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'Make in India' Re-imagined

A Case for Agri-industrialisation

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Abstract

This paper views Industrialisation of India through a new approach: '*Agri-industrialisation*'. It builds on the analysis that the government should get serious about agriculture-centric industrialisation and re-imagining the *'Make in India'* initiative through the prism of rural India. It could help us unbind India from growth constraints and achieving high and sustainable development in both agriculture and industry. This is bound to make a significant dent on absolute poverty and agrarian distress. They say good economics does not make good politics. This paper says clever politics can make excellent economics.

It analyses sectors, such as irrigation, power, fertilisers, agricultural productivity, applied bio-technologies, food processing and warehousing to identify gaps and show how smart decision making can move the curve outwards.

My father use to say that once in your life you need a doctor, a lawyer, a policeman and a preacher but every day, three times a day, you need a farmer

– Brenda Schoepp

Introduction

Since last two years, the public policy dialogue has been all about foreign direct investment (FDI), smart cities, high-speed trains, internet and ease of doing business, all having accumulated to in a tag of '*suit & boot ki sarkar'*. One wonders whether this discourse benefits India or is more of narrative of some of the globalised middle-income countries seeking to catapult themselves to the next level.

The India, we know has 69 per cent of rural voters; 276.4 million people live on less than US$1.25 per day;[1] 263 million workers are employed in agriculture (more than 50 per cent) which contributed 17.4 per cent of India's gross domestic product (GDP),[2] and grew at a mere 1.1 per cent in 2014;[3] 43 per cent of children are suffering from malnutrition,[4] higher than the estimated averages for sub-Saharan Africa (20 per cent) or least developed countries (25 per cent); and 50 per cent of households practice open defecation.[5] In India, there is hardly room to debate who comes first in any dialogue on public policy.

Why is Agricultural Development Key to India's Growth Strategy?

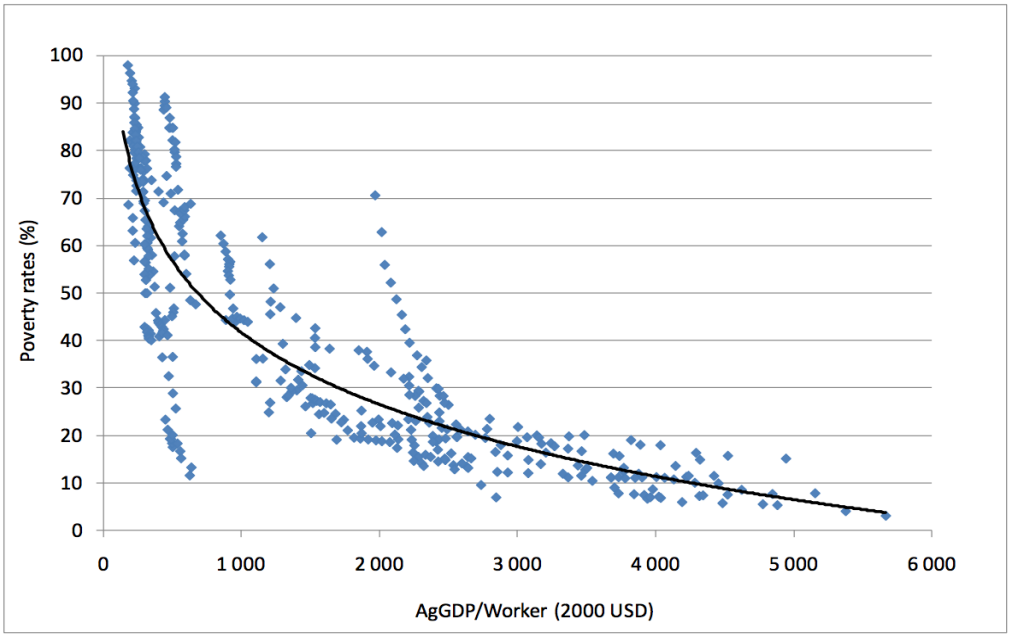
Rural demand drives growth of Indian industry. Textiles, fast moving consumer goods (FMCG), auto industry, electronics, mobile phones are glorious examples of such rural-based growth in consumption. Investing in Indian agriculture has the potential to drive demand for industrial goods, such as fertilisers, pesticides, cement, steel, materials for construction of roads and irrigation projects, warehousing and transport sector. Downstream food processing promises huge employment and export potential.[6]

It will contribute to taming inflation, which is most sensitive political issue in India. The gains by concentrating on reforms in agriculture could be visible in six months, whereas manufacturing, heavy industry and hi-tech sector development can take years to fruition.

As our population keeps on growing, more and more need to be fed and employed. The industrialisation process needs to be linked to the growth of agriculture to ensure mutual benefit of both sectors.

There is no dearth of literature to support that upliftment of the rural poor in the near term will require robust farm-oriented strategies. A study[6] conducted by the Organisation for Economic Cooperation and Development (OECD) revealed that 12 out of 25 countries surveyed, growth in agricultural GDP per worker was most important for poverty reduction, with only four countries showing reduced poverty because of growth in the non-agricultural sector.

Figure 1. Poverty and agricultural GDP per worker, (25 selected countries)



Note: Number of observations = 147.
Source: OECD calculations based on data from Povcalnet, 2009 and WDI, 2009.

