands for "Bacillus Thuringiensis", which is a common soil bacterium. This bacterium has been used as an organic pesticide for about 40 years. When you spray the Bacillus onto the plant ballworm pest eats it. The Bacillus is only toxic to ballworm pest. It does not kill butterflies, beetles or bees. However, Bacillus never caught on commercially as pesticide, because it gets degraded in the sun. Farmers have to keep on spraying all the time. Genetic engineering came along and took the Bacillus Thuringiensis gene and put it straight into the cotton seed.

So the plant produces the toxin, instead of it having to be sprayed on. Through genetic engineering, the gene responsible for that quality of Bt bacterium has been introduced into cotton, making the plant resistant to ballworm pest.

Resistant

If Bt Cotton is used too much, pests may become resistant to it. That is why farmers are now being told that 20 per cent of their crop should continue to be regular cotton. Pests can feed on that. This strategy seems to have worked in other countries. There are million of acres under Bt Cotton cultivation, yet no pest has developed resistance. Between 1990 and now, the area across the world growing GM crops has shot up from a few acres to 100 million acres.

Inserting the gene within the seed itself carries it with certain advantages over the traditional way. The pesticide degrades easily in the sun, which is why repeated spraying is required to tackle the pest menace comprehensively. With the pesticide now produced by the crop plant itself, the obvious

benefit is of reduced application of pesticides, resulting in cost savings for the farmer. In Bt Cotton usage, no damage to environment has been materialized so far in any country where the crop has been introduced. Data from USA, Mexico, Argentina, Australia, South Africa, China and Indonesia as well as Indian laboratory and field trials suggest that Bt Cotton yield is significantly higher than non Bt Cotton yield.

Field Trials

Indian field trials show a 15 to 40 percent increase in yield. Gujarat and Andhra farmers who accessed and planted contraband Bt Cotton seed testify to yields of 10 quintals per acre from Bt Cotton seed, as compared to non Bt Cotton average yield of 1.2 quintal per acre.

Currently, India ranks third among the world's cotton producing countries, but accounts for only 15 per cent of global cotton production. This is despite India having the largest acreage under cotton (it accounts for 25 per cent of the global area under cotton).

Indian cotton industry which supports one million farmers and textile products contribute substantial foreign exchange to the exchequer is today yielding less than it did three years ago, thanks to the destruction caused by the ballworm pest. In 2000-01 Kharif season itself, 13 per cent of Indian cotton crop was damaged by ballworm pest according to official figures. This is for a country whose yield per hectare is less than half of the world's average.

In recent times, many desperate farmers plagued by high costs of production, poor

yields and virtually no crop insurance have been driven to suicide. Therefore, farmers across the country's cotton producing belt have strongly come out in favour of Bt Cotton. The Bt Cotton should hopefully be a precursor to an enlightened government policy on genetically modified (GM) crops and food.

The extensive field trials in China, which has regions similar to Indian geo-climatic conditions, had already established that commercial farming of Bt Cotton have no unmanageable risks involved. Over two million farmers in China were using Bt cotton seeds since 1997 with about 30 per cent dip in production costs. The irony is that India imports over ten lakh bales of Cotton, much of it being Bt Cotton from Australia and China. It was absurd that we force our farmers to spend on pesticides, given the irresponsible manner in which they are sued, rather than just approve Bt Cotton.

Profitable Yield

Bt Cotton seed which is available commercially from April 1, 2002 may cost five times more than non Bt Cotton. But the comparative input-output analysis observed during 1999-00 and 2000-01 seasons have conclusively proved that it performs much better. An agronomic evaluation study done by experts of GEAC show that the benefit would amount to over Rs 5000 per acre, after accounting for all costs.

At present, India plants nearly nine million hectares of land under cotton and produces about 12 million bales of 170 kgs each of cotton annually.

According to Dr P K Ghosh, Advisor, Department of Bio-

Cost Benefit Evaluation

Particulars	Bt Cotton		Non Bt Cotton	
	Qty/acre	Costs (Rs.)	Qty/acre	Costs (Rs.)
Inputs Costs				
Seeds	450 gsm	1500	450 gsm	300
Fertilizers	5 bags	1200	5 bags	1200
Pesticides (include ballworm and other pests)	5 sprays	950	8 sprays	160
Other costs (land, sowing, inter-culture irrigation, cotton plucking)		4160		4160
Total Inputs		8760		9660
Output/Recovery				
Seed cotton (Rs. 2,200/qlt)	6.46	14,229	4.73	10,410
Other recovery	-	-	-	-
Total Output		14229		10410
Benefits per acre		5,469		750

technology, the average yield of cotton in the country works out to about 320 kg per hectare. The national average for the past five years has varied between 200-300 kg per hectare. Comparatively, the average productivity from hybrid cotton seed is about 600 kg, while that from non-hybrids is 200 kg per hectare.

According to him, the final results after 2001-02 trials established the same trends with a marginal rise in the figures. Therefore, it is estimated that with Bt Cotton, the productivity is likely to go upto 700-800 kg per hectare. It has been estimated that 10 million acres of land out of the total 22 million acres under cotton cultivation could be brought under Bt Cotton cultivation.

The US which occupies the top position has productivity levels of 1000 kg per hectare while China which stands second has a 900 kg yield per hectare.

Guidelines

The GEAC has notified detailed

guidelines for commercialization of authorized Bt Cotton seed varieties from April 1, 2002. The three-varieties of Bt Cotton seeds approved for commercial use are Bt Mech 12, Bt Mech 162 and Bt Mech 184. These three varieties of Bt Cotton seeds are found to be suitable for growing in southern parts of the country. The fourth variety Bt Mech 195, suitable for cultivation in north and north-west India is also expected to be cleared by the GEAC shortly. All the four Bt Cotton hybrids have been tested by the Maharashtra Hybrid Seed Company (Mahyco). It has a tie-up with the US multinational firm Monsanto.

The three-year approval for April 2002-March 2005 is with several obligations on the seed company and the farmers to facilitate controlled cultivation, data collection and continuous monitoring. As per the guidelines, the farmers cannot grow only Bt Cotton. The Bt Cotton crops must be surrounded by a belt of land called 'refuge' in which non-Bt

Cotton seeds should be sown. The size of the 'refuge' belt should be such as to take atleast five rows of non-Bt Cotton seeds, or should cover 20 per cent of the total sown area, whichever is more.

The cultivation should be in the ratio of 80:20- 80 per cent for Bt Cotton and 20 per cent for non-Bt Cotton. The onus of ensuring compliance would rest with state governments and local bodies, while some studies and monitoring would be conducted by a special group set up under the Ministry of Environment and Forests.

Scientific Concerns

Cotton is just one among the many crops—maize, soyabean, tomato etc. that account for the 56 million hectares of genetically modified plantations around the world. There are three main scientific concerns. Firstly, since alien DNA is imported into seeds, there is a danger of allergic reactions. Secondly, herbicide-resistant crop could transfer genes to weeds nearby leading to superweeds impossible to control. Thirdly, pesticide-resistance also could be transient of advantage with possible disruptions to environment. There are also moral objections to unnatural interventions.

The unscientific cultivation of Bt Cotton would result in the ballworm mutating and developing resistance of Bt Cotton bacteria, leading to a natural eco-friendly pesticide losing effectiveness for ever. Reports from some countries that have allowed unscientific Bt Cotton cultivation suggest that the ballworm is on its way to becoming resistant to Bt. There was a danger of that happening in India even

before Bt cultivation was allowed, thanks to illegal cultivation in Andhra Pradesh and Gujarat. Now allowing Bt Cotton has atleast enabled the government to prescribe internationally tried method of checking mutation by providing a 'refuge' growing of Bt Cotton alongwith non-Bt Cotton. Then the bollworm would feed on non-Bt Cotton and would not be forced to adapt by mutating.

However, there is no way the government would be able to force its chosen 80:20 (80 per cent Bt. Cotton and 20 per cent non-Bt Cotton) ratio on the farmers especially when the yield differences are expected to be almost double. The government

is likely to be more successful if it were to tell the farmers that if they do not follow the prescribed norms, after an initial spurt, yields would decline to where they are today. The best way of doing that is to pass on that task to the company selling the seed, which has a stake in the matter.

It is important to remember that bio-technology is far from an exact science. So either one waits eternally for a definitive balance sheet to come in, a precise evaluation of proven long-term benefits and dangers-or one undertakes field trials and makes an evaluation based on them. Countries with large agricultural tracts like US which has a two-

third share of total global production of genetically modified crops, China, South Africa and Australia have wisely chosen the second alternative. No technological revolution lasts for ever.

But, certainly, Bt Cotton has the potential to transform the productivity of Indian cotton farm lands and improve the quality of life for farmers. Every technology has the potential to do both harm and good. It is for the ultimate user to weigh the benefits against the potential for harm and then take a decision based on sound economics. Ultimately, it is for the Indian farmer to decide whether to use or not Bt Cotton. □



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Why FDI Inflow Needs to Improve

Pulak Mishra
Ramakanta Prusty

Considering that the trend of foreign investment has to be reversed failing which the Indian industry sector will lose much in the present era of globalisation and competition, efforts should immediately be made not only in removing the imperfections and making the policy framework more consistent, transparent and rule-based, but also in creating an investors friendly environment by eliminating different obstacles to proper implementation of these measures as well as providing necessary infrastructure facilities.

THE IMPORTANCE of foreign direct investment (FDI) inflow for an economy in transition like India can never be ignored as the FDI inflow not only integrates the host country close to the world economy, but also acts as a developmental resource in the form of capital, technology, managerial and marketing know-how, and market access required for sustained economic growth and development. Besides, a large and quality inward FDI can make the relationship between the domestic and foreign enterprises more dynamic in terms of both technology and environment, which is very urgent particularly in the present era of globalisation and competition.

Compared to the earlier restrictive FDI policy regimes, in India, the New Industrial Policy (NIP) of 1991 accords a much liberal attitude towards FDI to

exploit the opportunities for promoting foreign investment in the country. The industrial policy changes in the nineties, especially in the form of simplification of procedural rules and regulations and removal of entry barriers have created a favourable environment for the foreign investors. The new policy framework not only permits the firms to have higher equity participation in their ventures in India, but also opens up many new sectors to them that were earlier reserved exclusively for the domestic firms.

It is a matter of serious concern that despite giving much attention on attracting large and quality FDI inflow and introducing a number of liberal measures in this direction ever since the initiation of the liberalisation process, the amount of FDI is yet to reach a satisfactory level. Although as many as 11,874 numbers of FDI proposals have been received with proposed investment

of Rs. 2,42,602 crore during 1991-2000, total amount of inward FDI including foreign portfolio investment is still only about 1 percent of the country's national income and only about 2 per cent of the total investment in the country.

Furthermore, the rate of realization has also not been picking up as per expectation. As shown in Table-1, the realized FDI as a percentage of the proposed FDI on an average was as low as 35% in the nineties. With the number of foreign technology collaborations approved declining over the years since mid-nineties and the MNCs preferring for equity-linked technology transfer, the situation seems to have a serious implication particularly in respect of having access to foreign technology.

It is also important to note that India's share in global inflows has

M/s Pulak Mishra is Lecturer, Dr Meghnad Saha Institute of Technology, Haldia (West Bengal) and Ramakanta Prusty, Lecturer, S.K. Patel Institute of Management and Computer Studies, Gandhinagar, Gujarat.

declined sharply from 0.75 per cent in 1997 to 0.24 percent (estimated) in 2000. India does not figure among the top ten investment destinations in the globe. It fares badly even when compared with the smaller countries like Venezuela, Argentina, Saudi Arabia, etc. Actual FDI inflow from the European Union so far has been far from the potential. Worse perhaps is the number of investors walking out of the country being frustrated by the procedural hassles and endless red-tapism coupled with the slow pace of reforms of the infrastructure sector and the lack of required focus in the policy resolutions.

Apart from its very low volume, the quality of FDI inflow also was not as per expectation. First, the distribution of FDI, FTCs and FFCs are not even across industries. While FTCs are concentrated mainly in the capital goods sector and to some extent in the basic and consumer non-durable goods industries, in case of FFCs, it is the service sector, which received the maximum followed by capital and consumer non-durable goods industries. As regards FDI inflow, on the other hand, the distribution is skewed towards the basic goods and service sectors, which together received more than 75% of the total amount during this period (Table 2).

Takeover

Secondly, with the liberal FDI policy measures of nineties and abolition of FERA facilitating cross-border mergers and acquisitions (M&As), most of the recent FDI inflows seem to be for taking over of the existing Indian companies rather than to invest for capacity expansion or new ventures in the host country. While until 1990

Table-1: Trend of FDI Inflow into India, 1991-2000

Year	No. of FTCs	No. of FDI Proposals	Proposed Investment	Actual Investment	Actual/Proposed (%)
1991*	661	289	534	351	65.73
1992	828	692	3888	675	17.36
1993	691	785	8859	1787	20.17
1994	792	1062	14187	3289	23.18
1995	982	1355	32072	6820	21.26
1996	744	1559	36147	10389	28.74
1997	660	1665	54891	16425	29.92
1998	595	1191	30814	13340	43.29
1999	498	1726	28367	16868	59.46
2000**	365	1550	32843	15436	47.00
Total	6816	11874	242602	85380	35.19

Note : *August to December; **January to November.

Source : Ministry of Industry (GoI): SIA Statistics, April 2000.

