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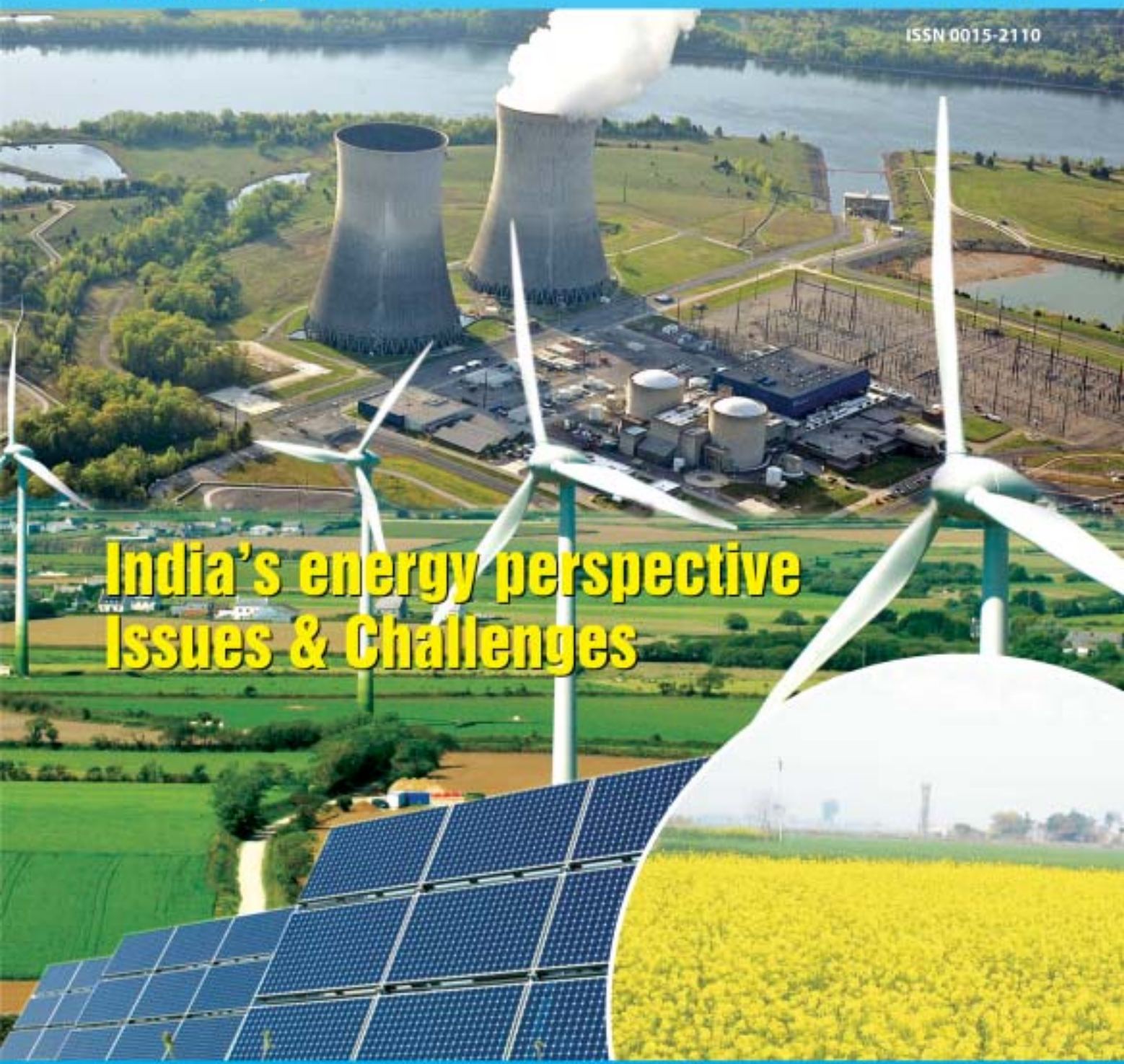

India's energy perspective Issues & Challenges

GREEN MARKETING:
THE INDIAN SCENARIO

DISCOVER THE VARIOUS
POWERS OF MUSTARD

ACTIVITIES OF
REGIONAL CENTER –NATIONAL AFFORESTATION & ECO-DEVELOPMENT BOARD
Ministry of Environment & Forests, GoI
Agricultural Finance Corporation Ltd, Mumbai

Exposure Programme for enhancing confidence level, marketing skills and group cohesiveness amongst SHG members for SMFE's, Dediapada, Rajpipala FDA, Gujarat- Visit to Bamboo enterprises

Capacity building and strengthening of JFMC's/ FDA members at Gavese village, Ajara Taluka, Kolhapur

IGA activity- Culture of bee keeping at Shivbhandane, Nasik (E) FDA

Different SHG's activities by the SHG's members at Bahadarpur, Parola, Jalgaon

Dr. M. C. Pandey (PO, RC-NAEB, Mumbai) explaining the benefits of SHG's/ Federation under NAP

PRA exercise in a village of Silvassa, UTs of DD & DNH

Articles to be published in this journal may be mailed to fa.afcl@gmail.com only. Authors may indicate their postal address and contact number. Articles may be between 4,000 to 6,000 words. Relevant photographs may also be sent.

EDITORIAL

India's economic progress is marked by gradual exhaustion of energy resources. The July issue of Financing Agriculture magazine seeks to explore the energy challenges of India, the cause and effect relationship between energy and economic development and the sustainability of its environment for its millions. Energy security and sustainable development are critical issues to ensure India's economic growth and its human development objectives.

The threat of climate change and the importance of sustainable development have brought nuclear power in sharper focus in recent times. India should focus on holistic energy policies, diversification of fuel mix, clean technologies, research and development, energy efficiency, utilisation of nuclear green energy, creating awareness and strengthening governance for Sustainable Development at the local and national levels.

Innovation is the key to success. Highlighting the irreparable damage caused by pesticides, Indian Oil Corporation has introduced 'Agro-spray' – an environment friendly biodegradable substitute to harsh pesticides. The new 'Servo Agro Spray Oil' is based on a highly refined petroleum stream, the base of which is mineral oils and thus the whole product is bio-degradable in nature with no harmful chemicals. Scientists of TERI (The Energy and Resources Institute) have created a better variety of mustard, whose nutritional value surpass expectations. It has the lowest amount of harmful saturated fatty acids and also contains two essential fatty acids – linoleic and linolenic – that most other edible oils do not possess.

Jute cultivation and its prospects in contributing to India's revenue via exports have been elucidated along with guidance on cultivating methodology. Benefits of soya and organic mango cultivation have been specified in details with examples.

We have endeavoured to cover all aspects of Power and Energy Conservation. Emphasising the need of bringing modern agriculture practices to India, we have enumerated the benefits of biotechnology, Power Engineering, Green Consumerism, Solar Pumps and Clean energy along with innovative methods of cultivation.

Please do leave your suggestions and comments at fa.afcl@gmail.com

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Editor-in-Chief

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I N S

I D E

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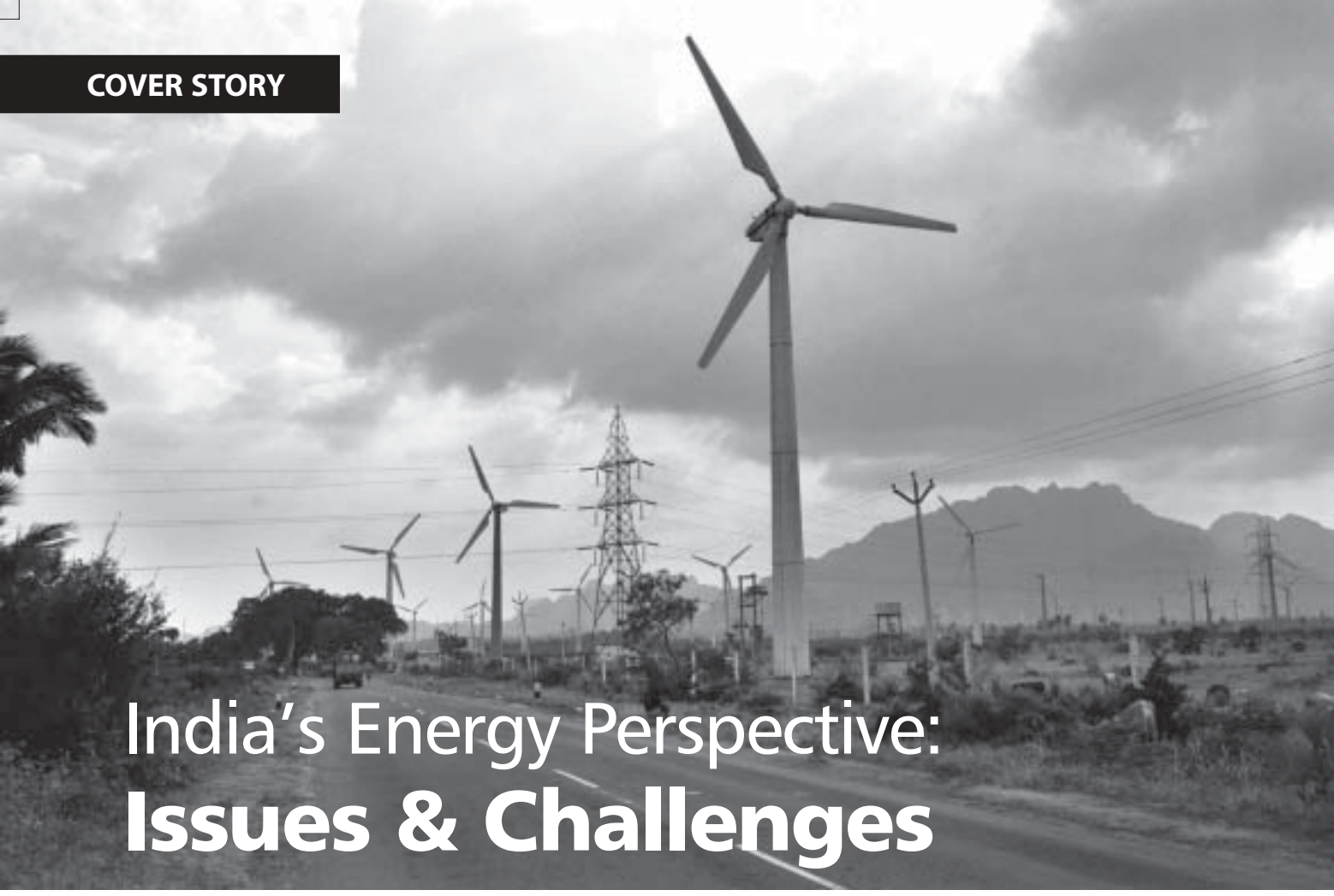

India's Energy Perspective: **Issues & Challenges**

By **Mr. Sarthak Behuria***

Today, the global society stands at the precipice of unprecedented change that has the potential to forever influence world history. The most confounding problem that humanity will face in the next decade will be to find a simultaneous solution to its energy needs while addressing the concerns of global climate change. What we do today about climate change and sustainable growth has consequences that will last a century or more. We are aware that the part of that change that is attributable to greenhouse gas emissions is not reversible in the foreseeable future.

Delivered in a sermon on social justice four decades ago, Martin Luther King's words retain a powerful resonance – "Human progress is neither automatic nor inevitable. We are faced now with the fact that tomorrow is today. We are confronted with the fierce urgency of now. In this unfolding conundrum of life and history there is such a thing as being too late… We may cry out desperately for time to pause in her passage, but time is deaf to every plea and rushes on. Over the bleached bones and jumbled residues of numerous civilizations are written the pathetic words – Too late."

At the start of the 21st century, we too are confronted with the 'fierce urgency' of a crisis that links our today and tomorrow. That crisis is climate change. The message that we hear from the top climate scientists is simple: our world will be a very different place, in perhaps as few as ten years and there is little questioning that this change will have a major impact on the world.

Let us view this against the spectre of rising energy demand due to growing consumption and improving quality of life the world over, particularly in rapidly growing economies such as India and China. The result is that today, the global economy faces a threatening prospect of an acute energy and resource squeeze that presents a defining moment and impacts our collective future. As resources face a crunch, the demand on energy sources such as coal, petroleum, natural gas and uranium, will witness intense scrutiny. Our efforts rely on energy conservation, alternative energy sources and new finds of traditional fossil fuels.

The global peak oil event will change everything about how we live. It will challenge all our assumptions and no combination of alternative fuel systems currently known will allow us to run what we are running, the way we are running it, or even a substantial fraction of it. We will have to change the way we live; we will have to downscale and re-scale virtually everything we do.

With a GDP growth rate of over 9 percent, we are now amongst one of the fastest growing economies in the world. India is the latest theatre of global action and is considered an 'emerging superpower' and along with China, it forms a formidable economic market. It is estimated that India will contribute an

impressive 17 percent to the world GDP by the year 2050.

Throughout India's history, the vast majority of its people have lived in desperate poverty. As recently as 1985, more than 90 percent of Indians lived on less than a dollar a day. Yet, India is poised to undergo a remarkable transformation. New research shows that within a generation, the country will become a nation of upwardly mobile middle-class households, consuming goods ranging from high-end cars to designer clothing. In two decades, the country will surpass Germany as the world's fifth largest consumer market.

To fuel the Nation's growth and be a part of the fast expanding world, Indian oil and gas companies are exploring opportunities abroad, and bidding aggressively for developed fields overseas. In order to feed their burgeoning economies, India and China have been seen as fierce competitors in recent years to acquire oil and gas assets abroad and bolster their energy security. This trend, perhaps, is symptomatic of the shape of things to come.

It may be pertinent to note that developed economies, though having lower energy intensity with respect to GDP, have grown during the low crude oil price regime. Growing economies like India face incredible challenges to balance high import requirements with rising crude oil prices and at the same time, sustain good growth rates in the current situation.

As the demand for energy increases, one way to lessen the impact is to ensure that it is used more efficiently. For instance, India's Integrated Energy Policy document says that the elasticity for India's primary commercial energy supply with respect to GDP is 0.82 since 1990-91, which is a significant improvement over a figure of 1.08 in the 1980s. So, we can see that the amount of energy needed to power further economic growth has dropped over the recent decades. However, we feel that this is not enough; more work needs to be done to further improve it. This is also to say that world over; the economies need to progressively move towards attaining higher levels of economic growth with reduced levels of energy consumption.

The need of the hour is the full-scale implementation of India's Integrated Energy Policy. In the process, the challenge lies in tiding over the unresolved issue of integrated energy pricing. A complete and unrestrained implementation of the integrated energy policy would rationalise energy choices in a free market economy, while ensuring efficiency and least cost.

Finally, India is also looking at demand-side management since we believe that increased energy efficiency, better public transport and imaginative urban planning, are vital to reduce demand without compromising on growth. Today, India is adopting a multi-pronged strategy and implementing several policies to address the challenges of energy security, including bringing in natural gas in the energy basket and increasing fuel efficiency.

