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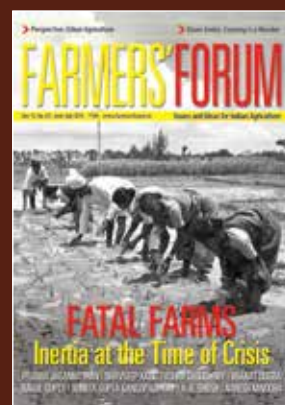
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Issues and Ideas for Indian Agriculture

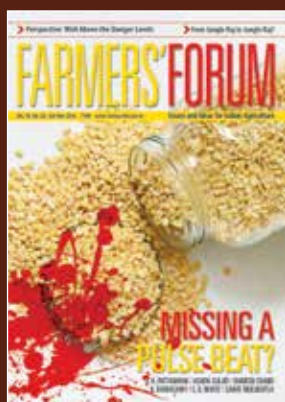
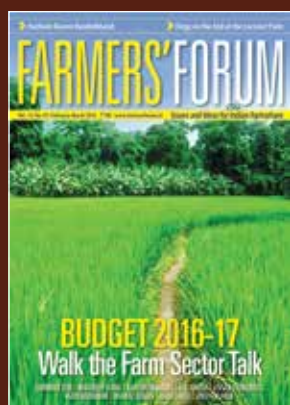


SUCCESSES AND ROADBLOCKS CAN AGTECH ADDRESS INDIA'S FARM WOES?

ARVIND SUBRAMANIAN | RADHA SARKAR & AMAR SARKAR | SUBIR ROY | BHARAT DOGRA



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Bharatiya Kisan Ko Gussa Kyon Aata Hai

The Indian farming scene does appear to be emerging straight from the pages of a black comedy. How else does one correlate the dramatic announcement of a doubling of farm incomes with the growing farmer agitation across the country? Farmers commit suicide, they are fired upon, they lay siege to India's capital in despair and many senior economists, from whom the government seeks counsel, come up with inane and outright insensitive comments: about the "mystery of farmer agitations circa 2017"... which they resolve "is heavily political".

Surely one has arrived at an inflexion point even in India's otherwise limited understanding of issues agricultural. It seems to have progressed to a deliberate misunderstanding of the situation on the ground by rearranging data, courtesy major changes in the methodology of the National Crime Records Bureau; something so brilliantly exposed by P. Sainath, who has followed it up with detailed explanations on the plight of the farmers.

The reported decline in farmer suicides is a classic case of selectively torturing data when the same numbers prove that farmer suicides increased by 42 per cent in 2015. After 2014, farmer suicides are enumerated separately from those of agriculture labour. Thus the disparity in suicide data. Many states like Jharkhand, Chhattisgarh, West Bengal and Odisha have even refused to record farmer suicides and now under-report. Farmer suicide data remains unreliable; for example, land is normally registered in the name of men, so when women farmers commit suicide, they do not get counted.

It is a dark satire to tell a farmer that the Minimum Support Price (MSP), CPI and WPI changes reflect that farmer incomes are doubling and farmer suicides are declining. The trigger for the recent farm agitation are the depressed farm gate prices. The government declares MSPs for some crops but more than two-thirds of all such crops are selling below MSP or far lower than in the previous years. That is what matters on the ground. Worse, over 80 per cent of farm produce is not purchased under MSP. Even vegetable prices are about half.

The BJP's election manifesto promised the crop production cost plus 50 per cent pricing formula based on the M.S. Swaminathan report but the government quietly filed an affidavit in the Supreme Court, stating that it could not be implemented. Farmers are losing hope and faith in this government, just as they did in earlier governments that consistently broke promises.

Last year in Maharashtra, farmers were compelled to sell milk for as low as ₹16/litre, compared to the

THE TRIGGER FOR THE RECENT FARM AGITATION ARE THE DEPRESSED FARM GATE PRICES

DISORGANIZED FARMERS HAVE EARLIER DONE WHAT THE COMBINED OPPOSITION COULD NOT; BRING GOVERNMENTS TO THEIR KNEES. MORE IMPORTANTLY, THEY HAVE SHOWN THAT IT CAN BE DONE



average purchase price of ₹35/litre in many other states. Most farmers keep cattle and were reeling from lower milk prices, impacted by policy-induced imports of butter oil (ghee). They now have to contend with the ban on cow slaughter and buffalo sale restrictions. Every farmer's cash flow is disrupted. This has added to the pent-up frustration that exploded.

After a decade of bad policies, the farmer agitation in Maharashtra was waiting to happen. What has rattled most economists is the agitation in Madhya Pradesh, a state where farming was supposedly progressing at an unbelievable double-digit growth rate. Economists with no 'skin in the game', who trumpeted farmer prosperity through agriculture GDP and agriculture production numbers, now try to escape the blame by branding the agitation "political". Production increases do not translate into income increases. Inversely, when production peaks, farmers suffer.

The farmer agitation is not just about demonetization-induced farm deflation and poverty, it is also about frustrations arising from unfulfilled aspirations and farmers' realization that other communities have progressed at their expense. By wilfully disregarding how farmers remain the primary tool for controlling inflation, academics evade the heart of the farmer distress issue.

The farmer agitation will be the defining image marking three years of the Modi regime. The mess on the farm is not a creation of the Modi regime but expectations were high that Narendra Modi would solve the crisis. Now, with hopes of off-farm jobs and "ache din" evaporating, he is losing the moral authority to carry forward reforms and resorting to a populist agenda, like the UPA.

The larger question is not why farmers are agitating but why agitations do not yield long-term tangible changes to their livelihoods. The demand for a higher MSP or loan waiver does not represent all sections dependent on agriculture. The demands of agricultural labour are never raised and, subsequently, farmer agitations lose steam. For the first time, educated youth participated in the farmer agitation and they will eventually bring their families into the movement. Agitations not driven by politicians are a harbinger of tumultuous times. Disorganized farmers have earlier done what the combined opposition could not; bring governments to their knees. More importantly, they have shown that it can be done.

Reacting with loan waivers, pandering governments cannot dispel the discontent of alienated farmers but can only prolong the uncertainty and the inevitable. Depressed international commodity prices, plummeting cotton and maize prices in the coming harvest time can be the flashpoint for the next farmer agitation. ●



A handwritten signature in black ink, reading 'Ajay Jakhar'.

Ajay Vir Jakhar
Editor

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To the Editor

Fertilizers for whom?

Sir,- Apropos of your excellent editorial, Fertilizing Farm Sector Woes, (*Farmers' Forum*, April-May 2017), I totally agree with your view that the disempowered farmer's voice is being drowned in the din generated by the fertilizer industry and the small farmers are in danger of getting even more deeply trapped by their circumstances. This, even as DBT clearly emerges as a mechanism to transfer benefits exclusively to the industry. International experience in similar industries proves how fallacious such arguments are but, as you so rightly say, in a world where agnotology reigns supreme, how can the simple logic of the farmer cut any ice? What option does he have but to agitate for his cause?

Jitender Saini
New Delhi

Women on the move

Bharat Dogra's article, Towards The Right 'Disha': integrating social reform with livelihood improvement (*Farmers' Forum*, April-May 2017) warms the cockles of one's heart in a world where the farm sector is all about stories of misery. The work of this small social organization "Disha" serving the farmers' cause in Uttar Pradesh is inspiring. It is for the general citizenry to applaud and support such enterprises. Unified women can bring about massive social change and, if given professional leadership, they can transform society and economies. May many such Dishas bloom in India.

Deepak Sharma
Sonapat, Haryana



Future lies in IOT

Your report, Agriculture and the Internet of Things: stories from across the world (*Farmers' Forum*, April-May 2017) was an eyeopener. It is crucial that every stakeholder in the farm sector strives to ensure that IOT pushes farming to the next level even in India. Indian farming is going through tumultuous times. Not only is there pressure to feed the Indian population but also to feed the farmer himself, even as it has to address the forces of climate change and markets. India must rein in the marvels of IOT to strengthen the plough.

Biman Sinha
Kolkata, West Bengal

**Farmers' Forum website
www.farmersforum.in
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Log in to check out all
the earlier issues.**

Knowing Koraput

It was interesting to see your Greenfingers travelling to Koraput to bring to us this very significant development that "Koraput is Globally Important Agriculture Heritage Site (*Farmers' Forum*, April-May 2017). India's vast agro-cultural heritage never ceases to amaze one.

How beautifully Koraput's traditional systems have been linked to age old customs that have helped them conserve regional biodiversity through this in-situ conservation. It was most heartening to learn that the locals have sustainably managed the forest preserving endemic species as well. Please continue to publish more of such articles.

Sumit Singh
Jaipur, Rajasthan

Magnificent collaboration

I was most impressed to read Intelligent Cloud; Increasing Yields the Icrisat-Microsoft Experiment (*Farmers' Forum*, April-May 2017). It is only when the best of technology impacts on the lives of the hard working farmers that the entire country benefits. It was quite fascinating to read about the players at the two ends of the spectrum: a ground nut farmer from Andhra Pradesh at one end and representatives of a top multinational company along with some of the best scientific minds of India at the other. The outcome was bound to be good. One shares Microsoft's hope that applying the intelligent cloud will mark a significant start for digital agriculture and that more governments and stakeholders will reap the benefits of this innovation.

Madhavan Nair
Chennai, Tamil Nadu

TRANSFORMING INDIAN AGRICULTURE

Redressing the Imbalance in Love Some Agriculture Less; the Rest More

Arvind Subramanian

The topic I have chosen does not need any justification either in terms of its contemporary or historical importance. The government has made doubling farm incomes one of its top policy priorities. To this end, it has taken a number of important policy actions to boost agriculture: instituting soil health cards, emphasizing efficient irrigation, strengthening government procurement of pulses, introducing neem-coating of urea, building more assets under the Mahatma Gandhi National Rural Employment Guarantee Scheme Act (MGNREGS), expanding crop insurance for farmers and building a common agricultural e-market via e-NAM.

The historical salience derives from this being the 100th anniversary of the Champaran movement. The first salvo of satyagraha was fired by the Father of the Nation on behalf of farmers, the indigo farmers oppressed and exploited by



ARVIND SUBRAMANIAN, the Chief Economic Adviser, Government of India, delivered this speech at the National Academy of Agricultural Sciences

all and employment to many. In addition to these intrinsically positive reasons to invest in agriculture, there are other instrumental reasons: poor agricultural performance can lead to inflation, political and social disaffection and restiveness — all of which can hold back the economy. There are intrinsic as well as instrumental reasons for prioritizing agriculture.

We must be clear and honest about one important link though. Nobel laureate, Sir Arthur Lewis, showed that economic development, always and everywhere, is about getting people out of agriculture and of agriculture becoming over time a less important part of the economy (not in absolute terms but as a share of GDP). This must, however, happen along with rapid productivity growth, ensuring rising farm incomes and adequate food supplies for the people.

The reason why agriculture cannot be the dominant source of livelihood is that levels of productivity and hence living standards can

Economic development is always and everywhere about getting people out of agriculture and of agriculture becoming, over time, a less important part of the economy

colonial rule. Perhaps, as a result, the farmer has acquired a mythic status in Indian legend: pure, unsullied, hard-working, in harmony with nature and yet poor, vulnerable and the victim, first of the imperial masters and then of indigenous landlords and middlemen. Bollywood (and Kollywood and Tollywood) has, of course, played a key role in creating and reinforcing the mythology of the Indian farmer. I have in mind movies such as *Mother India*, *Do Beggah Zameen*, *Upkaar*, and more recently *Peepli Live* and even *Lagaan*.

To support and protect the farmer is also a professed ideology and mantra of politicians of all stripes and all times, reflected, for example, in the periodic granting of loan waivers and the perennial lure of announcing free power. The question that I want to pose today, however, is: has this mythological status actually come in the way of really being good to him?

Why Agriculture Matters: An Irony

The reasons that agriculture matters are well-known: it provides sustenance to so many, food to

never approach — and have historically never approached — those in manufacturing and services. That, of course, means that we must get our industrialization and urbanization right for the alternatives to agriculture to become meaningful, prosperous alternatives.

When Dr Ambedkar, famously derided the village as a sink of localism, a den of ignorance, narrow mindedness and communalism, he was perhaps on to a deeper truth — an Indian social complement to the Lewisian economic insight — that in the long run people need to move and be moved out of agriculture. Dr Ambedkar was warning about the patronization of agriculture masquerading as a romanticization of rural India. So the irony is this: we must care deeply about farmers and agriculture today because we want there to be fewer but more productive and prosperous farms and farmers tomorrow.

In other words, all good and successful development is about facilitating this transition in the context of a prosperous agriculture and of rising productivity in agriculture not least because

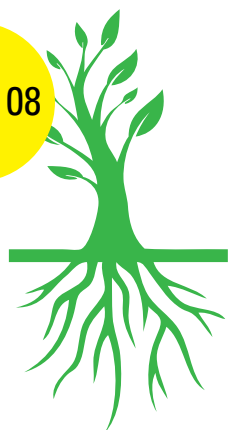




Photo: Pixabay

that will facilitate good urbanization and rising productivity in other sectors of the economy.

Today, I am going to provoke/force us all into collective self-reflection on the state of agriculture and its future. It is easy to list 10 or 20 different things that need to be done to improve India's agricultural performance: stem the deterioration in agricultural research, educational, and extension institutions, improve resilience, incentivize drip irrigation and such others. Easy as this is, it is perhaps useless.

A simple question needs to be asked of any improvement or reform that experts recommend: if that is so obviously good for agriculture why has it not happened already. Put differently, what it is about today that will make these proposals successful when they have demonstratively failed to persuade in the past? To ask the question or tentatively pose a hypothesis: is it possible that India actually loves some crops (cereals) and their farmers too much and, for all the pious professions and mythologizing, other crops and their farmers not enough. To put it more bluntly, perhaps India is smothering cereals with too much government support and other crops — pulses, dairy, oilseeds, livestock and fruits and vegetables — not enough?

The Successes

Before elaborating on the main theme, it would be worthwhile to take stock of the achievements and shortcomings of Indian agriculture. Indian

Vallabhai Patel & the Kheda Struggle

Sardar Vallabhai Patel's first major participation in the freedom movement was during the Kheda Struggle. The Kheda division of Gujarat was reeling under a severe drought and the peasants asked for relief from the high rate of taxes. When it was denied, Sardar Patel, Gandhi and others led the villagers in their refusal to pay taxes. Ultimately the government granted tax relief for that year resulting in the first major success for Sardar Patel in his public life.

When farmers were at the mercy of milk contractors in Kheda, they turned to him for a solution. Sardar Patel, who had advocated farmers' co-operatives as early as 1942, reiterated his advice that they should market their milk through a co-operative society of their own. This co-operative should have its own pasteurization plant. His advice was that the farmers should demand permission to set up such a co-operative. If their demand was rejected, they should refuse to sell their milk to middlemen. Sardar Patel pointed out that in undertaking such a strike there should be some losses to them as they would not be able to sell their milk for some time. If they were prepared to put up with the loss, he was prepared to lead them.

— <http://www.amuldairy.com/index.php/component/content/category/8-2013-04-10-04-59-11>

Figure 1: Overall Agricultural Productivity: Still Very Far From Frontier Countries

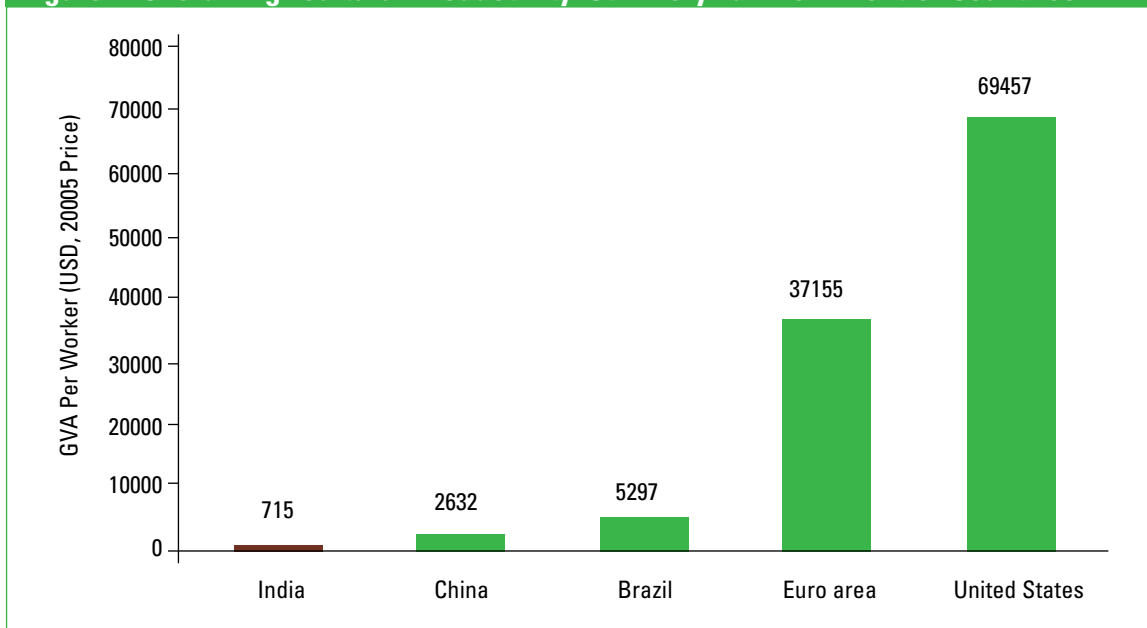
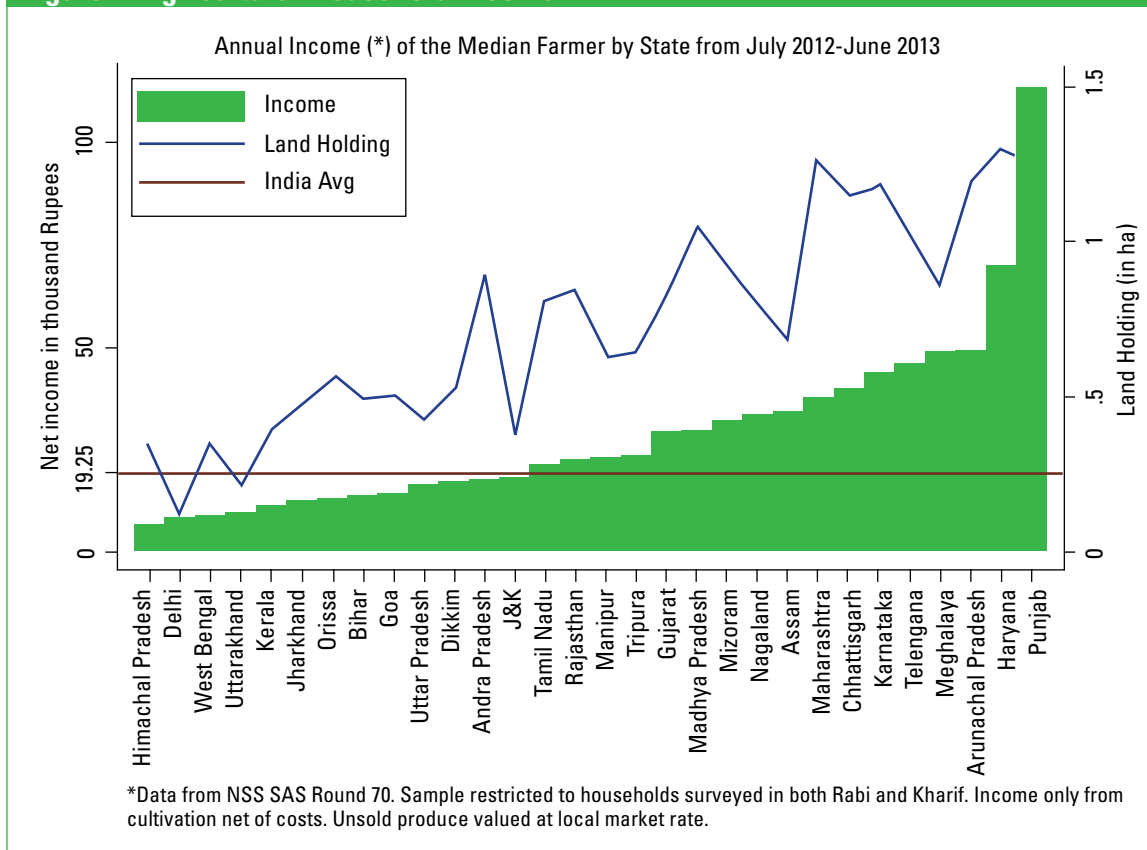


Figure 2: Agricultural Household Income



agriculture has come a long way given where it was in 1947. India has achieved food security – at least on the major crops; rural poverty rates have declined substantially; agricultural incomes have risen; nutrition levels have risen.

