Taking Stock of India's Livestock

Innovative Ways in Poultry Products Processing

Veterinary Education in India

Interview

Dr. N. R. Bhasin
President,
Indian Dairy Association
India’s Livestock and Poultry: The highly overlooked Industry

Livestock in India has always been known as an allied industry of agriculture, or more correctly a sub sector of agriculture. Slowly but steadily, the industry is rising to prominence. Today, the once sub sector contributes 28 per cent of the agriculture GDP and about 5 per cent of the country’s GDP. In 2010-11, it generated outputs worth Rs 3,40,500 crore – higher than the value of food grains (Rs 3,15,600 crore) and fruits and vegetables (Rs 2,08,800 crore).

These growth numbers has been the direct result of the changes in the dietary patterns of the Indian population. The newly evolved and booming middle class is more inclined to a high protein diet constituting mostly of meat, eggs and milk. The demands of the high end consumers are mostly met by the resource hit poor. About 70 per cent of the livestock market in India is owned by 67 per cent of the small and marginal farmers and by the landless. In India, nearly 20 million people depend upon livestock sector for their livelihood, where women’s share is about 70%.

India’s animal wealth has put the country in a favourable position in terms of livestock production. India is home to 13.5 per cent of the global cattle population, 57.3 per cent of buffaloes and 18 per cent of goat and 5 per cent of the world sheep stock. India has 187.38 million cattle and 96.62 million buffalo. These two species contribute 97.5 per cent of the total milk production in the country. India is now world’s largest milk producer. India is the fifth largest producer of egg and ninth largest producer of poultry meat. The Indian poultry production is considered to be the cheapest in the world.

Being the largest milk producing country in the world, India produces in excess of 80 million tonnes of milk every year. Milk processing in India is around 35%, of which the organized dairy industry accounts for 13% of the milk produced, while the rest of the milk is either consumed at farm level, or sold as fresh, non-pasteurized milk through unorganized channels. Dairy Cooperatives account for the major share of processed liquid milk marketed in India. India, traditionally a market for milk forms like butter and ghee, has recently started to open up to more diverse platter of processed forms like cheese, dairy whitener, condensed milk and traditional variants like Paneer.

India rank first in cattle wealth. But when it comes to meat processing, India is still a novice. Only 1 per cent of meat produced is processed into value added products like sausages, ham, bacon, luncheon meat, kababs, meatballs etc. There is a huge scope for expanding exports in meat and meat products. Since 1995, production of meat & meat products has been steadily growing at a rate of 4 per cent p.a. Currently, the processing level of buffalo meat is estimated at 21 per cent, poultry 6 per cent and marine products 8 per cent.

India has the world’s largest livestock population, yet India does not figure among the top players in this field. India’s livestock productivity is 20-60 per cent lower than the global average. In India, mostly local, non-descript breeds are used by the farmers. Poor quality diet has been haunting the Indian dairy sector for ages. The problem becomes severe during lean periods such as drought. Development of the concept of fodder banks where surplus fodder is be conserved and stored for supplying to farmers on nominal price during scarcity periods is a pursuable proposition. Inadequate breeding and reproduction has also marred the economic viability of the industry. Many well-known local breeds are losing grounds to exotic breeds due to cross breeding and are on the verge of extinction. A well coordinated effort can save the displaced breeds which can offer a new direction in breeding programmes.

Livestock sector has been in a situation of credit crunch since long time. It receives only 12 per cent of the total public expenditure on the agriculture and allied sector and four-five per cent of the total institutional credit flow happens in the sector. Hardly six per cent of the livestock are insured. Moreover, limited access to bigger markets, lesser investments and negligible use of innovative technologies have added distortions in the sector and dampened the prospects of an otherwise lucrative enterprise. In the present era of open global trade, Indian livestock and livestock products can only enter freely and compete in the world market when they are free from zoosanitary specifications.
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Taking Stock of India’s Livestock

Horticulture Sector recognized

Dr. KL Chadha honoured with Padamshree

Know Your Minister
Jayanthi Natarajan
The Great Grain Drain

India has been blessed by an incredible grain rain this year, thanks to the monsoon and food policies that have been implemented allowing the bumper crop produce. This year the food grain production has crossed all records and is expected to be above 250 million tonnes. Procurement of rice and wheat, which is going on in full swing is expected to register new records. The all time high procurement has been the result of the MSP (Minimum Support Price) that has been offered.

But what is ironical here is that the government of India is unable to keep up with the surplus grains leading to grain drain. The Wall Street Journal reports that the state run warehouses have a capacity of 63 million tonnes while the grains stocks are expected to be much more than that.

The granary of India are facing the problem of plenty. While farmers in some parts like Bundelkhand are worried about poor produce, Punjab is thriving on the plenty produce. But the state has run out of space for storage facilities. Blame game has begun with the Deputy Chief Minister Sh. Sukhbir Singh Badal accusing the Centre for the grain storage problem. He has asked the government to allow export of wheat to Pakistan and other CIS countries through integrated check posts in Attari. According to him this would have solved the problem of surplus and would have remunerated the farmers. Punjab has also crossed its target produce of 115 lakh tonnes of wheat. Around 1750 purchase centres have been set up but the problem still exists.

Wheat procurement in Madhya Pradesh has also taken an all time high of 7.5 million tonnes but the problem of plenty once again has left the government with no option but to leave the wheat exposed to rains.

Government officials have been accused of coming out with wrong estimates. Ministry had promised availability of jute bags for storage, but still sacks of rotting wheat and other grains could be seen lying unattended in the railway yards with no protection against rats, insects and other diseases.

Government has made arrangements for some amount of wheat but the limit has exceeded the storage capacity available. Hence now private parties have been roped in for provision of storage facilities. Apart from this, some amount has also been kept under cap cover with the assurance that it would be lifted up by the concerned agencies as early as possible.

In a country like India, approximately 41.6 percent of the population falls below the International Poverty line. We cannot afford to allow our food grains to go waste. We need proper storage and distribution systems for the grains. Systematic approach would be beneficial in this case, where food grains are managed from the cutting and feeding stage till the last stage of storage and distribution. In each stage such as threshing, separating and cleaning, poor quality grains should be separated from the good quality and accordingly storage priorities be given. They should be properly dried and moisture content should be kept at a specified level and stored in auto cleaning silos. Government is encouraging private sectors to join in and help in grain storage by providing the private companies with concessions to build storage facilities. The high costs borne by the government in this process can be justified with less spoilage. The road to success in this endeavour may not seem an easy one but does not seem impossible too.

- Sumbul Khan
Corporate Corner

Tata Coffee net profit rises 64%

Tata Coffee has posted 64 per cent rise in consolidated net profit to Rs 28.83 crore for the quarter ended March 31, 2012. The consolidated net profit of the company for January-March quarter of 2010-11 stood at Rs 17.53 crore. Total income stood at Rs 382 crore for the period under review against Rs 335 crore in the year-ago period. For the whole 2011-12 fiscal, the company reported a consolidated net profit of Rs 81.19 crore against a profit of Rs 72.56 crore in the previous fiscal. Total income was at Rs 1,548.99 crore in FY12 against Rs 1,301.36 crore in the previous fiscal, the filing said.

Tata Coffee

DCM Shriram Q4 standalone net up 78% on higher bioseed, sugar sales

DCM Shriram Consolidated Ltd reported a 78 per cent jump in standalone net profit for the quarter-ended March 2012 on higher sales from bio-seed, sugar and chlorovinyl business. The company reported a net profit of Rs 34.69 crore on revenue of Rs 1,296 crore for quarter against a net of Rs 19.49 crore on revenue of Rs 1,078 crore in corresponding last quarter. Consolidated net profits for the quarter stood at Rs 49 crore on revenue of Rs 1,337 crore against a net of Rs 29 crore on revenue of Rs 1,106 crore in corresponding last quarter. For fiscal 2012, DSCL bounced back into black with a profit of Rs 11.9 crore against a net loss of Rs 14.3 crore in the previous year. Revenues for fiscal 2012 grew 21 per cent to Rs 5,039 crore against Rs 4151 crore in fiscal 2011.

United Phosphorous to buy back shares worth Rs 288 cr

United Phosphorus announced a buy-back of 1.92 crore equity shares for up to Rs 288 crore from the open market. The company would buy the shares at a price not exceeding Rs 150 per share, which is over 25 per cent higher than the current market price of Rs 119.65 per share. In a filing to the Bombay Stock Exchange, the company said: “The board of directors have unanimously approved the buy-back of equity shares up to 1,92,00,000 fully paid-up equity shares of Rs 2 each.”

Murugappa Group plans Rs 1,000 cr capex

Chennai-based Murugappa Group has planned Rs 1,000-crore capital expenditure in the current year with three-fourths going into expansion of its engineering and fertiliser businesses. The group is confident of maintaining its growth at about three times the GDP growth, as it has done in the last three years, but there are concerns, said the Group’s Executive Chairman, Mr A. Vellayan. In 2011-12, the Group sales were Rs 22,314 crore, which is 31 per cent higher than the previous year; and operating profit Rs 2,692 crore, a growth of 20 per cent.
Sanwaria Agro to invest Rs 200 cr to raise capacity
Sanwaria Agro Oils plans to invest Rs 200 crore this fiscal to enhance its processing capacity and venture into new products. The company plans to raise Rs 50 crore through external commercial borrowing (ECB). Mr C.A. Anil Agarwal, Director, said that the company has not firmed up fund raising plans yet, but will definitely look at raising Rs 50 crore through ECB. “We plan to import pulses for retail distribution under our brand. We will source basmati rice from Madhya Pradesh,” said Mr Agarwal.

Indian companies in talks to buy stake in Canadian potash firms
The Indian government plans to help local companies buy as much as 10% in Canadian potash firms to secure supplies of the key fertilizer after failing to buy a stake in Belarus government-owned potash producer JSC Belaruskali. Indian Potash Ltd and Gujarat State Fertilizers and Chemicals Ltd are in talks with Canadian potash companies to buy stakes and get an assured supply of the mineral at a discount, according to a fertilizer ministry official and an industry executive.

PDIL is working to establish and expand its global footprint
Projects and Development India Ltd (PDIL), was established as a technology wing of Fertiliser Corporation of India (FCI) in 1951 with an objective to obtain technological self-reliance. PDIL became an independent entity at the time of re-organisation of FCI in 1978. PDIL is working to establish its footprint globally. It has received an order for consultancy services for a fertiliser project in Nigeria and discussions are in advance stage for finalising consultancy assignments in other African countries. Recently, PDIL completed a consultancy assignment for Petrofac of Sharjah, UAE, for an ammonia urea fertilizer project. PDIL is also handling engineering services for JIFCO in Jordan.

Jain Irrigation in pact with Nebraska varsity
Jain Irrigation Systems has said that it has signed a Memorandum of Understanding with the University of Nebraska, US, to identify common research areas that will generate applicable technologies for ensuring water conservation and sustainable food production. The MoU was signed between Jain Irrigation System Managing Director, Mr Ajit Jain and the President of University of Nebraska, Mr James Milliken, the company said in a release issued here. Many of the envisaged applications of the joint effort would assist farmers in India to become efficient food producer with judicious use of water and energy resources. The focus will be to research in water science and technology, policy and education to develop agriculture in states and the world as a whole, especially the small farmers of India and Africa. The University of Nebraska has also agreed for exchange of faculty and students between the two organisations.

Jain Irrigation finishes acquisition
Irrigation and agriculture firm Jain Irrigation Systems Ltd said it has signed an agreement with Israel-based Kibbutz Naan, to acquire the remaining 50% of the irrigation solutions company Naandanjain Irrigation Ltd, which up till now was jointly owned by Jain and Kibbutz Naan. In 2007, Jain Irrigation had taken a 50% stake in Naandanjain, which provides irrigation solutions. Naandanjain has nine subsidiaries around the world, and six production sites, two of which are located in Israel (Kibbutz Naan and Kibbutz Dan).
Ministry mooting extra allocation of grain to BPL, APL families

With the grain stocks held with Food Corporation of India (FCI) and other state government owned agencies crossing a record level, the food ministry has proposed additional allocation of grain to BPL and APL families for dealing with storage crunch. Under the proposal sent to finance ministry, the food ministry has proposed to hike grain allocation for the estimated 18 crore APL families to 15 kg per month from prevailing 10 kg per month. This will result in excess grains allocation of 6.5 million tonne. Besides, the food ministry has also recommended increase in grain allocation to 2.5 crore families covered under Antyodaya Anna Yojana (AAY), which focusses on the poorest amongst 6.5 crore BPL families covered under the Targeted Public Distribution System (TPDS). Under the proposal the grain allocation to AAY is to be increased from current level of 15 kg to 20 kg per families. “We need the finance ministry nod for extra allocation of grain, which would deal with the storage crunch issue,” BC Gupta, secretary, Department of Food and Public Distribution told FE. According to the estimate, the food subsidy bill has already crossed Rs. 88,000 crore during last fiscal. If the food ministry’s proposal is accepted, the food subsidy bill is expected to cross Rs. 1 lakh crore. The food ministry proposal comes when the country’s grain stocks held with the FCI and state government owned procuring agencies has crossed all time record of 71 million tonne at the start of this month mainly attributed to record rice and wheat procurement drive. FCI has a storage capacities of around 62 million tonne. The current grain stocks are far more than strategic reserve and buffer stocks norms of 21 million tonne prescribed on April 1. Food secretary, Gupta also said that if the current trend in wheat procurement continues, the grain stocks is expected to touch 75 million tonne by June 1. Meanwhile, food minister K V Thomas hinted at possibilities of exporting wheat from the central government’s excess stocks. “We are looking at export of wheat from our stocks. There are some countries like Uganda, some Gulf nations, Afghanistan and Pakistan, who need wheat,” Thomas said. The panel headed by Prime Minister’s Economic Advisory Council (PMEAC) chairman C Rangarajan, set up to look into excess grain stocks, will examine the matter, Thomas noted. In anticipation of bumper wheat output estimated at 90.2 million tonne (mt), the government has set a record procurement target of close to 32 mt against a lifting of 28.33 mt last year. FCI had recently brought to the notice of food ministry that India could see unprecedented levels of grain being destroyed because of lack of storage capacity.

Government notifies free export of sugar

The government has notified the decision allowing free export of sugar, a move that will help industry ship surplus sweetener and clear cane payment arrears to farmers that have mounted to over Rs 10,000 crore. The food ministry issued the notification more than a week after an inter-ministerial meeting, chaired by Prime Minister Manmohan Singh, decided to eliminate ceiling on sugar exports by putting it under the Open General Licence (OGL).

House Panel against pruning Farm Budget

A parliamentary standing committee has taken a grim view of constant pruning of budget of agriculture ministry. It has asked the Centre to adopt a fresh outlook towards allocation of finances to the sector as it sustains economically weak farming community. The parliamentary panel examining the demands for grants of agriculture ministry found that in the Eleventh Plan there was a wide difference between proposed budget estimate (BE) of the ministry and the approved budget estimate. Moreover, the budget estimate amount was pruned at revised estimate (RE) stage and the actual expenditure was almost half of the proposed BE. During oral evidence of officials of agriculture ministry, finance ministry and Planning Commission, the panel found that the final allocations are pruned seeing past expenditure of the ministry.
Ration shops in remote areas to have grain storage facilities
In a modest step to usher in food security in remote and tribal areas and vacate storage space in Food Corporation of India (FCI) godowns, ration shops in backward regions, tribal areas and hilly and inaccessible areas would soon double as mini-godowns and storage houses. The food ministry has prepared a scheme for creating fair price shops-cum-godowns in the 12th five-year Plan. Budget 2012-13 had made an interim allocation of Rs 2 crore for the programme. The estimated outlay for the programme during the 12th Plan is Rs 506.2 crore. These ration shops would have the facility to store three months’ foodgrain stock to be distributed through the Public Distribution System (PDS). This would also be distributed to beneficiaries under the Antodyaya Anna Yojana.

Currently, most rations shops across the country do not have facilities to store grains and other items for long durations. This leads to shortage of foodgrains, especially in remote, tribal and inaccessible hilly areas. The PDS is operated through a network of about 500,000 ration shops across the country. “The central government would provide financial assistance of up to 50 per cent of the cost of constructing such ration shops-cum-godowns, up to a maximum of Rs 1 lakh, while the remaining would be contributed by the state government,” said an official.

Under the PDS, the central government is responsible for transporting grains to the nearest FCI godowns, while states are responsible for collecting and transporting these from the godowns to ration shops. The ration shop-cum-godown scheme has also been endorsed by a Planning Commission working group, constituted to devise ways to streamline storage and PDS operations. The official said initially, such dual-purpose shops would be allowed only in specific areas, but depending on the success of the scheme, it could be expanded to cover the entire country. “Cooperatives, self-help groups and other community-based organisations would be given preference in running such shops,” he said, adding assistance could also be given to existing rations shop owners if they wished to expand their business to include storage facilities as well. The state government would be responsible for determining the procedure for constructing these facilities and working out details of the use and functioning of such shops. India’s foodgrain storage woes compounded in the last few years, following record harvests of wheat and rice. These were also aided by a massive surge in government purchases. As on April 1, the government’s stock of grains stood at about 53 million tones, about 152 per cent higher than the required quantity. Though government annually allocates about 55-56 million tonnes of grains for distribution through the PDS, inadequate storage facilities often lead to diversion and damage of grains.

Sugar exports freed, onion floor removed
In a major step towards removing the curb on exporting farm products, a high-level meeting chaired by the prime minister decided to free the export of sugar for the current season and abolish the export floor price for onions for two months. However, traders said the decision on sugar was delayed since international prices were at record lows, with the new Brazilian crop expected by June. In fact, raw sugar futures fell to the lowest in one year at 20.60 cents a pound on New York’s commodity exchange, after the move. “The high-level meeting on farm exports today decided to remove all curbs on the export of sugar by putting it under open general licences and abolish the export floor price for onion,” said a senior official.
That alphonso you got a little cheap may be fake

That box of Ratnagiri/Devgadh alphonso mangoes that you paid for through your nose could be something very, very cheap, and it won’t even be genuine. Mango buyers are being cheated by some traders who sell them Karnataka alphonso with a label of Ratnagiri or Devgadh mango. The cheating is especially rampant among the hawkers who roam the streets carrying their wares from door-to-door. Since most of us are no experts on mangoes, it is easy for these hawkers to pass off the inferior Karnataka variety as the famed mangoes from Konkan. A box of four-dozen medium-sized Ratnagiri or Devgadh mangoes costs around Rs 1,200 (A-plus or export quality will come for Rs 2,500 for four dozens), while the Karnataka mangoes come as cheap as Rs 500 for a four-dozen pack. So how does one distinguish between the high-quality mangoes from Konkan and their poorer versions from Karnataka? The obvious difference between the two varieties lies in the fruit’s skin (rind). The Ratnagiri alphonso have a tinge of saffron, and their skin is a lot delicate compared to the Karnataka mango, which is bright yellow.

Hail punctures hopes of Himachal apple growers

The apple of Himachal Pradesh’s eye is turning sour. Attacked by hailstorms, the state’s apple crop, worth more than Rs 200 crore, is lying unattended in the fields. Horticulture department officials say hailstorms damaged crops in Shimla, Mandi and Kullu districts, but the continuous spell of snow in the higher reaches has rung alarm bells for growers in Kinnaur district too, the area known for producing delicious apples.

Maharashtra farmers can soon hope to sell fruits, vegetables directly

Farmers in Maharashtra can now hope to sell their horticulture produce to any person or a company of their choice. A draft notification issued by the Maharashtra Government gives them relief from mandatorily selling their horticulture produce through Agricultural Produce Marketing Committee (APMC) yards. This also means companies in agri-business, food processing and organised retail sector are in for a bonanza. The notification, paving the way for free movement of fruits and vegetables within and outside the State, will delist fruits and vegetable from the AMPC Regulation Act. The Agriculture Produce Market Committee yards are controlled by a committee that is an autonomous body. Price discovery for vegetables and fruits is done by the committee. This, in turn, helps farmers to sell to traders.

UP sugar mills seek government aid

The private sugar units in Uttar Pradesh have asked the state government to help them overcome the financial crisis being faced by the mills. In a letter to Chief Minister Akhilesh Yadav, UP Sugar Mills Association chairman CB Patodia has highlighted the fact that the industry in UP is going through a severe financial crisis this year. Possible solutions suggested by UPSMA include sanctioning of cash subsidy equivalent to the differential cane price of Rs 15 per quintal for 2007-08, as has been done in the case of cooperative factories and interest-free agricultural loan through the UP Cooperative Bank with a moratorium of five years and equivalent to the cane price of Rs 30 per quintal.
Jobless workers of Rani Tea Estate seek government’s attention

For two years the 300 workers at Rani Tea Estate in the outskirts of Guwahati have been living a life of hunger and unemployment. For these workers, fate took an ugly turn on March 22, 2010, when Mridul Kumar Bhattacharyya, the owner of the tea estate fired at a mob that had gathered outside his bungalow to protest his alleged molestation of a female tea garden worker. This resulted in the death of Pradip Murari, a young student. The angry mob then set ablaze his residence and the tea factories. The tea garden was subsequently sealed down, rendering the 300 workers in the 2,700-bigha tea estate jobless. The legal procedure on the violence is still in progress. Taking up cudgels for these helpless workers, the Sangrami Krishak Shramik Sangha has been demanding that the Rani Tea Estate should be brought under the fold of the Assam Tea Corporation (ATC).

