WATER SECTOR AS A SILENT GAMECHANGER: CASE STUDY OF INDIA

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ABSTRACT

Water and food security have been viewed as a basis for sustainability of any nation. But at the same time the present competitive environment compels to review the water and agricultural sectors from profitability point of view at the annual financial planning stage. After all the game is for optimizing the monitory benefits. There has been a general perception that dependence on agriculture for any nation is a sign of backwardness leading to the tenet that industrialization is synonymous to modernization. Dependence of India on agriculture is well known in the world. The paper focusses on the journey of India since its independence from the British rule and concludes that, on the anvil of competitiveness from fiscal aspects point of view, water and agricultural sectors have performed better than other sectors associated with industries; rather, water sector has nourished their growth. Returns from water and agricultural sectors have clearly proven their worth. In the present time when several countries have been facing survival related challenges, India has withstood the shocks of the time as it was fortunate to have agriculture as its basis. It has been finally drawn from the analysis that water sector is the most crucial domain for survival of India. Other countries may learn a lot from the case study of India and make the globe a better place to live on.

Keywords : Agriculture, Competitiveness, Profitability, Sustainability, Water

1. AGRICULTURE – BASIS OF SURVIVAL OF INDIA

When India became independent, the population of the country was approximately 300 million whereas at present is 1,250 million. Limitation of land and water resources are bound to be the biggest constraints as they can not be increased. Providing food to so many people is the biggest challenge for India as it not only becomes the point of survival to begin with but also connects to several other aspects like development, law and order, education, health, etc.

Providing food in India could be thought of as a two-fold issue – production and distribution. Distribution is an issue related with management. Production is when considered, food grain production is the obvious meaning. The main reasons for that are the geographical vastness, climatic verities, cultural values and limited water resources which are all interconnected in some or the other way. One can also state that the proven sustainability of life in India is a product of time-tested practices derived from geographical, climatic and resource conditions. In different perspectives, the dominance of food grains in lifestyle has been there since long back and is impossible to change in the Indian condition.

2. TOP PRIORITY TO AGRICULTURE IN POST-INDEPENDENCE PERIOD – RIGHT STEP, SOLACING RESULTS

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Since independence (from British-rule) in 1947, India having the second biggest population in the world, faced two key economic challenges - achieving food security and alleviating poverty. Because of India's geographical and social conditions, agriculture was viewed as a promising domain for effectively addressing the issue of food security to a great extent and partly the issue of poverty. India gave the top most priority to food security and food grain production in the post-independence period and accordingly the five year plans were devised. In spite of serious flaws in implementation of them, India could attain self-sufficiency in production of food grains from a state wherein their import for feeding crores of people was the only way. The results of all the efforts to make the agricultural sector perform can be summarized as following.

1. From a mere 50 million tons of annual food grain production in 1950s, India produced 277.5 million tons of food grains in the year 2017-18.

Table – 1 Production of Food Grains in India (DES, MoA&FA

Year	Food production (million tons)
1950-51	50.8
1960-61	82.0
1970-71	108.4
1980-81	129.6
1990-91	176.4
2000-2001	196.8
2011-12	257
2017-18	277.5

2. Area under agriculture got increased from 132 Million Hectare in 1050-51 to 199 Million Hectare in 2010-11 which is apparently a small achievement. However, importance of increasing area under cropping is immense as two factors – area under cropping and yield decide the performance of agriculture to a great extent.

Table – 2 Area under Agriculture in India (DES, MoA&FA)

Year	Area under Agriculture (million hectare)
1950-51	131.89
1990-91	185.74
2000-2001	185.34
2009-10	188.99
2010-11	198.97
2014-15	198.36

3. In production of food grains the yield has played a major role. Total yield of all the food grains was 5.22 quintal/ hectare in 1950-51 which escalated up to 21.53 quintal/ hectare in 2016-17. Almost all the food grains have witnessed a fourfold rise in the yield. Yield of rice was 6.68 quintal/ hectare in 1950-51 which got increased to 25.5 quintal/ hectare in 2016-17. Yield of wheat was 6.63 quintal/ hectare in 1950-51 which got increased to 32.16 quintal/ hectare in 2016-17. All the food grains have shown steady rise in yield which finally became a boon for India and completely changed the scenario at the world level.