In terms of successes, one could highlight the following: The green revolution transformed Indian agriculture by increasing yields of wheat and

rice, especially in northern and then in southern India. Credit here goes to international research but perhaps even more so to Indian scientists, agronomists and researchers, extension workers in public institutions that completed the link from technology to actual farm output.

The white revolution that transformed the Indian dairy sector, increasing milk production,

Figure 3: Ground Water Depletion



In addition to sectoral successes, there have been regional achievements — cotton in Gujarat, maize in Bihar, sugar in Uttar Pradesh, wheat in Madhya Pradesh, potatoes in West Bengal

reducing dependence on imports, creating vibrant and participating institutional structures on agriculture and founding a vibrant consumer goods industry based on dairy. Credit here goes, of course, to Dr Verghese Kurien, the Kheda Co-operative movement and the enlightened leadership of the NDDDB.

In addition to these sectoral successes, there have been, other regional achievements — cotton in Gujarat, maize in Bihar, sugar in Uttar Pradesh, wheat in Madhya Pradesh, potatoes in West Bengal. Despite these successes, the honest story here is one of the glass being less than half full. Two statistics support my assertion.

- Overall agricultural labour productivity is less than a third of that in China and about one per cent of that in the frontier countries.
- Land productivity (measured as yield per hectare) is also well below the frontier. For example, in the case of rice, Indian yields are about 50 per cent of those in China and one-third those in the U.S.
- Agricultural incomes (as measured by income from cultivation, net of cost and unsold produce valued at local market rates) are still meagre.¹ The median household net farm income was about ₹19,250 in 2012-13 or about ₹1,600 per month, which is not very far above the poverty line. To be sure there is enormous variation but the truth is it simply does not pay to be a farmer in India.

The New Malthusian Challenge

Before elaborating on the central hypothesis, there is need to alert everyone to the new and serious challenge: raising agricultural productivity and reducing vulnerability are going to get harder because of “the re-emergence of the Ghost of Malthus”. The four key agricultural resources: atmosphere, water, land and soil quality are all moving in very unfavourable directions.

- Climate change will reduce agricultural productivity and increase variability (all the models show a disproportionate impact on Indian agriculture);
- Water is becoming perilously scarcer for climactic reasons and because of over-use and misuse domestically, especially in Punjab and Haryana (see figure 3);
- Soil quality is getting depleted and the pressures on land are mounting, as population surges and alternative uses are becoming more attractive.

Smothering with Love: Cereal-Centricity

How great is the support for cereal and especially rice production! They are too numerous to exhaustively enumerate. The government helps the farmers through policies that affect the prices of outputs and inputs; through schemes and through institutions. It provides minimum support prices to farmers and the benefits accrue mainly to



¹ Data based on Agricultural Situation and Assessment Survey, NSS for 2012-13.

those who produce a marketable output and that too mostly in cereals and wheat. This, in turn, is confined largely to a few states, notably in the north (Punjab and Haryana). The government also provides subsidies for power, water, fertilizer (now the second largest subsidy), seeds, credit; exempts agricultural income from income taxes; and periodically grants loan waivers. *Figure 2* shows that agricultural incomes in Punjab and Haryana exceed those in the rest of India to indicate a sense of this biased, smothering with love.

Smothering with Love: Big, Not Small Farmers

There is a second aspect to this smothering with love: not only does it mainly benefit the cereal farmers, it also tends to favour larger farmers or, at least, it does not adequately reach the smaller farmer. To give some examples: by definition, the exemption of agricultural income from tax favours those with larger incomes. The Economic Survey estimated that only about one-third of the total subsidy went to small and marginal farmers. On agricultural credit,

there is now growing evidence that not all of this goes to farmers. On the loan waiver, a surprisingly low number of small and marginal farmer borrow from formal financial institutions (less than 50 per cent); borrowing much more from informal sources. The large farmer relies on formal sources to the extent of about 75 per cent. The Economic Survey estimated that the bottom quintile received about 10 per cent of the total power subsidy while the top quintile received about 37 per cent because of highly skewed electricity consumption.

Is there something as loving too much? The experience of Punjab is perhaps suggestive that there is. Thanks to support, incomes are high and amongst the highest but there is growing evidence that this is proving now to be counter-productive. Punjab has lost most of its earlier agricultural dynamism. Between 1971-72 and 1985-86, agricultural growth was 5.7 per cent compared to the all-India number of 2.3 per cent. Since 2005-06, its average agricultural growth has declined to 1.6 per cent compared to India's 3.5 per cent (*Figure 4*).

The Economic Survey estimated that only about one-third of the subsidy went to small and marginal farmers. There is evidence that not all agricultural credit goes to farmers



Turning the wheels
of farming fortunes

Photo: Pixabay



Figure 4: Agricultural Growth in Punjab and India (Average decadal, %)

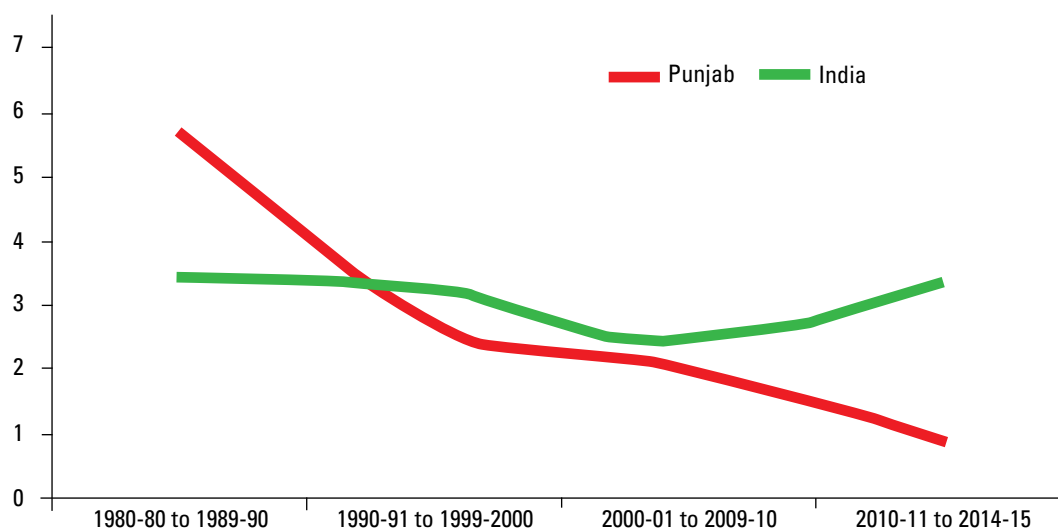
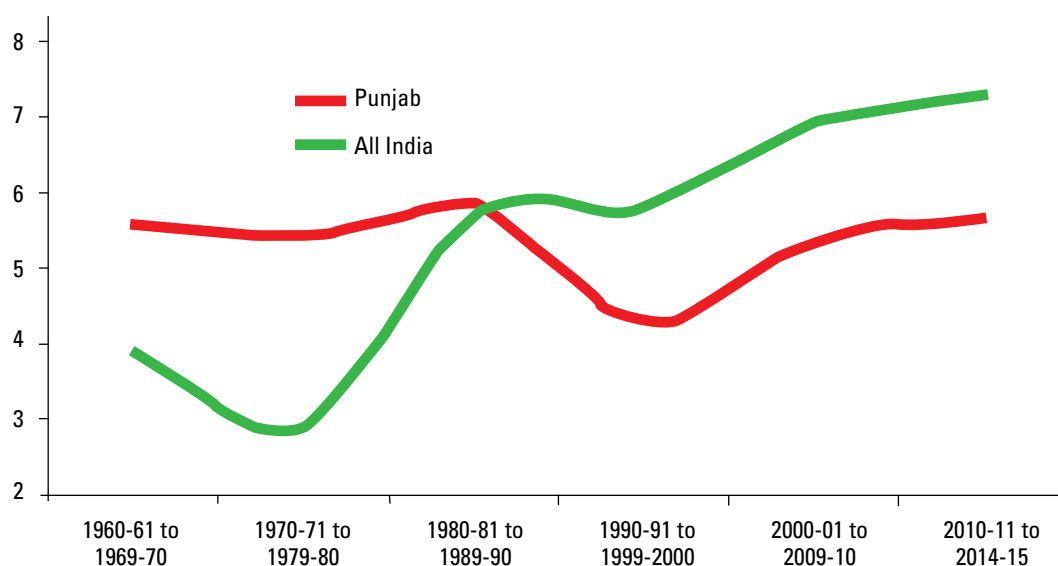


Figure 5: Overall GDP Growth in Punjab and India (Average decadal, %)



Consequently, Punjab's overall dynamism has suffered as its overall growth has slipped from being substantially above the Indian average to well below (Figure 5) and the state has slipped from being the richest large state (excluding special category states) in 1984 to the 9th richest state by 2014. Professor Ramesh Chand has made an excellent analysis pointing in a similar direction. One can hazard that Punjab's dynamism will only be restored if it weans itself off agriculture that has taken a toll of its water resources, soil quality and human health (refer to cancer district). Its fading dynamism may be in part due to the excessive support that its agriculture receives.

Loving Too Little

If some crops are loved too much, perhaps many others are loved too little: pulses, dairy and livestock, fruits and vegetables and oilseeds come to mind. How are they loved too little? In the case of pulses, commendable efforts have been made to increase procurement at MSP — MSP without procurement, it must be emphasized, offers little comfort for farmers — and this Kharif season there was indeed a substantial increase to two million (out of a total output of 8.7 million. Despite this, an estimated 60 per cent of the record Tur output was sold at less than MSP, resulting in depressed income. Stock limits and export restrictions kept

market prices low; had they been eased the fortunes of farmers would have been better.

An important economic insight highlighted in the pulses report seems to have been misunderstood. Some of the loving-too-little occurs because of the perception of a tension between farmer and powerful middle-class consumer interests. This leads to a response that creates policy volatility and pro-cyclicality, which increases price uncertainty for farmers. Thus, when prices go up, export restrictions are imposed and when prices decline, import restrictions are imposed and so on. This perception and the consequent policy action do not adequately recognize a fundamental alignment of interests. Lower farmer prices today will adversely affect future agricultural supplies (especially in crops that are predominantly produced domestically such as pulses, fruits and vegetables) that will increase consumer prices tomorrow. So, even over reasonable planning and political horizons, what is good for the farmer is good for the consumer.

- Restrictions on selling imposed via APMCs on fruits and vegetables are perhaps taking a toll too. The government has created an electronic common market and the results are awaited.
- Two points are worth emphasizing on dairy and livestock. Governments have the right to choose their social policies but in doing so they must be fully aware of the economic costs of these policies. If social policies impede the workings of the livestock market, the impact on the economics of livestock farming could be considerable. These must be costed for appropriate choices to be made.
- It must be recognized that the economics of livestock farming and hence the fate and future of this source of livelihood will depend critically on the terminal value of assets, in this case the no-longer-productive livestock. If social policies drive this terminal value precipitously down, private returns could be affected in a manner that could make livestock farming less profitable. Recent research by Anagol, Etang and Karlan (2013) — NBER Working paper No. 19437 — suggests that returns to livestock farming are in any case very low and even negative. This declining terminal value arises both because of the loss of income from livestock as meat and the additional costs that will arise from having to maintain unproductive livestock. There is more. It is possible that social policies could affect social returns even more adversely. Stray cattle — and a lot of it — will have to be looked after, otherwise



Photo: Pixabay

diseases (foot and mouth) could spread, leading to health hazards and social costs.

Responding to changing consumer preference for proteins, which Indians under-consume to the detriment of their health, needs both reduced cereal-centricity and, at the same time, promoting — not hindering — alternative sources of protein from pulses, dairy and livestock.

Finally, there is technology that again is especially important for pulses, oilseeds and dairy. Harish Damodaran has written persuasively about the choices we face on GM. To paraphrase him, it seems that the patronization of farmers masquerading as romanticization is rife. This must be addressed rationally even beyond mustard. If farmers are to benefit from new technology, they must be allowed these benefits regardless of the provenance of the technologies, just as in other sectors. Expropriating property rights retroactively and undermining sanctity of contracts as sought by voices on opposing ends of the ideological spectrum could impede the flow of technology and thus end up hurting not helping farmers.



power be each provided as a direct transfer than as a conditional subsidy.

Perhaps this idea could be expanded into a quasi-universal basic income by combining some of the major support — power, fertilizer, even MNREGA — into an unconditional basic support for all farmers or farmers below a certain farm size. It is estimated that if these three forms of support were replaced by direct support the amount provided could be about ₹1 lakh per year per cultivator. In any event, ways must be found of reducing the addiction of agriculture in Punjab and Haryana to free power and cheap fertilizer.

On the other category of crops that are loved too little, the challenge is equally daunting and is really the flip side of the cereals challenge. Here one cannot but help come to the conclusion that policies can only seriously and sustainably be implemented if they — farmers in pulses, dairy, livestock, oilseeds and such others — acquire more political voice to countervail other voices. Top down efforts clearly have not been enough and pressure from below seems a necessary condition for redressing the balance. How that will happen, is best left to better minds than mine to dwell on.

A final and simple proposal is a distinction that I have drawn – I do not know how valid it is — between these two categories of objects

There must always be an underlying cost-benefit analysis while choosing technology but as farmers themselves would do it rather than as how the analysis might be done for them

No abuse of patent rights or other monopolistic practices should be permitted but the right instruments must be chosen; moreover, there must always be an underlying cost-benefit analysis but an analysis as farmers themselves would do it rather than as how the analysis might be done for them.

Conclusions

How is this imbalance between the two sets of crops to be redressed? On the loving-cereals-too-much challenge, it will be politically impossible to reduce current levels of support. Entitlements have been created and exit from entitlements is fiendishly hard not just in India but the world over. The only possible way forward is to keep the magnitude of support and change its form in order to change incentives. Professor Ashok Gulati has recommended that support for fertilizers and

that the government loves in agriculture to make suggestions for re-balancing this love. A start should be made by highlighting and making clear this differential treatment and the CACP should be urged to quantify not only the private costs and returns of various crops but also their true social costs in its MSP calculations.

For example, the social cost of cultivating rice in north-western India far exceeds private costs because of the damage to soil quality, depletion of water tables, damage to human health and spewing of pollution into the atmosphere. The disinfectant effect of more information and clarity might be a small technical step that could help in responding appropriately to the challenge. Perhaps more hard-nosed realism rather than woolly romanticization of the Indian farmer is what the doctor must order to transform Indian agriculture. ●






**COVER
STORY**

Can Technology Come to the Rescue of the Indian Farmer?

A Farmers' Forum Report



“The real impact for us is...when our farmers see a better and healthy crop, enhanced income and improved livelihoods and consumers getting a good quality, healthy farm produce which is..... Direct from Farm”.

No. Vijay Pratap Singh Aditya, co-founder, CEO and director; Tapan S. Parikh, co-founder; Rohit Magotra, director; and Rishabh Mehrotra, chief strategy officer, do not represent a big corporate. They represent an agri-start-up; a for profit social enterprise, Ekgaon, which aspires to enrich rural lives by leveraging technology, with operations from Madurai to Mandla (Tamil Nadu and Madhya Pradesh) and headquarters in New Delhi.

Cut to the global picture and there is Sweden's Johan Jörgensen, once named as Sweden's venture capitalist of the year, who, after investing across different tech industries for several years, is now focussed purely on food tech. "When I started looking into food I saw nothing, no innovations, no tech whatsoever, which is fascinating coming to think of it, that it is the largest sector on the planet and it is really killing the planet and everyone on it, so it is full of problems", he told Louisa Burwood-Taylor.¹ It was clear to him that the technology sector should make resolving these problems a big

health professionals and so on. So everyone needs to be on it... Then, of course, it is also about legislation and how you support certain industries".

Jörgensen is a Swede and is striving to get politicians and the public sector on board because in Sweden "something like 50 per cent of all meals... are served outside the home; are served in the public sector, which means that if you can get the public sector on board that means you have a tool for change that is tremendous, so that is super important".

This is not exactly how things obtain in India but there is much in common. As far as India is concerned, despite the great Indian civilization being a storehouse of farming wisdom over vast fertile regions, Indian farm productivity is appallingly poor. It is in this disastrous scenario that the enterprising Indian has found a business opportunity to enhance food availability, help the farmer and improve the system by leveraging technology. Ekgaon, for instance, is a 'for profit' social enterprise focussed on providing utility services for farmers, rural businesses, under-served

Indian farm productivity is appallingly poor. It is in this scenario that the enterprising Indian has found a business opportunity; to enhance food availability using technology

business and he vowed to his friends in the tech sector, 'From now on, I'm only going to do food tech'. He has "kept that since".

Why are agri start-ups "in"? For one, India is at once a prospective farm power and a country with a large near starving population. It is at once a country without food and one where up to 67 million tonnes of food is wasted every year (more than the national output of countries such as Britain),² valued at ₹92,000 crore; nearly two-thirds of what it costs the government to feed 600 million poor Indians with subsidized ration under the National Food Security programme. India is where technology may be able to make a difference even though the farm ecosystem is complex. It is so in India and elsewhere as well, which makes it difficult for technology companies.