Table-2: Industry-wise Break-up of FTCs, FFCs and FDIs, August 1991 to February 2001

Industry	Share FTCs (%)	Share in FFCs (%)	Share in FDI (%)
Basic Goods	22.1	14.2	39.4
Capital Goods	46.2	24.1	9.1
Intermediate Goods	3.6	4.3	Negligible
Consumer Durable Goods	19.6	20.5	10.0
Consumer Non-durable Goods	Negligible	Negligible	3.3
Services	7.9	36.0	36.0
Total	100.0	100.0	100.0

Note : FTCs-Foreign Technology Collaborations, FFCs-Foreign Financial Collaborations, FDI-Foreign Direct Investment

Shares in FTCs and FFCs are in respect of numbers whereas the shares in FDI are in respect of amount.

Negligible = < 0.05.

Source : SIA News Letter, Ministry of Commerce and Industry, various issues.

almost all of the FDI inflows in the country took the form of green-field investment, about 40 percent of that was through M&As during 1997-99. In 2000-01 only, around 43 percent of the FDI inflows were for takeover purpose. This increasing tendency of FDI inflow in the form of M&As might have

limited the economy from its very objective of attracting quality FDI inflows that have domestic capital augmentation potential, spillover benefits along with competition, employment and efficiency generating competencies.

The failure of the neo-liberal

economy of India in attracting large and quality FDI inflow, therefore, requires a clear understanding of the factors responsible for such dismal situation. Existing empirical studies on FDI show that the magnitude of FDI inflow into an economy is largely driven by the factors like market size, the extent of urbanization, geographical and cultural proximity with the source countries and quality of infrastructure. Considering that the composition of the set may vary depending on the situation/context, the present paper attempts to discuss four major factors, namely, adverse economic environment, poor and inefficient infrastructure, decelerating corporate profitability, and imperfections in the policy framework which seem to have influenced the quantity as well as quality of FDI inflow into the country in a considerable way in recent years.

Adverse Economic Environment: The recent economic slowdown seems to be one of the major factors responsible for the sorry state of FDI situation in the country. The erratic economic growth since the latter half of the nineties in general and industrial recession in particular have undoubtedly limited the market for industrial products and thereby broken the confidence of the potential foreign investors to invest in the country. With the recession of the domestic as well as global economy, continuing and the rate of inflation being very low, it is very unlikely that the situation will reverse in near future unless appropriate measures are taken in this regard with immediate effect.

Table 3: Performance of the Corporate Sector vis-a-vis Foreign Private Firms in the 1990s

Year	Operating Profit/ Gross Sales		PBDIT/ Gross Sales		PAT/ Gross Sales	
	Overall	Foreign Private	Overall	Foreign Private	Overall	Foreign Private
1993-94	7.2	8.0	12.5	12.2	2.5	3.6
1994-95	7.9	8.0	13.0	12.7	4.0	4.5
1995-96	8.2	8.5	13.3	13.2	4.1	4.9
1996-97	7.1	8.5	12.5	12.9	2.3	4.6
1997-98	6.3	8.1	12.2	12.6	1.6	4.7
1998-99	5.6	7.0	11.5	11.7	0.7	3.7
1999-00	5.4	6.8	10.8	11.7	0.9	3.6
Average	6.8	7.8	12.3	12.4	2.3	4.2
Growth	-6.2	-2.7	-2.7	-1.2	-21.6	-1.5

Note : PBDIT - Profit before depreciation, interest and taxes; PAT - Profit after taxes.

Source : Industry - Financial Aggregates & Ratios, CMIE, 2001

Decelerating Corporate Profitability : Declining corporate profitability in the nineties, especially since the mid-nineties, seems to be another important factor responsible for the low investment. Table 3 depicts the trend of profitability of the overall corporate sector as well as that of the foreign private sector enterprises operating in India in the post-liberalisation era. It is observed that, though increased initially after the introduction of the NIP, the profitability in the sector (measured in terms of operating profit, i.e., net of sales and costs, profit before depreciation, interest and taxes (PBDIT) and profit after tax (PAT) as proportions of gross sales) shows declining trend since 1995-96, for foreign sector enterprises as well as for the overall corporate sector.

Further, to note that all the indices used have experienced negative rate of growth during the period under consideration though the extent of negativity is considerably less for the foreign

enterprises. This declining state of corporate profitability, especially that of the foreign firms, might have undermined the confidence as well as risk-taking attitude of the potential foreign investors in a considerable way. Not only that, the sorry state of profitability of the existing foreign firms might have also reduced their ability to expand capacity of the existing units or opening up new ones and forced them to take the relatively safe route of M&As to entry into and increase presence in Indian industry.

Poor and Inefficient Infrastructure : It goes without saying that for attracting more inward FDI, a developing country like India badly needs fast development and provision of industrial infrastructure facilities, which seems to be absent creating severe obstacles in the way of rapid investment inflow even in the current situation. Although a lot has been discussed regarding the poor infrastructure facilities

existing in the country, very little is done so far. Hardly anything could be more shocking than the fact that among 47 industrialising countries worldwide, India stands at the bottommost in terms of infrastructure competitiveness (World Investment Report, 2000). No or very little progress has been made in respect of roads, railways, port, power, etc. during the last ten years or so. For example, while the major ports are still over-utilised and hence cost inefficient compared to other Asian ports like Singapore, Hong Kong and Colombo, the growth rate of power generating capacity is gradually decreasing. Similarly, although about 30 million people in the country enjoys telecom services, the penetration is far behind the other developing countries.

Imperfections in the Policy Framework : A group of studies postulate that policies relating to FDI play a relatively minor role in influencing the magnitude of inward FDI, especially after the harmonization of policies across the world. But what is more important perhaps is that while the liberal policy measures may not necessarily guarantee a bigger and quality inflow of FDI for many economies, the imperfections and inconsistencies therein can surely pose a threat on its way in. Besides, with the developmental impact of FDI being influenced to a large extent by the initial conditions prevailing in the host country, investment strategies of the foreign firms and policies and performance of the host government in channelising FDI inflows in tune with the objectives of its development policy, development of a comprehensive policy framework is quite imperative.

There is no doubt that the NIP

accords a much liberal attitudes towards FDI than ever in post-independence India but its failure to attract a large amount of FDI

While the liberal policy measures may not necessarily guarantee a bigger and quality inflow of FDI for many economies, the imperfections and inconsistencies therein can surely pose a threat on its way in.

inflow might have a bearing to the existence of a large number of imperfections in the policy framework. For example, in the financial sector, the CRR, SLR and priority sector lending requirements are not as pervasive as it is in other developing countries with which India competes for attractiveness. Similarly, the food processing suffers from very high indirect taxes and a long waiting period of approval under the Food Products Order and the Prevention of Food Adulteration Act.

Besides, with India being a pre-matured economy in terms of infrastructure and demand in the pre-liberalisation era, liberal policy measures relating to FDI only do not seem to be enough to attract greater and quality FDI inflow into the country. While a comprehensive policy framework should also include reforms of the infrastructure and trade related policies, the measures on these fronts are not only inconsistent and unclear, they have also failed in their respective fields, creating a greater deal of confusion in the minds of the potential investors.

Thus, even after a decade or so since the NIP was introduced, India

has failed to appear as one of the hot destinations for the foreign investors particularly for greenfield investment. This contrasts strikingly to the experience from several developed nations where high standards of living and corresponding high costs have forced many manufacturers to shift their operations to the poorer countries. The failure may largely be due to the imperfections and inconsistencies in the policy measures that have made the investment climate more rather than less uncertain coupled with economic slowdown, poor corporate performance and inadequate infrastructure facilities reducing the ability as well as the willingness of the potential investors to invest in the country.

Considering that, in some way or the other, the trend of foreign investment has to be reversed failing which the Indian industry sector will lose much in the present era of globalisation and competition, efforts should immediately be made not only in removing the imperfections and making the policy framework more consistent, transparent and rule-based, but also in creating an investors' friendly environment by eliminating different obstacles to proper implementation of these measures as well as providing necessary infrastructure facilities. With private investment being unlikely to come in a big way, especially in the long-gestation infrastructure projects, the government must step in and play out its part in developing industrial infrastructure. Besides, attention should also be made in reversing the economic slowdown in general and the declining trend of corporate profitability in particular so that the foreign investor get enough confidence to invest in India. □

E-Governance : A Case Study in Rural Informatics

Anjali Dhingra and D C Misra

E-Governance aims at bringing transparency into the system and help common man take more informed decisions. It also envisages prompt and quality delivery of services by taking Information and Communication Technology to the common man. Effective implementation of e-governance requires a phased approach.

E-GOVERNANCE refers to Information & Communication Technology (ICT) enabled route to better governance. ICT is now being recognized as a key factor to move towards more efficient, responsive, accountable and effective governance. An evolutionary process, the journey towards e-governance is a tedious one. There could be two options for the transformation process—Option-I : Map the IT structure over the existing administrative set up and consolidate it further. This is the easiest and known route and has better degree of acceptability by the system. Option-II suggests thinking the unthinkable and reform the government space. This requires re-engineering of processes and is relatively a difficult and radical path. It may face reluctance from the system.

The journey towards e-governance would be guided by the option selected from the above

two choices. First, these issues are discussed in general and later on demonstrated with the help of a case study on Rural Soft 2000.

Irrespective of the course of action selected for the e-governance process, it has been observed, based on experience, that there are definite steps in the process, each of which needs to be addressed, to reach the desired goal. Ultimately, the aim is to cater to the common man's need in the most effective, prompt and accurate manner.

Steps towards E-Governance

- Develop a high-level awareness and commitment among decision makers that will carry forward e-governance
- Study Government space
- Identify priority areas and conduct a detailed study for each priority area
- Assess existing status of computerization

- Evolve a policy framework
- Build-up ICT infrastructural (technological, data, institutional & legal) and Human capacities
- Standardize the format for Content/data
- Information generation and consolidation
- Backend computerization (intra-organization computerization)
- Integration of backend applications
- Applications' integration across organizations (inter-organization computerization), establishing a-
 - Government-to-Government interface
 - Government-to-Business interface
 - Government-to-Constituent interface
 - Government-to-Foreign Government interface

Mr D C Misra is Technical Director & Ms Anjali Dhingra is Scientist, Rural Informatics Professionals at National Informatics Centre, IT Ministry.

- Establish, maintain and strengthen a secure bi-directional interface—
- Between Government and Citizen on anywhere, anytime, any device basis
- Sustain and strengthen the effort

A critical pre-condition in successful e-governance for development is to put e-governance onto the agenda and make it happen. All the operational e-readiness in the world is of limited value if there is no vision to give direction to e-governance. Therefore, it is pre-requisite to develop a high-level of awareness and commitment so that the e-governance process is successfully steered to meet its ultimate objectives.

Review

To begin with, it is important to understand and analyze the complete government space, so that the government domain, its inter relation with other entities and areas of information exchange can be identified in concrete terms. Based on the this understanding, a review of the existing status of computerization may be carried out to assess the level and extent of e-governance in the country. This would reflect the work that remains to be done and also prevent the possibility of any duplicity. Having understood the inter relation of government, its constituents and other stakeholders, e-governance policy guidelines may be evolved, which would act as a blue print detailing vision, priorities, architecture, administrative & legal framework and implementation mechanism to transit from paper-to-less paper-to-paperless government. Next, a needs assessment study may be

conducted to establish the requirements in terms of content, computation, communication and information access infrastructure. E-Governance demands standardization in all areas to facilitate seam less integration of information between various entities. To begin with, standardization of the format of content should be the primary focus area.

Before, the actual process of information generation and/or consolidation can commence; it is necessary to build the requisite ICT capacities in terms of technological, institutional & legal infrastructure and also the Human capacities to effectively implement, utilize and sustain e-governance services.

It is important to adopt a phased approach for the process of information generation and consolidation. In the first phase, emphasis should be laid on backend computerization i.e. automation of departments within an organization with the objective of streamlining and standardizing the internal processes and procedures. This should be followed by integration across departments and organizations taking into account various interoperability issues. Having laid down a strong backbone through information generation and consolidation process, an effective interface between Govt. and citizen can be formed by publishing relevant information into the public domain. The entire effort needs to be sustained and continuously strengthened so that more and more information flows into the public domain, thus easing the life of common man and meeting ultimate objectives of e-governance.

The e-governance framework discussed above has its origin and basis in years of rural informatics endeavours. Following section presents one such effort that was initiated in 1986 and marked the beginning of rural informatics in the government sector. Evolution of Rural Soft 2000 represents a case study that focuses on a domain (Rural Development), most reflective of Indian conditions and raises issues that are most challenging for implementing e-governance.

Rural Soft 2000 ✓

Several years of effort has gone into the process, which is difficult to summarize in a few paragraphs. However, an attempt is being made to briefly describe the evolution of Rural Soft 2000, that allows on-line monitoring of progress right from the desktop of monitoring agencies, at State and Centre, (cross-organisation flow of information) enables a common man to access information of public interest using a browser based interface provided by the software.

National Informatics Centre (NIC) introduced Information Technology (IT) in Rural Development (RD) sector in the year 1986 with active support of Department of Rural Development, Govt. of India. As a result, Computerized Rural Information Systems Project (CRISP) was launched. It is worth mentioning here that induction of IT in Rural Development and its subsequent evolution have not been easy tasks, owing to the unstructured nature of Rural Development domain, slow pace of development reforms, low IT literacy and usual reluctance to adopt IT. Nevertheless, Indian Rural Informatics has reached a

stage today where IT finds a significant place in RD, not only in terms of expanse and magnitude of its application but also in terms of technological advancement.

