Small Farm Incomes

IRMA
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Shifting Grounds

Transitioning to Sustainable Agriculture in India

Edited by: C Shambu Prasad and Deborah Dutta

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Foreword

Managing Sustainable Transitions in Agriculture: Co-creating Ideas, Innovations and Institutions

The pandemic had the unintended impact of getting humans closer to nature with citizens of Jalandhar having a clear view of the Himalayas and those in the big metros getting to listen to birds and become more conscious of their food choices. An opportunity to rethink our food systems towards sustainability tends to get missed out with normalcy returning. Our small team at the Living Farm Incomes project had undertaken small steps towards thinking about sustainable transitions that began with action research in promoting conscious consumerism[1] at IRMA and Anand to support a Farmer Producer Organisation that was looking for avenues to reach customers during the Covid lockdown. The easing of the lockdown meant the opening of opportunities for fieldwork, to see, feel, listen and learn from pioneering organic farmers and other stakeholders. We also leveraged the potential of online meetings to connect diverse stakeholders across different institutions.

The Kurien Centenary in 2021 gave us an opportunity to bring stakeholders together and we began conversations on ways to scale up agroecology in Gujarat[2] and hosted leading practitioners and proponents of agroecology to explore rural transformation through agroecology[3] with a national workshop in November with the National Coalition for Natural Farming (NCNF). An ambitious plan for scaling natural farming by the Government was announced at Anand in December 2021 and the dynamic changes presented us an opportunity to meet farmers and promoters and understand, and make sense of, their diverse experiences. Our support to young students in academic institutions through the Verghese Kurien Rural Internships[4] helped us understand and document stories of champion farmers across India.

[1] https://www.smallfarmincomes.in/post/conscious-consumerism-institutions-of-india-s-milk-capital-enable-fpo-sell-mangoes-during-lockdown
[2] https://youtu.be/_waW2BGa1O8
[3] https://www.smallfarmincomes.in/workshop-rural-transformation-agroecology-27nov2021-irma
[4] https://www.smallfarmincomes.in/post/verghese-kurien-rural-internships-creating-pathways-for-empathy-and-empowerment

As we dwelt into the sustainable transitions (ST) literature, the lacuna of research in the Indian context became clear. Apart from the lack of focus on food systems in the general ST literature, softer aspects of the transition process involving stakeholder dialogues and institutional change has not garnered much scholarly attention. These 'subterranean' stories nevertheless form the crucial catalyst for the visible transitions from niche innovations to policy level changes and eventually systemic changes. As our field studies grew richer, we felt the need to work on the theme of "Managing Sustainable Transitions"[5] and use systems thinking principles and ideas to foster conversations and dialogues among dissimilar actors. At a macro level, the dilemmas are palpable with the Government of India having to deal with a disproportionately large fertiliser subsidy bill running into an estimated Rs 2.5 lakh crores. At the same time, the vocal thrust for natural farming has been met with mixed reactions ranging from confusion to explicit dismissal of the practices. Complex and wicked problems such as climate change or sustainable food systems need the early involvement of multiple actors in understanding the dimensions of the problem. Further, collaborative platforms are required to navigate the complexity of interpretations before working towards solutions. Often, the metaphorical elephant in the room, has to be understood as such, lest we flounder like the blindfolded people assuming each part to constitute the entire problem. How can one understand sustainable food systems? Is it simply a question of efficient markets, technology transfer to farmers, price incentive to grow climate resilient crops, or conscious consumerism? As we start connecting the dots, each of these aspects need to be critically analysed and brought together.

The set of 21 blogs as part of this compendium is our small offering of ideas, innovations and institutions that could help us think differently about contemporary problems. With the explicit understanding that there are different kinds of expertise beyond the conventional scientific that requires to be recognized, documented and dialogued with, these blogs have been consciously inclusive. They have been written by 37 interested citizens from a veteran working on innovative methods on water conservation like K S Gopal to a young student from Lokbharti pursuing his Bachelor's in the new vocational studies program in organic agriculture. The blogs have all been written in the last two years beginning with the excitement of the team's visit to the Bhaikaka Farm and ending with a report of a recent workshop on sharing our farmer perception survey to members of the emerging Gujarat learning alliance on sustainable food systems. The blogs have been grouped into four themes that begin with "Characterising approaches in Agroecological knowledge and practices" that encourage us to think beyond the usual, even restrictive practices and debates on

[5] https://www.mdpi.com/2071-1050/13/11/6076/htm

'natural' versus 'organic' farming. In the section on "Institutions and knowledge systems" we present our excitement and reflections on field visits to organic farmers and innovative Krishi Vigyan Kendra and universities in Gujarat. The efforts of organisations to build institutions from below or ground-up in bio-input resource centres, training in natural farming or biodynamic farming the critical role of grassroots workers in bringing about transitions have been highlighted. The last section is a reflection by youth from higher education institutes on agriculture through their field visits.

