IMPACT OF JAIN IRRIGATION'S AGRI BUSINESS MODEL ON ENVIRONMENT

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ABSTRACT

Jain Irrigation' Agribusiness model is socially responsible and environmentally conscious. The mission statement of the company, which was coined in late 70s states that "Leave this world better than you found it" conveys the philosophy behind the business policy of Jain Irrigation and all the actions and business activities of the company are leading to a sustainable business. All the products that company manufactures and all its business activities lead to conservation and preservation of natural resources and environment. Water creation and conservation through rain water harvesting, efficient on farm storage of water and water conveyance through pipes saves water by preventing leaching out and evaporation which happens in open canal system. Micro irrigation saves water to the extent of 50-60% depending upon soil type helps in conserving water which could be used for irrigating more land thus helping in solving food security related issues and making available more water for drinking and for industrial activity. Presently 82% of all the available water is used for agriculture and 40% of India's agricultural land is irrigated mostly by flood irrigation with a water use efficiency of only 35%. Micro Irrigation can save 50% of this water which will not only fulfill the need of population for drinking and domestic use and industrial requirement but also can be used for bring additional land under irrigation thereby increasing crop productivity. Jain Irrigation promotes Good Agricultural Practices through its Jain GAP program bringing safety, hygiene, sanitation and traceability in agriculture. This program leads to judicious use of agricultural chemicals and the system of scientific methodology of handling. Jain irrigations energy division has developed strong renewable energy development program in bio-energy through plant and agri waste and also through its solar energy program. Solar pumps manufactured by Jain Irrigation are becoming a boon to energy starved farmers. Jain Irrigations business focus has been on Sustainable Agriculture, Water Use Efficiency and Production and Use Renewable Energy. All these business activities conserve natural resources and protect the environment to make it better than we found.

1. MITIGATING CLIMATE RISKS NEEDS SMART AGRICULTURE

Smart Agriculture is explained as agriculture with increased productivity and farm income through minimum use of resources and which is environmentally safe, socially responsible. In short producing more from less with inclusivity and shared gains.

Climate-smart agriculture, forestry and fisheries (CSA), as defined and presented by FAO at the Hague Conference on Agriculture, Food Security and Climate Change in 2010, contributes to the achievement of sustainable development goals. It integrates the three dimensions of sustainable development (economic, social and environmental) by jointly addressing food security and climate challenges. It is composed of three main pillars:

- Sustainably increasing agricultural productivity and incomes;
- Adapting and building resilience to climate change;
- Reducing and/or removing greenhouse gases emissions, where possible

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The greatest challenge the world faces today is to produce enough food and generating adequate income in the developing world to better feed the poor and reduce the number of those suffering. It is a very noble thing to achieve but the path to arrive there is strewn with obstacles- resource limitations especially water and energy, land limitations and the most difficult one, reluctance to accept change!

Surely, there is not much choice left with us. We must produce more, use fewer resources, increase the value of the products so that the primary producer gets the benefit, and encourage him to produce more efficiently. It is easy to say all these things. Nevertheless, I am not talking about a Utopian world, but a world with physical exhaustible entities where only technological incursions can help achieve the goal.

As we go along, the challenge is only increasing in magnitude; the global population is set to increase to 7.8 billion by 2025 and 80% of this increase will occur in developing countries. This factor puts a lot of pressure on Food Security and concomitantly on resources like water for irrigation.

The story of India is not different from this. By 2050, India should produce 494 million t (present 247 m t) from a net cultivated area of 145 mha (present 143 mha). The irrigated area then would be 145 mha (present 79 mha). We need water “Created” to bring about the increase in Irrigated area. In addition, we can see the net cultivated area has come to a plateau. The Prime Minister’s slogan of “Water for Every Farm” can become reality only and only if we save existing water use with 3-4 times water use efficiency and very high water productivity factor. It is simple to conceive that without water saved from the existing irrigated agriculture it will be very hard to achieve the targeted area under irrigation.

Irrigated agriculture is the major contributor to the world food security for the last 4-5 decades. On a global scale, irrigated agriculture accounts for less than 20% of the total cropland area but yields 40% of agricultural output.