Monitoring

CRISP was launched by Department of Rural Development, Ministry of Rural Development (MORD), Government of India, with an aim to facilitate the District Rural Development Agency (DRDA) staff in the monitoring exercise of poverty alleviation schemes through a Computer Based Information System (CBIS). A study of the problem domain indicated that CRISP application software was required to address following problems faced by DRDAs:

- Selection of works/families/beneficiary
- Monitoring of taken up cases
- Performance of various agencies (Banks, Block Development Offices (BDOs), Public Works Departments (PWDs) etc.)
- Pre-disbursement problems with Banks
- Post disbursement problems regarding
- Product marketing/Asset Retention
- Loan Repayment
- Subsidy Adjustment
- Insurance Settlement
- Preparation of Annual Action Plan for each scheme at the beginning of financial year

CRISP Phase-I : 1986 to 1998

Initial versions of the CRISP software were designed and developed to meet the following

objectives :

- Help DRDA Staff to quickly understand simple data storage (input) and data retrieval (output)
- Create basic records of beneficiaries and works under Rural Development Programme
- Provide an easy method of generating various reports prescribed by the State and the Centre
- Gather basic information about villages to support planning activity for Poverty Alleviation Schemes

CRISP software was introduced, by NIC, in 10 districts in the pilot phase. The end users in all the districts were thoroughly trained to use the software. Feedback from the pilot districts was incorporated and the first version of CRISP software i.e. CRISP 1.0 was launched in all the districts of the country. It was a DOS based software with dbaseIII plus at the backend. CRISP 2.0 was on DOS/Clipper platform, whereas CRISP 3.0 was available in Xenix/Foxbase and Oracle 6.0 environments. The computing infrastructure was provided by the Ministry of Rural Development to all DRDAs.

MORD authorized the States to select a technical support agency to customize the software for local needs and maintain it. NIC handed over all the software artifacts and provided the necessary training to the State appointed technical agencies, thus initiating the decentralization of CRISP.

At the end of Phase-I, there was a fair acceptance of the software and quite a few DRDAs entered the data and generated reports using CRISP software. The reports were

initially sent to the monitoring agencies in printed form and floppies and later on with the establishment of dial-up connectivity, e-mail based transmission was adopted. CRISP marked the beginning of Poverty Alleviation Informatics and several software modules (e.g. Financial Accounting) were added to it to further automate the functioning of DRDAs.

CRISP Phase—II

In Phase-II of DRDA computerization, the Ministry of Rural Development decided to sponsor the upgradation of the computing and communication infrastructure as requested by DRDAs and consequently funds were sanctioned for —

- One Server (Windows NT 4.0)
- Five Clients (Windows 95 or later)
- SQL Server 7.0
- Visual Basic 6.0 (Enterprise Edition or later)
- MS Office 97 or later

Besides, ministry also sanctioned V-SAT based connectivity to 15 DRDAs in the pilot phase. Meanwhile, there was a restructuring of various poverty alleviation schemes, by the ministry and as a result NIC was requested to design and develop a new application software package to meet the fresh requirements.

The fourth version of CRISP application software package has been re-christened as Rural Software 2000. Apart from the new environment, lessons learnt from Phase-I were also taken into account while designing the new software. The end users, experience with earlier versions of CRISP application software had instilled some amount of

familiarity to deal with CBIS, and this was an added advantage.

Fresh Study

A fresh study of the domain was conducted by NIC to understand the restructured poverty alleviation schemes. Ministry of Rural Development constituted a Group comprising officials from the ministry, State and DRDAs and several rounds of discussions were held to finalize the input format for capturing the data and output formats for sending the reports to the monitoring agencies (i.e. from DRDA to State and from DRDAs to MORD), to be used by all the DRDAs. It may be noted that this exercise brought in the necessary standardization, to the extent possible, among all the DRDAs for entering the data and generating the reports. It is pertinent to point out that the previous experience of Phase-I greatly reduced the time and effort for the standardization process. It may also be noted that the standardization process was based on the commonality that existed across the domain, which could be modeled at a central location, whereas variations were also observed, that needed to be tackled locally at the State and District level.

The domain study was followed by design, wherein several issues were taken into account. Some of the design considerations have been outlined now:

- Easy to use and intuitive Graphic User Interface in view of users characteristics and low IT literacy level
- Provide a web based interface to facilitate online monitoring
- Provide for off-line monitoring as well, in view of non-availability of network all the time

- Graphical tools for better monitoring of data
- Future customizations and upgradation to be made easy

Taking into account these design considerations, Rural Soft 2000 has been developed using a centralized-decentralized approach. It was decided to develop the core module, representing the commonalities that existed across the layers of administrative set up for the poverty alleviation domain throughout the country, at NIC New Delhi and the variations were decided to be dealt with by the local NIC offices in the States and Districts.

It may be recalled that the technical support at local level was earlier extended by the State appointed agencies during the phase-I. However, towards the end of phase-I, most of the States started to opt for technical support provided by local NIC offices in the districts and States.

Rural Soft 2000 is a highly robust and scalable solution that aims at capturing and processing the data related to poverty alleviation schemes. The software allows on-line monitoring through web based reports and also facilitates periodic exchange of reports to facilitate off-line monitoring as well. Following are some of the features of the software:

- Consistent and user-friendly GUI based interface
- Web based reports
- Dynamic user-defined queries
- Supports GIS based monitoring
- E-mail based exchange of reports

- On-line help
- HelpDesk for latest technical updates

Rural Soft 2000 can be easily configured to work at any of the layers of administrative set up i.e. Panchayat, Block, DRDA, State or MORD, provided the requisite computing and communication environment is available. A desktop version of the software is also available for low end computing environments.

After conducting a thorough training for the end users, the software is operational in 15 pilot districts with the technical support of local NIC offices. Recently, the software has been released to all the State Rural Development and State NIC offices for customization to meet state specific needs and distribution to all the DRDAs in the States.

Conclusion

Effective implementation of e-governance requires a phased approach. The proposed framework addresses the steps involved in the transformation process broadly comprising intra-department, inter-department computerization and publishing information into the public domain. Evolution of RuralSoft 2000 inspired the formulation of the proposed framework. This case study represents information exchange between layers of administrative set up within a specified domain i.e. Rural Development. However, the architecture of the software permits cross-domain interface, whenever related domains are ready for it. Lessons learnt during the evolutionary process have acted as valuable input towards the formulation of e-governance

(Contd. on page 39)

Regionalism in International Trade : Role of WTO

Joseph Abraham

Nature and scope of RTAs since the recent past are showing an ever increasing growth around the world which may widen the conflict between multilateralism and regionalism and these would require greater streamlining under the WTO to ensure that the regional trade groups do not hinder the liberalized multilateral trading system.

WITH THE growing influence of global trade in every sphere of the world, regionalism in the realm of international trade has far wider significance than regionalism in any other domain of civil society. As the present day world is rapidly surging towards greater trade liberalization, globalization and rule-based multilateral trading system, the emergence of an ever-growing number of Regional Trade Agreements (RTAs) between countries have opened a wide debate on their role and significance in the contemporary globalized multilateral trading environment. These debates mainly revolve around the objectives of RTAs, their economic and political costs and benefits, and the extent of threat which they pose to the stability of the recently established rule based multilateral trading system under the World Trade organization (WTO). To facilitate conceptual clarity ON RTAs, prior to any discussion on these issues, it may be apt to begin

with a definition on the concept of RTAs and regionalism in international trade, the most apt one being that of the "Dictionary of Trade Policy" which defines trade regionalism as "actions by governments to liberalise or facilitate trade on a regional basis, sometimes through free trade areas or customs unions".

In recent years, particularly since the 1990s, there has been a dramatic increase in the number of Regional Trade Agreements (RTAs). From 1947 to the present day, over 200 RTAs have been notified either through the World Trade Organisation (WTO) or the erstwhile General Agreement on Tariffs and Trade (GATT) and among these, about 150 RTAs which are in force now have been concluded during the last decade. Among more well known RTAs are: European Union (EU), European Free Trade Association (EFTA), North American Free Trade Agreement (NAFTA), The Southern Common Market (MERCOSUR), Association of

South East Asian Nations (ASEAN), Common Market of Eastern and Southern Africa (COMESA), Caribbean Community (CARICOM), Latin American Integration Association (ALADI) and the one well known in India: The South Asian Association for Regional Cooperation (SAARC). The network of RTAs in the present day world is a highly complex mechanism as each country may be a member of several RTAs each with its own rules. Nearly 60 per cent of the RTAs as of now have been concluded among the countries of Europe while only 15% of the total RTAs have been concluded by the developing countries, indicating the relatively low degree of regional integration among developing countries.

Several studies have revealed that in the short term, the RTAs tend to increase the volume of both domestic and international trade by creating considerable dynamism to the RTA partners. However, over a period of time, the

growth of trade by the RTA participants with the third parties tends to reach an equilibrium with that of intra-RTA trade. Theoretically in terms of revenue effect, customs revenue is expected to decline once the RTA becomes effective though the empirical studies show that there is no clear evidence on the positive or negative effects of regional trade liberalization on revenue or development.

Broadly, RTAs fall into either Customs Unions or Free Trade Areas. In the Customs Union, all members charge the same set of customs duty rates on imports from non members, as in the case of European Union (EU). In the Free Trade Area Zones, the trade within the group is duty free, but each member can set its own duty rates on imports from non-member states as in the case of North American Free Trade Agreement (NAFTA) or ASEAN Free Trade Area.

Benefits

No doubt, both economic and political interests are the driving forces behind a country's decision to join an RTA. From the economic perspective, there would be tremendous economies of scale that could be reaped through expansion of domestic market after the dismantling of trade barriers among the RTA partners. Further, competition from RTA partners also serves as an impetus for domestic producers to enhance competitiveness of their products vis-a-vis those of their RTA partners, which in-turn transform the monopolistic structure of the domestic market. RTAs also facilitate faster, broader and deeper trade liberalization among members than under a multilateral trade regime through mutual tariff

reduction for the products from RTA partners.

From the political perspective, RTAs not only promote greater peace, security and cooperation among the partners but also facilitate effective coordination and harmonization of economic reforms and measures towards greater political stability, particularly in the case of transition economies. Besides, some of the RTAs also insist on commitment to democracy among the members. Membership in RTAs also enhances the bargaining power of smaller countries either at the regional or at multilateral level, which may not be otherwise possible for them if they are in a state of isolation at the regional and multilateral level. These countries therefore may very often follow the lead of other bigger regional powers to avoid the perils of getting marginalized through economic and political isolation at the regional and multilateral level. It is also observed that larger the number of partners in an RTA, the greater would be the incentive for others to set up their own RTAs.

The consumers of RTAs have the benefit of getting relatively less expensive imports from the partner country which would eventually displace the high priced goods produced domestically (often termed as the "Trade Creation Effect"). RTAs also accelerate the in-flow of foreign investment and transfer of technology, besides improving the bargaining power of the region and the regional terms of trade through higher and more efficient regional coordination of trade with partners outside the RTA particularly in the area of competition and investment.

But these economic and political advantages of RTAs are not without any corresponding economic and political costs. The RTA partners may have to forego the loss in customs and other tariff revenues as a result of concluding the RTA. The removal of trade barriers may also result in considerable trade diversion as it forces an RTA partner to accept high cost imports from within RTA partners instead of the relatively low cost imports from countries outside the RTA. The complicated rules of origin in a free trade area further makes the tasks of the customs staff more cumbersome and complex. Administrative complications arising out of tariff reduction regulations also mount up. Moreover, if a country has membership in multiple/overlapping RTAs, there would be considerable administrative complications in enforcing the complex tariff reduction facilities and other preferential treatment which are mandatory for the imports from the concerned RTA partners.

Adverse Effect

RTAs also have considerable adverse effect on third parties which may lose market share if the tariff concessions of an RTA partner results in greater intra-RTA sharing. The sourcing requirements of RTAs rules of origin may lead to diversion of trade and investment away from third parties and move it more towards RTA partners often termed as "Trade Diversion Effect". Multilateral trade negotiations also become more complicated due to trade frictions between trading blocs of RTAs. No wonder these political and economic costs of RTAs have given rise to considerable scepticism and widespread fear that the recent growth

in the RTAs might pose a threat to the present day rule based multilateral trading system. Though RTAs can harmonize regional integration of economic reforms, it provides only partial trade liberalization as the regional economy is not fully open to partners outside the RTA. Moreover, competition is restricted within the RTA members only who may not be the most efficient suppliers. These costs can be reduced only by minimizing the level of trade discrimination against non-members and through extending the benefits of trade policy reforms within RTAs to non-members also on a non-discriminatory basis.

Regulations

Though the multilateral trade rules of WTO is against increase in the level of protection among members, the RTAs effectively restrict free trade due to its accompanying administrative procedures, rules of origin and preferential treatment which all tend to increase the discrimination against non-members and create new complications for RTA members themselves. The WTO rules on RTAs seek to ensure that the rights of third parties are not compromised. However, the WTO agreements recognize that regional agreements and closer economic integration can significantly benefit countries. But at the same time, WTO also recognizes that customs unions or free trade areas would effectively violate the WTO's principle of equal treatment of all trading partners (i.e. the most favoured nation-MFN) and the guiding principle of non-discrimination defined in Article I of GATT, Art. II or General Agreement on Trade in Services (GATS) and elsewhere. In the WTO context, Regional

Trade Agreements (RTAs) have both a more general and a more specific connotation: more general, because RTAs may be concluded between countries which may not necessarily belong to the same geographical region. It is more specific because, the provisions of GATT Art. 24 and GATS Art. 5 relate specifically to conditions of preferential trade liberalization with RTAs. The WTO Members are however, permitted to enter into such arrangements (i.e. RTAs) under specific conditions which are laid down in the following three sets of rules.

Paragraphs 4 to 10 of Article XXIV of GATT (as clarified in the Understanding on the Interpretation of Article XXIV of the GATT, 1994) provide for the formation and operation of Customs Unions and free trade areas covering trade in goods. Article XXIV states that, if a free trade area of customs union is created, duties and other trade barriers among RTA partners should be reduced or removed on substantially all sectors of trade in the group, over a specific period, normally not exceeding 10 years. Further non-members should not find trade with the group more restrictive than before the group was set up.