The compendium of blogs while interesting in themselves also present ideas for higher education knowledge institutions to reconnect with ongoing social movements as their institutional practices take them further away from the field. The academia has an important role in enabling knowledge dialogues among stakeholders and making sense of the diversity of field experiences that are often confusing with multiple terminologies and contestations. We believe that a learning alliance is a good level playing knowledge field where young and old, farmers and researchers, civil society organisations and government agencies can meet, deliberate, and envision futures through collaboration and dialogue. I thank our Director, Prof. Umakant Dash and colleagues at IRMA for enabling this at IRMA and the Ford Foundation for their support for unconventional ideas through the "Living Farm Incomes" project. We hope that this compendium will celebrate the work of the large number of pioneers in agroecological and chemical-free farming across India and encourage many others to start similar initiatives in their own region. This compendium is an open invitation to contribute, in multiple languages, to the growing organic farming movement and the knowledge embedded in these initiatives. Even as we rebuild our livelihoods following the pandemic, the number of extreme weather events impacting farmers and food systems underscore the urgency to transition to sustainable food systems. Our hope is that we don't rely on the inevitability, but instead leverage the collective wisdom and agency to make the right choices for ourselves and the generations to come.

C Shambu Prasad 24 October 2022

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Managing Sustainable Transitions: Ten Guiding Thoughts to Frame the Path Ahead

Deborah Dutta and C Shambu Prasad

In this blog, Deborah Dutta and C Shambu Prasad explain the need for initiatives that enable sustainable transitions in the agrarian context and explore ideas that can kick start the process.[1]

Green Revolution practices characterised by input-dependent, fossil fuel-driven, mono-cropping methods have adversely impacted ecological systems, while also pushing farmers into debt due to the induced dependence on external inputs for agriculture. The input intensity has a deleterious effect on climate change with the agriculture sector being the largest consumer of scarce groundwater in India. To counter these trends, India has attempted or initiated several discussions and roadmaps towards sustainable food systems in recent times. These include policy directives to '*Double Farmer Incomes*', the new "*Vocal for Local*" and *Atma Nirbhar Bharat*, and NITI Aayog's vocal commitment to spearhead natural farming initiatives across the country. These initiatives should also shift the goals of food production and provide some rethinking, even a reset in a few cases, of our food systems. As the Government of India readies itself for nation-wide food systems dialogue it might be pertinent to situate some of the discussions with alternative discourses for the future, especially following the Covid 19 pandemic.

Enabling Sustainable Transitions

Among the many discussion starters, the United Nations and FAO's Track 4's is important for its emphasis on the key problem - namely removing inequality and power imbalances. The need for equitable access to livelihoods and its fundamental connections with sustainable food production systems is well articulated. A fuller expression of these initiatives however cannot happen without a significant rethinking of the relations between producers and consumers in food systems.

[1] This article was originally published in AESA - https://www.aesanetwork.org/blog-153-managing-sustainable-transitions-ten-guiding-thoughts-to-frame-the-path-ahead/

We suggest that while there are many technical solutions that exist, and many more are being discovered by both researchers and practitioners and farmers there is a greater need for institutional reform to align organisations towards these objectives or goals, a commitment to shift dominant paradigms of food production or managing sustainable transitions in short. While most of the transitions literature is focused on urban systems, India has a unique advantage of being in a vantage position to lead this transition in agriculture given both the knowledge and its large farming community. Here, we briefly discuss ten pointers to enable sustainable transitions.

Ten Guiding Thoughts

1. Reversing unsustainable practices

It would be futile to continue proposing alternatives unless dominant, unsustainable practices are simultaneously curbed. This entails slowly dismantling the socio-economic and institutional arrangements that support such practices. Policy nudges that incentivise use of organic nutrients, multi-cropping systems, cut back on pesticide and fertiliser subsidies could help level the playing field for alternate practices to become economically viable.

2. Recognising multiple pathways and constructive synergies

Rather than design for a 'one nation one everything', or the grassroots version of a bad design, 'one district one product' it is imperative that plurality of approaches is encouraged. Food systems are often that are embedded in particularities of regional geography and a diverse set of practices that could include shifting cultivation, dry grain complex, natural farming, pre-monsoon dry sowing, regional water conservation methods and so on. Rather than follow a blue-print approach of any particular alternate practice, it is important to acknowledge specificities and encourage regional adaption and innovation.

3. Promoting knowledge dialogue and interdisciplinary collaboration

Institutions that are supposed to foster such innovations in thinking and practice are often locked into old approaches of intervention. On the other hand, practitioners having the most valuable knowledge and experience may not exist within formal institutions and state-led extension services. These actors must be supported in explicit ways with formal institutional arrangements to enable transition into sustainable food systems. An example is the Odisha Learning Alliance, a network of multiple stakeholders who approached the problem of

food security and its alternative, the System of Rice Intensification (SRI) together and were facilitated to work across silos.

4. Partnering with civil society initiatives focusing on agro-ecology

Initiatives such as APZBNF and the Odisha Millet Mission are examples of how Governments can work with farmers and Civil Society Organisations (CSOs)to upscale alternatives by creating a critical pool of local resource experts and facilitating linkages with public distribution systems (PDS) or FPOs. Academic institutions need to see themselves as facilitators of knowledge dialogues and broker connections between diverse knowledge sources. Marginalised pioneers and creative dissenters within the establishment need to be recognised and supported in pro-active ways. Networks have an important role in this.

5. Strengthening local institutions

The sheer scale of expected transition demands dynamic, decentralised and situationally-responsive measures, none of which are possible through top-down bureaucratic channels due to the cost and time lag. Instead, local institutions need to be empowered and encouraged to form stable partnerships with grassroots organisations. Hyper-local market linkages and supply systems need to be built that can favour small and marginal farmers.

6. Strengthening adaptive capacities of vulnerable communities

Collective institutions need to be strengthened and invested in as they have the potential to address the critical issue of inequality of power relations in the market. Building capacities of these institutions takes both investment and time, especially if they are to enable the critical investments in capacities. Most vulnerabilities and shocks are responded to by enhancing the adaptive capacities of vulnerable communities.