Johan Jörgensen explains: "When you talk normally about the ecosystem in a tech sector, it is kind of a limited ecosystem. It is entrepreneurs and then it is investors and that is the ecosystem... When it comes to the food world, which is infinitely more complicated and complex, you need to bring other people into the equation as well: the retailers, food producers, the

rural women and the large urban migrant labour population of aspiring consumer (<http://ekgaon.co.in/ekg/index.php>). It is the first company to provide mobile phone enabled financial services delivery platform in South Asia. Its market connect platform ekgaon.com provides high quality 'Direct from Farm Produce' that is "healthy, organic certified and naturally grown from farms of small farmers to urban customers".

The areas of interest include spaces that can leverage the Internet of Thing: precision agriculture, big data sustainable inputs, farm automation; efficient supply chains and the gamut of areas under food, including safety, nutrition, innovative food products and services. There is also interest in the fundamentals of Indian agriculture: water management, rural energy, financial technology and all that makes for an inclusive society. However, Yourstory.com chucks a stone at this promising proposition.³

"While everyone is trying to change the agri status quo, it is funny how the problems are more than the solutions. Agriculture is not like city transport systems that can be disrupted by Uber or Ola.

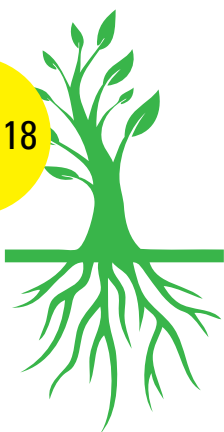




Photo: Pixabay

There are deep-rooted inefficiencies with powerful incumbents who control farming resources such as finance, seeds, chemicals, distribution and supply chain. These systems have complete access to the distribution networks that supply to eight million kiranas across the country too. The ecosystem supports the political class financially and, therefore, has a sway over agriculture that is a state subject as specified by the Indian Constitution". That is the first issue to be addressed.

What are the manifestations of this pan-ecosystem problem? The agitating farmers across the country; the death and destruction across Indian farmlands, with farming and allied industry seriously at risk courtesy market changes and policy measures. "rising price risks faced by farmers, especially horticultural producers, lack of adequate policy support and a sense of betrayal among the land-owning community", as the Mint says.⁴

Can technology address obstacles existing across the board from the trucking-transportation-transit space to the store and save sector? Some lend themselves to little knowledge-based improvements; others to Big Data impacting on

Serving the Underserved

"Ekgaon is a 'For Profit' social enterprise focussed on providing utility services for farmers, rural businesses, under-served rural women and the large urban migrant labour population of aspiring consumer. It is the first company to provide mobile phone enabled financial services delivery platform in South Asia. Its market connect platform ekgaon.com provides high quality 'Direct from Farm Produce' that is healthy, organic certified and naturally grown from farms of small farmers to urban customers".

Indian agriculture and empowering farmers to take informed decisions; from professional financing to trade facilitation and middlemen eradication; from agricultural equipment leasing to other farm services. This is what has led to agri start-ups intervening everywhere because there is a belief that technology can help break nexuses and lead to a genuine modernization of the Indian food chain. As India's food output is set to increase sharply, according to projections, at a time when agtech is

'Rudibens'

Rudi Sandesh Vyavhar (RSV) is a mobile-based management solution for the Rural Distribution Network (Rudi) of Self Employed Women's Association (Sewa) in rural Gujarat. It was leveraged on the mobile phone revolution and developed in partnership with the Vodafone Foundation, Cherie Blair Foundation for women and Sewa. RSV enables 'Rudibens' to order stock from the field (often distant villages), receive important updates from the Rudi Company in real time and run reports on their business – all with the convenience of automated text messaging on feature phones. The software was developed by Ekgaon Technologies.

making its impact, agro start-ups find the prospects pleasing as do venture capitalists.

The psychology is simple; the problems are known; so are the solutions that essentially revolve around organizing existing inefficiencies in the system, traversing as it does the informal to the formal segments of the farm value chain, with myriads of fragmentations and innumerable interventions that constitute a many splintered ecosystem.

What are the striking dimensions of the problems? A series of charts (*Mint*; June 14 2017; Why are farmers protesting despite bumper harvests?) tells the story under some interesting heads. The question is whether technology and the start-ups are addressing these major issues apart from the innumerable others.

1. Horticulture products, not foodgrain, are the major part of agricultural output in India now. Production of horticultural products was half of total foodgrain production in 1991-92

2. Volatility in prices of horticultural products has increased significantly

3. Real MSPs have gone downhill since the UPA II days and in three years of the Modi government, while real Minimum Support Prices have not increased at all

4. Agricultural export earnings have crashed after a boom period.

Eventually, these lead to a sense of desperation, especially amongst the more affluent farmers who have a major stake in the farm supply chain (See charts, page 22-23).

To go by global trends manifest in the AgTech Summit 2016 (hosted by *Forbes* magazine in



Photo: Pixabay

Salinas, CA), "action in precision farming and the wider world of ag technology is heating up in horticulture crops"⁵ as the audience comprising venture capitalists and tech companies homed in on fruit and vegetable growers. "Event attendees took a field trip to visit major grower-shipper Taylor Farms, which in turn is a partner — along with AGCO, DuPont, Trimble, and Wilbur-Ellis, among others — in Google's Farm 2050 initiative, created to 'accelerate the path for new disruptive AgTech ventures'". Whether India is learning from this experience remains to be seen. Things are beginning to happen though in a business that is being hailed as a "\$200 billion opportunity" (See *Global Honour for String Bio* Page 55).

Experts agree. "Agriculture start-ups is an emerging area, which can unleash umpteen opportunities for start-ups and strengthen the supply chain in India agriculture", says Will Poole, managing partner, Unitus Seed Fund. Under the state-sponsored Agricultural Technology Management Agency (ATMA) retrieval of data and data entry from the internet based web portals without actually having internet by using a simple mobile phone. Upwards of 12 services of innovative technology like USSD (Unstructured Supplementary Services Data) are being operationalized for farmers and other stakeholders.



Leveraging Mobile Telephony...

mKisan, an SMS portal for farmers, enables central and state organizations in agriculture and allied sectors to give information/services/ advisories to farmers by SMS in their language, preference of agricultural practices and location. It is a part of agricultural extension (extending research from lab to the field), under the National e-Governance Plan - Agriculture (NeGP-A). Mobile telephony (with or without internet) is the most potent and omnipresent tool of agricultural extension. Unstructured Supplementary Services Data (USSD) Applications enables access to databases and information on the web and carrying out data entry in web based applications in databases on the internet by simple interactive messaging without having any Internet on the handset. Farmers can access information about input dealers, farm machinery along with its prices, where all extension related activities are being run in their area, list of beneficiaries and such others. Similarly, persons from APMCs/mandis, fertilizer and other dealers would be able to enter price and sales/stock details even from the areas where internet availability is still not available.

— <http://mkisan.gov.in/ussdapplication.aspx>

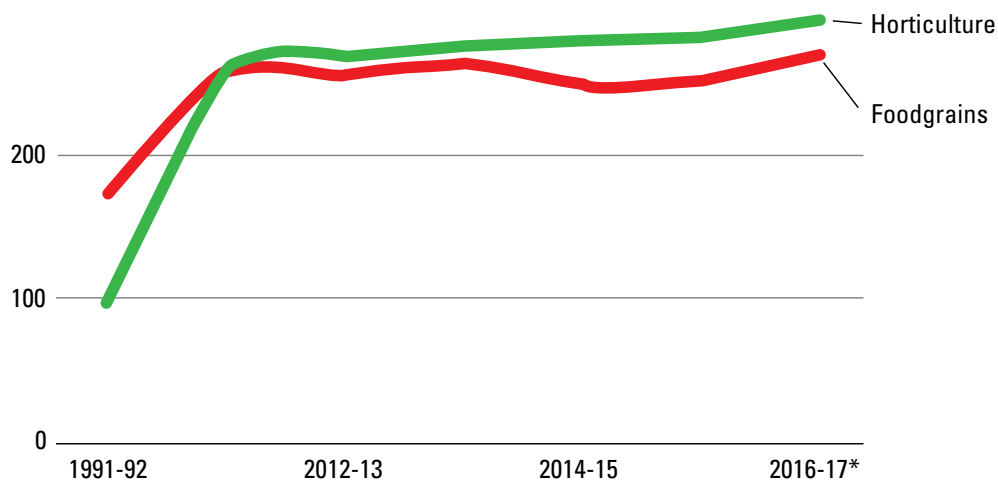
Barrix Agro Sciences uses top technology for eco-friendly crop protection methods that may have a transformative effect on pest control methodology

The government says that a key goal is to decentralize decision-making to the district level, through the ATMA. A second goal is to increase farmer input into programme planning and resource allocation, especially at the block level, and to increase accountability to stakeholders. A third major goal is to increase programme co-ordination and integration, so that the programme thrusts such as farming system innovations, farmer organizations, technology gaps and natural resource management can be more effectively and efficiently implemented.

The agritech ecosystem got a boost in 2016 with the advent of start ups and with entrepreneurs from across the board; not just from farming backgrounds. Technology was their forte. There was also the arrival of the institutional investor, backing early stage companies such as Nubesol, BigHaat,



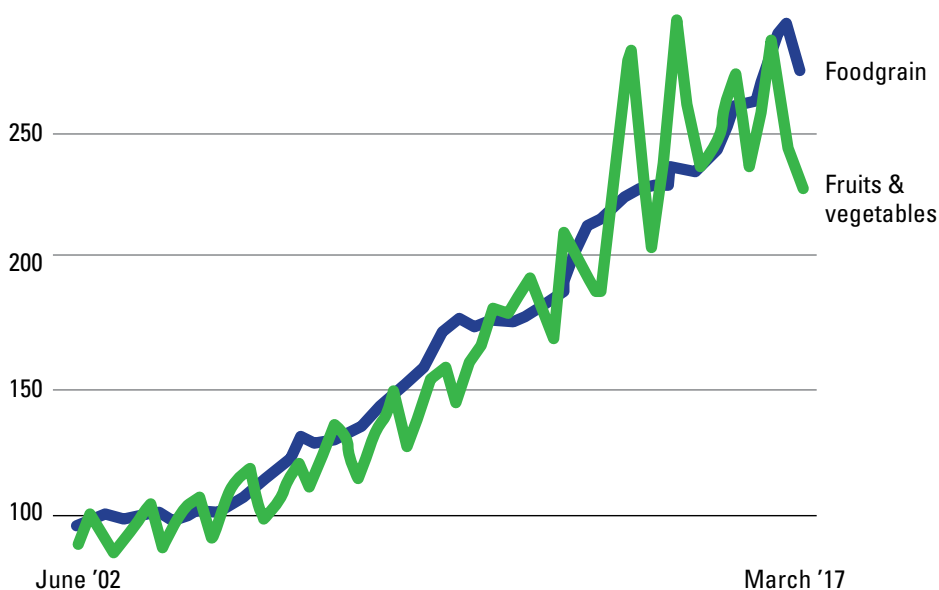
Figure 1: Production of horticultural products was half of total foodgrain production in 1991-92



Lines show production of foodgrain and horticultural products in million tonnes.
*2016-17 figures are advanced estimates

Source: Ministry of Agriculture, Government of India

Figure 2: Lines show movement in Wholesale Price Index (Base year 2004-05) for foodgrain and fruits and vegetables



Source: CMIE

MeraKisan, says Hemendra Mathur, investment lead and venture partner at Bharat Innovations Fund (<http://bharatinnovations.fund/>), a \$150 million early stage fund with a focus on agtech, amongst others.⁶ He talks of five emerging trends amongst agtech start-ups: farming-as-a-service; big data for improving farm productivity; market linkage models for farmers; fintech platforms for farmers; and supply chain models for dairy and horticulture.

Today there are venture capital firms focussed on

agro technology. Omnivore Partners invests in early stage agricultural technology (agtech) companies in India, choosing tech-focused companies in agriculture sub-sectors such as farm automation, information services, precision agriculture using internet-connected devices, sustainable agriculture and agri-supply chain.⁷ This year's start-up Innovator of the Year 2017 award went to Barrix Agro Sciences Private Limited, set up in 2011. It uses top technology for eco-friendly crop protection

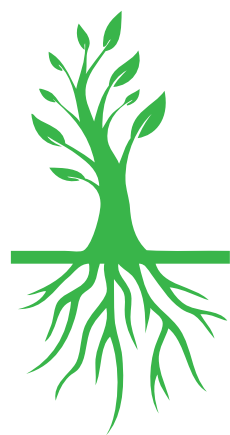
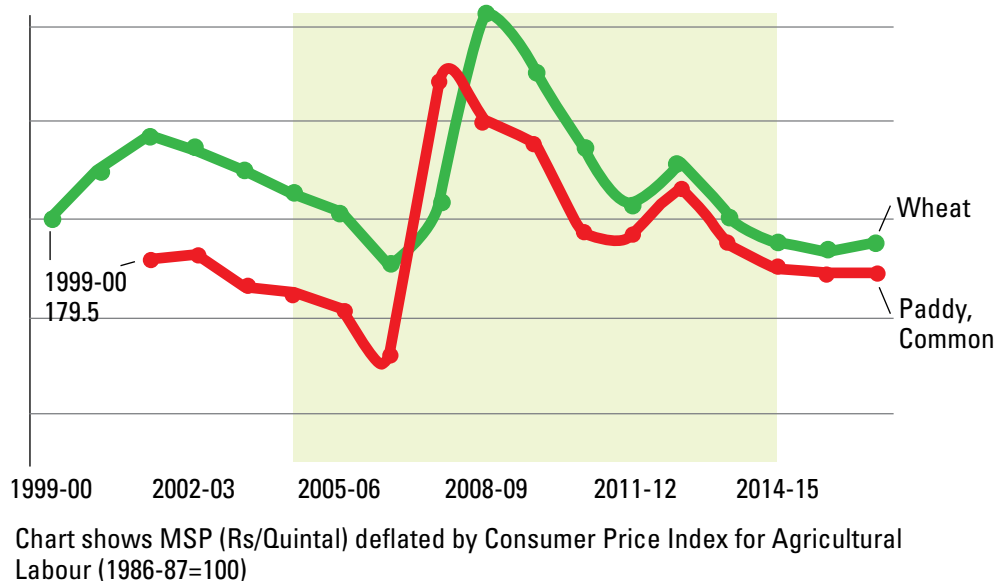
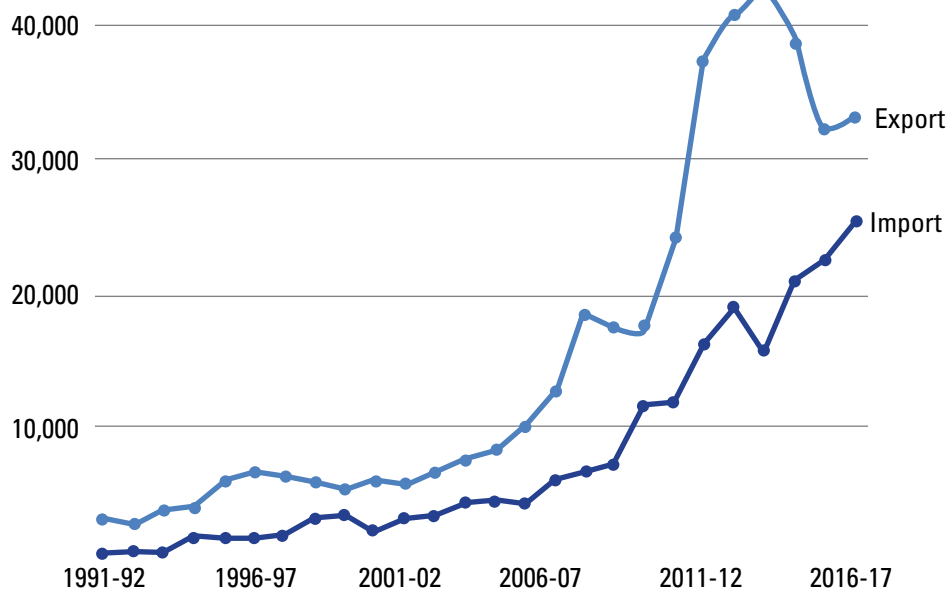


Figure 3: In three years of Modi government, real Minimum Support Prices have not increased at all



Source: CMIE

Figure 4: Value of exports/imports in agriculture and allied products in \$ million



Source: CMIE

methods that may have a transformative effect on pest control methodology in the country. Barrix Agro Sciences is a venture backed by Omnivore Partners, (<http://www.omnivore.vc/>) venture capitalists and CIIE incubator.

“Godrej Agrovet is an anchor investor in Omnivore Partners and participates actively in the investment committee”,⁸ says the Godrej Agrovet website.

There have been very few innovations in the agri space targeting small-scale farmers, who form the

biggest chunk of the market and Omnivore has helped such companies evolve into corporates. CBInsights list some active investors in agtech⁹ in 2015 (see Table 1, *Active Investors in Agtech, 2015*).

The uberization of services for the farm sector — farming as a service or FaaS — may have begun informally a while back but was formally launched by EM3 Agri Services,¹⁰ which offers farming services and machinery rentals to farmers on a pay-for-use basis. “Samadhan - FaaS creates a platform

Food for Cities

When we started building this ecosystem here in Sweden, which we have done now the past few years, we thought about two distinct directions for Sweden and Stockholm to go in terms of getting people on board with the industry. The first is urban food systems; Stockholm is growing at a tremendous pace and will add something like 50 per cent in population over the next 20-30 years if projections hold... That means that we have the chance of building a city where food has been integrated from the start. That means everything from the distribution methods that we have to how food is actually grown and produced. So you could say yes, that's ag and urban farming is definitely a huge part of the food system of the citizens of the future.

— Johan Jörgensen

Photo: Pixabay



Table 1: Active Investors in Agtech

Investor	Select Portfolio Companies
Khosla Ventures	Blue River Technology, Granular, The Climate Corporation
Omnivore Partners	Eruvaka Technologies, Ecozen Solutions, FrontalRain Technologies
Andreessen Horowitz	Granular, FarmLogs, Aglocal
Felicis Ventures	The Climate Corporation, Grove Labs, Granular
Y Combinator	Tule, Farmlogs, TerrAvion

that enables technology to reach the farmer and the farm in an efficient and affordable manner through a network of farm centres (Samadhan Kendras). Each centre, managed through IT enabled systems and manned by agri-professionals, is equipped to handle a comprehensive suite of basic and precision farm operations throughout the entire crop production cycle”, says the company. Supported by funding from Aspada (www.aspada.com), the operations were scaled up and stabilized.

India's average farm holding being around 1.2 hectares against several hundreds or even thousands across Europe and the USA means that the farmers have less income to invest in equipment like irrigation pumps, storage solutions and so on. “FaaS variabilizes the cost of farming and reduces the need for capex making it relevant to small farm sizes and affordable to small and marginal farmers”, says Hemendra Mathur. Today, there are several farm equipment leasing services.