- The Enabling Clause (i.e. the 1979 Decision on Differential and More Favourable Treatment, Reciprocity and Fuller participation of Developing Countries) refers to preferential trade arrangements in trade in goods between developing country Members; and
- Article V of GATS which governs the conclusion of RTAs in the area of trade in services for both developed and developing countries.

Indepth discussion have taken place on many aspects of GATT Article XXIV, the Enabling Clause and Article V based on submission by Members and papers by the WTO Secretariat.

Other non-generalised preferential schemes for example: non-reciprocal preferential agreements involving developed and developing countries, require Members to seek a waiver from WTO rules, which requires the approval from three quarters of WTO Members. Such agreements which are currently in force includes the US-Caribbean Basin Economic Recovery Act (CBERA), and the CARIBCAN Agreement whereby Canada offers duty free non-reciprocal access to most Caribbean countries and the Andean Trade Preference Act. The waiver for the Cotonou Agreement recently signed between the EC and the African Caribbean and Pacific (ACP) countries is still under the consideration of the WTO.

Recent Developments

On 6.2.1996, the WTO General Council created the Committee on Regional Trade Agreements (CRTA) to examine regional groups and to assess the consistency of RTAs with WTO rules and also to examine its effect on the multilateral trade system and the possible relation between RTAs and multilateral agreements. The establishment of the CRTA as an exclusive body for examining RTAs have helped to streamline the examination procedures and provide a forum for the discussion of cross cutting systematic issues which are of concern to most of the RTAs.

The RTAs which are within the purview of Article XXIV are notified to the Council for Trade in Goods (CTG). The RTAs which are under the ambit of the

Enabling Clause are referred to the Committee on Trade and Development (CTD). The Agreement is placed in the Agenda of the CTD meeting where a debate is held and generally no in-depth examination in the CRTA is requested by the CTD.

RTAs covering trade in services under Article V of GATS concluded by any WTO Member are notified to the Council for Trade in Services (CTS). The CTS may decide to pass the agreement to the CRTA for examination and such examination is only optional and not mandatory.

There are twin advantages of an in-depth examination of RTAs by CRTA. Firstly it ensures the

transparency of the RTAs and secondly it allows members to examine its consistency with the WTO rules. On concluding the factual examination of the RTA, a report as prepared by the Secretariat and agreed by the CRTA is submitted to the relevant superior body of the WTO for adoption. The CRTA's other two functions are to consider how the required reporting on the operation of agreements should be carried out and to develop procedures to facilitate and improve the examination process.

The scope of the preferential treatment to RTA partners varies widely between the RTAs i.e. from a few goods/sector to wider areas such as Standards (sanitary and phytosanitary), Services,

Intellectual Property, Competition etc. Some of the recently concluded RTAs cover not only the conventional area of tariff liberalization but also cover subjects such as government procurement, investment or competition policy which have so far been excluded from or not fully discussed in multilateral trade negotiations. Thus the nature and scope of RTAs since the recent past are showing an ever increasing growth around the world which may widen the conflict between multilateralism and regionalism and these would require greater streamlining under the WTO to ensure that the regional trade groups do not hinder the liberalized multilateral trading system. □

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Community Participation and Management of Marine Eco-system

Jeyanth K Newport

When it comes to development, the initiation of Ship Breaking Project at Vodarevu near Chirala of Prakasam district will disturb the coastal eco system, potable water and also the livelihood of many rural people. Eventhough, the fisherfolk of Prakasam district is continuing their struggle for the management of sustainable coastal resources, community participation has resulted in the conservation of marine eco-system in Prakasam district of Andhra Pradesh to some extent.

IN THE month of September 1998, the Andhra Pradesh government issued an order and signed *Memorandum Of Understanding* with selected parties for setting up the Ship Breaking and Minor Port Projects at Vodarevu near Chirala of Prakasam district. A Company from Madras planned to initiate the construction works in the month of January 1999. The State government will collect cess and has the royalty and in-turn came forward to provide the following infrastructures in three phases.

Phase: I

- Allotting 2.25 acres of land for the construction of office complex.
- Allotting 200 acres of land for port development.
- Thermal plant of 250 M.W. capacity.
- 1000 acres of land for

establishing export-oriented industries.

- Feeder road parallel to the coast to a length of 3.6 kilometers.
- A two-lane by-pass road of 2 kilometers.
- Widening and strengthening the feeder roads.
- Formation of secondary by-pass road with a length of 3.4 kilometers.
- Construction of 12 bridges.
- One rail over-bridge at a cost of 55 million.
- Formation of new road with a length of 3 kilometers
- Land acquisition.

Phase: II

- 36.2 kilometre of by-pass road to link National Highway-5.

Phase: III

- Strengthening District

Headquarters new by-pass road and strengthening of National Highway, construction of rail bridge and an over bridge near the ship breaking project area.

The Alang ship breaking yard near Bhavnagar in Gujarat is the prime focus of environmentalists in the recent years. The study conducted by the GREENPEACE reports widespread contamination of sea and potable water and occupational hazards at the Alang and Mumbai Ship breaking Yards in India. The analysis of water samples taken from Alang and Mumbai revealed the presence of high levels of toxic metals from the ships paints, carcinogenic asbestos and polycyclic aromatic hydrocarbons (PAHs) and dioxins released from the open burning of non-recoverable wastes on the beach.

According to a specialist estimate every fourth worker in

Mr Jeyanth K Newport is a freelance writer from KanyaKumari district, Tamil Nadu.

Alang may be expected to contact cancer due to lack of safeguards in handling the contaminants. White asbestos (chrysolite), which is used in substantial quantities in ships for multiple applications such as insulation, wall cladding and cable insulation, breaks down easily into fibers. These fibers mostly have a diameter of less than 1 micrometer. The carcinogenic potential of asbestos increases with thickness, length of the fibers and with the period of time lock into human tissue and can also move through the body. The ingestion of fine asbestos dust irritates the eyes and mucous membrane and can cause lung cancer of pleura and peritoneum cancer. Study conducted by Labour Ministry of Singapore has shown that the concentration of lead in the blood of ship breaking workers is closely correlated with the lead concentration found in the paints of ships that these workers broke. Lead is a potent element that can cause blood, nerve and kidney poison. Both metallic lead and its compounds are toxic. These can enter the human body through ingestion, inhalation and skin absorption. Steady intake of lead, even in small quantities can impair the blood count and damage the nervous system, besides contributing to the cancer of stomach and duodenum. All the toxic substances found by GREENPEACE on ships-for-scrap are hazardous wastes covered under the Basel Convention.

Increased a Lot

According to statistics, the growth of ship breaking industry at Alang in the past two decades have increased considerably. The main reason for the growth of ship breaking yard industry in developing countries is that the developed countries have banned

ship-breaking activity in their coast due to environmental reasons.

Andhra Pradesh has a rich fishery potential in all areas: inland, marine and brackish water. The state has a coastline of 974

Vodarevu, the target area of ship breaking project, comprises 3 fishing hamlets. The total population of 4455 will be the vulnerable groups who will be displaced by the project.

kilometres and a continental shelf of 33,227 square kilometers, a river course of 8500 kilometres and large fresh and brackish water lakes. Brackish water areas are estimated to exceed 1,50,000 hectares. In addition, the state already has 2,75,000 fishermen operating out of 508 landing centers.

Prakasam district has a coastline of 106 kilometres. The district accounts for 12% of Andhra Pradesh marine landings with 8% pelagic and 3% of demersal species. Fishing is considered as semi-subsistence, caste specific occupation practised by men, while processing and sale of the catch are within the domain of women. There are 73 marine fisherfolk hamlets of which Pattapu caste inhabits 37 hamlets and Palli Caste inhabits 36. The fishing villages are to a large extent geographically isolated increasing the problem of socio-economic development.

Vodarevu, the target area of ship breaking project, comprises 3 fishing hamlets. The total population of 4455 will be the vulnerable groups who will be

displaced by the project. The vulnerable population has to migrate to other fisherfolk villages along the coastline. The displacement as well as occupational migration will have greater impact on the socio-economic conditions of the vulnerable groups, with more repercussion on women.

Primary Problems

- ❖ Displacement of 1228 families.
- ❖ Occupational migration and socio-economic imbalances of the displaced families.
- ❖ Gender imbalances due to displacement.
- ❖ Imbalance in resource distribution in the new settlements.
- ❖ Exploitation by other communities.
- ❖ Health hazard, environmental pollution and eco imbalances.
- ❖ Sea pollution and resource depletion.
- ❖ Wastage of agricultural lands due to development interventions.
- ❖ Demolition of welfare institutions, training institutions, infrastructures, etc.

Secondary Problems

- ❖ Socio-Economic problems in the existing fisherfolk villages where the displaced community will be settled.
- ❖ Pollution of sea and resource depletion.
- ❖ Pollution of riverine systems as the district is disaster prone.
- ❖ Occupational migration due to resource depletion in the sea.
- ❖ Traffic related problems.

The Samudra Theera Matsya Karmikula Union (STMKU) is a

registered body of the traditional fisherfolk community covering Prakasam & Nellore Districts of Andhra Pradesh. The total membership of the union is around 10,000 fish workers and the union is working for the socio-economic development of the fishing community from 1997 onwards.

The Samudra Theera Matsya Karmikula Union is affiliated to the National Fish workers Forum (NFF). After finalizing the installation of Ship Breaking Yard Project in Prakasam District, the members of the STMKU organised mass meetings in the fisherfolk villages and educated the community regarding the adverse impact of the ship-breaking project. The union organised press meetings at District level and made the general public aware of the issue. Further the union submitted representations to The Prime Minister, Minister-Environment & Forest and Chief Minister of Andhra Pradesh to withdraw the project as it will pollute the marine eco system and hinders the socio-economic development of the

marine fisherfolk in Prakasam District.

In the month of December 1999, the STMKU hosted the General Body meeting of NFF at Vodarevu of which 200 fish workers from 8 unions throughout 8 Coastal States of India participated in the same. The STMKU of Andhra Pradesh organised a rally and a mass meeting at Vodarevu to highlight the problems of the ship breaking activity. The NFF representatives and local fisherfolk comprising of 500 members participated in the protest rally and 5000 members attended the mass meeting.

In the same month, the government officials visited Vodarevu fishing hamlets and ordered the villagers to shift immediately to a nearby fisherfolk village, which is 8 kilometers south of Vodarevu.

As a part of their strategy, a representation to cancel the ship breaking project was prepared and copies of the same were sent to Central & State Administrators, District Administrations, politicians and concerned

Fisheries & Pollution Control Department Officials.

To halt the ship-breaking project, the STMKU members visited Regional Pollution Control Board at Nellore and submitted representation not to give pollution clearance for the project. Also, the STMKU prepared a detailed report about the livelihood problems of the fisherfolk at Vodarevu and submitted representations to various Central & state departments and like-minded international and national level NGOs to extend their support in halting the project.

In the meantime, after a fisherfolk representation submitted to the National Institute of Oceanography at Goa, 3 scientists from the Regional Office at Vishakapatnam visited the proposed ship breaking yard project and studied area characteristics, resources from the sea and community perspectives and responded to the STMKU members that at any cost, the project has to be stopped □

PRODUCTIVITY IN THE AGE...

(Contd. from page 8)

During the low growth decades of fifties through seventies, India had not been able to address the domestic and economic challenges but resulted in development of reasonably good manufacturing base fully. The subsequent decades of eighties and nineties witnessed a moderate growth, with steady but slow onset of liberalisation and opening up of the economy. But India still remained a developing country

with huge-potential.

India being the fast and rapidly growing market can provide a sustained domestic market only when the fast changing aspirations of the domestic customer are effectively met, lest countries like China should takeover the Indian market once WTO regime comes up fully. However, the dynamic management of the enterprise has to focus on continuous renewal of its skills, introduce competitive compensation-cum-remunerations to the workforce

and promotion of innovation which would not only ensure success in the domestic market but also in the global environment. This should be supported by stepping up investment to enhance capacities and raising their productivity. At macro level, policy instruments should aim at reducing social and economic disparities and empowering people ultimately to harness the full potential of the economy resulting at least 7 to 8% economic growth in the coming decade. □

Biotechnology in Developing Countries : Perspectives

G Ravi Kumar, Ranjit Kumar and V B Patel

Given the complexity of socio-economic, political, and ecological problems behind deficits in food security, agricultural biotechnology can be panacea for all countries. If used wisely in conjunction with conventional breeding, improved agricultural methods and better agricultural policies, it can become a powerful tool in the fight for higher productivity in the small farmer's field.

IT IS Well quoted by James, C. in International Service for the Acquisition of Agri-biotech Applications (ISAAA) that, "... it is in the developing countries, not the industrial countries where 800 million people suffer from malnutrition today and where transgenic crops could increase crop productivity and contribute to the alleviation of hunger and poverty, which are inextricably linked".

For the world as a whole, the Green revolution has allowed food production to keep pace with exponential population growth, but not yet in some regions, such as Africa. There remain an unacceptably large number of chronically undernourished or malnourished people, as Malthus predicted there always would be. In India, there has been virtually no increase in arable area since the

beginning of the Green Revolution, when India's population was about 500 million, but that average cereal yields have increased faster than the population, thanks to substantial increases in both irrigation and fertilizer consumption. Along with the doubling of India's population, average yields have increased 2.3-fold for all cereals, 2.7-fold for wheat and 2.1-fold for rice, whereas those of the dryland crops sorghum and millet have increased by only 65 per cent.