7. Building a critically-conscious consumer base

Concerted efforts are needed to empower consumers to make conscious choices through supporting local agricultural initiatives. Critical awareness programmes and options can be designed to help consumers create demands that are ecologically responsive and offer fair price to farmers. Across the world, many community-supported agriculture projects can offer interesting design insights. A small number of initiatives are also gaining popularity in major metropolitan cities of India.

8. Governance structures to support small-scale urban agriculture

Rural and urban access to nutritious food can be increased through creating small, kitchen gardens for personal consumption. Integrated farming is also a promising avenue to supplement nutritional and income requirements, as documented in many case studies.

9. Reskilling in Agriculture

A neglected dimension of agroecology is its potential to reverse the continued deskilling in agriculture and providing spaces for newer skills. The education system needs to be framed in ways that value practical skills and labour, as opposed to relegating them as vocational subjects. The artificial dichotomy between intellectual and manual labour has a role in creating livelihood aspirations and societal status. This should be challenged through systematic reforms in the curricula with a discerning approach to avoid being co-opted by other agendas. The Natural Farming Fellow in Andhra Pradesh is an excellent example of agriculture graduates finding their mojo by returning to farms and demonstrating newer skills.

10. Rethinking food system goals

Finally, healing must begin by re-embedding local economies in ecosystems, increasing business accountability, and strengthening democratic structures. Newer health, economic and food system goals must be defined based on ecological wellbeing and flourishing rather than abstract figures that are supposed to indicate GDP.

These ideas are not sequential but synergistic and it is hoped that the renewed focus on food systems will help us rethink agriculture for a climate-stressed world. Operationalising these ideas require the creative facilitation of generative dialogues across different stakeholders and institutions. The wicked sprints by Socratus shows promise in applying in practice systems thinking to collective problem-solving. Managing sustainable transitions will need institutional innovations of various kinds that could lead to empowered civic action bodies, farmer collectives and social enterprises.

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Natural farming is naturally complex: We need to go beyond efficiency narratives

Deborah Dutta

Wider uptake of natural farming practices needs to engage with two big issues – overcoming the knowledge and policy inertia set-up due to the Green Revolution, and building skills needed to design and implement agroecological methods. Some insights from Andhra Pradesh explore how does one manage the trade-off between increased labour and healthy soil vs convenient routines at the expense of soil and nutrition?

Behind every successful farm is a woman

Shop selling cow dung manure and organic insect repellents. It is run by Padmavati, the woman on the left. Others are CRPs

'Natural farming' involves agricultural practices that preserve the fertility and ecological health of the land. I didn't have to understand Telegu to feel the excitement and pride in Lakshmi's voice as she showed me the crops being grown in a model plot (a one-acre farm used to demonstrate natural farming methods to farmers). I was visiting some field sites at Kurnool, Andhra Pradesh (AP). In 2016, the Agriculture Dept., Govt of A.P initiated the programme that was called 'A.P Zero budget natural farming' later changed to AP community-managed natural farming (APCNF). This initiative builds on an earlier programme of the State Govt's Rural Development Dept. Over the years, the program has

mobilized many women and men who have taken a lead in convincing farmers to switch to natural farming by showing them tangible results in terms of soil health, crop productivity and better incomes. Lakshmi was one such senior Community Resource Person (CRP) guiding farmers across different villages.

Hemasundar Reddy, a man in his early thirties explained that he runs a shop along with his mother, Padmavati, an experienced natural farmer to sell bio-inputs and organic insect repellents to farmers. Nearly 86% of farmers in India are small and marginal landholders, and may not have the livestock to create bio-inputs. So, such village-level shops selling ghanajeevamrutam, kashayams, bio-enzymes etc can go a long way in supporting farmers and providing easy alternatives to chemical fertilisers and pesticides.

Overcoming practice bottlenecks and knowledge hierarchies

Resource institutions who have partnered with APCNF explained that it is important to make natural farming practices respectful (would you dip your hand in animal dung and urine daily?), and easy to implement. For instance, Ravindra from WASSAN commented,

"*It is crucial to understand the difference between effort and jhamela. It is not that natural farming practices demand a lot more effort, but that one has to be mindful of the processes involved, like stirring the Amrit-Jal thrice a day... such things become a jhamela for a farmer doing ten other things on the farm as well.*"

Small innovations addressing critical bottlenecks can go a long way. For instance, an Amrit-Jal dispenser has been designed which partially automates the process of mixing dung, urine and jaggery with a daily stirring process so that farmers can simply collect bottles of it for use at the farm. Such interventions can facilitate collective actions, which create the peer support and norms for natural farming. Adding to the perspective, Ramoo from CSA commented, "Given the unique soil conditions of different agro-climatic zones, encouraging farmers to experiment with and develop suitable bio-inputs is part of a larger movement to develop decentralized knowledge systems and empower farmers to make informed choices... The question is, how does one build people's knowledge?"

For instance, Hemasunda Reddy explained that he has a mango orchard, and he uses the overripe and damaged mangoes to make fermented bio enzyme.