Indeed, the agtech business has been making it to global headlines too. Barcelona 2014 saw the Rudi Sandesh Vyavhar project, a collaborative

effort between Vodafone Foundation, SEWA and the Cherie Blair Foundation for Women being honoured at the Mobile World Congress for the Best Mobile Product, Initiative or Service in Emerging Markets category. Accepting the award, the Vodafone India managing director and chief executive officer, Marten Pieters, said: “Women in rural India face several challenges. Given its wide reach, mobile telephony is an effective and efficient medium to provide last mile delivery of products and services that they need. The Rudi project, where Vodafone Foundation has partnered with SEWA and the Cherie Blair Foundation is an excellent example of how rural women entrepreneurs are now using mobile phones to manage their purchase, sales and inventory resulting in substantial increase in their incomes”.¹¹

Essentially, RSV, developed by Ekgaon Technologies, addressed inefficiencies by tracking primary and secondary sales in the central supply chain and transferring the entire management of the Rudi business from a paper-based system to one based on a secure electronic backend.



Problems that Startups must Address:

- Six lakh villages that comprise the business landscape.
- Fragmented farming; small landholdings (less than 30 guntas) offer no efficiencies.
- Absence of finance.
- Powerful chemical and fertilizer distribution lobby.
- These distributors double up as money lenders.
- Their distribution network is a multi-layered network and stronger than the banking and FMCG networks.
- Startups are successful closest to the major cities and are yet to connect to the majority of tier 2 cities. Tier 3 and 4 cities have not yet been touched.
- Tier 3 and 4 cities have a completely different ecosystem compared to cities.
- 80 per cent of major cities still work with the agriculture wholesale supply chain run by traditional distribution companies.
- Organized retailers source 20 per cent of their produce directly from farmers, the rest is from mandis.
- There is no water in most regions and agriculture is still rainfall dependent.
- Ground water digs go more than 1,000 feet deep, on an average, only to find brackish water.
- Farm labour has become scarce as people flock to cities for jobs.

— <https://yourstory.com/2016/12/2017-may-turn-year-agri-tech/>

The technology has been on for half a decade, launched as it was at the Mobile for Good Summit, December 2012, London.

Since then more than a thousand Rudi women have been trained on the RSV tool and have benefitted. Some, earlier earning ₹4,000 to ₹5,000 per month, have graduated to incomes of ₹12,000 to ₹15,000. Elsewhere they have moved on to affording two meals a day for the family from just one in 2014. It was then projected that a scaling up to benefit 2,500 women in Gujarat by 2015 was underway, enabled by the “easy adaptability and functionality of the RSV tool”.

This is what helps manage a disjointed value chain within which there is a convoluted supply chain of myriad players, all of whom need to be organized to rid them of their inbuilt inefficiencies. Yourstory.com says¹² that there are upwards of 30 startups trying to precisely organize these things. “There are drones, of V Drone Agro, flying over Bengaluru’s Ramanagara district helping farmers identify dying crops. Farmers in Telangana are using an app called Plantix, built by Progressive Environment and Agricultural Technologies, which helps in identifying plant diseases. Then there is Kisan Network (a Y Combinator company) in Madhya Pradesh, which works directly with the farmers to create standards in produce”. There are many others that face not just a fractured landscape but one with fragmented interventions. Yourstory.com suggests



that agri startups could combine their resources to address that fragmented ecosystem and that “2017 could be the year of agri-tech, just like how the last two years were about fintech. With demonetization, it could be a combination of the two to change agriculture”.

This has been assessed as a “\$200 billion opportunity” but one that demands a great deal of understanding of the complex system for solutions to work. There are simple solutions that can be scaled up. In case of the RSV tool that one has seen earlier, it was a matter of technical enhancement and incorporation of Vodafone’s M-Pesa service into the Rudi channel. Ekgaon Technologies said that 11 additional technical features would include elements such as SMS alerts on orders, a mobile app for customers to place direct orders with Rudibens and a feature to enable the transfer of customer-specific transaction data from the phones of the Rudi women directly to the RSV backend.

This was easy enough but as Yourstory.com point out: “This incumbent system exists because



Photo: Pixabay

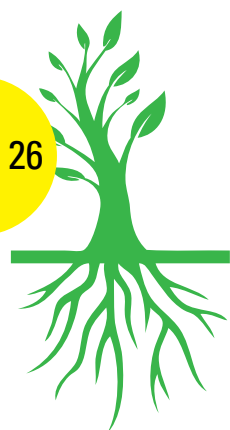
RSV addressed inefficiencies by tracking sales in the central supply chain and transferring the management of the ‘Rudi’ business from paper to a secure electronic backend

farming caters to local tastes and cultures. The farmer works on the demand side based on his region and the consumption needs are supported by the local supply chains dominated by a chain of middlemen and agents who control the pricing of the produce and all dealings are entirely in cash. For technology to disrupt such a system it requires the existing supply chain to change their cash based transactions (a difficult task) and record transactions digitally and pay tax. Farmers are not taxed but they do not have the power or the requisite information to force the system to pay them in digital transactions. They do not even possess bank accounts in majority of the cases”.¹³

Politics of India may be difficult to change but technology trends are hard to avoid too. Hitherto those investing in farming were the socially responsible kind of investors. Today agriculture is the

focus for impact investors. Louisa Burwood-Taylor writing for Agfunder News says: “There are a growing number of regions of the world and within the U.S. that are vying to become the Silicon Valley of food and agtech, each of them with different resources to offer startups and investors from investment capital, customers, accelerator programmes, conferences and more. There is still a large funding gap in the food and agriculture industry, which has, in many ways, been left behind technologically and is still inefficient and opaque at several points in the supply chain, not to mention the world’s biggest greenhouse gas emitter”.

Globalized India will sooner rather than later be a part of this changing farm environment because technology has an endearing quality and will, much like the mobile phenomenon in India, win over even the Indian farming





grassroots, changing the entire societal attitude towards food and how it will be consumed. Indians have just begun to realize that the food sector is changing and can change because there is technology at hand. More importantly, the fascination with this change is impacting not just tech companies but food companies too. Johan Jørgensen believes that many of them have been silently wondering “How can we change the food sector?” and... “we do not have the tools to do that” and suddenly they realize that the tools

Breaking Stereotypes

At EM3 we are breaking traditional stereotypes for increasing agricultural productivity by bringing tech and mechanization for the farming community on a Pay-for-Use basis. This approach greatly deepens the impact on farm viability. We are harnessing the power of information technology and mobile telecom services, financial services... to integrate and strengthen the value proposition.

— EM3 Agri Services

are out there and the people are out there that can help them with this”.

What is good enough for food companies in the west may not do for India where the farmer, more than the food company, must be impacted. There is need to impact small scale farmers on the import and possibilities of technology from the sowing stage to the harvesting and processing and marketing stages. There are tech tools available to help them and there is work being done on this. The need is to upscale it all to transform Indian agriculture.

For starters though, Agfunder News¹⁴ says: Investment across the agricultural supply chain in India has averaged around \$250 million each year for the last five. We expect this to gain momentum with more focus on the above five trends in agritech innovation. Indian agriculture is set for a big leap forward in 2017, with an infusion of capital and high quality entrepreneurial talent focused on scaling up innovations. (research ARG Syndication) ●

Notes

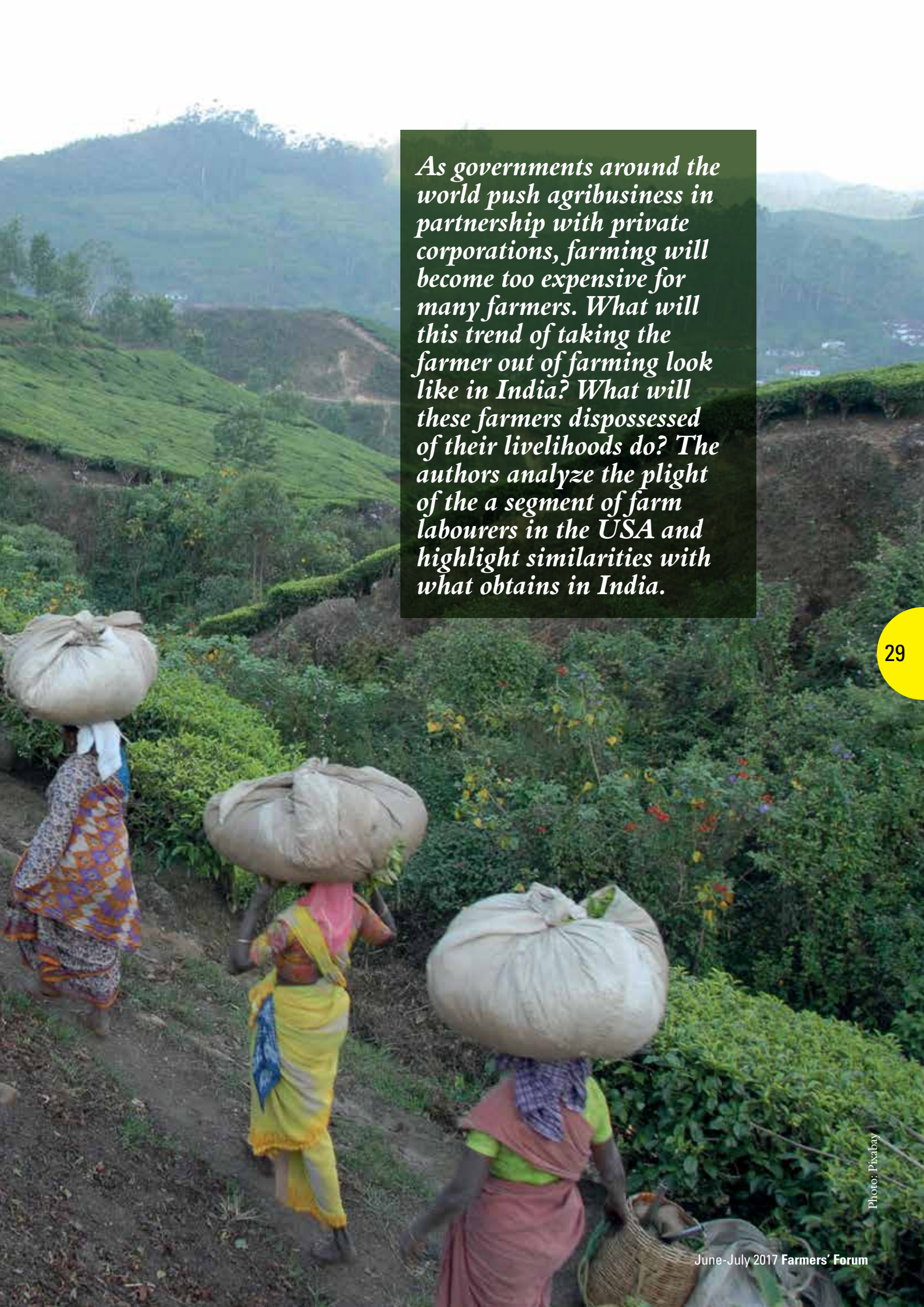
1. <https://agfundernews.com/venture-capitalist-year-building-food-tech-ecosystem-sweden.html>
2. Source: Ciphert; <http://www.hindustantimes.com/india-news/food-india-wastes-can-feed-all-of-bihar-for-a-year-shows-govt-study/story-qwV3C9YnJAoXn83b3htmsK.html>
3. <https://yourstory.com/2016/12/2017-may-turn-year-agri-tech/>
4. <http://www.livemint.com/Politics/nhqKfNAkmcVQct1kv1EN/The-paradox-of-farm-unrest-amid-bumper-harvests.html>
5. <http://www.growingproduce.com/vegetables/ag-tech-is-hot-on-horticulture-get-a-handle-on-what-this-means-for-you/>
6. [https://agfundernews.com/five-trends-in-](https://agfundernews.com/five-trends-in-agritech-innovation-in-india-to-watch-out-for-in-2017.html)

[agritech-innovation-in-india-to-watch-out-for-in-2017.html](https://agfundernews.com/five-trends-in-agritech-innovation-in-india-to-watch-out-for-in-2017.html)

7. <http://www.barrix.in/>
8. <http://www.godrejagrovet.com/omnivore-partners.aspx>
9. (<https://www.cbinsights.com/blog/agtech-startups-investment-report/>)
10. <http://www.em3agri.com/>
11. <http://ekgaon.co.in/node/14281>
12. <https://yourstory.com/2016/12/2017-may-turn-year-agri-tech/>
13. <https://yourstory.com/2016/12/2017-may-turn-year-agri-tech/>
14. <https://agfundernews.com/five-trends-in-agritech-innovation-in-india-to-watch-out-for-in-2017.html>

From Florida (Immokalee) Farm Workers to India's Farmhands

Radha Sarkar and Amar Sarkar

A photograph showing three women from behind, walking up a dirt path in a tea plantation. They are carrying large, full white sacks on their heads. The woman on the left is wearing a patterned sari, the middle one a yellow and pink sari, and the right one a red and green sari. The background features rolling green hills with tea bushes and a distant village under a hazy sky.

As governments around the world push agribusiness in partnership with private corporations, farming will become too expensive for many farmers. What will this trend of taking the farmer out of farming look like in India? What will these farmers dispossessed of their livelihoods do? The authors analyze the plight of a segment of farm labourers in the USA and highlight similarities with what obtains in India.

The small town of Immokalee in the U.S. state of Florida encapsulates many problems of agribusinesses, currently the dominant form of agricultural production in that country and closely resembling the experience of Indian workers. Interviews¹ with farm workers in Immokalee, where the system is characterized by exploitation, show how it disables and dehumanizes them, stripping them of dignity and health.

The residents of Immokalee call it a ghost town because much of the town is deserted for eight months in a year. It is also a ghost town because its people are reduced to phantoms, their labour present on all plates while they themselves are invisible; here again there are uncanny similarities with some Indian agribusinesses.

What are the global trends and their likely effects on Indian farm workers? Agribusiness refers to a model of food production that draws on strategies deployed in any other large-scale industry and is, therefore, markedly different from farming and agriculture on smaller scales. Agribusiness is, essentially, a transformation of food production along the lines



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AMAR SARKAR has a master's degree in experimental psychology from the University of Oxford, U.K.

along with agrochemical conglomerates that control seeds and pesticides such as Monsanto. Collectively, these firms dictate industry protocols to millions of farmers and consumers around the world.

The agribusiness model requires a rural underclass to work the vast plantation-style fields. Profits are reaped through large-scale production and low pay for workers. In the USA, undocumented immigrants from Mexico and Central America comprise the majority of farm labour. Their precarious presence in the country makes them particularly vulnerable to workplace abuse amidst the omnipresent risk of deportation. Organizing and demanding justice in the face of exploitation are dangerous tasks.

There are two sets of legal violations at play in Florida's tomato fields that collude with one another in favour of agribusiness. One, the farm workers' violation of U.S. immigration laws and, two, growers' and buyers' violation of labour laws and human rights. The former enables the latter. Where undocumented immigrants face exploitation and persecution, big business generates enormous profits from a vulnerable, unorganized labour force. According

Agribusiness is a model of food production drawing on strategies deployed in large-scale industry and markedly different from farming on a smaller scale

of any other large-scale industrial production and it is predicated on the commercial principles of market dominance and maximizing profits.²

In contrast to agriculture, defined as the practice of farming,³ the agribusiness industry follows the "field to fork" model, which encompasses the entire process of agricultural production and management, from seeds, fertilizers, pesticides and machinery to food processing, distribution and retail. The industry is dominated by a handful of private corporations that dictate what farmers grow.

However, corporate control of agriculture in itself is not new. The present dominant grain-trading companies are the same as a century ago, namely, Cargill, Bunge, Continental and Louis Dreyfus. What is new is the emergence of multinational supermarkets with consolidated distribution and retail practices, such as Aramark and Wal-Mart,

to author and activist Chris Hedges, Immokalee is the "sacrifice zone" of unfettered agro-capitalism.⁴

Immokalee is located in the heartland of U.S. tomato production. Though the town itself is dilapidated and colourless, the industry it is associated with is flush with cash: Florida has been the biggest producer of fresh-market tomatoes for decades and the industry generates an annual revenue of \$565 million.⁵ The population of Immokalee varies by season. For most of the year, it is home to about 4,000 people but in the harvest season, during June and October, the population swells to 10,000 with migrant farm workers pouring in from across the country to pick tomatoes.

The majority of the people who come seeking work in Immokalee's fields are undocumented immigrants from Mexico and Central America. Most are men who are without partners or families

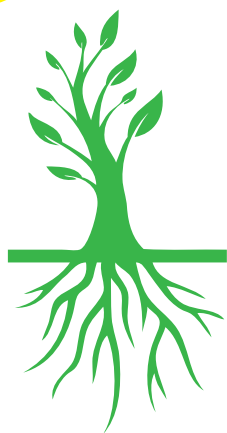




Photo: Pixabay

Where is Immokalee

Immokalee is an unincorporated area and a census-designated place in Collier County, Florida, United States. The population was 24,154 at the 2010 census. It is part of the Naples–Marco Island Metropolitan Statistical Area.

— Wikipedia

in Immokalee, although one worker estimated that 30 per cent of the farm workers in Immokalee are women. There are also farm worker families in Immokalee, permanent residents or migrants.

Farm workers start their day by arriving at one of Immokalee's three parking lots, hoping to be hired for the day by a crew leader. Depending on the time in the season (that determines how many other people are looking for work), farm workers might have to be here as early as 4.30 am to increase their chances of being hired.

The La Mexicana parking lot is not very big but, at the height of the tomato-picking season, there can be anywhere between 40 and 90 school buses

waiting to ferry farm workers to the tomato fields. Another smaller parking lot uses a unique and uniquely cruel mode of transportation, windowless U-Haul trucks, with workers piled in the container, not unlike the tomatoes they will soon be picking.

Securing work is uncertain business. The supply of workers outstrips demand and many are turned away. "It's hard," a Coalition of Immokalee Workers (CIW) member, who used to be a farm worker, tells us. "Sometimes you get lucky, sometimes you don't. Sometimes you're without work for days."

Personal connections make a difference here. Crew leaders responsible for recruiting workers are much more likely to hire people they know. Age is another important factor; 20 to 30 is prime picking age. A 56-year-old Cuban man said he lived between homeless shelters because no one wanted a middle-aged farm labourer. Had he known what life in the USA was like, he would never have left home, he rued.

Those lucky enough to get hired for the day get in one of these buses and are driven to the tomato fields; a journey anywhere between 30 minutes

and two hours from Immokalee. The crop cannot be picked until it is dry and farm workers wait for several hours for the night's dew to evaporate. Since they are paid by the bucket of tomatoes picked — and not by hours — they receive no payment for the time spent waiting in the fields.

Once the tomatoes are suitably dry, at about 10 am or 11 am, the picking begins and lasts through the heat of the day, with temperatures sometimes as high as 35°C. A full bucket of tomatoes weighs 14.5 kilos and a worker has to run about 30 metres with the bucket and then toss it up three metres to a waiting crew leader in the back of a truck.