Biotechnology is based on the use of tools such as in vitro tissue and cell culture techniques, molecular methods and recombinant DNA technology that are used to modify the genetic make-up and generate new products. These tools have given researchers a new capability of modifying crop plants to produce

natural components more effectively, and even to produce unexpected materials.

A revitalized Indian agriculture can be the engine of growth for the 21st century, and biotechnology will provide the needed impetus. Many experts say that the biotechnology has greater promise in developing countries like South Asian countries because of their high reliance on agriculture (for income and employment of the large population) coupled with low crop yield, which is detrimental for these countries as latter erode the level playing field for these countries in agricultural trade under liberalized trade policy. Developing countries such as Mexico, Argentina, China and Chile have already made considerable economic advances by integrating biotechnology into their agricultural programmes.

M/s G Ravi Kumar, Ranjit Kumar and V B Patel are with IARI, New Delhi.

Others such as Cuba, Egypt and South Africa are also following close behind and clearly see towards biotechnology as a means of advancing their economies.

Fighting Hunger and Diseases

More than 100 years ago, it took the scientific world a whole generation to understand the significance of Gregor Mendel's findings. We hope that it will take much less time to grasp the importance of genetic engineering for a world that will have to feed nearly 9 billion inhabitants in 2050 (Table 1). Developing countries are faced with the formidable task of providing nutritional security to their ever-burgeoning population, large chunk of who are already malnourished (Table 2). On the other hand, population pressure has already begun to affect the environment in large parts of the developing world. Because of intensive land use and widespread biomass shortage, cultivated soils are being depleted of essential nutrients and organic matter. Fisheries, livestock and forestry resources are also under increasing strain.

Against this backdrop, the main objectives of biotechnological research become (1) to secure the given yield potential, (2) to increase the yield potential and (3) to raise the productivity.

Efforts to achieve these objectives need the introduction of desirable characters in the variety such as resistance to plant diseases (fungi, bacteria, virus) and animal pests (insects, mites, nematodes) as well as to stress factors such as climatic variation or aridity, poor soil quality and crop rotation practices, etc. With the help of biotechnology, besides these, it also seems likely that apomixis (asexual type of reproduction) for hybrids

Table 1: Current and Projected Population, by Region, 2000-50 in Millions

Region	Population		
	2000	2025	2050
World	6,070	7,909	9,243
More Developed	1,184	1,232	1,222
Less Developed thereof in;	4,886	6,677	8,021
Africa	800	1,258	1,804
Asia	3,566	4,707	5,379
Latin America	520	712	838

Source : Population Reference Bureau, Washington, DC, personal communication, May 2000

Table 2: Estimates and Projections of the Incidence of Chronic Undernutrition in Developing Countries

Region	Year	Total Population (millions)	Undernourished Population	
			Per cent of total	Millions
Sub-Saharan Africa	1990-92	500	43	215
	2010	874	20	264
Near East/ North Africa	1990-92	317	12	37
	2010	513	10	53
East Asia	1990-92	1,665	16	268
	2010	2,070	6	123
South Asia	1990-92	1,138	22	255
	2010	1,617	12	200
Latin America	1990-92	443	15	64
	2010	593	7	40
Total	1990-92	4,064	21	839
	2010	5,668	12	680

Source : FAO (1996) Food, Agriculture and Food Security: World Food Summit Technical Background Documents, Vol. 1, p. 9.

will be achieved, which would prove a potential breakthrough for small and big farmers alike.

Further, in the long term, plants may be developed that can produce vaccines for humans. These edible vaccines once delivered in locally grown genetically engineered crops could do more for humanity than Red Cross Missionaries and U.N. task forces combined even at a fraction of the cost. Equally important objectives are the transfer of genes with nitrogen-fixing capacity onto grains, and the improvement of food quality by overcoming vitamin or mineral deficiencies (e.g., rice).

Present Status

The total global hectareage of genetically improved crops increased by 11% from 39.9 million hectares (mha) in 1999 to 44.2 mha in 2000 in all six continents. The number of countries planting these crops went up to 13, from 12 the year before. And this represents a 25-fold increase in five years, from the 1.7 million hectares planted in 1996. The total biotech product market (medical, agriculture, functional food/nutritional, research products and services) is expected to grow to \$3.0 billion by 2002. The genetically engineered

seed market is estimated to reach \$US 500 million by 2001. Crops on which considerable work has been done so far include corn, soybean, potato, tomato, canola and rapeseed oils, sugarcane, beet, coffee, pineapple and rice.

Many varieties of GM food crops have been already released and many more are in the process of development. These include *Bt*-potato for resistance to tuber moth and to soft rot bacteria, improved amino acid profile and less glycoalkaloids, rice with increased Vitamin A, canola oil with increased stability, longer shelf life, high oleic and low linolenic fatty acids. Other targets include canola resistant to insect pests, such as diamond back moth, flea beetle, root maggot and Bertha armyworm and maize to combat virus infection in poultry. Novel crop varieties, forest trees, horticultural plants, herbs and medicinal plants will initiate a new dimension in the cropping patterns and use of agricultural resources and waste products. Genetically engineered new crop varieties hold the promise to yield more food of improved quality from less land. New varieties will be able to grow in adverse conditions, and require less input of chemicals, fertilizers, pesticides and insecticides. Biotechnology also holds the potential to produce animal breeds capable of yielding more and better quality milk, meat and wool. The newly designed crops, animals and microbes will have a vital role in human welfare.

Agricultural biotechnology made good stride during the past 10 years. Genome mapping and other biotechnological research offer powerful tools for crop improvement, for example, in China, where transgenic varieties

are now routinely produced in crops such as rice, corn, wheat, cotton, tomato, potato, soybean, and rapeseed. The objectives of such research and development are to produce crops that are disease-resistant, tolerant to abiotic stresses and have improved product quality besides increased yield potential. According to Gordon Conway, president of the Rockefeller Foundation, "China is doing "spectacularly well" with *Bt* cotton crop and harvesting increased yields, simultaneously reduced significantly the number of pesticides sprays from about 12 to 3 per season".

Achievements

Achievements in India include tissue culture regeneration, stress biology, and marker-assisted breeding, as well as new types of biofertilizer and biopesticide formulations. Research to develop genetically improved (transgenic) plants for brassicas, mung bean, cotton, and potato is well advanced. Programs adapted to local needs and priorities are under way in countries like Philippines, Thailand, Brazil, Costa Rica, Mexico, Egypt, Iran, Jordan, Kenya, South Africa, and Zimbabwe. Of particular interest for Africa, the research results are thriving well on the transgenic sweet potato resistant to feathery mottle virus in Kenya and on South African transgenic sweet potatoes that contain up to five times the normal protein levels.

In many countries, tissue culture has produced and provided planting material to the farmers that increased crops' yields manifold. In addition, market-assisted selection and DNA fingerprinting allow a faster and

more targeted development of improved genotypes for important agricultural species. Moreover, these technologies make available new research methods, which can assist in the conservation and characterization of biodiversity. The new techniques will enable scientists to recognize and target quantitative trait loci and thus increase the efficiency of breeding for some traditionally intractable agronomic problems such as drought resistance and improved root systems.

Among many achievements to date, one is of particular value: it has become possible to genetically modify rice so that it contains increased Vitamin A level. The efforts are going on to achieve a similar result for iron. Once it happens, it would prove to be a great boon for about 250 million poor, malnourished people who are forced to subsist on rice. As out of them, 180 million people are said to be Vitamin A-deficient, and 2 million of them die annually, hundreds of thousands of children turn blind and million of women suffer from anaemia, one of the main killers of childbearing women.

Another achievement could turn out to be a major breakthrough. Researchers from Washington State University were able to transfer a maize gene into rice. The new strain of genetically modified rice, unveiled in late March 2000 in the Philippines boosts yield by a massive 35 percent. As an added benefit, the genetically modified (GM) rice, which has been tested in China, South Korea, and Chile, extracts as much as 30 percent more carbon dioxide from the atmosphere, offering a way of curbing climate change.

Green Revolution with the help of seed-fertiliser-irrigation technology helped significantly in increasing the yield of foodgrains. It has not only expanded farm and nonfarm output, employment and wages, but reduced the cost of production also, thus contributed to achieve food security. It also helped in preserving the biodiversity by reducing the conversion of forests, grasslands and swamplands for cultivation of food crops. Conventional seed-breeding programs adopted hitherto will remain important in the future also. They, however, have a comparative disadvantage in that they have to proceed through various steps towards single target and are thus time-consuming. If, in contrast, selection systems are developed for the test-tube through characterization of genetic markers for certain properties, for example, then research can be carried out with a notably greater efficiency. The genetic engineering and biotechnological interventions in the agriculture of developing countries will have more positive impact than the application of present day mechanical and chemical technologies.

However, unlike other technology, this (bio) technology has also borne the brunt recently in the form of protest by farmers' group in some parts of the country. Many have apprehension that large-scale farmers only will be favoured by transgenic technologies. In the short-term, it seems that the poorer section of society is bound to lose out. Additionally, it would increase the farmers' dependency on seed companies, as has been felt with "Terminator Technology". It has raised substantial ethical concerns in that it ensures that seed cannot

be saved at the end of one crop cycle for sowing in the following cycle. This would potentially put the farmer very firmly under control of the company providing the seeds and would, if deployed in such areas, preclude using home-produced seed, a common practice in many parts of the world, not just in developing countries.

Legislation

Legislation on gene patents is being debated in developing countries, which are most affected by the system of gene patents being used in developed countries. Plant breeders' rights in developed countries prevent the free use of protected varieties for seed propagation and for breeding new varieties. However, developed countries are using the genetic resources of developing countries freely. Similarly, the patenting of natural and mutated genes and use of public property for private profit by multinational companies is questionable. Some companies have patented the use of single genes (e.g. Bt) and are making huge profits without paying for the use of genes and genomes held in public trust for the good of humanity. Compensation by multinational companies for the use of germplasm and genes held in trust by FAO and Consultative Group of International Agricultural Research (CGIAR) institutions has strong implications in the equitable trading of genes and genetic resources, most of which have originated in developing countries. Biopiracy of germplasm by the developed nations from developing countries and subsequently declaring it as 'protected' germplasm and 'patented' genes is morally unacceptable under fair trading practices. Moreover, many developing countries fear losing

their markets of cash crops such as coca, copra oil, pyrethrum, vanilla and perfumes, which could be produced in non-conventional crops by gene transfer.

Undoubtedly, the entire globe is at the dawn of another revolution fuelled by biotechnology. The development in gene technology promise new genetically-based advances leading to higher yields and better food quality. Already the biotechnology revolution is of significance in global agriculture. There are transgenic crops of cotton, maize, soyabean and canola, planted in more than 40 billion hectares worldwide. Under prevailing condition, it is desirable to use the technology foresight (TF), which is a prospective and transparent framework, to analyse the future use of the rapidly progressing scientific field of GM crops. TF is the process and dialogue involved in systematically attempting to look into the long-term future of scientific field of GM crops. TF is the process and dialogue involved in systematically attempting to look into the long-term future of science, technology, economy and society, with the aim of identifying areas of strategic research. Public acceptance for agricultural biotechnology is at a critical juncture. Given the complexity of socioeconomic, political, and ecological problems behind deficits in food security, agricultural biotechnology can be panacea for all countries. If it is used wisely in conjunction with conventional breeding, improved agricultural methods and better agricultural policies, it can become a powerful tool in the fight for higher productivity in the small farmer's field. □

Stem Cell Research

Narottam Sahoo

An exciting new approach is poised to revolutionize the treatment of patients who need new vital structures: the creation of man-made tissues or organs, known as neo-organs. In the process of developing neo-organs, the core part of the structure is a biopolymer. Biomaterials for organ regeneration involve biocompatible and biodegradable synthetic polymers. These materials usually function as a scaffold for the growth and organisation of implanted organ cells.

IMAGINE A day when people with liver failure can be cured with implanted 'neo-organs' made of liver cells and plastic fibres; when insulin-dependent diabetics can forgo their frequent insulin injections because they have semisynthetic replacement pancreases; when kidney dialysis machines became obsolete anyone with damaged kidneys can be fitted out with new ones grown from their very own cells.

The above are neither the wording of any science fiction nor the content of any abstract novel. Indian and international scientists have now become skilled at cultivation of cells-known as human embryonic stem cells-that might one day allow to build custom-made organs on demand. Tiny tubes containing cells that secrete painkilling substances have been implanted into the spinal columns of people with chronic pain. And tissue-engineered cartilage is in clinical tests and is expected to be commercially available within the next few years.

Scientists have now set eyes on the potential to develop cures for

diabetes, Alzheimer's, Parkinson's, cancer, heart disease and paralysis... and India could play a lead role and benefit commercially. Research work in this direction has been already started and taken a very good shape in the institutions like, National Centre for Biological Sciences, Centre for Cellular and Molecular Biology, Hyderabad, Reliance Life Sciences, Mumbai, etc.

The human body is a complex biological machine and may be more than a sum of parts, but replacing failing parts should extend and improve life. When it is functioning properly, its various parts interrelate and work together smoothly. In the absence of such balanced relationships, however, an entire organ or a major part thereof fails. Often the only way to correct this problem is by whole-organ transplantation. Many lives are saved or improved by this procedure, but the huge scarcity of donor organs is the major limitation to the whole-organ transplantation procedure.

In addition to donor scarcity, other complications with whole-organ transplantation have

compelled researchers to search for alternative methods for replacing or repairing the failed or weakly functioning organs. Such problems include foreign tissue rejection and patients' continual need for immuno-suppressive drugs, difficulty in preservation and transportation of the donor organs, and the complicated, severe and expensive surgery involved in the organ transplants.