With growing irrigation-water demand and increasing competition across other water-using sectors, irrigating crops would be difficult proposition let alone bringing in a second crop in the rainfed areas. McKinsey reports that the global water requirement is likely to rise from 4500 billion m3 to 6900 billion m3 by 2050 and this figure is 40 % more than the current accessible or reliable water supply. Doubling agricultural output by 2050 will require increasing the rate of productivity growth to at least double. This will certainly require substantial investments in making rain fed agriculture more efficient.

In India, we have arrived at a Critical juncture as far as our agriculture production is concerned. With just 48 % of agriculture land with irrigation cover the contribution to GDP by agriculture is possible ONLY by bringing in more rainfed area into irrigated to enable those dry land farmers to go for a second crop after the rain-fed crop. Analytically, it is increasingly become clear that sheer increase in productivity in the existing irrigated lands cannot push GDP much. However, encouraging one rain-fed crop farmer to cultivate a second crop would hike the Agriculture GDP to up to 8%.

Let us look at a practical way of to go about it.

1. Development of small rainwater harvesting practice / farm ponds at suitable locations
2. Package is for small/marginal farmers doing rain fed agriculture and for the farmers using diesel generators/diesel pump sets; as an alternative to electricity.
3. Components: Solar Pump Set, Solar PV module, Drip Irrigation system and plastic tank to store water

4. Target Crops: Cotton, Pulses, etc. after the traditional rain fed crop (cereals)
5. Benefits : Slow application of water and fertilizers through drip, Reliable, All inherent benefits of drip irrigation, No operation and maintenance cost, Early Payback period compared to diesel pump sets, Environment Friendly, No pollution
6. Market Potential: Large stretches of Rain Fed areas can be brought under irrigation and a second crop can be cultivated.

This would come by adopting farm level water harvesting and using the harvested water to raise a second crop. Productivity can be enhanced from 2 t/ha (rainfed single crop) to 4 t/ha (micro irrigated using harvested water and raising two crops).

2. DOUBLING PRODUCTIVITY IN SMALL FARMS IS THE NEED OF THE HOUR TO ACHIEVE A SUSTAINABLE GROWTH IN AGRICULTURE.

Small farmers produce most of India's food, and do so with minimal resources. They get very little support both technically and financially. They are deprived of even the necessities like quality seed, and availability of water during crop season. At first, there should be a change in attitude towards them.

In the Past, Farmer is considered as a Problem, and Not Part of the Solution.

Farmer should be placed on a high pedestal and provided with resources and solutions and make him a Successful Entrepreneur.

His productivity should be equated to the productivity of the Nation.

His welfare will form the crux of national wealth!

About 120 Million farmers with average family size of five is 600 Million people; the biggest consumers in the country who will drive growth in all sectors.

To transform subsistence farming into a viable commercial activity smallholder farmers need quality seeds, appropriate fertilizers, improved land and water management practices. They also need access to markets, low cost finance, infrastructural facilities for storage and transport. They need access to knowledge and information thru well-focused extension program. Above all the country should have policies that provide comprehensive support to these farmers.

The task may look daunting but it can be done. The inspiration from the past can be helpful but India needs a second uniquely Indian Green Revolution, one that is based on smallholder farmers; that respects the multiple agro-ecologies of India and its many staple food crops; that works for comprehensive change across the agricultural value chain, and that does so while protecting the environment, a Second Green Revolution must help small and marginal farmers prepare for unprecedented challenges lying ahead. Production shocks from floods and drought will increase risks faced by farmers. Smallholder farmers, who depend almost entirely on rain-fed farming, will be most vulnerable of all. They must be able to adapt to the impacts of climate change, from higher temperatures to changes in crop diseases and pest outbreaks, and increased stress on agro-ecosystems that are already degraded. Adaptation will require technological and policy innovations, coupled with new farming systems like the use of advanced technologies.