To make Florida's daily minimum wage (\$7.67 per hour, approximately \$61 per day), a worker has to pick and carry 680 kg of tomatoes. Workers receive tickets for every bucket satisfactorily picked, as decided by the crew leader. They exchange these tickets for wages at the end of the day or a longer period determined by growers and contractors. Payment can easily be withheld and the undocumented status of many farm workers means that they have no recourse to the law.

Picking tomatoes is a lot more difficult and dangerous than one might imagine. A worker often has to go over the same plant three or four times, filling a new bucket with a different specification (size, colour, shape) each time. Picking for eight to 10 hours a day, under the Florida sun, often without a break for rest or food, makes for gruelling work.

Back problems and exhaustion are common complaints. In addition, the tomato plants are covered in pesticides. Contact with these chemicals is so hazardous that healthcare posters in public places around Immokalee advise farm workers to change their clothes at work if possible and to avoid physical contact with others while still in their work clothes. Respiratory diseases and cancers, also caused by the high toxicity levels, are common, as are miscarriages and birth defects in female farm workers.

Back in Immokalee, a long line begins to form outside the local soup kitchen, the Guadalupe Centre. People start gathering as early as 7 am for the first lunch service at 11.30 am. Farm workers' families and those who fail to secure work for the day are the bulk of the hungry, ironically unable to feed themselves despite playing an essential role in feeding America.

On Thanksgiving Day, the Guadalupe Centre organizes a feast consisting of food donated by richer neighbourhoods and supermarkets. Wealthy volunteers from across Collier County serve the



food. For many farm workers and their families, this is the most satisfying meal of the year.

As the sun sets, farm workers leave the fields in the same buses (or U-Haul trucks) to return to Immokalee. For most of this overwhelmingly migrant community, home is a rented trailer consisting of a bathroom, a small kitchen and a bedroom. Absurdly, these tiny living spaces reportedly cost the same as a New York City apartment. For people who barely earn minimum wages, the only way to cope with the astronomical rate is by living 'amontados', as they call it. Literally, this means one on top of the other; at least eight people and often 10 or 12 share the living space.

Land and housing for farm workers in Immokalee are monopolized by two families. One of them, the Blocker family, owns most housing opportunities and land. Prices are set ruthlessly. Proximity to the parking lots, where farm workers are hired, means more expensive trailers, while those further away are more affordable. Often the poorer migrants are forced to rent the more expensive housing because they do not own cars and must be within walking distance from the parking lots. The Blockers also own a discount furniture store in Immokalee since the trailers are not furnished with even the bare necessities, despite the astronomical rents.



Most farm workers are first-generation immigrants with none of the support structures available in their native countries. There are no family or community members to care for children



In addition to rent and food, educating their children is a problem for farm workers. This is partly due to the nature of their work. They migrate with the seasons, to work with different crops across the country. The same people who harvested tomatoes in Florida may well travel to Maine to pick blueberries and to Massachusetts to pick apples. Most farm workers are first-generation immigrants

with none of the family or community support structures available in their native countries. This means that there are no other family or community members to care for children.

In addition, all adult members of the family must often contribute to the meagre earnings and cannot afford to give up even the possibility of work by staying at home with children. Effectively, farm workers have no option but to take their children with them on their migratory picking routes, disrupting their education several times a year.

Under extreme pressure to put food on the table, parents would rather have older children contribute to the household income than pursue higher education. The Migrant Centre of the Immokalee high school cites the lack of parent buy-in as a major obstacle to academic achievement and subsequent socio-economic mobility.

As one councillor at the centre put it, for many of these families, education is a luxury because they are so hard-pressed to feed themselves, to pay the

Figure 1: Growing Agribusiness Opportunities in India

Farm Management Services

- New agri business, which provides inputs such as seeds, fertilizers along with providing advice and training farmers on latest agricultural practices
- It introduces efficiencies into the whole gamut of agri practices
- Provides assistance to sell products at appropriate prices

Agricultural Inputs

- Limited arable land against growing population makes agricultural inputs crucial
- Huge opportunity exists for agri input segments like seeds and plant growth nutrients
- In India, commercial seeds only account for minor percentage (25 per cent) and huge demand is expected for quality branded seeds

Logistics

- The 12th Five Year Plan estimated a potential storage capacity expansion of 35 million tonnes
- Cold storage capacity needs to grow rapidly from the current level of 24 million tonnes
- Private warehouse operators are supported by multiple income streams, subsidy and available credit
- It is expected that 4 per cent growth in the food grain storage capacity would restructure agricultural sector over the next few years

Source: Ministry of Agriculture, TechSci Research

rent. This is why many kids just do not make it; their families cannot afford the luxury. Stories of deportation separating undocumented parents from children and forcing teenagers to drop out of school to support the rest of the family are common.

In this bleak landscape of exploitation and poverty, the Coalition of Immokalee Workers (CIW) provides a ray of hope.⁶ The CIW was founded in 1993 to organize farm workers to secure better pay and working conditions in the fields of Florida. Apart from a small administrative staff of five or six, the organization is run by former farm workers. These ex-farm workers earn the same as those in the fields. The majority of the CIW's funds go towards raising awareness among farm workers and consumers.

Many CIW actions target large companies that buy huge quantities of tomatoes for retail fast-food chains such as Wendy's and Burger King, and supermarket chains such as Publix and Stop & Shop. These companies demand cheap tomatoes from growers and the plantation owners underpay farm workers in response, for the sake of their profit margins. Negotiating with growers is pointless, the CIW says, because they are not the ones who determine the price of the crop. Raising awareness among consumers and organizing them (those who eat tomatoes) is how the CIW attempts to make companies listen.

Complementary to the CIW's initiatives of bargaining with big business are its initiatives to organize and educate farm workers. The CIW conducts workshops about labour rights, anti-slavery measures and the community resources available to farm workers. Perhaps the most significant victory for the CIW has been the design and implementation of the Fair Food Programme (FFP) launched in 2011.

The CIW describes the FFP website as a model of "worker-driven social responsibility".⁷ The programme

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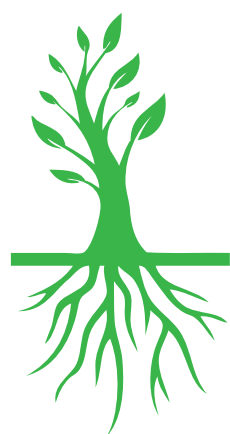
Photo: Pixabay

hinges on better pay and treatment of workers in the fields. The main components of the FFP are:

- Worker education about the new labour standards;
- The establishment of a third-party council to monitor and ensure compliance with the FFP; and
- A small premium paid by participating buyers that goes directly to farm workers as a line-item bonus in addition to their regular pay cheques.

Why would companies and growers sign the legally binding agreements laid down by the FFP? Although the CIW is at pains to highlight the good business sense that underlies such a decision with sentences that say growers gain a "means to distinguish their product in an increasingly competitive marketplace",⁸ the main reason is, of course, bad media coverage that may affect profits.

Whatever the reasons for organizations to sign on to the FFP, the effects are appreciable: 13 companies have signed the FFP (such as Subway, McDonald's, Trader Joe's, Wal-Mart and Aramark). Between January 2011 and October 2014, \$15 million in Fair





Food premia was paid into the FFP and distributed among farm workers at the rate of one penny extra per pound of tomatoes.

A CIW organizer said: “A penny a pound may not seem like that much money to you but for us it is 32 cents more a bucket or \$10 more for every 450 kilos of tomatoes. It adds up to hundreds of dollars a year and that money can make a real difference to our lives”. He added that the campaign “has been a tremendous symbolic victory for our people; they know what is possible, that we can actually achieve things, even if this is a small step”.

Though farm labourers continue to be among the lowest paid workers in the USA and their occupational hazards — ranging from exposure to toxic chemicals to trouble educating their children — persist, the CIW’s successes represent the power of collective action in bringing about change even against the most exploitative status quo.

How does this compare with the Indian situation? Investment firm, Rabo Equity Advisors, announces the growth of agribusiness in India by

proudly stating on its website, “As India’s economy transcends its USD 1 trillion benchmark, agriculture is moving towards agribusiness”.⁹ For a few, such as Rabo’s potential agribusiness clients, this will create enormous wealth. For many more, it will lead to poor working conditions, exploitation and poverty.

This is because, unlike in a luxury goods markets, an onion cannot sell at a huge premium. So a key channel to increase profit is to hold down labour costs. Grain production in the USA no longer requires farm workers and combine harvesters have replaced humans on farms. However, fruit and vegetable crops still need labour. So the issue of their working conditions in the face of expanding agribusiness is a pressing one.

Big business runs the tea industry in India and workers’ conditions in some estates are barely distinguishable from their counterparts in the tomato fields of Florida. Consider Amalgamated Plantations with 24 plantations in Assam and West Bengal and a total of 30,000 workers.¹⁰ Till the late 2000s, the plantations belonged to the Tata Group. With financial



help from the International Finance Corporation, a branch of the World Bank funded partly by the U.S. government, the Tatas created Amalgamated during a restructuring process in 2008.¹¹

For tea-pickers, the vast majority of workers on Amalgamated's plantations, life is grim. Their housing is dilapidated and overcrowded; they face hazardous water and sanitation conditions; basic benefits such as healthcare for workers' family members are denied; and occupational safety measures are disregarded while they receive pitifully low wages. An Amalgamated Plantation worker earns about ₹89 a day, not enough to subsist on. Fish and eggs are a luxury. Protective equipment to shield labourers from harmful pesticides, such as gloves and masks were withheld from them lest they wear out. Far from being able to organize for

collective action, tea workers risk harassment or layoff for even speaking to journalists and non-government organizations (NGOs).

Florida's tomato fields are the future of agricultural production in many parts of the world, including India. As in Florida, agribusiness everywhere entails the repression and exploitation of farm labourers, the lowest rung of the production ladder.

Some other trends of the agribusiness model that will shape relations of power and labour in the developing world are:

- The concentration of power in the hands of a few private corporations;
- Decline in the number of small farms cultivated by individual families, unable to sustain themselves in the agribusiness model; and
- An attendant increase in the ranks of the rural poor.

Today just 10 companies control half the global market for commercial seeds.¹² The American giant, Monsanto, controls 90 per cent of the U.S. market for soya seed, 90 per cent of the cottonseed market in India and 30 per cent of all seed markets worldwide. Monsanto genetically engineers crops, which in turn depend on the chemicals it also manufactures. Its Roundup Ready soybeans are an example of this two-pronged strategy to reduce competition and increase profits.

Corporate control extends beyond seeds to farming practices as well. There is increasing vertical integration, with power concentrated in the hands of retailers who now dictate very strict specifications to suppliers. Chris Pewalski, an onion farmer in Orange County, New York, has little choice in how big his onions are, a decision made by retailers. Potato growers in Gujarat, who supply to McDonald's, are forced to meet similarly rigid requirements. Agribusiness leaves farmers with very little control and very little room to manoeuvre.

As a matter of fact, it does not leave farmers with very much at all. The agribusiness model is expensive and resource-intensive — a single bucket of onion seed, with 1,50,000 pellets, cost farmer Pewalski \$1,600. His farm is \$4,00,000 in debt. As with Pewalski, farming is not profitable for most farmers across the USA: 75 per cent report revenues of less than \$50,000 a year.¹³

For many farm households, this is not enough for even subsistence, let alone profit — for 52 per cent of U.S. farmers, farming is a secondary occupation. Other farmers are able to continue in agriculture because their family has additional sources of income. For many, however, farming simply does

What will taking the farmer out of farming be like in India? What will these farmers dispossessed of their livelihoods do? Some will work on the farms that implement the agribusiness model



Photo: Pixabay

not represent a sustainable livelihood (in states such as Rhode Island and Massachusetts, small farms are protected by farm conservation laws and so their numbers have not declined as sharply).

With medium farmers leaving the business, one sees a trend of land consolidation; though the number of farms in the USA dropped from 2.2 million in 2007 to 2.11 million in 2012, the average farm size went up from 414 acres to 434 acres; an increase of 3.8 per cent in five short years.

As governments around the world, in partnership with private corporations, push agribusiness, farming will become too expensive for many farmers. What will this trend of taking the farmer out of farming look like in India? What will these farmers dispossessed of their livelihoods do? Some will, in all likelihood, work on the farms that

implement the agribusiness model, comprising the desperate and unorganized labour force that agribusiness requires, such as the pre-FFP Immokalee farm workers.

However, mechanized agriculture does not require much labour. From one farm worker tending to 27.5 acres in 1890 in 1990, the figure rose to 740 acres per worker in the USA's grain production.¹⁴ In India too, the surplus labour will be forced to move to urban centres, seeking work as domestic servants, construction labourers, rickshaw pullers and in other low-wage jobs. In all cases, they will face poverty and exploitation at the hands of an increasingly rapacious system. ●

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Notes

1. By mutual agreement, interviews with the farm workers themselves remain confidential and anonymous. Most individual quotations have been omitted in favour of aggregated views.
2. See <http://www.greenpeace.org/international/en/campaigns/agriculture/problem/Corporate-Control-of-Agriculture/>.
3. See http://www.oxforddictionaries.com/us/definition/american_english/agriculture.
4. See <http://billmoyers.com/segment/chris-hedges-on-capitalism%E2%80%99s-%E2%80%99s-sacrifice-zones%E2%80%99/>.
5. See <http://www.freshfromflorida.com/Divisions-Offices/Marketing-and-Development/Education/For-Researchers/Florida-Agriculture-Overview-and-Statistics>.
6. See ciw-online.org.
7. See <http://ciw-online.org/about/>.

8. See <http://ciw-online.org/about/>.
9. See http://www.raboequity.com/food_and_agribusiness.php.
10. See <http://www.nytimes.com/2014/02/14/world/asia/on-indian-tea-plantations-l>.
11. See <http://timesofindia.indiatimes.com/city/guwahati/Assam-tea-company-denying-benefits-to-workers/articleshow/55326667.cms>, and <http://www.bbc.com/news/world-asia-india-37936349>.
12. See <http://www.grain.org/article/entries/4055-global-agribusiness-two-decades-of-plunder>.
13. See http://www.agcensus.usda.gov/Publications/2012/Preliminary_Report/Highlights.pdf.
14. See <http://www.epa.gov/agriculture/ag101/demographics.html>. See more at: <http://www.epw.in/journal/2017/14/commentary/experiences-agribusiness.html#sthash.jVG7eYuy.dpuf>

OPINION

Not Rocket Science

SIMPLE MEASURES
TO TRANSFORM
INDIAN AGRICULTURE

Subir Roy

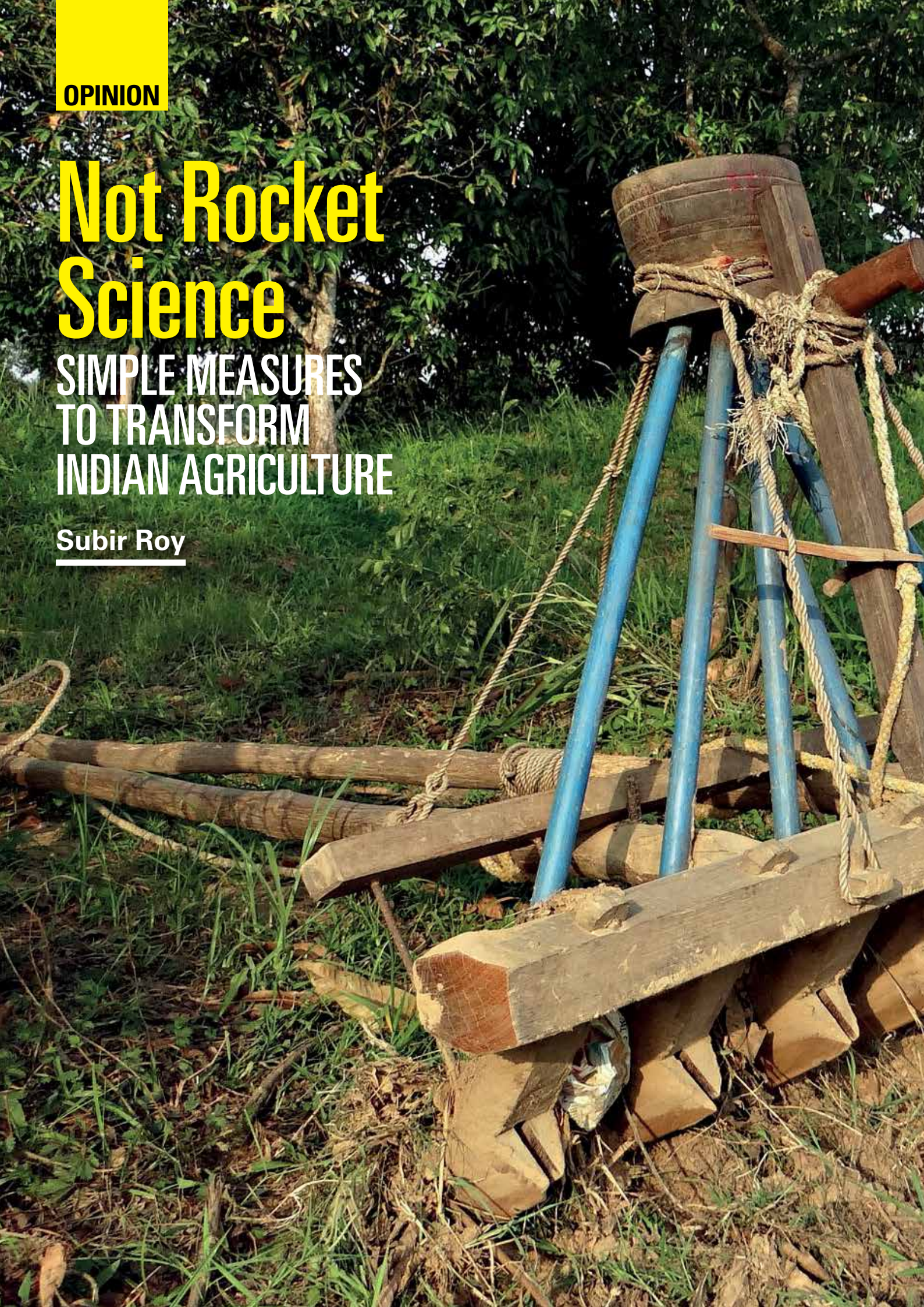




Photo: Pixabay

The problems of Indian agriculture are as well known as they intractable.

Agriculture engages 59 per cent of the country's workforce (2011 census) but contributed 18.5 per cent of gross value added (a close proxy for GDP) to the economy in 2011-12.

It is, therefore, easy to see how a sharp jump in agricultural incomes will have a transformational impact on the Indian economy and the quality of life of a majority of Indians who have something to do with agriculture.

There is no dearth of solutions proposed by experts that, if logically collated and stacked, according to their importance, will transform agriculture and the countryside. Yet, the political class seems to be bereft of ideas to make up a policy that will deliver. When the present NDA government came to power with a promise of *vikas* (development) for all, it mainly focused on cutting down bureaucracy and regulation. After nearly three years it blessed the decision of its compatriots who took over the reins of power in Uttar Pradesh to waive farm loans.