An exciting new approach is poised to revolutionize the treatment of patients who need new vital structures: the creation of man-made tissues or organs, known as neo-organs. In one scenario, a tissue engineer injects or places a given molecule, such as a growth factor, into a wound or an organ that requires regeneration. These molecules cause the patient's own cells to migrate into the wound site, turn into the right type of cell and regenerate the tissue. Biomolecules can be utilized to replace or repair tissue function, induce cell proliferation, or provide a matrix for cell attachment and tissue ingrowth.

Dr Narottam Sahoo is Executive Scientist, Gujarat Council of Science, Gandhinagar.

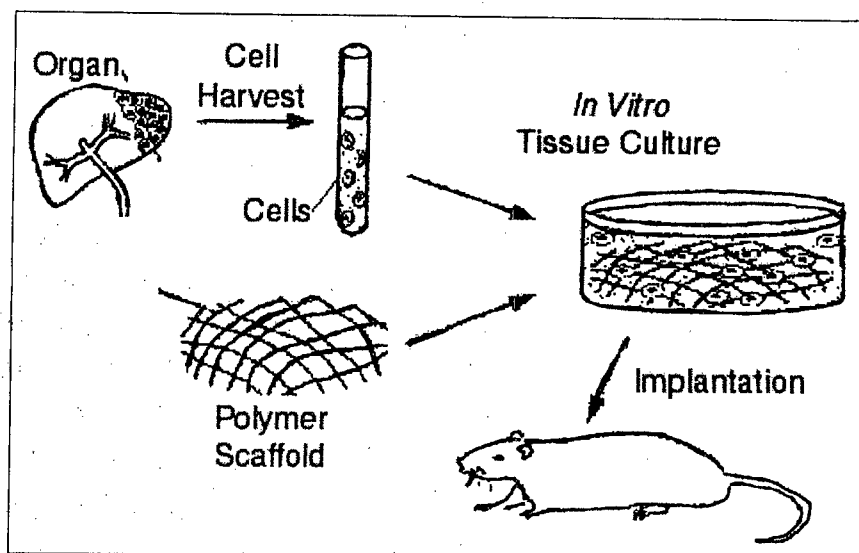
Not only non-degradable synthetic materials but also bodily tissues and biodegradable synthetic polymers can be used to replace or repair the defective organ.

In the process of developing neo-organs, the core part of the structure is a biopolymer. Biomaterials for organ regeneration involve biocompatible and biodegradable synthetic polymers. These materials usually function as a scaffold for the growth and organisation of implanted organ cells. Parenchymal cells are isolated from the tissue and seeded into the polymer and the cell-polymer structure is implanted in the Chart. Basically, the scaffold degrades simultaneously as the cells proliferate and excrete their extracellular matrix (ECM) substances. The growing cells, ECM and nutrient supplying vascular tissue continually replace the void spaces of the disappearing scaffold until eventually the scaffold/cell implant has been replaced by natural organ tissue.

Since many cell population can grow in vitro, cells from a small biopsy of organ tissue can be cultured to produce a significant mass to be used for implantation. The biopsy tissue may be obtained either from the patient or from a close relative. This approach would greatly increase the donor pool and diminish the need to wait for cadaver organs, a time during which some transplant candidates die. It also avoids additional surgical trauma for the patients and result in reduced medical costs.

Indeed, evidence abounds that it is at least theoretically possible to engineer large, complex organs such as livers, kidneys, and breasts, bladders and intestines, all of which include many different kinds of cells. The proof can be found in any expectant mother's

Chart



womb, where a small group of undifferentiated cells finds the way to develop into a complex individual with multiple organs and tissues with vastly different properties and functions. Barring any unforeseen impediments, teasing out the details of the process by which a liver becomes a liver, or a lung a lung, will eventually allow researchers to replicate that process.

Biopolymers are the compounds, which have been very widely used for biomedical applications. These are further classified into biostable and biodegradable polymers. Basic properties of inertness, stabilities and durability of polymers have led to the development of biostable polymers which have found regressive applications in the field of extracorporeal and permanently implanted devices like artificial kidney, teeth, heart, heart valves and contact lenses, vascular grafts, knee caps, etc. and many more.

Application

Artificial Kidney: Artificial kidneys are hemodialysis units with a polymeric semipermeable membrane, which removes waste products from the blood. Permeability limits the clinical utility

of polymeric membranes for these applications. Commercial dialysis membranes are made of cellulose acetate, regenerated cellulose, polycarbamate, polymethacrylate (PMMA), polyacrylonitrile and polysulfones.

Artificial Teeth: Dentistry has become one of the prime customers of bio-organic polymers. Acrylic polymers in many forms have been used as dental cement, crown and bridge materials and mainly as artificial teeth. Polymethylmethacrylate (PMMA) has been most widely used in manufacture of artificial teeth. The potential of injectable, biodegradable hydrogels-gelatin like, water-filled polymers-for treating dental defects, such as poor bonding between teeth and the underlying bone, through guided bone regeneration. The hydrogels incorporate molecules that both modulate cellular function and induce bone formation; they provide a scaffold on which new bone can grow, and they minimize the formation of scar tissue within the regenerated region.

Artificial Heart: Most recently there have been several clinical significant applications of a totally artificial

heart in humans. The success of these applications as bio-medical development is widely accepted. The first patient survived 112 days and others much longer. The most widely tested design and the one used most in these early procedures was the jariwk-7-type artificial heart with a pump body composed of polyurethane. The polymeric materials that have been used in artificial heart studies include polyvinylchloride, silicone rubber, polyurethane (Avcothane) and polyolefin rubber. Artificial valves generally made up of dacron and polyurethane polymer have replaced diseased and injure valves. The valves have a normal heart beat and proved to be very successful.

Ophthalmological applications: Soft contact lenses are the most widely used applications of stable biomedical polymers. These lenses are poly (hydroxyethylmethacrylate) hydrogels, which are copolymerised with vinyl pyrrolidinone. Soft contact lenses have replaced the intraocular lenses of PMMA which were previously used for eye surgery mainly for cataract extraction.

Orthopaedic application: Polymeric artificial joints have been used in most orthopaedic replacements, especially for hips, knees, shoulders and fingers. Ultra high molecular weight polyethylene (UHMWPE) is used for acetabulum cups in total artificial hips and as the gliding parts in knee, shoulder, ankle and elbow joints.

Similarly, for many years there has been interest in the synthesis of biocompatible and biodegradable polymers for biomedical applications. In these applications, the polymer serves a temporary function of a support or barrier, whose ultimate degradability is a pre-requisite for successful medical use. The biodegradable polymers must be fabricated to allow for cell adhesion and for retention of cell function, and to enhance the growth rate. Important classes of degradable polyester biomaterials include polylactic acid, polyglycolic acid and their copolymers, which are among the few synthetic polymers approved for human clinical use.

To match the specifications for a given application, there is need for polymers with a controlled rate of biodegradation. On this basis, these polymers have been used as surgical sutures, for various orthopaedic applications, tissue adhesion and drug delivery systems. They are also referred as bioresorbable, in their degradation products are low molecular weight compounds, such as lactic acid and glycolic acid, which enter into normal metabolic pathways. These synthetic polymers can be fabricated in specific shapes needed for implants, their pore size and surface area can be altered for increased cell attachment, their mechanical properties can be engineered, and their degradation rates can be tailored to vary from a

few days to years. Biomolecules can be physically introduced into a polymer matrix or chemically bonded to a polymer backbone.

The majority of the polymers used in cell transplantation are polyesters and polyanhydrides. They have been produced in sheets, in porous scaffolds, and in fibrous strands that can be woven into a mesh. The degradation of the material can occur by bulk degradation, bulk erosion or surface erosion.

Advances in the production of bio-engineered spider silk that could lead to the large-scale manufacture of a biodegradable fiber that surpasses kevlar in tensile strength and elasticity. Promising new research into the use of biopolymers in anti bacterial coatings that prevent medical implants from becoming infected.

A polymer-based drug is about to come on the market, that has been proven to control phosphorous in kidney patients without the risks posed by traditional remedies. Polymer gels that shrink or swell in response to small changes in temperature, pH, or electric fields, with potential applications as artificial muscles" in robotics and medical prosthetics. Tissue-engineered heart valves constructed around scaffold minimize the danger of rejection, infection, and complications from blood clots. □

E-GOVERNANCE : A CASE...

(Contd. from page 25)

framework, major among them include-

- Thorough domain study
- organized effort towards standardization of input and output formats

- Centralized-Decentralized approach for software development and implementation
- Active cooperation among all the stakeholders i.e. MORD, Rural Development Officials in States & Districts and NIC
- Constant technical support to sustain the effort

Though the proposed e-governance framework is based on Indian experience, it could apply to other developing countries as well, since India encases a wide variety of diverse conditions, ideally required for realistic and more complete domain modeling. □

Commonwealth Games : Bonding Goodwill & Friendship

D K Bharadwaj

THE 17TH Commonwealth Games are scheduled to be held in Manchester (England) from July 25 to August 4, 2002. In range, reach, impact and importance, the Commonwealth are generally considered second only to the Olympics.

The Commonwealth Games, as we know them today, were originally known as the British Empire Games. Conceived by Reverend Astley Cooper as early as in 1891, who believed that holding of a sporting festival of the British Empire, its Dominions and Colonies would draw closer the ties and increase the goodwill and understanding among them. The idea took a shape when a "Festival of Empire" was held at London's Crystal Palace in 1911 as a part of the Coronation celebrations of His Majesty King George V in which competitors from Great Britain, Australia, Canada and South Africa took part in athletics, boxing, wrestling and swimming events. Canada emerged as the overall winner of this sporting festival. It was sort of a precursor to the great event that was to take place in the future.

A Reality

However, it took 19 years more for the British Empire Games to become a reality. At the initiative of the President of the Canadian Amateur Athletics Union, the inaugural British Empire Games

were held in Hamilton city of Canada in 1930. Apart from the host nation, the participants in the historic Games included England, Scotland, Wales, Ireland, Australia, New Zealand, Bermuda, British Guiana (now Guyana), Newfoundland (now a province of Canada) and South Africa. Athletics, bowling, boxing, rowing, swimming and wrestling were the six disciplines in which about 400 sportspersons competed for the medals in the Hamilton Games. Expectedly, England topped the medals tally by winning 24 gold, 22 silver and 12 bronze medals. The host, Canada came second with 20 gold, 16 silver and 20 bronze medals, while South Africa was placed a distant third with 6 golds, 6 silvers and 7 bronzes.

Changes in Name

Since then these Games were held every four years in between the Olympic Games barring the scheduled years 1942 and 1946 when the Games couldn't take place due to the World War II. In 1952, these Games were renamed as the British Empire and Commonwealth Games. In 1966 at Jamaica, there was a further change in the name of the Games as they were retitled as the British Commonwealth Games. Eight years later at Christchurch, the Games were finally given the present name—the Commonwealth Games.

At the political level, the

Commonwealth was founded by the United Kingdom, Australia and New Zealand in 1931 as per the Statute of Westminster. The Commonwealth of Nations is a free association of independent member nations and their dependencies. India joined the Commonwealth in 1947 after gaining Independence. The Commonwealth today has a strong voice in socio-economic and political matters of international importance. The Commonwealth Heads of Government Meet (CHOGM) which is held from time to time has now become an important international event. Representing nearly 30 per cent of the world's population, 54-nation Commonwealth today faces a big challenge in the form of racial tension among its white members and African nations as was evident at the CHOGM in Australia recently.

India and Commonwealth Games

Although India did participate in the 2nd Commonwealth Games held in London in 1934 where the women's events were included in the competition and its wrestler Anwar won a bronze medal in the welterweight category and in the 3rd Games at Sydney in 1938 its team of cyclists returned home without success as was the case of its four athletes who took part in Vancouver Games in 1954 and

Mr D K Bharadwaj is a sports writer based in Delhi.

returned empty-handed, India's participation in the earlier Games was merely token. India's real campaign in the Commonwealth Games began from the Cardiff Games in 1958. India tasted its first golden success in the Commonwealth Games at Cardiff through the stupendous feats of the "Flying Sikh" Milkha Singh who reigned supreme in 400 M race in a very strong field and wrestler Lila Ram who emerged victorious in heavyweight category. Another wrestler Lakshmikant Pande won a silver medal in the welterweight category. Incidentally, Milkha Singh's gold remains to be the only gold medal won by India in athletics in the Commonwealth Games.

However, the Cardiff success inspired the other Indian sportspersons to perform creditably in the future Games. After missing the 7th Games at Perth in Australia in 1962 India returned strongly to the 8th Games in Kingston (Jamaica) to capture 3 gold, 4 silver and 4 bronze medals. Most of these medals were won by the wrestlers who had a rich haul of 3 golds, 2 silvers and 3 bronzes. The gold medal winners were Bisamber Singh (bantamweight), Mukhtiar Singh (lightweight) and Bhim Singh (heavyweight). Indian wrestlers again shone four years later at Edinburgh in 1970, where they simply dominated the wrestling competition by winning 5 golds, 3 silvers and 1 bronze medal. The child prodigy 14-year old Ved Prakash (light-flyweight) caused sensation by winning a gold.