An energy alternative is needed to power the human race. The World over, large petroleum companies are beginning to adapt their business strategies to reposition themselves as prominent players in the ensuing new global energy economy. While companies in the energy sector thrash out strategies to transform

themselves into sustainable energy providers during the coming decades, the challenge of managing current energy demands of developed and fast developing countries is growing in its formidability.

India has made a modest but firm beginning in the use of alternative and green fuels. Green fuel options such as Bio-diesel and Ethanol-Blended Petrol are set for large-scale commercialization in the near future. India is already ranked fourth in the world in terms of installed wind power generation capacity, with most of the high-quality sites taken over for harnessing the potential of this clean and renewable source of energy. Solar energy is also being put to good use for improving living standards in the hinterland. Hydrogen and Hydrogen blends with Compressed Natural Gas (CNG) are also undergoing trials in the country as part of a detailed road map for moving towards a Hydrogen economy.

It would be very difficult to put a price to the impact of energy use on environment and incorporate the same in corporate balance sheets or develop statutory systems of rewards and punishments worldwide. However, a consensus approach, for instance in the Kyoto Protocol, would go a long way in incorporating such systems into the policies of the nations, their corporations, and in alleviating the great dangers of greenhouse gas emissions responsible for global warming.

However, what is also of utmost importance, especially for developed and developing economies, is the tough balance between the economic growth and a possible curb in green house gas emissions. 'Per capita green house gas emissions', which for India is a fraction of the world average and is not expected to change for many years to come, should be one of the key parameters in determining equitability of contributions for curbing emissions and protection of environment.

What is desirable and inevitable in the medium & long term is to de-carbonise energy supplies to the highest extent possible. For this to happen, Government policies have to play a vital role in demand management and in adjusting tariffs and taxes in such a way as to ensure a smooth transition from fossil fuel economies to alternative, renewable fuel regimes.

India is already ranked fourth in the world in terms of installed wind power generation capacity, with most of the high-quality sites taken over for harnessing the potential of this clean and renewable source of energy

Climate change, energy security and the urgent need to increase access to modern energy services for the world's populace create an enormous need for more efficient low-carbon and no-carbon energy supply options. Creative responses based on solid research, shared knowledge and engagement of people at all levels is required to meet the critical challenge. Climate change will be one of the defining forces shaping prospects for human development during the 21st century. Through its impact on ecology, rainfall, temperature and weather systems, global warming will directly affect all countries.

The implications of this are overwhelming. It may be hard to believe that successful human ecologies in the near future will have to be supported by intensively farmed agricultural hinterlands. Places that cannot do this will fail. Any mega-structure – buildings that depend on huge amounts of natural gas and electricity for heating purposes and are energy guzzlers – may not be usable in the future. We may even be envisioning creation of lifestyles in which, communities will produce and expand energy locally.

The spectre of climate change and global warming confronts all humanity with the threat of a twin catastrophe. The first is an immediate threat to human development as climate change affects people in all countries. This first catastrophe is not a distant future scenario. The second catastrophe is located in the future. Climate change poses risks not just for the world's poor but also for the entire planet – and for the future generations. The effects of these changes are already grave and they are growing by the minute.

For an action on this front to succeed, in the short and medium term, the key factor would be the speed at which the political aims of the countries, continents and the world at large can be aligned with the energy stakeholders' and environmentalists' concerns and the objectives of a developed and sustainable green planet.

SOURCE: Extracts from Mr. Sarthak Behuria's speech at the 93rd International Petroleum (IP) Week, Former Chairman, Indian Oil Corporation Limited

Nuclear Energy: The Pulse of Life

By **Shashank Nakate***

Nuclear energy is obtained from the splitting of uranium atoms in a process known as nuclear fission. Although there are three ways from which nuclear reaction is possible – fission, fusion and decay – only the energy from the first has been utilized till date.

Food and Agriculture

The use of isotopes and radiation techniques in agriculture come under this category. Leading organizations have been working on the technology to increase agricultural production, improve food availability and quality, reduce production costs and minimize pollution of food crop.

In agriculture, radiation helps breed new seed varieties with higher yields, such as the 'miracle' rice that has greatly expanded rice production in Asia.

By the end of the 1980s, radiation had eradicated approximately 10 species of pest insects in wide areas, preventing agricultural catastrophes. These pests included the Mediterranean fruit fly and the screwworm fly.

Agricultural researchers also use radiation to:

- Develop hundreds of varieties of harder, more disease-resistant crops, including peanuts, tomatoes, onions, rice, soybeans and barley;
- Improve the nutritional value of some crops, as well as improve their baking or melting qualities or reduce their cooking time;
- Pinpoint where illnesses strike animals, allowing the breeding of disease-resistant livestock; and,
- Show how plants absorb fertilizer, helping researchers to learn when to apply fertilizer and how much to use; this prevents overuse, thus reducing a major source of soil and water pollution.

Environmental Safety

The process to generate nuclear energy is one of the cleanest with the lowest impact on the environment. Nuclear plants do not emit harmful gases like carbon dioxide, nitrogen oxide and sulphur dioxide, produced from the conventional electricity power plants that threaten atmosphere by increasing global warming. The energy can hence be termed as 'emission-free energy'. They require little space for the production, thus promoting land and habitat preservation. There is absolutely no effect on land, water or air resources.

Clean Water

The water discharged from nuclear power plants is very safe, free of any radiation or harmful pollutants and meets all regulatory standards. Hence, it helps in protecting the aquatic life and conserving wildlife.

Reliable

The energy does not have to depend upon weather conditions, unpredictable costs, or foreign supplies. It is a reliable source of energy even during extreme weather changes. The plants can run for about 500 to 700 days continuously, before they are shut down for refuelling.

Reduces the Dependence on Fossil Fuels

There has been an increase in production and supply of fossil fuels like oil and gas, as the world has been using them at an unbelievable pace. These deposits are emptying. On the other hand, nuclear energy requires a very smal quantity of fuel to produce large quantities of energy. One ton of uranium can produce energy that is more than that of several million tons of coal and oil.

Human Health

One very common application of nuclear energy is in the treatment of cancer – radiotherapy. Also, small amounts of radioisotope tracers are used for diagnostic and research purposes. These techniques have helped in monitoring the levels of toxic substances in food, air and water.

Other Uses

There have been great advances in using nuclear energy for peaceful purposes, such as medicinal use of isotopes and radiation techniques. A major on-going advancement is the research on Sterile Insect Technique (SIT) that helps in large scale food irrigation and biological control of pests.

Nuclear energy can also be used in industries for processing and sterilization of various products by means of radiation. With so many above mentioned advantages, nuclear energy is surely the fuel for the 21st century. To conclude, nuclear energy has enormous benefits but it is up to humans to use it safely and for peaceful purposes.

SOURCE: Mr. Shashank Nakate, Writer of Nuclear Power and Alumni of College of Agriculture, Naigon

Greening India The Nuclear Way

The threat of climate change and the importance of sustainable development have brought nuclear power in sharper focus in recent times. Growth of nuclear power worldwide, however, requires satisfactory technological responses to the challenges of a very high level of safety and security assurance (as dictated by a very large increase in the number of reactors), ability to perform with a lower level of technological infrastructure as it prevails in several developing countries, a high degree of fuel-use efficiency and superior waste disposal options. The development of the Advanced Heavy Water Reactor, AHWR300-LEU, is an effort to realise these futuristic objectives through innovative configuration of present day technologies.

Nuclear Green is following the development of the Indian nuclear program, the world's only nuclear development program that has as its long term goal a commitment to the Thorium Fuel Cycle. Indians hope to accomplish this through a refinement of old technologies. Indian progress today has been impressive and if they keep to their present schedule, it will be far more impressive during the next 10 years. While the Chinese appear likely to outbid in new reactors, Indian reactor technological developments may far outpace the developments of the Chinese.

India, barred from international nuclear trade since 1992 until early this year, plans to export atomic power reactors and is developing an advanced design for the purpose.

Dr. Anil Kakodkar, former chairman of the Atomic Energy Commission (AEC), said at the IAEA conference in Vienna two years back that India had designed a new version of AHWR named Advanced Heavy Water Reactor-Low Enriched Uranium (AHWR-LEU) that uses low enriched uranium along with thorium as fuel. The long-term goal of India's nuclear program has been to develop an advanced heavy-water thorium cycle.

The first stage employs the pressurized heavy-water and light water reactors, to produce plutonium. Stage 2 uses fast neutron reactors to burn the plutonium and breed uranium-233 from locally mined thorium. The blanket around the core will have uranium as well as thorium, so that further plutonium is produced as well.

In Stage 3, AHWRs burn the uranium-233 from the second stage with plutonium and thorium, harnessing about two thirds of their power from the thorium.

The first AHWR is expected to start construction in 2012, although no site has yet been announced. A prototype 500 MWe (Megawatt electric) fast neutron reactor being built at Kalpakkam in southern India should be completed this year.

"This version can also meet the requirement of medium sized reactors in countries with small grids while meeting the requirements of next generation systems," Dr. Kakodkar said indicating that India was ready for export of such reactors in the near future.

"While we strongly advocate recycle option, AHWR-LEU would also compete very favourably at least once through mode of fuel cycle (where spent fuel is stored without reprocessing)," he said, adding that the Department of Atomic energy has circulated a brochure of AHWR-LEU at the Vienna conference for the benefit of potential customers.

The prospect of exporting power reactors is significant in view of the fact that India was effectively isolated from international nuclear trade from 1992 until early this year when a U.S.-led initiative resulted in special arrangements for India under the Nuclear Suppliers Group (NSG), based on an India-specific safeguards agreement with the IAEA.

Overseas firms can now do business with India, which is keen to import uranium

General Description

AHWR300-LEU is a 300 MWe, vertical, pressure-tube type, boiling light water-cooled and heavy water-moderated reactor. The reactor incorporates a number of passive safety features and is associated with a fuel cycle having reduced environmental impact. AHWR300-LEU possesses several features that are likely to reduce its capital and operating costs.

- Using heavy water at low pressure reduces potential for leakages
- Recovery of heat generated in the moderator for 'feedwater' heating
- Elimination of major components and equipment such as primary coolant pumps and drive motors, associated control and power supply equipment and corresponding savings of electrical power required to run these pumps
- Shop-assembled coolant channels, with features to enable quick replacement of pressure tube alone, without affecting other installed channel components
- 100-year reactor design life

A design objective of AHWR300-LEU is to require no exclusion zone beyond the plant boundary. The AHWR300-LEU uses natural circulation for removal of heat from the reactor core under operating and shutdown conditions. All event scenarios initiating from non-availability of main pumps are, therefore, excluded. Another unique feature of its design is passive poison injection in moderator in the event of non-availability of both the primary and the secondary shut down system due to failure of all active systems or malicious employee action.

and large power reactors. In turn, India looks forward to offering its goods and services to the wider world. Producing 300 MWe (Megawatt electric; electric output of a power plant in megawatt), the unit is less than one-third the capacity of a typical large reactor. "It is designed to operate for up to 100 years and has a 'next generation' level of safety that grants operators three days' grace in the event of a serious incident and requires no emergency planning beyond the site boundary under any circumstances," the World Nuclear News (WNN) says.

The design is intended for overseas sales and the AEC says that "the reactor is manageable with modest industrial infrastructure within the reach of developing countries".

The new fuel mix, AEC says, produces less plutonium than mainstream light-water reactors and what it does produce contains three times the proportion of plutonium-238, lending it proliferation resistance. Furthermore, it leaves only half the amount of long-lived radioactive waste per unit of energy compared to mainstream light-water reactors.

Apart from introducing India as a potential new major player in reactor sales — especially to new markets – the announcement reaffirms India's commitment to proceeding with the thorium fuel cycle using the original AHWR as the final stage, says the London-based WNN.

India has a flourishing and largely indigenous nuclear power program and expects to have 20,000 MWe nuclear capacities on line by 2020 and 63,000 MWe by 2032. It aims to supply 25 percent of electricity from nuclear power by 2050.

The country has vision of becoming a world leader in nuclear technology due to its expertise in fast reactors and thorium fuel cycle. Nuclear power for civil use is well established in India. Its civil nuclear strategy has been directed towards complete independence in the nuclear fuel cycle. It is excluded from the 1970 Nuclear Non-Proliferation Treaty (NPT) because of acquiring nuclear weapons capability after 1970.

The five countries (Britain, France, USA, Russia and China) doing so before 1970 were accorded the status of Nuclear Weapons States under the NPT. As a result, India's nuclear power program has proceeded largely without fuel or technological assistance from other countries. Its power reactors to the mid-1990s had some of the world's lowest capacity factors, reflecting the technical difficulties of the country's isolation, but rose impressively from 60 percent in 1995 to 85 percent in 2001-02.

India's nuclear energy self-sufficiency extended from uranium exploration and mining through fuel fabrication, heavy water production, reactor design and construction, to reprocessing waste management. It has a small fast breeder reactor and is building a much larger one. It is also developing technology to utilise its abundant resources of thorium as a nuclear fuel.

SOURCE: News Flash by IDN News Service with inputs from Dr. Anil Kakodkar, former Chairman, Atomic Energy Commission of India

Biotechnology and Power Engineering

All Set to make a Pioneering Contribution to Clean Energy

By **Dr. Rajah Vijay Kumar ***

Across the country, as energy prices climb, farmers are turning more and more to clean energy practices. From energy-saving light bulbs to solar panels, farmers are making their operations more profitable, efficient and cleaner.

The renewable energy and agriculture sectors have clear and under-explored synergies. Vast areas of farmland can be used for wind installations without impacting agricultural yields and the crops themselves can be used as a source of power or heat generation and fuel supply. Even farm bi-products like animal waste can be converted to biogas and used for heat and electricity generation. These options allow farms to reduce their own energy costs and receive an income for the products they produce.

Scalene Energy Research Institute (SERI), the research wing of Scalene Cybernetics Limited (SCL), a leader in innovative technologies in Bio Medical Engineering, Biotechnology and Power Engineering, is all set to make a pioneering contribution to the world starved of clean energy.

SERI has developed a highly controlled biological reaction process, which yields in the production of high purity combustible gas. The energy thus produced is not only carbon neutral, but also carbon negative. Thus, it drastically reduces the carbon footprint.

Dr. Madhavan Nair, former Chairman of Indian Space Research Organization (ISRO), inaugurated the power plant. The Principal Guest was Ms. Shobha Karandlaje, Honorable Minister of Power and Energy, Govt of Karnataka and the keynote address was delivered by Dr. A.R.

Shukla, Advisor, Ministry of New and Renewable Energy, Gov't of India.

A host of other dignitaries, including Mr. Murali Kasi, Executive Director of SGCL; Shri. Nandish Reddy, Honorable Member of Legislative Assembly, Govt of Karnataka; Shri. Ramachandra Gowda, Deputy Chairman, Planning Commission, Govt of Karnataka; Shri. N. S. Srinivasa Murthy, President, FKCCI; Shri. Murugesh N Nirani, Honorable Minister for Medium and Large Scale Industries, Govt of Karnataka; Smt. Poornima Srinivas, Corporator, Ward No. 53, BBMP; Shri. A.R. Krishnappa, former Minister for Social Welfare, Gov't of Karnataka, Industry leaders; and others attended the function.