According to him, farmers need to use materials from immediate surroundings to reduce costs and develop local solutions. Through the initiative, farmers are encouraged to experiment with different methods such as maintaining a 365-day

crop cover through multiple cropping, pre-monsoon dry-sowing (PMDS) and so on. Padma, another CRP in the area showed a PMDS plot where a farmer was growing cattle fodder. She explained that the field had already been harvested thrice (by cutting the fodder grass) and farmers were motivated to build on the technique after observing the increase in yield and quality of the soil. To understand the significance of these grassroots initiatives one needs to understand the historical forces being challenged in the process.

Amrit-jal dispenser used and maintained by farmers (Picture credit: WASSAN)

Fill the belly and deprive the land?

Since the decade after Independence, there has been a dramatic shift in India's food production. From a dependency of nearly 75% on food imports in the 1960s, the country had buffer stocks of grains approaching 100 million in 2020. However, these short-term gains were made possible due to the Green Revolution practices which relied on the intensive use of chemical inputs, fertilisers, and heavily irrigated lands, and a narrow focus on just a handful of crops (wheat, rice, sugar). As a result, India uses more groundwater than any other country in the world. Crops have become increasingly unresponsive to high doses of pesticides. Instead, pesticide poisoning is a major source of an occupational hazards for agrarian workers. The focus on just a few grains, through providing various incentives in the form of MSPs and subsidies have led to a major decline in crop diversity. The poverty of food diversity is evident in the twin problems of widespread malnutrition as well as diabetes. The adverse impact on the country's ecological, economic and health far surpass the

superficial gains of the initiative. The obvious imperative involves a paradigm shift in agricultural practices that restore the land's fertility and provide a decent source of livelihood to the farmers.

Embracing the natural complexity of natural farming

"We get good milk from the buffaloes because they eat good fodder. We can grow good fodder because their dung makes the soil fertile. It is all connected."

- Padma, CRP, APCNF

Composted cattle dung harbouring many beneficial critters and earthworms

The much-touted 'efficiency' of industrial agriculture rests on dangerous over-simplifications and convenient linear thinking that make only a specific kind of production possible and valued. Farmers, along with land are reduced to becoming uniform 'units of production'. These reductive metaphors of technology exclude a biological and cultural perspective, manifested most tangibly as 'waste' as an end-product, and by reducing farmers to mere tools of top-down knowledge. On the contrary, natural farming is the result of intimate knowledge, attention and care of the land. It emphasizes relational and embodied knowledge that recognizes the various levels of interdependencies from soil health, livestock and biodiversity to the quality of food produced. Following Padma's reflections, one can understand that farming based on ecological principles works in cycles that complement natural processes of decomposition, thereby eliminating the concept of waste. Many traditional practices of mixed

cropping, use of livestock waste as manure, growing regionally-suited crops, seed saving embed these principles and ideas. However, persistent deskilling in agriculture and the uncoupling of livestock from farms have created significant obstacles in the uptake of natural farming practices, despite the fallouts of the Green Revolution. More crucially, rigid top-down institutional arrangements have stifled and stagnated vibrant grassroots knowledge based on continuous experience and experimentation.

Economic decisions must fall in line with ecological practices

A lead farmer showing a model plot with a variety of crops grown it. Some fodder plants used for mulch and green cover

Apart from knowledge decentralisation, the uptake of natural farming crucially depends on the subsequent marketing of the products, given that farming remains a key livelihood source. Additionally, some financial assistance when farmers decide to make the switch from chemical to natural farming can be a crucial incentive. As one of the farmers practicing in natural farming in Kurnool explained, farmers rarely have the financial buffer to withstand the temporary dip in yields when initially transitioning from chemical to natural farming and need some guaranteed safety net. Simultaneously, subsidies for fertilizers and pesticides need to be gradually decreased to make natural farming economically viable. Additionally, incentives can be given for multi-cropping through innovative collaborations with Public Distribution Systems. Natural farming arises

out a deep appreciation and understanding of natural systems. Its implementation, however, will not happen naturally. It requires active partnerships between civil society organisations and resource agencies to support and sustain such farmer-led initiatives.

For real, the grass is greener on the other side.

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Rooting for change: Building networks for rural transformations through agroecology in Gujarat

Arnab Chakraborty

Experiential learning on biodynamic farming at the Bhaikaka farm of Sarvadaman Patel

The need for Sustainable transformation in India.

54% of India faces high to extremely high water stress, due in part to the high ecological footprint of agriculture. Even as a significant part of the country's freshwater resources being used for irrigation at an unsustainable rate, degraded lands and depleted soils continue to make chemical farming less responsive, According to the State of Agrarian and Rural India Report, 2020, the ecological base of India's food production is under threat, with adverse implications for food security, safety and livelihoods. Recognition of these ongoing crises has led to a global call for transformative measures towards sustainable initiatives.

Discussion on climate change such as in the recent COP-26 at Glasgow has focused largely on developed country issues and adaptation and mitigation responses through market, climate finance and insurance mechanisms. Agriculture and food systems has remained marginal in these discussions even

though agriculture is currently the 4th largest contributor to GHG emissions and paradoxically also has enormous potential to absorb atmospheric carbon. Therefore, supporting farmers to adopt sustainable farming would entail deep transformations, tackling issues of ecology, social justice, and livelihoods in the process.