At Christchurch (New Zealand) in 1974, India maintained its 6th position in the medals table despite capturing fewer number of golds. In Christchurch Games, India won 4 golds, 8 silvers and 3 bronzes. Once again all the golds were won

Venues and Medals Tally Toppers			
Year	Venue	Country	Medals Tally Topper
1930	Hamilton	Canada	England (24 G 22/S 12-B)
1934	London	England	England (29-G 20-S 24-B)
1938	Sydney	Australia	Australia (24-G 19-S 22-B)
1950	Auckland	New Zealand	Australia (34-G 27-S 19-3)
1954	Vancouver	Canada	England (23-G 24-S 20-B)
1958	Cardiff	Wales	England (29-G 22-S 29-B)
1962	Perth	Australia	Australia (38-G 36-S 31-B)
1966	Kingston	Jamaica	England (34-G 23-S 23-B)
1970	Edinburgh	Scotland	Australia (36-G 24-S 22-B)
1974	Christchurch	New Zealand	Australia (29-G 28-S 25-B)
1978	Edmonton	Canada	Canada (45-G 31-S 33-B)
1982	Brisbane	Australia	Australia (39-G 39-S 29-B)
1986	Edinburgh	Scotland	England (52-G 42-S 48-B)
1990	Auckland	New Zealand	Australia (52-G 54-S 56-B)
1994	Victoria	Canada	Australia (87-G 52-S 43-B)
1998	Kuala Lumpur	Malaysia	Australia (80-G 60-S 58-B)
2002	Manchester	England	—
	G- Gold	S-Silver	B-Bronze

by the wrestlers. In all, the grapplers won 4 gold, 5 silver and 1 bronze medal. In fact, every member of the wrestling squad won a medal. Among them, Sudesh Kumar had the distinction of retaining his flyweight crown.

In the 11th Games at Edmonton (Canada) in 1978, the Indian wrestlers continued to win the laurels for the country. Out of 10 medals at stake in wrestling competition, they won 3 golds, 3 silvers and 3 bronzes. Remaining two golds were won by the

badminton ace Prakash Padukone who defeated England's Derek Talbot in the singles final and E. Karunakaran who captured a gold with a record lift of 205 kg in flyweight category. For the first time, Canada topped the medals table leaving the traditional rivals England and Australia way behind. In Brisbane Games in 1982, India bagged 5 golds, 8 silvers and 3 bronzes and retained its sixth position in the medals table for the fourth time in succession. Four of the golds were won by the wrestlers

Ram Chander Sarang (lightflyweight), Mahabir Singh (flyweight), Jagminder Singh (lightweight) and Rajinder Singh (welterweight), while the fifth gold was won by the badminton star Syed Modi.

The number 13 proved unlucky for the 13th Commonwealth Games, which were boycotted by 32 countries including India because the UK had refused to impose sanctions against South Africa for the latter's continuing apartheid policy. At the 14th Commonwealth Games held at Auckland in 1990 for the second time in the history of the Games, the Indian contingent gave its best ever performance and obtained 5th position, its best, in the medals table. In all, India won 13 gold, 8 silvers and 11 bronze medals. As wrestling was not included in the Auckland Games in 1990, the Indian weightlifters rose to the occasion and grabbed 12 gold, 7 silvers and 5 bronze medals. The ace shooter Ashok Pandit completed India's gold medal tally by capturing a gold in 23M Centre Fire Pistol with a new Commonwealth Games record of 583 pts.

In the 15th Commonwealth Games at Victoria (Canada), the wrestlers failed to win even a single gold but the weightlifting and shooting squads won three golds each. However the weightlifters performance too was below expectations. The Indian shooters, particularly Jaspal Rana (Centre Fire Pistol) and Mansher Singh (Trap) performed splendidly. With 6 gold, 11 silver and 7 bronze medals. India occupied 6th position in the medals table. In the last Games held at Kuala Lumpur (Malaysia) in 1998, five new events—hockey, squash, cricket, rugby and netball—were included in the competition programme for

India In Commonwealth Games

Year	Serial No.	Venue	G	S	B	Total
1930	1st	Hamilton (Canada)	-No Participation-			-
1934	2nd	London (England)	-	-	1	1
1938	3rd	Sydney (Australia)	-No medal-			-
1950	4th	Auckland (New Zealand)	- No Participation-			-
1954	5th	Vancouver (Canada)	- No medal-			-
1958	6th	Cardiff (Wales)	2	1	-	3
1962	7th	Perth (Australia)	- No Participation-			-
1966	8th	Kingston (Jamaica)	3	4	4	11
1970	9th	Edinburgh (Scotland)	5	3	5	12
1974	10th	Christchurch (New Zealand)	4	8	3	15
1978	11th	Edmonton (Canada)	5	4	6	15
1982	12th	Brisbane (Australia)	5	8	3	16
1986	13th	Edinburgh (Scotland)	- No Participation-			-
1990	14th	Auckland (New Zealand)	13	8	11	32
1994	15th	Victoria (Canada)	6	11	7	24
1998	16th	Kuala Lumpur (Malaysia)	7	10	8	25
Total			50	57	47	154

the first time. For the first time in seven decades, the Games were held in Asia. For the third time in succession, Australia dominated the Games with her female swimming star Susan O'Neill grabbing 6 gold and 2 silver medals. Susan had won 10 gold medals from three Games, undoubtedly an astonishing feat. India won 7 golds, 10 silvers and 8 bronze medals and occupied the seventh position in the medals table. Once again, the shooters and weightlifters secured most medals for the country. The weightlifters won 3 golds, 5 silvers and 5 bronze medals, while shooters captured 4 golds, 2 silver and 1 bronze medal. Arumugam Pandian (56 Kg), Dharmaraj Wilson (56 Kg) and Satish Rai (77Kg) won golds in weightlifting, while Jaspal Rana (Centre Fire Pistol), Roopa Unnikrishnan (sport rifle prone event), Jaspal Rana/Ashok Pandit (Centre Fire Pistol pairs) and Mansher Singh/Manavjit Singh

(Trap pairs) were gold medal winners for India in shooting events.

A number of legends and all-time greats have made the Commonwealth Games memorable over the years through their charisma and stupendous feats. Among them are such great male and female athletes as Roger Bannister, Sebastian Coe and Daley Thompson of England, Herb Elliot, Majorie Jackson and Cathy Freeman of Australia, Peter Snell and Murray Halberg of New Zealand, Kip Keino and Henry Rono of Kenya, Don Quarrie and Merlene Ottey of Jamaica and such swimming sensations as Graham Smith of Canada and Dawn Fraser, Mike Wenden, Shane Gould and Susan O'Neill of Australia. No doubt there will be more additions to this galaxy of stars in the future Games too. Hopefully, the latest edition of the Commonwealth Games at Manchester will further strengthen the goodwill and friendship among the Commonwealth nations. □

QUESTIONS

- i) A historic event took place during the Commonwealth Games when a sub-four minute mile race (3 M 58.8 sec.) was recorded for the first time in the history of world athletics by the same athlete. Name the venue and the record breaking athlete.
- ii) India has won only one gold medal in athletics in the Commonwealth Games. Name the athlete and venue.
- iii) There was some reluctance on the part of the organisers in the Edinburgh Games in 1970 to allow a 14 year old Indian wrestler to take part in the wrestling competition. The boy went on to win a gold medal. Name the wrestler.
- iv) Three Indian wrestlers won gold medals in successive Commonwealth Games. Who were they and where did they achieved this distinction?
- v) Only once cricket has been included in the Commonwealth Games. Name the venue.
- vi) Who won the Commonwealth Cricket crown? Also name the other medal winners.
- vii) Which are the two badminton stars, who won gold medals for India in the Commonwealth Games.
- viii) Only two cities have the distinction of holding the Commonwealth Games twice. Name the cities.
- ix) Which is the only Asian city where the Commonwealth Games were held.
- x) Name the three sports which have been part of all the Commonwealth Games held so far.

(Answers in Page 49)

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Welcome Stress on Agriculture in Budget

A B Bhuleshkar

At present fundamentals in the economy are positive and strong. These augurs well for higher economic growth in the coming year.

THE ECONOMIC reforms process has been continued by the Finance Minister in his fifth consecutive budget of 2002-03 presented by him. It is a reformist budget and investment oriented one and I have no doubt, it will spur to higher economic growth rate of 6 per cent per annum. When I say that it will achieve economic growth rate of 6 per cent per annum, because I feel that Mr Sinha has tuned the right chord; he has decided to revolutionise our agricultural sector. I am convinced that the Government of India has finally realised that the key to higher economic growth rate lies in boosting the rate of growth in the agricultural sector, from the present 3 per cent per annum to at least 4 per cent per annum, in the coming decade. The green revolution in 1960's followed by the white revolution in the milk sector has brought realisation in the government circles that if we revolutionise the agricultural sector by diversifying it, we can increase the productivity growth rate and enhance the overall production in the agriculture and in the allied agricultural activities such as animal husbandry, fishery, plantations,

horticulture, floriculture and the food processing sector. Sinha has rightly stated that "a new thrust on agricultural research and extension, and a new climate that encourages much greater investment by both the public and the private sectors, can help to modernise our agriculture and processing sector. For this purpose, the level of institutional credit arrangements has been raised from the present level of Rs. 64,000 crore to Rs. 75,000 crore by next year. It is a step in the right direction. Further, the stepped up funds allocated to rural infrastructure development at Rs.5,500 crore for the year 2002-03 will certainly help to augment the infrastructure facilities in the rural areas, which will benefit promotion of agriculture and allied industries. The Finance Minister says "Even though agriculture is a state subject, there are a number of Central government policies that influence the agricultural sector", and now the state governments, should encourage inter-state movements of agricultural goods and products henceforth.

The State government should decentralise export of agricultural commodities and should phase out remaining export controls. It is

necessary to introduce expansion of futures and forward trading to cover all agricultural commodities as well as removing the restrictive orders inhibiting storage, selling of agricultural products, etc. Mr Sinha has emphatically stressed the need for strengthening of the micro credit delivery system through the encouragement of Self-help Groups and proposes to cover 70 lakh farm families in the near future. He has proposed a 'New Corporation for Agriculture Insurance', which will be floated by the existing public sector general insurance companies and the private sector companies by way of equity contribution in this new insurance corporation. This will go a long way in safeguarding the interests of the farmers, especially of the small and marginal farmers in future.

Foreign Funds

In order to attract inflow of funds from the outside world, especially from the NRIs, the Finance Minister has allowed them to repatriate their deposits/investments on full convertibility in currency of their choice and this is a step in positive direction. Furthermore, Corporate Income Tax on foreign companies has been reduced to 40 per cent, from the

existing 48 per cent, a measure to ensure a level playing field in our corporate sector. Mr Sinha has further proposed in this budget, as an additional measure to encourage the flow of foreign funds by way of permitting the Foreign Institutional Investors to invest in India under portfolio investment route beyond 24 per cent of the paid-up capital of the company.

The long awaited measure to control the fiscal deficit of the Central Government has found mention in this budget when the Finance Minister says, the Fiscal Responsibilities and Budget Management Bill will become an Act soon. He said that the Parliamentary Standing Committee of Finance is seriously looking into the recommendations. Thus, there is a ray of hope of reducing the fiscal deficit to 4.7 per cent in the year 2002-03 as against 5.1 per cent in the revised estimate of 2001-02. He emphasised that to attain this ratio of 4.7 per cent of fiscal deficit to Gross Domestic Product, the Non-Plan expenditure has been kept under strict control, but at the same time, to overcome the present slow down in our industrial sector, he has stepped up the plan expenditure, as there is a need for continued public investment in our industrial sector. The budget support for Central, state and union territories has been placed at Rs. 1,13,500 crore, an increase of Rs. 18,400 crore over the budget estimates of 2001-02. This amounts to an increase of 19.35 per cent over the last year, which is the highest increase in over a decade.

The Non-Plan expenditure in 2002-03 is estimated to be Rs. 2,96,809 crore compared to Rs. 2,65,282 crore in revised estimates. The increase in Non-Plan expenditure is mainly in interest payments (Rs. 10,333 crore);

Subsidies (Rs. 9,278 crore); Defence (Rs. 8,000 crore) and Grants to state governments (Rs. 2,196 crore), respectively.

Salient Features

- (1) Emphasis on agriculture and food sector;
- (2) Enhancement of public and private sector investment in infrastructure;
- (3) Strengthening the banking sector, capital and money markets and the financial sector;
- (4) Deepening of structural reforms and regeneration of industrial sector;
- (5) Consolidation of tax reforms and continuance of adjustment at both the Central and state levels;
- (6) Provision of social security to the poor;
- (7) Encouragement to private sector entrepreneurs;
- (8) Implementation of expenditure reforms;
- (9) Carry forward economic reforms with an emphasis and view to benefit the common man;

Other Important Budget Proposals

- (1) Abolition of 16 per cent Special Excise Duty on all items except 8 only;
- (2) Cotton hank yarn attracts the excise duty of 4 per cent - but if handloom weavers purchase this hank yarn cotton, they will be given subsidy;
- (3) Excise Duty exemption on handloom fabrics continues;
- (4) Reduction of Customs Duty from 25 per cent to 10 per cent on certain textile machineries;
- (5) Foreign Institutional investors can invest in a company under

the portfolio investment route beyond 24 per cent of the paid-up capital of the company;

- (6) A pilot Asset Reconstruction Company will be set-up by June 30, 2002.
- (7) The Deposit Insurance Credit and Guarantee Corporation will be converted into the 'Bank Deposit Insurance Corporation';
- (8) Subsidy on fertiliser will be reduced by 5 per cent;
- (9) Disinvestment in public sector investment will release Rs. 12,000 crore;
- (10) Employment Guarantee Scheme in rural areas will be started soon.

Concluding Observations

The conclusion drawn here of achievement of higher economic growth rate of 6 per cent per annum is on the premise that the diversification of our agricultural sector envisaged by the Finance Minister will help to increase the level of our national income in future, on two counts; (1) Demand from the agricultural sector will definitely increase for industrial products due to higher level of income generated in the agriculture. The higher demand for industrial products will thereby overcome the present recessionary trend being faced in our industrial sector. The creation of new economic zones planned by the Finance Minister will certainly boost our exports of goods and services, to other countries since the package of incentives and concessions are being accorded to the exporters, in the present Union Budget of 2002-03. The Food processing sector can now manufacture many agricultural products with value addition and

(Contd. on page 47)

The Disinvestment Scenario

Raghunath Rau

This time around, the targets have been chosen with care and precision. As a result, there have been hardly any protests.