Speaking on the occasion, Dr. Madhavan Nair said that Scalene will provide the technology know-how to companies who wish to set up their own power plant. The cost of this plan will be substantially lower; and far more important, is environmentally safe. Even the bi-products of the process such as high NPK, Nitrogen fixed fertilizers and Phosphate solubilised high alkaloid pest repellents can be a boon to the farming community.

Companies such as the UB Group and Malankara Plantations have signed agreements with Scalene to have such power plants set up in Nelamangala, Bangalore and Kottayam respectively. Other organizations that are setting up the plant include Prabha Power Corporation, Hyderabad, House of Khoday's, Bangalore, Global Green Energy Parks, Bangalore, Krish Power & Gas Pvt. Ltd., Ghaziabad, and many more.

Dr. A.R. Shukla, Advisor, Ministry of New and Renewable Energy, Govt of India said, "It is heart warming to know that a technology like SPARSE was developed in Bangalore. This technology will enable organizations and households to have their own source of energy which is carbon neutral, thereby radically changing the production and usage of energy. I am sure that this technology will be one of the most significant contributions to the world which is badly in need of clean energy. This technology has the potential for utilization of both lower capacity household usage as well as higher capacity; this includes production of clean gaseous fuel upgraded to forms such as CNG for various applications like cooling, refrigeration, water pumping, vehicular applications and power generation. In addition to cooking, the bio-fertilizer and bio pesticides available in solid and liquid from the plant will enhance organic food production."

SERI Organic Fuels Technology, a proprietary technology, is the first of its kind in the world that has given rise to this unique concept. This is the result of over 20 man-years of research. The entire energy production process is simple: It processes any organic feedstock using specifically designed Microbe Incubated Bio-Reactor (MIBR) and a natural gas refinery to produce pipeline grade natural gas called SERIGAS. Thus produced 'organic' natural gas is enriched using a proprietary technology called Spiral Protium Accelerated Reactor Super Enrichment. SERIGAS can also be filled in cylinders or pipelined for cooking purposes, automobiles and industrial usage.

The feedstock includes wasteful substances arising out of our day-to-day living – wasted food; parts of animals, poultry and fishes that are not eaten;

Profile: Organization de Scalene

Scalene Cybernetics Limited is a public company incorporated under the Companies' Act of 1956. It was established in the year 2001 as a part of Organization De Scalene with an aim to develop intelligent and unique technologies for the benefit of mankind. Organization De Scalene was established in 1993. Scalene Cybernetics Limited has its corporate office at S-CARD campus, on Seegehalli Main Road, a suburb of Bangalore, India.

Scalene Cybernetics, with offices at Malaysia, Singapore, Netherlands, Dubai, North America and several European countries, has its interests in telecommunications, cutting-edge medical technologies like medical Nanotechnology, artificial intelligence, environmental sciences, power engineering and energy generation among others. Its nodal R&D centre, which is committed to break-through scientific innovation, is based in Bangalore. In Medical Engineering, two important breakthroughs have been the Cytotron and Haemoseis 256 3 D Vasculography, both of which are advanced therapeutic and diagnostic devices respectively.

Cytotron: This is an innovative technology, which applies low-spectrum radiation to alter the cellular signalling pathways, finds applications in regeneration (in case of Osteoarthritis) and degeneration (in case of Solid malignant tumors) of human tissues.

Haemoseis 256 3 D Vasculography: This is an avant-garde, non-invasive device for early identification and management of life threatening cardiovascular diseases. The device makes use of advanced patented technologies of trans aortic signal wave modulation (TASWM), Flow turbulence Accelerometry (FTA) to measure and record minute changes in the cardiovascular system every millionth of a second, and provides more than sixty vital cardiovascular parameters, which directly aid the Doctors in decision-making.

Scalene Greenenergy Corporation Limited (SGCL) is a part of Organization de Scalene. SGCL aims to develop and implement intelligent and unique technologies for generation of clean and green energy using advanced fuel enrichment techniques, various natural resources and also achieve the best-cost performance ratio. Its nodal R&D centre is based in Bangalore. SGCL has set up a 2.4 MW experimental power plant at its head quarters in S-CARD campus, Bangalore.

non-consumable part of fruits, vegetables and other agricultural waste; municipal solid waste; and oil effluents excreta of humans and animals that add to green house gases year-by-year. Weeds such as water hyacinth, water lettuce parthenium and the like, that clog our water bodies or cause allergies, also make for excellent feed for this unique energy creation.

In the light of the recent quest to derive alternate energy sources, this finding comes as a significant step forward in alleviating the need for 'clean energy'. We believe that this technology will cause a revolution in the way we produce and consume energy. At a time when the entire world is facing a severe energy crunch, this will allow for production of energy at both enterprise and individual levels. We have already seen a very positive response for this technology from across the world and we are excited about the changes it can bring about not only in India, but globally as well.

The carbon equivalent of 200 million barrels of oil are burnt each day to support the Planet's growing population of approximately 6 billion persons' search for prosperity. Carbon dioxide build up in the atmosphere has reached levels that are about 30 percent higher than at any time in the last 170 years. Recently the thermosphere – an upper layer of Earth's atmosphere – has collapsed in an unexpectedly large contraction. The thermosphere, which does the role of protecting the planet by blocking harmful ultraviolet rays, normally expands and contracts rhythmically with the solar activities. Now as greenhouse gases increase, it has a cooling effect at such high altitudes, which further contracts the thermosphere. Environmental damage and health threats due to air, water and food chain pollution have reached every area of the planet. Continued dependence on fossil fuels is detrimental to public health and is an extremely dangerous experiment that may have no point of return for our civilization, as we know it. The world's largest killers are not Cancer, Heart Disease or AIDS and the like. It is simply the air we breathe, the water we drink and the food we eat, all of which are highly polluted.

** Dr. Rajah Vijay Kumar heads Organization De Scalene as the Chairman and Chief Scientific officer of the Group.*

Green Marketing
The Indian Scenario

By **Lulu Raghavan***

According to the American Marketing Association, 'green marketing' is the marketing of products that are presumed to be environmentally safe. Thus green marketing incorporates a broad range of activities, including product modification, changes to the production process, packaging changes, as well as modifying advertising. Yet defining green marketing is not a simple task where several meanings intersect and contradict each other; an example of this will be the existence of varying social, environmental and retail definitions attached to this term. Other similar terms used are 'Environmental Marketing' and 'Ecological Marketing'.

Green, environmental and eco-marketing are part of the new marketing approaches which do not just refocus, adjust or enhance existing marketing thinking and practice, but seek to challenge those approaches and provide a substantially different perspective. In more detail, green, environmental and eco-marketing belong to the group of approaches which seek to address the lack of it between marketing as it is currently practised and the ecological and social realities of the wider marketing environment.

The results of the recently released 2011 edition of the Global Image Power Green Brands Survey undertaken by Penn Schoen Berland, a research based strategic communication advisory show that the majority of Indians think the state of the environment is heading in the wrong direction and want the government to support more green innovation and regulation.

'Limited choice' and 'lack of transparency in labelling' are the key obstacles to

buying green in India. Consumers want the government to mandate extended producer responsibility and greater label clarity with respect to ingredients and food origin. Packaging needs to be improved to highlight: the ingredients & origin, food testing & safety as well as environmental impact. Additionally, green products also need to be more widely distributed and made available in mainstream shopping venues.

"Transparency and consumer engagement will drive preference for green brands. 'Green Marketing' needs a different approach and those who will seize the initiative will see a greater share of wallet and brand equity," said Ashwani Singla, Managing Director and Chief Executive, Penn Schoen Berland, South Asia.

Concern about the environment is translating into a willingness to pay a premium for green products. 64 percent of Indian consumers indicate they plan to spend more on green products next year. Furthermore, consistent with other emerging countries, Indians are willing to pay a green premium price, with 48 percent of Indians willing to spend 10 percent more on a product simply because it is green.

Lulu Raghavan, Country Director (India), Landor, the partner for the survey says, "The survey findings tell us that greenness remains a major issue for consumers around the world and that they expect green practices from the companies they do business with. There are huge opportunities in the Indian market for companies that establish their green credentials early."

Consumer education continues to be a major contributor to purchasing decisions though Indian consumers are significantly more influenced by mass media. Consumers in India trust green advertising easily compared to their counterparts in the UK and US. With 86 percent of Indian consumers reporting that advertising about green products help consumers make more informed choices, TV advertising, programs and newspaper articles have the greatest impact on their likelihood to purchase green products.

Globally, consumers are expanding their demand for green products from the "in me and on me" category to bigger ticket items. In India 28 percent of consumers intend to purchase green auto in the next year, which is a significant increase from the 16 percent that purchased green auto last year. Similar trends are seen around the world, with China and Brazil demanding green auto and the UK, US and France demanding green technology.

Most of the companies are venturing into green marketing due to the following reasons:

Opportunity: In India, around 25 percent of the consumers prefer environment-friendly products and around 28 percent may be considered health conscious. Therefore, green

marketers have diverse and fairly sizeable segments to cater to. The Surf Excel detergent which saves water (advertised with the message—'do bucket paani roz bachana') and the energy-saving LG consumers durables are examples of green marketing. We also have green buildings which are efficient in their use of energy, water and construction materials and which reduce the impact on human health and the environment through better design, construction, operation, maintenance and waste disposal. In India, the green building movement, spearheaded by the Confederation of Indian industry (CII) - Godrej Green business Center, has gained tremendous impetus over the last few years. From 20,000 sq ft in 2003, India's green building footprint is now over 25 million sq ft.

Social-Responsibility: Many companies have started realizing that they must behave in an environment-friendly fashion. They believe both in achieving environmental objectives as well as profit related objectives. The HSBC became the world's first bank to go carbon-neutral. Other examples include Coca-Cola, which has invested in various recycling activities and Walt Disney World in Florida, US, that has an extensive waste management program and infrastructure in place.

Governmental-Pressure: Various regulations are framed by the government to protect consumers and the society at large. The Indian government too has developed a framework of legislations to reduce the production of harmful goods and bi-products. These reduce the industry's production and consumers' consumption of harmful goods, including those detrimental to the environment; for example, the ban of plastic bags in India, prohibition of smoking in public areas, etc.

Cost-Reduction: Reduction of harmful waste may lead to substantial cost savings. Sometimes, many firms develop symbiotic relationship whereby the waste generated by one company is used by another as a cost-effective raw material. For example, the fly ash generated by thermal power plants, which would otherwise have contributed to a gigantic quantum of solid waste, is used to manufacture fly ash bricks for construction purposes.

The Indian government too has developed a framework of legislations to reduce the production of harmful goods and bi-products

Benefits of Green Marketing

Today's consumers are becoming more and more conscious about the environment and are also becoming socially responsible. Therefore, more companies are undertaking responsibility to fulfil consumers' aspirations for environmentally less damaging or neutral products. Many companies want to have an early-mover advantage as they have to eventually move towards becoming green. Some of the advantages of green marketing are as follows:

- It ensures sustained long-term growth along with profitability;
- It saves money in the long run, though initially the cost is more;
- It helps companies market their products and services keeping the environment aspects in mind. It helps in accessing the new markets and enjoying competitive advantage; and,
- Most of the employees also feel proud and responsible to be working for an environmentally responsible company.

Paths to Greenness

Green marketing involves focusing on promoting the consumption of green products. Therefore, it becomes the responsibility of the companies to adopt creativity and insight and be committed to the development of environment-friendly products. This will help the society in the long run. Companies which embark on green marketing should adopt the following principles in their path towards greenness:

- Adopt new technology/process or modify existing technology/process so as to reduce environmental impact;
- Establish a management control system that will lead to adherence of stringent environmental safety norms;
- Explore possibilities of recycling used products so that it offers similar or other benefits with less wastage; and,
- Using more environment-friendly raw materials at the production stage itself.

Problems of Green Marketing

Many organizations want to turn green, as an increasing number of consumers' want to associate themselves with environmental-friendly products. Alongside, one also witnesses confusion among the consumers regarding the products. In particular, one often finds distrust regarding the credibility of green products. Therefore, to ensure consumer confidence, marketers of green products need to be much more transparent and refrain from breaching any law or standards relating to products or business practices.

About the Green Brands Survey

The Image Power Green Brands Survey identifies emerging trends related to consumer perception and purchasing behaviour of 'green' products.

This is the seventh annual study conducted by WPP agencies (NASDAQ: WPPGY) Penn Schoen Berland (PSB), Cohn & Wolfe, Landor Associates as well as independent sustainability strategy consulting firm Esty Environmental Partners. The study was conducted online with consumers above 18 years of age in between 27 February and 24 March 2011. It has a margin of error of +/- 3.0 percent. For Brazil, India and China the research was limited to Tier 1 cities. Sample size in India represents the consumer that has the means and can "put their money, where their mind is."

SOURCE: Mr. Lulu Raghavan, Country Director (India), Landor Mr. Nayan Ranjan Sinha, School of Management Sciences, Varanasi

The Power of Solar Pumps

By **Mr. Nitin Mutiyan & Mr. Ajit Bhandari ***

A solar powered pump runs on the power of the sun. A solar powered pump is environment friendly and economical in its operation compared to pumps powered by an internal combustion engine (ICE) or animal power. Solar pumps are powered by another device (such as solar panels), which in turn are powered by the renewable electricity generated from the sun (solar electricity). A solar powered pump consists of four parts:

- The actual fluid pump (that moves gases or liquids under pressure);
- The controller (adjusting speed and output power according to input from solar panels);
- The engine (usually an electric motor); and,
- The energy source being powered by the sun (usually photovolatic cells i.e. solar panels).

Solar array (photovolatic cells, solar panels) takes up 50-80 percent of the whole setup cost. There are two major types of solar pumps, DC (direct current) and AC (alternating current).

Characteristics of DC solar pump are as follow:

- Power output up to 2KW;
- Suitable for small applications (garden fountain, landscaping);
- Relatively low-priced (require slightly less solar panel); and,
- Low compatibility (only selected controller work selected motor).

For AC solar pump, a solar pumping inverter is needed. The inverter converts DC generated from solar array to AC, which is responsible for driving pumps to control output and speed.

Characteristics of DC solar pump are as follow:

- Power output range from 150W to 55KW;
- Suitable for all kinds of applications from landscaping to irrigation, especially large scale such as farmland irrigation, desert control, etc.; and,
- High compatibility (inverter works with different kinds of AC motor and pump).