Mapping the terrain and understanding the actors

Based on this idea, the Small Farm Incomes team at IRMA and NCNF organised a webinar bringing together the experiences of different actors in Gujarat on October 27th. Farmers practicing natural farming such as Sumitra ben from Anklacch village in Navsari and Suresh Bhai from Bhorya village in Rajkot shared their insights. Proponents of agroecology like Rajendra Khimani, VC Gujarat Vidyapith, Rameshbhai Patel, SRISTI, and Kapil Shah from Jatan Trust reflected on ongoing efforts in promoting sustainable agriculture. Prof. Shambu Prasad from IRMA, in his introductory overview, presented Gujarat's present knowledge around sustainable agricultural practices. Highlighting the various contradictions in policies and the state of knowledge, he flagged the scope for creating a "learning alliance" in Gujarat. In that respect Prachur Goel shared how a collective approach could be taken to creating a vision for transition towards agroecology.

In the moderated panel discussion by Apoorva Oza from AKRPSI, panelists shared insights on practices that could enable a faster spread of agroecology in the state. This included greater documentation of the efforts and outreach as well as having more platforms for dialogues with dissimilar actors like the Government departments and agricultural research universities that are currently not aligned with ongoing efforts of civil society organisations.

The mainstream state agricultural universities often don't provide enough space or exposure for students to learn the principles and science of agroecological practices. Rameshbhai of SRISTI pointed out the need for scientific validation and collaboration to augment the collective knowledge around agroecological practices. Nafisa Barot from WGWLO, highlighted the importance of the knowledge which resides with women working in the fields. She mentioned that one of the spheres where women have clear advantage, is the nutritional aspects of their produce.

To engage with these issues, Dr Rajendra Khimani explained how Gujarat Vidyapeeth is in the process of designing a course that would involve farmers as teachers, and students would spend the majority of the time in the fields with them. Dr Kandarp Mewada from Gujarat Organic Agricultural University also

explained their efforts to mainstream organic farming practices. Such institutional innovations are needed for creating enabling ecosystems for sustainable transitions.

Civic action, context and cumulative changes: A recipe for social transformation

The webinar was the beginning of a deeper engagement of collective learning and action of an informal coalition of actors. The LFI team organised a workshop along with National Coalition for Natural Farming to create an opportunity to listen to similar experiments in other parts of the country and learn together for actors in Gujarat. The workshop was attended by representatives from NCNF's partner organisations from several states - Madhya Pradesh, Meghalaya, Assam, Rajasthan, Andhra Pradesh, and Gujarat on 27th November. They shared the barriers and opportunities for promoting sustainable agroecological practices. The lenses used by the different organisations are also diverse. While some used a food systems lens, others used a water conservation, gender or livelihoods lens. Debashish Sen from People's Science Institute, Kapil Shah, and activists like Rajinder Chaudhari and Kavitha Kuruganti are closely associated with efforts to mitigate the agrarian crisis and promote sustainable agriculture experience of engaging with farmers.

T. Vijaykumar, speaking at the workshop on scaling agroecology at IRMA

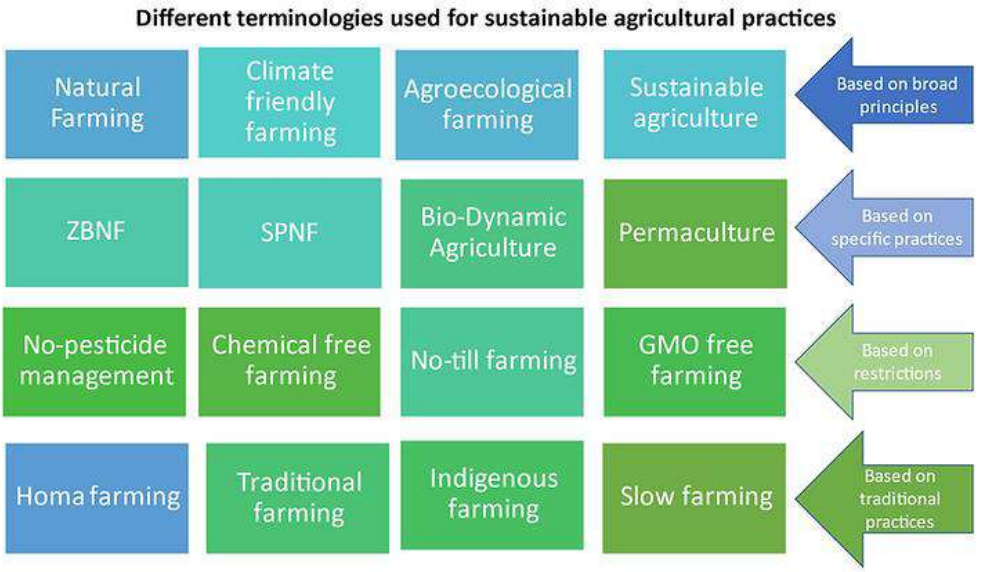
A visit to Sarvadaman Patel's farm along with the participants was an ideal start for the conference on the 26th morning, that was followed by a talk on the experience of promoting natural farming in Andhra Pradesh by Mr Vijaykumar.

Rajinder Choudhari speaking at IRMA

During the workshop, Rajinder Chaudhari, who is an economist and an activist in Haryana, narrated the story of how a group of farmers in Haryana, have been able to self-finance their transformation to sustainable farming practices. At the heartland of green-revolution agriculture, the farmers have been able to grow organic wheat and compete with conventional farmers. The only support they have received has been in the form of guidance and motivation from a strong network of civil society actors across the country. Building social capital has been the common factor across the initiatives in Haryana and Andhra Pradesh's Community Managed Natural Farming (CMNF). In AP, as Vijaykumar noted, the community (especially the women) was mobilised through the SHG movement and had continuous support from the civil society organisations. Similarly, Bhogtoram from Meghalaya, who had been associated with NESFAS, explained how their organisation is combining activism around food sovereignty to transform agricultural systems within the local communities, through farmer's markets, cooking classes and spreading awareness about wild foods. In Himachal Pradesh, the movement is centered around conservation of springs and water

supplies. For Srijan in Madhya Pradesh and SeSTA in Assam, Farmer Producer Companies and Social enterprises with SHG members are enabling transition pathways.