THE DISINVESTMENT Minister, Mr Arun Shourie is a man of steely determination as journalists who worked with him in his previous avatar in that profession will testify. Now that determination has been carried on into the political arena, where the Union Minister for Disinvestment has finally taken the privatisation bull by the horns.

Those who felt that Mr Shourie's zeal would have died down after he burnt his fingers on the Balco and Air India deals have been mistaken. This time around, the Minister has chosen his targets with care and precision. As a result, there have been hardly any protests from the leftist parties and trade unions. It is as if the earlier intense battle over the Balco decision had exhausted them rather than the Minister.

Balco was a case of a manufacturing unit located in tribal land, with a large tribal work force to boot. As such, it was a fertile ground for activists of all categories.

In the case of Air India, the need to bring out the Tricolour and stick it on the "national carrier" never really arose. For, the world airline was willing to come forward even

as a strategic partner for the Tatas to buy out Air India.

Now, the same Tatas have cornered a very big chunk of the State telecom giant, the Videsh Sanchar Nigam Ltd. (VSNL). There are no "interested" parties opposing the sale, for there is already competition in the telecom sector, and in any case the public experience of the State monopoly in this area has been almost uniformly poor.

The same disinterest extends to the strategic sale of 33.58 per cent equity in IBP Limited to Indian Oil Corporation (IOC). Both are public sector petroleum firms and only the technocrats are questioning the nitty gritty of the process involved.

As for the outright sale of four India Tourist Development Corporation (ITDC) hotels to private parties, the general reaction among the public is: why not more? Five or four star hotel culture has not yet percolated down to the general middle class, upper or lower, and even where it has the general reaction have been that the government could well spend the money elsewhere.

Thus, Mr Arun Shourie seems to be assured of a smooth ride on this issue during Parliament's budget session. The only point on which the opponents of the programme may be able to get focussed on is the Voluntary Retirement Scheme (VRS) for government employees. But even there the loopholes are so many that this could be the one item in Mr Shourie's programme which is not able to get off the ground.

Of the lot, the sale of 25 per cent equity in VSNL has naturally attracted the most attention. This sale, to a Tata Group company, Panatone, would fetch the government Rs. 1,439 crore as bid price, plus Rs. 1,887 crore as dividend. In addition, the Tatas will have to make an open offer for acquiring 20 per cent floating shares of VSNL.

That would thus make the Tatas the primary player in the management of the telecom giant. Yet, since it is deemed a sensitive area, no private party can acquire more than 49 per cent of the equity in the company. Besides, government directors will ensure that there is no deviation from Cabinet guidelines in this field.

Mr Raghunath Rau is a freelance writer.

This point was emphasised almost simultaneously with the disinvestment announcement. An information technology company in Bangalore wanted to sell its concern to a Chinese firm, but the matter has had to be referred to the Central government because of charges that superior Indian technology in the field could be used to pass on sensitive security material to non-friendly countries. There can be no quibbling with that point of view.

Apart from that, another interesting point for the people was that the Tatas outbid Reliance in the VSNL deal. As against the Tatas' bid of Rs. 1,439 crore, Reliance had put in an offer of Rs. 1,346.62 crore. The Government had fixed a reserve price of Rs. 1,218.37 crore for the deal.

The VSNL's current monopoly over international telephony comes to an end in less than two months. From April 1 new international operators will enter the scene. Besides, the government has already run down the cash reserves of the VSNL by taking out substantial dividends.

That is why many critics have pointed out that the sell-off in VSNL should have taken place much earlier when foreign players were not already in the picture in such a big way. But India is a vast country

and VSNL's reach will be far more than that of its competitors. That is why the Tatas paid far above the reserve price.

The sale of IBP is in a different category altogether. Here again, critics have been quick to jump into the fray saying that the sale is like transferring money from one government pocket to another.

But it is a fact that IOC has outbid a top foreign player like Royal Dutch Shell for control of IBP. This will now give IOC a virtual stranglehold in its nationwide marketing reach.

As if to balance that, IOC has been prevented from trying to expand further by not bidding for two other integrated government-owned oil companies, Hindustan Petroleum and Bharat Petroleum, when these two are privatised, three months after the dismantling of the administered price mechanism. Presumably, some of the petroleum majors, Reliance included, might bid for them.

Where the hotels are concerned, people at large may feel disappointed that only four such units have been sold outright so far. They are Qutab Hotel, New Delhi, Laxmi Vilas Palace Hotel, Udaipur, Lodhi Hotel, New Delhi and Centaur Hotel, Mumbai.

Mr Shourie admitted that the

government was not successful in getting a favourable response for 12 properties of the ITDC and Hotel Corporation of India that were on the block. These issues would be looked at afresh. But this could well be a correct reflection of the public view of the performance of such money-guzzling and non profit-making governmental ventures.

At the level of the villages, the decision to allow the free movement of foodgrains, edible oil and sugar across the country also needs to be welcomed along with the formulation of a new drug policy which seeks to encourage domestic research and development, even though the last of these could lead to a temporary increase in prices.

The country is saddled with stocks of 59.15 tonne of foodgrains, much of which rots in FCI godowns, even as there are repeated cases of starvation deaths in different parts of the country. The removal of licensing curbs on the private sector to store agricultural commodities will help to at least reduce this ugly phenomenon.

All in all, the Disinvestment Minister, Mr Arun Shourie has been able to make a dramatic comeback in his chosen, and vitally important, field of governance. Most likely, we will be hearing much more from him on these lines in the near future.

(PIB Features)

WELCOME STRESS ON...

(Contd. from page 45)

capture the markets, in the 'convenience food sector', by way of increasing new package techniques.

In the past we had achieved higher economic growth rate of 6.6 per cent in the year 1998-99. The decline in the economic growth rate to 6.1 per cent in the year 1999-2000, and thereafter to 5.2

per cent in the year 2000-01, is on account of fall in our agricultural output (i.e. agriculture, fishing and forestry together by 0.2 per cent and that of non-banking financial institutions by 2.2 per cent in 2000-01 over its level in 1999-2000. At present fundamentals in the economy are positive and strong. We have foreign exchange above US \$ 50 billion plus; our export rate is

being planned at 3 per cent for the year 2002-03; agricultural sector is poised for higher growth rate due to well-distributed rainfall in many parts of the country. Furthermore, our inflation rate has come down to 1.52 per cent as on January 12, 2002. All these factors augur well for higher economic growth rate of 6 per cent per annum in the coming year 2002-03. □

Valuable Field Experience

COALITION OF INTEREST : PARTNERSHIP FOR PROCESSES OF AGRICULTURAL CHANGE : Ruth Alsop, Elton Gilbert, John Farrington and Rajiv Khandelwal : Published by Sage Publications, New Delhi : Pages : 308; price Rs. 395.

The book under review documents a process designed to effect agricultural change in the semi-arid areas of India, particularly in Rajasthan. Launched by the Ford Foundation, the process has focussed on improving the demand-response relationship between government research and extension service and their most poorly or ill-served clients, namely, farmers who operate rainfed holdings.

Although recent years have witnessed a spate of policy reforms in Indian agriculture both at the national and state levels, there is a general feeling that vast swathe of Indian agricultural population remained untouched by these development initiatives. As such, the authors advocate the need for process monitoring (PM) or the interaction and collaboration between different stakeholders such as various levels of government, non-governmental organisation (NGOs) and farmers' groups.

Building on first-hand knowledge and grassroots experience, the authors enumerate the performance gaps flowing from misplaced policy concerns and from inept implementation of policy decisions in the farm sector. They point out persuasively that difficulties in forging links between governmental organisations and NGOs impede development programmes. No doubt, the NGOs have a close rapport with the rural

people but they sadly lack the technical expertise to bring about beneficial technologies. Per contra, the strength and advantage of the governmental agencies lie in technology even as these agencies are not able to respond to the needs of low-income farmers. Add to this, the Government remains by far the largest player in the provision of services for low-resource agriculture, as a consequence which private organisations do not have adequate space to function.

In these circumstances, the authors state that practical mechanisms need to be evolved to effect the right consensus required to bring about change through multiple stakeholder interaction. Process Monitoring (PM) is deemed the key tool for these coalitions. A principal factor for coalescing multiple organisations together for agricultural development is to increase the quality and coverage of services, particularly to ill-served indigent communities. This is unlikely to occur through government channels alone, as with extant manpower and budget constraints it cannot reach these communities. As pressure escalates to prune public spending on these services further, government ought to look for ways to increase efficiency and coverage.

The authors contend that the quest for alternative ways to organise services comes at a time

when decentralisation and devolution are the bywords of a newly emerging democratic intention such as the Panchayati Raj institutions. For effective participation, the authors opine, no alternative to a process approach is available at this juncture. To date the experience gained in Rajasthan supports the authors' assertion that process approaches are desirable for individual intervention. Alongside, enabling environments (policies and programmes) and enabling mechanisms (channels for information flow and convergence, fora for debate and platforms for decision-making) must be present. These are desirable desiderata if the interests of the multiple actors are to become shared or to coalesce to the point of effecting change.

The authors rightly argue that through improved donor and government flexibility and some improvement in the skills of government staff at key levels, it would be possible to assist the formation of coalitions with triple goals: first, to bypass or modify behaviour opposed to positive agricultural change; second, to accompany this with persistent longer-term efforts to encourage organisational change particularly in government organisations and finally to take due advantage in a sensitive and flexible way the opportunities for structured interaction that are driven not only by a vision of rural people's demand pull on government services but also by practical and achievable goals. In sum, shorn of technicalities on information system, the book under review is a required reading for development economists in general and agronomist in particular for deriving valuable field experience on the subject so thoroughly studied by the authors.

G.S. Srinivasan

ANSWERS

- i) Roger Bannister of England won the mile race with a new world timing of 3M 58.8 sec. at Vancouver Games in 1954 on 7th August, the concluding day.
- ii) Milkha Singh won 400 M race with a new Commonwealth record of 46.6 sec. at the Cardiff Games in 1958.
- iii) Fourteen years old Ved Prakash (Light-flyweight) won the gold medal in his weight category.
- iv) Mukhtiar Singh won golds

in Kingston Games (1966) and Edinburgh Games (1970) in lightweight and welterweight categories respectively. Sudesh Kumar (flyweight) won golds at Edinburgh (1970) and Christchurch Games (1974) and Rajinder Singh (Welterweight) won golds at Edmonton (1978) and Brisbane (1982).

- v) Cricket was part of the 16th Commonwealth Games held in Kuala Lumpur (Malaysia) in 1998.
- vi) South Africa won gold, Australia silver and New

Zealand bronze.

- vii) Prakash Padukone won badminton gold at Edmonton in 1978 and Syed Modi won the same at Brisbane in 1982.
- viii) Auckland (New Zealand) in 1950 and 1990 and Edinburgh (Scotland) in 1907 and 1986 staged the Commonwealth Games twice.)
- ix) Kuala Lumpur (Malaysia) in 1998.
- x) Athletics, boxing and swimming.

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Development Diary

Indian Aid to Nepal

India and Nepal have signed a memorandum of understanding (MOU) in which India will grant an assistance of Rs. 840 million to Nepal for setting up the East-West Highway Optical Fibre Cable (OFC) Network, which is expected to cover all the main cities and towns in the Himalayan Kingdom.

The 1000 km OFC will run right from Bhadrapur in the East upto Nepalgunj in the West, covering 81 main cities and towns. The project will be implemented over a period of two years.

Nabard's Record Refinance

NABARD has disbursed an all time high amount of Rs. 2676 crore as refinance and other financial assistance to the banks, state governments and other institutions in Punjab and Haryana during the year 2001-02. The assistance was for investment credit, production credit, rural infrastructure development and other development activities.

Foodgrains Export

The Centre has decided to export 150 lakh tonnes of foodgrains during 2002-03 and earn foreign exchange worth Rs. 12,000 crore. This comprises 100 lakh tonnes of wheat and 50 lakh tonnes of rice. There was a record offtake of 301 lakh tonnes of wheat and rice from the Central pool during 2001-02 as against a total offtake of 179 lakh tonnes last year, marking an increase of 122 lakh tonnes.

The increase in the offtake was from open market sales scheme, food-for-work programme and Sampoorna Gramin Rozgar Yojana.

India to launch Satellites

INDIA'S domestic communication satellite system will make a quantum jump with plans to launch seven satellites under the new INSAT-4 series by 2007. The satellites in the new configuration are expected to help in increasing the INSAT transponders in various bands to 251.

Power Grid Net Up

POWER Grid Corp of India Ltd plans to invest Rs 55,000 crore in the transmission and telecom sectors in the 10th and 11th Plan periods. The company has posted a net profit of Rs 760 crore (Rs 742 crore last year) on a turnover of Rs 2,850 crore (Rs 2,683 crore) during 2001-02.

Augmenting Crop Production

The Centre has launched a special scheme to raise crop production in 10 states including Bihar, for which the Agriculture Ministry has allocated Rs. 130 crore under the Farm Water Management Scheme. The Ministry has earmarked Rs. 46.77 crore during the current financial year for the implementation of the scheme aimed at providing assured irrigation facilities to the farmers on 2.15 lakh hectares.

The scheme will be credit linked and implemented by NABARD in all the 10 states in close coordination with the state governments.

Under the scheme, subsidy would be given to farmers at 30 percent of the cost for sinking of shallow tubewells with pumpsets as well as to group of farmers for setting up low lift irrigation points (LIP) to the group of farmers in the states.

The beneficiaries would have to contribute only 20 per cent of the cost and the balance 50 per cent would be provided as loan by the banks.

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