Bhajan Grewal, Helena Grunfeld and Peter Sheehan (2012) quote Martin Ravallion and Gaurav Datt (1996) as having found that growth in agriculture had been highly beneficial in reducing rural poverty and promoting growth of the rur
al economy in India.[7]

Thirtle et al. (2001) interpreted that agricultural productivity growth can be expected to have an impact on poverty. They estimated that, on an average, every one per cent increase in agricultural productivity reduces the percentage of people living on less than a dollar a day by 0.6-1.2 per cent.

Similarly, Virmani (2007) found that for every one per cent increase in agricultural growth poverty reduces by 0.45 per cent. In fact, Ashok Gulati, Infosys Chair Professor at Indian Council for Research on International Economic Relations (ICRIER) states that farm growth results in decrease of rural poverty two or three times faster than other sectors put together.[8]

Growth in agriculture is expected to reduce poverty through three mechanisms:

- A direct and immediate effect of increased agricultural productivity on rural incomes;
- Higher agricultural productivity leading to improved availability of food with consequential benefits for the poorest of poor. The United Nations Annual Hunger Report estimated that India had the highest number of hungry people in the world at 194 million, making it crucial to increase food production in India; and
- Growth of agriculture impacts upstream and downstream economic activities, i.e. generation of economic opportunities in non-farm sectors.

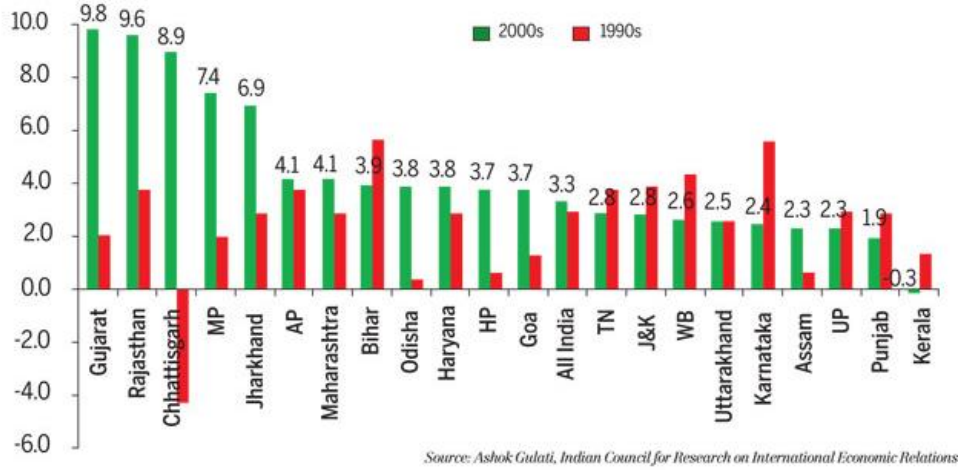
The multiplier effect of growth in rural India and from farm incomes have been least understood by successive administrations. Development of agriculture directly drives demand for goods, such as fertilisers, agro-chemicals, seeds, transport and warehousing which require chemicals, steel, cement, and above all, manpower employment. Rural demand in India drives growth of industries, such as textiles, FMCG, auto, electronics, and increases consumption in general. More than 70 per cent of sales is made to middle class households today and over 50 per cent of the middle class population resides in rural India.[9]

Rural India is a powerhouse propelling the nation's growth. Rural spending outpaced urban consumption in two years up to 2011-12, which was for the first time in nearly 25 years, according to a study by CRISIL Research. During 2009-10 and 2011-12, additional spending by rural India was Rs 373,566 crore, significantly higher than Rs 297,770 crore by the urban population.[10]

Many new age economists have been skeptical of the idea that the primary sector may be the source of revitalisation of our economy. According to them, economies banking on agricultural-led growth models have rarely exceeded a growth rate of four per cent. However, this notion is highly flawed. Firstly, none of the studies has looked at the size and diversity of country like India. Secondly, the theory of 'mutual benefit' (studied in a report by Lin and Koo, 1997), while investigating the interdependency between China's agricultural and industrial sectors during 1952 to 1988,[11] found that growth of the Chinese agricultural sector contributed to the growth of the industrial sector, however, growth in the industrial sector did not lead to growth in the agricultural sector.

There can be no better proof than an analysis of five states in India – Gujarat, Rajasthan, Chhattisgarh, Madhya Pradesh and Jharkhand – all of which have been growing at 9.8, 9.6, 8.9, 7.4 and 6.9 per cent respectively[8] whilst being larger than most nations in terms of both – population and area.

In order to elaborate on the linkages of development of agricultural infrastructure with overall economic prosperity, this paper examines the case of two most 'successful' states – Gujarat and Madhya Pradesh to provide empirical data, which can go into framing of a course correcting public policy.