The following steps will help to accomplish the setup of the solar pumps:

1. **Initiate the Pump** – All kinds of water pumps, regardless of the electricity powered water pumps or solar powered water pumps, cannot present well if it is pumping air. To initiate the solar pumps, you need to put the body into the water so that the intake can fill with water and the air inside can be removed at the same time. This process takes a little time but is quite essential.
2. **Expose the Solar Panel to Sunlight** – Solar panel must be located where the panel can receive maximum sunbeam. The longer the solar panel is exposed the more power it will get.
3. **Get the Debris out of the Water** – Though most solar powered pumps are equipped with a filter to prevent dust and waste from blocking the solar fountain intake, the choice of water type can still exert some influence on the performance. The fact remains that pure water enables more efficient pumping. The tap water which seems to be quite pure can also produce some minerals from the water in the pump. To prevent this, the distilled water can be used, which however would cost more. On the other hand, you can also change the water more frequently and pay more attention to water cleaning.

Water Pumping

Solar PV water pumping systems are used for irrigation and drinking water in India. The majority of the pumps are fitted with a 200 watt - 3,000 watt motor, powered

with a 1,800 Wp PV array, which can deliver about 140,000 litres of water/day from a total head of 10 metres. Over 7,068 solar PV water pumping systems have been installed.

Chemical Injection

Many oil and gas wells require accurate injection (metering) of various chemicals, under pressure to ensure safe and environmentally sustainable operation. Historically, these chemical injection pumps (CIP) have been driven by a gas reciprocating motor, utilising the well's gas and exhausting the gas into the atmosphere. As it results in adding to the Earth's Greenhouse Gas problems as well as other environmental issues, Solar Powered Chemical Injection Pumps (Solar CIP) have been a welcome development.

The installation of a Solar Array (Photovoltaic cells) not only provides a sustainable power source for the Solar CIPs but can also provide an electric source to run remote SCADA type diagnostics with remote control and Satellite/Cell communications from very remote locations to the desktop/ notebook computer.

Pune based Span Pumps have launched Solar Powered pumps for Community and Institutional water supply. The first of these unique pumps was launched at the hands of Mrs. Savita Tai Dagde, President, Zilla Parishad, Pune. The first solar water pump was installed by the Gram Panchayat of Talegaon Dhamdhere in Pune District. Speaking to reporters, Directors of Span Pumps Mr Nitin Mutiyan & Ajit Bhandari said that during a normal day the pump operates for about 7-8 hours between sunrise and sunset and pumps about 9000L water.

The advantage of these pumps is that there are no recurrent costs as the solar power is free and the systems can run without an operator. A large percentage of the rural communities are dependent on bore well for drinking water supply. While some of these wells are energized with power pumps, most are provided with the manually operated pumps developed in the nineteen eighties. Since then, rural communities have been using these pumps for over three decades. The hand pump is recognized as a backbone of the rural water supply programme. On the other hand, however, the over development of ground water coupled with lack of adequate re-charge has lead to lowering of water levels in many areas.

During the lean summer months, it is common to see that operating a hand pump gets laborious. With this in mind they developed the Solar powered bore well pumping system especially as an alternative option to overcome the above mentioned difficulties. The system consists of a submersible pump which runs on power generated from the photovoltaic solar cells. The system is very useful for areas without access to or intermittent electric supply. The system is suitable for use on 100 mm and above diameter bore wells up to 80-90 metres depth. In practice a solar array (300-800W) is installed near the bore well. A submersible pump powered with DC motor is installed below the hand pump cylinder. Both the submersible and the hand pumps share the same riser pipes.

The system developed by Span Pumps operates without batteries and inverter. The pump draws power from the solar array directly. The pump is connected to a storage tank and water is dispensed through a stand post. After sunset or when solar power is not available, the users can operate hand pump to obtain water. The system, thus, has a back-up and ensures uninterrupted water supply. The life of a solar panel is estimated to be around 15-20 years plus the product is also environment and user friendly.

Advantages of Solar Pumps

In comparison to traditional electric or gas-powered pumps, solar-powered water pumps are an effective, advantageous alternative. Nowadays, these modern pumps are being used to a great effect around the world, particularly in India, where they are widely used for both irrigation and drinking water.

The primary advantage of solar-powered pumps is that they run free of cost. A solar array attached to the pumping mechanism gathers all the necessary power from simple sunlight. This also means that the system is self-contained. There is no need for complex wiring to the electrical grid and outside fuel is also not required.

The amount of pollutants created due to the usage of traditionally powered pumps is also eliminated. This is a great advantage, particularly when used for irrigation on farms, where pollution could cause possible on-site harm. Potential contamination is reduced by keeping fossil fuels out of the equation when pumping drinking water. In addition, the application of solar pumps has many benefits for agriculture; for instance, farmers can use a solar pump to drain a low-lying field that frequently gets flooded or to divert water used for feeding livestock and plants.

The primary advantage of solar-powered pumps is that they run free of cost. A solar array attached to the pumping mechanism gathers all the necessary power from simple sunlight. This also means that the system is self-contained

For any water-pump system, both large and small scale, the installation of solar powered systems is among the easiest and cost-effective. There are no lengthy wiring procedures beyond attaching the solar array and there is no need for further transportation of fuel. Many of these systems also incorporate digital monitoring and control devices, further adding to their ease of operation.

In Summing Up,

Overall, solar energy is among the best means of powering pumping devices. Ease of installation, low maintenance equipment and pollution reduction are just a few of the many advantages.

** Mr Nitin Mutiyan & Ajit Bhandari are Directors, Span Pumps*

Safety for Crops

Indian Oil introduces Environment Friendly Servo Agro Spray Oil

By **Dr. Pankaj Bhatnagar, Dr. Deepak Saxena, Dr. R.T. Mookken and Dr. K.P. Naithani ***

Ministry of Fertilizers is spending over Rs.1,00,000 crores by way of subsidy on fertilizers every year. Most of this amount is wasted because the crops produced with the use of fertilizers, are not adequately protected from pests, diseases and weeds, by using the right pesticides.

The environmental impact of pesticides is often greater than what is intended by those who use them. Over 98 percent of sprayed insecticides and 95 percent of herbicides reach a destination other than their target species, including non-target species – air, water and food. Thus, basic constituents of life i.e. soil, water and air some way or another get affected by the evils of modernisation.

While Science & Technology make every effort to provide a healthy lifestyle, some side effects of the same technology create certain problems for the environment. One such issue which has been prominently visible in the agricultural sector for some years is the use of pesticides by farmers to protect their crops from being affected by the menace of pests. Most of the pesticides or insecticides that are used in India are imported and are composed of harmful chemicals. To ward off the pests and maintain their quality of yield, farmers have no solution but to use these pesticides which form a large part of their expenditure per annum and also affect their health.

The amount of pesticide that migrates from the intended application area is influenced by the particular chemical's properties: its propensity for binding to soil, its vapour pressure, its water solubility and its resistance to being broken down over time. Factors in the soil, such as texture, ability to retain water and the amount of organic matter it contains also affect the amount of pesticide that will leave the area.

A recent study put forth by Nanjing Agricultural University and funded by the National Natural Science Foundation of China provides further insight into the delicate relationship between plants and the soil in which they are grown. An experiment involving ryegrass shed light on how environmental toxins, chemical pesticides and other pollutants are fully capable of absorbing directly into plants and distributing throughout plant cells.

The vast majority of the world's rivers are also threatened by pollution, pesticide runoff and destructive species, say researchers from The City College (CCNY) of The City University of New York (CUNY), the University of Wisconsin and seven other institutions. And not only is the integrity of the world's water at heightened risk, but so are countless aquatic species that rely on the threatened habitats for survival. Thus, the rampant use of harmful pesticides is leaving its mark everywhere.

Indian Oil's Research and Development wing has developed an environment friendly alternative to this harmful yet necessary ingredient called 'pesticide' used widely by farmers across the Indian agro terrain. This Centre has announced the solution by formulating a biodegradable spray oil called Servo Agro Spray Oil for pests and disease management in farms. Commercialised through Indian Oil's Servo Network, this product is environment friendly, safe and biodegradable.

Prolonged use of chemical pesticides and

chemical sprays in agricultural lands leads to resistance of pests to these products and even outbreaks or resurgence of secondary pests. Though the use of chemical pesticides might result in an increased yield, and control of unwanted diseases and insects, they prove to be more harmful in the long run. They leave chemical toxic residues in the crops thereby polluting the soil, water and air. Presence of such residues also affects the export of such crops to other countries, thus affecting the business of farmers in India.

As a part of the mission by Research and Development Centre to create environment friendly products which are oil based but have inherent biodegradable constituents, the new Servo Agro Spray Oil is based on a highly refined petroleum stream, the base of which is mineral oils and thus the whole product is biodegradable in nature with no harmful chemicals. Because of this nature, this new oil does not leave behind chemical residues on the food crops which are meant for consumption.

This new spray Oil has been developed to cater to a myriad range of crops such as rice, mango, banana, apple, mustard, tea and has also proven its effect on various other plantations. The 'T' type of Servo Agro oil has been launched for use in tea plantations, while 'M' type for Mango trees and the 'S' type are for other crops such as paddy, mustard and rape seed. The oil is sprayed before flowering for best results and has been reported as a crop-friendly, farmer-friendly bio-degradable spray by some of the cotton and vegetable farmers across the nation. The oil spray works in killing the insects by an oxygen-cutoff method. An 'oil in water' emulsion (0.5 to 2.5%) is sprayed on the plantation. Once the water evaporates, the oil creates a thin film over the pests, insects or pathogens which act like a physical barrier, cutting off their oxygen supply and thus killing them. This spray seeps into crevices where insects generally lay their eggs thus killing them at the source and stopping them from spreading.

A study conducted in cultivated areas for important crops like tea, grapes, rice, mango, apple, citrus, mustard, banana, mustard, vegetables etc. showed that regular use of spray oil yielded better

results. To assess the quantity of spray oil to be used, research conducted on the same cultivated areas proved that the total potential for agriculture spray oil works out to be 10000 kilo litre per year. Servo Agrospray Oil possesses over 70 percent bio-degradability as per CEC test method and meets the criteria of ECOMARK notification by the Ministry of Environment and Forests, Government of India.

In order to establish the performance of 'Servo Agrospray Oils' with respect to bio-efficacy and non phyto-toxicity, joint evaluations were conducted by leading Agriculture Institutes of (Indian Agricultural Research Institute) IARI and Agriculture Universities. Detailed evaluation about the performance of this oil has been recorded in crops like tea, grapes, rice, mango, apple, citrus, mustard, banana, mustard and other vegetables to name a few. From the study, it was found that the new oil is very effective in killing pests such as mites, san jose scale, hoppers, aphid, caterpillar, mealy bug, sucking pests etc.

Besides the above research studies, extensive toxicological studies were also conducted on livestock and plant friendly pests (honey bee, useful for pollination) and animals (rats, rabbits, fish, chickens, pigeons) by Shriram Institute of Industrial Research, Delhi, where the non-toxicity and safe nature of this spray oil were established. After thorough analysis of all the data, approval was obtained from 'Uttaranchal State Organic Certification Agency (USOCA), Dehradun' and suitability certificate from 'IMO Control Private Ltd. (Institute of Market Ecology), Bangalore' for organic farming.

Since this new Agro Spray Oil has been developed indigenously, it proves to be a more cost effective solution for Indian farmers than buying imported pesticides. As the oil does not have dangerous chemicals, the spraying is easier for a worker; there is no requirement to wear any kind of goggles or gloves, or to take extra precautions or even worry about the after affects.

An Indian and Russian patent has been obtained for this innovative spray. The Servo Agro Spray Oil has been awarded the prestigious CSIR (Council of Scientific and Industrial Research) Science & Technology Innovation Award for Rural Development. The citation along with the trophy for this new unique oil was received by the Chairman and Director (R&D), Indian Oil Corporation, from the Honourable Prime Minister of India.

** With inputs from Dr. Pankaj Bhatnagar, Dr. Deepak Saxena, Dr. R.T. Mookken and Dr. K.P. Naithani, Research and Development Team, Indian Oil Corporation Ltd., R&D Centre, Sector-13, Faridabad – 121 007*

Soya Products

Value Chain Analysis in Punjab

By **Arjinder Kaur and Parminder Kaur ***

Soybean is one of nature's wonderful nutritional gifts having a high quality protein with minimum saturated fat, making people feel better with enhanced quality of life and longevity. Soybean contains all the three macro nutrients required for good nutrition – fibre, vitamins and minerals. This legume crop is considered as 'Gold' obtained from soil, and is rightly called 'Gold Nugget of Nutrition' owing to its nutritional composition.

The ever increasing population of India, now touching 125 crore, has only 2.3 percent share of total land area on the planet earth. The question of providing food and nutritional security through quality food at an affordable cost has always been of paramount importance in the Indian scenario. Thus, sustained food and health security depends on the progress of existing cropping systems as well as identification of food raw materials which are more productive and nutritious. Soybean is one such option.

Soybean is a global crop grown in more than hundred countries. It has been cultivated in China for over 3000 years. The miracle food was introduced to India from China through Himalayan Mountains several centuries ago. But it was only during the past decade that India emerged as a major player in soybean and is the fifth largest producer of soybean.

Table 1: Growth of Soybean Area, Output and Yield in India

Year	Area (000 ha)	Output (000 tonnes)	Yield (kg/ha)
1971-72	30	10	426
1979-80	500	280	568
1984-85	1240	950	768
1989-90	2250	1810	801
1994-95	4320	3930	911
1999-2000	6220	7080	1138
2004-05	7570	6870	908
2008-09	9520	9900	1040

Source: Agricultural Statistics at a Glance.2009

The major producing states in the country have been shown in Table 2.

Table 2: Area, Production and Yield of Soybean during 2007-08 in Major Producing States in India

State	Area (000 ha)	Percentage to all India	Output (000 tonnes)	Percentage to all India	Yield (kg/ha)
Madhya Pradesh	5020	56.53	5480	49.95	1091
Maharashtra	2660	29.95	3980	36.28	1492
Rajasthan	800	9.01	1070	9.75	1343
Andhra Pradesh	90	1.01	170	1.55	1966
Karnataka	110	1.24	100	0.91	858
others	200	2.25	170	1.55	-
All India	8880	100	10970	100	1235

Source: Agricultural Statistics at a Glance.2009

Increasing incomes as well as urbanisation is always accompanied by a change in the food basket. A large part of this shift is driven by the processed food market (Corporate Catalyst, India). The food processing sector is recognized as having an important role in improving agricultural productivity, reducing wastage, providing better nutrition and improving food availability in desired form for the domestic market with changing lifestyle patterns and health consciousness.

In recent years, with the popularity of soy products, soy processing is picking up in the state of Punjab. There are approximately 40 medium and small size units existing here.

So, this study was devised with the following specific objectives:

1. To study the value-addition in soy-processing units in the state.
2. To study the capacity utilization in soy units.
3. To estimate the breakeven point of soy units.

Methodology: The analysis has been based on both secondary as well as primary data. The status of soy in India has been presented with the help of secondary data, while the value-addition analysis of Punjab state is based on the primary data collected from randomly selected two of the processing units existing in the state – one small sized and the other medium sized on the basis of installed capacity, as there is no large sized unit in the state. Break even value analysis was used to know the minimum level of production required for recovering the total fixed capital employed in the sampled units.