These go on to show that mobilising social capital through civic action initiatives is an important pre-requisite to sustain interventions such as agroecology, and just getting funds is not enough. To initiate such social action, there is a need to bring together the diverse voices (look at the diversity of terms used for sustainable agroecological practices) and create a knowledge base that respects the context-dependent approaches to agroecology.



The state initiatives, however have marginalized the civil society actors, as many of them lament. Their experiences and knowledge from the field, which could have been crucial for better designing of state schemes have been replaced by a limited number of top-down package-of-practices, derived from very specific contexts.

Towards a growing learning alliance

Platforms for discussion and sharing ideas can be the beginning of creating a learning alliance where the ideas and knowledge of all actors are systematically aggregated for everyone's reference. For the learning alliance to be successful, there is a need to create an agenda for systematic engagement with all these forms of knowledge.

The first effort will be to map the history of the organic agriculture movement, and the actors who are involved in producing and implementing the knowledge in this sphere. This will give us a clear direction to how we can approach the various dilemmas and conflicts, preventing the various actors to work together and create peer learning.

The goal of the learning alliance is to create a level of alignment between the different islands of innovation and knowledge, so that Gujarat can embark upon a common goal. The insights from the alliance can be used to leverage agroecological practices, as Kapil Shah said, to transform the overall production and consumption relations, where the main focus is on the well-being of humans and nature across the rural-urban as well as socio-economic divides.

The Prime Minister addressing dignitaries and the state on the need to push for natural farming during the pre-vibrant Gujarat summit

On the other hand, another economic alliance is being formed, through top-down mechanisms of the government, with the agenda for promoting sustainable agriculture. A learning alliance can feed into this government policy, to push for a more inclusive agenda.

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Designs that build on interdependence: Connecting water, soil and microbes through SWAR technology

K S Gopal and Aneesh Mohan

Despite increasing water scarcity in India, initiatives and policies have remained limited to water conservation and availability. Agriculture consumes a significant portion of water resources, and it is imperative to invest in innovations that can focus on efficient water use instead of increased irrigation measures. Turns out, the answer literally lies under our feet. Changing the focus of interventions that go a long way in transforming farming practices and ensuring a healthy ecosystem.

India as a country has been struggling with the groundwater depleting beyond rechargeable limits. 20% of the blocks of India have been critically exploited for groundwater, with more than 3/4th of it being overexploited, beyond natural rechargeable capacity.

When drip irrigation was introduced in the agricultural mainstream, it was hailed as 'State-of-the-Art' technology that shifted the focus to water conservation. In the simulated test, drip could save upto 70% of water, compared to flood irrigation. For many years, and even today, Drip Irrigation continues to carry the reputation of a one-stop solution to saving water. What remains largely undiscussed are the caveats of this system.

In drip irrigation, the water falls on the surface, resulting in a lot of evaporation loss, which in peak summers is very likely death sentence for horticulture crops and fruit trees. Hence, in 2011, Centre for Environment Concerns (CEC), an NGO in Hyderabad and National Rural Employment Guarantee Mission (NREGM) together with farmers, dissected the issue which, initially seemed to be that of water availability. Women in Andhra Pradesh had to walk miles to fetch water for household use and irrigation. Understanding this, water-trolleys for women were created with the idea that instead of head-loading 20L of water, they could more efficiently just push 200L. While this reduced the drudgery significantly, the core issue of water-shortage remained unsolved.

Tribal woman in Mahaboobnagar district in Telangana installing SWAR for backyard vegetable cultivation (2017)

During that time, NREGM's number one priority was water conservation. However, it was realised, that to solve the farmers' problems, the conversation needs to be shifted from water conservation to water efficiency.

"How do we ensure efficient uptake of the available water by plants?"

Moving From 'Water on field' to 'Moisture at roots'

CEC sat down with farmers once again to build a solution and clay pots emerged as a potential answer. Clay pots, however, came with their own set of problems. There is no uniformity in size or material between batches, and there is breakage. Neither can water diffusing through the pots be increased or decreased. Such a scenario is okay when one is concerned with long-term growth (like in case of forestry trees). However, when it comes to yield (like in case of horticulture and fruit trees), water scarcity can be detrimental to the plant's health.

Beeragowda of Kadur in Karnataka installs SWAR on his pomegranate plants in 2019

This led NREGM, and later CEC, through multiple iterations, to formulate the criteria and architecture of low water "ideal irrigation" to cultivate fruit, flower, forestry, and vegetables in groundwater scarce areas and for farmers with drip systems, thus, innovating 'System of Water for Agriculture Rejuvenation' (SWAR). It is the first-of-its-kind "moisture at plant root zone irrigation technology" requiring 50% less water compared to scientists' recommendations in drip systems. It consists of a low-cost buried plastic moisture diffuser that comes as an add-on to drip laterals with a special dripper from where water is sent via a micro-tube into a

box containing granular cut size quartz. Using design software and field testing - the ideal box size, shape, and height that release water slowly and to maximize moisture spread – was calculated. Short-runs on vegetables convince the farmers, once they see the results themselves.