Table – 3 Crop Yield (Quintal/ Hectare) (DES, MoA&FA)

Crop	1950-51	1990-91	2000-01	1010-11	2011-12	2016-17
Rice	6.68	17.4	19.01	22.39	23.72	25.5
Jowar	3.53	8.14	7.64	9.49	9.54	8.89
Bajra	2.88	6.58	6.88	10.79	11.56	13.11

Maize	5.47	15.18	18.22	25.4	24.76	26.64
Wheat	6.63	22.81	27.08	29.88	31.4	32.16
Coarse Cereal	4.08	9	10.27	15.31	15.93	17.84
Gram	4.82	7.12	7.44	8.95	9.12	9.73
Tur or Arhar	7.88	6.73	6.18	6.55	6.56	8.85
Total Pulses	4.41	5.78	5.44	6.91	6.94	7.79
Total Food grains	5.22	13.8	16.26	19.3	20.59	21.53

4. Area under agriculture and yield - both witnessed a steep rise and therefore per capita net availability of food grains went up from 144.1 Kg/ year in 1950-51 to 177.9 Kg/ year in 2016 in spite of fourfold growth in population.

5. In total land availability, India stands 7th in the world but in crop production it stands 2nd in the world from percentage share point of view. Table – 4 shows how India has served the world through excelling in the agricultural sector in spite of many challenges and constraints and limited resources.

Table – 4 India's Position in World (Year 2015) (DES, MoA&FA)

	India	**World**	**% Share of India**	**India's Rank**	**Next to**
1. Total Area (Million Hectares)	329	13461	2.4	Seventh	Russian Federation, Canada, U.S.A., China, Brazil, Australia
Land Area	297	13009	2.3	Seventh	Russian Federation, China, U.S.A., Canada, Brazil, Australia
Arable Land	157	1396	11.3	Second	U.S.A.
2. Total Population* (Million)	1309	7383	17.7	Second	China
Rural	862	3368	25.6	First	
3. Crop Production (Million Tons)					
(A) : Total Cereals	284	2796	10.2	Third	China, USA
Wheat	87	737	11.7	Second	China
Rice (Paddy)	157	740	21.2	Second	China
Total Pulses	17.6	68	25.9	First	
(B) : Oilseeds					
Groundnut (in shell)	7	45	15	Second	China
Rapeseed	6	71	8.8	Third	Canada, China

6. Agriculture has been providing employment as agricultural labor to 263 Million people i.e. 32 % of the rural population of India. If counted the agricultural owners, food-processors, etc. agriculture provides employment to 60% population and hence is the backbone of the Indian Economy.

7. Share of agricultural sector in GDP is 16% approximately at present.

3. WATER SECTOR – INVISIBLE BASIS OF GROWING ECONOMY

The achievements of agricultural sector are not still up to the world standard and India is below average on some indices. However, the achievements are noteworthy considering several constraints the country has been facing.

An important observation is that the expenditure for irrigation and flood control and agriculture in five year plans went on reducing sharply from percentage of plan size point of view as shown in Figure 1 which means other sectors were given higher priority with the passage of time.

In spite of reduced share in the investment, the past investment for irrigation sector continued yielding better results constantly. Assets in the forms of reservoirs and canal systems and pumps went on paying and delivering a lot for many years. Small increment in assets every year and their tendency to produce long lasting results have significantly enhanced the situation of India in food production.