Nothing illustrates the intellectual inadequacy of the country's rulers when it comes to agriculture than this one act which, instead of doing something positive for the sector, will only perpetuate its long-term ill health. Among other negatives, this act will worsen the health of the agricultural credit sector, making it more difficult for farmers in the future to get loans from healthy institutions and participate in a smoothly functioning agricultural credit market. Simultaneously, the loan waiver will not make an iota of difference to farmer indebtedness even in the medium term. Indebtedness will reappear.

The problems of the farmer (they lie at the core of the problems facing agriculture) are well illustrated by a single personal experience as a consumer. For several months, until a month ago, one has been buying tomatoes at a little over ₹10 per kg. Given the current realities about the price markup between farm gate and the consumer, the farmer is getting not much more than ₹2 per kg that, possibly, does not even cover his costs. This for a produce that can easily be turned into ketchup and preserved. There should be no reason why the price that the Indian farmer gets for his tomato across regions and seasons should not be reasonably steady and predictable.



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economic journalist

If this were so, the farmer would know his likely revenue, look at his costs and decide whether to invest in a tomato crop. If his sums did not produce the right results, he would never take a loan that he might not be able to repay.

Instead, what usually happens is that the farmer takes several gambles. Not just for tomatoes but in general; the farmer goes for particular crops or varies the acreage guided by what that crop fetched the previous season. If the earlier experience over a crop was good, there is a move by many to go in for the particular crop or higher acreage that often leads to over supply and crash in prices. This is one reason behind the cyclicity of agricultural produce.

Even if a farmer gets all his other calculations right, the one great uncertainty that he faces is the weather. It can let him down in a way that nothing else can. In fact, weather and receiving an optimum amount of rain or not plays an important role in the shortage and over supply cycles. If farmers across the country had reliable weather inputs at the time they took their investment decisions by way

green revolution gone sour in Punjab where farmers, in response to assured procurement, have, year after year, simply gone on cultivating the same crops with the same high doses of chemical fertilizers (excessive use of urea) and ground water. It is deeply worrying that even though the green revolution that one has known till now has plateaued and its shortcomings have become clear, the country persists with a policy to “extend” the green revolution to eastern India.

To outline a simple checklist of what needs doing to safeguard the future of Indian agriculture and the Indian farmer, it is also critical to bring in the issue of the future of the planet, nothing less. India is heading towards an era (it is already there) of inadequate water, depletion of the world’s stock of fossil fuels (source of chemical fertilizers) and ecological imbalances created by farming and logging (cutting down of forests) practices.

Policy Checklist for Politicians

First, water: Through water harvesting (dig ponds and create check dams) and watershed management

Even if a farmer gets all his other calculations right, the one great uncertainty that he faces is the weather. It can let him down in a way that nothing else can

of what produce to go in for, the story of Indian agriculture today would be different.

This brings one to the other great uncertainty that the farmer faces, the role of the supply chain that determines the farm-to-fork price differential. It is idle to say that the farmer is at the mercy for the well-funded speculator who, by the very nature of his business, also periodically books losses.

Two great contrasts face one in this regard. On the one hand, there is the predictability that the Amul type co-operatives have brought to the price of the milk that the smallest farmer produces. It is widely perceived that the spectre of farmers’ suicides does not hang over areas where there is active and regular milk procurement by Amul type co-operatives even though just about a third of a small farmer’s income can come from selling milk. On the other hand, there are the distortions that agricultural prices continue to suffer from, in parts of the country, that have still to live with unreformed agricultural produce marketing committees (APMCs).

Additionally, for a healthy future for agriculture, it is imperative to follow the right policies in terms of soil nutrition. The country is facing the spectre of the

(stop cutting down trees), so that rain water does not run off, groundwater has to be recharged. On no account should aquifers be depleted as is being done extensively across India today. Proper water harvesting enabling greater use of rain water in rain fed areas can immediately raise crop yields.

The corollary to this is extensive adoption of micro irrigation, with the use of drip technology and sprinklers, so that crops can be cultivated with less water than is the case today. This requires high initial investment. It is far more sustainable for government subsidy to go to micro irrigation rather than for consumption of chemical fertilizers. While on the issue of water and agricultural subsidies, it is imperative to stop subsidizing the growing of water guzzling sugarcane (state support prices) and consequently manufacture of double refined sugar. What is the use of a clear political mandate if it does not help initiate such policies?

Second, farming practices. These have to change so that use of chemical fertilizers and pesticides goes down and agriculture slowly moves down the organic route. Unlike some of the policy options outlined earlier this cannot be done in a day but

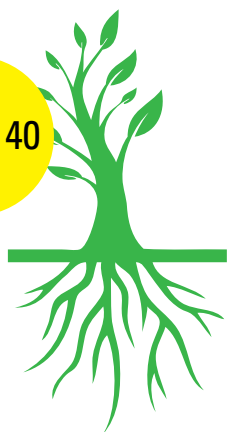




Photo: Pixabay

there is no question as to which way things should be moving. A movement towards organic farming will help maintain nutritional balance in the soil. A nudge has to be given in this direction by slowly reducing the subsidy paid for the consumption of urea and a subsidy policy has to evolve encouraging the balanced use of nutrients to which is linked the issue of maintaining soil fertility.

Third, central government effort has to be focussed on getting all the states together to pursue commonly agreed policies on agriculture without which there is little chance of improving the lot of the farmer. This is because agriculture belongs to the states' list and most of what needs doing has to be undertaken by the states. The centre can ideally focus on helping set up good agricultural universities that can take a leading role in research.

States have their work cut out in two areas. They need to step up procurement so that farmers get an incentive to invest and raise output. Plus, choice of crops for procurement has to play a role in encouraging farmers to go in for the right crops that keeps in mind the need for crop rotation and retention and replenishment of soil nutrition.

Also, states have to play a critical role in freeing up the market for agricultural produce by dismantling the structure of APMCs though this in itself will

not be enough. If a major element in a supply chain is taken away, something else has to take its place. Businesses have to come up to buy produce from farmers, warehouse it to the extent possible and trade up. Ideally, powerful and efficient co-operatives for agriculture as a whole need to come up in the mould of Amul.

A new opportunity is also emerging with the growth of retail chains that stock, among other things, fresh fruits and vegetables. These need to be given incentives to develop supply chains right up to the farm gate so that the farmer is assured of a decent price. The retail chains have an incentive to do this as there is increasing demand for quality farm produce among well off urban consumers. If chains can ensure not just freshness but also quality, consumers will be ready to pay a premium.

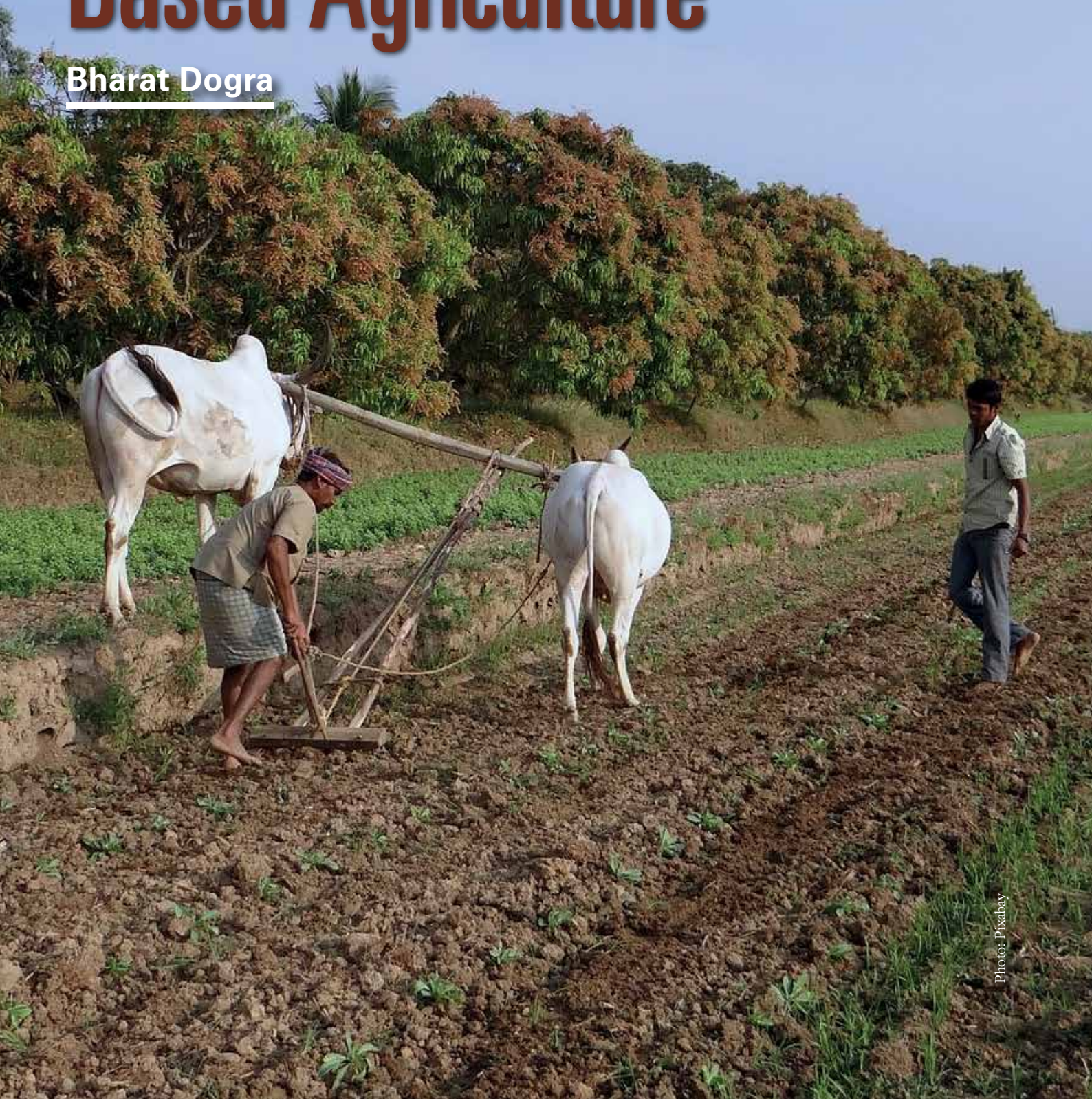
It is as not as if this cannot be done. Madhya Pradesh has been able to notch up a dramatic success in agricultural growth by taking care of things like water, electricity, procurement and roads. The model can be replicated in other states with one modification. Electricity should be used less for raising ground water and more for energizing farm equipment and simply lighting up homes (particularly at exam time) so that the next generation on the farm can grow up literate and educated. ●

INSIGHT

CUTTING COSTS TO SUSTAIN

Small Farmer Based Agriculture

Bharat Dogra



Reducing farming costs is of the greatest importance for the success and sustainability of small and medium farmers, who constitute over 90 per cent of the farmers in India. It is surprising though that this has been neglected at the policy level to an alarming extent. In fact, even when farming issues have been very extensively debated in recent times, the focus has been on remunerative prices and loan waivers with very little focus on the considerable possibilities of reducing cost of farming.

The hard working and skilled Indian farmers must depend for yields on several factors including weather conditions. In any event, yields are never fully assured though most of them are low-resource farmers, with low capacity to absorb losses. It is obvious then that the sensible approach would be to adopt those farming strategies and technologies that can help farmers to obtain reasonable yields while keeping costs at very low levels.



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pesticides, can help to reduce costs. The point is that some aspects of organic farming can also increase costs. Organic farming involves expensive certification procedures, which causes fresh problems for farmers. In the context of the needs of small farmers and rural communities of India, one needs not just any organic farming but organic farming that is specifically low-cost and self-reliant.

This is not to say that it will be out of the ambit of modern science and technology but that they will be used in such ways that promote the self-reliance of rural communities and help to meet their need for those eco-friendly methods that are extremely low-cost as well. Science and technology can be used to advance the interests of big business but can equally be harnessed to serve the interests of self-reliant communities of small farmers.

Mangal turbine, innovated by a farmer scientist Mangal Singh is a good example of a modern technology that promotes the self-reliance of rural communities as it enables farmers to lift water from

The obvious way of keeping farming costs low is to encourage self-reliance in villages. This is compatible with the Gandhian principle of self-reliant villages and rural communities

The most obvious way of keeping farming costs at the lowest levels is to encourage and support the self-reliance of village communities to the extent possible. This is something very compatible with the Gandhian principle of self-reliant villages and rural communities. The government can contribute to this by providing adequate resources to rural communities to take up water and moisture conservation and protection of forests and pastures as well as planting of indigenous trees in a big way. This helps to create a strong base for self-reliant and prosperous communities.

Villages can certainly be self-reliant in preparing manure and compost as well as using other methods of fertilizing their fields that do not involve any cash spending. Mixed farming systems and crop rotations offer ways of providing nutrients to soil while also reducing the possibilities of the crops being damaged by pests and disease. Draught power can be obtained by balanced development of animal husbandry. (See box *Lowering Costs; Increasing Benefits*)

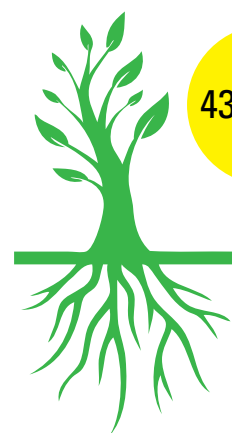
There are ill informed comments that going organic, by avoiding chemical fertilizers and

small rivers and streams without using diesel and electricity. (See *Farmers' Forum* October-November 2013, page no. 60)

Unfortunately, during the last five decades or so the government has not followed this approach of promoting the self-reliance of villages or zero cost/very low cost methods of eco-friendly farming. Rather, the farmer has been treated as someone from whom others should earn as much as possible. In the name of helping farmers and farming, such policies and technologies are promoted from which various business interests can earn a lot but which increase the costs and economic burden of farmers.

Sadly again, some of these technologies promoted by the government also have various adverse impacts on ecology like harming the natural fertility of soil or killing friendly insects and micro-organisms or overusing water. As these adverse impacts manifest themselves over a period of time, the problems of farmers go on increasing and coping with them means further cost escalations.

A myth has been created to somehow justify these wrong priorities and policies: that certain



policies and technologies may be very costly in financial terms and even more so in ecological terms but these help to increase food productivity or yield per hectare and should be accepted despite their high economic and ecological costs.

Such assertions are not supported by actual evidence. In the 12th Plan document, the Planning Commission had published the annual increase of farm yield data for various crops before and after the green revolution. As is well known, prior to the green revolution, very little chemical fertilizers and pesticides were being used. During the green revolution years a lot of chemical fertilizers and pesticides started being used and such use increased very rapidly.

Also, farmers were using their own seeds of diverse traditional varieties of crops before the green revolution but the green revolution made them become dependent on cash purchased seeds of new HYVs. The purchase of tractors also increased rapidly, generally with loans carrying high interest rates.

In other words, while before the green revolution the farming was close to the concept of zero-cost farming, post green revolution the costs of farmers increased very rapidly. Given this perspective, the data presented in the 12th Plan, which compares the crop yield during the period 1951-52 to 1967-68 (pre-green revolution) with the period 1968-69 to 1980-81 (green revolution) is very significant.

This data compares the pre and post green revolution periods.

- In the previous period, the average annual growth rate in yields per hectare (AAGRYH) for wheat was 3.7 per cent, in the later phase this was lower, at 3.3 per cent.
- In the case of rice, the AAGRYH for rice was 3.2 per cent while in the later period this was much lower, at 2.7 per cent.
- In the case of maize the AAGRYH was a robust 4.8 per cent in the former period but in the later period this had declined very significantly to 1.7 per cent.
- In the case of pulses the AAGRYH in the previous period was placed at 2.3 per cent but in the later period this had tumbled to a miserable minus 0.2 per cent.

This very significant data shows that in the case of most important food crops, despite the very substantial increase in economic costs, the average annual growth in yields per hectare actually declined in the green revolution period compared to the pre-green revolution period. Now the time has come to challenge the long perpetuated myth that

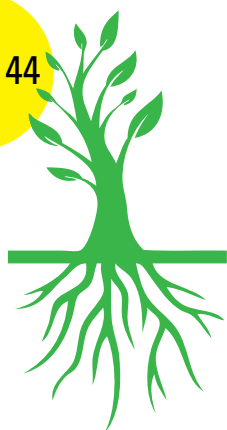


Photo: Pixabay

Despite the substantial increase in economic costs, the average annual growth in yields per hectare actually declined in the green revolution period

technologies and policies that have high economic and ecological costs are nevertheless needed for increasing farm productivity and production.

Instead, there is enough evidence to show that technologies that harm ecology, that harm the basic soil and water resources and are poisonous for pollinators can never increase farm productivity in a longer time horizon. Several scientists have time and again tried to demonstrate this but their voice are hardly heard.





The former director of the Central Rice Research Institute, Cuttack, Dr R.H. Richaria was widely recognized as India's most eminent rice scientist. He carried out pioneering research work that revealed that tribal farmers and traditional farmers, who were considered very backward by the modern research establishment, were actually getting yields equivalent to or higher than green revolution varieties from some of their traditional varieties and that too without using chemical fertilizers and pesticides. Such research was stifled as otherwise it would have been difficult to justify the adoption of more expensive technologies on a vast scale.

Now, after a gap of several years, in the name of a second green revolution, there is another big move to spread genetically modified or GM crops that can bring huge gains to some of the biggest multinational corporations but which will further increase the economic and

ecological costs of farmers to a much higher extent than before.

Once again this is being propagated in the name of increasing productivity but the reality is very different. A group of eminent scientists from various countries who constitute the Independent Science Panel have said in their conclusion after examining all aspects of GM crops: "GM crops have failed to deliver the promised benefits and are posing escalating problems on the farm. Transgenic contamination is now widely acknowledged to be unavoidable and hence there can be no co-existence of GM and non-GM agriculture. Most important of all, GM crops have not been proven safe. On the contrary, sufficient evidence has emerged to raise serious safety concern that, if ignored, could result in irreversible damage to health and the environment. GM crops should be firmly rejected now." ●

Lowering Costs; Increasing Benefits

Just as with agriculture, much can be done in terms of reducing overall costs for irrigation and rural drinking water supply even as benefits to villagers are improved. A visit to the Bundelkhand region in the peak of the heat wave was an eye opener.

The visit was to assess and report on the water scarcity and related problems of several villages in the Bundelkhand region. This region, spread over 13 districts of Uttar Pradesh and Madhya Pradesh, has often been in the news due to its recurring water shortages. True enough the water shortage for human beings as well as farm and other animals was acute in all the eight villages that were visited and the plight of the residents pitiable.

Yet, in such times of distress, local ingenuity shone and people in all the villages spoke about specific local, decentralized, low-cost solutions for their villages. In some cases they talked of work that was started and abandoned midway because of shortage of funds or other reasons that they were not informed about.

