

> Enterprise: Its Quite the Perfect Day

> Jharkhand's Organic Route for Income Security

FARMERS' FORUM

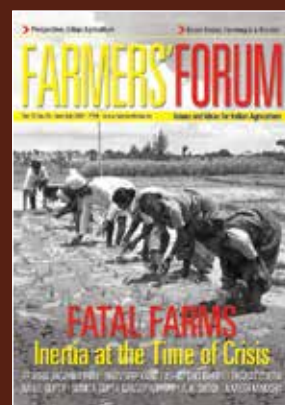
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Issues and Ideas for Indian Agriculture

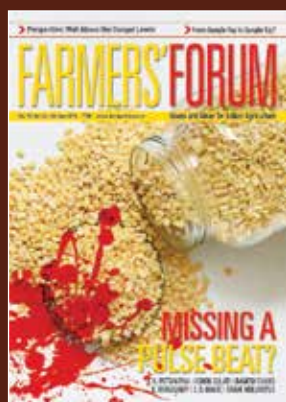
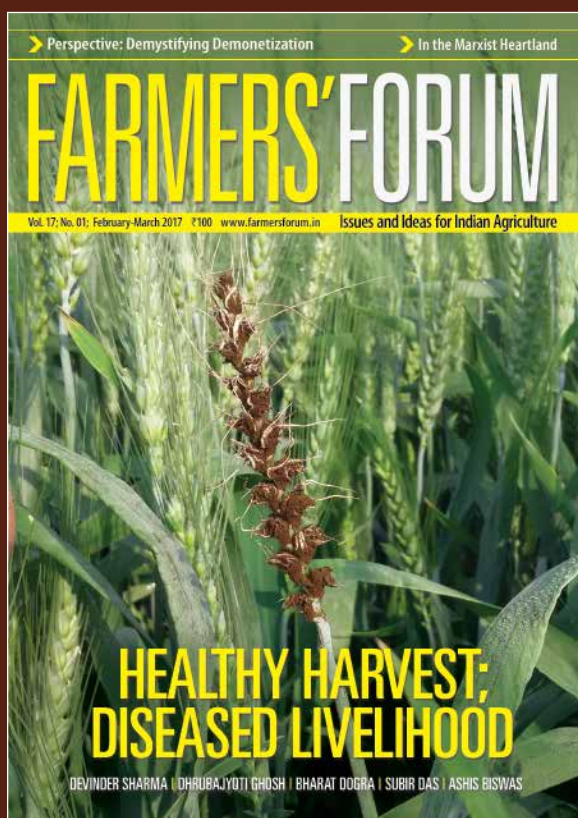
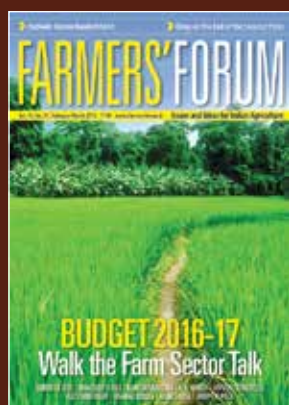


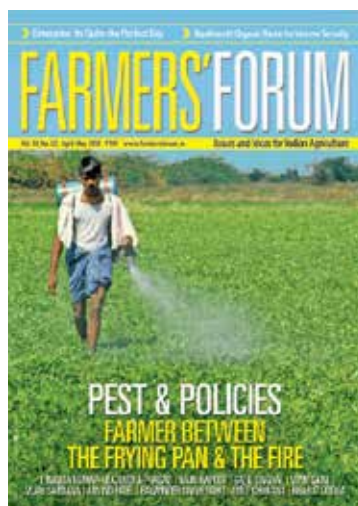
PEST & POLICIES FARMER BETWEEN THE FRYING PAN & THE FIRE

T. NANDA KUMAR | RAJENDRA PRASAD | RAJU KAPOOR | SALIL SINGHAL | VIPIN SAINI
VIJAY SARDANA | ARVIND PATEL | BALWINDER SINGH SIDHU | AMIT KHURANA | BHARAT DOGRA



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Long March; Short Story; No Twist in This Tale

Duped, deceived and deserted; forsaken and forgotten; disgraced, dishonoured, humiliated and discarded; and, yes, depressed; some hopelessly suicidal... These are not synonyms googled for effect. These represent the agony of the farmers across the countryside; their pain and those of their compatriots, whose feelings resonated with farmers trudging all the way from Nasik to Mumbai. The politics of the country had persistently ignored them and it was time that they changed all this. How long would the farmer be bludgeoned into passivity?

The farmers' march was not triggered merely by some unfortunate events of drought-induced low yields aggravated by low farmgate prices or missing MSP; it was not a reaction to any pink bollworm-impacted cotton crop failure or the infamous note bandi; the farmers were not protesting the disrupted cash flow from cow slaughter ban or opposing land acquisition for 'Maharashtra Samruddh Maha Marg'. They were not even complaining about the continuing farmer suicides and the sheer chicanery of the falsified government report that blamed the tormented farmers themselves for their horrific pesticide deaths. This was not an angry march; it was one to signify that they were Indians and had the right to be treated as worthy citizens of a forward-looking country that they were.

One would have thought that the dishonoured farmers would be angry and simmering with hate. Truth to tell, anger was an emotion that had been forsaken years ago; dejection has made them resigned to their fate, as realization dawned that policies formulated in the corridors of Lutyen's Delhi could only aggravate the torture. So it was a silent, even courteous, march but with a deafening quality. India, which came out of its homes to express solidarity, realized that the silence of the heartbroken farmer would only become more deafening with each passing day.

This will owe itself not only to on-farm distress but, in a larger measure, will stem from the hurt of promises betrayed. The heartless government in Mumbai was no better than the communists who chose to give each marching farmer a red party flag affixed to a stick instead of giving each a pair of slippers. For the democracy that India is, it was humiliating that the sight of bruised and bleeding farmers' feet was not enough to move the young Maharashtra Chief Minister from the comfort zone of his chair to meet the farmers halfway.

The strategy was to wait for the momentum to collapse in the scorching heat on the melting tar on the roads to Mumbai. The state had misread again for the resolute farmers did reach Mumbai, only to be duped

INDIA, WHICH CAME OUT OF ITS HOMES TO EXPRESS SOLIDARITY, REALIZED THAT THE SILENCE OF THE FARMER WOULD BECOME MORE DEAFENING



04

PROMISES OF ACHE-DIN, DOUBLING FARMER INCOMES, ₹15 LAKH IN EACH BANK ACCOUNT, CROP INSURANCE, C2+50% PROFIT HAVE TURNED INTO A NIGHTMARE AS THE EMPIRE RENEGED ON POLL ASSURANCES

again. Last year's verbal assurances of farm loan waiver have not materialized and the written assurances of C2+50 per cent and forest rights for forest tribes, given to gullible farmers this time will meet with an identical fate.

Party spokesperson's describing the marching farmers as urban Maoists finds resonance in John Steinbeck being accused of being a communist for writing 'Grapes of Wrath'. Farm loans have not been waived as promised but even a waiver will bring no respite. Loan waivers only remove pressure of unpaid debts; the absence of fresh bank loans is pushing farmers into the vicious grip of moneylenders.

Year 2017 saw a farmers' agitation in Maharashtra that was a precursor not only to the March demonstration of solidarity but also a response to the firing by Madhya Pradesh police on the agitating farmers in Mandsaur. The sands of Shekawati in Rajasthan saw farmers digging themselves into them to prevent a takeover. In Maharashtra and the centre, the NCP and the Congress had been partners in this enormous betrayal of the farmer for 10 long years; farmer suicides went on unabated. While the current chief minister did inherit a grand mess of lost opportunities and failed corrupt programmes, he did little over the three years in power to correct the situation and lost the right to blame the old regime for the quagmire that he finds himself in. Apart from smarter sloganeering and repackaged programmes, nothing has changed on the ground. The farmer has realized that it was not intended to.

The same story reverberates at the centre. After four years in power, the 14-volume document to double farmers income is still work in progress. The voluminous, nearly 2,000 pages, could rival the Mahabharata. The promises of acche-din, doubling farmer incomes, ₹15 lakh in each bank account, crop insurance or the promise of C2+50 per cent profit have all turned into a horrible nightmare as the empire reneged on the election assurances.

Lies, deceit and broken promises have become the hallmark of all political parties; more so for the current regime. Fed up with the confused and much-maligned UPAI II, farmers — in fond expectations that their aspirations would be fulfilled — had voted in overwhelming numbers for what was expected to be



Photo: Pixabay

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05

a strong selfless leadership of Narendra Modi. Alas, the last beads of hope are fast disappearing.

The Bhartiya Kisan Sangh (an RSS affiliate) has, like the Bharat Krishak Samaj, constantly warned the government of the impending storm but to no avail. The establishment has now been woken up from its deep slumber to the fact that its policies have aggravated the misery and distress on the farms and is now trying to promise more from the acche din kitty. It has reacted by promising to purchase crops at announced MSP prices, imposing hefty import duties and such other handouts. With elections approaching, it may be too late in the season to sow a good harvest.

The recent string of setbacks beginning in Gurdaspur, Ajmer and Alwar and the defeat in the by-elections in Madhya Pradesh, the near loss in Gujarat, followed by stunning defeat in Gorakhpur, Phulpur and Araria may be like the 'Ides of March' for emperor Julius Caesar.

Meanwhile, abandoned by a pontificating leadership, farmers have decided whom not to vote for though they are still undecided about who deserves their vote. The Congress is far from spearheading any farmer movement in the nation; it is not in a state of resurrection but ironically is well placed to capture the discontent.

I take solace in the words of Steinbeck who responded to the critics by stating: "I want to put a tag of shame on the greedy bastards who are responsible for this". Let there be no mistake, as someone wiser than us has said: 'hamam men sab nange hain' (all political parties are naked in the bath).•



Ajay Vir Jakhar
Editor

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To the Editor

Of promises forgotten

Sir, — Apropos of your editorial “The Farmer in the Centre; the Devil in the Allocations” (Farmers’ Forum, February-March 2018), you are right that the Prime Minister must now direct his immense power to end the sorry saga of farmer suicides. He must quickly resolve the farm sector crises or be warned about the consequences. The farmers’ march is only a beginning. In any event, the numerous promises of the government need to be taken with a pinch of salt. As you point out, clearly there are questions of feasibility around the government’s assurance to purchase all crops at a promised A2 (actual paid out cost)+50 per cent profit. There is every chance that it will follow in the footsteps of another pre-election promise of C2+50 per cent, which was conveniently forgotten. Forgotten promises are all that the farmer gets in this country.

Suraj Tyagi
New Delhi

Budget blues

Your cover story on Budget 2018 (Farmers’ Forum, February-March 2018) very competently covers many differing viewpoints and enables the reader to understand the fine print in the budget. I am sure you will continue to take up different segments of the farm economy and analyze them with your penetrating gaze.

Rohit Dabral
Sirsa, Haryana

Looking for answers

Debashish Mitra hits the nail on the head when he argues that,



Policies that bomb

The Green Fingers “Hot Potato; Rot Potato” (Farmers’ Forum, February-March 2018) is an interesting read and a revelation. Every time it is the farmer who suffers on account of wrong government policies. It is most disconcerting that in two of the four years of the Modi government, when opportunities arose to double farm incomes, its inflation targeting strategy kicked in and each farmer lost around ₹1,04,000. Can there be a greater shame?

Sachin Singh
Raipur, Chhattisgarh

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Log in to check out all
the earlier issues.**

for all its pro-farmer focus, what comes through clearly in Budget 2018 is the lack of understanding of the issues involved in the agrarian crises and, therefore, bleak chances of finding possible solutions in “A dozen questions; zero answers” (Farmers’ Forum, February-March 2018). Yet, as he suggests, it is indeed possible “for the current crisis to be converted into opportunity for wealth creation for hundreds of millions of small, marginal and tribal farmers with significant and comprehensive multiplier effects on the whole economy”. One wonders why the government — and others before it — is so reluctant to do so for certainly had it wanted to, it could have made a difference.