The formula used is as follows:

$$B.E.P = \frac{F}{1-V/S}$$

Where: F = Total fixed cost of the unit in rupees per day; V = Variable cost of the unit in rupees per day; S = Sales realization of the processed production rupees per day

Benefit cost ratio has been worked out by dividing present value of benefits with present value of costs. The production is acceptable when ratio is more than one.

B: C Ratio = PWB/PWC

Where: PWB = Present worth of benefits; and, PWC = Present worth of costs

Results & Discussion:

The primary data pertaining to sampled units of the state has been analysed on various parameters.

a) Capacity Utilization in Soy-Processing Units.

Table 3: Capacity Utilization of Sampled Units

Unit Size	Installed Capacity	# of days	Annual installed capacity	Quantity processed/ day	Capacity utilized (%)
Small	240 lts/ day	255	61200 lts	68.6 lts	26.21
Medium	480 lts/ day	275	132000 lts	88.2 lts	18.38

In small unit, annual installed capacity of production is calculated at 61,200 litres of milk. The average quantity processed in this unit was 68.6 litres of soybean per day. The small unit worked for 255 days in a year. The utilized capacity in relation to installed capacity indicated that only 26.21 percent of the total capacity was utilized here. In the medium unit, the installed capacity is 480 litres per day but quantity of soybean processed was 88.2 litres per day. Thus, utilized capacity in relation to installed capacity came to be a mere 18.38 percent. The medium sized unit worked for 275 days in a year.

The installed capacity of medium sized unit is found to be double to that of small sized unit. The working days are also found to be more in the medium sized unit and thus quantity processed per day is higher here. But capacity utilisation is less than that

of a small sized unit. Punjab is a non-traditional soy processing and consuming state. The demand is slowly picking up here. But the processing units have installed higher capacity machinery. Thus, capacity utilization is found to be very low.

b) Quantity of Products per kilogram of Soybean processed in the sampled units:

Table 4: Quantity of Main Product and By-Product per Kilogram of Soy Processed in Sampled Units

Particulars	Quantity Produced	% to total output	Small unit (% to total output)	Medium unit (% to total output)
Soy milk	7 litres	22.22	57.02	70.57
Tofu	1.25 kg	7.94	4.85	7.41
Namkeen	5 kg	38.09	12.92	21.24
Biscuits	5 kg	6.35	-	-
Soy flour	1.43 kg	25.39	23.28	-
By-product	1.10 kg	0.28	1.69	0.78

As clear from table 4 soy milk is found to be the main product in both the sampled units. In technical terms, 1 kilogram of raw soy processed gives rise to seven litres of milk, 1.25 kilograms of tofu (paneer), five kilograms of namkeen pakoras, five kilograms of biscuits and 1.43 kilograms of soy flour in sampled units. In percentage terms soy milk contributes 22.22 percent of total value of processed products, tofu - 7.94 percent, namkeen pakoras – 38.09 percent, biscuits – 25.39 percent and soy flour – 6.35 percent respectively. In small sized units the quantity percentage of main product and by product per kilogram of soy processed has been calculated at 57.02 percent of soy milk, 4.85 percent of tofu, 23.28 percent of soy flour, 12.92 percent of miscellaneous products and 1.69 percent of soy waste per day respectively.

In medium sized unit, this quantity percentage of various products has been worked out at 70.57 percent of soymilk, 7.41 percent of tofu, 21.24 percent of miscellaneous products and 0.78 percent by product i.e. soy waste. Thus, it is clear that production of all the main products is higher in medium sized unit except for the soy flour, which is not under production here.

c) Value addition per kg. of Soybean:

Table 5: Value Addition per Kilogram of Soybean

No.	Particulars	Small Unit	Medium Unit
1	Sale value of Soy product Rs/day	8075	12535
a	Milk	3000	7500
b	Tofu	525	735
c	Miscellaneous Products	2100	4300
d	Soy flour	2450	-
2	Purchased value of raw Soy Rs/day	2450	2610
3	Value addition Rs/day	5625	9925
4	Percentage of value added	229.59	380.27

Value addition per kilogram of soybean processing has been shown in table 5. In small sized unit the sale value of soy products per day has been calculated at Rs.8075. Of this value soymilk contributes Rs.3000, tofu Rs.525, miscellaneous products Rs.2100 and soy flour Rs.2450 on per day basis. Purchase value of soy that is processed per day has been worked out at Rs.2450. Thus per day value addition to raw soybean has been put at Rs.5625 per day in small sized unit which accounts for 229.59 percent of value addition.

In case of medium sized unit total sale value of soy products per day has been worked out to be Rs.12535. The contribution of soy milk is found to be Rs.7500, of tofu Rs.735 and miscellaneous products at Rs.4300 per day. Purchase value of raw soybean for this unit has been calculated at Rs.2610 per day thus depicting the value addition at Rs.9925 on per day basis. This has led to percentage of value added at 380.27 percent.

d) Cost and Return structure in the sampled units:

Table 6: Cost & Return Analysis of Sampled Units (Rs/day)

Particulars	Small Unit	Medium Unit
Sale Realization	8450	12985
Total cost	10635.84	14621.22
Net Return	- 2185.84	- 1636.22
Benefit Cost Ratio	0.79	0.89
RFFR	1693.39	5988.44

As shown in table 6, the total cost of small unit has worked out at Rs.10,635.84 per day, while the sales realization is calculated at Rs.8,450 per day, indicating net returns of (-) Rs.2,185.84 per day. It shows a benefit cost ratio of 0.79, which is economically unviable. Similarly in the medium sized unit, total cost has been worked out at Rs.14,621.22 per day, while sales realisation are at Rs.12985 per day. This resulted in negative

net returns of Rs.1636.22 per day showing benefit cost ratio at 0.89. However, the returns to fixed farm resources for small sized unit were found to be Rs.1,693.39 per day and for medium sized unit at Rs. 5,988.44 per day. Thus, a higher fixed cost in terms of plant, machinery and equipment was accounting for negative net returns and less than one benefit cost ratios.

e) Breakeven value in case of sampled units:

Breakeven analysis is useful in understanding the relationship between the level of operation, revenue, variable costs, fixed costs and their influence on profitability. For the small sized sampled unit, total fixed cost was worked out at Rs.3,879.23 per day and the total variable cost comprising cost of raw material, labour, fuel/electricity, packing material, transportation, marketing etc. as well as interest component of variable cost was computed at Rs.6,756.61 per day, thus indicating the total cost at Rs.10,635.84 per day. However, gross returns of the unit were calculated at Rs.8,450 per day including returns from soy main products and by product. The breakeven capacity of the unit was calculated at 177.47 percent, in the light of huge fixed investment and very low utilized capacity in relation to the installed capacity. Similarly, in case of medium sized unit, the fixed cost came to be Rs.7,624.66 per day and the variable cost at Rs.6,996.56 per day. Thus, total cost computed at Rs.14,621.22 per day. On the other hand, the gross returns for the unit were worked out to be Rs.12,985 per day. In this light, the breakeven value of output for the unit was at Rs.16,532.22 per day.

Table 7: Breakeven Value of Production

	Small Unit	Medium Unit
Fixed cost (Rs/day)	3879.23	7624.66
Variable cost (Rs/day)	6756.61	6996.56
Total cost (Rs/day)	10635.84	14621.22
Gross Realization (Rs/day)	8450	12985
Breakeven value (Rs/day)	19347.78	16532.22
Breakeven capacity (%)	177.47	465.99

f) Mode of Marketing Adopted by Sampled Soy Processors:

As the soy products are unconventional food items, the sampled units are generally catering to localized demand in nearby areas. In case of small sized unit two marketing channels were reported as: Producer to Customer share of output at 65 percent; and, Producer-Distributor to Retailer-Consumer at 35 percent

The producer was found to be giving 10 percent margin to the distributor. A further 5 percent was given to the retailer. However, in medium sized unit, the total marketing was reported to be direct through hired salesmen on commission basis. So, the only channel available was: Producer-Consumer share of output at 100 percent.

Conclusion

It has been witnessed that in the light of low demand, utilised capacity of the sampled units has been very low. However, due to high initial cost, fixed cost of the units was found to be high, thus indicating negative net returns. However, returns to fixed farm resources (RFFR) were found to be positive. Value addition component was found to be very high in soy products. Value addition is an essential part of transforming Punjab agriculture. Acceptance of soy products by the consumers will lead to high demand for these and thus further scope for food processing industries in Punjab.

SOURCE: By Arjinder Kaur and Parminder Kaur, Deptt. of Economics and Sociology, PAU, Ludhiana - 141004

Micro Finance in India
A step towards Rural Prosperity

By **Dr. Mohd Azam Khan &Tosib Alam** *

Poverty and unemployment are the major problems of under developed countries including India. The Planning Commission has estimated that 27.5 percent of the population live below the poverty line. The criteria used for assessment were monthly per capita consumption expenditure below Rs. 356.35 for rural areas and below 538.60 for urban areas. About 71 percent of the poor are in rural areas, most of them are daily wagers, self-employed and landless labourers. One of the important reasons identified for the stagnancy in the poverty line was low access to credit from the formal financial institutions.

In this scenario microfinance has emerged as a cost-effective and efficient way for reducing poverty. Microfinance has proven to be an effective and powerful tool for poverty alleviation.

Growth and Development of Micro Finance in India

Recognising the potential of micro-finance through Self-Help Groups (SHGs) to positively influence the development of the poor, the Reserve Bank, NABARD and Small Industries Development Bank of India (SIDBI) have taken further fillip in micro-financing. The basic purpose of the linkage is to strengthen the financial health of SHGs by ensuring adequate flow of bank credit to these institutions.

Self-Help Groups (SHGs)

India has been experiencing micro credit in the form of SHGs as a part of formal credit delivery system giving freedom to Non Government Organizations (NGOs) to set up SHGs on various models. They have been recognized as useful tools to help the poor and as an alternative to meet the urgent credit needs of the poor.

SHGs go through Various Stages of Evolution:

Group Formation: At this stage, groups are formed, developed and strengthened to evolve into self-managed people's organisations at the grassroots level.

Group Stabilisation: Through thrift and credit activity among the members and building their group corpus, the group undertakes internal lending to the members of the corpus.

Micro Credit: The group corpus is supplemented with Revolving Fund. It is sanctioned as cash credit limit by the banks for livelihood.

Micro Enterprise Development: Here, the group takes up economic activity of its choice for income-generation.

NGOs create a strong base for the members in forming SHGs where the

members contribute their saving to a common pool and money is lent to the members on rotation basis according to their need and preference. The groups are eligible for the loans from the banks after six month of saving and credit operations. The opportunity provided in safe saving as well as availability of need-based credit encourage more poor people to join SHGs. The members use the credit for a variety of purposes like small business, agriculture, health, education of children, festivals and so on.

SHGs have developed rapidly in the country due to the following reasons:

- This is a flexible system;
- The association of people in the group is based upon mutual confidence;
- Common pooling of funds;
- The common fund meets the credit need of members;
- This is a cost effective system;
- Active population of NGOs increase their strength;
- Interest rate on borrowings is comparatively low;
- Recovery is encouraging because of member's active participation;
- SHGs help the poor villagers to freed themselves from the village moneylenders.

SHG-Bank Linkage Programme: The SHG-bank linkage programme is the flagship microfinance intervention mechanism of NABARD which, with the policy back up of the RBI, is designed to link these groups with banks to overcome the financial constraints. With the NABARD programmes on self-help groups, the emphasis is shifted to loans without collateral, 100 percent repayment norms and lending to groups of people who would also invest their saving and regulate their groups and group's loans, thus reducing transaction costs for the borrowers and for the banks.

Under the SHG-Bank Linkage Programme as on March 2010, 69.53 lakhs SHGs held saving bank accounts with total savings of Rs.6198.71 crores as against 61.21 lakhs SHGs with savings of Rs. 5545.62 as on March 2009, thereby showing a growth rate of 13.6 percent and 11.8 percent. Thus, more than 97 million poor households were associated with banking agencies under this programme.

Models of Linkage: The three broad models of linkage programmes are as follow:

- **First Type:** Bank takes the initiative to form the groups, open their savings account and provide them credit.
- **Second Type:** Groups are formed and developed by government agencies, NGOs or communities.
- **Third Type:** The NGOs that forms and develops the SHGs also act as financial intermediary. The banks lend to financial intermediaries for further lending to the members of SHGs.

The second type has emerged as the most popular model accounting for over 70 percent of the total SHGs financed under their category, followed by model I and model III.

Table 2: SHG Bank Linkage Progress Last Two Years (Rs. Crore)

Particulars	2008-09		2009-10		Growth Rate	
	No. of SHGs	Amount	No of SHGs	Amount	No of SHGs	Amount
Savings SHGs with Banks	6121147	5545.62	6953250	6198.71	13.6	11.8
Bank Loans Disbarred to SHGs	1609586	12253.51	1586822	14453.30	-1.4	17.9
Bank Loans Outstanding with SHGs	4224338	22679.84	4851356	28038.38	14.8	23.6

Source: Status of Micro Finance in India 2009-10, NABARD.

Table 1: Progress of Self-help Groups

Year	Credit (Rs. Crore)	Self-Help Groups (in lakh)	No. of self Employment (in lakh)
1999-2000	192.98	1.15	9.31
2000-2001	480.87	2.64	9.78
2001-2002	10,26.34	4.61	NA
2002-2003	20,48.70	7.17	32.48
2003-2004	39,04.21	10.80	45.67
2004-2005	6898.46	16.18	NA
2005-2006	11,397.55	22.38	62.75
2006-2007	12,366.49	28.94	73.25
2007-2008	16,999.90	36.26	93.21
2008-2009	22,679.85	42.24	120.89

Source: Status of Micro Finance in India 2009-10, NABARD, Economic survey 2009-10. The number of poor families benefiting through SHGs increased from 9.31 lakhs in 1999-2000 to 120.89 lakhs on 2008-09.

Women Empowerment: The widespread formation of the SHGs means that it has also taken the form of a movement for social development of women in India. The percentage of loans outstanding exclusively for women has increased to 82.1 percent on March, 2010 from 81.9 percent on March, 2009.

The Issues and Challenges: Micro-finance has been seen as a social obligation rather than a potential business opportunity. Sometimes, a few financial institutions charge the beneficiaries of a

group high interest rate which makes the repayment difficult for the poor. In most of the cases, it has been found that members of a group take up certain economic activities for their sustenance which are not preceded by relevant training.

Financial Support and Promotional Efforts by NABARD

NABARD has been playing the role of propagator and facilitator by providing conducive policy environment, training and capacity building besides extending financial support for the healthy growth of SHG linkage programme. Significant support and promotional efforts are as follow:

NABARD Refinance Support to Banks: NABARD provides refinance support to banks to the extent of 100 percent bank loans disbursed to SHGs. The cumulative refinance disbursed under SHG bank linkage programme by NABARD to banks up to 31 March, 2010 stood at Rs. 12861.65 crores.