3. TOTALLY UNCONVENTIONAL BUT REVOLUTIONARY THINKING IS WHAT IS REQUIRED AT PRESENT

Few other unconventional ideas , that are at least not in serious consideration in the country ; are also of high need at this juncture; like reuse of waste water for farming and changing the method of irrigation for crops like rice and wheat in large areas.

Using technology to assist us one should increase the water productivity of these crops and divert the water thus saved to other rain-fed crops where a small change in irrigation cover and productivity can make a large impact!

On all India basis, while 65% primary cereals are irrigated, only 27% oil seed and 16% pulses are irrigated. Research has shown very high yield hikes in both these groups of essential commodities by limited irrigation. Can we tilt the irrigation practices favoring oil seeds and pulses?

I also list here a fundamentally new approach to our agriculture to achieve food security through resource security. The role of all of us including farmer, consumer and policy makers are clear.

- Treat farmer as “Entrepreneur”
- Focus on knowledge transfer and competency building of individual farmers.
- Convert agriculture to precision farming model and identify risks
- Provide Causes mitigation solution through PPP model
- Creation of supply chain infrastructure through cluster approach
- Provide capital subsidies and not consumption subsidies
- Create decentralized irrigation and power infrastructure for optimum productivity
- Create Integrated Soil-Crop-Climate-Market Plan on national basis
- Create a national forum between Centre and State on lines of finance commission
- Present separate agricultural budget in the parliament and create a committed agency for monitor and evaluation and timely course correction.
- Focus on increasing per capita income rather than productivity alone.

This model provides an integrated, comprehensive approach in transforming Indian agriculture: improved soils, good seeds, access to markets and enabling policies. All are important, and must work together seamlessly to drive results. Indian agriculture grows only if the small farmers prosper and become self- supporting and contributing individual to the community. All our efforts are to enable him.

4. AT JAIN IRRIGATION, CONTINUOUS TRANSFORMATION IS PERHAPS THE MOST ENDURING CONSTANT

There is a need to reinvent our existence in an ongoing way for some good reasons. An increase in global population, prosperity and consumption are creating a larger demand for food than ever before in the world’s recorded existence. The finiteness of arable land is increasing the need for cutting-edge technology to be incorporated into farm solutions. There is a growing divergence between urban and rural incomes, widening the economic divide between food providers and food consumers. There is a growing aspiration among the rural millions, which, if unaddressed, could translate into social unrest. In view of these emerging realities, there is a widening need to transform agricultural realities across the largest farmer population with the biggest impact in the shortest time.

At Jain Irrigation, we recognize that, such a focus warrants an over-arching commitment–to approach the business not just with a sense of purpose but a sense of passion; to approach the subject not as a business but as a calling; to extend from what is beneficial for farmers to what is good for all our stakeholders; to evolve from a focus only on the profitable to the holistically sustainable. Transforming ourselves; benefiting the world.

5. AT JAIN IRRIGATION, OUR OBJECTIVE ISTO INCREASE FARMER INCOMES, STRENGTHEN AGRICULTURAL VIABILITY AND CREATE A SUSTAINABLE SOCIETY

This is not as simple as it appears. In a world where realities are evolving all the time, there is a growing premium on our need to reinvent our existences that our solutions can be customised around the contemporary.

- Over the decades, we have helped transform realities through the following initiatives:
- Extended farmers from subsistence crops to commercial alternatives
- Extended cutting-edge technology to legacy farm practices
- Widened our value chain from seed to soil to food processing to non-banking financial support
- Right-balanced the use of natural resources, demonstrating the principles of sustainable agriculture

It is our conviction that when you fuse modern-day innovation with one of the oldest livelihoods known to man, some remarkable transformation can happen. At Jain Irrigation, we have been able to transform the agricultural prosperity of entire regions, lift farmers out of relative poverty, stagger the rural-to-urban migration, strengthen national food security and increase India's respect as a dependable processed food provider to the world. Transforming lives; enhancing prosperity.

6. AT JAIN IRRIGATION, SUCCESS IS DERIVED FROM THE ABILITY TO QUESTION CONVENTION ACROSS EVERY MANAGEMENT TIER, FUNCTION AND INITIATIVE.