Moving from 'Water in soil' to 'Microbes in soil'

Water does not work autonomously; it works in conjunction with the soil. The soil's ability to absorb and retain moisture is important, therefore soil health becomes important, and roots (Mycorrhizae) are significant players in this. CEC studied traditional Indian farm soil rejuvenation practices across multiple states and engaged scientists, microbiologists, and farmers to learn various approaches. This helped them develop 'Living Compost' as a microbe inoculate. It is locally made using available soil microorganisms. It is a "produce it yourself" multiplier of soil organisms that takes four weeks to prepare. It is an upgrade of farmyard manure coupled with select other ingredients, added for microbe biodiversity such as soil under a banyan tree and seeding of *Navdanya* (multiple diverse native grains covering multiple traits) to foster Mycorrhizae.

However, often farmers give exclusive importance to only water and despite a drip, they over-irrigate the fields by 65-70%. It was realised, drip irrigation functions on field capacity to wilting point, (i.e., water that remains in the soil, and the point at which the water becomes insufficient for a plant to recover from wilting). The logic works effectively with chemical applications as these happen through water (e.g., Urea, NPK, etc), but it is extremely poor in accounting for the biology of the soil.

Hence, 12-inch portable root-zone moisture metres were installed with sensors that are linked by Wi-Fi to regularly provide soil moisture status to the farmers. With measurable readings, farmers feel confident with the irrigation quantity and over-watering is avoided.

Moving from 'Water for Chemicals' to 'Biological inputs'

Decades of sole focus on crop yields using artificial inputs, at the expense of soil health has resulted in multiple interconnected problems, the inability of eroded soils to store water being one of them. However, this is also an opportune time for farmers to build a mezzanine for a fundamental shift from 'chemical to biological', especially with climate change, water scarcity, heat waves and consumers wanting healthy food. The shift's payback time is 1-3 years. CEC is confident that investing in soil health and efficient moisture provision will reduce

the need for external nutrients by at least 30%, with a minimum of 10% increase in yield.

Measuring root zone moisture to plan irrigation using portable sensor in Chetna Organic Demonstration Farm in Odisha (2018)

In the transition period, chemicals could be used sparingly with simultaneous practices to increase the biological activity of the soil. Care should be taken that the chemicals being applied do not kill the soil microbes.

Growth and plant health difference after 40 days of SWAR (40% less water) with drip on tuber rose flowers in Yavatmal district of Maharashtra (2017)

The foundation to successful farming and conservation of productive natural resources is by changing our irrigation architecture. It must foster a dynamically rich natural ecosystem of bio-diverse living organisms that maximize water storage, soil aeration with efficient suction of moisture by the roots along soil micro-nutrients.

The 5Ms of farming summarise the success as –

- ✓ **M**oisture at the root zone that reduces water usage.
- ✓ **M**easured moisture to optimise as per plant need.
- ✓ **M**icrobes to improve soil health and efficient use of water by the plant.
- ✓ **M**ycorrhizae for the root zone for effective nutrient uptake.
- ✓ **M**oisture adequacy data at the root zone to plan and be confident of irrigation adequacy crucial for bridging the *gap* that exists between what the scientists recommend and the practice of farmers.

All of these maximize water savings and plant-produce, soil health and is basis for changing the approach to irrigation. Both SWAR and Living Compost sufficiently impact and build the 5Ms. Further studies and feedback from farmers would help in building better iterations of the products.

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Institutions and Knowledge Systems

Time for a revolution? Leveraging Natural Farming thrust to support sustainable transition

Arnab Chakraborty and Deborah Dutta

A welcome change in the air

It is not often that government led events such as the Pre-vibrant Gujarat Summit on Agribusiness and Food- processing offer centre stage to proponents of natural farming. The event saw prominent politicians like Shri Acharya Devvrat (the Governor of Gujarat) and scientists like Dr Neelam Patel (NITI Aayog) endorse an unequivocal support for organic farming movement in the state and the country.

The prime minister and the home minister also spoke at the summit urging those from large cooperatives like Amul to support organic agriculture enterprises. The Chief Minister of Gujarat, leaders from civil society and high-ranking government officials also attended the event.

At the pre-vibrant Gujarat summit that hosted a series of talks on natural farming

(Picture credit: Vidit Ajmera)

The various panels and talks by civil society representatives and policy makers marked what Kapil Shah, a panelist and the founder of Jatan Trust (a network to promote sustainable farming in Gujarat) commented as being

"A much-needed platform for convergence and depiction of political will".

Having worked to create awareness regarding sustainable agriculture for more than three decades, Kapil Shah was clear that the ground is shifting.

The push by the government might be partially motivated by the record burden of subsidies on chemical fertilizers and steep rise in fertilizer import prices, however, it does not take away the gesture's significance. Listening to him helped us understand the context of state initiatives in a more nuanced manner.

From an unwanted alarm to the need of the hour

Kapil Shah, is a product of the Nai Talim education system, advocated by Gandhi, and was taught agriculture from his school days. But later when he was studying agricultural science at the Anand Agriculture University (AAU) in the early 1980s, he realized, the model of agriculture that was being promoted by the establishment was at odds with the Gandhian notion of agriculture he had grown up learning. As he walked us to his former agri-engineering lab in AAU, he pointed out how the institution including its architecture and syllabuses, was inspired by the American agricultural education institutions, which were the birthplace of chemical farming. In that respect, hosting a summit proclaiming natural farming at AAU was symbolic.