Source: Ashok Gulati, Indian Council for Research on International Economic Relations

Gujarat: A Case Study for Agri-industrialisation

Sector	GDP (crore) in 2010-11 and state-wise ranking in India	Growth rate in 2010-11 (in per cent)
Overall	367,540 (5th)	10
Industry	150,964 (2nd)	8.97
Agriculture & allied	46,379 (6th)	14.41
Service	167,953 (6th)	10.79
Manufacturing	100,730 (2nd)	8.73

Source: Knoema, Statewise GDP Ranking in India by Industry (2013)

Gujarat does not have fertile land and most of its landscape is arid. Despite being faced with challenges like depletion of water table, deterioration of soil and water conditions due to salinity, irregularity of rainfall and recurrent drought, it has managed to have an agricultural growth rate of 9.8 per cent. *Business Standard* quotes Dilip Patel, who runs oil mills and yarn producing factories in Mehsana, a city of Gujarat, summed up the state government's initiatives in the following words: "Building small canals to deliver water to farmers' fields; dissemination of knowledge on farming practices through events, such as *Krishi Mahotsav*, subsidies for improved seeds and fertilisers as well as drip irrigation; use of Bt cotton; thriving rural cooperatives, excellent roads that extend into rural areas and regular supply of electricity are primary factors for Gujarat's success". Gujarat not only tops the list in terms of agricultural output but has also shown one of the highest growth rates in secondary and tertiary sectors.[1]

Thus, the policy of intensively improving agricultural productivity through irrigation, fertiliser distribution, adopting bio-technology, improving road connectivity, boosting power to rural sector and improving cooperative institutions has seen the industrial sector of the state prosper. This goes to prove how powerful is the rural multiplier in the Indian context and a prospering primary sector automatically leads to growth in the secondary and tertiary sectors.

[1] Business Standard (2015), *'Indian agriculture's 'Gujarat Model'* (Author- Rahul Jacob)

Even more impressive is the case of Madhya Pradesh, which has left all major states behind in terms of economic growth, with an unprecedented growth rate of 11 per cent in 2013-14, a year when India recorded its second successive year of sub-five per cent growth in GDP.[1] What is noteworthy is that high growth in Madhya Pradesh was not dragged down by the state's sluggish industrial growth of 2.1 per cent in 2013-14, down from 5.5 per cent in 2012-13.[12]

[1] According to CSO data, Madhya Pradesh's gross state domestic product registered a double-digit growth of 11.08 per cent at constant prices, up from 9.9 per cent in 2012-13

Led by largely agricultural growth, and a modest growth in services sector, the dramatic overall growth of Madhya Pradesh compensated the dismal performance by the industrial sector of the state. Madhya Pradesh registered a record growth at 24.99 per cent in 2013-14 in the agriculture sector, including animal husbandry.[13] The agriculture growth rate was 20.16 per cent in 2012-13 topped the 19.85 per cent achieved in 2011-12, according to Central Statistics Organisation reports. How did Madhya Pradesh achieve these commendable results?

The Madhya Pradesh Success Story

Crop	**2010-11 (lakh tonnes)**	**2014-15**	**Productivity (Kg/Ha)**	
			2010-11	2014-15
Wheat	76.27	184.80	1757	3079
Rice	17.72	54.38	1106	2526

Sector	**2010-11**	**2014-15**	**Notes**
Agri Loans	15090 crore	46454 crore	Increase of three fold
Kisan Credit Card	35 lakh	78.845 lakh	Growth of 100 per cent
Crop loans	5,845 crore	13,598 crore	Interest rates brought down from 5 to 0 per cent
Power to agri sector	6.7 billion units	16.1 billion units	Rs 4480 crore subsidy provided for agricultural pumps
Irrigation (assured – Canal)	9.75 lakh hectare	32.29 lakh hectare	The state government targets to cover 60 lakh hectare by 2020
Warehousing	79 lakh metric tonnes	158 lakh metric tonnes	Highest in any state

Madhya Pradesh had declared a bonus of Rs 150 per quintal for two years – 2013-14 & 2014-15 over and above the Minimum Support Price (MSP) declared by the Centre. Mobile technology was leveraged to the fullest. In 2014-15, over 9.85 crores of SMS were sent out to farmers with agricultural advisories. All bank accounts are linked with mobile phone numbers and no sooner that a subsidy is directly transferred to a beneficiary that a message is received informing the person.

Perhaps no other input could have played a more critical role than power. The state government took a critically strategic decision of separating the rural and urban grids. The supplies to the agricultural sector were doubled between 2010-11 to 2014-15 from 5 to 10 hours.

Source: Department of Farmer Welfare and Agriculture Development, Madhya Pradesh

Both these case studies bring us to the core theme of suggesting revitalising of the Indian growth story through a strategy, which harnesses complementarities between agriculture and industry in India. While doing so, 'soft' issues such as fragmentation of land holdings, availability of credit or regulatory hurdles like Agricultural Produce Market Committees (APMCs) are not being discussed. This is not because these are less important but theme so demands. If '*Make in India'* initiative is driven by expanding investment in core areas, which drives agricultural growth, it will become a potent multiplier for industrialisation.

Key Sectors of Development

This paper has identified 'core' industries, whose constrained performance has most plagued the farm growth in India and thereby not only prevented rapid amelioration of rural distress, but also from realising its industrial potential.

By directing investment in these sectors, which can be channelised by sensible public policy as well as direct intervention by the government, we can unleash a virtuous cycle of investment and consumption, driven by rural India, manifesting itself rapid growth. The core industries identified are:

- Irrigation
- Steel and Cement
- Fertilisers
- Warehousing, Food Processing and Power
- Mechanisation, Auto-sector and Agricultural Machinery

Irrigation

India's cropped area is 199 million hectare, while the net irrigated area is a mere 63.6 million hectare or 32 per cent. The water-use-efficiency (WUE), in Indian agriculture is the lowest in the world, at 30-40 per cent. Micro-irrigation is thus essential in a country like India as its WUE ranges from 70-95 per cent.[14]

According to International Water Management Institute (IWMI), India is faced with serious water scarcity, both due to global warming and increasing population. "India is becoming a water-stressed country like the Middle East, if current trends continue," says Colin Chartres, Director General of IWMI. Satellite images show that across the Gangetic Plain, some 54 cubic kms of water are disappearing each year. Due to the falling water table, farmers now have to bring up water from greater depths, resulting in higher energy requirements.