Micro Finance Development and Equity Fund: The Micro-finance Development and Equity Fund is being utilised for promotion of various micro finance activity such as formation and linkage of SHGs through SHPIs, training and capacity building of stake holders, capital and soft loan assistance to MFIs, livelihood propagation, studies, documentation, etc. During 2009-10, an amount of Rs. 80.91 crores was released, of which Rs. 20.49 crores grant was for capital support/Revolving Fund Assistance (RFA) to MFIs, as against Rs. 18.73 crore and 15.93 crore in the previous year, respectively.

Support for Partner Agencies: NABARD continued to extend grant support to NGOs, RRBs, DCCBs, FCs and Individual Rural Volunteers (IRVs) for promoting and nurturing quality SHGs. As on 31 March, 2010, Rs. 4,037.74 lakh was released and 2,36,863 SHGs credit linked to banks.

Capability Building and Training of Partner Agencies: To fine-tune the strategies for enhancing support to the microfinance sector, NABARD conducted many awareness oriented programmes and arranged exposure visits for SHG members, NGO, bankers, trainers, Panchayati Raj Institutions (PRIs) representatives, NABARD officials, IAS officers and micro-entrepreneurs throughout the year.

Joint Liability Groups (JLGs): NABARD has issued comprehensive guideline on Joint Groups to banks focusing on small and marginal farmers, tenant farmers engaged in farm sector and other clients under non-farm activities.

Micro Enterprise Development Programme for Skill Development: The Micro Enterprise Development Programme (MEDP) was launched by NABARD in 2006 with the basic objective to enhance the capability of the numbers of matured SHGs to take up micro enterprises through appropriate skill upgradation/development in the existing or new livelihood activities both in the farm and non-farm sectors by way of enriching knowledge of participants on enterprise management business dynamics and rural markets. In 2009-10, a total of 1530 MEDPs, both under farm and non-farm activities were conducted across the country covering 38,313 numbers of the matured SHGs. Cumulatively, so far covering 93,777 participants.

Pilot Project on SHGs – Post Office Linkage Programme: NABARD sanctioned additional Rs. 200 lakhs Revolving Fund Assistance (RFA) taking the total RFA sanctioned to Rs. 500 lakhs.

Providing Technology Support to NGOs: The scheme of supporting NGOs for computerisation of MIS of the SHG-Bank linkage programme has been revised. NGOs promoting a minimum of 250 SHGs would now be eligible for a maximum grant assistance of Rs. 50,000 for hardware components.

Support to SHGs Federation: Recognizing the emerging role of the SHGs Federation in nurturing of SHGs, enhancing the bargaining power of groups members and livelihood promotion, NABARD introduced during 2007-08, a flexible scheme to support such federations, irrespective of their model.

Conclusion

Microcredit and microfinance has received extensive recognition as a strategy for poverty reduction and for economic empowerment. The assumption is that increasing women's access to micro-finance will enable them to make a greater contribution to household income. This contribution and subsequent increase in status in the household will, in turn, give women the support they need to bring about wider changes in gender inequality in the community.

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Discover The Various Powers of Mustard

Diet, nutrition and fats are often the subject of heated debates and animated discussions at dining tables, in laboratories and health shows on television. The informed and the health-conscious scrutinize, literally, every grain they eat. Hence, it is not a matter of surprise to note that the grains of the Indian rapeseed-mustard (Brassica) do not find any takers in the international export market. The high content of erucic acid and glucosinolates in it keeps the international market at bay. Erucic acid, which is feared to be an agent of cardiac problems and high glucosinolates in the oil cake, is not desired for animal feed. On the other hand, as a condiment, mustard averages approximately five calories per teaspoon. Some of the many vitamins and nutrients that mustard seeds are high in include selenium and omega 3.

The Balancing Act

Rapeseed-mustard is the second most important edible oilseed crop in India and its nutritional advantages surpass many other edible oils. It has the lowest amount of harmful saturated fatty acids and also contains two essential fatty acids – linoleic and linolenic – that most other edible oils do not possess. The high amounts of erucic acid and glucosinolates define its drawbacks.

TERI Uttam – The First Double-Low Variety released for Cultivation in Madhya Pradesh: In the early 1990s, researchers at TERI took up the challenge to produce a variety that retained the existing nutritional properties and minimized the detrimental effects of the undesired components in the oil and oil-free cake.

About the Indian Rapeseed-Mustard

The rapeseed-mustard produced in India does not match up to the requisite international standards of canola quality—less than 2 percent erucic acid, more than 60 percent oleic acid in the seed oil and less than 30 micromoles of glucosinolate per gram of oil-free cake. The efforts made by Indian scientists to introduce exotic canola quality (commonly known as double-low or 'OO') met with limited success due to their unsuitability to Indian agro-climatic conditions.

Adding to the dilemma was the fact that erucic acid and glucosinolate contents are governed by multiple recessive genes. Thus, a combination of conventional methods of plant breeding coupled with

The canola-quality oil produced from the new variety, fittingly called TERI Uttam, is nutritionally superior. Its oil meal attracts nearly 1.3 times the price commanded in the international market

biotechnological approaches was employed to develop new strains.

On Par with the Best

Intelligent selection of plants having desired quality parameters as well as good yielding attributes plays the most critical part in the development of rapeseed-mustard of canola-quality variety. To overcome the difficulties in crossing diverse varieties, an 'in vitro' sequential embryo rescue technique was established. The half-seed technique along with improved methods of gas chromatography established high performance liquid chromatography and employed for quick, quantitative estimation of fatty acids and glucosinolates, followed by rigorous selections in the field.

In Vitro Embryo Rescue and Plantlet Regeneration: The result was the development of seven genetically enhanced rapeseed-mustard strains that have been registered by the ICAR's (Indian Council of Agricultural Research) committee on germplasm registration. Work is under way to combine attributes of high yield and superior nutritional quality in 'B. juncea genotypes'.

TERI Uttam, the first double-low variety in India with high oil content (43 percent), is tolerant to pod shattering and white rust. Its high oleic acid content (60 percent) gives it longer shelf life. The yield is at par or higher than the national check varieties, when tested at multi locations under the All India Coordinated Research Project on Rapeseed and Mustard, ICAR. TERI-Uttam has been released for cultivation in Madhya Pradesh; scientists and farmers are enthusiastically looking forward to the first international quality variety for their state.

TERI Uttam, has the potential of commercialisation under contract farming for production of new health oils and

The enhanced quality strains registered by ICAR

T E R I (OO) R9903 - INGR 04077 [T E R I Uttam]; high oil content, canola quality, early maturing B. napus

TERI-GZ-05 - INGR 04078 [T E R I Uphaar]; high oleic and linoleic acid, yellow seeded, double low B. juncea

T E R I (OO) R986-INGR 99007 [T E R I Gaurav]; early maturing, dwarf double-low B. napus

T E R I (OO) R985-INGR 99008 [TERI Garima]; high oleic acid, double-low B. napus

T E R I (OE) R09-INGR 98005 [T E R I Shyamali]; low erucic acid, high oleic B. napus

T E R I (OE) R03-INGR 98002 [T E R I Phaguni]; low erucic-acid, early maturing B. napus

T E R I (OE) M21-INGR 98001 [T E R I Swarna]; low erucic acid, yellow-seeded, early maturing B. juncea

Beneficiaries

The canola-quality oil produced from the new variety, fittingly called TERI Uttam, is nutritionally superior. Its oil meal attracts nearly 1.3 times the price commanded in the international market. This has created a larger niche in the market for it to fetch a premium price and substantial foreign exchange.

Applications/Benefits

The new, nutritionally improved oilseed, meals as per international standards. The improved oil-free cake will also benefit the animal husbandry sector. Even with a conservative estimate, the oil and meal together will fetch almost double the price per hectare. Thus, masses too can exercise their right to a healthier option while farmers can get a premium price for the produce.

TERI-Uttam has shown enormous potential under the multi-location testing of All India Coordinated

Research Project on Rapeseed-Mustard, Indian Council of Agricultural Research. It is not only nutritionally superior as compared to the presently cultivated varieties in India, but also has high oil content and matures early in 135 days as compared to the conventional varieties of Gobhi Sarson, which take 150-160 days for maturity. Due to early maturity it will be well suited to grow in mustard growing areas and the yield is 20 percent more than the Brassica napus National Check variety GSL-1. India imports 45-50 lakh tonnes of edible oil worth Rs. 8 to 10 thousand crores every year.

Due to high oil content, TERI-Uttam gives 25 percent higher oil yield than the Brassica napus national check variety GSL-1 and 5 percent higher oil yield than popularly grown Brassica juncea variety, Varuna.

Apart from providing a healthier cooking medium, it will also bridge the yawning gap between supply and demand of the oil. Above all, the oil has low erucic acid (2 percent), high oleic acid (60 percent), and moderate amount of essential linoleic and linolenic acids which makes it nutritionally beneficial besides prolonging its shelf life.

On the oilseed map of the world, India occupies a prominent position, both in terms of production and consumption. Brassica, commonly known as rapeseed-mustard, is the second most important edible oilseed crop in India after groundnut. TERI-Uttam is ready for commercial production.

Properties and Benefits of Mustard

Because of the presence of mucilages, mustard is good for digestion. The white seeded mustard has milder effects. However, it is a major source of vegetable oil and an excellent source of proteins, calcium, magnesium and potassium. When combined with warm water it increases arterial pressure and stimulates blood circulation. At the same time, mustard has anti-inflammatory properties.

Mustard is a herb with various usages. Mustard baths are recommended for treating headaches, colds and cough

Treatments

Mustard is a herb with various usages. Mustard baths are recommended for treating headaches, colds and cough. The consumption of one spoonful of mustard seeds 2 or 3 times a day improves digestion. Also, the mustard seeds, whether white or black, are used for treating respiratory problems.

The lack of food appetite can be alleviated through consuming black mustard seeds dissolved in a glass of milk, administered 15 minutes before a meal. Asthma can be treated by applying black mustard flour poultice on the chest area for approximately twenty minutes. For headaches or pains caused by long exposure to cold or to air drafts, it is recommended that a small bag of 200 grams of black mustard seeds be added into the bath water. It should be immersed for approximately ten minutes and then removed. There is a noticeable decrease in rheumatic pains and neuralgias.

Intoxications can be treated by drinking a spoonful of black mustard flour in a glass of water. The mixture should be taken in an empty stomach. Bronchitis, asthma and pneumonia are treated by applying black mustard flour poultice on the chest area.

SOURCE: Based on the Research conducted by TERI scientists

Jute Cultivation

Paving the way for a Green Economy

Jute is a natural fibre second only to cotton in terms of global production. Jute can be cultivated best in plain alluvial soil and standing water. Warm and wet climates offered by the monsoon are ideal for growing jute. Temperatures ranging between 20-40 degrees centigrade and relative humidity of 70-80 percent are favourable for successful jute cultivation. Apart from 5-8 cm of weekly rainfall, jute requires extra water during the sowing period.

White Jute (Corchorus Capsularis)

In several historical documents obtained during the era of Mughal Emperor Akbar (1542-1605) states that the poor villagers of India used to wear clothes made of jute. History also states that Indians, especially Bengalis, used ropes and twines made of white jute for household and other uses.

TossaJute (Corchorus Olitorius)

Tossa jute (Corchorus olitorius) is an Afro-Arabian variety. Tossa jute fibre is softer, silkier and stronger than white jute. This variety displayed remarkable sustainability in the climate of the Delta region in 'The Ganges'. Along with white jute, tossa jute has also been cultivated in the soil of Bengal from the start of the 19th century. Currently, the Bengal region (West Bengal, India, and Bangladesh) is the largest global producer of the tossa jute variety.

Jute and the Environment

Jute has an intense relationship with the environment. It is bestowed with natural processes to clean the air. One hectare of jute plants can consume up to 15 tons of carbon dioxide and release 11 tons of oxygen during the jute growing season (about 100 days).

It improves soil fertility by providing nutrients to the soil thereby increasing the yield of other crops. Jute agricultural practices are environmentally sound. They cause minimal impact to the natural environment as it gives back to nature 60 percent of the nutrients it takes for its growth. Jute products are 100 percent biodegradable and recyclable. They can be disposed of without causing environmental hazards. Jute Products can be disposed of within 100 days by dumping it in the soil containing 22 percent water. Dumping requires a very small amount of space and can be conveniently done at any place. After completion of dumping period, the soil could be used as natural manure.

The concept of Green Market is becoming very popular and jute trade is also likely to come under the influence of Green Market very soon. The Green Markets are being driven by factors such

as Carbon Footprint, Water Footprint, Eco-label, Supply Chain Audits, Retail Chain Sustainability Policies, Chemicals in the value chain, Life Cycle Assessment and comparative assertions with peer review.

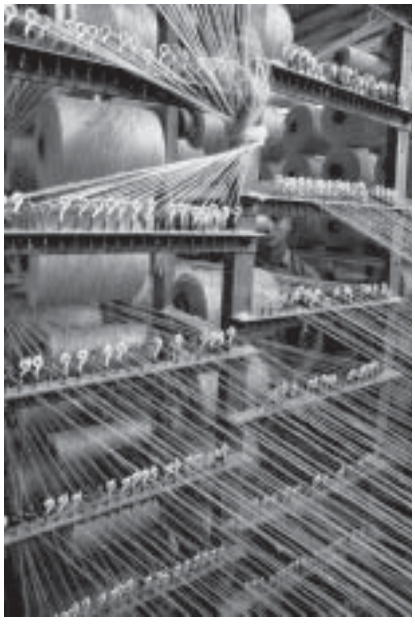
Area under Jute Cultivation

On an average 1300-1400 thousand hectares (Ha) of land is now cultivated for growing jute and allied fibres. In 2004-05 the jute cultivation area in Bangladesh was 4,65,400 hectare which increased to 4,85,600 hectare in 2005-06 and to 5,33,400 hectare in 2006-2007. The area, however, reduced to 4,08,100 hectare in 2008-09 and in 2009-10 it reached 4,85,800 hectare, an increase of 19 percent from the previous year.

Modernization of Processing Machinery

New machinery need to be designed to process greater volumes, higher standards, consume less power, easy maintenance and affordability. A number of jute mill machinery manufacturers like Lagan Engineering Company Ltd, Milltex Engineering (P) Ltd, GSL, India and Zhejiang Golden Eagle Co., Ltd, China manufacture and supply jute processing machinery to the jute industry of Bangladesh and India.

Government of India is currently implementing a project on 'Jute Technology Mission (JTM)' for overall development of the jute sector in India. Under Mini Mission IV of JTM, a Scheme for Machinery Development has been earmarked for technology upgradation in the jute industry. Several mills have taken subsidy benefits under the scheme and have gone mostly for partial replacement and modernisation. The scheme is also supporting a modern machinery development program with Lagan Engineering Company and the outcome is still awaited.



Jute mills in Bangladesh also require modernization to cope with market requirements and also for production of value added diversified products. Bangladesh Jute Mills Corporation (BJMC) may consider upgrading its factory Gulfra-habib to produce modern machinery in addition to its present production of spare parts.