Punjab, Haryana procure over 150 lakh tonnes wheat

With the procurement season in full swing, government agencies in Punjab and Haryana have procured over 150 lakh tonnes of wheat, food and supplies. Both states, which contribute over 70 percent of the food grains to the national kitty, are expecting a bumper harvest this year. In Punjab, government agencies and private millers have procured more than 81 lakh tonnes of wheat. Sangrur, Patiala and Ludhiana districts were leading in wheat procurement. The state government has set up over 1,750 procurement centres across Punjab. In adjoining Haryana, nearly 69 lakh tonnes wheat was procured by government agencies. Even as the procurement is in full swing, the opposition Congress in Punjab slammed the state government for its failure to provide enough gunny bags for the procurement season. Accusing the Punjab government of lack of preparedness, Congress leader Lal Singh said that enough gunny bags were not available in mandis (grain markets), leading to harassment of farmers.

TN move on support price spices up turmeric

The Tamil Nadu Government’s move to send a team of officials to study the situation in the turmeric buoyed markets. According to Regulated Marketing Committee officials, a special team will meet growers, traders to discuss issues such as production, sales, price and acreage. The team will submit its report to the State Government which will enable them to decide whether turmeric has to be procured at a minimum support price. This led to some sort of anxiousness among stockists who purchased heavily, leading to prices increasing by Rs 150-200 a quintal. “Also exporters have received reasonable orders from North Indian towns. Local traders also purchased and of 16,200 bags that arrived, 10,400 were sold,” said R.K.V. Ravishankar, President, Erode Turmeric Merchants Association.

Maharashtra, Andhra sign accord in irrigation project

Maharashtra and Andhra Pradesh today reached an agreement to set up an inter-state board for speedy execution of the Pranhita irrigation project which will serve both the states. Maharashtra chief minister Prithviraj Chavan and Andhra Pradesh chief minister N Kiran Kumar Reddy signed the agreement in the presence of water resources minister Pawan Kumar Bansal. Under the agreement, a joint inter-state committee will be formed to ensure efficient, speedy and economical investigation and execution of the project on the Pranhita river.

Small tea growers contributing to State’s economy

Amidst cries for making tea the national drink of the country, Chief Minister Tarun Gogoi emphasized adoption of latest technology to enhance tea production in the State, even as he urged the small tea growers to lay stress on quality so that they are able to get better prices and face the increasing competition from big industries. Addressing the “Convention-cum-Workshop for Small Tea Growers” at the auditorium of Tezpur University, Tarun Gogoi said, “While there is a need to increase production, at the same time quality must also be maintained to get the remunerative price.” The workshop-cum-convention was held at a time when there is a growing debate about granting tea the status of national drink. Assam presently produces 52 per cent of the total tea of the country, the Rajya Sabha was informed.
Go-slow on kisan cards

Banks have allegedly slowed down issuing Kisan Credit Cards (KCCs) after the Mamata Banerjee government eased a norm. Data available with the agriculture department suggest that of the 4 lakh applications the agriculture department endorsed since the change of guard at Writers’ last May, only around 90,000 had been approved by banks till March. With banks slowing down the process of issuing cards, the state government’s target of bringing 18 lakh farmers under the scheme by the end of the 2012-13 financial year seems difficult to achieve.

Banks may not hit priority sector lending target for FY12

Banks are likely to fall short of their priority sector lending targets in 2011-12. As on March 23, 2012, the proportion of priority sector lending of banks was down at 32.7 per cent against 33.7 per cent a year ago, according to data available on Reserve Bank of India Web site. Priority sector includes loans to agriculture and allied activities, small-scale industries, poultry and other core economic activities in rural areas, including loans to microfinance institutions. According to RBI mandate, domestic banks have to lend at least 40 per cent of their total loans to the priority sector. For foreign banks, the target is set at 32 per cent of net bank credit. The figure of 32.7 per cent has been arrived at a calculation based on the gross credit level. The ratio could be slightly higher at the net bank credit level, however, it might not be adequate to bridge the gap (as in meet the target of 40 per cent). Though there is no bank wise data available for priority sector lending performance last year as yet, however, a number of banks have been falling short of this target. In fact, priority sector lending as a percentage of gross non-food credit is at a multi-year low, as indicated by the RBI data. According to senior bank officials, the drop is mainly on account of a slowdown in lending to the core agriculture sector on the back of rising non-performing assets (NPA). NPAs in the agriculture loan, which accounts for majority of priority requirement (18 per cent), were high at 3.3 per cent in 2010-11. The NPAs may have risen further during the current fiscal on account of crop failures and instances of wilful defaults. While the data is not available for the banking system as a whole, however, SBI’s agriculture NPAs to total agriculture advances had risen by more than three percentage points to 9.45 per cent during the nine months ended December 2011. Banks exposure to microfinance institutions have also come down significantly following the recent crisis in Andhra Pradesh, which brought down the repayment rates. This apart, the declassification of farm credit by RBI in July last year and the recent diktat from the central bank to reduce banks’ exposure to NBFCs including those lending against gold have only added to the woes of banks, said Mr D Sarkar, chairman and managing director, Union Bank of India. In 2010-11, seven public sector banks, three foreign banks and a private bank missed the overall priority sector lending target. However, banks made good for this by lending to other avenues such as on-lending to non-banking finance companies, securitisation and demand from micro-finance companies. In 2011-12, however, this looks slightly difficult to achieve with direct lending to NBFCs ceasing to be classified as priority lending, said Ms Vibha Batra, senior vice-president and co-head, ratings, ICRA. Interestingly, banks have significantly stepped up their lending to agriculture sector in the month of March (2012). In a month, lending to priority sector (including agriculture) went up by 10 per cent and accounted for 65 per cent of the incremental bank credit during the month.

Banks told to give farmers smart cards

The Reserve Bank of India (RBI) has asked commercial banks, regional rural banks and cooperative banks to issue smart cards/debit cards to farmers under the revised Kisan Credit Card (KCC) scheme so that they can access credit with ease. These cards should be compatible for use in the ATMs, hand-held swipe machines, point of sale (PoS) terminals and mobile banking and be capable of storing, among others, adequate information on farmers identity, assets, land holdings and credit profile. Using the cards, farmers can access credit from ATMs and PoS terminals directly to meet their immediate operational requirements. This move comes as a need was felt to align the KCC scheme to current requirements, said a RBI circular.
RBI study suggests change in paddy procurement by AP

An RBI study on paddy crisis in Andhra Pradesh observed that the present structure of procurement is largely responsible for the failure to ensure minimum support price to farmers. It called for change in this system and revising the MSP to make paddy farming remunerative to the farmers. RBI’s Department of Economic and Policy Research conducted the study after disturbing news of crop holiday and huge stocks of paddy lying unsold last year. “The present procurement structure allows overwhelming procurement of rice from millers and insignificant amount of paddy from farmers. There is a need for a change in the procurement policy of State Government to ensure MSP to farmers,”

Regional Rural Banks’ count will reduce to 46 as government starts consolidation

The government has kicked off a major consolidation exercise among regional rural banks, which play an intense role in the country’s scheme of financial inclusion. It plans to amalgamate geographically contiguous RRBs within a state, to help optimise the use of resources, three persons familiar with the development said. As many as 63 RRBs will come under the purview of amalgamation and 27 larger and stronger banking entities will be created to improve services to essentially poorer segment of the population residing in the country’s interiors.

Banks told to Give Subsidised Post-harvest Loans to Farmers

The UPA government at the Centre has told banks to provide postharvest loans to farmers at a subsidized 7% rate to discourage distress foodgrain sales. The government will also offer another 3% concession on interest rate if the loan is repaid on time. The benefit will be available to farmers against negotiable warehouse receipts. Senior bankers said the scheme will encourage farmers to store their produce in warehouses. Banks have been told to kick off the scheme immediately for farmers carrying Kisan Credit Cards and for loans up to 3 lakhs. Banks have been providing post-harvest loans to farmers at about 9% interest rate. The government will now offer a 2% interest subvention to them for extending the subsidised post-harvest loans. This is an extension of the existing subsidised pre-harvest crop loan facility, which has been in place for the last several years. The government raised the subvention to 2% for 2011-12 from 1.5% for the preceding fiscal. Banks have advised their regional offices and branches to start extending the benefit to farmers. Regional rural banks and cooperative credit bodies will also get interest subvention for extending this new facility to farmers. “This move is expected to encourage farmers to keep their produces in warehouses, regulated by the Warehousing Development and Regulatory Authority,” said S Padmanabhan, chief general manager with National Bank for Agriculture and Rural Development, or Nabard. Earlier, cold storage owners used to provide financial assistance to farmers against farm produces stored with them. With the new scheme in place, farmers are expected to shun the prevalent system and seek bank loans. The government introduced negotiable warehouse receipts system in April 2011 to help farmers gain access to bank loans and avoid distress sale of farm produces. Negotiable warehouse receipts also allow transfer of ownership of the commodity stored in a warehouse without having to deliver the commodity physically. The negotiable receipts are eligible as collateral for loans under the Warehouse (Development and Regulation) Act, 2007.

State cooperative bank gets RBI licence

The Reserve Bank of India granted a licence to the 100-year-old Maharashtra state cooperative bank, once controlled by NCP, on the recommendation of the National Bank for Agriculture and Rural Development (Nabard). “As per Nabard norms, a cooperative bank is eligible to secure RBI licence if it has 4% capital adequacy. The RBI granted a licence as the bank achieved the target in the current financial year.”
World corn crop forecast raised

Global corn production will be 932.11 million tonnes in the year starting July 1, Informa Economics Inc said in a report to clients. Last month, the Memphis, Tennessee-based agricultural researcher forecast output at 918.599 mt, up from an estimated 868.017 mt harvested in the current year. The US Department of Agriculture is scheduled to make its first estimate of this year’s harvest.

Malaysia approaching limits of arable land for palm oil

Malaysia, the world’s second-biggest palm-oil producer, is approaching the limits of arable land for the commodity, said Mr Abah Ofon, a Singapore-based agriculture analyst at Standard Chartered Plc. Palm-oil output growth will decelerate and demand is set to outpace supply.

Brazil’s Dominance in Global Sugar Markets Fading

The dominance of top producer Brazil in the global sugar market is fading as the first surplus in four seasons will come from more supplies in other countries including India and Thailand, according to Czarnikow Group. Sugar supplies will outpace demand by 7.7 million tonne in the current season for the first time since 2007-08, the company, which traded sugar in over 90 countries last year, estimates. The crop in Brazil’s main growing area has faltered while processing capacity climbed in India, Europe, China and Thailand, the world’s second-biggest shipper, London based Czarnikow said in a statement on Friday. Brazil’s role in the sugar market is “seemingly in decline, and other exporters rising in importance,” Toby Cohen, a director at the company, said. “We continue to believe that 2012 will be a better year for consumers.” Sugar prices have fallen 11% this year after dropping 27% last year, the most in a decade. Bigger and more affordable supplies will benefit consumers and allow inventories to be rebuilt, according to Czarnikow. The crop in Brazil’s center south, the main growing region in the country, is forecast to be 509 million tonne in 2012-13, up from 493.3 million tonne in 2011-12.

World food prices fall; inflation threat remains

World food prices eased in April after rising in the first quarter of this year, the United Nation’s food agency said, but inflation worries are still simmering as soyabean prices climb. Record high food prices last February helped to fuel the Arab Spring uprisings in West Asia and North Africa. Prices receded in the second half of 2011 but the uptrend resumed in January. The FAO Food Price Index, which measures monthly price changes for a food basket of cereals, oilseeds, dairy, meat and sugar, averaged 214 points in April, down from revised 217 in March, the UN’s Food and Agriculture Organisation (FAO) said.

Vietnam sees coffee export rising to 1.25 million tonnes

Vietnam is expected to export 1.25 million tonnes, or 20.83 million bags, of coffee in 2012, up from a prior forecast of 1.15 million tonnes, the farm ministry said. Coffee export revenues for Vietnam – the world’s largest robusta coffee producer – would hit $2.66 billion, down around 3 per cent from 2011, the Agriculture Ministry said in a monthly report.
India emerges as world’s top rice exporter

Rice India, a leading exporter of rice before a slew of domestic curbs came in the way, returned with a bang in the global markets in 2011-12, toppling traditional leaders like Vietnam and Thailand to emerge as the biggest exporter. However, sustaining this performance might be difficult. For, exporters have started raising prices. Last year, they had huge stocks because of a ban imposed on non-basmati rice since 2007. Even then, India will continue to be a big player in global rice markets, albeit not as big as it was in 2011-12, says those in the trade.

Weak Europe Demand Hits Darjeeling Tea

The Eurozone crisis has affected the export of premium first flush Darjeeling tea. First flush tea, which has a distinctive light colour and aroma, fetches the maximum revenues for Darjeeling’s tea industry. Most of these teas are exported while hardly any are consumed in the domestic market. According to industry estimates, production of Darjeeling tea till the end of April was down by 30%. First flush tea is harvested in mid-March after the spring rains. “European countries, that are the largest importers of Darjeeling tea, have cut down their import quota by 30%. We are unable to supply high quality tea to supply to these countries as well. It’s a double whammy for us. There are mixed quality teas now which are not attracting foreign buyers,” said Sanjay Bansal, chairman of Ambootia Group. It is the second largest producer of Darjeeling teas. Rainfall was lower this year and production came down by 40% from last year’s level during March.

Indian basmati set to scale Chinese wall

Basmati rice exporters are gearing up to tap the market in China, which has recently decided to allow imports from India. Exporters believe it may take a couple of years to develop this new market, which largely consumes the glutinous sticky rice. “It will take a while for us to develop this market. So far, there have been no orders from China,” said Mr Vijay Setia, President, All India Rice Exporters Association. A formal system is being set up to facilitate the Indian rice exports.

Asia faces threat to crops if El Nino unleashed again

A return of the El Nino weather pattern may threaten food output in Asia, the world’s top producer of rice and palm oil, but drier conditions in some areas could also benefit crops such as coffee and cocoa and keep global prices in check. With memories of the devastating El Nino in the late 1990s still fresh in their minds, farmers are braced for the return of the weather anomaly, which can bring drought in some places and heavy storms in others. Although forecasters say it is too early to say whether a full-blown El Nino is on the way, several models in Australia and India show warming of the Pacific Ocean after two straight years of La Nina that resulted in excessive rainfall.
16,000 Sirsa farmers get soil health cards
With a view to improving the fertility of soil after ascertaining the minerals and micronutrients it lacks, the agriculture authorities have issued 16,000 soil health cards to farmers in Sirsa. Samples of soil taken from the fields of 16,000 more farmers have been collected and the authorities hope to issue cards to them by next month. “The agriculture department has set up a laboratory in the district where the soil is tested for NPK (nitrogen, phosphorus and potassium) culture,” said the Deputy Commissioner J Ganeshan. Ashok Kumar Yadav, Director-General of Agriculture, said Haryana is the only state in the country to have issued soil health cards to its farmers and has soil fertility maps for its entire agriculture land.

Nuclear-powered crops
Dr Tomoko Abe at the Centre for Accelerator-Based Science in Saitama, outside Tokyo is not using namby-pamby X-rays and gamma rays to mutate her crop, as is the way in most other countries. Instead she is sticking them in a particle accelerator and bombarding them with heavy ions—large atoms that have been stripped down to their nuclei by the removal of their electrons. This produces between ten and 100 times as many mutations as the traditional method, and thus increases the chances of blundering across some useful ones. Salt-tolerant rice would, though, be of much wider use than just restoring the paddies of Miyagi prefecture and its neighbours, the worst-affected part of the country, to full productivity. About a third of the world’s rice paddies have salt problems, and yields in such briny fields may be half what they would be if the water in them were fresh.

High-yield sesame developed
Scientists at Chaudhary Charan Singh Haryana Agricultural University in Hisar have developed an improved variety of sesame (Til) with high-yield potential and resistance against diseases. According to Vice-Chancellor K.S. Khokhar, this variety had been identified for release at the annual meeting of the All-India Coordinated Research Project on sunflower, sesame and niger held at University of Agricultural Sciences, Bangalore, recently. The new variety, Dr. Khokhar added, had recorded 15 to 25% more seed yield.

Wheeling in green change
Many farmers spend a substantial amount of money for diesel or electricity to lift water flowing in small streams and rivulets to irrigate their fields. However, the innovation of a rural scientist from Bundelkhand region could help save millions of litres of diesel per year (or equivalent electricity). Innovator Mangal Singh has devised and patented a low-cost and efficient fuel-less turbine, named Mangal Singh Water Wheel Turbine Pump-cum-PTP machine that can harness the energy of flowing water to lift water for irrigation and also operate cottage industries.

Napier Bajra grass can generate substantial power for Tamil Nadu
At a time when Tamil Nadu has been reeling under a severe power crisis for over three months, and the problem may have eased with the arrival of wind power over the past week, the existing demand-supply can possibly be addressed through alternate sources. One such solution lies in tapping the right renewable green resource like the humble Napier Bajra grass also called as NB CO-4 hybrid or Emperor grass. This grass can be grown in most soil types, except in heavy clay, highly alkaline and water logged areas.
Down to good earth
Introduced by Prof Shripad A. Dabholkar in the 1980s, the Natu-eco technique revolutionised the cultivation of grapes, bananas, sugarcane, maize, bamboo, root crops and vegetables. It encourages farmers to experiment and look around their environment for resources and find their own solutions to problems. Deepak Suchde of Bajwada in Dewas district of Madhya Pradesh is a major practitioner of this technique. An alternative to the commercial and chemical techniques of modern farming, it emphasises harvesting the sun and developing a thorough understanding of plant physiology, the geometry of growth, fertility, and biochemistry.

Focus on innovation in agricultural technology
The 18th edition of the international exhibition “Israel Agritech 2012” will showcase innovations in the field of agriculture. Technologies developed by Israel would focus on enhancing agricultural productivity through stimulation of innovation in agricultural technology and a general renewal of technologies to feed the world population, expected to increase from 7 billion to 9 billion by 2050. The three-day exhibition, preceded by a pre-conference seminar “Agrivest Summit” and two conferences on 20 years of India- Israel diplomatic relations and International CIPA Conference: Plasticulture for a green planet, will provide a platform for interaction between producers, researchers, distributors, farmers, administrators and others involved directly or indirectly with agriculture or water technology.

Pesticide exposure linked to brain changes
Babies exposed in the womb to a commonly used insecticide have brain abnormalities after birth, according to a study that looked at children born before the US limited the chemicals use. Magnetic resonance imaging of elementary school-aged children with the highest exposure to chlorpyrifos, used mostly in agricultural settings now, showed structural changes in the brain compared with those who had the lowest exposure, research online today in Proceedings of the National Academy of Sciences found. Some parts of the brain were overgrown, while other regions were smaller, the scientists found.

Coconut-Shell Products a Big Hit in Europe
The coconut industry is pinning its hopes on the ‘Go Green’ campaign in the coming London Olympics to provide a fillip to the coconut-shell product makers at a time when the share of export of coconut products is steadily going up. Ice cream cups made of coconut shell are a big draw in European countries like Spain and Italy, where they are valued for environment-friendly quality. The cups were a big hit even in Barcelona Olympics in the nineties. With London Olympics approaching, the industry is expecting more orders to come from Europe. “The exporters have tied up with buyers there who import large numbers. We expect a rise in the orders with big events like Olympics,” said Murali, director of Coconut Development Board (CDB).

A groundnut variety that does not need much water
Mr. Dhirajlal Virjibhai Thummar, a groundnut farmer from Gujarat, is credited with developing a new groundnut variety named “Dhiraj 101,” which is resistant to stem rot. The crop matures in 95-105 days and bears 35-40 pods per plant. About 90-100 kg of seeds are required for sowing in an hectare. This variety matures eight to ten days earlier and also has more average oil content.
Livestock in India has emerged as an important contributor to India’s GDP. Though the sector had a simple beginning, mostly restricted to farmers’ backyards, the livestock sector of today has metamorphosed into a stand-alone enterprise catering to the diverse needs of the Indian population. India’s livestock has many firsts to its advantage, but has seldom been successful in translating these firsts into an economically viable equation acceptable in international parlances. The article examines India’s potential in livestock sector in meeting up with the requirements of the foreseeable future.
India’s livestock industry has risen from the shades of agriculture and now commands a respectable position. It is no longer the ‘shock absorber’ of farmers when the rain gods play spoilsport. From being a side kick of agriculture, the industry has flourished over the years to develop into a main stream vocation that has acquired industrial proportions.