According to estimates, India has a total water demand of around 700 billion cubic metres (bcm), nearly 90 per cent of which is used for producing food. IWMI projections show that India's water demand is set to double by 2030, at 1,498 bcm, while the total water supply will be 744 bcm.[15]

Coupled with water scarcity, rural India has to combat with vagaries of the southwest monsoon and attendant vulnerability to drought, floods and cyclones. One hardly needs imagination to measure rural distress and poverty in such a scenario. In 2015, unseasonal rains and hailstorms destroyed wheat, pulses and

mustard in Haryana, Madhya Pradesh, Maharashtra, Punjab, Rajasthan and Uttar Pradesh.

The release of Rs 200 crore[16] from the emergency state fund by a State's Chief Minister, which trickled down by way of cheques as low as Rs 37 to some farmers were a matter of much mirth in the Indian media for weeks at end. The only way out, Chartres suggests, is to store more water, which means, India will have to invest in interlinking of rivers, water recycling, rainwater harvesting, and construction of dams and tanks;[15] precisely where opportunities for investment and industrial growth also exist.

The project of inter-linking rivers and building a grid of canals provides a unique opportunity for steel and cement companies as well as manpower employment. Downstream, one can visualise improved sanitation, drinking water and yes, power. Considering that India's annual subsidies bill is to the tune of Rs 2.27 lakh crores per year,[17] a projected investment of Rs 5,60,000 crores over 7-10 years for solving serious problems relating to public health hardly seems debatable. To this, one can add benefits of a reduced carbon footprint by moving away from traditional cooking and lighting methods.

Steel and Cement

The central theme of this paper is advancing the multiplier effect of investment in agrarian India. Irrigation through the interlinking of rivers is the most effective strategy for improving productivity in agriculture. Inter-linking of rivers through building a network of canals will boost the demand for cement and steel and lead to an expansionary effect in the industry.

Accordingly a closer look at the steel and cement industry is warranted. India is the fourth largest producer of crude steel in the world[18] with a production of over 86 million tonnes. However, the per capita steel consumption has remained a dismal sub-60 kg, in comparison to China's 510 kg. It shows the growth potential of steel industry in India. Yet public policy has not regarded it as a nascent industry worthy of nurture and protection. The industry has been plagued with an ore mining scam, a coal scam, plunging international prices of steel, high prices of power and one of the highest domestic transport costs of inputs in the world. Coupled with the high cost of land acquisition and some of the highest interest rates in the world, a tonne of reinforced steel produced in India for use in buildings can cost up to Rs 15,000 more compared to China, according to industry sources.[19]

Lack of competitiveness and disappearing fiscal protection (*India unwittingly signed FTAs with Japan, Korea, ASEAN who already had very high propensity to export steel*), steel imports by India of a mere 10 per cent of domestic production have begun to play havoc. Imports increased by 71 per cent touching a record high of 9.31 million tonnes in 2014-15.[20] Undoubtedly, an inward looking strategy of providing domestic industry a protection of 25 per cent, as is being demanded, will be a right step. More importantly, the industry needs strong demand, which can only come from sectors such as infrastructure, housing and irrigation canals, which again promise to be a very productive strategy for agricultural growth.

India is the second largest producer of cement in the world, with a production of 270 million tonnes.[20] As of now, India's installed capacity is estimated at 366 million tonnes,[20] which means the industry is operating at 75 per cent capacity. The demand for cement has been driven by housing, which accounts for 67 per cent of the consumption whereas infrastructure accounts for only 13 per cent. Evidentially an infrastructural push for agrarian-India holds huge potential demand. The per capita consumption of cement in India at 225 kgs[21] in comparison to China which stands at 1581 kgs. While lack of demand has led to sub-optimal capacity utilisation, one cannot belittle the headwinds faced by industry in terms of environmental issues, shortages of gypsum, inverted duty structures, competition from imports from neighbouring countries under free trade areas (FTAs), high cost coal and sky priced power tariffs of India.

In a memorandum to various Union Ministries on April 10, 2015, The Cement Manufacturers Association (CMA) said that cement was allowed to be imported into India at zero import duty, whereas all major raw materials required to make cement, such as limestone, pet coke, packing bags and gypsum had import duties levied on them.[22]

The government has to harness the potential of a core industry like cement for its '*Make in India'* initiative. A demand thrust can come from housing, which the government has to realise can happen if rural incomes increase. Agrarian prosperity will eventually percolate to improved demand for housing and lead to improved capacity utilisation in the cement industry. Similarly, a thrust in infrastructure spending (on canals and roads) can lead to increase in demand for cement by 30-35 per cent, with consequential improvement in the industry and be a step towards realising the *'Make in India'* objective.

