

## MODERN TECHNOLOGY

The progress of research has established the history of science, technology and ecology as viable branches of the discipline of history. This has added new and important dimensions to general history. At the same time, detailed research has demonstrated the close inter-relationship between the histories of science, technology and environment. All this has altered the shape of history.

After Independence studies of technology acquire an analytical historical perspective. A preliminary venture in this direction was a series of lectures by leading scientists and technical educators. Technology was treated in such preliminary works as part of the history of science. It took some time to give more complex and critical attention to technological history on its own.

Many historians in the West continued to emphasize the progress brought about by technology transfer from the West to non-Western societies.

An important article in this collection, 'The Building of India's Railways: the Application of Western Technology in the Colonial Periphery', by Ian Derbyshire, pointed out that railway development in India, unlike UK, secured few direct, 'backward linkage' benefits. Labour market conditions discouraged greater mechanization.

Forward linkage effects, on the other hand, mean the stimulation of demand for other products resulting from the new product. In the case of railway construction in India, a forward linkage benefit might have come about with the construction of locomotives.

The emergence of environmental history added a new dimension to the existing criticism of the role of technology and science.

At the same time, he has not forgotten to emphasize the positive benefits of railways in particular and technology in general. One aspect of science and technology is the import of Western medicine in India. Here, too, recent research has highlighted not merely the positive effects, but also some of the negative developments.

Over all, the new research, even when at its most critical has still not dislodged the impression that technology brought important benefits. Without science, technology and modern medicine, India's vast and growing population would have been more (and not less) vulnerable to famines and epidemics.

Pathways by which science ministries can address issues and specific technology needs of the states and ways to strengthen the centre-state co-ordination for the socio-economic development of the nation.

Top scientific administrators across Ministries and departments discussed pathways. They highlighted the need for adequate investment in research and development from the private sector.

Some states have received substantial foreign direct investment, and some like Karnataka and Uttarakhand have made exemplary efforts in some areas like One Health Mission.

DST has supported startup incubation centres in places like Hyderabad and Vadodara.

We are working for catalysing Science Technology Innovation (STI) ecosystem in the States by facilitating human resources, S&T infrastructure & socio-economic development through appropriate partnerships and strengthening of the S&T-based delivery system.

Indian researchers at all corners of India should pursue scientific research for the benefit of society with practical application-driven innovations.

## OFF 'D' CUFF

### Walking on the path of Devotion

If you want to walk on the path of Bhakti [devotion], then learn to keep your temperament cool. Learn and try to be simple, prevent yourself from doing cunning activities. Nowadays, people pretend to be more knowledgeable and learned than they actually are.

According to Mann, the greater a person is in his artificial behavior and attitude, the more restless he will be. Wealth brings such an addiction with it that the more you have the more is the craving to add to it. A person who does not have hunger or lust for anything is the richest of all. A simple and modest person with peace of mind is referred to as 'Saumya'. Saumya'. According to Maharishi Ved Vyasa, Lord Krishna had three major attributes, which we all should try to adopt.

The first attribute is Happiness for Loyalty

If you want to walk on the path of Bhakti, don't let smile disappear from your face. If you encounter any problem, do not worry it.

Smile and you will gather strength to face the problem.

If you smile, your problem will not be a problem anymore, you will solve on its own. When clouds of sorrow envelope you and you find someone very dear approaching you, tears roll down your eyes.

So was the case when Draupadi saw Lord Krishna towards the end of the period when Pandavas were in exile. Krishna comforted Draupadi and advised her neither to think about the past nor to worry about the future. The best is to think about the present and gather your strength.

To this Draupadi remarked that it was easy for him to say all this because he himself had not seen sorrow. How could he understand her state of mind? Lord Krishna smiled and asked Draupadi how she could

think that the person who had taken birth behind the four walls of a prison had seen less sorrow. The only difference was that he never treated sorrow as sorrow.

The second attribute for devotion.

The second attribute is that one should not lose one's balance of mind when one encounters a problem.

When problem comes on our head one after the other, we human beings have a tendency to say: "O Lord, why only me? What have I done?"