Historically, livestock rearing evolved as a co culture with the crops. It fitted well in the conventional farms especially in providing the most essential inputs – draught power and manure. The farms were mostly sustainable and in lean period, the farmers could depend on livestock products to keep their household running. Though, the years that followed took away the focus from livestock and put it right on monoculture, mixed farming had its own takers. A prominent tool to alleviate rural poverty, initiatives like Operation Flood gave that extra boost to the industry. In the years that followed, with a significant improvement in lifestyle and with the rise of a sizeable ‘well to do’ middle income groups, demand for livestock products has increased.

Livestock industry vis-à-vis Agriculture

Livestock is always better known as an allied industry of agriculture, or more correctly a sub sector of agriculture. Slowly but steadily, the industry is rising to prominence. Today, the once sub sector contributes 28 per cent of the agriculture GDP and about 5 per cent of the country’s GDP. In 2010-11, it generated outputs worth Rs 3,40,500 crore – higher than the value of food grains (Rs 3,15,600 crore) and fruits and vegetables (Rs 2,08,800 crore). In 2009-10, output from livestock was 2.5 times the value of paddy and more than thrice the value of wheat, as per the Central Statistical Office data. It’s contribution to the total output of the agriculture sector has increased from 15 per cent in 1981-82 to 26 per cent in 2010-11. Livestock is thus the fastest growing component of agriculture. In 1980s, its growth rate was 5.3 per cent—almost twice that of the crops. This declined to 3.6 per cent in 2000s but is still 1.5 times the rate of growth of the crops component.

Strangely, this growth pattern has nothing to do with livestock’s utility in agriculture. Technically, their contribution as draught power has declined with the advent of mechanization in modern day farming. Also, intensive agriculture has displaced cattle manure with chemical fertilizers or other forms of concentrated organic inputs. The growth, in fact, is spurred by the changes in dietary patterns of the modern Indian population. The newly evolved and booming middle class is more inclined to a high protein diet constituting mostly meat,
eggs and milk. Between 1983 and 2004, the share of animal products in the total food expenditure increased from 21.8 per cent to 25 per cent in urban areas and from 16.1 per cent to 21.4 per cent in rural areas.

“The livestock sector is expected to emerge as an engine of agriculture growth in the 12th Plan and beyond in view of rapid growth in demand for animal food products,” says the report of the working group on animal husbandry and dairy. Rise of livestock is believed to aid in alleviating rural poverty as well. The planning Commission report has even noted that rural poverty was lesser in those states that had a strong livestock support in farm incomes. Punjab, Haryana, Jammu and Kashmir, Himachal Pradesh, Kerala, Gujarat and Rajasthan are few such states. Livestock is a big hit among marginal, landless and female farmers. About 70 per cent of the livestock market in India is owned by 67 per cent of the small and marginal farmers and by the landless. In India, nearly 20 million people depend upon livestock sector for their livelihood, where women’s share is about 70%. Over 60% of close to 11 million members in about one lakh village milk cooperatives/societies all over the country, are small or marginal farmers. Livestock, therefore is extremely crucial in supporting and sustaining livelihood of a large number of poor. Probably, it must be the only livelihood option available to the poorest of the poor in the country. Nearly half of the world’s 1.3 billion poor depend on livestock for their livelihood and for many of them it is the only source of income to break the vicious circle of poverty.

Indian Livestock Heritage

India’s livestock capital has put the country in a favourable position in terms of livestock production. India is home to 13.5 per cent of the global cattle population, 57.3 per cent of buffaloes and 18 per cent of goat and 5 per cent of the world sheep stock. India has 187.38 million cattle and 96.62 million buffalo population. These two species contribute 97.5 per cent of the total milk production in the country. India is now the world’s largest milk producer.

India ranks second in world in goats and third in sheep. India possesses 61.4 million sheep and 124.3 million goats (National Livestock Census, 2003). Sheep and goat husbandry is the backbone of landless, marginal and small farmers in terrains as diverse as desert, mountain and hilly regions of the country. The National Livestock Census (2003) reported 0.632 million camel in the country. Camel rearing is mostly carried out in Rajasthan.

Projected demand for major milk products in the organized sector, 1988-2009/ metric tonne

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Ghee</td>
<td>100,000</td>
<td>200,000</td>
</tr>
<tr>
<td>Cheese</td>
<td>4200</td>
<td>15000</td>
</tr>
<tr>
<td>Paneer</td>
<td>1000</td>
<td>16000</td>
</tr>
<tr>
<td>Shrikhand</td>
<td>3000</td>
<td>5600</td>
</tr>
<tr>
<td>Rasgolla</td>
<td>1600</td>
<td>6000</td>
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<tr>
<td>Gulabjamun</td>
<td>3000</td>
<td>5850</td>
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Cover Feature – INDIA’S LIVESTOCK

<table>
<thead>
<tr>
<th>Animals</th>
<th>Livestock Population (000)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1997</td>
</tr>
<tr>
<td>Crossbred cattle</td>
<td>20099</td>
</tr>
<tr>
<td>Indigenous cattle</td>
<td>178782</td>
</tr>
<tr>
<td>Total cattle</td>
<td>198881</td>
</tr>
<tr>
<td>Buffaloes</td>
<td>89918</td>
</tr>
<tr>
<td>Yak</td>
<td>59</td>
</tr>
<tr>
<td>Mithun</td>
<td>177</td>
</tr>
<tr>
<td>Total Bovine</td>
<td>289035</td>
</tr>
<tr>
<td>Sheep</td>
<td>57494</td>
</tr>
<tr>
<td>Goats</td>
<td>122721</td>
</tr>
<tr>
<td>Camel</td>
<td>912</td>
</tr>
<tr>
<td>Total Ruminants</td>
<td>487916</td>
</tr>
<tr>
<td>Pigs</td>
<td>13291</td>
</tr>
<tr>
<td>Horses &amp; Ponies</td>
<td>827</td>
</tr>
<tr>
<td>Mules</td>
<td>221</td>
</tr>
<tr>
<td>Donkeys</td>
<td>882</td>
</tr>
<tr>
<td>Total Non-ruminants</td>
<td>15221</td>
</tr>
<tr>
<td>Total Live Stock</td>
<td>485385</td>
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</tbody>
</table>

Dairying in India is an integral part of the total farming system. Symbiotic relationship exists between agriculture and dairy farming. According to estimates of the Central Statistical Organisation (CSO), the value of output from the livestock at current prices was about Rs 173,350 crores in 2005-06. Milk accounted for 68 percent of this output. It was higher than paddy and wheat. In terms of value of output, milk is now the single largest agriculture commodity in India. Dairy contributes to one third of the gross income of the rural households and in the case of those without land nearly half of their gross income.

Milk production increased from about 20 million tonnes in 1960 to about 115 million tonnes in 2010-11. It grew at an annual rate of 4.4 percent during 1990’s and 3.8 percent during 2000s. Although per capita availability of milk has increased from 128 gms per day in 1980-81 to 276 gms per day in 2010-11, it is far below the requirement of 280 gms per capita. In an effort to increase milk production, the government of India has been implementing the National Project for Buffalo and Cattle Breeding since 2000 with focus on genetic upgradation of cattle, streamlining AI services and support system. Unfortunately most of the AI services are still stationary resulting in poor progress. Over the years the availability of feed resources has improved. But the deficit of dry fodder, concentrate and green fodder currently stands at 10, 33 and 35 percent respectively. Only 25 percent of forage seeds are available, that too of the older varieties. The schemes on fodder and feed development have not delivered the desired results.

There remains a huge gap between the potential and realized yields in Indian livestock, on account of constraints relating to feeding, breeding, health and management. Crossbreeding of indigenous species with exotic stocks to enhance genetic potential has been successful only to a limited extent. Even after more than three decades of cross breeding, the crossbred cattle population is just 16.6 percent. Livestock sector has not received the policy and financial attention it deserved. Further, livestock extension has remained grossly neglected. Only 5 percent of farm households have access to information on livestock technology.

It has been observed that NPCBB has contributed to strengthening of semen stations and AI delivery, however the production of bull has been low mainly due to the lack of the initiatives shown by the states. Technologies on sexed semen, embryo transfer, ovum pick up should be integrated with breed improvement programme. Indigenous breeds that have the potential to contribute and be part of the production system should be identified, evaluated and improvement programs for them have to be initiated on priority basis. These should include Gir, Red Sindhi, Sahiwal, Kankrej and Rathi breeds. Further, the current production of 50 million semen doses needs to be increased to about 150 million to cover 50 percent of breedable population by the end of 12th Plan.

Further IDA has suggested to exempt central excise duty on essential dairy equipment and machinery to facilitate clean milk production, processing and packaging. It has also suggested a levy on export of oil meals, de oiled cake, cattle feed etc. It is a fact that over the last few years there has been a major increase in the price of several cattle feed inputs like de oiled cake, molasses etc which has tremendous cost burden on milk producers.

The feed and fodder is one of the most important contributing factors for the growth of livestock sector. Its development has not received adequate focus in the past. Forage crops are usually area, region and season specific. Normally the regional and seasonal deficiencies are serious as it is not economical to transport the forages over long distance. For achieving the targeted milk production of 160 million tonnes by 2020, the requirement of feed, green and dry fodder should be planned.
became a mega company based on the cooperative approach. Varghese Kurien (chairman of NDBB at that time), gave the professional management skills and necessary thrust to the cooperative, and is considered the architect of India’s White Revolution (Operation Flood).

Between 1951 and 2007, India’s livestock population increased by 81 per cent. There was an increase of about 28 per cent in cattle, 143 per cent in buffaloes, 82 per cent in sheep and 198 per cent in goats. Among cattle, the decline was largely confined to the male population, an important source of draught power in Indian agriculture. The population of adult female cattle, on the other hand, were on the rise. The share of adult female in total cattle population rose from 30 per cent in 1982 to 37 per cent in 2003.

Apart from the numbers, India witnessed several events that streamlined country’s livestock development. During 1970s, livestock were considered an important instrument to counteract adverse effects of land-based Green Revolution on rural income distribution. The poor were provided credit assistance to build up livestock assets under poverty alleviation programs such as Integrated Rural Development Programme (IRDP). Major support to livestock sector, however, came in the form of ‘Operation Flood’, which was launched in 1970 to link rural milk production with high-demand urban consumption centres a network of dairy co-operatives. Launched in 1970, Operation Flood has helped Indian dairy farmers direct their own development, placing control of the resources they create in their own hands. The bedrock of Operation Flood has been village milk producers’ cooperatives, which procure milk and provide inputs and services, making modern management and technology available to members. Operation Flood was primarily directed to increase milk production (“a flood of milk”), augment rural incomes and reasonable prices for consumers. Gujarat based Amul (Anand Milk Union Limited) was the engine behind the success of Operation Flood and in turn became a mega company based on the cooperative approach.

Besides, the dairy industry was protected from cheap imports through licensing, quotas and tariffs. Some important policy initiatives to improve growth and efficiency in livestock production and processing were taken after the initiation of the process of economic reforms in 1991. Entry of private sector into dairy industry was freed from regulations, and the import-substitution policy was given up removing quantitative restrictions on imports and reducing tariff rates. Processing of

<table>
<thead>
<tr>
<th>Exports of Meat and Meat Products (Quantity in MT, Value in Rs Mn)</th>
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<tr>
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<tr>
<td>---------------------------------</td>
</tr>
<tr>
<td>Buffalo meat</td>
</tr>
<tr>
<td>Sheep/Goat meat</td>
</tr>
<tr>
<td>Poultry Production</td>
</tr>
<tr>
<td>Animal Casings</td>
</tr>
<tr>
<td>Processed Meat</td>
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<tr>
<td>Total</td>
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Source: Ministry of Food Processing Industries, Annual Report 2007-08 to be compiled

Camel are still continuing as an important means of public/army transport in desert states. The country’s pig population has been pegged at 14.14 million. Pig meat, often called as pork, is more popular among non-Muslim, non-vegetarians across the world and is especially popular in NE regions of India.

Jashtan, Gujarat, Haryana and UP. The country’s pig population has been pegged at 14.14 million. Pig meat, often called as pork, is more popular among non-Muslim, non-vegetarians across the world and is especially popular in NE regions of India.
It is believed that the Indian Poultry Industry is 5,000 years old. The industry has grown phenomenally in the past few years. From being a pure backyard industry, today’s hatcheries are well organized with world class productivity standards. The layer lays around 300 eggs on hen-housed basis per year. Broiler growth of 2.0 kg for an F.C.R (Feed Conversion Ratio) of 1.8 is common. The organised sector of poultry industry is contributing nearly 70 per cent of the total output and the rest 30 per cent in the unorganized sector. The broiler industry is dominated by southern states in our country with nearly 60-70 per cent total output coming from these states. The layer industry once again is represented more in southern states especially, Andhra Pradesh, Tamil Nadu and Maharashtra producing nearly 70 per cent of the country’s eggs. 75 per cent of eggs produced is consumed by 25 per cent of population living in urban and semi-urban areas. Presently, about 800 hatcheries are operating in the country. India is the fifth largest producer of egg and ninth largest producer of poultry meat. India was positioned 17th in the world poultry production scenario. The Indian poultry production is considered to be the cheapest in the world.

India’s sheep and goat rearers make up 15 per cent of all rural households in the country and most of them are small and marginal farmers and landless labourers. With an estimated 25,000 unauthorised slaughter locations and 4,000 registered slaughterhouses, India’s meat trade is highly unorganized and largely unregulated. India’s small ruminant market is predominantly a wet market as Indians prefer fresh meat over their frozen or processed counterparts. The other important byproduct of the industry is leather and wool. Most of India’s leather industry units are small and medium enterprises with 60–65 per cent of the production coming from small/cottage sectors. The Indian Wool Industry is the 7th largest in the world and it accounts for about 1.8 per cent of total world production of wool.

Adding value to the Product
Being the largest milk producing...
country in the world, India produces in excess of 80 million tonnes of milk every year. In the year 2006-07, the total milk production in the country was over 94.6 million tonnes with a per capita availability of 229 gms per day. The industry has been experiencing an upward trend with an annual growth of 4 per cent during the period 1993-2005, which is almost 3 times the average growth rate of the dairy industry in the world. The value-added dairy products market in India is expected to treble to Rs. 12,000 crore by 2014 from Rs. 4,000 crore in 2009. Milk processing in India is around 35%, of which the organized dairy industry accounts for 13% of the milk produced, while the rest of the milk is either consumed at farm level, or sold as fresh, non-pasteurized milk through unorganized channels. Dairy Cooperatives account for the major share of processed liquid milk marketed in India. Milk is processed and marketed by 170 Milk Producers’ Cooperative Unions, which federate into 15 State Cooperative Milk Marketing Federations. Milk translates into several value-added milk products like milk powder, packaged milk, butter, ghee, cheese and ready-to-drink milk products. Many new products are making their way into the Indian markets like flavoured milk, flavoured yoghurts, cold coffees etc.

India, traditionally a market for milk forms like butter and ghee, has recently started to open up to more diverse platter of processed forms. Cheese for that matter has started to catch the fancy of Indian consumers. The organized cheese market including its variants like processed cheese, mozza-
rella, cheese spreads, flavored and spiced cheese, is valued at around Rs 4.5 billion. Processed cheese is the most popular form and it occupies 60% of the overall market (Rs 2.7 billion). The next most popular variant is cheese spread claiming a share of around 30% of the total processed cheese market. Gujarat Cooperative Milk Marketing Federation (GCMF) with the Amul brand continues to be the main operator in the branded cheese market in India. It pioneered the market for processed, branded cheese in India.

Although Indians insist on drinking their cup of tea with fresh milk, they are also not averse to dairy whiteners. The market for dairy whiteners (commercially known as beverage milk powders and condensed milk) and creamers is around Rs 3,000 million. Apart from MNCs like Nestle and companies like Britannia, the Indian variants have also made palpable presence in the Indian markets. Amul, Sapan, Vijaya, Mohan, Parag and several others are the few popular names. These are available mostly in pouches, tetrapacks, and in the near future, may be in miniportion cups.

Apart from these, milk is processed into traditional forms of regional relevance. Paneer, Shreekhand, Rasgulla, GulabJamun, Kulfi and many other sweets fall into this category.

India rank first in cattle wealth. But when it comes to meat processing, India is still a novice. Only 1 per cent of meat produced is processed into value added products like sausages, ham, bacon, luncheon meat, kababs, meatballs etc. There is a huge scope for expanding exports in meat and meat products. According to APEDA, the export of buffalo meat was 34,381.08 tonnes (value Rs 1,536.77 crore) in 2003-04, 33,777.65 tonnes (value Rs 1,774.52 crore) in 2004-05 and 45,993.63 tonnes (Rs 2,629.57 crore) in 2005-06. The export of sheep/goat meat was 16,820.53 tonnes (Rs 110.39 crore) in 2003-04, 9,024.48 tonnes (Rs 81.27 crore) in 2004-05 and 7,177.51 tonnes (Rs 80.37 crore) in 2005-06. The growth is perceptible but not commensurate with the actual potential. Since 1995, production of meat & meat products has been steadily growing at a rate of 4 per cent p.a. Currently, the processing level of buffalo meat is estimated at 21 per cent, poultry 6 per cent, and marine products 8 per cent.

Livestock yet to unleash its true potential

Livestock is a force to reckon with as far as India is concerned. In India, nearly 20 million people depend upon livestock sector for their livelihood. A formidable number of people mostly living in meager resources are the real beneficiaries of animal husbandry. India has the world’s largest livestock population, yet India does not figure among the top players in this field.

India’s livestock productivity is 20-60 per cent lower than the global average. On an average, Indian cows yields only half litre of milk per day and a buffalo gives one and
a half litres of milk per day, whereas in some of the advanced countries of the world, a cow produces 8 to 11 litres of milk per day. In India, mostly local, non-descript breeds are used by the farmers. Poor quality diet has been haunting the Indian dairy sector for ages. The problem becomes severe during lean periods such as drought. Development of the concept of fodder banks, where surplus fodder can be conserved and stored for supplying to farmers on nominal price during scarcity periods is a pursuable proposition. Inadequate breeding and reproduction has also marred the economic viability of the industry. Many well-known local breeds are losing grounds to exotic breeds due to cross breeding and are on the verge of extinction. A well coordinated effort can save the displaced breeds which can offer a new direction in breeding programmes.

Livestock sector has been in a situation of credit crunch since long time. It receives only 12 per cent of the total public expenditure on the agriculture and allied sector and four-five per cent of the total institutional credit flow happens in the sector. Hardly six per cent of the livestock are insured. The only Centrally sponsored scheme on livestock extension, with a budget of Rs 15 crore in 2011-12, is yet to be allocated. During the 11th Plan it was decided to establish the Indian Council of Veterinary and Animal Science Education and Research. It is yet to take off.

With the globalization of the markets, many markets hitherto inaccessible have opened up for the Indian traders. But the high level of protection that is demanded from these countries is virtually impossible to meet from the current package of practices. Stringent food safety and quality standards and our low level of processing has crippled this sector. Moreover, limited access to bigger markets, lesser investments and negligible use of innovative technologies have added distortions in the sector and damped the prospects of an otherwise lucrative enterprise.

Outbreak of contagious diseases has a direct impact on trade and marketing of livestock. Over the years, several diseases have been kept under control. Rinderpest, for instance has been completely eradicated. However, there are others which are still a persistent problem like Foot and mouth disease (FMD), Black quarter (BQ) and Hemorrhagic septicemia (HS). Poultry is also highly susceptible to a number of diseases such as New Castle disease, Infectious bursal disease (IBD) and chronic respiratory disease. This is mainly due to the lack of proper prophylactic measures. In most cases, preventive measures are better than curative practices. Better hygiene during rearing and transport are also some of the areas which have been over looked. Even notifying the authorities at the beginning of the incidence can help prevent colossal damage. However, the disease notification can affect the consumer preference and their dislike for the meat and other animal products during that period. In the present era of open global trade, Indian livestock and livestock products can only enter freely and compete in the world market when they are free from zoo-sanitary specifications and standards prescribed by the OIE (an international organization for animal health).