Fertilisers

Agricultural productivity in India critically hinges upon assured canal irrigation, rural electrification and balanced use of fertilisers. The story of India's fertiliser industry is the saddest of all. The fertiliser industry has been mired with complexities unknown anywhere in the world. The industry suffers from price control. The price at which urea is distributed is even cheaper than salt. The industry has to buy its inputs in free markets but cannot sell freely priced fertilisers. This led to a highly complex system of subsidies and possible leakages plaguing the system are no secret.

India's domestic production of fertilisers is 38 million tonnes[23] and 40 per cent of total domestic production is still imported (16.62 million tonnes in 2014-15 – urea, di ammonium phosphate, muriate of potash). What possible reasons could have prevented India from building a thriving fertiliser industry capable of exporting to rest of the world rather than landing up importing from China and Iran through a complicated process of central procurement and following a complex subsidised distribution system in which annually Rs 67,971 crore[24] are spent (about 0.6 per cent of GDP). This inability to provide a half-decent commercial environment has in fact led to shutting down of nine public sector undertakings (PSUs).

There is unhappy farming community who occasionally protests on lack of timely distribution of inputs;[25] a leaky market which encourages the smuggling of fertilisers to neighbouring countries as well as their diversion to industrial use;[26] an unhappy scientific community who rightly complain about the imbalanced use of fertiliser leading to degradation of soil; and a sick domestic industry which is unable to expand capacity.

While the fertiliser subsidies face global issues emerging from the WTO agreement, political and socio-economic reasons will not permit these from disappearing soon. Under the circumstances, one has to put the blame on the administrative system of disbursement of subsidy as well as some form of patronage, all of which contribute to market imperfections.

With the advent of Mobile Technology Enabled Services (MTES) and a near 100 per cent penetration of mobile phones as well as *Aadhar* cards, there is potential for a unique IT-based online system[25] for continuing the subsidy mechanism for fertilisers and yet not hurting the industry. One can visualise farmers having register themselves on a web portal, managed and serviced by an IT major by way of service centres and registering every farmer through the *Aadhar* card number and mobile phone. The manufacturers would also be on the same system, maintaining their production, distribution, sales and accounting data on it. Fertilisers would continue to be sold under Fertiliser Price Control Order at notified prices.

Except, instead of the dodgy district-level cooperatives, they would sell through their privately-owned depots and every bag sold would be on an invoice generated in favour of *Aadhar*-linked mobile phone, at the controlled price, and lead to the subsidy amount credited simultaneously to the company through online banking. India does disburse income tax refunds or drawback to exporters through such online banking. Since accurate figures for dark deals are never available, it would not be a surprise that the government save thousands of crores by preventing leakages.

If the government can rectify the fertiliser distribution-cum-subsidy regime, the industry holds tremendous potential for firing the '*Make in India'* initiative. The total investment in the fertiliser sector by the end of 2005-06 was Rs 25,923[27] crore and despite the demand gap, the sector has failed to attract more investment due to low returns and huge regulatory uncertainties. To increase the capacity of fertilisers by 16 million tonnes (which we import) India will need to invest at least Rs 80,000 crores in the sector, which provides immense opportunities.[28] Recently, the government has signed agreements with Gulf countries, such as Iran for subsidised supply of gas, and agreed to establish plants in those countries for manufacture of fertilisers. The jury is still out there on whether this strategy of importing cheaper fertilisers was a preferable alternative to '*Make in India'.*

Warehousing, Food Processing and Power

Leakages, wastages, losses have been often cited as one of the big banes of Indian agriculture. While multiple reasons are cited for these loses ranging from pestilence to lack of roads, to absence of warehousing, this paper concentrates on two primary

strategies, which can benefit agriculture and be leveraged for '*Make in India'* initiative. These two areas are – warehousing and food processing. The Food and Agriculture Organisation (FAO) of the UN has documented that India loses 10 per cent of its food production, post-harvest, due to storages in warehousing and food processing.[29]

The Economic Times reported that an Right to Information (RTI) application filed by *Times of India* revealed that the quantity of food grains damaged in Food Corporation of India (FCI) godowns across the country recorded a drastic jump over the last two years when the country lost more than 40,000 tonnes of food grains.[30] Though losses are attributed to natural calamities, such as cyclone and floods, experts opine that it is also an indication of poor storage facilities, pilferage and transit loss. The reply from FCI shows that the damaged quantity rose threefold in five years. A total of more than 56,000 tonnes of food grains, including 27,000 tonnes of rice and 26,000 tonnes of wheat, have been damaged since 2010.[28]

The warehousing sector, promises advantages of both worlds – a kick start to the economy through construction and the other of providing longevity to the supply chain, which in turn would reduce losses as well as improve the bargaining power of farmers. Building community warehouses, which should remain in control of *panchayats*, would provide farmers protection against the freak weather, improve their bargaining position, keep rodents at bay and also prevent hoarding by anti-social elements. Building of village-based community-owned storage houses would have tremendous benefits. The construction itself will generate demand for steel, cement and labour. Once the infrastructure is in place, India could potentially save much of Rs 200,000 crore worth of fruits and vegetables from post-harvest losses.[31]

Similarly, cold storage facilities are the prime infrastructural component for perishable commodities, such as fruits and vegetables. It has the potential to play a vital role in stabilising market prices. The cold storage industry renders other advantages and benefits to both farmers and consumers. The farmers get opportunity of producing cash crops and increasing their sale *(if more can be stored, more can be produced)* whereas consumers get the supply of perishable commodities with lower prices. According to estimates, India has around 6,300 cold storage facilities, with a capacity of 30.11 million tonnes.[32]