In spite of its necessity, modernization in jute industry is not taking place at the desired level in both the countries because of non-availability of precision processing machinery at affordable price. Moreover, the machine manufacturing companies are not investing in the Research and Development for upgrading and producing the new generation machinery because of lack of demand. Jute mills in Pakistan, Nepal and Myanmar are also in dire need for modernisation. In Nepal and Myanmar the Governments are said to be thinking of disinvestment in its public sector jute mills which can open new investment opportunities for investors from Bangladesh and India in these countries. The fast growing jute mills in Bangladesh and India can explore the possibility of overseas acquisitions.

Jute Product Mix

In India jute products mainly include Sacking, Hessian and Carpet Backing Cloth (CBC). Other jute products such as Floor coverings, Hand Bags, Shopping bags, Wall hangings and Decorative fabrics are also produced and exported. Production of Hessian fabrics is around 2,50,000 - 3,50,000 metres and domestic consumption is around 2,00,000-2,50,000 metres a year. Production of Sacking in 2003-04 was 9,79,000 metres which increased to 11,43,000 metres in 2007-08 with proportionate higher domestic consumption. In 2008-09 and 2009-10, production of jute products was lesser as production in the mills was disrupted due to strike in the jute mills. CBC production was 4,700 metres in 2002-03 which went up to 6,000 metres in 2007-08. Production and export of diversified products from India is on an increasing trend and now constitutes 28 percent of the total jute product export from India. Although there is little change in Hessian and CBC, the Sacking and diversified sector is showing an upward trend.

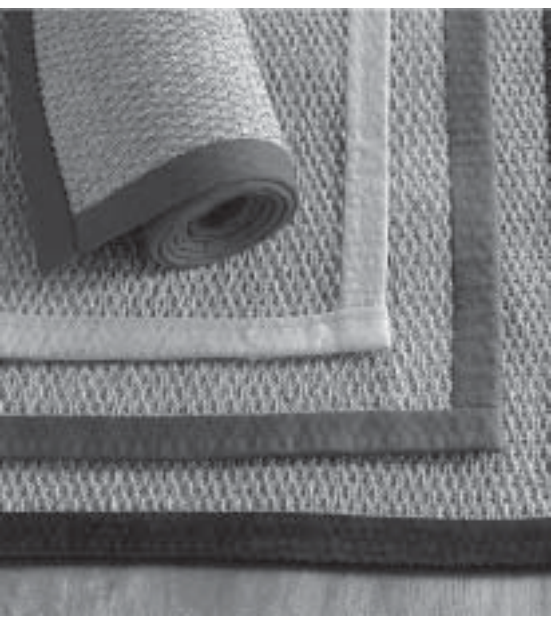
Besides being used as packaging materials, jute is now widely used as floor covering, home textiles, decorative fabrics, shopping bags, carry bags, handicrafts, cushion cover, curtains, blankets, nursery pots, insulation material, soil saver and jute based composites, etc. Bangladesh, India and China export jute diversified products (JDP) like Floor Covering, Hand bags, Shopping Bags, Decorative Fabrics, Wall Hangings, Gift Articles, etc. Exports of JDP from India have been showing an increasing trend. India exported JDP of value US$56.39 million in 2004-05 and US$65.46 million in 2008-09.

The upward trend of export of JDP indicates that JDPs are receiving appreciation from the foreign consumers. Promotional activities such as participation in International Fairs and Exhibitions on the patterns of mainstream textile sector may be useful as this would make the consumers familiar with various jute products, their applications and the source of their availability. The Jute mills can also get involved and promote JDP sector by supplying yarns and fabrics necessary for production of JDP to medium and small entrepreneurs as a constant source for their market. The mills will get a local market and production of JDP will increase. The JDP production can also be enhanced and organized by forming cooperatives or 'Self-Help Groups' with the small entrepreneurs of the unorganized sector.

International Jute Study Group (IJSG) has recently implemented a project on 'Small-Scale Entrepreneurship Development in Diversified Jute Products' through which a large number of small entrepreneurs – about 1150 in India and about 1420 in Bangladesh – have been trained to develop and produce diversified jute products. Many of them have already started production and sale of various jute products in the local as well as the foreign markets. Through this project some Raw Material Banks (RMB) and Jute Entrepreneurs Service Centres (JESC) have been established both in India and Bangladesh which encourage the new entrepreneurs to start producing and marketing the diversified jute products. This is in addition to the efforts by producing countries through their own organizations like Jute Diversification Promotion Centre (JDPC) in Bangladesh and National Jute Board (NJB) in India.

Manufacturing and export of jute shopping bag is an important area that needs attention of the policy makers as well as the manufacturers. Jute has established itself as the most versatile and economically viable alternative to polythene and other synthetic products. The adverse impact of polythene bags resulting into environmental degradation has made people inclined to use more natural fibre products.

As a consequence of adverse impact of polythene on the environment many countries around the globe including Bangladesh, India and others have already taken regulatory measures to reduce the use of polythene bags. UAE has decided to completely ban the use of polythene bags by 2014. Several other countries like Ireland, Thailand, Japan, and some States in USA, Denmark and Norway have already taken such steps to discourage use of polythene bags in some form or others.



SOURCE: Research conducted by International Jute Study Group

Model Bankable Scheme for Organic Cultivation of Mango in Tamil Nadu

India has the richest collection of mango cultivars. Cultivation of mango is believed to have originated in South East Asia. Mango has been cultivated in Southern Asia for nearly six thousand years.

International Scenario

The total global area under mango is 43.69 lakhs hectares and the global production is to the tune of 312.51 lakh tonnes. India ranks first among the world's mango producing countries accounting for about 46 percent of the global area and 40 percent of the global production. Other major mango producing countries with their percentage share in the global production include China (11.8%), Thailand (5.8%), Mexico (5.4%), Pakistan (5.1%), Indonesia (4.5%), Brazil (4.3%), The Philippines (3.2%), Nigeria (2.6%) and Egypt (1.2%). Worldwide production is mostly concentrated in Asia, accounting for 75 percent of the global production.

The world trade in mango consists of an export of 9.29 lakhs tonne valued at US$6189.17 lakhs and imports to the tune of 7.93 lakhs tonne estimated at US$7592.35 lakhs. Among internationally traded tropical fruits, mango ranks only second to pineapple in quantity and value. Major markets for fresh and dried mangoes are Malaysia, Japan, Singapore, Hong Kong and The Netherlands, and canned mangoes are The Netherlands, Australia, United Kingdom, Germany, France and USA. Southeast Asian buyers consume mangoes all year round. Their supplies come mainly from India, Pakistan, Indonesia, Thailand, Malaysia, Philippines and Australia, and most recently from South Africa.

National Scenario:

India's share is around 40 percent of the world production of mangoes i.e. 12.5

million tonnes against world production of 31 million tonnes (2006). The state wise area, production and productivity of mango are given in Table 1.

State Scenario

In Tamil Nadu, Mango is cultivated in about 1,25,104 hectare with production of about 5,37,780 tonnes with average productivity of 4.30 t/ha. Major mango growing districts are Dharmapuri, Krishnagiri, Vellore, Dindigul, Thiruvallur and Theni.

Table 1. Statewise Area, Production and Productivity of mango in India

State	Area (000'ha)	Production(000' t)	Productivity(t/ha)
Andhra Pradesh	399.3	3194.3	8.00
Uttar Pradesh	251.5	2673.3	10.60
Karnataka	124.5	1236.8	9.90
Bihar	140.2	1222.7	8.70
Gujarat	96	772.1	8.00
Maharashtra	444.5	638.6	1.40
Tamil Nadu	125.1	537.8	4.30
West Bengal	70.1	513.3	7.30
Kerala	88	511.1	5.80
Orissa	125.3	428.8	3.40
Others	156.2	809.1	5.20
Total	**2020.7**	**12537.9**	

Organic Farming

Organic farming is a crop production method which encourages sustainable agriculture by enhancing the biological cycles in nature. It is targeted at producing healthy, nutritive, pollution free food maximising the use of on farm resources and minimising the use of off-farm resources. It seeks to avoid the use of chemical nutrients and pesticides. There is no published data available for area under Organic mango. Organic mango is being practised by individual entrepreneurs and NGOs in isolated pockets of Theni, Kancheepuram, the Nilgiris and Dindigul districts.

Climate: The ideal temperature range for successful mango cultivation is between 24 - 27 degrees centigrade. It can be grown best in regions with a rainfall of 25 cm and 250 cm. High humidity, rain or frost during flowering is detrimental to mango cultivation. Higher temperature during fruit development and maturity gives better quality fruits. Regions with bright sunny days and moderate humidity during flowering are ideal for mango growing.

Soil: Mango can grow well in all types of soil from alluvial to lateritic, except the black cotton soils, which are considered poor. The only prerequisite is a deep (2 to 2.5 metre) and well drained soil. In Tamil Nadu, red loamy soil with good drainage is preferred for mango cultivation. Mango prefers slightly acidic soil. It does not grow well beyond a soil pH of 7.5. Soils with an appreciable amount of gravel or Kankar in the profile too can grow good mangoes provided they are not alkaline. Saline and alkaline soils are not conducive for profitable mango cultivation.

Land Preparation: The land is prepared by usual ploughing, harrowing and levelling. A gentle slope is provided to facilitate proper irrigation and prompt drainage to avoid the harmful effects of water stagnation. After marking of the points for the plants, pits of 90 X 90 X 90 cm are dug during summer months. This operation is done by utilizing a planting board so that precise location

of the plants in the middle of the pit remains undisturbed. While digging of pits, it is essential to keep the topsoil and subsoil separately in two heaps near each pit for two to four weeks. This helps in exposing the harmful soil organisms to weathering agencies, providing better aeration to the root zone and in making provision for nutritional requirements for healthy development of the soil. The pit is filled with 20 kg of FYM, 5 kg of vermicompost and Biofertlizers (Azospirillum and Phosphobacteria). Green manuring is also done with the onset of south-west monsoon in July/ August with Daincha and Sunhemp. Growing of leguminous green manuring crops helps in Nitrogen fixing besides providing excellent green cover to the entire field, which in turn prevents moisture loss.

Spacing: Spacing varies from 7 - 10 metres either way.

Planting Material: Mango is propagated by inarching and veneer grafting, but of late, epicotyl and softwood grafting are replacing these two methods. As regards selection of root stock, research trails show that polyembroyonic cultivar Vellaikolambam significantly reduces the canopy size by half without reducing production. Planting material is procured from nurseries, which propagate the planting material either by organic or chemical means. However, it is preferable to procure planting material from organic sources.

Varieties

The varieties recommended for mango cultivation in Tamil Nadu are as follow: Neelum; Bangalora; Alphonso; Rumani; Banganapalli; Kalepady; Peter; PKM 1; PKM 2; Sendura; Jahangir; Mulgoa; Paiyur 1; Mallika; Amrapali; Salem Bangalora; Arka Anmol; Arka Aruna; and, Arka Puneeth and Arka Neelkiran.

Varieties for Processing: Alphonso, Banganapalli, Totapuri

Varieties for Export: Alphonso, Banganapalli, Sendura

Alphonso has become a popular variety among organic growers, in view of its better varietal characteristics and market demand.

Planting

It is done with the advent of monsoon. The planting season could be July to December, depending upon the monsoon and availability of irrigation facilities.

Water Management

The water requirements mainly depend on the age, soil type and climate. However, young plants up to 2 years should be watered regularly. The newly planted grafts need about 25-30 litres of water everyday. Irrigating the grown up trees after fruit set at 10-days interval increases their yield. Mango growers commonly practice drip irrigation so as to control watering and also to irrigate a larger area with better management practices.

Government Programmes for Organic Farming

Department of Agriculture, Government of Tamil Nadu is implementing a project for promotion of organic farming with 100 percent assistance from Government of India with an outlay of Rs.56.77 lakhs for conduct of trainings, seminars, workshops and setting up of Model Organic Farms in the State Seed Farms and establishment of vermiculture hatcheries. Various components of the project are as follows

- Training of certification and Inspection agencies;
- Training on Production and Quality control of Organic inputs;
- Training of field functionaries/ Extension officers;
- Field Demonstration on Organic inputs;
- Setting up of Model Organic Farms;
- Organization of State and Regional workshops; and,
- Setting up of vermiculture hatcheries in the State Seed Farms

Unit Cost

As per the technical and financial parameters, the unit cost per hectare works out to Rs. 152300 spread over five years (1 year: Rs. 32100 + 2 years: Rs. 24200 + 3 years: Rs. 27100 + 4 years: Rs.31100 + 5 years: Rs.37800).

Margin Money

The percentage of margin/down payment to cost of development prescribed is 5, 10 and 15 percent for small, medium and large farmers respectively. The rest of the cost of development will be provided as bank loan. Margin considered in the present model is 10 percent.

Bank Loan

Bank loan of 85-95 percent will be available from the financing institution. Bank loan considered in the model is 90 percent. The rate of interest to be charged to the ultimate borrower would be guided by RBI guidelines issued from time to time. However, the ultimate lending rate has been considered as 12 percent for working out the bankability of the model scheme. Banks are guided by RBI guidelines issued from time to time in this regard.

Financial Analysis: Based on the detailed financial analysis, the financial indicators are given below:

- NPW: Rs.191891.66
- BCR: 1.95: 1
- IRR: 35.53 percent

Repayment Period: The bank loan along with interest is repayable in ten years including four years grace period.

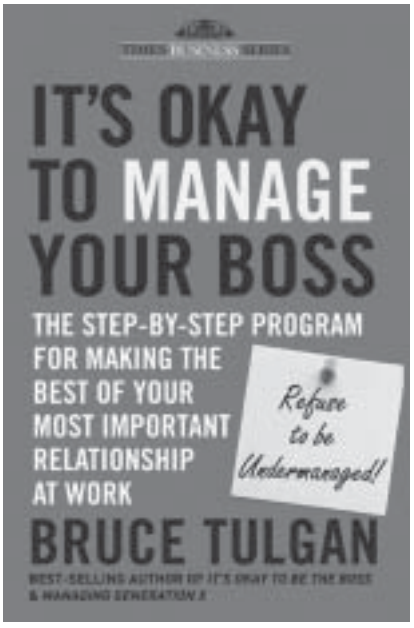
Conclusion

Organic cultivation of mango is technically feasible, financially viable and bankable.

SOURCE: Research conducted by NABARD

It's Okay to Manage Your Boss

By **Bruce Tulgan**



Low-performers usually look for a boss who will treat every employee equally; a boss who does not know who is doing what, where, why, when or how, a boss who does not keep track and ignores performance problems. A boss who does not tell them what to do and how to do it and who does not spell out expectations but leaves them to their own devices. These employees collect their pay packets just as everyone else does, regardless of their mediocre performance. In other words, they are the beneficiaries of under-management.

And therein lies the importance of appraisals. They help to strategically review the strength, weaknesses and achievements of workers during the year, says Bruce Tulhan, author of 'It's Okay to Manage Your Boss'. The title is catchy, specific, detailed and honest. Tulhan's warning that becoming a better manager is like starting a fitness programme could not have been more apt. The book advises the reader on how to engage his/her boss in at work, get clear directions from him and guides employees with tools and feedback for success.