Raghu Bhambani,
Patna, Bihar

Replace bad policy with good science

A. K. Ghosh once again brings out the frightening effects of the unused nitrogen from the fertilizers that affect surface water and pollute the groundwater in “The Nitrogen Factor: Nightmare in India’s farmlands” (Farmers’ Forum, February-March 2018). It is worrisome to learn that studies in Punjab, Haryana and western Uttar Pradesh — major fertilizer using states — revealed that nitrate (NO₃) concentration extends to dug wells and shallow tube wells. The permissible limit is 50 mg/litre but the results from these areas revealed 99.5 mg/litre, which is nearly double the permissible limit, as he points out. When will good science take over from bad policies in India?

Kamal Mathur,
Kolkata, West Bengal

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**COVER
STORY**

DRAFT PESTICIDE MANAGEMENT BILL 2017 **Making a Pest of Itself?**

A Farmers' Forum Report





In 1962, the American marine biologist, Rachel Carson, wrote the *Silent Spring*, drawing global attention to what could happen if pesticides were used in an indiscriminate manner. Many believe that it was this book that led to the US and other countries banning Dichlorodiphenyltrichloroethane (DDT). "In India, the public sector Hindustan Insecticides continues to manufacture DDT that is still used as an ingredient in pesticides. India had an Insecticides Act in 1968; a Pesticide Management Bill (PMB) in 2008 and now the Draft Pesticide Management Bill, 2017 (DPMB)", said senior economic journalist, Paranjay Guha Thakurta, setting the ball rolling on a discussion on the Draft Pesticide Management Bill 2017", organized by the Bharat Krishak Samaj, publisher of Farmers' Forum, in New Delhi on March 5, 2018, at the India International Centre Annexe.

While whether or not to use pesticide; go in for organic farming exclusively; use pesticides in a regulated manner to ensure higher crop productivity for meeting the country's food security requirements and whether organic farming alone can serve the purpose, are debatable, "there can be no difference of opinion over insisting on zero misuse of pesticides; there can be no case for use of sub-standard, spurious or expired pesticides or herbicides. Yet this scourge exists in India and it causes deaths", Paranjy Guha Thakurta said.

There is also the slow poisoning of the soil that affects the food chain and greater pesticide use has been associated with greater incidence of cancer. "Cancer trains' from Punjab, India's most agriculturally prosperous state, are a scandalous reality. There is a worldwide debate about the use of antibiotics in poultry and dairy farming and the extent to which they contribute to human diseases".

Besides, there are large pesticide makers, which own pesticide brands, operate through marketing agents or outsource their production to smaller manufacturers and there are retailers, some of whom seem to be getting away with unsavoury practices, raising questions about the effectiveness of the law.

Ajay Jakhar, the president of the apolitical Bharat Krishak Samaj (BKS), said that the organization, formed in 1955, seeks to provide a platform for all those wanting to work for farmers' prosperity and is happy with the government for coming up with a Bill that the UPA government had put in cold storage. "We are confident that we will have a Bill that provides for safe pesticides, at reasonable prices, incentivize optimum utilization and full enforcement and regulation", he said.

It is not for the BKS to make recommendations to the government, based on this conference;



Photo: Pixabay

Table 1. Examples of class I pesticides used heavily in India and banned in other countries:

Pesticide	Banned in countries including EU*	Consumption during 2015-16** (Metric tonnes)
Triazophos	40 countries	315
Phosphamidon	49 countries	90
Carbofuran	49 countries	337
Methyl Parathion	59 countries	674
Phorate	37 countries	455

*Source: 'Consolidated list of banned pesticides' by Pesticide Action Network (May 2017);

** Source: Directorate of Plant Protection, Quarantine and Storage

nor comment on whether one wants swadeshi or multinational industry. The BKS only wants a safe pesticides regime so that farmers do not get killed. "We want a regulation that works. Who sells the pesticide does not make a difference as long as I get the best product that the market has to offer".

The Punjab State Farmers' Commission has recommended a ban on the sale of 21 pesticides as a way forward. Several issues rock the pesticide space: the need to change the way agri-inputs are packaged—for barcodes, databases and databanks; the legal and inspection procedures that seem to be in need of an overhaul and others. Consultations around the new bill have raised a lot of issues

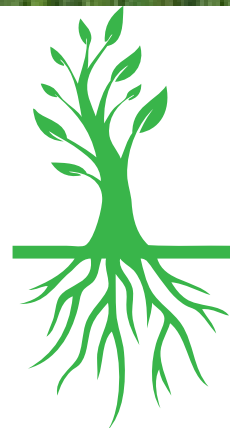


Several issues rock the pesticide space:changing how agri-inputs are packaged — for bar codes, databases and data banks and the legal and inspection procedures

including whether the consultation process has been truly representative.

Farmers' Forum presents a cross-section of opinions from people in the know of things. They include T. Nanda Kumar, former Agriculture Secretary, India; Rajendra Prasad, Joint Secretary, Plant Protection, Ministry of Agriculture & Farmers Welfare; Raju Kapoor, Leader-Corporate Affairs, Dow AgroSciences India Private Limited; Salil

Singhal, Former President, Crop Care Foundation of India; Vipin Saini, Executive Director, Agro-Chem Federation of India; Vijay Sardana, Expert on agricultural trade; Arvind Patel, Secretary, Agro Input Dealers Association; Balwinder Singh Sidhu, Commissioner Agriculture, Punjab and Secretary, Punjab State Farmers' Commission; and Amit Khurana, Programme Manager, Centre for Science and Environment.●



**COVER
STORY**

Determining the Contours of Regulation

T. Nanda Kumar



India needs pesticides to reduce crop losses. It is nobody's case that India can do without pesticides. Most of our rules evolved from the old bureaucratic mindset, largely a control mindset. We have not really moved to a proper regulatory framework. Very often, control is over-emphasised while drafting any legislation and regulation is underplayed. A fundamental characteristic that needs to be considered in any modern legislation is moving away from controls and provide for effective regulation. This calls for more than what is often done — including transparency, science and evidence-based conclusions.

The concerns that people have about pesticides are primarily related to its effectiveness and its impact on the environment. When a farmer buys pesticide, he needs to know if it is effective and sufficient to address the problem. Where does the technical know



T. NANDA KUMAR

Former Agriculture Secretary, India

how come from? Does he rely solely on the local dealer of the pesticide? Relying solely on the dealer is often a dangerous thing and probably part of the problem. Does it cause environmental damage? Does it affect sustainability over the long-term? Indiscriminate use of pesticides often causes long-term damage to sustainable agriculture.

There are also consumer concerns. There are limits on pesticide residues within the country. With the Food Safety and Standards Authority of India (FSSAI) trying to ensure safe food for all, these could become more stringent. India's experience in agricultural exports over the last 30 years has enough examples about pesticide residues becoming barriers to export competitiveness. The questions are: what kind of pesticides should be used; how much to use; what kind of residues do they leave? These are extremely important in terms of the market and the consumer.





India is entering a space where unsafe use of pesticides by workers is going to be a catastrophe. Should pest control be undertaken on a contract basis by professionals?

Next come issues relating to the law. Most people in the manufacturing segment would probably argue that the definitions, process of registration, the data protection arrangement and the inspection processes are all outdated and need to be revised. What is needed is a process that is quick and transparent but one that also addresses the concerns of all other stakeholders, including the consumer and farmer in particular.

How much inspection is needed is also a debatable issue. India took a conscious decision long ago to move away from an inspector raj to a more self-regulated, consumer-interest oriented responsible code of business ethics. Will having too many inspectors, samples and prescriptions and procedures be counterproductive or will it get us results? If inspections are reduced, where will accountability be factored in? Is the industry willing to have a voluntary compliance as an industry body and be accountable and answerable to consumers and farmers? More often than not, industry shies away from answering this question.

Another issue that is probably beyond the control of industry and in the realm of administration is misbranding, spurious, selling beyond expiry date type of issues that call for much better control and inspection processes. How effective is the

regulatory mechanism at the field level, particularly in the districts?

Another serious issue is the safety of workers who apply these pesticides. Is there a protocol recommended by the manufacturers or one practiced or recommended by the agriculture department. We cannot allow unsafe use of pesticides by workers and be mute spectator to an impending catastrophe. Should there be a move towards pest control being undertaken on a contract basis by professionally trained people and industry made accountable for the results?

The big question is who compensates the farmer buys pesticides, based on official recommendations, which, on application, results in a loss of a part or the whole crop. Who will compensate him? In what form will the compensation be? Will it be an insurance delivered compensation from the Prime Minister's agricultural insurance scheme? Will there be a liability clause that will determine the loss and provide the compensation either through insurance, from the supplier/manufacturer or any other mechanism? The farmer is concerned about the compensation reaching him in time and in the quantum.

Finally, is there a need to rewrite the current Pesticide Management Bill or should it be enough to amend the existing Act? •

Making Pesticide Use Safe

Rajendra Prasad

The Pesticide Management Bill was drafted in 2008 and introduced in the Rajya Sabha later. It was then referred to committees. In 2017, it was sent to the legislative department that advised that the Bill be redrafted. This was followed by a stakeholder consultation on January 11, 2018 with all stakeholders and the comments have been posted on the ministry's website along with the Bill. Comments have been received from different ministries, state governments and different associations. The ministry will also take on board inputs from this discussion. The process will be completely transparent.

The objective of the Bill is safe use of pesticides because use of pesticides cannot be obviated, as they are very important for improving productivity. How can they be best used to improve productivity and reduce crop losses? There is need to consider all points of views — from industry, farmers and consumers — before the Bill is finalized over the next few months.

There are misconceptions about the Bill in various quarters; that is anti or pro someone. This is not true and one needs to consider the overall context. Nor is it true, as some reports



RAJENDRA PRASAD
Joint Secretary,
Plant Protection,
Ministry of
Agriculture &
Farmers Welfare



suggest, that the consultations were not representative or not wide enough. A consultative meeting was held and it was appreciated that the registration process had to be quick and transparent; inspections should be done away or reduced to the extent possible.

Q1. Journalist with Mint: Can you clarify the compensation clause in the Bill saying that the farmer or one affected by misuse has to go to the consumer forum? Is this how the Bill will try compensate farmers or are there other provisions for liability?