According to Siraj Hussain, Secretary, Ministry of Food Processing, the present requirement is assessed to be 61 million tonnes. However, some 75-80 per cent of these refrigerated warehouses are actually suitable for storing only potatoes, a commodity that produces only 20 per cent of agricultural revenue.[33] An assessment made by the Institution of Mechanical Engineers (IME), a professional organisation based out of UK may be better place to start an assessment of the demand-supply gap. The report states that only 4 out of 104 million tonnes of fresh produce is transported through a cold chain. It found that only 10-11 per cent of fruits and vegetables produced in India use cold storage.[30]

Investments modelled on third parties-owned cold storages would allow small farmers to leverage these facilities on rent. The revenue stream for investors is reasonably assured from year round rents. But a cold storage in rural India will

require assured 24X7 power. For a nation that bears the burden of in-sufficient rural electrification, with only 44 per cent of rural households having access to electricity,[34] rural electrification must precede large scale cold chaining.

In other words, not only rural electrification holds the key for irrigation and better productivity but also for building farm endurance through cold chaining vegetables and fruits. Both of these also happen to be far higher on value chain of nutrition and income, and hold the greatest potential for changing the landscape of rural India in every which way, we conceive.

The discussion on fruits, vegetables and cold chains brings us to the food processing industry. Within this sector one cannot but mention India's dairy, poultry, fisheries, floriculture, and plantations; one cannot but recall with some twinge of remorse, how small economies like New Zealand or Holland have stormed the world with their milk, cheese, chocolates or even tulips!

According to the Ministry of Food Processing Industries, there is wastage of approximately Rs. 92,651 crores (per annum at 2014 wholesale prices) of fruits and vegetables every year.[35] Only two per cent of fruits, six per cent of poultry and eight per cent of seafood is processed by the country.[32] Due to lack of food processing, the lifespan of many items further reduces and increases the total post-harvest wastage.

The 2015 budget provides for revitalisation of the 'blue revolution' with much fanfare. For the un-initiated, it represents the equivalent of the 'white revolution' in the fisheries sector. Total Rs 500mn (Rs 50 crores) [36] has been allocated for starting a 'blue revolution' for developing inland fisheries, which is nothing more than 0.06 per cent of our budgeted annual fertiliser subsidy. Considering that a 'blue revolution' will not only mean increasing marine production, but also more cold storage, better transportation for the product, this seems like a budget too tight to achieve anything substantial.

Mechanisation, Auto-sector and Agricultural Machinery

No paper on agri-industrialisation can be complete without mention of mechanisation of Indian agriculture as a source of improved productivity and its huge potential in any '*Make in India*' initiative. Agricultural machinery and implements are an important factor in enhancement of agricultural production. There are direct and indirect benefits of using machinery for improving productivity resulting in increased levels of cropping intensity (Venugopal, 2004). Number of tractors per 1000 hectares in India was 9.43 as compared to Japan's 456.24. The number of combined harvesters per 1000 hectares in India cannot even be represented by an integer as it is a near-zero (0.026) when compared to Japan's 234.42.[37]

According to the government's farm mechanisation policy, to be eligible for a tractor loan, the size of farmer's land must be at least 8 hectares, as this is the size of land considered viable for optimal use of a tractor.[34] In a country like India, where arable land was last measured at 0.13 ha (hectares per person) in 2011,[38] government's policy effectively eliminates a very large number of farmers from

being eligible to avail a loan for a tractor. If farm productivity is to be increased, use of farm machinery is to be seen as an enabling tool. In cooperative and *panchayat*-ownership of mechanised tools, lies a quick solution than involving ourselves in getting more land together.

Are We on Course?

A discernible shift in government's strategy is somewhat evident through the budget speech on February 29, 2016. The Finance Minister said:

'Let me first take up Agriculture and Farmers' Welfare. We are grateful to our farmers for being the backbone of the country's food security. We need to think beyond 'food security' and give back our farmers a sense of 'income security'. Government will, therefore reorient its interventions in the farm and non-farm sectors to double the income of the farmers by 2022. Our total allocation for Agriculture and Farmers' welfare is Rs. 35,984 crore'

'We need to address issues of optimal utilisation of our water resources; create new infrastructure for irrigation; conserve soil fertility with balanced use of fertiliser; and provide value addition and connectivity from farm to markets'

'Implementation of 89 irrigation projects under Accelerated Irrigation Benefit Programme (AIBP), which have been languishing, will be fast tracked. This will help to irrigate 80.6 lakh hectares (8.06 million)...We will ensure that 23 of these projects are completed before March 31, 2017'.

While this was an encouraging opening, unraveling the numbers was not. It will, effectively speaking, take the government 35 years to cover the remaining 76 million unirrigated land (considering that the *Pradhan Mantri Krishi Sanchayee Yojna* and AIBP will together bring 11 million hectares under irrigation in the next five years *if* the government can deliver on its promises, which as past records suggest is nothing but unimpressive). One finds it hard to believe that the so-called AIBP launched in 1996 and admittedly languishing could be rejuvenated as to meet targets by 2020. The Hon'ble Finance Minister went on to add:

'To increase crop yields in rain fed areas, which account for nearly 55 per cent of the country's arable land, organic farming is being promoted'

It is a little difficult to comprehend how bringing organic farming to rain-fed areas can boost yields or insulate farming families from vagaries of the great south-west monsoon. According to a study conducted by UC Berkeley[33] yields from organic farming are 20 per cent lower than conventional farming.