But he also says clearly that the book is meant for high-performers. He says that one needs to create a close, official relationship with every boss, no matter how great or awful he is, no matter how he is on any given day or how he himself performs.

Tulhan charts out four basic things an employee must take responsibility for. They are: Clearly spelled-out and reasonable expectations with a concrete timetable; skills, tools and resources necessary to meet those expectations; accurate feedback about your performance; as well as course correcting direction and fair quid pro quo, ie, recognition and rewards in exchange for performance. There are also tips on keeping a close, official relationship with your co-workers.

Tulhan is also able to sift the wheat from the chaff and says that though managers are demanding more and more from employees, they are also providing them with less guidance than ever before. But employees can improve their careers despite this lacuna. He debunks certain myths such as if you are a high-performer, then your boss should not tell you how to do your work.

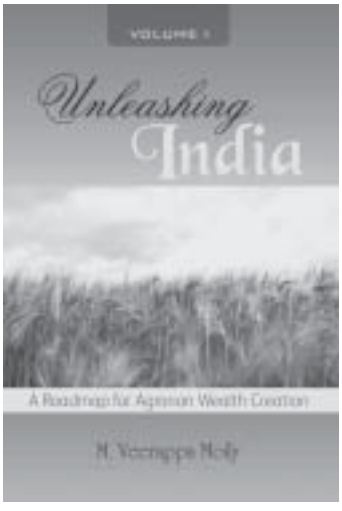
This book is especially relevant in today's times when companies are cutting back on overhead expenses and staff as they ride out the financial crisis. Many of today's employees are overworked, often performing the job of two or three people for no additional pay. Research shows that many employees feel powerless and are not in a position to complain about their circumstances, holding on to the job the way one would cling to a lifeboat. It also talks about the epidemic of under-management, which is responsible for the precarious environment at the workplace.

It is a well-researched book and a successful follow-up to Tulhan's earlier book "It is Okay to be Boss''. And the bottomline is: It is okay to manage your boss if you are good.

SOURCE: Arun Sharma, The Times of India, 10 July 2011

'Unleashing India: A Roadmap for Agrarian Wealth Creation'

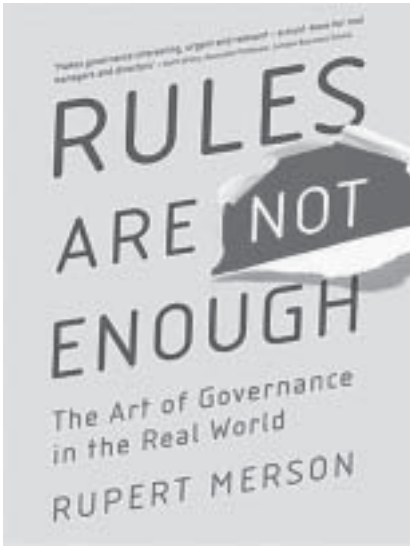
By **Dr M. Veerappa Moily**



In formulating a vision for the future of India, Dr M. Veerappa Moily in his informative and insightful book 'Unleashing India: A Roadmap for Agrarian Wealth Creation', believes that it is important to see beyond the limits of the immediate past to rediscover the greatness that is India. When India got her freedom, the world witnessed how the comprehending national spirit touched the sublime. The legacy for which the foundation was laid survives with a vibrancy that offers the nation the vision to raise itself to the status of superpower by 2020. The book emphasises on the fact that for the realisation of this dream, the vision needs to be woven into the mindscape of every Indian in the country.

Rules Are Not Enough: The Art of Governance in the Real World

By **Rupert Merson**



Business history littered with scandals that have put the spotlight on corporate governance – Robert Maxwell, Barings and Andersen on one side of the Atlantic, Enron and WorldCom on the other. More recently, the global financial crisis brought about by the credit crunch has highlighted others. Yet again, directors and regulators and those involved in partnerships, family-owned business and not-for-profit organisations, together with stakeholders in the many different forms of enterprises, are asking: What is the role of a director? Should there be more, less or better regulation? How should remuneration of executives be set? To whom should directors be accountable?

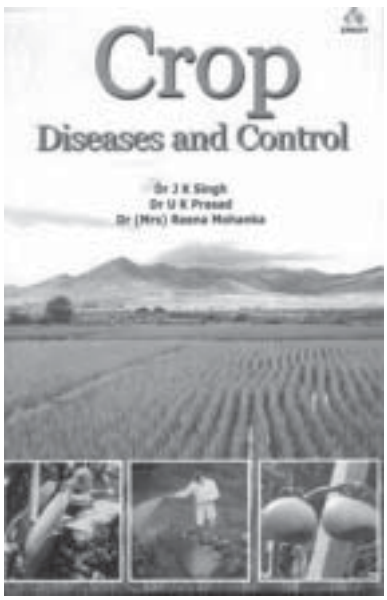
Good governance is crucial to the well-being of organisations of every type and size. It is integral to management, and should be seen not as an obstacle but as an opportunity to work better, in the interests of everyone involved. It is something that should be deeply embedded in an organisation's culture, guiding principles and behaviour – simply sticking to the rules is not enough.

Rupert Merson, formerly a partner at BDO LLP, teaches at London Business School and has advised a wide range of entrepreneurs, organisations and partnerships. Drawing on his many years of experience and an in-depth understanding of the issues, Rules Are Not Enough is a lively, well-argued and practical guide to corporate governance and how to make it work in the real world.

About the Author: Rupert Merson is both a chartered accountant and a fellow of the Chartered Institute of Personnel and Development. He was a partner in BDO LLP for 15 years, where he advised organisations of all shapes, sizes and nationalities on 'the problems that arise in the gap between accountancy and human resources.' Rupert now leads his own consulting practice. He has advised companies on governance issues in the UK, Europe and the Middle East. Since 2001 he has been on the faculty of London Business School, where he teaches MBA electives on Managing Growth and New Venture Development. He has also delivered an MBA elective on New Business Ventures at INSTEAD in France. He has written four previous books on senior roles in owner-managed businesses: Owners, Managing Directors, Finance Directors and Non-executive Directors, all published by Profile Books.

Crop Diseases and Control

By **Dr. J.K. Singh, Dr. U.K. Prasad and Dr. Reena Mohanka**



Potential losses of major world crops to pests, diseases and weeds have been estimated at approximately 70 percent. However, the actual losses are approximately 30 percent due to efficient crop protection practices. The increase in human population density and the subsequent demand for meat are predicted to cause crop production to double in the next four or five decades. To achieve this objective, an improvement or at least maintenance of crop protection efficacy against agricultural pests, diseases and weeds is critical. The impressive progress in crop protection achieved in the past has, for a large part, relied on the use of synthetic pesticides.

AGRI NEWS

Anand Sharma Invites New Zealand Partnership in Agro Processing, Infrastructure and Renewable Energy

Shri Anand Sharma met the visiting prime Minister of New Zealand Mr. John Key along with the Trade Minister of New Zealand Mr. Tim Groser. The PM was leading a large business delegation in his first visit to India. While delivering his keynote address with the business session with the P M of New Zealand, Shri Sharma said, "India and New Zealand have a longstanding and positive bilateral relationship. The two economies are essentially complementary and there is considerable potential to increase bilateral trade and economic relations. It's time to give depth and width to our partnership. India is looking forward to partner with New Zealand in Infrastructure sector, agro-food processing, renewable energy and IT." The Commerce Minister appreciated the state of art technology being used by dairy industry and renewal energy and asked for bringing such technology to India. He also appreciated New Zealand for taking forward the Doha development round and believing in rule based and rule governed multilateral system.

Shri Sharma later informed that, "We had covered all aspects of bilateral economic engagement, India-New Zealand FTA progress and the state of play in the WTO negotiations. We had also indentified several areas of possible bilateral cooperation-including post harvest technologies/logistic management for agriculture sector, renewable energy sectors including wind and geo-thermal energy, tourism, films (including animation films), pharmaceuticals, education; IT enabled services, financial services and others".

He further said, "During my business forum meetings in New Zealand, I had stressed India's core competence in IT related services, pharmaceuticals, film technology, green technologies and others. I had also stressed the complementarities which can be fruitfully enjoyed in sectors such as tourism and education":

India and New Zealand trade has more than trebled between 2004-05 and 2010-11. In 2010-11, Indian exports to New Zealand were US$191.39 million and Indian imports from New Zealand were US$621.55 million. Total bilateral trade was thus about US$812.94 million and grew 7.83 percent over the previous year.

Top ten items of India's exports include parts of engineering goods, mineral fuels, pharmaceutical products, natural or cultured pearls, precious and semi precious stones, items of jewellery set in gold and diamonds, textiles, inorganic chemicals and electrical machinery and equipment. These top ten items explain 68.17 percent of India's total exports to New Zealand. And major items of India's imports are mineral fuels and mineral oils and products of their distillation, wood and articles of wood, dairy products, papers and paperboard, wool, engineering goods, raw hides, skins and leather, iron and steel, electrical machinery and edible fruit and nuts. These top 10 items explain 94.09 percent of India's total imports from New Zealand.

Maharashtra Needs a Green Revolution: Prithviraj Chavan

Chief Minister (CM) Prithviraj Chavan emphasised the necessity of green revolution to meet the increasing demands of the country. Speaking at an event organised at the Shiv Chhatrapati sports complex, Balewadi early July, 2011 to felicitate 1,500 farmers of the state, Chauhan said that the emergence of globalisation, open market and increasing population has enhanced the demands of the state.

He said that it is up to the people working in the agriculture sector, including farmers, to deliver in order to meet the supply.

"More use of technology in agriculture will enable the development of the sector in the state. The present scenario of the state demands a green revolution," Chavan said.

Deputy CM Ajit Pawar, MS Swaminathan Research Foundation, Founder and Chairman MS Swaminathan and state agriculture and marketing minister Radhakrishna Vikhe-Patil were present.

Swaminathan urged on to make scientific enhancement in farming in order to motivate educated young people to join the agriculture sector.

AGRI NEWS

There is No Zero Risk in Agriculture; Biotech is a Necessity

Mr Clive James, who is the Founder and Chairman of ISAAA (International Service for the Acquisition of Agri-Biotech Applications) is a strong votary of biotechnology in agriculture. He says biotechnology is not a panacea for the food problems of the world. "It," he emphatically says, "is a necessity". Mr James was in Hyderabad in July 2011 to address a global meet, on Demystifying crop biotechnology – issues and concepts for mass media. He spoke about the growth prospects for biotech in agriculture, challenges and on the concerns about the safety of genetically modified (GM) food.

There is no zero risk in agriculture. This holds good for conventional crops as well. But biotech maize and papaya have been introduced in countries such as the US and China. BT maize, in fact, showed reduced levels of micro toxins. There is no suggestion of any health risk (in biotech food).

But regulatory framework that governs biotech crops is very weak, particularly in developing countries. Regulation has been there in the last fifteen years to guide the growth of biotech crops. In the beginning, scientists had asked whether it poses a risk. But evidence shows that it is safe. We have to use 15 years of experience (in building regulation). We need to have simple and responsible regulations. About 1,000 people are dying every hour due to hunger and malnutrition. Countries like India need biotech in agriculture.

Resistance is fast building up to technology. Also, utter disregard in sparing space for refugia too is a concern. This results in contamination and increase prospects of development of resistance. Refugia are just one element of managing resistance. It has been 15 years of biotech in maize and cotton and resistance has not broken down yet.

You need to have biotech crops in order to feed the world. By 2050, the world would have nine billion people. The next five years would witness much faster growth of biotech crops. Indications show that the number of countries that adopted biotech in commercial agriculture would grow to 40-42 by 2015 from the present 29. Growth would more accentuated in developing countries in Asia and Africa. Potential is quite huge. Maize, soybean, cotton and canola collectively represented 150 million hectares of biotech crops last year. There is a scope to reach out to 150 million more hectares.

Indian Scientists Develop a New Variety of Rice

After tremendous amount of research, Indian scientists claim to have developed a rice variety that requires no cooking; only soaking in water. The rice variety developed at the government-run Central Rice Research Institute (CRRI) at Cuttack in Orissa is characterised by low amylase content and becomes soft on soaking in water. Indian Production of rice is massive considering the last year's figure of 98.5 million tones.

The new variety of rice can serve specific niche consumers and make rice cooking a hassle free affair. The new variety, named Aghanibora, tested by the institute is of 145 days duration with a yield of 4-4.5 tonnes per hectare and is at par with the currently grown rice varieties in the country. It is like any other rice variety grown and consumed in India. The initial experimentation was to test whether the rice variety could be grown in the hot and humid climate of Orissa and still retain the property of softness.

Scientists at the institute have done extensive research over the past three years and tested its nutritional properties and other biochemical parameters. The experiment has proved successful and can be grown more in the eastern states of India

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- Consultancy for World Bank Assisted Process Monitoring of Andhra Pradesh Rural Poverty Reduction Project – Phase-II (Zone-II) – Society for the Elimination of Rural Poverty, Government of Andhra Pradesh – 2007-08
- Implementation of DFID funded Western Orissa Rural Livelihood Project (WORLP) – Watershed Development Mission, Govt. Of Orissa – 2005-2010
- Comprehensive Watershed Development Project in Karnataka - Watershed Development Department (WDD)-Government of Karnataka – 2006-07
- Madhya Pradesh Tribal Development Project - The International Fund for Agriculture Development (IFAD), Rome – 1997

Grass Roots level Livelihood Implementation

AFC has undertaken large scale Agricultural Extension Programme in 820 Blocks covering all 71 districts of Uttar Pradesh.

The mission of the implementation project is to increase the farm productivity, profitability and sustainability of farming systems, efficient use of natural resources and agricultural inputs etc., by customised farmers' trainings at village cluster level and to provide online information on weather parameters, demand and use of agricultural inputs and market intelligence.

Organic Farming

This project involves the adoption and certification of Organic Farming in 22000 hectares.

Watershed Development

AFC is implementing Livelihood Development Programme based on Watershed Development with funding by DFID, and NABARD.

Panchayati Raj Institutions

AFC has set up an independent division for providing support services in terms of grass roots level planning, training of various stakeholders in UP, Bihar and Jharkhand. AFC has prepared Perspective District Plans in 25 districts of Uttar Pradesh under Backward Region Grant Fund (BRGF).AFC has also conducted TNA and prepared Training Manual for PRIs in Jharkhand.

The PRI division will also provide the following services:

- Organise training programmes for the senior & middle level executives of the NGOs.
- Capacity building of the ERs and various stakeholders.
- Conduct research studies, develop learning material for each level on local self governance, organise seminars and workshops, promote exchange of academic expertise on various aspects related to local planning & DPCs, disseminate specialised information and provide expert advice to all concerned.
- Take up advocacy role to strengthen democratic process, particularly grassroots level democracy through decentralised institutions.
- Lay special emphasis on involving the poor, marginalised and weaker sections of the society in the democratic governance.

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