Q2. SHALINI BHUTANI (lawyer): What is the treatment of intellectual property rights (IPR) vis-à-vis agri chemicals and pesticides in the Bill, particularly because the 2008 version had a controversial provision on data exclusivity? The current Bill is silent on that aspect through there are a lot of pressures such as WTO or TRIPS plus pressures on India's free trade agreements and regional treaties. What is the thinking of the ministry on data exclusivity with regard to pesticides? Also, is the Ministry of Agriculture mindful

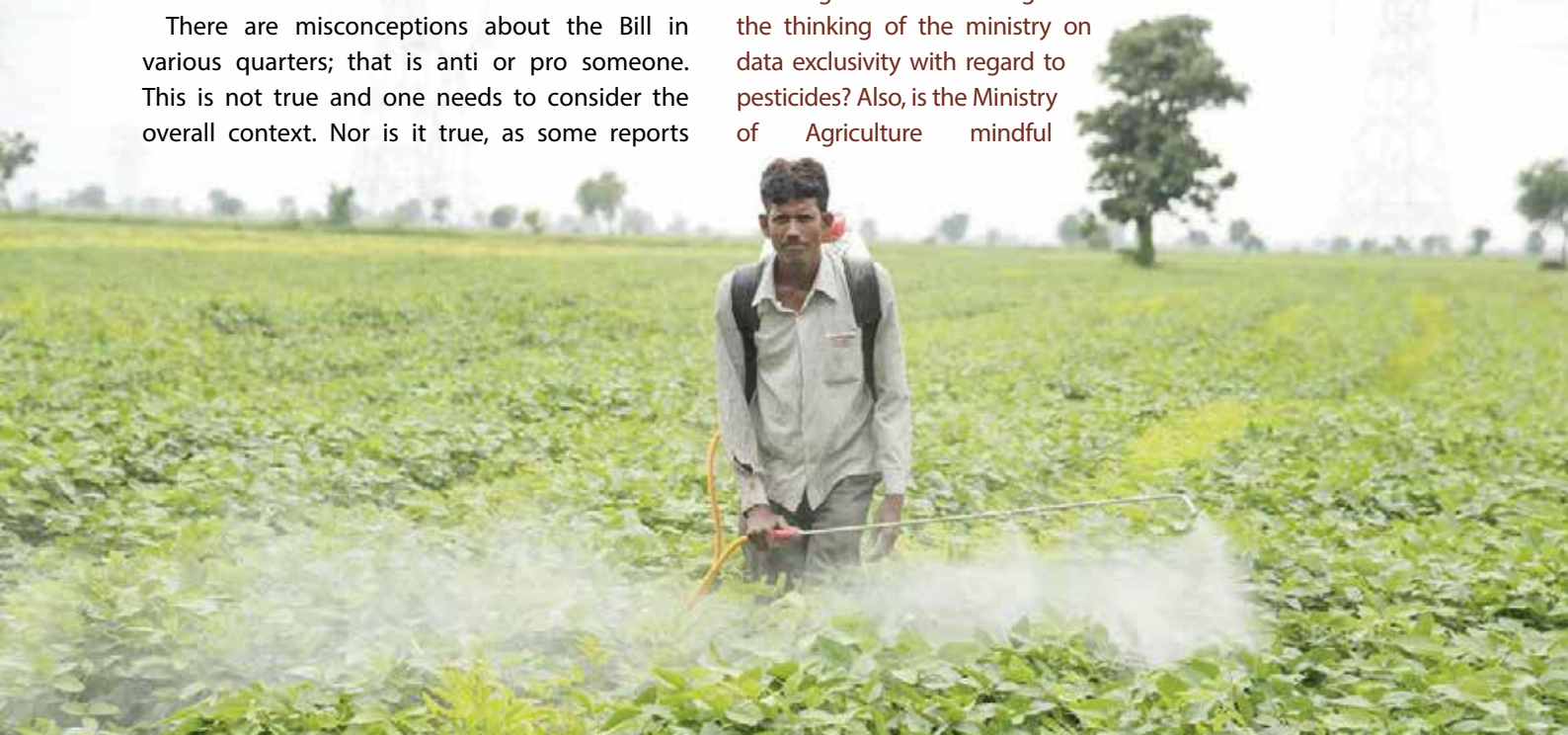






Photo: Pixabay

Section 26 gives inspectors more power than even police or IPS officers; they can enter houses or factories or premises without any permission at any time

of the Competition Commission of India's (CCI) investigations on the Bayer-Monsanto merger that is going to change the landscape of the pesticide industry as well? One hopes that there will be representations from the Ministry of Agriculture on actual corporate behaviour and on pesticides in the CCI investigation as well.

Q3. SALIL SINGHAL: Before redrafting the Bill to replace the Insecticides Act, were the aims and objectives of the proposed new law clearly articulated?

RAJENDRA PRASAD: The Act and the proposed Bill were compared at the January 11 consultative meet and the clauses left out earlier will be addressed through this Bill. Each and every clause was explained, I made a presentation and the objectives have been clearly mentioned.

Q4. VIJAY SARDANA: There are two points in every law that concern citizens or stakeholders: one is the lack of transparency and excess power that leads to corruption. This Bill has no provision to improve transparency and check corruption by people to whom power is given. What are the changes that have been brought in to ensure transparency at every step, starting from registration, testing, sampling and other procedures? Section 26 gives inspectors more power than even police or IPS officers; they can enter houses or factories or premises without any permission at any time. This can lead to massive extortion and corruption. What are the checks and balances that will be brought in the Bill?

RAJENDRA PRASAD: These two things will be taken care of while finalizing the draft. Please give your suggestions on the Act on wording or provisions. The Bill is in the interest of farmers and no misconceptions should be spread about it. ●



Problems with the Regulatory Regime

Raju Kapoor

Crops being damaged by pests during and after cultivation is a major issue because resultant losses have been estimated at around ₹200,000 crore per annum. This figure is probably conservative, especially since recent Indian Council for Agricultural Research (ICAR) data says that losses due to weeds alone is over ₹85,000 crore.

Essentially, farmers lose their entire initial investment and the resultant income that should have accrued to them because of pests. Farmers gain significantly by using crop protection. The damage is more pronounced keeping in mind that most of the Indian farmers are caught up in a



RAJU KAPOOR
Leader-Corporate
Affairs, Dow
AgroSciences India
Private Limited

low-yield, low-income cycle, across crops. The worst part is that India probably has one of the lowest crop protection coverage in the world, with very low pesticide usage of only 450 grams per hectare, compared with advanced countries like the USA (8-10 kg per hectare) or South Korea (14 kg per hectare). India's low protection coverage is a big risk to the farmer's investment and income. The farmer spends upfront on cultivation, tilling of land, seeds, fertilizers and irrigation and if, after this, the crop is destroyed, the farmer loses everything. The ₹200,000 crore figure does not include the farmer's loss of his investment in the crop cultivation that is lost to pests.



Any regulation in crop protection must address the user's (farmer's) safety apart from that of the environment and the food chain. This is the essence of regulation but one has to be wary about over-regulation, which ultimately leads to complications and corruption. Through regulations, India must aim for a win-win for the government, the farmers and the food consumers. However, the approval process must have a thorough screening for safety and efficacy of the products along with appraisals for their safety and efficacy. In India there is enough scope to make regulation farmer and industry-friendly while protecting the environment.

There is also the stewardship issue that pertains to judicious use of pesticides and relates to quality, quantum and method of use. It takes about

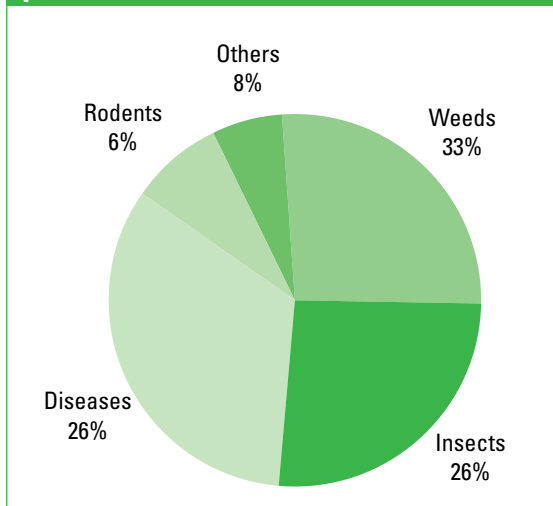
\$286 million and around 15 years to bring one pesticide molecule to the farmers and responsible manufacturers follow a responsibility curve from the stage of innovation to the stage of disposal. From cradle to grave the product life-cycle is ethically managed. That is responsible use of pesticides.

What comes to the farmer is only after significant rigour and a huge investment and, if the pesticides are used as per the approved labels, there is no doubt around their utility and benefit to the farmers. They have been tested by a number of scientific regulators.

Contrary to the belief that the food chain is polluted, ICAR data says that just 2.1 per cent of the total food samples deviated from the stipulated standards out of 140,000 sample across the country



Figure 1. Losses caused by different pests (%)



Source: Industry Reports, Analysis by Tata Strategic.

Crop	Avoidable Crop Loss (%)	Cost : Benefit Ratio
Cotton	49 – 90	1:7
Rice	21 – 51	1:7
Mustard	35 – 75	1:12
Groundnut	29 – 42	1:26
Maize	20 – 25	1:3
Sugarcane	8 – 23	1:13
Pulse	40 – 88	1:4

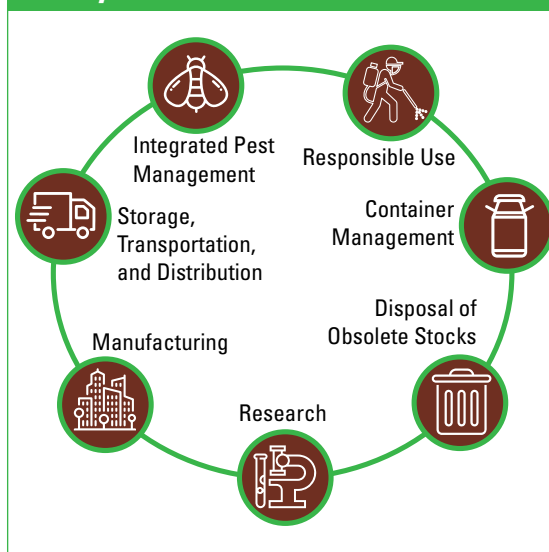
Source: IARI – Pesticides – A Critical input for increasing crop yield





Photo: Pixabay

Figure 2. Agricultural Chemical Product Life Cycle



Ideally, 12 months should be enough for a registration but it takes 3-6 years for registering a molecule. Introduction of new chemistry and new molecule thus becomes time-consuming

and across crops. Astounding as it is, India seems to be performing much better than other countries. The EU is at five per cent against India's 2.1 per cent. This despite the fact that the EU is recognized as the region with maximum 'pesticide-related activism'.

In terms of the draft Pesticides Management Bill, the definitions have to be unambiguous and clear. For example, when it says 'control pest', the definition of the word pest must be very clear. One objective of the Act seems to be safe and judicious use of pesticides but this has been missed totally in the text. Clauses like 'restrict' and 'prohibit' show a control mentality and one would advocate the use of the word 'regulate'.

Similarly, the term 'active ingredient' has to be defined properly. 'Animals' referred to need to be listed more clearly in terms of the safety aspect and be determined by the registration committee that must have experts from all relevant ministries including; health and environment. It needs to





Table 1. Indian Food Chain are Safer than the Public Perception...

Monitoring Results (All Food Commodities)

Year	Samples Analysed for Pesticide Residues	Samples found above MRL
2008-09	13348	212
2009-10	14225	155
2010-11	15321	188
2011-12	16948	303
2012-13	16494	436
2013-14	16790	509
2014-15	20618	543
2015-16	22103	523
Total	1,35,847	2869 (2.1%)

Monitoring of Pesticide Residues at National Level Annual Progress Report (April, 2014 - March, 2015) Department of Agriculture, Cooperation & Farmers Welfare Ministry of Agriculture & Farmers Welfare Krishi Bhawan, New Delhi Project Coordinating Cell All India Network Project on Pesticide Residues Indian Agricultural Research Institute New Delhi - 110 012

name the animals needing protection and how they can be protected.

Similarly, a 'batch' has to be defined; it can mean the whole production, across products, it can mean anything. The word 'environment' too must be judiciously used and clearly defined. Such words can cause major problems during interpretation. The essence of the problem today is not with the existing pesticide Bill but with the way in which it is being interpreted by various states during implemented.

What do the words 'premises' or 'vehicle' mean? Does this mean every vehicle carrying pesticide must have a pesticide licence and will the state give the licence? What does sale mean? Does that include attempt to sell or provide services? The industry works with farmers to understand what they do, carries out a lot of extension work and field level demonstrations. All of this can be interpreted as attempts to sell and the company can be prosecuted. There is thus need to be mindful about these terms.

The word 'sub-standard' also represents a conflict between definitions of sub-standard, spurious and misbranded. While, misbranding is when one has not followed protocols in writing or instructions. If the permitted tolerance limit of analysis is fixed at five per cent, the product does not become sub-standard if it is within this range. The draft bill projects this as 'sub-standard'. Staying within the tolerance limits is not failing.