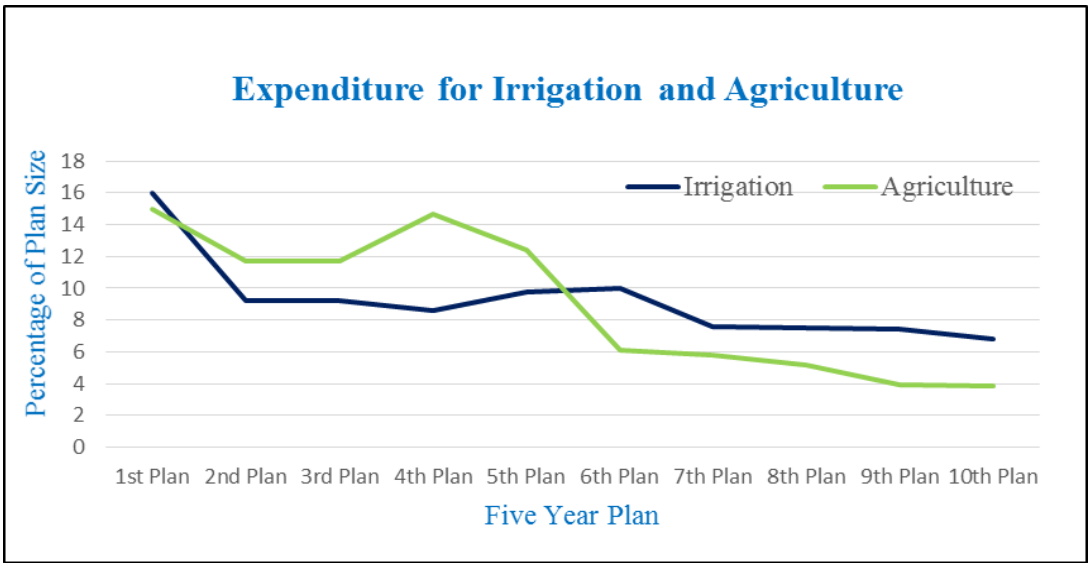

Figure 1. Plan-wise Percentage Expenditure for Irrigation and Agriculture

The history of agricultural growth and constant enhancement in water sector have gone hands in hands. India has made a tough struggle to address the issues in water management. During this planned development period, India has increased its water storage capacity from a meagre 15 BCM to more than 200 BCM by constructing over 4000 dams. This in addition to other types of irrigation resulted in to gross irrigated area increased from 22.56 Million Hectare in 1950-51 to 89.96 Million Hectare in 2010-11.

Table – 5 Irrigation Potential in Different Parts of India

Region	States	Ultimate Irrigation Potential as % of cultivable area	Created potential as % of Ultimate Irrigation Potential
Eastern	Bihar, Orissa, Sikkim, West Bengal	116.6	53.24
North Eastern	Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura	66.97	28.65
Northern	Haryana, J&K, Punjab, Rajasthan, UP	84.81	*95.32*
Southern	AP, Karnataka, TN, Kerala	64.37	54.59
Western	Goa, Gujarat, MP, Maharashtra	58.58	39.95
India			**64**

Increased storage not only increased the irrigated area but also raised the level of reliability of irrigation. The present status of irrigation - ultimate potential and created potential as shown in Table – 5 suggests that India has gradually built up its wide spread basis for agricultural development and all the states have tried to develop irrigation to the possible extent. Irrigation potential was created as per availability of the respective region. How vital role irrigation sector has played in the food production and enhancement of yield can be understood from the fact that in every crop there is a large

difference between the yield of irrigated segment and unirrigated segment as shown in Table - 6. It also shows how reliability in agriculture was provided by the irrigation sector. Agriculture can perform only if assured water is available and to what extent it can improve is understood from Table – 6. It justifies the need of irrigation to the agricultural sector. In absence of water, no efforts either in the domain of hybrid seeds or good quality fertilizers would have produced any results. Rainfall is erratic in India and assured and timely availability of water has been the precondition for success in agriculture and therefore has been the requirement of water storage. Due to some irrigation facilities, in spite of lack of awareness in irrigation and agriculture sectors, India has been able to manage the scene so far.

Table – 6 Irrigated and Unirrigated Yield Levels of the Principal Crops (tons/ Ha)

Crops	Irrigated segment			Unirrigated segment		
	71-72	81-82	91-92	71-72	81-82	91-92
Food Crops						
Paddy	1.65	1.91	2.09	0.70	0.90	1.05
Wheat	2.40	2.77	3.18	1.04	1.54	1.83
Jowar	1.33	1.48	1.32	0.63	0.93	1.08
Maize	1.02	1.64	1.98	0.66	0.99	1.56
Non-Food Crops						
Groundnut	1.46	1.59	1.83	0.81	0.90	0.96
R.seed and Mustard	0.54	0.75	0.99	0.24	0.32	0.48
Cotton	0.85	1.37	1.87	0.32	0.68	0.73
Sugarcane	41.41	58.37	63.84	37.47	41.33	46.87

Main inputs in agriculture are water, seeds and fertilizers. India made a remarkable progress in all the three domains in simultaneity and hence the noteworthy achievements. Seeds and fertilizers are thanks to the scientific innovations but water being a natural resource, only management was the option with the country which was also not so easy. In case India had neglected the water sector, import of food grains would have broken the backbone of economy as almost the entire annual income of India would be spent. Perhaps this aspect has not been properly endorsed in India.