The practice of rearing animals in India is as old as our civilization. The purpose and practice have changed over the years. Harbouring the world’s largest number of livestock and employing a sizeable amount of the world’s second most populous nation is a huge responsibility which the sector has been performing dutifully. But with time, the means to maintain the same tempo changes and we have to rise to the occasion. We still have the livestock capital, but not the policy support or technological succor. So the need of the hour is a comprehensive policy that addresses all the issues of the sector.
Summit cum Exhibition
2nd Green Revolution
Agriculture-to-Agribusiness

11 July, 2012 – New Delhi

CHIEF GUEST:
SHRI SHARAD PAWAR
Hon’ble Minister of Agriculture & Food Processing Industries

GLIMPSES OF PREVIOUS SUMMITS

OBJECTIVES

- Sharing technologies and services towards increasing agricultural efficiency to meet food security challenges
- Deliberating on PPP or other new business models for thwarting investments in agriculture.
- Understanding & seeking new/unique/common areas and precedence for cooperation to reinforce affiliation
- Reaching the consensus or planned actions among the stakeholders to address the burning issues
- Discussing strategies for achieving sustainable & inclusive growth as predicted by the policy makers

FOCUS AREAS

- Ensuring high agricultural growth by advocating favorable policy environment or infrastructure development
- Innovations & Partnerships in agricultural research, extension and marketing;
- Agricultural Retail: expectations and issues
- Agri. Commodity exchange & future trading: importance, success and future concern
- Farm economics & management: managing for higher returns, credit facilities and management
- Agricultural diversification: Integrated business models for raising farm income
- Sustaining the sustainability: surviving the climate change & changing cropping patterns, increasing water use efficiency
- Agriculture and Food security: production, productivity, storage & distribution
- Global Challenges: responses and investment opportunities in agriculture

PARTICIPANTS & EXHIBITORS PROFILE

- Seeds & Biotechnology Companies
- Pesticides & PGR Companies
- Fertilizers & Micro-nutrients Companies
- Tractor and Agriculture Implements Manufacturing Companies
- Public and Private Sector Banks as well as Other Financial Institutions
- Cold Storage and Supply Chain Management Companies
- Agri-Biotech & Nanotech Companies
- Agricultural Research and Extension Organizations
- Packaging Companies & Agri Retail Companies
- Consultants and Service Providers
- Central & State Government Departments, Corporations and Officials
- Progressive Farmers & Representative of Farmer Groups and Farmer's Organizations & Cooperatives
- Policy Makers and Other Stakeholders from Union and State Governments
- Experts/Representatives from Multilateral, Bilateral and Other International Organizations
- Representatives from NGOs and State Agricultural Universities

ORGANIZERS

ASSOCHAM

IN COLLABORATION WITH

IN COLLABORATION WITH

MEDIA PARTNER

ASSOCHAM

YES BANK

Ministry of Agriculture

Government of India

MOFPI

MINISTRY OF FOOD PROCESSING INDUSTRIES

Government of India

AGRICULTURE TODAY

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Mr. Nakul P. Lakhe
Mobile: +91 9953135866
Email: nakul.prakash@assocham.com

Mr. Vipul Gajingwar
Mobile: +91 8010472950
Email: vipul.bg@assocham.com

Mr. Abhishek Singh
Mobile: +91 9953050423
Email: Abhishek.singh@assocham.com

online registration – www.assocham.org
Poultry production has undergone rapid changes during the past decades due to the introduction of modern production methods, new breeds and improved preventive disease control and biosecurity measures. These intensive production methods have placed high demands on proper health, hygiene and management and require only a small but very skilled labour force. This type of production has also been adopted in developing countries but their scope has been limited due to the enormity of inputs and skills required. In Kashmir Valley, industrial poultry production is not up to the mark. However, rural poultry production can be an important aspect contributing to poverty alleviation/mitigation for improving rural livelihoods. With right policies and investment, there is ample evidence that well designed and participative development programmes can overcome the constraints faced in the rural poultry production with significant economic and social benefits.

In Kashmir Valley, there are about 5325 million chickens and 237 million Ducks (2003). Despite rapid growth of commercial poultry farming in India, eggs and meat are still being procured from other parts of country in Kashmir. However, commercial poultry farming has recently emerged in different areas of Kashmir Valley, mostly by the urban and municipal populations, to satisfy the huge market demand. Although commercial poultry farming has expanded, it is still unable to satisfy the needs of rural population.

Rural poultry production, particularly chicken (followed by duck production) plays a significant role in the socio-economic development of people in Kashmir Valley. Ninety percent of all rural families keep a small number of indigenous chicken and ducks under traditional free range semi scavenging systems. This traditional system is very popular in the villages and has been employed for centuries. The main feature of this production system is the low – input generating- quick return on investment. Farmers who can’t afford to keep large animals because of the huge investment can easily maintain a few chicken or ducks for supplying meat and eggs and in turn promote the rural economy.

Chicken generally scavenge around the homestead areas during the day time, where they feed on kitchen waste, left over cereal grains like rice, wheat, pulses, green grasses, insects & other available feedstuffs. These waste feedstuffs are utilized by these birds to produce a good quality, cheap source of animal protein.
Managing the Poultry Stock

A household flock in Kashmir Valley comprises of two or more varieties of poultry species (i.e., chicken, ducks and/or geese). Occasionally farmers keep guinea fowl as a hobby. Depending on the space available, there is a wide variation with regards to the number of birds per household. Customarily, a small number of males are maintained in the flock for the sake of fertilization & hatching. This is a common practise here because some farmers erroneously believe that mating is a pre-requisite for inducing hens to lay eggs. Accordingly, eggs sold in rural areas are mostly fertile.

Broodiness, a trait that retards laying performance, is common in indigenous birds. Native hens become broody after laying a small number of eggs in small clutches. However, indigenous ducks are known to have relatively better maternal instincts compared to chicken. Depending upon the body size of the birds, about 8-12 eggs are set under the hen placed on bamboo basket in which rice straw is used as bedding material. The hatchability of eggs by natural incubation is poor (70%).

After hatching, hens usually take care of their own chicks and protect them from predators or other adverse situations. Baby chicks therefore have the extra privileges during early stages of their life and they can run around with their mother for scavenging. Chicken houses in rural areas are generally constructed with materials that are locally available such as wooden planks, mud or mud bricks.

Feeding rural poultry is mainly based on scavenging and utilizing by products. Most rural families provide a small amount of feed twice a day; once in the morning when the birds leave their night shelter and again in the evening when the birds return back. Generally, these feeds include rice polishing, rice bran, broken rice/ wheat. During the scavenging period, domestic birds consume various types of feed materials that are available around the farmer’s homestead area.

Several varieties of indigenous fowl with distinct colour characteristics exist in Kashmir Valley. In general, they thrive under harsh environmental conditions and are strong enough to prevent themselves or their chicks from predators, well adapted to changes in quality and quantity of nutrients and resistant to common diseases. The average egg mass of indigenous chicken is very low (35-37/ egg); only two thirds of the egg weight of exotic strains.

Biosecurity in its true sense, is neither possible nor workable with indigenous scavenging birds reared in rural areas. Of course, the indigenous scavenging chicken in rural areas has good resistance to few local diseases. In spite of this fact, they are susceptible to some of the diseases like Newcastle Disease & Fowl Cholera.

More than 95 per cent of eggs and live poultry are sold by farmers either at their gates or in the village market. Generally, two step transactions are usually observed in the marketing channel, first at the level of village market. The assemblers accumulate live birds and local eggs from villagers. The assemblers either sell the products to wholesalers or transport accumulated products to the retail market in urban or semi-urban areas. The meat and eggs that are produced in the rural areas must reach the consumers through good marketing channels. Unfortunately, rural poultry are not moving to the market in an organized way. Problems still exist in assembling, storage, transportation, distribution and marketing, so some losses inevitably occur and sometimes the quality of products suffer.

There are many constraints to the development of rural poultry production in Kashmir Valley that are need to be addressed. These comprise disease control, protection against various predators, better feeding, genetic improvement, marketing, training and management, access to production inputs, infrastructure and capital. However, addressing any one or several of these constraints without attention to all will do little to improve the situation.

Prof. (Dr.) M. T. Banday; Dr. Madeeha Untoo and Dr. Henna Hamadani, Division of Livestock Production & Management Shere Kashmir University of Agricultural Sciences & Technology of Kashmir, Shuhama, Alusteng (J&K)
Livestock are the vital natural resource of livelihood security for hundreds of millions of people and the most economically important sub-sector of agriculture throughout the developing world. India had 218.18 million cattle, 93.77 million buffaloes, 57.96 million sheep, 123 million goats, 16 million pigs and 402 million poultry in the year 2000. 600 million rural people rely on livestock related activities for their livelihoods. Livestock not only provide poor people with work, food, income, traction, fertilizer and fuel but also act as catalysts that transform subsistence farming into income-generating enterprises, allowing poor households to join the market economy.

Contribution of livestock to agricultural GDP has been rising during last 2 1/2 decades (14 percent in 1980-81 to 26 percent in 2005) compared to agriculture sector, where the annual growth rate during last one decade has been negative (35 to 26 percent), the livestock sector over all these years has been able to record a steady annual growth of over 4.8 to 6.6 percent. In India 70 to 80 percent of the total livestock produce is contributed by the underprivileged families and livestock are central to their livelihood and culture. Hence, to improve the livelihood of the under-privileged families, it is of utmost importance to understand their way of life, livestock based farming system approach and the role of livestock in sustainable production.

Green revolution technology brought India from begging bowl in the mid 1960s to self sufficiency during 1990s. However, the gains of green revolution could not be sustained, agricultural productivity has been stagnating and there has been negative growth for few years particularly during 10th plan. The use of expensive inputs such as fertilizers, pesticides and machinery and ignoring the internal source of inputs like organic manure, bio-pesticides and draft power of animals made agricultural farming too risky to sustain. The plight of farmers in Vidharbha region of Maharashtra who committed suicides when crop failed is an eye opener. None of the farmers in this region who had cattle or buffalo committed suicide. Well managed domestic animals as an integrated approach can make agricultural systems in the developing world more productive and more sustainable.

**Livestock Biodiversity in India**

Livestock biodiversity is a valuable asset and provide insurance and a buffer in adverse situation. The Indian sub-continent occupies a pre-eminent position in diversified animal genetic resources. Over 140 breeds of livestock species, namely cattle (30), buffalo (10), sheep (40), goat (20), camel (4), horse (6), pig, donkey, mule, yak, mithun and poultry (18) have been distributed over the large area spread in different agro-ecological zones of the country.

**Livestock and Rural Economy**

Livestock sector plays a major role in the rural economy and is a driving force for food security and sustainable production in India. Livestock provide a diverse range of inputs for agriculture, irrigation, transport, fiber and leather goods, manure in the form of dung and urine besides production of 90.7 million tonnes milk, 45 billion eggs and around 45 million kgs of wool (2004-05). The value of output from livestock during the year 2003-04 was Rs. 1,64,510 crore which is 26 per cent of the value of output of agriculture sector.

**Providing Organic Manure and Draft Animal Power for Sustainable Agriculture**

Concept of organic farming and increased demand for cow based products such as bio-fertilizers, bio-pesticides, bio-energy and panch-gavya medicines gives an opportunity to make livestock economically viable on a sustainable basis. Though mechanization of farm operations has attributed to decrease in the draft animal power from 72 to 12% between 1961 and 1995, most of the agricultural operations and transportation in rural India still depend to a large extent on animal power.

Out of a total of 81.5 million ha operational land holdings in India, 72 percent are small holdings whose owners can hardly afford even a single pair of bullocks. Under these circumstances, Indian agriculture will continue to depend upon draft animals for a long time to come. Further, the increasing costs and limited availability of fossil fuels make it difficult to completely dispense with draft animal power for agricultural and rural transportation in the near future. Seven crore of bullocks along with 80 lakh of he- buffaloes, 10 lakh of horses and 10 lakh of camels provide about 30,000 mega-watts of energy equivalent to the
Role of Livestock in the Livelihoods of Rural Families

The role of livestock can be classified broadly into four categories. 1) output function, 2) input function, 3) risk coverage or asset function and 4) socio-cultural function.

Output Function: It relates to the production of food and non-food products (milk, meat, wool, hair and eggs) used for home consumption as well as for sale and to generate employment and income for the family. In mixed farming systems, dairy production contributes 20 to 50% of family income which is as high as 70 to 80% during drought. Dairy production is labour intensive and the employment generated is relatively high. Small ruminants are a major source of income for the underprivileged families and ranges between 17 to 24% of family income. Pig and backyard poultry are important livestock production systems in NE Region of the country.

Input Function: Livestock provide inputs (dung) for crop production, transport of produce and people and fuel needs of the families. Biogas system is an efficient alternative for use of dung as manure and fuel.

Risk Coverage or Asset Function: For resource poor families, any kind of animal is an asset since it can be easily encashed in times of need, namely; improving their farms, irrigation facility, houses, meeting marriage expenses including natural calamities like drought, flood, earthquakes etc.

Socio-cultural Function: Livestock have strong socio-cultural linkages and for most rural families particularly for women, livestock are part of the family. The choice of animals kept by a family and their management practices are influenced by socio-cultural practices. These factors have been borne in mind while studying production systems and suggesting interventions for increasing productivity and profitability underprivileged families.

Livestock Production Systems of the Underprivileged Families

The livestock production systems of the underprivileged families are different from those of resource-rich farmers since they aim at optimizing the use of the limited available resources and minimizing external inputs and avert risks, as against maximizing profits by the resource rich. The internalization and diversification are the main features as listed below of their production systems.

1. Mixed farming system and diversified crop and livestock activities are common.
2. Low external input and highly internalized system making maximum use of available resources like crop and animal wastes and residues, natural resource base, labour etc.
3. Extensive grazing with limited supplementary feeding.
4. Local breeds of livestock/poultry preferred over improved stock as part of risk management.
5. Traditional systems of livestock management and feeding preferred.
6. Livestock output is low but represents major share of daily cash income to family.
7. Women play a major role in livestock production and sale of produce.

Diversification

Crop-livestock diversification is aimed to optimize outputs from limited land and reducing risks. Diversification reduces risk in areas with erratic rainfall and frequent crop failures. Farmers from such areas, based on their innate wisdom, use a mix of crops (with different moisture requirement) and livestock so that subsistence is assured even if rains fail or disease occurs. Moreover livestock production is less severely affected by drought than crop production and it becomes the main source of income during years of poor rainfall. Diversification in livestock with innovative and effective approaches would improve the income of resource poor families in a sustainable manner.

Factors Influencing Production Systems

An important characteristic of the underprivileged families is preference for assured subsistence over risky productivity and hence changes in production systems and adoption of technologies or improved animals are slow (till farmers are convinced that change is not risky and is beneficial). Some of the factors influencing livestock production systems adopted by the underprivileged families are: a) agricultural and overall development of the area, b) agro-ecology and farming systems and c) women in livestock production.

Small Holder Livestock Production

Smallholder livestock production has a special role to enhance rural economy and reduce poverty. Other factors favoring smallholder livestock development are sustained growth in demand for livestock products indicating that income distribution through livestock is more equitable than from crops. The livelihoods of rural communities / individuals are based on five types of capital assets: natural, social, human, physical and financial capitals. Well-planned livestock development programmes have the potential to ensure development of all the five capital assets.

Dr. K.P. Agrawal, Former National Coordinator, National Agricultural Innovation Project (ICAR), New Delhi
Dr. N. R. Bhasin is the President of Indian Dairy Association. He was the former Principal Secretary to Government of Rajasthan. A descendent of the IAS clan, Dr. Bhasin’s experience spans more than 35 years. He had remained the FAO Consultant in Bangladesh and Burma in association with preparation of Livestock Development Projects. Also, he participated in a FAO Mission for Mid-term appraisal of the livestock development project in Ghana and Sudan. Being a FAO consultant for Kenya and Eritrea, Dr. Bhasin was involved with identification and preparation of dairy development projects. He was also the Consultant for World Bank in conducting a study for Livestock Industry in Ghana. As a member of World Bank Mission, he had participated in a livestock project in Bangladesh. Dr. Bhasin worked as a member of a survey team for UNDP to look into the potential of Indian meat and meat products export. He was the Former State Election Commissioner of Rajasthan. Dr. Bhasin has also held many coveted posts in his career such as Managing Director of the Rajasthan Cooperative Sheep & Wool Marketing Federation, Rajasthan Dairy Development Corporation and Rajasthan Cooperative Dairy Federation. His association with IDA began as early as 1978-80, when he was one of the vice presidents of the association. He is a member of Scientists Panel on Animal Breeding; Member of QRT for National Dairy Research Institute, Karnal; National Research Central on Camel and Indian Veterinary Research Institute, Izatnagar; Indian Standards Institute — member of Committee on Dairy Plants, Dairy Products, Animal Housing, equipments etc. Dr. Bhasin has been the examiner for Ph.D. degree for Agra University, Kurukshetra University, ICAR, Recruit Board and has also participated as Expert on many Selection Committee for NDRI, IVRI, CSWRI etc. In an interview to Sumbul Khan, Agriculture Today, Dr. Bhasin shares his views on Indian Dairy Industry.

**How can livestock be considered an asset generator?**

Two third of our agriculture sector constitute small farmers, marginal farmers and agricultural labourers and most of them have livestock which is their source of living. One third of agriculture farmers grow crop and two third don’t have sufficient land for growing crops. So they keep animals like goats, buffaloes, sheeps, camels and cows. These are the only assets that they possess. They may be having huts, they may be having chappars but in the name of assets they have only live stock.

**What are the major policy initiatives that you seek?**

Our major policy initiatives are to improve the productivity. If some farmer has a cow and that cow is not giving milk then it becomes a burden for him and not an asset. It becomes an asset only if it gives some return. This return could be in the form of milk in case of dairy or wool in the case of sheep, goat is sold invariably. Depending on the type of animal that farmer has, especially the poor farmers, these animals are the only source of income.

**Can you brief us about the history of IDA? How and when was the idea of instituting IDA conceived?**

Indian Dairy Association has got a history, which dates back to pre independence. During the British rules there were garrisons kept in Mumbai for the second world war and they required milk. So the authorities had given the right to collect milk from Anand area to Mr. Polson, and he had all the rights to collect milk from Anand and...
no other person was allowed this job. What Polson did was to employ agents to do this and agents were biased in selecting the farmer from whom milk was collected. No scientific method was there for selecting the good quality milk and finger was dipped in to the milk to check the fat content. Due to their bias, people thought that they were being cheated. So they went to their leader Sardar Vallabh Bhai Patel to resolve the issue. Sardar V B Patel told that you can’t fight the crown but you should not be cheated too so you all unanimously go for Satyagrah and stop giving milk to any agent. So no milk was left with Polson. Garrisons complained about the issue and turned to the Amul people for guidance. Amul people said, you want milk in Bombay, we will give you milk in Bombay but remove the agents. But it was easier said than done. So Sardar Vallabh Bhai Patel appointed Morarji Desai as the agent for doing this. They constituted a co-operative society in Anand under the leadership of Morarji Desai and they started collecting milk. First they collected 541 litres of milk and now it has tremendously increased to 1 crore 25 litres. All this development has been done by farmers themselves. Government had assisted but major work was done by farmers as it was solely a farmers’ organization.

Second Prime Minister Lal Bahadur Shastri went to Anand for an overnight stay when he came to know about it and asked Dr. Kurian who was behind this co-operative development. He said that my farmers of UP are much stronger than yours and my animals of UP are much better than yours in Gujarat, then how it is possible that your farmers are flourishing and ours are not. Dr. Kurian replied because you don’t have institution like we have here. Dr Shastri asked him why can’t you do the same thing there. Dr. Kurian replied who will allow me to set up an institution there. Hence Lal Bahadur Shastri gave permission for the development of National Dairy Development Board (NDDB) which was given the authority for dairy development in India. But hardly any work was done as Lal Bahadur Shastri died and other issues sprouted up. But NDDB prepared a project and took it to European Union for assistance. Europe was rich in butter oil and skimmed milk powder production and they exported them to many countries. Dr. Kurian asked them, you give us the commodities and we will reconstitute milk out of it and flush the cities with milk. When the cities will have enough milk, they will stop keeping cows and buffaloes. And so these cattles will be shifted to rural areas where they belong and could be looked after in a better way as the rural areas are rich in fodder and more care could be provided for. NDDB got set up from the commodities received from Europe which were of 1000 crores in value and this was what is known in the history as OPERATION FLOOD I. Later World Bank assisted Rajasthan, Madhya Pradesh and Karnataka in the Operation Flood II. Now the world bank has come up with Operation III or National Dairy Program (which will function in 14 states). Our agriculture minister inaugurated this project in Anand.

Oxytocin is widely used in buffaloes in India. Do you think it as a healthy practice?

Oxytocin has a half-life of few seconds, so there is no question of it coming in to the milk. Buffalo gives milk through tits and from the time oxytocin goes in the body to the time buffalo is milked, effect of oxytocin is nil. Even if it is added in the raw milk, we boil and it does not cause any harm as it disappears due to its short half life. Still it is not recommended to use on Milch animals. Now the questions arises why do people resort to use it. Well the system in India is such that, we don’t rear the calf, we allow the calf to suckle the tits of buffalo. Because of this, she does not let down the milk otherwise and if the calf is dead, she does not let down the milk. Everywhere around the world calves are reared separately so the mothers easily let down the milk.