The industry works with farmers to understand them; does a lot of extension work and field level demonstrations. This can be interpreted as attempts to sell and the company can be prosecuted

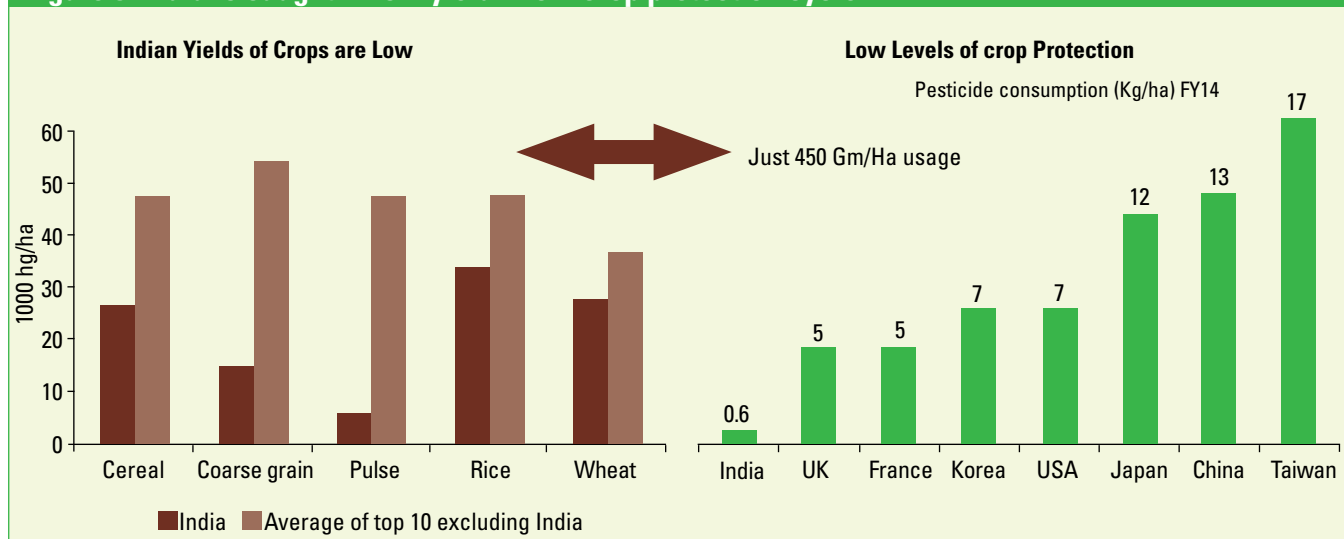
Table 2. Our Food Chains Compare Better than Developed Countries

Country	Year	Samples analysed for Residues	Samples tested With Pesticides Detection	Samples Found Above MRL
India	2008-2015	60,432	9,388 (15.5%)	1460 (2.4%)
USA	2008-2013	6,142	2,742 (44.6%)	137 (2.2%)
UK	2008-2014	11,738	7,088 (60.4%)	394 (3.4%)
EU	2011-2013	54,208	20,255 (36.4%)	2714 (5.0%)

Ref : Monitoring of Pesticide Residues at National Level Annual Progress Report (April, 2014 - March, 2015) Department of Agriculture, Cooperation & Farmers Welfare Ministry of Agriculture & Farmers Welfare Krishi Bhawan, New Delhi Project Coordinating Cell All India Network Project on Pesticide Residues Indian Agricultural Research Institute New Delhi - 110 012



Figure 3. India is caught in low yield – low crop protection cycle...



The word 'spurious' should also be clarified. Does it apply when one is using another's product identity and product formulation or trying to act as one? It can be used when someone is trying to sell a 'counterfeit' or sub-standard product against another's standard product or has packaging very similar to another's, as happens frequently. Bio products laced with pesticides also fall in the spurious category.

The 'board' needs to have an eminent agricultural scientist heading it to obviate issues arising from a lack of clear understanding at the top. This will reduce problems down the line. An industry association representative should also be present in order to enhance knowledge at the Central Pesticides Board (CPB) level. A lot of academic and scientific discussion takes place without understanding what happens on the ground. Besides, there is a shortage of competent technical manpower.

Though the existing act provides for a 12-month period to grant a registration, today it takes 3-6 years for registering one molecule. Introduction of new chemistry and new molecule for the farmer thus becomes time-consuming and it would help if full-time and accomplished people man the appraisal process at the Central Pesticides Board and Registration Committee. The term 'safer alternatives' too needs to be defined because it is open to misuse.

The performance of regulators and implementers must be transparent and measured on a fixed frequency to enhance the regulation. Similarly, the bio-efficacy performance of any pesticide is scrutinized through regulatory trials conducted on them at the testing institutions such as agricultural



universities, before they are accorded registration. That having been established, the onus of proving the field performance and settling the compensation claim for non-performance must not be made on the industry.

While, for purposes of 'ease of business', state licences were given perpetuity (meaning no repeated renewals), the draft bill again seeks fixed renewal of such licence after a period of time and this is undesirable.

While regulations are welcome, they must be science based, implementable and consistent. They must facilitate innovations and ease of supporting farmers. Along with industry, the regulators must also be held accountable for their performance since they support farmers welfare together. •

**COVER
STORY**

PMB 2017 Needs a Recast

Salil Singhal



Is the Pesticide Management Bill, 2017 (PMB) about control or regulation? Does it support environmentally-friendly sustainable products? How does it work for ensuring effectiveness and proper use of knowhow? I asked the Joint Secretary when they drafted the Bill if they had clear aims and objectives and I was told that this was presented on January 11 at the stakeholders' meeting.



SALIL SINGHAL
Former President,
Crop Care
Foundation of India

The document raises seven challenges that need to be addressed by the Bill, the first of which is improving the quality of pesticides. I do not see anything in the draft that addresses the issue. The PMB remains like the Insecticides Act; it is old wine in a new bottle but one that has become a little rancid and stale.

Also, the registration committee is not aware of how many registration certificates it has issued since 1972. So, what and whom are we regulating? States issue the registration certificate, their manufacturing licence. The central government has no database of this at all. Where is the baseline

minutes of the registration committee on the website. Interestingly, in the last 10 meetings of the committee, this very firm has got another 117 registrations.

What quality management and improvement is one looking at with such a porous registration process? Are these issues addressed in the PMB? Quality management on the field is equally important but nothing has changed vis-à-vis this in the PMB. How is the sampling

done? In 2006-07 an RTI question on sampling extracted information that in Andhra Pradesh, no samples were drawn from 103 companies and 793 were drawn from one company. Another company had 692 samples drawn. In Haryana, no samples were drawn from 100 companies whereas 59 samples came from a single company and 47 from another company.

Will this situation be changed after the PMB? It will become more vicious. The inspectors have a quota to fulfil and have an arrangement with the distributors. They know who is selling spurious material and

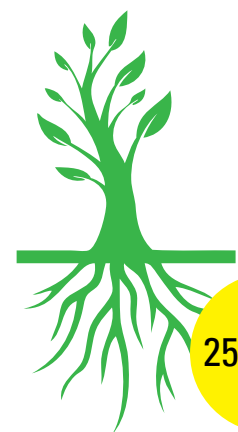
What and who are we regulating? States issue the registration certificate; their manufacturing licence. The central government has no database of this at all

from which quality is to be improved?

Today my sample failure is 10 per cent and I want to improve it to two per cent or zero defect and this needs a database. How many samples were drawn, how many were analysed and how many failed? This has not been done. There is no baseline to work on what improvements will be worked on? What objectives and challenges need to be addressed? One does not know and no one can run a business on this basis.

Consider how registrations are granted; it is easier to get registrations than buying an airline ticket online. One can check this on the website. A group of companies under two different names has obtained 784 registrations in one day, including 35 for technicals and exports only. The factory was raided by the registration committee in 2016 and they found that the entire factory was on less than an acre of land. There were three sheds; clothes hanging in one, a few instruments in another; and the third factory was lost.

The owner was issued a show cause notice in June 2016 but nothing further as is reflected in the



25



will never pick up their samples. They will pick up samples from good or responsible companies. In fact, laboratories call manufacturers saying their samples have been received and ask what do they want done. The condition of the laboratories is abysmal. The instruments do not work, the reagents are out of order, there is no trained manpower, no hygiene nor proper storing of samples.

The government of India has appointed Padma Bhushan Dr Padmanabhan Balaram as head of a committee comprising top scientists of India to see the entire registration process and the challenges and issues with regard to the Insecticides Act. He interacted with industry members on February 19 and said: we visited the central insecticide laboratory that is the referral laboratory. If a sample fails in the state laboratory, one needs to go the central laboratory to certify whether the state laboratory is wrong or right. He noted that the condition at the central facility was awful and he was ashamed of it.

Going back to the RTI data, in Uttar Pradesh, the sample failure by the state laboratory was 16.86 per cent, in Haryana it was 8.17 per cent, in Maharashtra it was 6.78 per cent, in Gujarat it was only 4.55 per cent. What can one make of this

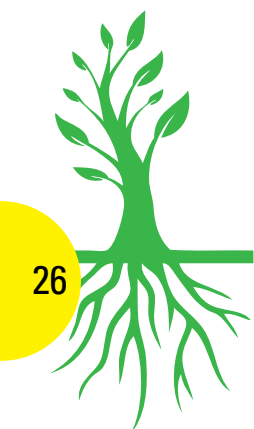
range? Does one believe that industry manufactures different quality products for different states or that there something seriously wrong in the way such analytical activities are conducted? Does the PMB address this challenge? Does it help in improving the quality of pesticides?

There is nothing in the law that does that. Time-bound discharge of regulatory responsibility is contained in the Insecticide Act but never followed. What is the point of inserting something into the law that will never be obeyed? The problem is of administrative commitment, proper organizational setup and accountability. This has not been built in the law. Creation of sufficient deterrence is the third challenge facing preemption of law violation.

The PMB makes the punishment oppressive rather than deterrent. It will only enhance the level of corruption even while being draconian, repressive and extreme. Given the laboratory conditions and that anyone can copy another manufacturer's label and the other manufacturer can be held liable, there cannot be fairness under the PMB as it stands.

There should be innovative thinking and a return to civil penalties? Reportedly, Amazon was fined

The higher the punishment, the greater the bargaining power of the inspector and the laboratory personnel. A serious issue can be handled by the IPC or CrPC



\$1.2 million dollars in settlement for supplying unregistered pesticides through its platform. Some 4,000 offences were noted between 2013 and 2017. In addition to the fine, it was directed to train retailers on what pesticides could be sold online. Can India not think of innovations instead of continuing with the penal provisions where litigations continue without end?

The higher the punishment, the greater the bargaining power of the inspector and the laboratory personnel. When something serious happens, the Indian Penal Code (IPC) or Code of Criminal Procedure (CrPC) should handle it. There is no need for an additional criminal law that can only increase corruption. This goes against the government's call for ease of business and to have a corruption free India.

Farmer participation in the regulatory policy mechanism too is not very clear. Farmer representation on the registration committee



Photo: Pixabay

makes for good optics but the right objective would be to ensure consultations to ascertain how the law is performing and evaluating it on an annual basis. The accountability towards environmental and public health issues should also be in the registration committee's domain; it must decide whether the product is environmentally sustainable; that it will not cause problems for public health; and will be safe and efficacious. Where is this accountability built in the PMB sections?

Industry is being made the flogging horse. The wording in the Act is loose and may be subjectively interpreted. Words like 'rent seeking' or 'safer alternatives', for example. What is meant by safer? Safer in dose, toxicology or in application or timing? 'Expected performance' of a dosage has been specified, the timing, pest has been identified, how much will be sprayed, how much water has to be added are all provided. How does one say the product does not meet expected performance? How will this be determined? 'Adverse impact', 'necessary and sufficient', 'ineffective on a certain crop' are all loosely worded cannon balls inserted in the PMB to flog industry and bid to throw the industry to the inspector raj mafia.

Yet farmers do not get any respite. The central government has been given power to cancel registrations but there are no provisions on the right to be heard or get reasons in writing.

Finally, on 'encouragement of registration of new and safe pesticides', Dr Balaram said that only 280 molecules are registered and most of them are toxic molecules. As an industry veteran for 50 years, one can say that the Indian registration process ensures that no safer or better molecules can come into India. Pakistan and Vietnam have 500 registrations, even the United States has 700 molecules but India is stuck at 280. This is because data protection is a highly controversial and a political issue and it is argued that prices will go up and local industry will suffer.