4. WATER SECTOR: NO LESS IMPORTANT THAN OTHER SECTORS OF INDIAN ECONOMY

Figure 2 shows the plan-wise expenditure for industrial, transport and power sectors. Total expenditure for them has been 45% or more of the plan size. It is interesting to note that the present contribution of industry, transport and power together to the Gross Domestic Product (GDP) amounts to 37% approximately. If total expenditure of all the five year plans in worked out, it would be at least five times what it has been spent for the water sector. The objective of discussing this point is not to undermine the usability of the sectors other than water sector but to underline the fact that by spending only 1/5th on water or 1/3rd on water and agriculture as compared to other capital intensive sectors, agriculture has been delivering 1/2 as compared to others which could not be underestimated.

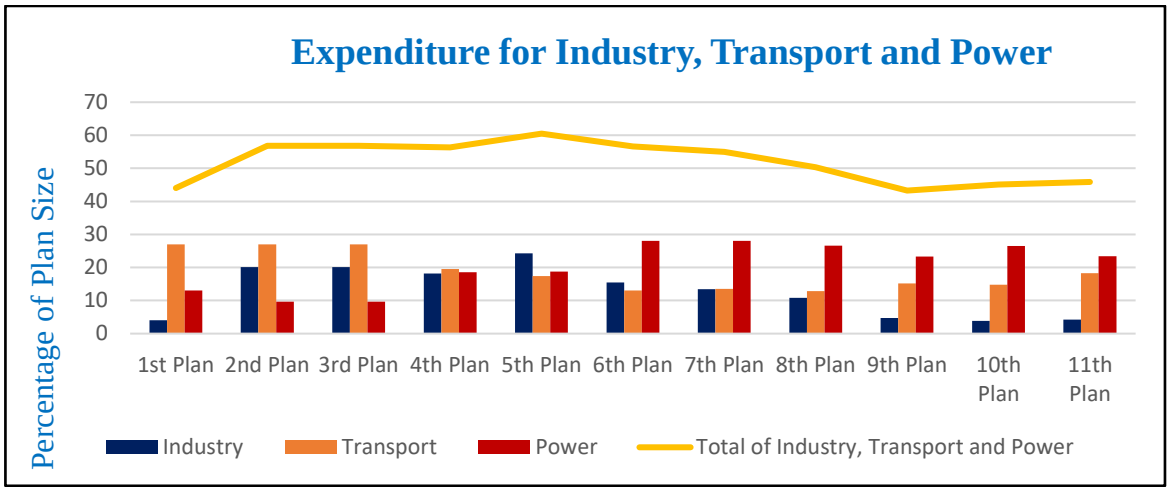

FIGURE 2. Plan-wise Percentage Expenditure for Industry, Transport and Power

Thus, water and agriculture are the crucial and productive parts of the growth process in the Indian perspective in spite of the fact that they are lagging much behind on the advancement front. Therefore, spending on water and agriculture is not a wasteful expense or merely a social service but is actually a productive expense even today.

One more important point is that the contribution of industry, transport and power sectors to the GDP i.e. 37% is not independent of water sector but is owing to contribution of it. Importance of water for the agricultural sector and its extent have been clear but water is equally crucial for capital intensive sectors needs special attention. Major source of power is thermal energy in India which consumes 87% of the total industrial consumption of water and contribution of power sector in GDP is only 2.4%. This suggests that the advancement in power sector is not independent of contribution of the water sector and its contribution to GDP whatever it is does have a bearing on water like the development of agriculture can not be imagined without water. Total industrial consumption of water has now increased to 15% and agricultural consumption has reduced to less than 70%. In India, because scientific water accounting and auditing is not done, debate goes on how much water the agriculture consumes but the fact is clear even with the macro level information from the irrigation projects. Their designated command areas are left deprived by transferring water to domestic and industrial purposes. This is because industries can not manufacture anything without water and different industries have different requirements of water and their contribution to GDP is not exclusive to an important input – water.