In a hamlet of the Sahariya tribals of Kauriya village (Tikamgarh district), one even came across a tank that had been constructed but not finished for use. Instead of prioritizing such work for urgent attention and completing such low-cost and location-specific solutions, the authorities are emphasizing mega projects that are extremely expensive in economic as well as ecological terms.

The most talked about such project in recent times is the Ken-Betwa river link project with an enormous budget of around ₹ 18,000 crore that is bound to see escalations. This project involves the cutting of about 18 lakh trees, apart from displacing many villagers and disrupting the protected habitats of endangered wild animals and birds. This ruinous project has come under repeated criticism over the years for its unrealistic assumptions, poor survey and study as well as neglect of many adverse impacts.

Pushing of such expensive projects will eat up the available resources while leaving the basic problems unresolved. There is still time to rethink priorities for the farm sector and determine solutions that will work. If instead of such a gigantic and highly expensive projects it may be strategically advisable to take up about 9,000 small projects with the involvement of rural communities in as many villages with a budget of around ₹2 crore for each project. This would certainly go a long way in terms of quenching thirst in these parched villages and farms.



A key to reducing costs while improving benefits is the better and closer participation of rural communities in these small projects. In some villages of Bundelkhand, this has been achieved by organizing pani panchayats and selecting jal sahelis from among them. These jal sahelis play a leadership role for ensuring the mobilization of people for meeting water needs.

They made headlines in 2011 when women from 60 gram panchayats of the three districts of Jalaun, Hamirpur and Lalitpur got together to form paani panchayats (water councils) in their villages, which have become a model for local self-governance to address water and employment problems in rural areas. Many of the women were dalits as were their leaders and their thinking was exceptionally forward.

The mission was clear: to enhance water resources by bringing to life neglected and dormant sources and resuscitate them. For



Pani panchayat members and Jal Sahelis of Gewra village, Lalitpur district, Uttar Pradesh

conservation they were happy to use present day technology. Thus a combination of traditional resources and knowledge was married with modern ideas to convert arid lands to a region flush with water.

Funds were obtained under the aegis of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), the water was clean, the ground water levels improved and an adversity was converted into an opportunity.

In August 2012, Prema Devi (55), illiterate but a Jal Saheli from Mallahanpura, told the Hindustan Times: "Our Paani Panchayat is a 20-member all-women one. We pressurized officials and managed to get two new handpumps and repair old ones. Before the onset of monsoon, we decided that through voluntary community work, we would clear the obstructions in the only pond we have so that

more rain water finds its way there. We mobilized the village, almost all men and women worked two hours several days. Now we have water in the pond. The next step is to coerce the district administration to clean and de-silt it".¹

Shyam Singh explains: "Earlier Meera (his wife, Meera Devi used to go to a handpump 150 metres away and made three trips each day. Each trip apart from walking to and fro had an average waiting time of one-and-a-half hours before her turn came to fill water. The queue used to be longer because 10 of the 26 handpumps were out of order for a very long time. Paani Panchayat pressurized the gram pradhan, block development officer (BDO) and sub-divisional magistrate (SDM); now all the 26 handpumps work, including the one that is barely 10 metres from my home".²

¹ Hindustan Times, Jal Sahelis to the rescue in UP districts; August 08, 2012

² Hindustan Times, Jal Sahelis to the rescue in UP districts; August 08, 2012

HUNDREDS OF GANDHIANS APPEAL TO THE PRIME MINISTER

To

SHRI NARENDRA MODI

Prime Minister of India,
New Delhi 110001.

June 14, 2017

Sub: GM Mustard – Request to Reject Commercial Release

Dear Hon'ble Prime Minister,

We, as members of the Sarvodaya movement and Gandhian networks, write to you, as consumers, as citizens of a democratic India and on behalf of all those who are concerned with the bio-violence that forms the inherent basis of the genetic modification technology. We have serious objections to the release of the Genetically Modified (GM) Mustard DMH 11 and are writing to you because this needs the attention of the Government of India at the highest level.

We strongly contend that GM crops have failed to deliver the much-hyped benefits. Transgenic varieties will contaminate all other crops and there will be no GM free agriculture after a point. There is sufficient evidence to prove that GM crops are not safe for human health or for flora and fauna. Cancer is growing at an alarming rate and ICMR projects 17.3 lakh new cases by 2020. We urgently need less carcinogens around us and more food safety, while GM crops will only increase use of dangerous toxins in agriculture. While 38 countries worldwide have banned GM crops and are moving towards nonviolent organic agriculture, we in India, through GM technology, are moving towards more violence to our environment and human beings. Once Frankensteinian genetics goes haywire, there will be no going back for the human race and new mutations will spread – permanently and globally.

GM Mustard will only act as a Trojan horse that will be used by the private sector and strong multinational companies to destroy the food sovereignty of the Indian farmer and the idea of Gram Swaraj will remain only lip service by the Government. The yield of hybrid varieties developed through traditional systems are more or at least equivalent to the GM Mustard.

We bring to your notice our adequately substantiated objections below and urge you to ensure that the government takes the right decision on this issue.

1. GM MUSTARD IS HERBICIDE TOLERANT

Serious concerns have been voiced against Herbicide Tolerant crops from scientists and experts, particularly in the Indian context. The Technical Expert Committee (TEC) appointed by the Supreme Court, in the 5-member report in 2013, devotes a section to the impact of Herbicide Tolerant crops. The Committee has recommended that field trials and HT crops not be allowed in India. Additionally, adoption of such crops will drastically impact rural employment, where manual de-weeding is a major source of employment.

2. CLAIMS FOR YIELD IMPROVEMENTS

The main basis on which this GM Mustard is being considered for approval for commercial cultivation is that field trials showed overall average higher yield over "national check" and if this is commercialized, oil production will be enhanced and India's edible oil import bill brought down. However, this is based on wrong claims and assumptions, as there exist other varieties and hybrids which give higher yields.

Worldwide, experience shows that in the case of rapeseed which is of the same family as mustard, countries which grow non-GM rapeseed such as Germany, France, England and Czech Republic show yields much higher, almost double, compared to the ones which grow GM-rapeseed such as Canada and U.S. Further, there are other non-seed based agronomic approaches to increase yield such as the System of Mustard Intensification (SMI). Experiences from Rajasthan (DRMR), Madhya Pradesh (Department of Agriculture) and Bihar (PRADAN/PRAN) show impressive yield increases. Furthermore, this will increase chemicals and use of herbicides in our farms, with severe danger to public health.

3. OTHER ISSUES: HONEY PRODUCTION, ORGANIC FARMING, AYURVEDA

Serious concerns exist about the impact on honeybees and honey production. Around 5 lakh beekeeper families exist in India, producing 90,000 metric tons of honey, out of which 35,000 metric tons is exported, with an estimated value of ₹350 crores. Around 60% of the honey produced is mustard honey. The testing of impact on all pollinators including honeybees is very inadequate. Further, it is not tested as Herbicide-Tolerant crop with the expected herbicide use. The Confederation of Beekeeping Industry of India has strongly opposed GM Mustard and is a key member of Sarson Satyagraha.

As the Prime Minister, you have rightly emphasized organic Agriculture as a priority through the Paramparagat Krishi Vikas Yojana. This would make agriculture more sustainable and move towards higher income for farmers by reducing costs. Promotion of GM crops is completely incompatible with this approach. This non-GM status of Indian food crops has given an advantage to exports of Indian produce to European and other countries, which will be reversed with the entry of GM food crops. Organic non violent agriculture or Rishi Krishi is the need of the hour is public health and long term food security is to be saved.

Similar is the complete disregard of the impact of GM mustard on Ayurveda, though mustard is extensively used in Ayurveda. You would kindly recall that you had stated that your Government is fully committed to promotion of Ayurveda and traditional systems of medicine. However, the testing and clearance of safety of GM mustard neglects this.

We request you to recall that the BJP Election Manifesto had a commitment to the Indian public that "GM foods will not be allowed without full scientific evaluation on the long-term effects on soil production and biological impact on consumers". This is indeed a case where full scientific evaluation did not happen, and no long-term effects studied.

It is worth noting that cutting across party lines governing different states, governments are rejecting the transgenic option. You would recall the rejection of BT brinjal too. In view of all the substantive objections that we have put forward on GM Mustard and GM food crops, and the threat to public and agriculture, we demand that the Government of India should reject GM Mustard and any other GM crop. We urge you to take this decision as Prime Minister, in the interests of farmers, consumers and environment, and ultimately, in the national interest.

Yours Sincerely

GM MUSTARD REQUEST TO REJECT COMMERCIAL RELEASE
Petition from Gandhian leaders to the PM

S.L. No	Name	Address	Signature
1.	Indra Kishore	Ekta Parishad Odisha, Khordha	Indra
2.	Babula Jana	Ekta Parishad Odisha, Khordha	Babula
3.	Ramesh Lenka	Ekta Parishad Odisha, Khordha	R. Lenka
4.	Bishambharan	Ekta Parishad Odisha, Khordha	Bishambharan
5.	Aarati Jana	Ekta Parishad Odisha	Aarati Jana
6.	Anusuya Mahapatra	Ekta Parishad Odisha	Anusuya Mahapatra
7.	Kiran Jana	Ekta Parishad Odisha	Kiran Jana
8.	Bhaskar Prasad	Banpur, Khordha Odisha	Bhaskar Prasad
9.	Madhu Nayak	Ekta Parishad Odisha	Madhu
10.	Nibadi Pradhan	Nibadi Pradhan, Banpur, Khordha Odisha	Nibadi Pradhan
11.	Pradip Nayak	Patta, Nayak, Odisha	Pradip Nayak
12.	Rudraprasad Sarangi	Soran, Khordha Odisha	Rudraprasad Sarangi
13.	Pradeep Kumar Patra	Manasingpur, Soran, Khordha Odisha	Pradeep Kumar Patra
14.	Hemanta Saha (Advocate)	Tangi, Khordha Odisha	Hemanta Saha
15.	Bhaskar Mohanty (Advocate)	Tangi, Khordha Odisha	Bhaskar Mohanty

20/6/17



COMMENT

The Case for Indian Farming

Aditi Roy Ghatak

***“But India’s Farmers
Should Go Bust,
That’s How Economic
Development Works”
— TIM WORSTALL***

Photo: Zoe Savitz

It is increasingly clear that that the author of this statement — rash, brash and even trash (as some would argue) though it is — has a sizeable fan following. It exists not just in the western world with its neoliberal ideology, far removed from Indian realities but even amongst the current crop of Indian policy makers. This cohort seem rather chuffed about the agony in the countryside that it takes to be a signal that the stressed out farm sector should die a natural death. This state of affairs is dangerous because eventually one is playing with India’s food security here.

Farmer stress and distress have been attributed to a variety of reasons – sex or lack of it, depression on account of inexplicable reasons, liquor – but never to the primary reason: that the farmer is the only producer who is often forced to sell at prices that do not cover cost of production and he is forced to do so because the rest of India must get food at an affordable price.

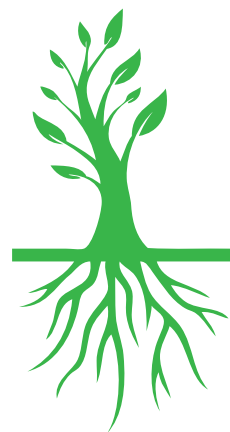
For a country that has suffered the ship-to-stomach experience vis-a-vis food shortage, India has a curious attitude to farmers. Farming has never been noble profession; the farmer is a yokel for most Indians; so much so that the farmer’s son today – who could be an independent entrepreneur in his own rights – wants to be a chaprasi in a city office.

To go by Tim Worstall’s asinine argument,¹ presented in the Forbes website, that is the way it should be because that is how development works. Is development all about transforming well-established societies – mainly farming and tribal communities – that abide by nature and draw sustenance from it and transporting them as virtually slave labour for the urban upwardly mobile? It is a prescription that the Bretton Woods institutions have been plugging from the 1990s and they have seem to found receptive ears in India.

What does this entail for the Indian farmer? The ‘development’ planned for them is never finalized after discussions with them nor is it in consonance with their ways. For this breed of planners, somehow, modern development needs to be in accordance with modern western thinking. However, sensitive change management, intrinsic to modern management lexicon, is never a part of the development plan.

Thus, change for the Indian farmer or tribal must be rammed down his throat; one that he is ill-prepared to face. The Singur farmer in West

¹ <https://www.forbes.com/sites/timworstall/2017/06/11/but-indias-farmers-should-go-bust-thats-how-economic-development-works/#5>



Bengal was told to be a cog in the automobile industry wheel, without anyone checking if he had the aptitude for it or was willing to do so. Even the Madhav National Park, currently in the news, secured its position as a national park but threw out the tribal communities that resided in village Ballarpur within the park area, without a sustainable means of livelihood.²

Since, Worstall is not alone in his conviction vis-a-vis the plight of farmers, one has the likes of the political leaders like Rameshwar Sharma holding forth on farmer suicide: that one who commits suicide is not a real farmer. "I have never seen any real farmer die. A true farmer only struggles. The ones who die are those who feed on subsidy in the name of agriculture". Three lakh farmers have killed themselves; victims of a poor policy regime and a hostile economic environment but Gopal Shetty, another member of parliament puts an interesting spin to this: "Farmer suicide has become a fashion and governments are competing to give compensation to farmers!"³ These opinions cannot be trashed because they are the opinions of influential law makers.

New Delhi now wishes to copy-paste the western model of getting people off farming and putting them on a more productive footing. Very little thought has gone into making the transition from low productive to higher productive occupations within the farming space. Rewarding opportunities in the meat industry, for instance, are being ruthlessly demolished to serve a right-wing agenda. Thus, bereft of opportunities in the village, the job seeker must venture out to find risky, unsustainable and degrading work in urban conglomerates that cannot even offer living space for them, leave alone a sustaining wage. The only takeaways are the dehumanized urban slums.

To revert to the copy-paste model, it is all very well for a western policy maker with his minuscule percentage of population in agriculture to say that development means "to get people off farming". India offers no other options; manufacturing and services cannot even offer jobs to the available job seekers and laudable though the National Skill Development Mission is, it is too little, too late. Recent employment statistics are terrifying.⁴

Jobless, underemployed, starving... do not impress; it is the Worstall argument that finds



Photo: Zoe Savitz

increasing resonance in modern India's political thinking. Industry represents development; therefore the farmers must go bust and give their land and labour to the cause of development. The argument works in the USA or even U.K. where no more than one or two per cent of the population are farmers but certainly India with upwards of 50 per cent of the population dependent on agriculture should have thought differently. No. Worstall calls the shots.

"There are protests and calls for political action,

² <http://timesofindia.indiatimes.com/city/bhopal/forest-dwellers-farmers-protest-displacement-from-mps-madhav-national-park/articleshow/59195758.cms>

³ indiatoday.intoday.in/story/bjp-mp-gopal-shetty-receives-flak-for-anti-farmer-comment/1/599637.html

⁴ thenewsexpress.co/unemployment-report-india/



The Worstall argument finds resonance in India's political thinking. Industry represents development; therefore the farmers must go bust and give their land and labour to industry

over the plight of India's farmers at present and the one important point we've got to get across to people is that India's farmers should be going bust because that's how economic development actually happens. People stop doing low productivity things like rain fed labour intensive agriculture and go off and do more productive things like working in factories or producing services". Worstall clearly has no clue about employment statistics in India.

Yet, Worstall, of the Adam Smith Institute

(ASI), London, is nothing if not considerate: "It's entirely true that we should make the transition as painless as possible, no doubt about that" without any thoughts on how the state of painlessness is going to be achieved in India. He insists: "We (witness the royal 'we') do not want to be preventing the change from happening because that just keeps everyone poorer than they need to be. The harsh truth is that not being able to make a living doing something is the



universe's method of telling you, you should be doing something else. This is as true of farming as it is of buggy whip manufacture. We are all, the people doing the labour most of all, made richer by people moving from low productivity activities to higher".

If wishes were horses, beggars would ride. In India, people with master of arts degrees seek a gofer's position but that is not a phenomenon that features in the western know-all's radar, nor does it dawn upon his Indian aficionados. The argument would have been hilarious had it not been over a matter of such critical importance to India.

Preserving farming as an activity "is fine" by them; "... We want the crops to be grown. But they will preserve the activity as it is, a labour intensive and low productivity activity. Which is not what we want at all" because it does not provide any resolution to the problem. Nor does the Worstall argument. The solution lies in creating conditions that allow the farmer to get a fair price and not in constantly hammering away with a lie that the farmer is protected by a statutory minimum price. Only a microscopic number of Indian farmers are thus protected and only for a few crops. More significantly, most Indian farmers do not have a marketable surplus, something that never figures in western calculations.

Binu Mathew and Colin Todhunter hit the nail on the head:⁵ "Washington's long-term plan has been to restructure indigenous agriculture across the world and tie it to an international system of



The solution lies in creating conditions that allow the farmer to get a fair price and not in constantly hammering away with a lie that the farmer is protected by a statutory minimum price

trade based on export-oriented mono-cropping, commodity production for the international market and indebtedness to international financial institutions. The result has been food surplus and food deficit areas, of which the latter have become dependent on agricultural imports and strings-attached aid".

A little knowledge can be a dangerous thing, especially when it becomes the motivation for policy. Worstall's specious argument runs thus: "The cost of a loan is an input into the

agricultural process. The price of the production is of course the value of the output. And if prices are below the combined costs of the inputs then the business or activity is making a loss. But take that one step further. People making a loss in the economy are subtracting value, they're making all of us poorer. Remember what GDP is, it's not the value of production, it's the value of production minus input costs, it's thus the value added. A loss is value subtracted, it's making GDP smaller". Someone needs to understand the numbers that India represents. Rural India will have around 800 million people even in 2050; most of them directly or indirectly dependent

⁵ <http://rinf.com/alt-news/editorials/pushing-indian-farmers-bankruptcy-isnt-development/>

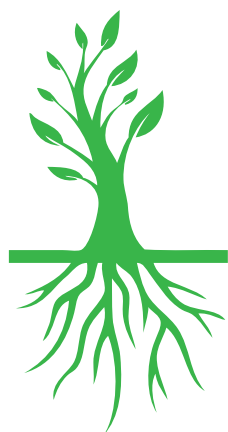




Photo: Zoe Savitz

on the farm economy. Is there any scenario, even in a hypothetical world, that can address the livelihood concerns of this humungous number or even a tiny part of it?

Worstell dismisses the suggestion that farmers are wanted off the land in order to provide cheap labour for industry. “No, that’s entirely the wrong way around, we want to provide higher incomes, that is pay labour more, by having them doing the more productive industry and services than agriculture. That is, we want fewer people being farmers and more people doing other things, so we don’t want to subsidize people to continue being farmers”. Does he have some ideas on the other things that the hapless farmer can do? No, his is to advise; not to resolve.

It is absolutely true that India has some 50 per cent or so of the population in agriculture and the output has a shameful value of some 15 per cent

or so of GDP.” The policy approach to that would be to invest in agriculture so that productivity rises; not to do away with agriculture. By the same token teachers in India are poorly paid. Will there be a suggestion that teachers quit teaching and start taking up non-existent administrative positions for instance?