The government should consider the registration process from the angle of agriculture and the farmer and not the industry. In the last 5-7 years, the entire regulatory regime has been driven by certain sections of Indian industry and not from the perspective of Indian agriculture or the farmer or for safer and better products. The Act needs to be put aside for now and some rethinking should ensue on what is to be achieved. •

One Loophole Too Many

Vipin Saini

Fifty years have passed since the Pesticides Act was passed in Parliament on September 2, 1968 and several years passed before the Act was enacted and made operational by framing of Insecticide Rules. The Act came into being in 1972 preceded by cases of pesticide poisoning and of pesticides being mixed with foodgrain in the 1950s and 1960s. Therefore, the JC Shah Commission recommended that a law be framed to regulate the storage, transport and use of pesticides. The Insecticide Act came first, followed by the PMB that was initially proposed in 2008.

Why was the PMB or the new proposals needed when the drafts of both 2008 and 2017 failed to meet the expectation of actually bringing about a new legislation? The Insecticides Act had nine chapters and the PMB has only eight. Where is the difference?

Pesticides need to properly packaged, labelled and understood and the message needs to go out clearly. This was part of Chapter 5 of the Pesticides



VIPIN SAINI
Executive Director,
Agro-Chem
Federation of India

Act that appears to be totally missing from the PMB. There are ad hoc reports from FAO regarding packaging and labelling in Punjab. The Insecticide Act was actually amended. The definition of pesticide was to be widened.

The agro-chemical industry is categorized as an 'orange' or highly hazardous industry with environmental and health concerns. However, the Drugs and Cosmetics Act has some good manufacturing practices. Why are there no good manufacturing practices in the pesticide industry?

There is a need to curb spurious, sub-standard and counterfeit material that the PMB has failed to do. Good laboratory practices need to be adopted. Toxicology and chemical data generation must be done by good accredited laboratories. The 46th Parliamentary standing committee on agriculture recommends that data protection should be included. The Mrs Satwant Reddy report on TRIPS and data protection strongly recommends 3-5 year



Photo: Wikimedia



of a balance between civil and criminal penal codes. Just putting a person in jail will not solve problems. Financial restrictions can also be put in place along with other measures. Labels need to contain certain information like MRP and manufacturing date but this is also regulated under the Metrology Act.

As far as enforcement is concerned, there is a shortage of inspectors to collect samples. Also, the act does not distinguish between agriculture and horticulture. Horticulture is a concern in both the global and domestic markets, as far as human consumption and global market

The PMB and the Insecticide Act talk of agriculture inspectors but no horticulture inspectors. Seed, pesticide and fertilizer inspectors can be rolled into one to achieve more

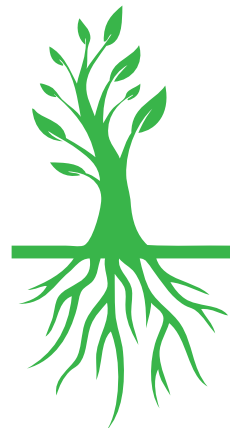
data protection but this is missing from the PMB.

The government is unable to understand the difference between patent and data protection. Patents are applied for once a molecule is identified and granted for 20 years. During the 20 years a lot of data is gathered to prove the efficiency of the product but this is basically on the toxicology and the chemistry aspects. The efficacy and the type of formulation varies from country to country and maybe region to region. The importance of data protection should be recognized and it should be there for at least five years.

Responsibility and accountability are other issues. There is need to stop passing the buck and looking for better co-ordination between state and central government. Cross legislation must be taken into account. The National Environment Policy 2006 talks

potential is concerned. The two could be clubbed together. The PMB and the Insecticide Act talk of agriculture inspectors but there is no talk of horticulture inspectors. Again, seed, pesticide and fertilizer inspectors can be rolled in one together and, possibly, much more can be addressed.

The chemicals ministry is working on a national chemicals inventory and the government could consider a national pesticide inventory within the Bill. This is not about being pro-multinational or anti-Indian. Indian companies too have grown today and have registered some combination molecules in the country. India needs new molecules and if the future lies in combining patented and non-patented molecules, we stand united on the issue with a holistic, inter-ministerial, inter-legislative approach in the PMB. ●



**COVER
STORY**

Nothing Progressive About PMB

Vijay Sardana





Photo: Wikimedia

The PMB is not in the interests of many stakeholders; its language indicates that it is designed to seek power and authority over other stakeholders. The concepts of facilitation, accountability, transparency and service are missing from the PMB and its tone is of a power seeker without accountability and is replete with loopholes.



VIJAY SARDANA
Expert on
agricultural trade

If it becomes a law in its present form, the first casualty will be an investment in India and the only thing that will grow is harassment and corruption. This will not be good for India. Having read the pesticides bills of Japan, USA, Europe, Australia, Brazil and other countries, one is struck by the illogical drafting of the PMB; a classic case how not to draft a bill. Those who drafted this bill would have benefitted from reading and researching laws in other countries.

Any bill or law passed has to be reported back to the WTO as a part of WTO commitments. India is no longer in a closed economy and every bill is circulated to countries for their comments. Those happiest will be India's competitors in the world market and it would seem that the drafting committee of has been induced by its rivals to kill the investment and exports in India's agro-chemicals sector.

If this is the reflection of India's intellectual capability and drafting skill with regard to an important bill, the message is clear: India cannot be a place to invest in; that the country will not allow investors to flourish as an industry and it will remain corrupt. The mindset of those approving this bill and placing it on the website is obvious. There is no desire to improve investment, quality, accountability, transparency, timeliness, exports or knowledge-sharing. Instead, it is committed to seeking control and power over the industry to ensure corruption and harassment continues.

An Indian law is designed for the territory of India and exportable products designed for markets outside India. A department that is unable to control spurious products in local markets with farmers suffering because of sub-standard products is illogically keen to decide what is good for exports, which is beyond its jurisdiction. One fails to understand the motive behind this approach. No domestic law in the world controls exports, which are controlled by the laws of the destination country, which determine whether

the product is suitable or not. How can an Indian authority decide that a certain chemical is sub-standard for buying a country?

The language of the bill says it wants to regulate exports. On the other hand, the Prime Minister says, India should focus on export promotion and minimize barriers with departments acting as facilitators. The PMB is willing to nullify the efforts of the Prime Minister. It is full of gaps and offers huge scope for corruption and harassment to industry.

Without clarity on many terms used in the proposed law (See box), interpretation will become a point of conflict along with corruption and, in worst cases, it will lead to a substantial litigation. Why did the drafting committee deliberately avoid this and leave such loopholes? Without clarity on these terms, there cannot be enforcement and no persecution. History teaches that all such disputes lead to corruption and harassment and the new law will make the situation more complex and worse.

The law is totally silent on the role of extension departments and universities on the methods of application of agro-chemicals in any form. Farmers are allegedly dying because of inhalation of pesticide but there are no guidelines for good fumigation and sparing practices.

Next, consider the composition of the Central Pesticide Board with 41 members but not one manufacturer, exporter, importer, trade warehouse or road transport representative. There are representatives from railways and shipping industry but none from consumers; it has no expert on toxicology, packaging or manufacturers of machines for spraying or application. These 41 members are not in trade, manufacturing or in development and

are, technically, not from this business but will decide how the business will be done. However, none of them are included in the registration committee.

Section 11 of the PMB states that the opinion of the committee will prevail. How this opinion will be reached is not clear. This process must be specified in the Act, not in the rules, so that no officer can change it at will. There is no mention of transparency and accountability at the decision-making bodies within the department.

As far as issuance, suspension and cancellation of registration are concerned, the use of digital technology like GPS and photography should be made compulsory to check spurious suppliers and corruption. There is no interest in using technology in registration. There are a host of issues relating to appeal on suspension and maintenance of records and quality of pesticides. There are no clauses that make inspectors accountable for approving bad or unfit factory.

There is also the question of why the laboratories used by the department are not National Accreditation Board for Testing and Calibration Laboratories (NABL) certified? The law must specify that no laboratory without NABL certification is authorized to test pesticides for regulatory purpose. This is a classic case where the incompetent system will decide the fate of another person.

Under Section 26, India's pesticide inspector has more powers than any other authority in the country and can walk into bedrooms if people are suspected of storing pesticide without prior permission. Not even IPS officers can do this. No security agency can perform a search operation without permission from the magistrate but an inspector can walk into one's bedrooms based on mere suspicion? Is this a dictator raj? No inspection should be allowed without following proper rules under various regulatory systems in India.

Under Section 26, India's pesticide inspector has more powers than any other authority in the country. He can walk into bedrooms if people are suspected of storing pesticide without prior permission





Undefined terms under the PMB

Active ingredient, Batch, Best before/expiry date, Biological control, Bio-pesticide, Chemical control, Multiple use chemicals examples Boric acid, etc. Dual use technology, Emulsion, Encapsulation, Entry Points, Flowable concentrate, Formulation, Formulator, Fumigation, Fungicide, Generic chemicals, Good Agriculture Practices, Grant of license, Granules, Export, Herbicide, Home use pesticide, Imported pesticide, Label, Larvicide, Maximum Residue Limit, Methods of application, Minor Crops, Misleading advertisement, Nematicide, Nominal value, Off-patent products, Packer, Packing, Patented Chemicals, Performance claim, Pest, Physical control, Post-harvest management, Premises, Product Concentration, Prohibited products and applications, Purity, Quality, Quarantine, Reporting Method, Restricted Pesticide, Rodenticide, Safe pesticide, Sale, Sampling methods, Shelf-life, Spray methods, Stock position, Storage, Testing methods, Tolerance limit, Toxicity, Pesticide Trader, Traps, Vector, Vector control, Warehouse, Wettable Powder/ Granules, International conventions, etc.

In legal terms, the definitions and interpretation may vary from the trade language that is why these definitions need clarity under the law.

The law does not talk about mandatory manufacturing in India to promote Make in India. There is no interest in bringing things into public domain beginning with documentation of minutes of the board or decision-making committees. There are no specified timelines in the law to ensure response on the applications by industry.

In terms of the penalty clause, there are many penal provisions but the law is silent on action to be taken if the inspector asks for a bribe. There is no system to make inspectors and officers accountable. There is always a threat of harassment and corruption. The silence of the proposed law on the provisions to check these two major reasons responsible for eroding trust dents its credibility and makes it look like a piece of legislation designed by and for the inspectors, with no accountability and transparency.

It would have been wise to adopt suitable provisions from the laws of other countries keeping in mind Indian conditions, to promote investment/ Make in India and making products affordable for Indian farmers. Undoubtedly, there will be many pulls and pressures but the law must keep the Indian farmer in focus and address the other concerns.

India needs a sensible, progressive law that ensures transparency and accountability with timelines for decision makers and zero tolerance for corruption. This will go a long way in making India a major hub for new agriculture technologies for both domestic as well as international markets. •





Dealers Get an Unfair Deal

Arvind Patel



The PMB is ultimately going to get stuck at the dealer level, which is where all agriculture-related initiatives get stuck. People who do business honestly, as per government norms, will have a hard time with the Bill.

While the Bill rightly talks of educational qualifications – and dealers must be qualified – this will work for new dealers for future licences. What is to become of the current 800,000 dealers, not more than 8-10 per cent of whom have a B.Sc. degree or a diploma that the Bill requires? If the requirement is changed



ARVIND PATEL
Secretary, Agro
Input Dealers
Association

overnight there will be a problem on the ground for there are dealers without the stipulated qualifications at the tehsil, village and district levels.

The entire farming business is based on the relationship with the dealer. If the farmer requires loans for pesticides or fertilizers, it is the dealer who provides the loan on time. The system will collapse and the industry will be destroyed, if this clause is passed. Old

dealers should be given three to four months to do an approved crash course and get updated with new learning and technology. Only those people

who complete the course should be granted a licence.

Licence suspension/cancellation is an issue that concerns both producers and farmers. Of course, everyone must follow the rules pertaining to pesticide, fertilizer and seeds; even small businesses with little turnover as must dealers with turnovers in the ₹25-₹40 lakh range. However, it must be borne in mind that dealers receive packed goods and sell them with the GST bill and the

principal's certificate. They sell only government approved goods.