To be fair, there were some bright spots in the speech when Hon'ble Finance Minister said:

'At least 5 lakh farm ponds and dug wells in rain-fed areas and 10 lakh compost pits for production of organic manure will be taken up by making productive use of the allocations under Mahatma Gandhi National Rural Employment Guarantee Act

(MGNREGA). The Soil Health Card Scheme is now being implemented with greater vigour. Through this, farmers get information about nutrient level of the soil and can make judicious use of fertilisers. The target is to cover all 14 crore farm holdings by March 2017'.

Another heartening move announced in the Budget speech was:

'Access to markets is critical for the income of farmers. The government is implementing the Unified Agriculture Marketing Scheme, which envisages a common e-market platform that will be deployed in selected 585 regulated wholesale markets'.

National Agriculture Market (eNAM) aims to remove information asymmetry between buyers and sellers by providing real time access to price discovery and to a nationwide market. At the time of this paper's publication, 14 states had amended the APMC Act in order to accommodate e-trading of 25 commodities proposed, but Punjab, a NDA partner had baulked. One could not help but note with some remorse the humble achievement of eNAM, which connects a mere 21 *mandis*/districts from eight states in the first phase.

Similarly, government's initiative of crop insurance is commendable. The Finance Minister said:

'Government has approved the path breaking Crop Insurance Scheme, namely, Prime Minister Fasal Bima Yojana. For effective implementation of this Scheme, I have provided a sum of Rs. 5,500 crore in the Budget 2016-17'.

This was perhaps the first time that a meticulous attempt was made to provide a context to the budgetary proposals with the Economic Survey. The 'connect' of both documents was exceptional, but the absence of a commercial understanding of business realities, which is so typical of India's bureaucracy, was evident.

The 'commercial sense' that is so required in India's Economic Survey and the Budget, continue to fall short of India Inc's expectations each year. There was no mention of interlinking of rivers; indigenous expansion of India's fertiliser industry; and how a faulty market has led to a sick industry. The survey seemed to make a feeble attempt to acknowledge the malaise in the shape of "…leakages and the need to make overseas investments for augmenting competitive imports in a de-canalised market." Neither was there any mention in the Budget about government's support in the mechanisation of Indian agriculture nor of warehousing/cold chains/food processing. All the government had to give was advice:

'With increase in fragmentation of landholdings and low rates of tractor penetration among small farmers, there is need for a market in tractor rentals, akin to cars and road construction equipment, driven by private participation. With suitable mobile and internet applications, manufacturers of tractors along with other stakeholders need to deliberate on this, since it will also increase demand for tractors'

It was almost conspicuous that for an agrarian economy, the word 'tractor' just appears twice in 376 pages that make up the survey.

Conclusion

The government continues to follow a disaggregated approach to economic growth by not reposing faith in complementarities between agriculture and industry. The approach to rural India remains compartmentalised with a focus on food security and addressing absolute poverty. The Economic Survey, 2016 is evident of such an approach when it sums the strategy for the farm sector as follows:

Given the low yields in agriculture and limited scope for increasing acreage under cultivation, India has to enhance productivity in agriculture by investing in key inputs, so as to ensure food security for the growing population. Therefore, the pathway to improved productivity in agriculture in India needs to be guided by the following strategies: expansion in the share of irrigated areas; investments to improve efficiency in water use; suitable pricing of water; mechanisation of operations of agriculture to lower costs and reduce wastage; seed development for improved varieties to increase yields; debate/address concerns about introduction of genetically modified seeds in a time frame of three to six months; efficient use of fertilisers and pesticides through improved practices; market-driven pricing of fertilisers with no restriction on imports; shift to direct benefit transfer of fertiliser and other agriculture subsidy; distinguish and target subsidy to the farmer and that (subsidy) to inefficient operations of agriculture inputs; credit access to farmers for investments at rates that the financial institutions pay for their deposits; ring-fencing of agriculture related operations of banks from Non-Performing Assets (NPA) to non-agricultural operations; replacement of intermediation of agricultural finance with direct benefit transfers; and development of real time information system to back an improved timely agricultural advisory services.

This approach misses the crucial point that the '*Make in India*' initiative and industrialisation can be driven by agriculture. Present policies still evidence that economic advisers and politicians are not thinking on lines of complementarities and multipliers, and India still appears to be stuck in the '*agriculture vs industry*' debate. As case studies of Gujarat and Madhya Pradesh have shown, the key to scorching growth and poverty alleviation lies in agriculture-led industrialisation. The rest will follow.