This warrants a need to explore a better way of doing things across the organization, locations and time. One of the most effective ways in which Jain Irrigation has transformed its business from the inside and realities on the outside is through its prudent evolution from a company manufacturing and marketing products into an organization delivering a holistic agricultural solution. Over the years, this company has delivered holistic value through the following initiatives:

- We enhanced farmer knowledge and aspirations to inspire an embrace of cutting-edge technologies.
- We enriched the application of cutting-edge technologies across farms with the objective to generate radical improvements
- We facilitated farmer access to financial capital that would encourage them to invest more aggressively in micro-irrigation systems.
- We focused on reducing the delivered cost of farm solutions that would enhance agricultural viability; we refused to increase tissue culture plantlet costs for years; we introduced the solar water pumps that would moderate energy costs.
- We introduced (and customized) global best practices like JAIN GAP that helped link the output of marginal farmers with global markets. The result is that we aggregated diverse products into an integrated farm solution that has helped enhanced rural prosperity.

Some of the Smart Farming Innovations by Jain Irrigation are stated below:

7. INNOVATION IS THE WAY OF LIFE AT JAIN IRRIGATION

We pioneered a tailor made drip irrigation technology for small holders in 1990s. While technology existed in early sixties, our innovation was in an integrated approach with a view of creating shared value. It was made possible by marrying the crop agronomy and irrigation technology for Indian conditions.

We worked tirelessly in R&D Lab and Soil before making the successful trials at farmers' fields.

This document features some of the recent innovations as follows: • Rice with Drip •Wheat with Micro Irrigation •Mango with UHDP • Precision Farming for Sugarcane•

Cotton with Drip• Tissue Culture Pomegranate• Agro=Voltaic Precision Farming• Jain Integrated Irrigation Solutions

8. RICE WITH DRIP

An innovative method of PADDY CULTIVATION with PRECISION FARMING Ensuring prosperity and sustainable use of Water and Energy for Food Security

Economic Benefits

•Rice yield enhancement upto 40%

•Water Saving upto70%

•Energy Conservation up to 50%

•Water and Fertilizer use efficiency upto 80%

•Soil health protection, leading to consistent crop production

Health Improvement of farmhands

•Reduction of skin, respiratory and mosquito bite diseases

Reduction of environmental pollution

•Lower Nitrate leaching in to water bodies

•No or low methane emission

•Ozone layer protection

•Global Warming mitigation

WHEAT WITH MICRO IRRIGATION

An innovative method of Wheat production with PRECISION FARMING offers several advantages to the grower and the society.

•Rain port protects wheat crop from heat stress, high temperature at grain filling stage

•Drip Irrigation and Fertigation during the crop life cycle and use of Rainport during grain filling stage enhances yield up to 50%

•Conserves precious irrigation water upto 50%

•Saves pumping energy upto 50%

•Micro Irrigation helps maintain right humidity I micro climate

•Reduces incidence of diseases and insects significantly

•Higher and cleaner straw production

•Reduces chaffiness & shattering of grains

•Micro irrigation enables crop rotation (Wheat & Rice) with intermediate pulse crop during summer

MANGO WITH UHDP

Ultra-High Density Planting – means three times more mango yield, on the same acreage, in just three years! The innovative UHDP method of mango cultivation with PRECISION FARMING offers several advantages.

•Accommodates 674 plants per acre compared to 40 in traditional planting method

•Commercial yield in 3 years compared to 7 -9 years in conventional planting, depending on the variety

•Increases yield and profit up to 300% making Mango farming remunerative

•Lower canopy enables easy pruning and training, better disease & pest management, effortless & quick harvesting farm operations

•Bears fruit every year

•All varieties can be grown under UHDP

PRECISION FARMING FOR SUGARCANE

•Changed plant spacing from conventional to paired and wider rows

•Drip Subsurface Irrigation allows several ratoons and its management

•Drip Irrigation ensures excellent germination even for ratoon

•Better sunlight penetration in maturing canopy resulting in higher photosynthesis