How can dealers be held responsible if they receive sub-standard packed material? If a cosmetic does not suit a skin, is the seller to be blamed or be held responsible? The manufacturer should be held responsible and the dealer category should be removed from the cancellation clause. Currently, the dealer is penalized for someone else's fault. Dealers are small businessmen without the facility to conduct tests on material. The manufacturers should be liable because they have knowledge about product quality, apart from the government.

How the farmer uses the product is also beyond the dealers' control. Under or over use, climatic factors, time of spraying — if they spray today and it rains tomorrow, the molecule is destroyed — cannot be the dealers' responsibility. The dealer cannot monitor every farmer but only inform the farmer visiting the shop about the do's and don'ts. It is for the farmer to choose to follow the instructions.

On the matter of compensation, the dealers stand with the manufacturers because it is impossible for the manufacturer to monitor use; neither manufacturer nor dealer should be impacted by the right to compensation clause.





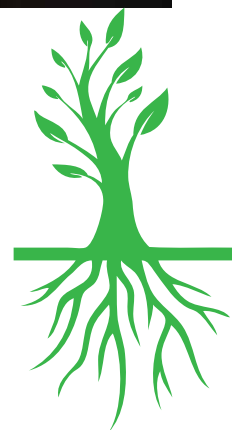
It must be borne in mind that dealers receive packed goods and sell them with the GST bill and the principal's certificate. They sell only government approved goods

Stock register is another issue and, even in this digital age, the agriculture inspector says that the licence can be cancelled if the stock register is not hand-written. Dealers have made several unsuccessful representations. Stock registers should be allowed in both computerized and hand-written formats.

The older laws state that information such as MRP of the products being sold should be available on a display board. Small shop owners cannot display prices of all the seeds, fertilizers and pesticides in their small premises even if they wish to. Yet the agriculture inspector can cancel the licence and impose penalties if prices are not displayed. It would help if price lists were acceptable; they could be made available to anyone wanting to see the price, instead of the insistence of display boards.

The Central Pesticide Board has no representation from the agro input dealers, who provide the foundation for both industry and farmers' businesses and are closest to the farmers. If these dealers are impacted, the farmer cannot do things on time and industry will be handicapped as well. The Agro Input Dealers Association should thus be consulted on any decision by the Central Pesticide Board.

Nobody knows the problems of the farmer better than the dealer. Yet dealers are avoided everywhere and their perspective is never taken on board. However, if anything goes wrong — in Punjab or Maharashtra — the dealer is blamed for supplying bad or spurious material. All industries have good and bad people and 70 per cent of the dealers are good. The rest may be bad. The need is for a law that does not destroy all dealers. •



**COVER
STORY**

Good Initiative but Needs Revisiting Clause by Clause

Balwinder Singh Sidhu





As someone who has regulated the sale of pesticides in the state for seven years, I think that the older Bill was inadequate. This is a delayed but good initiative but needs to be improved further and made more stringent so that it meets the aspirations of different stakeholders.

To begin with the inspectors, they exist not just in agriculture but in other departments of the government as well. They are not all bad. However, as far as inspector raj is concerned, inspectors cannot be allowed to walk into homes on the pretext of checking pesticides at will. An agriculture development officer should have the permission of the district officer and a district officer should get the nod from the director agriculture. No one should be permitted to conduct arbitrary checks. Further, the regulation needs to be carried out with a human touch and no good manufacturer should be harassed.

The extortion by inspectors happens when sub-standard materials are manufactured. In any event, a government-paid inspector lacks the money and muscle of industry. When the sale of pesticides was stopped in Punjab and the case was being heard in the Punjab and Haryana High Court, there were 11 advocates for the three respondents whereas the state was being represented by a deputy advocate general, who receives a paltry amount every month.

As such, the entire process of regulation needs to be reviewed. Further, the responsible person of a manufacturing company should be among the top five highest paid employees of the firm to improve the accountability of manufacturing.

The PMB should empower the states to stop the sale of any pesticide based on quality and need parameters. Punjab has more than 50 licences for manufacturing but has only three manufacturing plants. The state should be able to regulate the sale of agri-inputs within its jurisdiction. The clause barring the state from stopping the sale of a pesticide for more than 20 days should be withdrawn because it assumes incompetence of the state to regulate.

Deciding which pesticides should be sold in the state (on the recommendation of the State Agricultural University) should be within the domain of the



BALWINDER SINGH SIDHU
Commissioner
Agriculture,
Government
of Punjab and
Secretary, Punjab
State Farmers'
Commission



state. Further, there is a clause for safe and judicious use of pesticides that concerns the extension agents, people in the departments — who advise farmers on which pesticide to use, how much to use and when — whose efforts are complemented to some extent by dealers.

The Act should provide the control of manufacturing, efficacy, safety, transport and registration to the centre and leave the regulation within the state to it.

The constitution of the Central Pesticide Board (CPB) is also a contentious issue and Punjab has not been represented in the CPB in the last 13 years though its consumption of pesticides at 750 grams per hectare is 1.5 times more than the national average. The states should be represented in this regulatory body based on their per hectare consumption.

Imports are a tricky business and must be meticulously regulated. Nearly 30 per cent of manufacturers import intermediate products under some label. There should be a mechanism to check if the material is technical grade at the time of entry into the port. At least 80 per cent should



The Bill has to be revisited clause by clause. Officials dealing with these modifications should be made to sit with all stakeholders, including industry, and deal with them one by one

be active ingredients and not formulations in the name of technical grade material.

Industry should not sell formulated material to small manufacturers for packaging under their names. These are the mischief makers. There is need for self-regulation or the Act should specify this.

Granting licences under the PMB will become more problematic and there should be separate license for manufacturers, wholesale and retailers. Thus, three types of licences should be issued to check agri-input movement. Manufacturers sometimes get the formulated material from somewhere and are both wholesalers and retailers of pesticide. These are the fly-by-night operators, who cannot be regulated by inspectors.

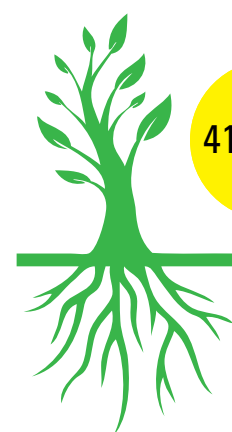
The educational qualification stipulated for the dealers is welcome step as the dealers are in touch with the farmers and should be well informed. The law should prescribe that they must have a diploma in use of pesticides. However, not all the diplomas are credible. There is a private university giving a crash course to dealers in Punjab, who come on Saturdays and Sundays; sometimes not even for the entire year; pay ₹70,000 as fees; and secure a

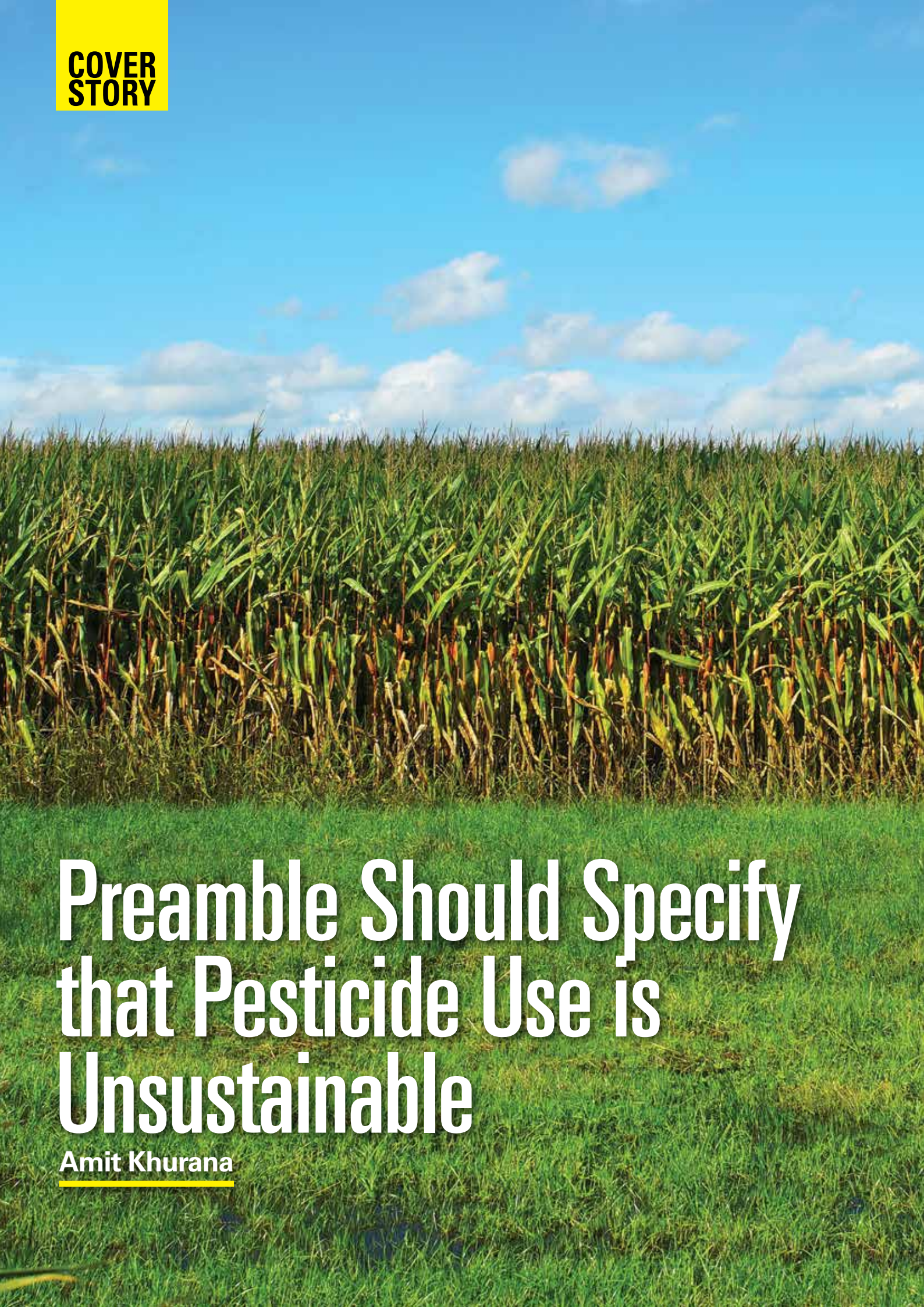
diploma. As such the PMB should lay down a uniform syllabus for the required diploma for the entire country.

In terms of quality control, some states have NABL accredited laboratories. Punjab has one. However, the monopoly of the central pesticide testing laboratory as a referral laboratory needs to be checked and more referral laboratories should be set up. Regional Pesticide Testing Laboratories (RPTL) should be declared independent referral laboratories. If it is not possible to set up new RPTLs, the NABL-accredited laboratories of a state should be declared referral laboratories for other states.

One is not in favour of private laboratories given the great variation between their results and those of state laboratories. The laboratories should be under the government as their analysis report forms the basis of prosecution in case a pesticide is found sub-standard.

The Bill has to be revisited clause by clause. Officials dealing with the modifications in the PMB should be made to sit with all stakeholders, including industry and deal with them one by one.●





Preamble Should Specify that Pesticide Use is Unsustainable

Amit Khurana

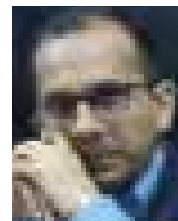


Photo: Pixabay

The Centre for Science and Environment has been working on the pesticides issue for two decades. It has tested pesticides in food products, such as Endosulfan in 2001 in Bhopal, pesticides in human blood in Punjab and conducted studies on enforcement issues in the country.

The CSE does not think the agriculture ministry should be in control of the Bill because this is largely a health and environment issue, which the health or the environment ministry should handle. The CSE believes that the health ministry should take charge. Since the mandate of the agriculture ministry is to increase productivity, it ends up promoting pesticides irrationally. It fails to recognize that pesticides are hazardous chemicals and must be used safely and judiciously. The promoter cannot be a regulator; hence the conflict of interest.