“The high growth of milk production in India does not seem to have been taken kindly by the West. They split the India’s milk production in to cow and buffalo to underplay and create an impression that milk production in India is not as high as it made out to be”
We are trying to make people aware of this fact but the extension system is poor and it will take time for us to reach each and every one.

What is your opinion about mixed farming?
Livestock in mixed farming is the bright future of farming. It is happening in Punjab. Mixed farming is when the farmer has both land and livestock. This is happening in Punjab due to acute shortage of labour. They have taken up mixed farming. They keep large herds of animals of around 150-200 and feed them with good fodder. Besides, they have got the land also. In return they get a large amount of milk from these cattle. But land is the pre requisite. Punjab farmers have land, but in Rajasthan, farmers don’t have land to farm. In dairy business also people don’t have land. Two third farmers don’t have land. So this process is setting but is progressing at a very slow rate as the land availability is diminishing day by day.

What are the major challenges in dairy farming today?
Cost of input is increasing, Feed cost is very high. Reason is that everything we produce is getting exported. All oil cakes were exported last year, 5 million tonnes of oil cakes were exported, if this was fed to our animals we would have increased the production of milk by 10-20 million litres. But the government offers a subsidy on export. So everything gets exported. What is left is rice bran, even that was exported last year. We have asked the finance minister to put some duty on it and so he has put 10 % duty on rice bran which was the cheapest and even that duty reduced the prices of RICE BRAN in India. So our animals are surviving on almost nothing as no land is there for fodder and all the good land is used for cereal production but only Punjab grows fodder.

How do you plan to promote dairy as the part of Animal Husbandry?
Dairy is the only part of animal husbandry that is showing progress. It has ready demand. If we go to any dairyman, we see people standing in long lines to get milk. Milk in India is consumed by each and everyone and so its demand is always there. Efforts are being made to make Milk as the National Drink of India. Measures to increase milk production through increase in productivity would need to be supported by setting up villages based milk procurement system to collect milk in a fair manner and ensuring timely payment. National Dairy Plan should be implemented with utmost sincerity so that we shall and will remain self sufficient in milk production.
Veterinary Education in India
A profession in transition

**Historical perspective**

Veterinary education in Indian subcontinent is as old as human civilization. Study of history of veterinary education shows definite reflections towards political, ideological, religious and philosophical transformations taken place over the times.

Since time immemorial, agrarian tribes were solely dependent on agriculture and livestock. Cattle were prized possessions and were considered as symbol of wealth and status. Religion became closely associated with animals especially cow. Thus the main interest in cow formed the basis for the development of socio-economic life in India, which continues to form the structural backbone of Indian society.

Worldwide animals provided food, wealth, companionship and were considered symbol of prestige to people especially from affluent society. Animals were used as custodian of territory in war and peace and used extensively in tracking and expeditions. Animal husbandry practices remained an art until 18th century when first veterinary school was opened in Lyon in 1761 and thereafter at Alfort, France in 1764. These became possible only through hectic persuasion of a French Veterinarian Claude Burgelat with King Louis XVI.

**Salient land marks in Indian subcontinent**

For the purpose of presenting sequential developments of this sector, historical perspective is classified in 3 periods- Ancient, Medieval and Modern period.

**ANCIENT PERIOD**

Veterinary education was endemic and existed as culture and passed on to generations through word of mouth. This period is divided into

- **Vedic Period** (1500-1200 BC)
  Brama thought to have created Veda as ethical guide to the civilization. Ayurveda was a section dealing with medicine.
  - Gauya Ayurveda – Dealt on cattle
  - Hasti Ayurveda – Dealt on elephant

- **Epic Period** (Period of Ramayana and Mahabharata)
  Salient contribution in this period was from Salihotra who is called Father of Veterinary Science. Significant documentations were made by;
  - Salihotra- a treatise on horses
  - Nakul- treatment of horses
  - Sahdeva- book on cattle

- **Puranic Period**
  Period between Epic and Mauryan. Several Purans detailing salient information on Veterinary interest are available.
  - **Mauryan Period** (324 to 187 BC)
    Chankya is known to have authored document that contains valuable information on animal husbandry.
  - **Manu Period** (circa 200 BC- 200 AD)
    Some description on animal husbandry is available in literature.
  - **Arthasastra or Post Vedic Period**

**Ashoka Period**

Detailed information on administration, functionaries, responsibilities, wages, breeding and cruelty towards animals were laid down. Hun-

**Some global developments taken place during that time and thereafter were:**

**England**
- 1791- Established First Veterinary School in London
- 1823- Edinburgh Veterinary College in UK established

**Canada**
- 1862-Opened Ontario Veterinary College which was later shifted to Guelph Ontario 1922.

**USA**
- 1852-First Veterinary College Philadelphia created
- 1854- Veterinary College New York established
Hundreds of well equipped veterinary hospitals were established. Each hospital was headed by a Salihotra who was paid by the government. Ayurveda or Indian system of school was practiced.

Invasion of Greek created Unani schools, Greek school of Medicine. Greeks derived their medical knowledge from Egyptians. Hippocrates (460-370 BC) used to treat fractures, dislocation and wound treatment. Greek period is considered as important era of development of human medicine.

Nearly up to 1000 AD no major developments took place. Serious setback was suffered at the beginning of this phase when Islamic culture in Middle East and Christianity in western countries was spreading. However in regions where Christians became liberal, they practiced Allopathic medicine and Muslim dominated regions were practicing Unani school of Medicine.

2. MEDIEVAL PERIOD (1206-1761 AD)
   • Mughal period
   Fazel provided history of reign of Akbar up till 1602. It provides important information on breeding, feeding of elephants, horses, cattle, mules and camels.

3. MODERN PERIOD
   There was a total eclipse on development of animal husbandry between 1000 AD to 18th century. At the beginning of 18th century, East India Company became interested in improving the quality of horses and bullocks for military purpose. British side tracked indigenous system of treatment (Ayurveda) and started propagating allopathic medicine. Significant development taken place here onward was as follows.
   1795: Lt. William Frezer, a non-veterinarian was entrusted to establish stud farm near PUSA.
   1799: Thereafter, William Moorcraft – The first western Veterinarian was called to improve conditions of Pusa Stud farm.

19th Century
   1821: JT Hodgson organized training centre on modern veterinary and AH practices. It made a beginning of Allopathic School.
   1827: British established first Army Veterinary Department at Pune.
   1862: Army school was established in Pune.
   1871: Owing to severe outbreak of cattle Plague (Rinderpest), Indian Plague Commission was established under the chairmanship of Col. J. B. Heller.
   Col. Heller was also appointed as First Inspector General at Madras, which was the first State where animal training establishment was set up.
   Subsequently some more army schools were opened.
   1877 (Hapur) – Established in 1877 but then closed in 1882 and students were shifted to Punjab Veterinary school, Lahore.
   1881 (Ajmer) - Existed for a short period
   1888 (Shimla) - Existed for a short period
   1892: Established a stud farm at Babugarh (UP)

Establishment of Civil Veterinary Educational Institutions
   1882: Punjab Veterinary school Lahore- First non-military educational institution was established. This was followed by colleges at Bombay-1886, WB-1893, Madras-1902, Patna-1930 and AP-1946

1900: Bacteriological lab established at Poona was later shifted to Mukteshwar as Imperial Bacteriological Lab and then re-designated as Imperial Institute of Veterinary Research and presently has become a multi campus organization - the Indian Veterinary Research Institute (IVRI) with main campus at Izatnagar.

Post Independence Era
   1947-48: Veterinary Colleges at Mathura Hisar, Jabalpur and Assam created. College at Hisar has been the outcome of bifurcation of Punjab Veterinary College, Lahore.
   1948: Indian Veterinary education commission was appointed under chairmanship of Dr. Sarvapalli Radhakrishnan. The commission stressed the need for strengthening agricultural education. It also coined the concept of RURAL UNIVERSITIES.
   1955: First joint Indo American Team of Agricultural Education was constructed under Mr. Damle.
   1960: Second joint Indo American Team constituted under Dr. N.S. Randhawa.
   1960: First Agricultural University was created at Pantnagar as per US model of Land Grant System of Education. Veterinary College was one of the constituent units of this University.
   All Veterinary educational institutions functioned as government colleges after the creation of State Agricultural Universities and were transferred as constituent units of the University.
   During early stage after independence, British educational pattern continued. The course content, du-
ration of programme and the exam system were quite variable between States.

To oversee the status of agricultural education (which included veterinary education) under the umbrella of ICAR-SAU system, ICAR constituted Deans Committee in 1966. This committee did a marvellous task and brought out recommendations with respect to academic regulations, duration of degree programme, course credit system of teaching and updating of course contents. Since ICAR remained a recommendation body without any regulatory authority, every university utilized its own wisdom to translate some of the broad recommendations, modified some and ignored others. Though, the ICAR was partly successful in bringing uniformity in education across the country, but some vital disparity continued to persist.

ICAR constituted second Deans committee in 1984, third in 1994 and fourth in 2005 and every committee suggested progressive reform measures for revamping education being imparted in SAUs. Implementations of Dean’s committee recommendation have now been linked with support through ‘Development Grant’ from the ICAR. This has resulted in bringing greater amount of uniformity of educational standards and also improved health of the institutions through structural and timely financial support.

Veterinary Council of India

The government of India, Ministry of Agriculture on the recommendations made by the national commission of agriculture, during early par of sixth plan introduced a bill in the parliament entitled “The Indian Veterinary Council Bill- 1981” and consequent on passing the bill, the Indian Veterinary Council was established in 1984.

The Act envisaged the establishment of Veterinary Council of India at the Centre and the State Veterinary Councils in States.

The VCI in its first meeting held on January 12, 1980, unanimously elected Dr. C. M. Singh and Dr. P. P. S. Tyagi as President and Vice President respectively and 7 members executive committee of the council.

To regulate veterinary education in the country, VCI had laid down Minimum Standards of Veterinary Education- Degree Course (BVSc & AH) Regulations, 1993.(MSVE). Between 1995-2000, most of the Veterinary Institutions through their academic bodies took decision to adopt MSVE regulation 1993.

MSVE regulations primarily pertain to:
1. Academic regulation
2. Syllabus, course curriculum and credit distribution
3. Minimum requirement pertaining to buildings, departments, staff (Teaching and supporting), equipment and other support system.

All Veterinary Colleges though, have claimed to have implemented MSVE regulations, but in factual situation, the universities could only be able to faithfully implement only item. 1 and 2 i.e., pertaining to academic regulations and course contents while the requirements in terms of manpower and infrastructure which needed financial back up and government support, the situation by and large remained unsatisfactory. Most of the States till date have not provided needed manpower and adequate financial support to faithfully implement MSVE, Regulations 1993.

The Veterinary Council of India took mammoth exercise to revamp MSVE Regulation, 1993. New regulations have been brought out in 2008. A reasonably good attempt has been made by the VCI to

- Greater emphasis to hands on training by incorporating non credit courses on
  1. Entrepreneurial development
  2. Tracking courses
  3. Study circle
- Internship programme has been made meaningful and linked to acquisition of minimum skills.
- Manpower requirements have been made more realistic.
- Infrastructure needs updated with newer technological innovations and scientific developments.

Establishment of Veterinary and Animal Science Universities

The first Veterinary and Animal Science Universities came into being in 1989 at Chennai. By the end of 20th century, 3 more Veterinary Universities were created at West Bengal (1995), Maharashtra (1999) and Mathura (2000).

In the first decade of 21st century, six more Veterinary Universities were established at Tirupati (AP) 2004, Bidar (Karnataka) 2005, Ludhiana (Punjab) 2005, Jabalpur (MP) 2010, Bikaner (Rajasthan) 2010, Kerala 2010 and the latest addition being Hisar (Haryana) 2010. Veterinary University established in 2010 at Himmatnagar, Gujarat is yet to become operational to impart veterinary education.

Present status of Veterinary institutions

There are 11 Veterinary and Animal Science Universities and two Deemed Universities (IVRI, NDRI).

Today there are more than 50 Veterinary Colleges in the country.
Apart from these colleges, there is an exclusive PG College at Akola (MS). IVRI and NDRI are Deemed Universities offering Master’s and Doctorate programmes in various disciplines of veterinary animal sciences and allied fields.

(Global Scenario: India of course has the highest number (>50) of Veterinary Colleges. Colleges in other countries as per the reports available are; USA- 28, Philippines- 22, Japan- 16, Turkey- 14, Italy- 13, Argentina & Mexico- 12 each, Spain-11, Brazil-, Korea & Ukraine- 10 each, UK- 8, Canada, Pakistan-7 France & Germany- 5 each.)

<table>
<thead>
<tr>
<th>Constituent colleges</th>
<th>Affiliated colleges (Private)</th>
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<tr>
<td>Attached to Veterinary Universities</td>
<td>29</td>
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<tr>
<td>TO SAU’s</td>
<td>14</td>
</tr>
<tr>
<td>TO CAU</td>
<td>1</td>
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<tr>
<td>Government College</td>
<td>1(Affiliated to gen. university)</td>
</tr>
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<td>Total (51)</td>
<td>44</td>
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Changing scenario of Veterinary education in 21st century

Privatization of veterinary education made its beginning in this century. This has added new dimensions to this sector. Public private partnership will provide much needed boost for the growth and development for animal husbandry sector. In times to come it will fill up the void in the availability of competent and qualified human resource in diversified spectrum of veterinary and animal sciences. Further, introduction of private sector will pose challenges as well as provide opportunity to the age old public sector institutions for multidimensional and multi-sectorial expansion in infrastructural developments, competitiveness, adding relevance to the programmes, professional competence and marketing of educational programmes globally. However, with the introduction of privatisation of veterinary education, some adjustments are called for, both in the governance mechanism as well as in its operationalization part. It calls for developing effective and meaningful ‘Public Private Partnership’ in this sector. However, these issues are required to be addressed at the earliest so as to build a confidence between regulators and implementers and also between public and private organisations.

Though, the process of establishment of Veterinary Universities started at the far end of last century, this century will mark creation of more Universities, at least one in every State of the country. There is every possibility to have an independent central co-ordinating organisation on the pattern of ICAR, apart from these colleges, there is an exclusive PG College at Akola (MS). IVRI and NDRI are Deemed Universities offering Master’s and Doctorate programmes in various disciplines of veterinary animal sciences and allied fields.

This will enable a common platform for frequent interactions and developing common strategies for the professional growth. Such process will help the Universities to expand horizontally as well as vertically to encompass vital components of Veterinary and Animal Sciences as well as there is a need to trigger offshoots branches of this vital segment for the holistic growth of this sector. There is also an imminent need to maintain linkages with agricultural sciences, rural development programmes, socio-economic aspect, livestock marketing strategies, aquatic biology, biosciences and biotechnology etc.

Veterinary professional education has undergone many transformations and is still in a stage of transition. Developments taken place over the times have been phenomenal and admirable for which every veterinarian is proud of. However, it is a time to revisit the present educational system as there is a need to re-define the GOALS, OBJECTIVES and lay road maps with definite targets under the changing world order with ever increasing needs to shoulder higher responsibilities in diversified spectrum to enable the profession to accommodate and accomplish aspirations of the society.

It is heartening to state that National Academy of Veterinary Sciences have come live to the situation and have put all possible efforts in the direction of formulating policy for reforms and implementable programmes in making a strong base for strengthening research and education through mutual interactions via brain storming, seminar, symposiums etc. in collaborations with Universities and scientific organisations. It has to go a long way to make its impact and presence visible. Resource crunch and permanent establishment are setbacks for the academy to fulfil its missions and goals effectively. Structured support must be given on priority by government, private sector, entrepreneurs and individuals.

Under the changing scenario, metamorphic approach is needed to bring transformation towards making our system more vibrant & productive, especially in producing professionals, who are competent, self-reliant and possess the capabilities to swiftly adjust with the changing environment. Change of mind set, coupled with co-ordinated efforts, public-private partnership & critical assessment of input to anticipated output as well as outcome analysis are the key components of the developmental processes. Both Central and State Governments, the scientific organisations, academies and associations, the Universities & Colleges, industrial houses and other stake holder should work in tandem to revamp the system for faster and meaningful development of this sector.

Prof. J.S.BHATIA, Former ADG (edu) ICAR. Professor Vet. Physiology, Khalsa College of Veterinary and Animal Science, Amritsar (Pb)
REFORMING PUBLIC DISTRIBUTION SYSTEM

The Public Distribution System (PDS) in India originated in the Second World War period with focus on distribution of ration in urban food scarce areas. It evolved as a system of management of scarcity of foodgrains and distribution at affordable prices and was mainly supplemental in nature, not meant to meet the entire foodgrain requirements of the consumers. Though PDS is supplemental in nature, the enhanced food grains production fulfill 50% of the monthly cereal requirements of the BPL families. As the national agricultural food production increased due to green revolution, the outreach of PDS was extended to tribal blocks and areas of high incidence of poverty in seventies and eighties. Till 1992 it was a general entitlement scheme covering all without any specific target. Revamped PDS (RPDS) was launched in 1975 in 1775 blocks throughout the country. It was for blocks comprising of hilly and remote inaccessible areas, where substantial poor population live and where area specific programme such as Desert Prone Area Programme were going on. Thereafter Targeted Public Distribution system was launched from June 1997. It was intended to benefit 6 crore families. Identification of poor is done by states as per the methodology developed by expert group under Professor Lakadwala. Allocation of food grains to states was done on the basis of average consumption. Transitory allocation to states over and above Targeted Public Distribution system was given for continuation of benefit of subsidized food grain to Above Poverty Line.

For APL, prices were also subsidized but were higher than Below Poverty Line. Despite all this a National Sample Survey pointed out that 5% of the total population of the country goes to bed without taking two square meals a day. Antodya Anna Yojana (AAY) was launched for these 1 crore poorest of poor families among Below Poverty Line. Under AAY, 25Kg of wheat and rice were given at Rs.2/Kg and Rs.3/Kg respectively. In 2002 scale of food grains that was initially 25Kg per family was raised to 35 Kg per family. In 2003-04, first expansion of AAY was done and 50 lakh household mostly headed by widows were included in the scheme. In 2004-05, second expansion was done and another 50 lakh households comprising of landless labourers, marginal farmers, potters, rickshaw pullers, snake charmers and cobblers were included. In 2005-06, third expansion was done which added another 50 lakh households taking the total number to 2.5 crore. Under PDS, rice and wheat are supplied to APL at the rate of Rs.8.30/Kg and Rs.6.10/Kg. The corresponding rates for the BPL are Rs.5.65 and Rs.4.15 respectively. For AAY, the rates are Rs.3/Kg for rice and Rs.2/Kg for wheat. More than 25 million tonnes of food grains are supplied to states for distribution under TPDS. For running this mammoth programme, the food subsidy bill is more than Rs.70,000 crore.

The overall production of food grains has now touched 240 million tonnes. We had already crossed the midway point in the time frame set for achieving the UN Millennium Development Goals, but still there is widespread hunger and poverty in the country. Today hunger and deprivation affects about 260 million people in the country. India is the home to 40% of the world’s underweight children. The International Food Policy Research Institute has put the country in the 66th rank out of 88 countries in Global Hunger Index. India ranks below all other South Asian nations with the exception of Bangladesh. What is miserable is that no state in India is in the ‘low to moderate hunger index’ category. India has more states under ‘alarming to extremely alarming’ categories with Madhya Pradesh being the worst affected. One of the reasons behind this is the loopholes in the Public Distribution System. A few years back, food grains worth.
Rs. 580 billion got spoiled due to lack of adequate storage facilities with the Food Corporation of India. What was shocking was that thousands of quintals of wheat meant for the poor was sold at few paisas per Kg as manure for the reason that the water from river Ghaggar in Haryana had entered the wheat bags which were kept open. In the past, leakages and diversion of food grains meant for BPL families have been reported.

Extent of Diversion:

The report of the National Sample Survey Organization (NSSO) with regard to the diversion of food grains meant for PDS is noteworthy. In 1999-2000, about one-tenth of the rice was diverted, whereas nearly half (49%) of all wheat was diverted. However, the proportion of rice that is diverted has been increasing rapidly from just 9.9% in 1999-2000 to 18.2% in 2001-02 and to 41.3% in 2004-05. Since 2004-05, there has been a marginal decline in the percentage of rice that is being diverted. At all India level, leakages from the PDS have increased from 24% to 54%. Even among the better performing southern states (for instance, Kerala), there was deterioration. Among the states, Maharashtra and Karnataka have very high diversion rates (over 40%). The estimated diversion ratio was around 54% in 2004-05. Tamil Nadu had the lowest diversion rate (around 7 per cent); the rate was well below the national average in the other southern States also (around 25 per cent in each case). This was in contrast to states like, Bihar, Jharkhand, Assam, and Rajasthan, where the estimated diversion rates ranged between 85 and 95%.