Or, we start having depression out of fear and frustration and several unhealthy thoughts like revenge, suicide, etc. crowd our minds.

We have to face problems firmly and boldly rather than sit and crib about them.

If you harm somebody, you cannot escape the harmful consequences of your deed for steadfastness.

The third attribute is that one should maintain one's poise and calm. One must not lose sweetness of voice.

Do not sound bitter and rude to people nor should you be harsh in your words. Be polite.

Whatever you achieve, learn to share it with others.

If you have been doing misdeeds in your life and have simultaneously been generous enough, you shall bear (Devotion) the fruits of both.

Also, treat others as you would like to be treated yourself. But always remember one thing: your actions are constantly being viewed and monitored by God.

Every person has to bear his share of sorrow. To save himself from the consequences of his misdeeds, he uses various products – stones, threads, metal pieces etc. But why? Do you think by doing all these, your share of sorrow will get reduced? Rather, if you have done something wrong, you should pray to God and ask for forgiveness and Devotion.

—Dr Archika Didi

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## SUBSISTENCE TO SUSTAINABLE Towards Holistic Development of Agriculture in J&K

■ DR. PARVEEN KUMAR

The Union Territory of Jammu and Kashmir falling in the great north-western complex of the Himalayan ranges having a geographical area of 42,241 Km<sup>2</sup> is predominantly agriculture based economy. About 70% of population is directly or indirectly engaged in agricultural and allied occupations. About 60% of area under agriculture in the UT is rainfed with frequent moisture stress. The size of holdings in this region is largely marginal and small (less than two ha). The two regions of the UT have a distinct climate and cropping pattern. The average land holding in the erstwhile state of J&K a few years back was 0.67 ha. While the major cropping systems in the valley are rice-mustard and rice-oat (fodder); in Jammu region, the predominant cropping systems are rice-wheat and maize-wheat in irrigated and rainfed areas respectively. The farming systems in Kashmir are mostly horticulture based and the important fruits grown here are apple, walnut, apricot, etc. With a vast natural resource base, varied agro-climatic conditions and an ideal climate for different crops, agriculture and allied sectors have played and a lot to play in its economy, employment and livelihood security of its populace.

The consumption requirements of food grains exceed the total production of food grains in the UT; as a result of which it has to depend on food grains from other states. The productivity of crops here is low as compared to national average. A host of factors can be attributed to this low productivity. The agriculture sector here is constrained by its rainfed regions, its hilly terrain, predominance of small and marginal holdings, fragile soils, low level of farm mechanization, mono cropping pattern more so in temperate and high altitude areas, low level of food processing and value addition, a chemical intensive agriculture, farmers' exclusiveness and many others.

To overcome these constraints and to devise a roadmap for holistic development of Agriculture and allied sectors in Jammu and Kashmir, Administration of Union Territory has come up with an Apex Level Committee (UTALC) for holistic development of agriculture and allied sectors. The eight member committee assisted by different Technical Working Groups (TWG) is being headed by Dr. Mangla Rai, Former DG, ICAR and comprises of Dr. Ashok Dalwai, CEO, National Rainfed Area Authority (NRAA); Atul Duloo (IAS) FC/ACS, APD UT of JK, Dr. P. K. Joshi, Secretary, NAAS, Pusa, New Delhi, Dr. Prabhat Kumar, Horticulture Commissioner, Agriculture and Farmer Welfare Department, MoA & FW GoI, Dr. H. S. Gupta, Former Director, IARI. The high level committee also includes the Vice chancellors of two farm varisties of UT of Jammu and Kashmir Prof. (Dr.) J. P. Sharma, HVC, SKUAST-Jammu and Prof. (Dr.) Nazir Ahmed Ganai, HVC, SKUAST-Kashmir. Prof. (Dr.) N. A. Ganai is the member secretary of the high level apex committee.