In the USA, the Environmental Protection Agency does it and in Sweden, the Swedish Chemicals Agency, which is a part of the Swedish Environmental Protection Agency, regulates the registration of pesticides. There is no instance of an agriculture ministry doing this.



AMIT KHURANA
Programme
Manager, Centre
for Science and
Environment (CSE)

Class I Pesticides should be Banned in India

- Based on acute toxicity, World Health Organisation (WHO) classifies certain pesticides as:
 - Extremely hazardous (class Ia)
 - Highly hazardous (class Ib)
- 18 class I pesticides are allowed in India; few of them are used heavily and account for about **30 per cent of the total pesticides** used in India.
- These are also **banned** for use in several countries.
- **Deaths** related to pesticide poisoning in India are common.
 - In 2014, National Crimes Records Bureau recorded 7,365 cases of poisoning due to accidental intake of insecticides/pesticides, out of which 5,915 died. In 2015, 7,060 deaths were reported out of 7,672 cases.
- Necessary provisions should be made to ban Class I pesticides.



Financial Penalties; No Criminal Prosecution

- Financial penalties are higher than earlier but **not deterrent enough for big companies** (say ₹1-5 lakh for selling misbranded, sub-standard etc., even ₹10-50 lakh may fail to deter industry giants).
- Further, there is not much historical precedence of a substantial jail term being awarded to decision makers of a company. Therefore, **criminal prosecution is not needed.**
- Focus must be on the **financial penalties, which should be aligned.**
 - In proportion to **total value of sales of the concerned pesticide in India till date.**
 - It should not be based only on annual turnover because the damage may not be limited to one year.

There is little focus on minimizing pesticide use and more emphasis on productivity and quality under the agriculture ministry. In view of public health and sustainability, the focus of the Bill has to be on minimizing pesticide use. In fact, there should be a preamble stating that pesticide use is not sustainable and that it is a temporary, stop gap measure, to be used as a last resort.

Pesticides have significantly contributed to the economic and ecological crisis in Indian agriculture. At a policy level, there is a contradiction with the Indian government wanting to promote organic farming and the Bill promoting pesticides.

State governments must have a greater role in pesticide management in states but the current draft Bill provides inadequate representation to states, both in the pesticides board and registration committee. States should have the final power to disallow the pesticide as they have the best understanding of the local agro-ecology and

CSE Analysis Post Maharashtra Deaths Due to Toxicity

Several pesticides are considered hazardous by the World Health Organization (WHO) — basically Class-I pesticides — at least 18 of which India uses. They account for 30 per cent of sales and are banned in many parts of the world. The Bill should prohibit registration of Class-1 pesticides.

Essentially, this pertains to more than 2000 tonnes of Class 1 pesticides that are highly toxic or toxic as per the WHO. Registration should be based on a comparative assessment. That means assessing safety and health risk posed by a pesticide and compared with the safety and health risk of an already registered pesticide being used for the same purpose.

Pesticides with overall low risk can be registered and high-risk pesticides can be de-registered within a reasonable time frame and after due diligence. Assessments based on comparison should be accompanied by adoption of precautionary principles. They should be reviewed by an independent committee every five years and not by a registration committee. Reviews should be public on the basis of comments and data and should be available in public domain.

Data of toxicology and safety should not be limited to private companies. The government should also build its own repository of information of data from scientific communities. There has been little involvement of civil society and public health experts in decision-making in the Central Pesticides Board or the registration committee. CSOs working in food safety, environment and consumer protection should have adequate representation.

It must be made illegal to sell pesticides if the company does not provide personal protective equipment. As per the international code of conduct on pesticide management, jointly released by FAO and WHO, pesticides that need personal protective equipment — that is uncomfortable, expensive and not easily available — while being handled and applied should be avoided, especially in the case of small-scale users and farm workers in hot climates as India.

The states should take responsibility for spreading awareness. India has failed to establish systems and standard operating



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procedures during medical emergencies or pesticide emergencies with farmers. There should be an administrative and accountability mechanism to handle acute medical emergencies due to pesticide poisoning.

There should be an emergency response system that identifies and equips medical facilities with necessary drugs, standard operating procedures and resources at no cost and up to the district levels.

The polluter pays principle is important for environmental contamination or health impact. A comprehensive data repository and information management system is very important on district level data on pesticide poisoning and pest attacks, district level data on pesticide use, studies on toxicity and efficacy of pesticide, monitoring pesticide residue, studies related to environmental impact of pesticides, sales of misbranded and spurious pesticides. This kind of data is needed to take things forward.

Pesticides are hazardous chemicals, a lot like drugs, only worse because they are much more toxic. They should be sold under prescription by professional experts, based on farm investigation, farm size and best crop

Professionally Prescribed Only

- Pesticides must be sold only under prescription of a professional expert and used accordingly
- They are **hazardous chemicals** with multiple, severe and even fatal, acute as well chronic, toxic effects
- They must be sold and used **cautiously under supervision like drugs**; like drugs - **target, dosing, mode of application** and **unbiased advice** is critical
- Over-the-counter availability and dealer influence causing overuse and misuse
- A concept of **Plant Health Experts** or **Plant Health Consultants**; just like medical doctors or veterinarians must be introduced
- Need not be agriculture extension officers; A **private** plant health consultant, say on the lines of a '**poultry consultant**' can prescribe based on farm visits, farm size and nature of pest attack
- Records of prescriptions should be maintained by the shops selling pesticides
- **Any sale other than prescription should be unapproved and illegal**

situation around climate, soil and pests.

What a state cannot be permitted to do, for example, is to register a pesticide not allowed by the central government. There must be something like a minimal national standard. The central ministry should come up with the basic standards and states can take over. Both agriculture and health are state subjects and there is no reason for a concentration of powers at the centre and none at the state.

Pesticides are hazardous chemicals, a lot like drugs, only worse because they are much more toxic. They should be sold under prescription by professional experts, based on farm investigation, farm size and best crop. I work closely with the government of India on the national action plan on anti-microbial resistance and we borrowed ideas from poultry consultants. Poultry consultants need not be government employees; they can be private veterinarians. Similarly, there should be plant health consultants.

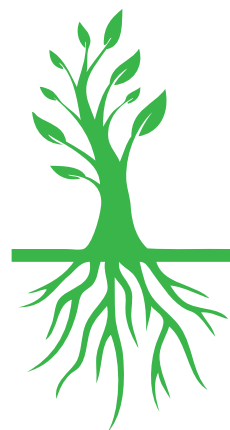
Any pesticide sold without prescription should be made illegal and the penal focus must be on financial penalties; criminal prosecution is not



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needed. There is no historical precedence of company bigwigs going to jail. However, just a fine of ₹1-5 lakh for selling misbranded pesticides would not be a deterrent. The financial penalty must be aligned to the offender's turnover. It should not be based on the annual turnover but sales made till date of offence because the damage done is not limited to a specific year.

Advertisement and promotion of pesticides should be banned in national and regional languages. Also, the final point of contact to the farmer should not be a company representative but an agriculture extension officer. Interaction of the dealer and company representative should be delinked from sale of pesticides. A code of conduct must be developed, audited by the government of India and followed by pesticide companies. •





Pros and Cons

A Farmers' Forum Report

Comment: 80 per cent of dealers do not give a receipt to the farmer. It takes three months or more to understand the impact of pesticides on a farm. Who can be held responsible if things go wrong? The company representative whom one has never seen? What responsibility are the dealers taking? Nothing. I represent 800 farmers and I have never seen a single receipt from even a single dealer. Your products are not even packaged. Dealers and manufacturers should be equally responsible. The farmer alone cannot be held responsible.

Arvind Patel: It is the responsibility of the customer to ask for the bill. There should be legal proceedings against those who do not provide bills.

Ajay Jakhar: Punjab is trying to make a law that a retailer selling a chemical input to a farmer will have to register it in real time, like with a PoS machine, to a state government server for fertilizer subsidy. Nothing more than that; no paper work will be required. It can be driven by a computer or a smart phone application. It needs just the farmer's name, telephone and address; no Aadhaar card or anything else. The information will be used not to regulate but to drive personalized extension services to the farmer buying. Hopefully, the industry and trade associations will not oppose this or hire expensive lawyers to stop the law in court. This is desirable for a good industry that gets a bad name because of fly-by-night operators.



“I represent 800 farmers. I have never seen a receipt any dealer. Products are not even packaged. Dealers and manufacturers should be equally responsible”

Comment: I am from the pests and pesticide management system at the FAO. I think it is laudable that the government is reviewing its legislation on pesticides. There are international best practices in pesticide use. There is an international code of conduct on pesticide management that is

a reference document with all the necessary guidelines on pesticide life cycle. There is a book on pesticide legislation and something called the pesticide management system. The FAO has also produced a pesticide registration toolkit.

Comment: I am a former IDG, IACR and handled regulatory processes in the earlier bill and current bill. There are inter linkages between various provisions such as consumer protection, environment protection and agricultural productivity but the bill is in silos. This needs to be changed and everything must be integrated. A major problem that has been overlooked in the management of farms is the vector management of animal diseases that passes on to humans. •



Its Quite the Perfect Day

Aditi Roy Ghatak

"We can't help it. We love cheese."

— RYAN PANDYA AND PERUMAL GANDHI

"What started in 2014 with two guys, a big idea, and a shared passion for cheese, has quickly grown into a company on a mission to create a world of delicious animal-free dairy products. They thought: 'Why give up our favourite foods? There must be a better way'. So they brought together 'a diverse team of chefs, food designers, nutritionists, scientists, engineers and one office dog, Sophie'. Thus was conceived Perfect Day.

Two boys of Indian origin, Ryan Pandya and Perumal Gandhi, studying in the USA were wondering why they had to miss out on the food that they had "grown up eating". True, food habits of the yesteryears had left a horrific ecological imprint and had to give way to a more sustainable way of addressing hunger but did that have to take the fun out of food?

They wanted to reduce the individual's impact on the planet and the best way to do that would be to avoid animal products. When they switched,



however, they missed the foods that they had enjoyed during their growing up years. "All of the substitute products available were not nutritional or tasty", said Perumal to Farmers' Forum, explaining the guiding force to the setting up of Perfect Day. This start-up from Berkeley recently completed a \$24.7 million dollar Series A round!

Ryan Pandya and Perumal Gandhi asked themselves: "Why not make real milk without the animal if that could be done, we could help evolve our food system to make it more sustainable and affordable". In 2014, Ryan and Perumal met Isha Datar of New Harvest — a non-profit in cellular agriculture — who was quick to appreciate the import of what the boys were thinking about. They were talking of creating a cellular milk product. Essentially, while most people were working on a substitutes for meats, Ryan and Perumal were taking the dairy route.

Getting their act together, the boys formed a company, Muufri, which they later renamed Perfect Day and soon caught the imaginations of venture capitalists. Pre-seed money came via Indie Bio and they were off to a promising start. They next caught the eye of Horizon Ventures and proceeded to meet the Hong Kong-based Solina Chau Hoi

**Join their
"moo-vement"**

Ryan Pandya and
Perumal Gandhi





Shuen, director of the Li Ka Thing Foundation and also a business partner in the Cheung Kong Group¹. Seed money was theirs to be had; so also a team of chefs, food designers, nutritionists, scientists, engineers. Office dog, Sophie, added to the team spirit.

The innovation lay in their concept that cellular agriculture would remove cows from the process altogether. To simplify the complex — or not so complex — science, the idea was to gene sequence and 3D print dairy proteins without bothering the cows. Essentially, it was possible to use yeast and everyday fermentation techniques to make the same dairy proteins (casein and whey) that cows make: the boys with a sense of humour call it “dairy meeting craft brewing”. The innovation used biotechnology for the yeast to acquire a ‘blueprint’ that allows it to ferment sugar and create real dairy proteins, which are identical to the blueprint — in the form of DNA — that cows naturally use.