These estimates, if proved correct, suggest a comprehensive breakdown of the PDS in these States at that time. The results of NSSO 63rd and 64th round revealed that things have improved, though only marginally, at national level. The overall diversion of grain has come down from 54% in 2004-05 to 44% in 2007-08. A study by Tata Economic Consultancy on the extent of diversion reported 36% diversion in case of wheat, 31% in rice and 23% in sugar at the national level. The Wadhwa committee in 2001 reported that subsidy amounting to Rs.28,000 crore meant for Delhi in fact went to the coffers of corrupt officers. The central vigilance committee constituted by Honorable Supreme Court revealed holistic collapse of PDS because of holistic corruption. All this necessitates looking for alternatives to PDS. The following alternatives to the PDS can be tried:

Food Stamps: The use of food stamps is already in practice in countries like USA. Under this scheme, the intended beneficiaries are provided with food stamps which recipients can exchange for an equivalent amount of food grains at any shop. The shopkeepers can get them credited into their bank accounts. The biggest advantage of the food stamps is that it can plug the leakages associated with the PDS.

Community grain storage Banks: To avoid rotting of food grains in the open, community grain storage banks should be established at the village or Panchayat level from which the food can be availed at subsidized rates. These banks should be managed by the Panchayat level functionaries. Department of Rural Development, Government of Madhya Pradesh is also running a grain bank scheme in the Jhabua district of Madhya Pradesh. The scheme was launched in 1995 on a pilot basis in 18 villages. Presently, there are 184 grain banks functioning in watershed areas and these are managed by the community itself. Community-based support systems to substitute/supplement PDS operations in areas where PDS does not exist should be provided. Self-help groups of BPL can be formed. These groups will be eligible to receive supplies of food grains and other infrastructure-based assistance from the government. They could organize activities, under the grain bank scheme. The grain banks will be managed by group of persons and are to be called anaj samitis. The government will give a one-time supply of 100 kg of wheat or rice to each grain bank. The grain will be stored by the traditional method in earthen structures. Grain banks can also be set up in remote and isolated areas beyond the reach of PDS and in regions where there is inadequate employment generation such as in tribal and forest areas. In order to be successful, the grain bank scheme can be a part of the largest employment programme, the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA).

Food Coupons: Andhra Pradesh has started issuing coupons for rice and Kerosene under TPDS to ensure that there is no impersonation or false accounting in distribution of essential commodities by fair price shop dealers. Coupons are issued to the beneficiaries at the time of issuance or renewal of ration cards. The next month’s allocation is based on the coupons submitted to the fair price shop dealer. Under the scheme, mere possession of the card will not be enough to draw PDS rice, wheat or kerosene. The cardholder, whose photo is affixed on the card,
has to be physically present when obtaining the coupons. Coupons are issued once a year and coupon holders are entitled to draw rice and kerosene on a monthly basis. To help the coupon holder draw rice and kerosene in easy installments in a month, coupons are denominated in smaller quantities like 4 kg, 8 kg etc. The coupon holder/beneficiary will be aware of his entitlement. The system has largely eliminated the scope of cheating by dealers by giving beneficiaries less than their entitlement. The coupon guarantees the stakeholder his right to draw a specific quantity every month. Rice or kerosene is not released unless the coupon is produced. Introduction of the coupon system has also reduced the number of bogus cards or those with ineligible families by approximately eight lakhs. This system has resulted in saving about 20,000 tonnes of rice and 7,100 kilo liters of kerosene every month. In financial terms, the exchequer has saved Rs.9 crore per month on rice and Rs.5.67 crore per month on kerosene as subsidy.

Universalizing the PDS and enlarging the food basket by including nutritious cereals like Jowar, bajra, ragi, maize and millets: However, it has the inherent risk of diluting the focus on poor families. The procurement of huge quantities of wheat and rice to meet the requirements of universal distribution system would result in very less availability of food grains in the market leading to rise in open market prices.

Restructuring the FCI: In India, the FCI is the main authority vested with the delivery of foodgrains through more than 5 lakh fair price shops. Role of private sector needs to be enhanced for creating the necessary infrastructure for storage of foodgrains. The benefits are concentrated in a few states. States like Kerala having 3% of the population receives 12% of the total allocation of the PDS because of necessary infrastructure. The various food deficient areas have become food surplus. Decentralization of procurement should be encouraged aggressively with emphasis on non-traditional areas and commodities. All the schemes serving the purpose of food grains distribution should be encouraged. The citizen charter should be strictly enforced for use by the citizens.

Local Production, local Procurement and Local Distribution model: Chhattisgarh relies on what is called local production-local procurement and local distribution model. It procures paddy directly from farmers, buying through cooperative societies and procurement centers at the village level. This is a sure method of ensuring that food is not wasted in procurement and storage, and it reaches the needy. For four years now, Chhattisgarh has been giving 35 kg of grain comprising rice and wheat per month at a heavily subsidized rate to 3.6 million of its 4.4 million households. The ultra-poor pay Re.1/Kg, while the poor pay Rs.2/Kg, against the market price of Rs.12-17/Kg. The ration card is the document that enables this subsidized transfer. Perhaps one way of looking at food security and avoiding leakages and diversion is to follow what Chhattisgarh has done in the past four years. This can be replicated, in varying degrees, as and when the Centre rolls out a national food security programme on similar lines. The whole process involves use of ICT to control diversion and leakage in the delivery mechanism. In 2007-08, Government of Chhattisgarh computerized whole food grain supply chain from procurement of paddy at 1532 purchase centers to transportation of PDS commodities to 10416 Fair Price Shops for further distribution. 3.7 million ration card holders. As an outcome of the project, 0.78 million farmers have received computer generated cheques without any delay. Citizen participation has been increased in monitoring PDS. The use of Global Positioning System (GPS) to trace the movement of trucks also ensures that the food grains are not lost midway. Most recently the state of Punjab has also come up with such scheme to use GPS for tracing the movement of vehicles carrying PDS ration from the storage points to the PDS wholesale points.

National Food Security Act: The National Food Security Act as proposed by National Advisory Council (NAC) headed by Ms. Sonia Gandhi aims to provide sixty five percent of the total Indian population the legal right to food security. Seventy five percent of the rural population in two categories, 46% of the priority households and 29% general households and 50% of the urban population comprising of 28% priority households and 22% belonging to general households would be covered. The priority households would be given 35 Kg (7 Kg per member for a family of five) of wheat at the rate of Rs.2/Kg, rice at the rate of Rs.3/Kg and millets at the rate of Re.1/Kg. The second type of household i.e., general will get the food grains at the cost of not more than 50% of minimum support price. However, for achieving food security, we have to also increase our domestic food grain production. This would require an increase in agricultural output by 20-25 million tonnes for which an investment of Rs.1,10,600 crore will be required in various areas. More emphasis has to be laid on creating infrastructure for food grains storage and rainfed areas which constitute 60% of the total cultivable land and have a significant share in the total production.

Praveen Kumar, PhD scholar in the Division of Agricultural Extension, SKUAST-J
After 4 years of extraordinary service to farmers’ community, K.R.Viswambharan, Vice Chancellor of Kerala Agriculture University has retired from his post on 28 March 2012. K.R.Viswambharan, IAS has provided stellar leadership during a period of vast change and considerable challenges. The emerging challenges in front of him were to sustain academic excellence in agricultural education and research by integrating the best of traditional knowledge and also evaluate how to preserve the state’s natural resource base in the prevailing Socio-Economic Environment. His numerous contributions include tie-ups with International Crops Research institute for the Semi-arid Tropics (ICRISAT), Hyderabad, Pharmaceutical Corporation (I.M) Kerala Ltd (OUSADHII), University of Manitoba, Canada (UManitoba) in the spheres of Academic and Research, Kerala Forest research Institute (KFRI) and University of Western Australia - (climate Change adaptation). He was in charge during a period of significant campus growth, guiding the campus through the development of Long-Range Development Plan, modernizing business practices and improving efficiencies, and implementing sustainability programs that have positioned KAU as the best Agriculture university in India.

He endorses the words of social and cultural critic, Late Sukumar Azhikode who once said that the Vice chancellor first should be a humble farmer. “Therefore I believe that agriculture is an art, science and business. The art of agriculture is the traditional knowledge, transferred from generation to generation. The modern agriculture aims at improvement in the traditional agriculture by the application of knowledge achieved in modern sciences like physics, chemistry and biology. The students of agriculture are exposed to the art of agriculture as well as the science of agriculture. So a blending of both traditional agriculture as well as modern technology is achieved. After the in-house learning, the students are exposed to the traditional and modern farming situations during their 6 month field training termed as “Rural Agricultural Work Experience Programme”. It provides diverse opportunities to the graduates for experiential learning and acquaints them with various farm operations and/or exposures them to actual work situations.

At the scientist level, there is frequent interaction with the farmers so that the best out of the traditional knowledge and the modern agricultural technology is achieved. In each region in the state, KAU organizes a Zonal Workshop to discuss and finalize the research and extension programmes to be undertaken by the University. In this workshop, technical persons from the extension departments and farmers representatives are invited”.

K.R.Viswambharan, IAS has been a trusted and thoughtful colleague and campus leader. His previous work experiences in various capacities such as Deputy Collector, Ernakulam, RDO, Fort Kochi, RDO, Moovattupuzha, ADM, Ernakulam, Director of Sports & Youth Affairs, Managing Director, KBPS, District Collector (Ernakulam), Director, Municipal Administration, CEO, VFPCK, Director of Public Instruction (DPI), Managing Director, Rubbermark, Chairman-Managing Director, TELK, and District Collector, Alappuzha has helped him to adopt a forward-looking approach, strategic thinking and innovations, solid management style, and made him a wise counsel. His talents and abilities are visible to us every day, and they are even more apparent when he guided the campus. Given the broad scope of his responsibilities, he has touched the lives of the entire campus & farmer community. All the Best for his future endeavor.
Poultry products processing is a fast growing industry all over the world. In addition to broilers being exclusively grown for meat purposes, the layers after their completion of production period are also processed for meat. As per figures of Ministry of Food Processing, the organized sector of poultry industry is contributing nearly 70% of the total output and the rest 30% in the unorganized sector. The southern states in our country contribute nearly 60-70% broilers. The layer industry once again is represented more in southern states especially, Andhra Pradesh, Tamil Nadu and Maharashtra producing nearly 70% of the country’s eggs. India’s 75% of egg produced is consumed by the 25% population living in urban and semi-urban areas. Presently about 800 hatcheries are operating in the country. The National Institute of Nutrition has recommended 180 eggs and 11 kg of meat for per capita consumption for our country. At present as per figures of Ministry of Food Processing, per capita availability of meat is 1.6 kg, that of eggs is 1.8 kg or 42 eggs. Average consumption of eggs in major cities is 170 eggs, in smaller cities 40 eggs, in developed rural areas 20 eggs, and in undeveloped rural areas it is only 5 eggs. Only 20% of Indian population is vegetarian. India is the fifth largest producer of egg and ninth largest producer of poultry meat.

India was positioned 17th in the world poultry production. The Indian poultry production is considered to be the cheapest in the world. Various poultry meat and meat products apart from live birds are available in market. To list a few such as fresh dressed whole carcass and cut up parts, cooked in gravy, canned, grilled, tandoori etc are available under various brand names. Egg production is fast catching with the increasing consumer demand. The eggs are available as fresh shell eggs, frozen liquid yolk, liquid albumin, and liquid whole and similar types or as dried powder. The demand for quality poultry meat and egg and egg products is manifold. The newer quality riders from the law enforcing agencies and quality control regulatory bodies have put a great challenge to processors for production of safe quality meat and egg. The growing middle class income has given boost to poultry production in India and the poultry industry is growing 15% annually.

The old technology is not capable of dealing effectively, efficiently and economically with the growing demand for quality products. Accordingly, newer technologies have come into play at various levels of processing poultry meat and egg products viz., ante mortem examination, catching, loading, transporting, unloading, shackling, stunning, bleeding, scalding, defeathering, evisceration, cutting of feet, oil glands and wing tips, chilling, portioning, packaging, freezing, storing and marketing with better results. The newer equipments which take care of animal welfare, hygiene and food safety, water and energy saving on priority basis should be able to handle 12,000 broilers/hour on one line.

Use of digestive enhancer for meat quality improvement

Digestive enhancers, the phyto-genic feed additives are being used in broiler industry. The advantages claimed are improvement in carcass composition and enhancement of juiciness, tenderness and aroma to poultry meat.

Ergonomics programme

In the modern poultry processing plants, although all the operations are automatic, manual involvement can not be avoided. To have efficient work output without compromising profits and workers safety, an ergonomics program is needed. Ergonomics can be simply defined as the study of work. More specifically, ergonomics is the science of designing the job to fit the worker, rather than physically forcing the worker’s body to fit the job. The adjustment of work programmes together with work stations with the workers can avoid stress, injury to workers and thereby save losses on account of compensation paid to workers and loss of workman days. It is reported that in USA musculoskeletal diseases among the workers due to work problems account for 34% of all lost workdays injuries and illnesses.

Ante mortem examination

The first and foremost thing to produce quality poultry meat is the freedom from pathogens especially salmonella. The newer concept as employed in some developed countries like Sweden is to isolate the birds carrying pathogens at ante mortem examination, which may be
even two weeks before slaughter. Such birds are not given any antibiotics but instead destroyed. This avoids the public health problem related to microbial infections, antibiotic residues in meat and development of antibiotic resistance by microbes.

Catching and transportation of birds
The bigger plants which require 6000-10,000 birds daily procure directly from poultry farms. The traditional method involved catching of birds by catchers and filling them in crates or cages manually before taking them for loading into trucks. The following newer methods are efficient involving less labour.

Modular system(Semi mechanical)
Modular system consists of 4-16 metal crates or compartments in a metal frame. The empty modules are taken into poultry house by a forklift. The birds are caught by hand and filled into crates. This avoids bruises and injuries to the birds. Only three persons are required to load 6000 birds/hour.

Novel mechanical method
In this system, birds are herded on to a conveyor, and a fully automatic harvesting system which consists of a catching unit. The birds are directed by long rubber fingers on vertical rotating reels, on to a belt conveyor up to a crating area. The crating system consists of a trailer with a special rotating platform and a loading conveyor, which has a hydraulic lifting device so that all drawers of the module can be filled automatically.

Transportation
For transport of live animals, container systems are used. Using these systems, manual handling is no longer required. This has improved the animal welfare at processing plants. On arrival at the plant, the birds are kept waiting about three hours. The new development is that these rooms are kept air conditioned so that birds do not undergo any stress.

Stunning
The electric stunning is the common practice than the gaseous stunning also called as controlled atmosphere stunning (CAS). The gases used are carbon dioxide or the mixture of carbon dioxide and inert gas argon. Gases are used only in turkeys. However, new development in the field of poultry stunning is slow controlled compression, also called as low atmospheric pressure system (LAPS). This is said to improve the welfare of poultry at slaughter by eliminating the stress associated with shackling of live birds required in electrical stunning. The gaseous stunning has disadvantages as it being costly involves large capital investment and running cost on account of use of gases. Electrical stunning is sometimes ineffective stunning (missed shock) due to low current. The LAPS renders the bird unconscious and induces non recoverable state due to hypoxia. Low atmospheric pressure is achieved using slow, controlled decompression which allows the body to adjust to changes in pressure with minimal or no discomfort. The method is reported to have been devised and tested for last six years by M/S TechnoCatch, a US based company. The stunning should follow immediate bleeding.

Scalding
Scalding should start only after the bird is practically dead with no sensory response. Scalding operation is critical for carcass grading and quality. At the higher temperatures chances of low grade carcass are increased. To overcome the problem, low temperature scalding is being adopted. The latest development is spray scalding which is believed to be more hygienic as it reduces chances of cross contamination of carcasses.

Chilling
The conventional ice water chilling is laborious and also lot of water is required for chilling which poses disposal problems. Hence air chilling is preferred over immersion chilling because air chilling is more eco-friendly and gives better microbial quality of the carcasses. Air chilling minimizes cross contamination, protects natural flavour and results in higher yields and a prolonged shelf life of poultry carcass. The air chillers reduce water and energy costs and above all allow 100% tracing and tracking of individual carcasses.

Postmortem Inspection
New systems are being developed using imaging technology. Image analysis systems are also being implemented for carcass grading, portioning and uniform batch weighing.

Deboning of poultry meat
Deboning of poultry meat was hitherto a complex and tedious process in big commercial processing plants. To address this problem an intelligent cutting deboning system has been developed by Georgia Tech Research Institute (GTRI) USA. This uses 3D imaging and robotic cutting arm to automatically perform precision cuts that optimize yield while eliminating the risk of bone fragments in the finished products. Accidental contamination of mechanically deboned poultry meat with metal pieces would sometimes prove fatal, but improved metal detectors have been evolved which are being used in poultry deboning operations. These have sensors which do not get disturbed by salt and water.

In future high quality poultry meat is expected by making advantage of sensors, cameras and robots in the processing line. Newer technologies are ecofriendly. Newer equipments which can regulate time, temperature, humidity control as per product requirement have revolutionized the further processing with high yield and quality products.

Altuf Hussain Malik, Professor/Chief Scientist, Division of Livestock Products technology, Faculty of Veterinary Sciences and Animal Husbandry. SKUAST-Kashmir, Shuhama, Alusteng, Srinagar
Professor Monty Patrick Jones, a Sierra Leonean, is the Executive Director of the Forum for Agricultural Research in Africa (FARA) and Chairman of the Global Forum on Agricultural Research (GFAR). He was awarded the prestigious World Food Prize in 2004 in recognition of his discovery of the genetic process to create the New Rice for Africa (NERICA) which gives higher yields, shorter growth cycles and more protein content than its Asian and African parents. He was the first African to be honoured with this highly regarded prize. In 2010 he also became the first recipient of the Niigata International Food Award. Professor Jones has spent the past 24 years working in international agricultural research, starting as a scientist and working his way to his current top leadership positions at continental and global level. His celebrated work on NERICA has made it possible for countries in the West, Central and East Africa to increase rice production thereby increasing their household food security and enabling them to cut back on expensive rice imports. He has published more than 100 scientific papers and articles. As the Executive Director of FARA he has been instrumental in mobilising political support at the highest level for increased investment in African agriculture to improve its productivity and ultimately its impact on the 60-70% of Africans who depend on this sector for their livelihood. As the Chairman of GFAR, he is leading a global effort to reform the global agricultural research system in order to improve its effectiveness and accountability. In recognition of his outstanding contribution towards improving food security in Africa, Professor Jones has been honoured with numerous other awards, namely the National Order of Merit of Côte d’Ivoire conferred on him in 2001 by the President of that country and the insignia of the Grand Officer of the order of the Rokel conferred on him in 2004 by the President of Sierra Leone. He has also received four honorary doctorate degrees - Philosophia Doctor (Honoris causa) from major universities in the United Kingdom, Belgium, Sierra Leone and South Africa. Time magazine named him among the 100 most influential people in 2007 and in 2010 the University of the Free State in South Africa appointed him to serve as an Extra-ordinary Professor.

In an Interview to Sreeni K.R, Agriculture Today, Professor Monty Patrick Jones, shared his views on how FARA has reduced poverty in Africa and his intention of achieving its Specific Objective of sustainable improvements to broad-based agricultural productivity, competitiveness and markets.
What is Forum for Agricultural Research in Africa (FARA) associated with?
FARA is the technical arm of the African Union Commission (AUC) on rural economy and agricultural development and the lead agency of the AU’s New Partnership for Africa’s Development (NEPAD) to implement the fourth pillar of the Comprehensive Africa Agriculture Development Programme (CAADP), involving agricultural research, technology dissemination and uptake.

How did Forum for Agricultural Research (FARA) in Africa come into existence? What is its mission?
Agricultural research in Africa was overseen by sub-regional organisations (SROs) – one for West Africa, one for East Africa and one for Southern Africa before FARA’s establishment in 2002. The mandate of each SRO was to look after the interests of the countries in their areas. Later, the SROs realized the need for a continental body to link each region of Africa. The WB’s Special Program on African Agriculture Research (SPAAR) was not enough. Together, the SROs created an organisation that could bring the SROs together on strategic research issues so that successes in one sub-region could be shared with others. Today, FARA maintains close ties with each of the SROs, and through them, with the national agricultural research systems of the 50-plus countries in the continent, FARA has broadened its operation to include not just research but also extension and education system as well as civil society organizations working in agriculture.

FARA’s mission is to create broad-based improvements in agricultural productivity, competitiveness and markets by supporting Africa’s sub-regional organisations in strengthening capacity for agricultural innovation; By providing a strategic platform to foster continental and global networking that reinforces the capacities of Africa’s national agricultural research systems and sub-regional organisations.