The goals and targets for next five years set up by UTALC include doubling contribution of Agri-GDP in next five years from \$4 billion to \$8 billion, meeting 100% SRR with quality seeds, doubling resource use efficiency from 30% to 60% in respect of nutrients and moisture by bringing in advance technologies; reducing food wastage to 1/3 (10%) through

proper post harvest management by building suitable infrastructure (CA stores, pack houses, refrigerated transport) and food processing; tripling of food processing from 5% to 15% by focusing on secondary agriculture; building capacity to meet the requirements of the quality planting material; establishment of 300 functional and profitable FPOs in 20 districts of J&K; avail Agriculture Infrastructure Fund of rupees 900 crore reserved by GoI for JK UT; vocational skill trainings to 2000 youth annually for next five years; build state data banks using artificial intelligence and ICT tools for Apple, Dairy and small ruminants in next five years; reduce the use of agrochemicals by 25% in next five years. The deadline for this is five years.

**Doubling Resource Use Efficiency:** Resource use efficiency means using the limited resources in a sustainable manner and at the same time minimising impacts on the environment. It creates more with less and delivers greater value with less input. Doubling resource use efficiency from 30% to 60% will need modification of agronomic practices along with adoption of conservation agriculture practices like system of rice and wheat intensification and organic/natural organic farming, crop residue management, water conservation, development of climate tolerant crop varieties etc. Use of ICT and Precision Farming technologies also aid in doubling resource use efficiency in agriculture and allied sectors.

**Quality Planting Material:** Planting material is a basic and critical input for agricultural production. Inadequate availability of quality seeds, planting materials and germplasm are major constraints limiting productivity. Quality Planting Material is the production of uniform, healthy, disease-free planting material raised through seed or vegetative methods with an overall goal to raise the physiological and Phyto-sanitary quality of the plant available to stakeholders to increase productivity.

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The goals and targets for next five years set up by UTALC include doubling contribution of Agri-GDP in next five years from \$4 billion to \$8 billion in the next five years. In Jammu and Kashmir over the last five decades, the share of primary and secondary sectors in the GDP has declined while as the share of service sector has increased. This may be due to the agriculture sector not receiving the impetus or scale of finance as

funds under Agri-infrastructure Fund can be utilized for this purpose also.

**Doubling Contribution of Agriculture in GDP:** The Agri-GDP in the UT has to be increased from \$4 billion to \$8 billion in the next five years. In Jammu and Kashmir over the last five decades, the share of primary and secondary sectors in the GDP has declined while as the share of service sector has increased. This may be due to the agriculture sector not receiving the impetus or scale of finance as

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**Seed Replacement Rate (SRR):** Seed constitute a very critical input for improving the production and productivity on a sustainable basis, improving SRR is must. Desirable SRR of 25% for self pollinated crops, 35% for cross pollinated crops and 100% for high yielding varieties at the national level has now been revised to 33% for self pollinated crops and 50% for cross pollinated crops. In case of Jammu and Kashmir the data available reveals a SRR of 33% in Kashmir and 26.2% in Jammu for rice, 24% in Kashmir and 32.1% in Jammu for Maize, 32% in Kashmir and 35% in Jammu for fodder grown in 'rabi' season. More can be done by creating 'seed villages' building seed multiplication chains in Public Private Partnership mode or through creating a pool of private entrepreneurs.

**Reducing Food Wastage:** About one third of food produced is spoiled or squandered before it gets consumed. This also represents a waste of the human labour, water, energy, land and other inputs that went into producing that food. In the next five years the food wastage has to be brought down to one third of the present through proper post harvest management by building adequate infrastructure and food processing. This will require creation of adequate infrastructure related to storages, pack houses, refrigerated vans and conveyance. The GoI has also recognized the need for this and is providing various type of support for infrastructure development. Operation Green launched by GoI also provides subsidy to the producers in transport charges for perishable items. Funds under Agri-infrastructure Fund can be utilized for this purpose also.

**Farmer Producer Organizations (FPOs):** Giving equal representation to each district in the formation of FPOs means formation and promotion of 15 FPOs in each district of the 300 FPOs to be formed in next five years. It is definitely a good move to mobilize the farming community and connect them to the markets. As the FPOs will also be formed on 'One District, One Product' approach, there is a lot of scope for branding, certification and promotional activities.

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