Even the change of name from the original Muufri to Perfect Day was inspired by the recognition that that dairy cows that listen to soothing music “like the Lou Reed song ‘Perfect Day’ are calmer, happier and produce more milk” and a Perfect Day

¹. perfectdayfoods.com/our-story/



it was, say the two scientists as they tell their story. Indeed, the entire concept was nature inspired.

“The industry already uses fermentation technology to produce rennet, an enzyme required for cheese production. We are leveraging the same tech to make the core dairy proteins, Whey and Casein. We hope to share our technology with companies across the world to allow them to move to a far more sustainable method of milk production”, Perumal told Farmers’ Forum.

Perumal addressed his constituency last year: “Nearly four years ago, we set out on a mission to create a world of delicious animal-free dairy products that were healthier, kinder and greener than ever before, with the hope of enjoying the dairy foods we all love without compromise.

“When we first started on our journey, we were obsessed





with finding a better way to make dairy products like milk and cheese. Since we started Perfect Day, we have had the opportunity to work and connect with innovators and visionaries across the food industry – and, frankly, we have learned a lot.

“We have learned that dairy proteins are the world’s highest-quality source of nutrition and they are the base for so many of the foods we all love, not just dairy products. In fact, most milk – the only source

of dairy proteins today – ends up in other products, either as an ingredient or as the starting point for cheeses, yogurts and ice creams – to name a few.

We also learned that by 2050, demand for protein is expected to increase by 80 per cent across the globe. This signals one of the most important challenges that we (and our food system) will face in the next few decades”².

There were changing challenges over the past half a decade. The current challenge is, of course, to scale the process, which is “the biggest challenge at the moment”, says Perumal. However, there were technology and finance problems that had to be scaled first. For funds they found support from across the scientific start-up supporters. UK’s Jeremy Coller apart, there was Continental Grain and Iconiq Capital, Lion Ventures (USA), Verus International and others to shore up the initial funding from Horizon that continues to back the duo and participated with a \$6 million contribution in the recent round.

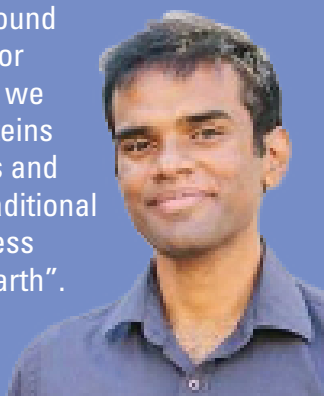
The technology had to be fine-tuned and the boys hired the relevant expertise. Technologists themselves, they focused on perfection and, in 2015, Mark Steer of the University of West England wanted to do a preliminary life cycle analysis and environmental impact study on animal-free brewed milk compared to milk from cows with Perfect Day. The results were impressive:

- GHG emissions vis-à-vis normal milk: down 84 per cent
- Water usage vis-à-vis regular dairies: down 98 per cent

Reducing Ecological Footprint

How can we produce enough nutritious protein to feed a global population of over 9.5 billion, while at the same time preserving our planet? This question, coupled with what we have learned about dairy proteins, got us thinking – and thinking big – about the impact that Perfect Day can have on how we eat. Our plan is to create a new way to make dairy proteins – the same proteins found in cow’s milk – for use in the foods we love. These proteins are as nutritious and functional as traditional dairy, but with less impact on the Earth”.

PERUMAL GANDHI;
Co-founder,
Perfect Day



2. [linkedin.com/pulse/future-dairy-perumal-gandhi/](https://www.linkedin.com/pulse/future-dairy-perumal-gandhi/)



- Land use: down by 91 per cent (no farms)
- Energy use vis-à-vis regular dairies: down 65 per cent.

Technologically, the young entrepreneurs were getting there. It was then about markets and industry space. A lot depended on every other player in the dairy and foods business and the boys decided to go in for a B2B model that would support withdrawing the animal from the supply chain animals and would involve partnering established companies in the foods ecosystem.

Animal-free dairy products would be a game-changer if they could be made to work and it would help the boys spread their technology over several products and not just milk. "Perfect Day could be the 'Intel Inside' for the dairy industry" to quote Forbes³. Asked how they would ensure sustainability for the product line and the environmental sustainability of the operations,

Perumal told Farmers Forum: "Because our process is far more efficient at converting plant sugars into milk protein (the same thing the cow does), we get more nutritious food from the same amount of feed that is fed to animals. This makes it more affordable and more environmental friendly".

They have no qualms in children having their product as a substitute for milk. "We make milk proteins that are identical to the proteins found in cow derived milk", says Perumal. However, India is not on their map as yet because the boys are currently focused on the US market. They would, however, "love partners to take the technology and commercialize in India" says Perumal.

The need now is to scale up in the USA first and the Temasek investment has come at the most opportune moment. The press release following the

3. forbes.com/sites/michaelpellmanrowland/2018/02/27/perfectday-disrupts-dairy/#419796b75f61





The Temasek investment “brings us closer to our goal: to provide dairy for everyone in a sustainable way. Thanks to the commitment and trust of our investors, we are in a better position than ever before to achieve the impact that motivates us”

– Co-founder and CEO, Ryan Pandya

investment said: “Perfect Day, a global leader in the science, research and production of animal-free dairy, has raised \$24.7 million in funding and received its first patent for the use of animal-free dairy proteins in food applications. The raise signifies the largest Series A in the history of the emerging food tech space”.

Co-founder and CEO, Ryan Pandya, said: “This round brings us closer to our goal: to provide dairy for everyone in a sustainable way. Thanks to the commitment and trust of our investors, we are in a better position than ever before to achieve the impact that motivates us.”

For Perfect Day, the funding was testimony to global investors beginning to share its vision of “creating a future-proof source of nutrition and dairy delight for everyone in the world”. Perumal said: “This funding will enable the company to grow the team, accelerate scale-up efforts and

Big Potential

‘In the milk market, plant-based products, such as soy, rice and almond milk have grown to command 10% of the overall dairy market, while animal-based dairy products have stagnated. That demonstrates the growth potential for the likes of Perfect Day and the ‘sustainable protein’ sector as a whole.’

JEREMY COLLIER;
Private equity entrepreneur;
founder Jeremy Collier
Foundation.



ultimately, commercialize with a wide variety of partners across the food and dairy sectors”.

There was good news on yet another front: On February 27, 2018, when Perfect Day received its first patent for the use of animal-free dairy proteins in food applications the company release predicted: “Given the VCs’ relationships with some of the largest food and beverage companies and brands in the world, this investment will help Perfect Day to bring animal-free protein to the market through collaborations with a wide variety of brands”.

There would be enough in the coffers to hire the right talent to accelerate the path to market for premium dairy protein ingredients, accelerates scale-up efforts amongst others. The 30-member cast is expected to grow to achieve its “commercialization potential” and provide the benefits of a hormones, antibiotics, steroids and cholesterol-free products, while addressing the problems of the lactose intolerant as well.

Farmers’ Forum asked Perumal: what the final product mix would be, what would they be called and what kind of approvals, FDA, EU clearances and such others would they need to secure. Early days yet; “We will share more info on our product roadmap as we near launch. And we will obtain approvals from the FDA and other regulatory bodies”, Perumal says.

Meanwhile, they remain connected to their roots. Says Perumal: “I was born and raised in India and I am pretty familiar with the issues in the country. Ryan’s parents are from India and he visits back once every 2 years”. All they want is for more people to join their “moo-vement”, enjoy the dairy food they love, while leaving a kinder footprint on the planet. •

Jharkhand's Organic Route for Income Security

Bharat Dogra

Prayag Mahto, a farmer of Parvatu area (near Ranchi) in Jharkhand, was in dire financial straits. He reasoned that since he could not increase prices of his produce he had to reduce costs. He had heard about an organic course in a 'green college' in Deoghar district and enrolled for it. The bottomline was that he got to understand the need to quit the chemical fertilizers, pesticides and weedicides route.

Mahto adopted organic farming practices based on local resources costing next to nothing but found himself facing a lower yield in the first year of this organic switch-over. Trained by the college, he did not lose faith. The next year, he recovered to the former yield status but without chemical agro inputs. Mahto had achieved the organic magic that translated into greatly reduced costs. His net income was up and his savings increased significantly. Today, he believes that he has exited the 'dire straits'.



BHARAT DOGRA
Senior journalist,
specializing in the
farm sector





Lakhiram Sardar, farms on a small, under two-acre plot in Arjunvilla village. Some years back he got enthused at the prospect of increasing yields quickly with chemical fertilizers but was soon struck with the huge cost hike. He also realized that the crops grown with chemical inputs provided lower nutrition and energy while giving rise to health problems. He shifted to a new field that was considered a no-good rocky land.

Lakhiram was by now committed to chemical-free farming and softened up the rocky land with the manure of his cows, bullocks, goats and poultry birds, apart from plenty of fallen leaves. Sticking to his organic route, he has emerged as a successful farmer growing a diverse basket of grains, legumes, oilseeds, vegetables and fruit. His annual net income in a normal year is

about ₹150,000 per year, which he has achieved even under water-scarce and poor marketing conditions.

Several villages around Ranchi and Jamshedpur cities have taken to the organic route in a small scale but these very interesting efforts have been linked to city consumers who are looking for organic produce. The entire movement has been driven by an initiative called Sustainable Integrated Farming System (SIFS).

SIFS is based on integrating plants and crops with water, farm animals, birds and market. It emphasizes use of the waste from one part of the system as an input for another so that the waste is minimized and costs reduced. This movement led to the formation of a 'green college' at Maniyarpur in Deoghar district.



Low-cost certification for organic produce in the form of the Participatory Guarantee System with farmers certifying each other's produce is possible

Thus emerged a centre where farmers, even from poor households, could get trained as potential entrepreneurs working with eco-friendly approaches. These efforts were implemented with the co-operation from two voluntary organizations: the Centre for World Solidarity (CSW) and the Abhivyakti Foundation, which in turn were supported by Welthunger-hilfe (WHH), working to end hunger.

The most recent phase of these efforts is a project called Safe Foods or India for Eco-Foods Project, which provides training in organic farming

in several villages. Efforts are also made to obtain very low-cost certification for organic produce in the form of the Participatory Guarantee System. Farmers can help to certify each other's farm produce. Technical help for this is provided by the Keystone Foundation.

Common facility centres are set up at some places so that farmers can avail of such facilities as processing and packaging their produce to add value. The entire effort is to make organic farming more possible for small farmers with a low resource base. At the same time efforts are made to





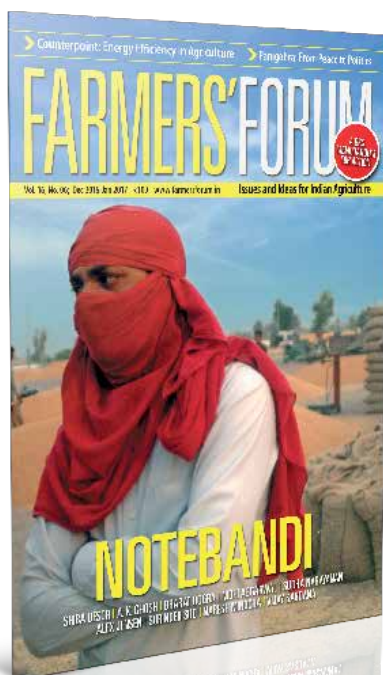
Women fond of cooking are encouraged to join the competitions for new recipes for organic foods. The idea is to move towards a healthy future

develop markets for organic farm produce in cities so that organic farmers in nearby villages can get a fair price.

Besides, a campaign has been launched to promote organic produce as health foods. A brand name and network of Bhoomi Ka has been created for this purpose. The organic produce is also promoted using social media, Facebook and youtube, with the page called [indiaforecofoodsjharkhand](https://www.facebook.com/indiaforecofoodsjharkhand).

Special programmes are being organized for school children to educate them about healthy organic foods. Women who are fond of cooking are encouraged to join competitions based on new recipes for cooking organic foods in a healthy way. The idea is to move towards a healthy future, achieving the twin objectives of improving farm livelihoods in an eco-friendly way and simultaneously promoting the consumption of healthy foods. •





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