How many percentage of African population depend directly or indirectly on agriculture for their livelihoods?
Between 70 and 80 percent of the population depends directly or indirectly on agriculture for their livelihoods.

FARA has developed four Networking Support Functions (NSFs) that correspond to the results FARA wants to achieve. Which are they?
FARA’s has got four Networking Support Functions (NSFs). The NSFs support the SROs in strengthening Africa’s capacity for agricultural innovation.

**NSF1/3: Advocacy and policy** – Supports the SROs and their constituent NARS in establishing appropriate institutional and organisational arrangements for regional ARD (including conducive research infrastructure and policy and financial environments).

**NSF2: Access to knowledge and technologies** – Empowers researchers and end users by providing them with access to information, learning opportunities, and new technologies. This is achieved through mechanisms for exchange of technology-based innovations and information both within and between sub-regions, and through decision-making tools designed to transform information into knowledge that can be used for innovation.

**NSF4: Capacity strengthening** – Ensures that Africa has the human and institutional capacity in public, private and civil society organisations and institutions for innovations needed to ensure the achievement of improved and broad-based agricultural productivity, competitiveness and markets. This is essential if the African Vision of a 6% annual growth in agricultural production is to be achieved.

**NSF5: Partnerships and strategic alliances** – Catalyses and facilitates the establishment of partnerships that bring together the range of expertise and capacity needed to achieve FARA’s objectives.

“As a weaver, FARA will play more critical role in ensuring that information flows, investments and changes occur quickly within networks, institutions and companies in Africa”
partnerships draw on all FARA stakeholders, both African and non-African, depending on the task at hand. They create capacity for agricultural innovation which, linked with the other supporting functions, improves the efficacy and impact of African ARD.

Who are the major partners?
Major partners are the SROs, AFAAS, RUFORUM and ANAFE and the national agricultural research systems of Africa, and several pan-African and international organisations working for the benefit of smallholder African farmers (PAFFO, PANAAC, PANGOC). FARA partners with international organizations such as GFAR, CGIAR, FAO, CTA and CABI.

FARA’s development partners (donors) are the African Development Bank (AfDB), the Canadian International Development Agency (CIDA), Centre de cooperation international en recherche agronomique pour le développement (CIRAD), the Danish International Development Agency (Danida), the UK’s Department for International Development (DFID), Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA), the European Commission (EC), the International Development Research Centre (IDRC), the Global Fund for Agricultural Research (GFAR), the Swiss Agency for Development and Cooperation (SDC), the Syngenta Foundation for Sustainable Agriculture, the World Bank and the Governments of Italy and the Netherlands.

How do you associate with Indian Council of Agricultural Research and the Asia-Pacific Association of Agricultural Research Institutions and which other major institute in India are you associated with?
FARA works under the umbrella of the Global Forum for Agricultural Research (GFAR) of which APAARI is a member. Within the umbrella of GFAR, FARA collaborates with APAARI and through APAARI with the Indian Council of Agricultural Research. FARA collaborates with APAARI in many areas such as use of biotechnology in agriculture, information and knowledge management for agriculture research. Recently on the First Global Conference on Women in Agriculture, which was held in New Delhi in April 2012, I was a guest speaker at the conference, along with Professor MS Swaminathan.

What are the impacts of climate change in agriculture? Is the research department helping to find an amicable solution to help farmers by giving proper feedback?
The impact of climate change on agriculture is a global issue but Climate change and its variability is a challenge to Africa’s food security, affecting both the quantity and quality of agricultural production. Many projects have started with an aim to bring awareness of renewable energy technologies, supporting coastal peri-urban population in their efforts to adapt to Climate Change, construct water harvesting tank, alternative to using fossil fuels, whose combustion contributes to global warming and to stop adverse effects of climate change, which is still enough to secure food security amongst African households.

Where would you like to see the cooperation between India and Tanzania in agriculture five years from now?
Indian cooperation in Africa is highly encouraged by FARA especially on knowledge sharing, catalyzing innovation and strengthening agribusiness across Africa. FARA believes that Africa can build on the knowledge in India especially on using ICT for agriculture advisory services and market access. For Tanzania in particular, agriculture product value addition will be key.

Where do you find FARA by 2020?
FARA will continue to evolve FARA in the coming years and become a network weaver, from a mandate on AR4D, to broader and wider agricultural science and innovation in Africa. As a weaver, FARA will play a critical role in ensuring that information flows, investments and changes occur quickly within networks, institutions and companies in Africa. FARA catalyses and facilitates the formation of hubs and matches capacities to gaps and investments on the basis of needs and opportunities within the agricultural science and innovation system. FARA will continue to focus on three major activities to ensure the weaver function that integrates learning in the system. These are connecting institutions and individuals, catalyzing investments and changes at the right time and right places and, communicating (feedback) of investments and innovations for further improvement and/or greater investments.
Bharatiya Janta Party for the first time in the history of post Independence period held a two day Parliament for the farmers at the Mavalankar Hall, New Delhi on 12th and 13th of May, 2012. Mr. O P Dhankad, National President of the Kisan Morcha raised various issues to be discussed in this parliamentary meet. The issues ranged from “The present condition of agriculture and challenges ahead, Government’s farm policies and declining income of farmers to market fluctuations and insecurity among farmers, poor market management, increasing agriculture input cost to lack of infrastructural facilities”. The highlight of the discussion was the growing number of suicides by the farmers.

The Kisan Parliament was attended by senior BJP leaders, who blew whistle on farmers’ key issues, sounding urgency. Arun Jaitley, former Union Agriculture Minister Rajnath Singh, Venkaiah Naidu, Murli Manohar Joshi and Bihar Deputy Chief Minister Sushil Modi were to name a few who attended the Kisan Parliament and shared their views. The event was inaugurated by Smt. Sushma Swaraj. “Food Safety Act cannot be made inside an air conditioned room, indicating people in the policy making are unaware of the knowledge that they should entail as a policy maker”, said Smt. Swaraj while stressing the need and importance of such events.

Mr. Dhankad accused the United Progressive Alliance Government of trying to ignore the plight of farmers. He said, “What’s more ironical is that the wages of Government employees have been at a sky rise in sync with the inflation but the increase in the MSP for wheat and Paddy has been minimal and farming has become a business of losses”.

Mentioning a letter from Prime Minister Manmohan Singh, written by Union Agriculture Minister Sharad Pawar, Kisan Morcha National Secretary Sukhminderpal Singh Grewal said that the Central Government’s policies were anti-farmer and the present MSP calculating system is incapable of bailing out farmers from the serious economic crisis they are facing. He further said, “Pawar’s letter echoes the issues the BJP Kisan Morcha had been raising,” adding that Pawar had vehemently condemned the ban imposed on export of cotton and sugar in the country and termed the decision anti-farmer.

To ensure effective implementation of Swaminathan report which includes 50 per cent profit to farmers on the input cost, synchronizing export-import of agriculture produce with the crop cycle, strategies was deliberated for the same. Opening of exports of sugar and cotton was also discussed.

Mr. Nitin Gadkari was the chief guest at the concluding function and the noted scientist Prof. MS Swaminathan delivered key note address.
Organic Farming is Eco-Friendly, Safe and Sustainable

Organic farming is a system of production where farmers follow a holistic production system that promotes and enhances agro-ecosystem health through management practices in preference to off farm inputs. It is based on minimizing the use of external inputs like synthetic fertilizers, pesticides, including growth regulators and livestock additives and relies on agronomic management practices such as crop rotation, green manuring, crop residue recycling and inclusion of legumes in cropping system. It is multi-enterprise approach where in nothing goes waste and all the farm remains are recycled in a scientific manner so that every enterprise is complementary as well as supplementary to each other. It minimizes the use of external inputs like synthetic fertilizers, pesticides including growth regulators and livestock additives. The primary goal of organic agriculture is to optimize the health and productivity of interdependent commodities like soil, plant, animal, people including environment and ecology.

Misconception about Organic Farming

The word ‘organic’ signifies different things to different people. For most, it implies pure and natural products, free of chemicals and contaminants. For conscious consumers, organic means not only health positive, eco-friendly and ethically produced as well. The general consensus however is that organic food is produced without use of chemicals, synthetic substances and genetically modified planting materials during all stages of production. According to some, switching to organic farming would lower crop yield and shatter the food security. There would certainly be a drop in productivity during the first 3 years of switching over to organic cultivation. The initial drop in production can be compensated by providing adequate subsidy to the farmers adopting organic agriculture for first 3 years like the government provides huge subsidies on fertilizers. For converting chemical agriculture to organic agriculture, the approach should be tapering off of the use of chemicals and then gradually to completely organic. The transition process should be completed in 3 years. The approach is well proven and adopted in several parts of the country without affecting the yield and at the same time maintaining healthy ecology and safe food. In certain cases the pesticides are ineffective like brinjal because the
India A Potential Organic Food Producer

Another reason for India to be potential organic food producer is low use of chemicals and rich in organic resources. The fertilizer use in Korea, Japan, Netherlands, Bangladesh and Germany is 357, 247, 172, 158 and 153 kg/ha respectively as compared to 89 kg/ha in India. The use of pesticides in USA, Japan, Korea, China and India is 1.50, 10.80, 16.60, 2.25 and 0.38 kg/ha respectively. As per the estimate of National Centre of Organic Farming, Ghaziabad the country at present has 8.312 million tonnes of major nutrients (NPK) in the form of crop residues (3.865 million tonnes), animals dung (3.854 million tonnes), green manure (0.223 million tonnes) and biofertilizers (0.370 million tonnes). India has 1.426 certified organic farms producing approximately 14,000 tonnes of organic food annually (FAO, 2003). As per Govt. of India report of 2005, approximately 77,000 ha of land is under organic cultivation that produces 1,20,000 tonnes of organic food annually (this largely includes certified forest collections). Market potential for organic food in India is growing at a rate of 20% every year. According to APEDA estimate, India has 1 million ha land under organic crops, but produces only 3,96,997 MT of certified organic products the total volume of exports amounts to only 37,533 MT. There are a number of farms in India which have never been chemically managed/ cultivated and are not classified as organic but are organic by default. Their produce is either sold in the open market along with conventionally grown produce at the same price or sold purely on goodwill and trust as organic through select outlets and regular specialized bazaars. These farmers do not opt for certification because of the costs involved as well as the extensive documentation that is required by certifiers.

Global Scenario

As per report of International Federation of Organic Agriculture Movements (IFOAM, 2004 and 2005), the total organically managed area is more than 24 million ha worldwide in 130 countries. There is increase in organic area by about 10% per annum. The global market for organic food touched 29-31 billion US $ in 2005. The demand for organic food is steadily increasing both in developed and developing countries with annual average growth rate of 25%. The market for certified organic food is huge. In 2004, the figures were: EU- Rs 2.16 lakh crore; USA – Rs. 2.12 lakh crore, Japan – 0.52 lakh crore and India – 1.00 lakh crore.

National Scenario

Organic agriculture has its roots in traditional agriculture practices of India. There is mention of several organic inputs in our ancient literatures like Rigveda, Ramayana, Mahabharata, Kautilya and Arthasastra. The country has a vast potential for adoption of organic agriculture as it is endowed with a wide variety of organic sources of nutrients, wide diversity in climate, topography, traditional farming systems, existence of large rainfed area, tribal/ nomadic populations. Small, marginal and resource poor farmers with poor purchasing power and vast dry lands which have not provided enough opportunities to the farming communities for intensive use of chemicals in many parts of the country are compelled to practice organic farming by default. Some of the North-East (NE) states have been declared organic by their respective governments. These NE states have potential to produce about 46 million tonnes of organic food. In Nagaland, about more than 3000 ha area is under organic farming with crops like maize, ginger, soybean, large cardamom, passion fruit and chilly. In Maharashtra, since 2003, about 5 lakh ha (of the 18 million ha of cultivable land in the state) is under organic farming out of which about 10,000 ha is certified area. The State of Rajasthan has about 6,000 ha area under organic farming with unique cropping pattern. The states like Tamil Nadu, Kerala, Madhya Pradesh, Himachal Pradesh and Gujarat are also promoting organic farming vigorously.
Organic Foods

Organic agriculture practice cannot ensure that products are completely free of residues, due to general environmental pollution. Foods from crops grown without use of conventional pesticides, chemical fertilizers, human waste or sewage sludge and processed without ionizing radiation or food additives and the foods from animals if reared without the routine use of antibiotics and growth hormones are categorized as organic. The level ‘organic food’ should however, denote compliance to specific production and processing methods. The average levels of minerals, vitamins, enzymes, trace elements and even antioxidants are higher in the organically grown foods as compared to conventionally grown foods.

Why Organic Farming?

The concept that organic farming provides sustained productivity, safe and nutritious food and good health is fast gaining ground. According to WHO report, 14,000 people die every year in the third world due to pesticide poisoning. Its immediate effect has appeared on environment, eco-system and biodiversity. The pesticide residue persistence in agricultural produce, food commodities, animal body, food, fodder, animal products and irrigation water more than the Maximum Residual Limit (MRL) is a matter of serious concern. Organic manures improve the soil structure, seed germination, water holding capacity and check soil erosion. The approach does not pollute the soil and water. Organic products promise better prospects for market and certified organic products fetch a premium price compared to conventional products. India has enormous amounts of commonly available organic resources like farmyard manure, farm wastes, crop residues, tree wastes, aquatic weeds, garbage, forest litter, poultry, sheep and goat droppings, sewage, sludge and green manures etc. Large quantities of these manures which at present are either used in an uneconomic manner or left unutilized can be usefully exploited to develop into good organic manure. Substantial quantities of plant nutrients removed from soil by crop harvesting can be replenished if organic wastes and surplus crop residues are recycled into soil by methods such as in-situ incorporation of organic matter or by organic mulch or by composting as per local situations. An integrated approach involving combined use of organic and chemical fertilizers can ensure optimum growth under intensive pattern of farming using high yielding varieties to cater to the need of food for increasing population. Vermicompost is working miracles in restoring degraded soils because of its high manurial value as compared to farm yard manure. Being rich in macro and micro flora, it improves soil health, provides all soil nutrients, improves texture, structure and chemical composition of the soil. Vermicompost is easy to apply, has very high moisture retention capacity and can be applied at any stage of the crop. It reduces water requirements up to 40 percent. It also improves quality of farm produce (colour, texture, taste and size), increase shelf-life and nutrient contents, adds value to the products and fetches premium prices.

Organic Livestock Farming

Animal is an important component of food chain (soil-water-plant-animal-human). A few important points to maintain food quality and food safety, consumer protection, animal health and welfare in a sustainable manner are given below.

1. Animal products may be sold as “product of organic agriculture” only after the farm or relevant part of it has been under conversion period for at least 30 days for dairy production and 12 months for meat production.
2. Use of hormones, antibiotics and other growth factors for augmenting growth, production, reproduction and induction of milk let down is not allowed.
3. Organically grown balanced and good quality feed should be fed to animals.
4. Genetically Engineered Animals and their produce do not fall under organic category.
5. Handling during transport and slaughter should be calm and gentle.

Benefits of Organic Farming

1. No side effects as no spray of pesticide.
2. Lower level of medicinal, hormonal residues and nitrate content.
3. Improving soil structure and preventing soil degradation.
4. Safe and more nutritious food.
5. Several organic farms are being successfully practiced in diverse climate, particularly in rainfed, tribal, mountains and hill areas of the country.
6. Minimizing the dependence on chemical inputs (fertilizers, pesticides, herbicides and other
agro chemicals.
7. Being labour intensive, it provides an opportunity to increase rural employment.

**How to Boost Organic Farming?**
There must be multi-pronged approach to boost organic farming by the government.
1. There are certain pockets particularly in North-East (NE) states of the country where organic farming is being carried out traditionally. These areas have never been classified as organic but are organic by default. In the absence of any scientific validation and certification, the produce from these areas are not marketed as organic, neither the producers get reasonable price for their product. As the practices in these areas are natural, they do not use chemicals and maintain the eco-system. The government should develop a simple system to label these as certified organic produce and also link farmers with market so that farmers fetch higher price for their produce.
2. The government should also introduce short-term courses in organic agriculture and also support farmers to undertake organic farming for sustainable agriculture.
3. Panchagavya (PG) from cow’s milk, curd, ghee, dung and urine if used as spray for crops mixed with water while irrigating is a proven organic growth promoter not only to protect crops from insects and pests but also improves yield. Apart from crops it also increases milk yield by about 2 liters, if fed to cows (As per scientific study on PG by TNAU, Coimbatore).
4. Promotion of eco-friendly methods to organic agriculture:
   i. Cultural practices like deep ploughing during dry summer season, inter cropping, crop rotation and planting of trap crops weeding and harrowing.
   ii. Mechanical approaches like destruction of insects by hand picking and using hand nets, use of light traps and sticky traps.
   iii. Biological methods like use of pheromone traps, predators and parasites, bio-pesticides like trichoderma and botanical pesticides based on neem, garlic etc. are sustainable and low cost approaches to control pests and insects in different crops.

**Monitoring the Use of Chemicals in Agriculture**
Consumption of chemical fertilizers and pesticides has risen 170 and 75 times respectively since 1950. In spite of large scale use of chemicals, the country has no system to monitor the use of fertilizers and pesticides, their movements and effects on environment and human beings. Pesticides are known to cause a variety of health problems. Even the use of banned pesticides is rampant. The Ministry of Environment and Forestry (MOEF) must ensure that all agricultural practices using chemicals and synthetic products must go through Environment Impact Assessment (EIA).

**Organic Farming Certification**
“Organic agriculture” is not limited to certified organic farms and products but includes all productive agricultural systems that use natural processes, rather than external inputs, to enhance agricultural productivity. It is important to distinguish certified from non-certified organic agriculture. Agriculture that meets organic production standards, but is not subject to organic inspection, certification and labeling is referred to as “non-certified organic agriculture”. Non-certified organic agriculture therefore includes traditional systems which do not use chemicals. These farmers adopt practices to conserve resources, enhance biodiversity, and maintain the ecosystem for sustainable production. This practice is often but not always oriented towards the market for food labeled as organic.

Organic Standards define precisely the minimum requirements that a farm or organic product should meet in order to be certified ‘Organic’. Organic standards at national and international levels are different. National Standards for Organic Products (NSOP) developed in India in 2000 stipulates that inspection and certification by a nationally accredited certification body is mandatory for labelling and selling products as ‘organic’. International Standards vary, namely EEC 2092191 for exports to Europe; IFOAM Basic Standards used as standards for setting standards on the national and international levels; US-NOP standards are used as standards in the US. For certification of products for exports, the standards of the target market or importing country are to be complied with. Genetically Modified Organisms (GMOs) and products derived from them are excluded from organic production methods. For recognition of organic status of farm produce, the conversion period should be minimum of 2 years before sowing annual crops and 3 years for perennials.

Dr. K.P. Agrawal, Former National Coordinator, National Agricultural Innovation Project (ICAR), New Delhi
Millions of jubilant faces and thousands of congratulatory notes appeared, as the news of Dr. KL Chadha, the tallest figure of India’s horticulture being felicitated by the Padamshree Award was announced. It was long overdue and the announcement came very late, but it was finally announced, which brought about a sigh of relief to everyone connected to agriculture and horticulture in India. They felt that it was not the recognition to Dr. Chadha, but to all of us and it was recognition to horticulture sector, and not to one person.

Agriculture Today has special affection for Dr. KL Chadha for his monumental contributions to the growth of horticulture sector as well for his support to the knowledge initiatives in agriculture sector. Agriculture Today itself may not have became a reality, but for his efforts from discussing idea to guiding on its contents to the launch and growth.

Dr. KL Chadha has many firsts linked to his long career of five decades, which saw horticulture sector rising from being mere a last choice activity of small farmers to now the being the most focused sector not only for profitable farming, but for the country’s nutritional security, agricultural development, exports growth and even for career choice.

To celebrate the occasion, Agriculture Today organized a special function at India International Centre on 28 April, 2012, which was participated by the important dignitaries from the Government, research and academic system and the industry. Dr. Balram Jakhar, one of the most recognized faces of India’s agriculture, former Speaker, Lok Sabha, ex Union Agriculture Minister and former Governor of Madhya Pradesh, who has known Dr. Chadha for over four decades, also graced the occasion. In his address, he described Dr. Chadha as the Bhishma Pitamah of India’s Horticulture, whose contributions will go deep in the annals of India’s history of agriculture and the world history of horticulture.

The list of who’s who included Dr. VV Sadamte, Advisor, Planning Commission, Dr. Swapna Datta and Dr. KD Kokate, DDGs of ICAR, Dr. Vibha Dhawan, ED, TERI, Dr. ML Madan, ex DDG, Dr. MP Yadav, former VC, Rahul Dhanuka, Director, DAL, Dr. PL Gautam, Chairman, PVPFRA, Mr. Sandeep Sudan, MD, Saveer Biotech Limited besides many other dignitaries.