Worstell holds forth: “Both what will mark out India as a rich country and what will make it one, is when the labour and output profiles of agriculture are similar to those other rich countries. Because that’s just what getting richer as a whole means. That the vast majority of the population stops standing around in muddy fields and goes off to do something more productive instead. It’s not just that this is what has happened everywhere that has got rich it’s that this is the very definition of a place and population getting rich”. Unfortunately, the Worstell formula cannot create that “something more productive instead” and without that magic the formula falls flat.

The Worstell bottomline is: “Not being able to make a living farming is the universe’s way of telling you to do something other than farming. India should smooth the transition, certainly, but not subsidize people to remain farmers”. Truth to tell, India has been subsidizing food that is sold in the market; the farmer is never really subsidized in the final analyses of the food economy in India. The twain of subsidy allocation and targeted beneficiaries is not destined to meet.

This is not to say that Indian agriculture is not a salvageable proposition. Agroecology, based on biodiversity and local farmers market, provide workable solutions too. They have proven to be most effective in different countries in the E.U., Africa, South America, especially in Mexico, Cuba, El Savador and Bolivia, in the west coast of the USA and several parts of India.

Other avenues are known as well and do not need rocket science to be figured out. They lie in sound agronomy, sound technology, access to fair finance, effective extension services, water management, basic infrastructure, access to markets, access to post harvest storage or processing and the right to sustainable practices and stable policies... anything that any other producer would demand and get.

Why does India not do these? That is the question that should worry Worstell and the world; not how to take the farmer out of farming. Following the now forgotten pointers in the BJP manifesto may be a good place to begin. ●

STRINGING UP A HIT
BIOTECH STORY

Global Honour for String Bio

A Farmers' Forum Exclusive





Photo: Pixabay

The news hit AgTech circuits in India on June 29 with a bang. ***“Indian Agritech Startup Wins FFAA in Milestone for Asian AgriFood Tech”***. It was Cal Foulner, the co-founder of beanstalk AgTech (supporting agricultural technology commercialization, adoption and investment with a focus on Australian and APAC markets) writing about String Bio, from Bangalore, India, that “took top honours at Asia’s first agrifood technology pitch competition, the Future Food Asia Award (FFAA)”.

For those unfamiliar with String Bio, essentially, this startup converts methane, a waste gas responsible for much of livestock production’s greenhouse gas emissions and also a significant source of energy as the largest constituent of natural gas, into proteins that can be used in animal feed. Its CEO, Ezhil Subbian, flew in from Bangalore to present at the finals of FFAA and won over the judges presenting String Bio’s patented platform that leverages synthetic biology and fermentation for a scalable, cost-effective, traceable and sustainable source of protein for animal feed.

Speaking to *Farmers’ Forum* post victory, Ezhil Subbian said: “Our solution delivers a sustainable, cost-effective and wholesome protein from a novel source. String Bio leverages methane as a source of carbon to manufacture green chemicals and feed/food ingredients. Our proprietary platform (SIMP-String Integrated Methane Platform) leverages advances in synthetic biology, fermentation technology, chemistry and process engineering for fermentative conversion of methane into products. The biggest impact of this is in enabling sustainable food for the growing population and creating a gas based value chain”.

Appetite for Agtech

FFAA marks a milestone in the fledgling Asian agrifood tech industry; the first competition of its kind showcasing the region’s top startups in the sector. The event was organized by Singapore-based boutique investment firm ID Capital. Founder and CEO Isabelle Decitre realized there was an “appetite for agtech and food tech venture investments from industry and financial players, as well as a critical need for money for entrepreneurs, especially at the Series A and Series B stage”. FFAA was Decitre’s model to scale up what she was doing at ID Capital but “in a more inclusive manner than raising a VC fund”.

— Cal Foulner



Bridging a Gap

“Protein is a significant source of energy and there is a growing gap in worldwide protein supply. To elaborate, on the demand side the world population is projected to reach 9.6 billion by 2050; 70 per cent of this growth is expected to be in urban areas with high meat consumption. On the supply side, the existing protein sources for the animal feed market, like fishmeal and soyabean meal, are both constrained by climate variability and land/water availability. Existing solutions in the market cannot provide a 70 per cent increase in output. Innovative solutions are needed to address the gap in the market. String Pro is a novel source of protein poised to address this growing gap. We are very excited about a home-grown innovative product being scaled for both local and global markets”.

—String Bio CEO, Ezhil Subbian,
to Farmers’ Forum

What won the top slot for String Bio? Given the widening chasm in the global protein supply, there is a search for alternative sources of protein for animal feed. String Bio presented its case as the “only company in Asia with proven technology to convert methane into protein using a biological process”.

The winning team believes that the technology is scalable and this would make it the cynosure of all eyes; “a proposition worth watching”, to quote Cal Foulner. The current global protein animal feed ingredient market is valued at approximately \$50 billion; projected to increase 70 per cent by 2050. Much of that growth will come from Asia.

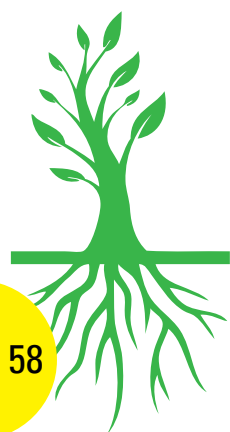
Subbian, who co-founded String Bio in 2013, had spent a dozen years working on scale ups of three bio-based products in Silicon Valley — all three successfully reaching IPO — convincingly conveyed her position to the judges; “her depth of experience showed as she answered pointed questions from judges and audience members with grace”.

Sharing her story with Farmers’ Forum, she said: “I moved back to India four years back with an avid interest in developing sustainable solutions that are specifically catered to fundamental problems in this geography. The biggest personal win has been in bringing on board a team of like-minded individuals excited to make a difference, small or big. Our drive is cost-effective solutions to solve fundamental problem, using the power of biology”.

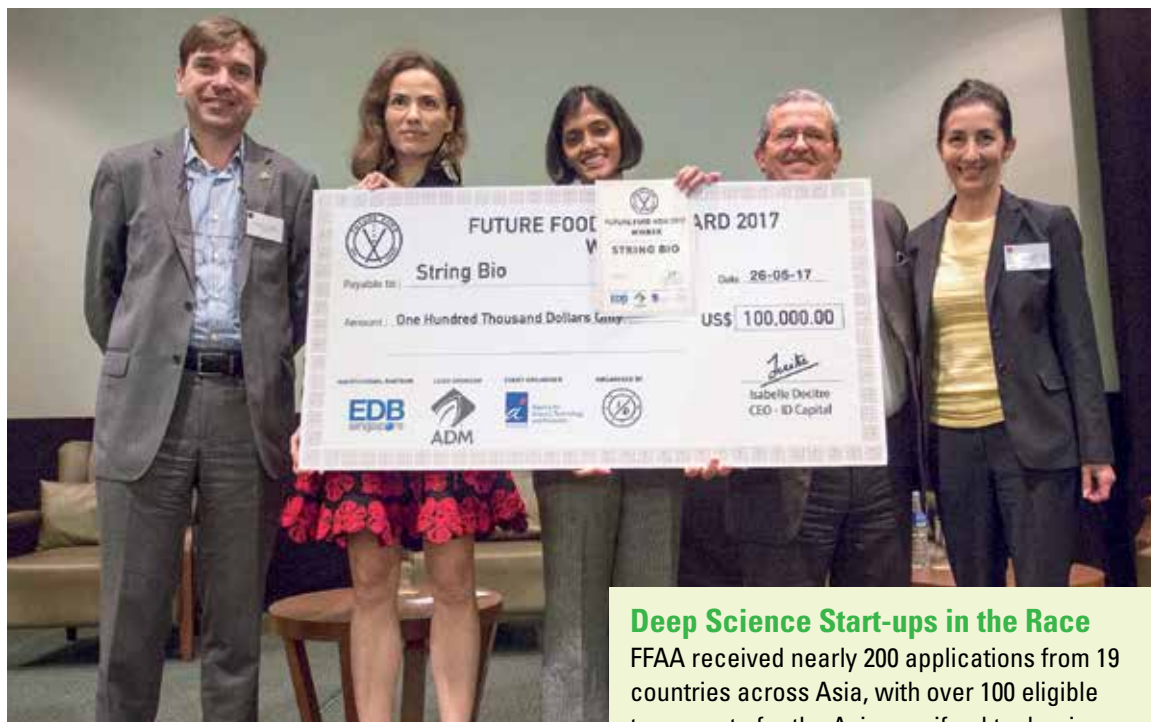
“On a personal note. I co-founded String in 2013 after working for 12+ years on scale up of various bio-based products. I was part of early technology development at three SMEs in the bio-based sector. My value add to String is first-hand knowledge of solutions that work and bottlenecks that plague the current bio-based product development”, she said.

Foulner says that String Bio (currently pre-revenue) is now focused on completing customer validation studies for the synthetic protein animal feed, as well as raising a Series A funding round. The startup will use the \$100k prize from FFAA, as well the Series A capital, to scale up its processing facility in Bangalore to pre-commercial scale.

Once in commercial production, String Bio plans to operate facilities with strategic partners and generate revenue through product sales with the goal of building its supply capabilities. The next challenge with the real payoff will be to “establish the



Bangalore Bioinnovation Centre
where String Bio is incubated



demand for a significant share of the Asian animal feed market”, Subbian told the overseas audience.

While at its core String Bio makes a social commitment to a circular economy by capturing a potent greenhouse gas — methane — in proteins and chemicals to enable a cleaner and sustainable way to source animal feed protein, it also runs a ‘Biotech Impact Program’ that brings together select undergraduates from leading colleges in Bangalore to undertake an eight or 16 week active industrial learning course with the String Bio team, giving them hugely valuable industry experience in the biotech space; a rare opportunity in India.

Clearly this group of biotech experts is committed to India, to Indian agriculture and to agtech. What is the future of agtech start-ups in India? Subbian says: “There are fundamental challenges that need to be overcome with regard to agriculture in India — yield enhancements, water and soil management, farm to store supply chain improvements and such others. We need to solve these in a cost-effective and sustainable way. I believe these solutions exist in inter-disciplinary areas. The future is for startups that can execute these solutions effectively”.

There are challenges and expectations of support, of course. Subbian’s expectations are simple: “Tax incentives for R&D and simple and transparent regulatory framework would be a great start”, she says and any sensible policy regime should make that available. The constraints are another cup

Deep Science Start-ups in the Race

FFAA received nearly 200 applications from 19 countries across Asia, with over 100 eligible to compete for the Asian agrifood tech prize based on the competition criteria:

- Technology beyond proof of concept
- Existing operations in the Asia Pacific region
- Team has good English proficiency
- Preparing to raise Series A
- Capital invested to date at least \$100k
- Main activities within FFAA’s 4 sectors

Around 60 per cent of the applications were “deep science” startups, which immediately competed with innovations from around the world. For these startups, the ability to secure IP protection for the technology plays a significant role in their value proposition. The remaining 40 per cent of the applications were technology-enabled platforms or business models that are more relevant in a local context. “When they originate from large countries like China, India and Indonesia, their addressable market is often a true competitive advantage and, in that case, the pace of development and quality of execution are of paramount importance”.

— Cal Foulner

of tea: “Our major challenges have been around finding the right talent and finding the right capital at the right time”.

The guest of honour at the awards ceremony, Jason Clay, of the World Wildlife Fund, deserves the last word: “If there is no Asian answer to the challenge of the future of food, there is simply no answer at all”. String Bio seems to have told him that there is no worry on that score. ●

**GREEN
FINGERS**

Sunny Side Up at Baripitha

Asish Biswas



Baripitha used to be just one of those many non-descript tribal villages that dot the landscape of Odisha. About 25 kms away from the state capital of Bhubaneswar, life had remained largely unchanged for its 350 residents till that fateful day of October 2, 2015. It was on this day of Mahatma Gandhi's birth anniversary that Baripitha became the first village in Odisha to go fully solar.

Suddenly major newspapers and television channels are visiting the village.

It is not just growing crops successfully that greenfingers empower; sometimes greenfingers emerge in the shape of power; technology, policy or sheer commitment to a cause. Baripitha, home to about 60 tribal families, provides one such happy, replicable example.

Located in the Khurda Sadar block of Khurda district and on the verge of the Chandaka sanctuary, Baripitha (also spelt Barapitha) is on the Bhubaneswar-Khandagiri-Deras route. The area is both hilly and forested, making regular access difficult. This is also



ASISH BISWAS is a development consultant working on national and international projects

centre television. The project was inaugurated in the presence of Joydeep Nayak, IGP, Niranjana Sahoo, the collector of Khurda and the Nalco chairman and managing director, T. K. Chand.

Each of the 61 households in the village now has two multi-purpose light connections. This meant reduced dependence on expensive and scarce kerosene and while children could study in the evenings, their mothers would not have to stumble around in dark kitchens.

Mobile phones too could be easily recharged and would lead to greater contact with friends and relatives in places elsewhere.

There is also a central one-kilowatt unit. This powers eight street lamps, the anganwadi centre and a community-owned LED television set along with a set top box in the community centre. Families and the village children would now have access to popular recreation and also be more up to date about the world in general. A 1-horsepower pump has provided an additional and a far-reaching benefit. Water during

Lack of artificial irrigation kept the people in a vicious cycle of poverty, the fear of elephants deterred them from entering the nearby forest and collecting non-timber produce

the reason why Baripitha lacked basic infrastructure like roads, water supply, electricity and such facilities that should have been its by right.

While the lack of artificial irrigation kept the people in a vicious cycle of poverty, the fear of elephants was a deterrent for them to enter the nearby forest and collecting non-timber produce.

All this rapidly changed when Joydeep Nayak, a senior IPS officer, Odisha cadre, took the initiative in starting a dialogue with ECCO Electronics, a solar power products manufacturing NGO and the Jackson Group, a diversified power solutions company, both based out of Noida.¹ With a combined budget of ₹7 lakh paid for by these two companies, this project was also supported by the National Aluminium Company, which helped in the strengthening of the village committee and also provided training to local youth on maintenance.

On October 2, 2015, the project was inaugurated during the India-South Africa T-20 match at Dharmasala, which was avidly watched by both village adults and children on the community

the dry season would mean an additional crop thus, improving income and nutrition.

Village level planning was the cornerstone of the project. A village committee was set up to facilitate this process and made responsible for its implementation. The two people who took the lead in the Village Committee were headman Narayan Hisa and a fellow villager, Epil Kumar Singh, an ITI diploma holder. These two are also in charge of the maintenance that largely comprises cleaning the panels and topping up the water levels of the batteries

Powering the Solar Model

"We requested companies such as Nalco, Ecco Solar and Jackson Solar to help us with the solar project for the village... This model can be replicated all over Odisha to provide power to its nearly 3,900 villages," senior IPS officer Joydeep Nayak, who is the driving force behind this initiative, told The Times of India.

— <http://www.thebetterindia.com/35711/baripitha-solar-powered-village-in-odisha/>



¹ <https://www.slideshare.net/SubodhKumar177/jakson-solar-overview-2016>



in the central unit. Thus, maintenance, always a contentious issue, has been almost eliminated.

“Till now, in all rural solar projects, central units would supply power to households. Often, the exposed cables would be tapped by some, while others would draw more than their shares. This would cause the central unit to overload and trip”, said Jakson’s executive vice-president Sandip Ghosh.² With units installed at the household level, these problems have been automatically eliminated.

Situated close to Odisha’s long coastline that is notoriously prone to the ravages of terrible cyclones, Baripitha’s central solar unit has an additional feature: made up of eight panels, these can be folded in a couple of minutes and packed away to prevent damage from high speed winds that regularly hit the coastal areas of the state.

Joydeep Nayak is optimistic about the success of the project as its key pillars rest upon community ownership, low cost and low maintenance. This is unlike other projects that have generally not been sustainable. So upbeat are the officials about the success of the project that they are now of the conviction that this model could be replicated in almost all the 3,900 villages throughout the state where supply consistently fails to meet demand and

Joining Hands to Go Solar

“The entire village has been involved in the planning and execution. Village mukia Narayan Hisa along with a local ITI diploma holder, Epil Kumar Singh, are responsible for the maintenance”, ECCO CEO Vivek Bihani in the Times of India.

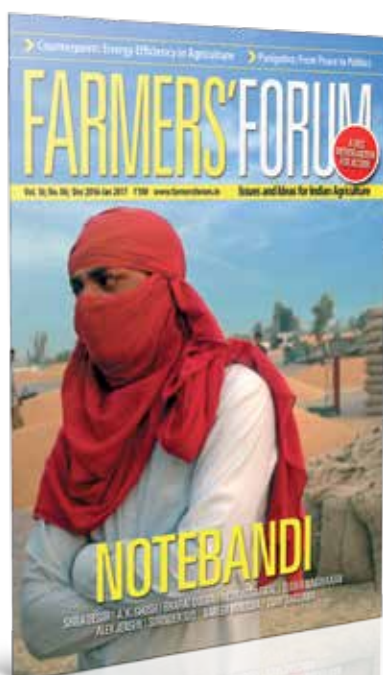
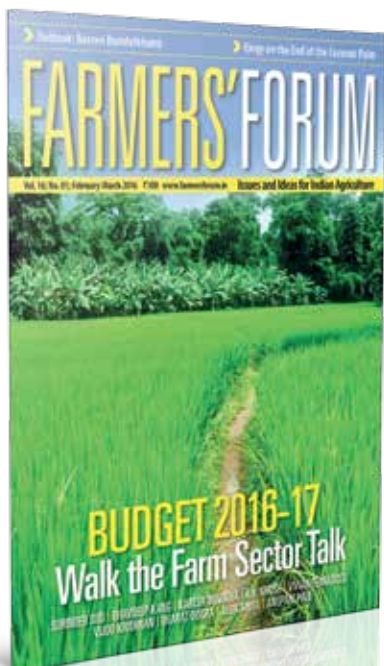
— <http://timesofindia.indiatimes.com/india/Odisha-gets-its-1st-100-solar-powered-village/articleshow/49212485.cms>

power outages are common. Nalco’s T. K. Chand and state government officials chipped in at this juncture with two multi-purpose LED lights for each of the 61 households priced at ₹2,650 and ₹1,750. This would be available through easy instalments from local micro finance groups. Senior government officials were confident that Nalco and other corporates would cover the costs under their CSR budgets.

Niranjan Mahapatra, forester of the Chandaka sanctuary, who is also in charge of Baripitha, sums it up: “The solar lighting project for the tribal people will definitely uplift their lifestyle. While living near the city for last several decades they never had any experience of power. Finally, with this solar venture, their dream has come true”.³ ●

² <http://timesofindia.indiatimes.com/india/Odisha-gets-its-1st-100-solar-powered-village/articleshow/49212485.cms>

³ https://www.telegraphindia.com/1151004/jsp/odisha/story_46068.jsp



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