5. REFORMS IN WATER SECTOR THAT COULD FUEL FURTHER ECONOMIC GROWTH OF INDIA

India has cultivated a mindset that by creating assets the development could be ensured and hence the focus has been all the time on creation of assets. But the fact is that maintenance of already created assets is a must to ensure required level of performance. India has created a storage capacity of over 200 BCM and has constructed over 4000 dams but the maintenance has not been done properly. Assets do need management whereas in India the most precious assets are not managed properly and are left on the mercy of the local people without caring for governance at all. Therefore, the efficiency of dams and canal networks in India is less than 40% as an average.

Public hygiene is discussed everywhere today and the Government is trying hard to make the villages and cities “Open Defecation Free” and therefore toilets are being constrcuted in every house. It is impossible to make this movement successful without availing water as a prerequisite to functioning of the toilets. This would escalate the domestic water demand significantly and finally agriculture would come under stress and more complex water management would be required.

Interstate sharing of water has also become a serious threat against national integrity. The Cauvery issue and the Ravi-Beas-Satluj issue are only a few examples but within the state boundaries the social stress is mounting day be day. There is scanty and ineffective legal or administrative framework to resolve such issues and hence they become more and more complex with passage of time.

There is a widespread complacence on all the issues of water sector. In parliament, the discussion on any such issue either derails the session or is limited amongst the parliamentarians from the respective states. But unfortunately no ruling party or people at the helm seriously think of enacting appropriate laws or framing administrative set up. On the other hand, the same democratic institution is proactive in sorting out the issues related to directly associated sectors. Commerce and industry are the fields closer to economy as the monitoring of economy is done with the measuring yards based on their performance. Therefore, the state of commerce always remains under the crosshair and as soon as there is some negative sign, people at the helm become alert and respond immediately. Amendments in the Patent Law of India provide sufficient evidence of responsive attitude at the highest level. Originally, the Patent Law was based on process patent philosophy. After downfall of the USSR in the late eighties of the twentieth century, the world perceived that communism could not lead to development and capitalism remained the only ideology left for paving the path to development. The air was surcharged with high pitched talks of globalization and the Dunkel Draft that eventually became General Agreement on Trade and Tariff (GATT) was in front of all the countries of the world. Signing up on it required many legislative reforms of earthshaking nature for many countries like India. For any democratic country it was difficult to sign the agreement because the legislative reforms were subject to nod of the parliament and the process was likely to be a dangerous move for the ruling party. A small but rudimentary part of it was the Trade Related Intellectual Property Rights (TRIPS) which necessitated product patent as the underlying philosophy as against the then prevalent patent law based on process patent philosophy in India. Amongst many difficulties, India did not lose much time as it wanted globalization as its agenda. Economic reforms and legal reforms went together and the world could see what India could do in no time. Fast reforms in patent regime India has made can be seen from the fact that the Act of 1972 was amended in 1999 and then subsequent reforms in 2002 and 2005. India became globalized on economic front. Thus, on economic front there is no allowance left by India in the recent past. But for water sector there is not the same level of awareness or enthusiasm exhibited ever by the Indian parliamentarians.

Knowing the fact that water sector has been a critical common basis for all the sectors which make the development tangible, India needs to appreciate that - it has withstood the shocks of the time thanks to its strong basis of agriculture till date whereas several countries of the world have been devastated by the economic catastrophe because they did not have agriculture as their basis; it can sustain for a long only if water sector is in order and it can fall down otherwise just as an old tree dies out in course of time if no water is available to it for a long; water sector has contributed a lot in spite of its being in anarchy and can make out so much in case is corrected to lead India to a remarkable position. Enough delay has already made a large dent on the future

prospect of the country and the present is also not really solacing but every moment lost in addressing the needs of the water sector is to cost heavy to India.

6. CONCLUSION

India's journey from independence onwards has not been marked with signs of fast growth and development but at the same time India has sustained in bad times unlike other countries that made remarkable progress and development in a short spell. Agriculture has imparted robustness to economy of India and water has been the main force behind it. Performance of industrial and power sector is also thanks to water. Water has not been paid necessary heed for last few decades in spite of its being the pivot of all the walks of life but the time has come India understood the significance of water. However, promising results of past investment in the water and agricultural sectors have been paying till date. India can survive and make progress with water sector in the center of the economic planning.

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