Horticulture Society of India, of which Dr. Chadha has been president for 18 long years and been associated for 45 years, also organised a felicitation function on 7th May, which was graced by the DG ICAR Dr. S Ayyappan, Chairman ASRB, Dr. Gurbachan Singh, Chairman, NRAI Dr. JS Samra, Chairman, PVPFRA Dr. PL Gautam, former Union Agriculture Secretary, Mr. JNL Shrivastava, besides large number of Directors and ex Directors of ICAR institutes and current and former Vice Chancellors of Agriculture Universities.
Success Story

A paddy yield of 22.4 tons/ha reported from the SRI trial plot of a farmer in Darveshpura village, Bihar, Shri Sumant Kumar, has attracted considerable attention because it surpasses the previously accepted world record yield of 19 tons/ha reported from China. With four other farmers in the village, also first-time SRI practitioners, achieving paddy yield levels of 18 or 19 tons/ha, Sumant Kumar’s achievement was not an isolated occurrence.

Local Situation

The most successful farmers involved in these reports were well-educated and have good learning ability for adopting innovative technology on their fields. As agriculture is their single source of household income, they were trying to utilize the inputs available to them in the best possible way. These farmers used green manuring, particularly dhaincha (sesbania), as well as vermicompost and other organic sources of nutrients along with some amount of chemical fertilizers. No major insect pests or diseases were observed in these rice fields during the crop growth period, possibly reflecting the suite of crop management practices.

Darveshpura village and the SRI demonstration plots are situated on the banks of the Sakri River. The water table is high, and soil organic matter has been built up and maintained. The soils are generally sandy clay and well-drained, with no water logging. Soil pH is in the neutral range. The climate and rainfall distribution were better in 2011 than in the previous year, when much of Bihar experienced serious drought conditions.

Farmers in this area practiced various rotations during the cropping year. The main rotations were: rice (kharif)/wheat (rabi)/then moong (mung bean, a short-season legume) and finally dhaincha (sesbania) for green manuring, or alternatively, rice/maize/moong/dhaincha. Other rotations include: rice/potato/onion; rice/lentil/gram; rice/mustard or toria, a rapeseed; groundnut/arhar (red gram); maize/red gram intercropping; or some other mixed cropping rotation. In a few pocket areas, a rotation of rice/potato/muskmelon or watermelon was also raised.

The Successful Farmers

The names of these five farmers – all relatively young, between 30 and 35 years old – are Sumant Kumar, Krishna Kumar, Nitish Kumar (coincidentally the same name as Bihar’s Chief Minister), Vijay Kumar, and Sanjay Kumar. Their rice crops were cultivated on upland soils with tubewell irrigation, and all worked closely with the local staff of the Agricultural Technology Management Agency (ATMA) for Nalanda district. Because they have tubewell irrigation, they have both incentive and capability for applying water sparingly.
The successful farmers have more than high school education, with 10 years of schooling plus 2 or 3 years of additional training beyond matriculation. Their landholdings were medium-sized for the region, 5 to 7 acres (2.0 to 2.8 ha). The size of Sumant’s SRI test plot was 1 acre, from which an area of 50 m² (10x5m) in the middle was harvested and evaluated to calculate yield. This measurement was made with the Department of Agriculture standard methods. The same methods were used for evaluating the farmers’ yields with conventional agricultural practices. The SRI plots of each of the other four farmers were also 1 acre each. Their area of conventionally-grown paddy rice in 2011 was 5 to 7 acres.

Cultural operations

Sumant Kumar planted the Bayer hybrid variety Arise-6444, while the other four farmers used Syngenta’s hybrid 6302. These are medium-duration varieties with a usual crop cycle of about 150 days, but in this season, Sumant’s SRI crop reached maturity in 142 days. Upland nurseries were established, with a maturity in 142 days. Upland nurseries were established, with a seed rate of 5 kg/ha for the SRI nursery compared with a usual rate of 35-40 kg/ha. Both the SRI and regular nursery were sown on June 20, 2011, with the seeds for both nurseries treated with Carbenazim (2 g/kg) for protection against seedborne diseases. The SRI nursery soil was kept moist but not flooded, while the regular nursery was irrigated with a pump set. Seedlings were removed from the SRI nursery on July 3, while those used for regular rice cropping were taken out on July 15. The respective seedling ages were thus 12 days and 24 days.

Deep ploughings of the SRI field were done on May 1 and June 16, followed by shallow ploughing on June 21 and June 29, with puddlings of the field on July 2 and July 3, the latter being the day of transplanting. The ploughing operation incorporated the dhaincha (green manure) vegetative material into the soil of both the SRI and the normal-practice fields. Farmyard manure (FYM) was applied to the SRI field at the rate of 6 tons/ha and was incorporated during land preparation. Both the SRI and the normal-practice fields received the same amounts of inorganic fertilizer, added as basal doses the day before transplanting, i.e., July 2 for the SRI field, and July 15 for the regular field. The applications of P and K were, respectively, 80 kg/ha of diammonium phosphate (DAP) and 40 kg/ha of potash. During the season, some N was applied as urea, at a rate of just 40 kg/ha, in split doses on July 18 and August 22, a relatively low rate of N supplementation.

For organic soil fertilization of the SRI plot, there was an application of poultry manure on July 2 at a rate of 400 kg/ha, plus 100 kg/ha of vermicompost and 40 kg/ha of a compound containing phosphorus-solubilizing bacteria (PSB) at the same time. Also, a micronutrient foliar spray of monohydrid zinc sulphate @ 25 kg/ha, was applied on both the SRI and conventional fields on August 22. The fertilization practices followed for SRI compared to usual production practices thus differed only in that the latter did not receive FYM, poultry manure, or vermicompost prior to transplanting. Also, for the conventional crop, the top dressings of urea were later (July 18 and August 30) as was the ZnCl foliar spray (August 30).

SRI seedlings were transplanted at 25x25 cm distance in a grid pattern, one seedling per hill, giving a plant density of 16 m². Regular-practice seedlings were transplanted 12 days later in a random pattern in the field, with 3-5 seedlings per hill. The plant population under SRI management was thus much lower than with standard crop management practices; with SRI, there was a 75-80% reduction in the number of plants.

The main weed problem for these farmers was broad-leaved weeds, and in the regular field a herbicide (2,4-D) was sprayed to control these, applied at a rate of 1.5 liters/ha. In Sumant Kumar’s SRI field, there was no chemical weed control--only soil-aerating cono-weedings done at 13 days and 26 days after transplanting. No chemical crop protection measures were taken as no insect pests or diseases or rodents were observed in either the SRI or regular fields.

The regular field was managed with flood irrigation, while the SRI field was served by sprinkler irrigation. SRI crop received about three times as much water during the crop-growing season as with flood irrigation.

Sumant Kumar’s SRI and regular fields were harvested, respectively, on November 10 and November 20, so his SRI crop matured 10 days sooner from the date of sowing in the nursery, giving much higher yield. The SRI crop cycle was 142 days, compared to the usual time to maturity of 150 days (in this case, 152 days for the regular-practice field). The weight of the paddy rice harvested from the cutting of 50 m² on the SRI plot was 112 kg. This

<table>
<thead>
<tr>
<th>Name</th>
<th>Production in 10x5 m² area (kg)</th>
<th>Production (t/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRI</td>
<td>Wet</td>
<td>Dry</td>
</tr>
<tr>
<td>Krishna Kumar</td>
<td>101</td>
<td>90.9</td>
</tr>
<tr>
<td>Nitish Kumar</td>
<td>98</td>
<td>88.2</td>
</tr>
<tr>
<td>Vijay Kumar</td>
<td>96</td>
<td>86.4</td>
</tr>
<tr>
<td>Sanjay Kumar</td>
<td>95</td>
<td>85.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>SRI (Rs./ha)</th>
<th>Conventional (Rs./ha)</th>
<th>Savings (Rs./ha)</th>
<th>Reduction %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursery</td>
<td>1,200</td>
<td>1,800</td>
<td>600</td>
<td>33</td>
</tr>
<tr>
<td>Transplanting</td>
<td>2,390</td>
<td>2,895</td>
<td>505</td>
<td>17</td>
</tr>
<tr>
<td>Weeding</td>
<td>2,600</td>
<td>4,405</td>
<td>1,805</td>
<td>41</td>
</tr>
<tr>
<td>Total</td>
<td>6,190</td>
<td>9,100</td>
<td>2,910</td>
<td>32</td>
</tr>
</tbody>
</table>
represents a wet-rice yield of 22.4 t/ha. The dried weight from the harvested area was 100.8 kg, which amounts to a dried-weight yield of 20.16 t/ha, well above the previously reported world-record yield from China of 19 t/ha.

These farmers along with Sumant Kumar have been advised to use a similar package of practices with the same hybrids on the same plots in the next kharif season to assess yield stability. All agronomic yield-contributing factors will be recorded with soil testing of nutrients.

**Economic Evaluation**

A common perception of SRI management has been that it is more labor-intensive. When farmers first begin to use the new methods, when they are just starting on their learning curve, the work does go more slowly. But the data available from the Department of Agriculture indicate as seen in other evaluations that there is labor-saving in most of the cultivation operations when SRI methods are practiced.

An assessment in Bihar has revealed that with the great reduction in nursery area and with a much lower seed rate, with SRI there is a saving of 40 man-hours per hectare for nursery management, and another 50 man-hours are saved for the pulling out and transporting of seedling bundles from the nursery area to the main field.

Due to more widely spaced transplanting and much lower numbers of plants, fewer labourers were required for SRI methodology. Farmers needed 50–60 women labourers in conventional method, whereas only 25–30 labourers were needed with SRI.

Once skill is acquired in using the cononweeder, weed control operations can also require less labour compared with the usual hand weeding. Moreover, this becomes a less laborious process than for manual removal of weeds.

The results show SRI reducing labour for these major operations by 32% in the sampled farms, with a major saving in weeding of some 40%, and 33% less labor needed for nursery preparation and management as there is less nursery area and no need to carry seedlings far away from the nursery to the main field.

More labor is needed to manage the water applications according to the SRI principle of keeping the paddy soil moist but not continuously saturated. But the cost of labor for irrigation is offset considerably by a reduced cost for the water itself. There is also more cost for harvesting because the yield is much higher, but this added cost is compensated for several times over by higher production and resulting greater income. Cost per kilogram of paddy produced is much lower with SRI management, giving farmers more income.

**Varietal Differences**

From Agriculture Department data for 57 farmers in Nalanda district where crop-cut estimates of yield were made for farmers using SRI methods, differences in average yields for different varieties are show below. The average SRI yield for the whole set of farmers was 9.34 tons/ha. These results are very encouraging for SRI production methods, and also for hybrid varieties. Note that with larger numbers of farmers, the average for Arise 6444 is less than for Syngenta 6032, which underscores that the growing environment, which can include the soil biota, has as much or more impact on results than simply the genotype involved. This also suggests that farmer differences are important in accounting for yield outcomes.

**Observations**

The experiences of Sumant Kumar and his neighboring farmers give strong support to the recommendations followed in SRI method:
- Manage a smaller nursery carefully with lower seed density and with aerobic soil conditions;
- Transplant young seedlings singly, carefully, and with wide spacing;
- Apply only as much water as the plant needs for its growth;
- Control weeds with soil-aerating weeding; and
- Enhance organic matter in the soil as much as possible.

What has not been assessed in Darveshpura is what effect, if any, these practices may have had on the soil biota: the massive and complex populations of bacteria, fungi, protozoa, and other larger organisms like mites and earthworms that inhabit the soil which has favorable conditions. These diverse organisms are known to have many beneficial effects on plant growth and to be promoted in aerobic soil with abundant organic matter.

It can be hypothesized that in this situation the soil biota played some role, perhaps an intermediary role, in producing healthy and more productive rice plants. That as many as five farmers in fairly close proximity achieved such super-yields lends some weight to this hypothesis and raises the possibility that soils in Darveshpura have some particularly beneficial species or associations of soil organisms. This seems to be supported by experience in this village with their potato crop last year.

The results from the 2011 kharif season in Bihar should remove any remaining reservations about utilizing SRI ideas and methods on a broader scale, making appropriate adaptations to local conditions, which is part of the SRI methodology.

M.C.Diwakar, Arvind Kumar, Anil Verma, and Norman Uphoff
now that the trade relationship between India and Pakistan is on a fast track, and the two countries are in the process of reducing the ‘negative lists’, it is time to reflect on the implications of a liberal border trade with Pakistan. While potato and onion growers appear to be positively inclined, citrus growers, especially those in Punjab and Rajasthan are feeling threatened by the superior quality and price competitiveness of their Pakistan counterparts. As the transit from Pakistan becomes easier, plums, pears, apricots, peaches, grapes, pomegranates and dry fruits from Afghanistan will also affect the Indian producers. The duty structure on these commodities will play an important role, and will be the subject of intense negotiations, but once the system is in place, it offers great scope for collaboration and partnerships, not just on the agriculture trade side, but also in terms of developing integrated value chains – from the establishment of Tissue Culture labs to Hi – tech nurseries, cold chain infrastructure and refrigerated transport logistics, aggregation. It must be acknowledged at this point that adequate homework has still not been done in terms of understanding the competitive edge of the several commodities which Pakistan produces. Unlike the Agmarknet which gives a fairly clear idea about production data and market arrivals, a web search is unable to reach any single website to address these issues. Unfortunately our libraries are not well stocked with books on agriculture production systems in Pakistan – or for that matter, other South Asian countries as well, and this lacunae needs to be addressed immediately. It must however be acknowledged that the trade organizations have done better. FICCI has an understanding with its counterpart body in Pakistan, and over the next few weeks, it would be interesting to see how these bodies work together to find out trade complementarities. It is true that India is emerging as a major supplier of cotton to Pakistan textile mills, but the full potential needs to be understood. The agriculture sector in India should welcome this move, as this will also pave the way for better co-ordination on food and agricultural policies for the SAARC region and many of the issues faced by this region, especially India and Pakistan are common. India and Pakistan have to take the lead to prepare a joint position with regard to ‘production protocols’. Europe imports its rice from India and Pakistan, but when it comes to imposing standards, it does so unilaterally without any reference to the prevailing agronomic practices, land holding patterns and the socio economic and cultural constructs in which production takes place. Just as each country in Europe invokes the EU when it wants to reject a consignment, the time has come for South Asia to set forth its set of conditions with regard to export inspection protocols and dispute redressal. Likewise it would be better if the standards laid down by FSSAI are discussed in bi lateral and multilateral forums in South Asia so that as a region one can take cudgels on behalf of the producers. Therefore the opening of India Pakistan trade must be followed with a series of dialogues on its implications on agriculture. Rather, the focus should be on how agriculture should leverage the opportunities that emanate from this opening. Apart from collaboration among the agriculture research institutions and agribusiness co-operatives and organizations, the dialogue should extend to issues like new technologies (farm mechanization, micro –irrigation, protected cultivation, tissue culture labs, irradiation facilities), institutions (farmer producer companies, weather based insurance products, credit through joint liability groups, warehouse receipts) and business to business collaboration. Thus if established Basmati brands from India pick up their rice from Pakistan or the leading honey processors pick up raw honey from Pakistan and leverage their marketing skills to give better price to the Pakistan farmer, it should be an engagement which has the potential of making all sides happy. Last, but not the least, once the trade relations between India and Pakistan are on an even keel and farmers see positive gains in terms of an expanded market, there is a very real possibility of thinking in terms of a Common Agricultural Policy, and preparing a common position with regard to UN agencies like the FAO. The Agriculture Ministers of SAARC are likely to meet in Doha after a few weeks, and if all goes well, some of these themes can be taken up for discussion. It may be mentioned here that most SAARC agriculture summits have focused on collaborative research and extension issues: the focus can now shift meaningfully to co-operation in trade and transit, which alone will ensure higher incomes for the farmers.
Articulate and verbally vibrant, Smt. Jayanthi Natarajan, our current Environment Minister, has a daunting task ahead of her. She has to deal with many touchy environmental issues, which is constantly under public scrutiny. Less than a year into being the minister, she has already made it clear that she is not soft as her words, when it comes to environmental issues. Her come back into the cabinet after more than a decade will bring cheers to environmentalists.
Smt. Jayanthi Natara-
jan, is the Minister of State of Environment and Forests (Independent Charge) in the current Union Ministry. Following a cabinet reshuffle, which saw the former Environment Minister, Jayaram Ramesh’s promotion as Cabinet minister in Rural Development department, Smt. Natara-
jan was given the responsibility of Environment Ministry. Jayaram Ramesh during his tenure had lifted the profile of this non glamorous ministry by several notches.

Smt Natarajan is a Member of Parliament representing Tamil Nadu in the Rajya Sabha. She was also Minister of State in the Ministry of Civil Aviation and Parliamentary Affairs during 1997-98. She was elected to Rajya Sabha in 1986, 1992, 1997 and 2008.

Affiliated to Indian National Congress, Smt. Natarajan has a chequered history with Congress. Once attached to INC, she moved to Tamil Manila Congress, following a stand by the then PM, P.V. Narasimha Rao to align with AIDMK. But once TMC was disbanded, she returned to her roots. Her abilities had earned her many positions of prominence in her po-
litical career. Grand-daughter of veteran Congressman and former Tamil Nadu Chief Minister, M. Bak-
thavatsalam, she had remained the Party spokesperson for years. Smt. Natarajan had earlier been member, General Body of the Central Social Welfare Board. She was nominat-
ed to the Panel of Vice-Chairman in 1991, 1992, 1996 and 2008. Since 1992 till date she also served as Member, Committee of Privileges, Committee of both Houses on environment and Forests, Business Advisory Committee, Committee on Public Accounts, Committee on Home Affairs, Consultative Committee for the Ministry of Civil Aviation Committee on Government Assurances, Parliamentary Forum on Children, General Purposes Committee, Committee on Person-
nel, Public Grievances, Law and Justice, Committee on Transport, Tourism and Culture, Consultative Committee for the Ministry of Civil Aviation, Consultative Committee for the Ministry of Health and Family Welfare, Select Committee to examine the Commercial Division of High Courts Bill, Court of the University of Pondicherry and Committee on Rules. Since August, 2009, she worked as a Chairman, Committee on Personnel, Public Grievances, Law and Justice.

Born on 7 June 1954 in Chennai, Smt. Jayanthi Natarajan studied law and became a practising advocate in Madras. Apart from her commercial practice, she also did pro bono work for a number of social organisations including the All India Women’s Conference, and the legal aid board. She had always been in the forefront fighting for women’s rights and headed a Parliamentary Committee that looked into the Women’s Reserva-
tion Bill.

When Smt. Jayanthi Natara-
jan was inducted into the cabinet in the new role of Environment Minister, she had a daunting task ahead of her. That was to fill in the shoes of Jayaram Ramesh who gave teeth to the ‘Non-descript’ industry. While Jayaram was known for his vociferous deliberations on issues of public dispute, Jayanthi has so far maintained a soft approach akin to her style. Her soft skills have helped her so far to manage the ministry without dilut-
ing the position of the Ministry in different issues.

She made her mark in the for-
ground soil of Durban during Climate change talks when she received a resounding ovation in a meeting of 195 countries when they got into a negotiating huddle. They ap-
plauded her for her stirring speech defending the Indian and BASIC countries’ position on climate change. Her position to not to relax mining norms in dense forests had in fact exposed her commitment to environmental issues. She does not see development as an excuse for diverting from environmental is-

Married to Shri. V.K. Natara-
jan, Jayanthi continues to be the hope of environmentalists. Her role is going to be crucial in the face of Climate Changes.
“There is no point in criticising anybody. I am answerable as the head of the state. The livelihood of about 57 per cent of the population depends on agriculture and hence irrigation is very important for the progress and development of the state.”

PRITHVIRAJ CHAVAN
Chief Minister, Maharashtra

“High subsidy on some fertilisers is leading to unbalanced fertiliser usage. For example, urea is being used by farmers in high quantity which is affecting productivity.”

SHARAD PAWAR
Union Agriculture Minister

“We have set a conservative food grain production target of 250 million tonnes for 2012-13 crop year. We expect to exceed the target the way we did in the last season.”

PK BASU
Agriculture Secretary

“Farmers should shun varieties HKR 47, HKR 127 and Pusa 44, which are being promoted by private agencies, as they are not resistant to prevailing pathotypes of bacterial blight disease.”

MS GILL
MP, Rajya Sabha

“Given the central role that food plays in human welfare and national stability, it is shocking—not to mention short-sighted and potentially dangerous—how little money is spent on agricultural research.”

BILL GATES, Chairman, Microsoft

“In responding to the global food crisis, it is easy to move from the symptom - prices which have suddenly peaked - to a possible cure - produce more, and remove as soon as possible all supply-side constraints.”

OLIVIER DE SCHUTTER, The UN Special Rapporteur on the Right to Food