Endnotes

[1] International Bank for Reconstruction and Development / The World Bank (2015), *A measured approach to ending poverty and boosting shared prosperity* p.50

[2] The World Bank Report (2014), *Agriculture, value added as a % of GDP*

[3] The World Bank Report (2014), Agriculture, value added (annual % growth)

[4] *Jean Dreze and Amartya Sen, 2013, India: An uncertain glory, Ch.3 – India in comparative perspective, National Family and Health Survey -3 (2005-6)*

[5] UNICEF India, *Water, Environment and Sanitation Jean Dreze and Amartya Sen, 2013, India: An uncertain glory, Ch.3 – India in comparative perspective, National Family Health Survey 2005-6, India*

[6] Organisation for Economic Co-operation and Development (2010), *"Economic Importance of Agriculture for Poverty Reduction*", OECD Food, Agriculture and Fisheries Working Papers, No. 23 (2010)

[7] Bhajan Grewal, Helena Grunfeld and Peter Sheehan (2012), Australian Centre of International Agricultural Research, *Contribution of agricultural growth to poverty reduction,* ACIAR impact assessment series no.76

[8] India Today (2015), '*Why rural India matters: Agriculture's share in economic GDP may be low but in electoral, political equivalent of GDP, it is about 60 per cent*' (Author: Shekhar Gupta)

[9] Avinash Pareek and Dr. Satyam Pancha (2013), *Indian rural market; An impulse to FMCG sector*, IOSR journal of Business and Management (Volume 8, Issue 1*)*

[10] Hindustan Times (2013), *Rural India buys brands* (Author: Rachit Vats)

[11] Won W. Koo and Jianqiang Lou (1997), '*The relationship between the agricultural and industrial sectors in Chinese economy development*', Department of Agricultural Economics North Dakota University, Agricultural Economics Report No. 368

[12] The Indian Express (2014), Madhya Pradesh now fastest growing state, Uttarakhand pips Bihar to reach second (Author: Anil Sasi)

[13] The Economic Times (2014), Madhya Pradesh registers record agriculture growth at 24.99% in 2013-14

[14] Sukhpal Singh (2009), '*Agricultural Machinery Industry In India: A study of growth, Market structure, and Business Strategies*', Centre for Management in Agriculture (CMA) India Institute of Management (IIM)

[15] DNA India (2011), *'India will have water and food crises by 2030: Study'*

[16] The Economic Times (2015), *'UP CM Akhilesh Yadav releases Rs 200 crore for rain-hit farmers'*

[17] The Times Of India (2015), *Union Budget: India to spend Rs 2.27 lakh crore on major subsidies*

[18] World Steel Association (2015), *'World Steel in Figures 2015'*

[19] Reuters (2014), 'Modi's 'Make in India' push to depend on Chinese steel', (Author: Krishna N.Das)

[20] Business Standard (2015), *'Steel traders urge government to repeal quality control order',* (Author: Dilip Kumar Jha)

[21] India Brand Equity Foundation (2016), *Cement Industry In India*

[22] Cement Manufacturers Association, *CMA Annual Report (2013-14)*

[23] Department of Fertilisers, Ministry of Chemicals and Fertilisers, Government of India

[24] The Hindu Business Line (2015), '*India's silent spring'*(Author: Ashwini K Swain/ Glada Lahn)

[25] Scroll.in (2015), *SEEDS OF VIOLENCE: As fertiliser riots spread across Haryana, police stations turn into urea distribution centres (Author: Dharendra K Jha)*

[26] Live Mint (2013), *New system to check fertilizer smuggling, pilferage* (Author: Gaurav Jain) - New system to check fertiliser pilferage and smuggling - The 2 monitoring systems, FMS (Fertiliser Monitoring System), handled by Lateral Praxis and the second, mFMS Mobile Fertiliser Management System, designed and managed by the National Informatics Centre (NIC), under the Ministry of Communications and Information Technology hope to help save the government at least Rs.5,000 crore a year by checking fake claims, pilferage and smuggling. Urea fertilisers purchased at subsidised rates are diverted to other industries such as plywood, dye, adhesives and even to

produce adulterated milk and smuggled to neighbouring countries such as Bangladesh and Nepal. Potash fertiliser too finds its way to firecracker industries. According to a 2012 report in *Tehelka* magazine, citing an unnamed fertiliser department official, at least 3-4 million tonnes of subsidised fertilisers are diverted to chemical industries every year in Gujarat and Tamil Nadu alone.

[27] Preserve Articles, *A Bird View of Fertilizer Industry of India (Author: Dr. Kamlesh S. Dave)*

[28] Department of Fertilizers, Ministry of Chemicals and Fertilizers, Government of India, 1-year e-book.

[29] Food and Agriculture Organisation, *Research and development issues in grain post-harvest problems in Asia.*

[30] The Times Of India (2015), *'In 2 years, 40,000 tonnes of grain went down the drain'* (Author: Christin Mathew Philip)

[31] The Associated Chambers of Commerce & Industry of India (2013), Post-harvest losses may cross Rs. 2.50 lac crore by 2013-14

[32] The Hindu Business Line (2014), *'India needs to expand cold storage facilities'* (Author: Jayanta Mallick)

[33] The Economic Times (2013), *'Private investments needed to fill cold storage facility gap, says MFP'*

[34] Nidhi Verma, Ishaan Dua, Naresh Kumari (2014), Scenario of Rural Electrification in India-Challenges and Impact, International Journal of Engineering Research and Applications (Vol. 4 Issue 12)

[35] Ministry of Food Processing Industries (2015), *'Food Processing reduces the distance between farm and fork'*

[36] Make In India: Food Processing

[37] Supra Note 14

[38] Trading Economics, Arable land (hectares per person) in India