•Irrigation and Fertigation through Drip, right in the root zone

•Enhanced water, fertilizer and land use efficiencies

•More number of ratoon crops per plant crop and increased income

•Very high yields of cane, upto 280% of conventionally planted ones

•Yields reach 100-120t / acre

•Drip Irrigation achieves up to 50% water saving and reduced cost of cultivation

•Revolutionizing sugarcane production even for small holders

COTTON WITH DRIP

Pre monsoon sowing with drip and better reflush management results in abundance of cotton

•Modified crop geometry, increased plant population

•Transforms conventional cotton farming into cash crop

•Reduces pesticide use by the advancement of sowing date before monsoon

•Drip irrigation results in better boll development

•Drip irrigation minimizes flower and square dropping

•Allows better reflush management and upto 300% increase in Yield is achieved

•Achieves higher water and nutrient use efficiency and reduces cost of cultivation

•This innovation prevents soil health deterioration because of reduced chemical use

•Provides opportunity for crop rotation with pulses or vegetables

•Drip-fertigation has brought back cotton cultivation in the areas where it was abandoned once

TISSUE CULTURE OF POMEGRANATE - ADVANTAGES

No Bacterial Blight, No Wilt, Early Maturity. Superior planting material with Tissue Culture, ensures Better Crop & Bigger Profits

•Introduced Tissue Culture Pomegranate for commercial cultivation first time in the world

•Tissue Culture ensures disease-free saplings

•Stops migration of Bacterial Blight and Wilt diseases

•Achieves commercial harvest in two years

•Fruits are maintained throughout the canopy

•Higher yield and lower production cost

•This technology provides low or no mortality, uniform growth and development of plants

AGRO- VOLTAIC PRECISION FARMING

Integrated Food and Fuel Farming for Sustainable Development- The innovative Agro-Voltaic Precision Farming offers several advantages.

•Optimal use of resources such as Land, Water & Sunlight

•Precision Farming Technology Integrated with Renewable Energy

•Architecture of Solar panel & Crop Geometry ensures optimum conditions for crop growth.

•A holistic approach to farming : TC Plants, Superior Seeds, Solar Energy, Drip Irrigation, Mulching, Fertigation, Automation & Hi-Tech Horticulture Practices

•Sub-surface drip, Sub-soil drainage, mulching & PV Panel as roof results in 99% water use efficiency

•PV Panel grid protects crops from extreme weather

•Rain water harvesting & recycling

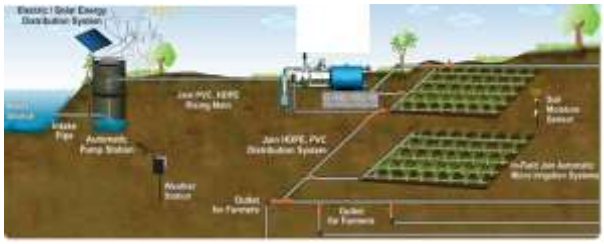
•No or lower methane emission due to Drip Irrigated Rice

•Zero net Green House Gas emission reduces Global Warming effect and protects Ozone layer

•Food and Energy production from same land gives higher income

JAIN INTEGRATED IRRIGATION SOLUTIONS (JIIS)

These community-based projects, being undertaken extensively in India and now in Africa, are opening up new vistas for the developing world. They are creating a seamless connect between Macro and Micro, Infrastructure and Agriculture, Availability and Productivity, Cost and Value.



This innovation ensures prosperity and sustainable use of Water and Energy for Food Security. This is a sensor based water delivery system with 24x7 availability of water with a crop specific productivity-enhancing package of practices more sustainably and with higher income.

Hence, to mitigate the risks in agriculture, innovation is the key and Jain Irrigation is committed to this .

Conclusion:

Jain Irrigation systems Limited, a leading agricultural conglomerate in India, has an enviable track record of developing down to earth solutions for complex problems with a sense of rustic commonsense Indians are known for. What makes Jain Irrigation unique is its ability to offer a complete range of irrigation solution to the farmer and help him produce more from less through integrated approach. JISL is not only a large agri business house, but 6-in-1. It is though such multidimensional activities that JISL nurtures the agri value chain and becomes a one stop agri shop.

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