His first major contribution was his book *Sajiv Kheti*, in 1985 which laid out some of the principles of organic farming. His reminiscences indicate that far from being a new intervention, proponents of sustainable farming have lived in Gujarat for a long while, working based on their own experiences from the field silently, which had limited reception from the public in those days.

"When I first co-authored a book on organic farming and was trying to get the attention of the government, it was still the heyday of Green Revolution ... our voice was more like unwanted alarms in the middle of the night. When people like Palekar have started talking about natural farming, Green Revolution has run its course and farmers are already looking for alternatives. The government is looking for solutions... this time is like the dawn when people want to get up."

Talking to Kapil Shah at the Jatan Trust office in Vadodara

Visionaries among progressive farmers

For instance Kapil Shah mentioned about the phenomenal initiatives of Bhaskar Save, often known as the 'Gandhi of Natural Farming'. Bhaskar Save started farming in the early 50s in South Gujarat. Like many of his peers, he too became interested in the emerging methods of chemical farming. In fact, his experiments with chemical-based farming were studied and admired by the scientific establishment at the time. However, after observing the negative impacts of chemical inputs on the soil and animals, he decided to develop organic methods for farming.

In 2010, the International Federation for Organic Agriculture Movements (IFOAM) awarded Save with the 'One World Award for Lifetime Achievement' in Germany, adding one more accolade to his already remarkable legacy. In 2016 IFAOM also awarded "Best Organic Farmer of Asia Award" to another Gujarati, Sarvadaman Patel. Like Save, he too began his career in farming with chemical-based practices, but within a decade he decided to transition towards a form of organic practice in 2000 and then to Biodynamic Agriculture, a version of agroecology.

Sarvadam Patel showing visitors the nursery at his farm

These were largely individual efforts. As Kapil Shah puts it, enlightened farmers, who had exposure to diverse schools of agriculture were able to adopt agroecological practices. Small and medium farmers were unable to resist the push of green revolution, except in tribal districts who largely practiced subsistence farming. He attributes this to the concerted effort by state and NGOs to promote chemical farming through extension, subsidies and other input support in Gujarat. His efforts to create networks and organizing workshops for farmers to learn about agroecological practices mainly from successful organic farmers stemmed from trying to create a counter narrative and alternate learning resources for farmers.

A new organic revolution: State sponsored or a social movement?

In the past decade or so, methods advocated by Subhash Palekar, a proponent of what he calls 'zero-budget natural farming' gained a lot of traction in different states. Endorsing its impact, Niti Ayog on its website says,

"It was concluded that ZBNF is a social movement, and the government should lead it. It was also decided that scientific validation of this practice and it's scaling up in all states must be done simultaneously. The attendees called for a chemical-free India."

A 'moo't point? Emphasizng desi cow breeds for preparing manure

The approach has garnered mixed reactions because while there is broad agreement on the need to move away from chemical agriculture, projecting a single way to do so goes against the very spirit of natural or agroecological farming which promotes innovative and diverse practices suitable for local needs. Additionally, rather considering chemical farming as a switch that can simply be turned off, various routes for sustainable transitions must be considered so that farmers don't suffer from yield penalties and livelihood losses.

Kapil Shah is skeptical about the government taking the lead without putting in place any institutions for communication between farmers and knowledge producers, which could clarify the basic science of organic farming to the farmers. In fact, some are comparing this rigidity of ZBNF with Green Revolution extension models because of its emphasis on specific package of practices, which undermine farmers' innovations or other science-based models of production.

According to him, there is no significant difference between various approaches of agroecology as far as science and principles are concerned.

Shah is of the opinion that given the diversity among farmers in the country, it will be a mistake to shift directly to a specific form of practice. Experience has proved that success in large scale shift towards agroecology can only be achieved if the transition plan is strategized over the years and proper extension, monitoring, problem solving service and market support is institutionalized. He suggests different options for certification for farmers at different stages in their transition process to bring better transparency and avoid malpractices in quality assurance. Participation of farmers, especially women in the in the socio-technical and institutional design process will be crucial for smoother transition.

Mainstreaming alternate movements through involving young professionals

While other civil society actors have previously commented on the unresponsiveness of research institutions to support organic agricultural practices Kapil Shah explained the need to go beyond turf issues. Devising inclusive solutions will require breaking disciplinary boundaries and nurturing dialogues. Rather than being seen as adversaries, he insists more space in the organic farming discussion must be given to scientists, who according to him are being kept out of the discussion. In that respect creating a receptive cadre of scientists, equipped with skills for dealing with socio-ecological diversity of farmers might be a greater challenge. Precisely for this reason creating platforms for co-production of knowledge and dialogue is essential. He mentioned the new generation of academics is much better placed to take up this role.

According to him, there is a need for creating parallel institutions like, - young professionals/ fellows programme, farmers' field schools etc. In the early 2000s, he had been able to create various spaces which can lead to such institutional innovations. He is certain, with new technology, as well as young professionals joining the movement, it will not be too difficult to scale these up. These can be supplemented by the network of civil society, who should actively get in dialogue with the government. And this present moment is as good as it gets.

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Sustainable Transitions in Farming: Can educational institutions prepare youth for a paradigm shift?

Deborah Dutta and C Shambu Prasad

Recognising education to be an important part of the dissemination of natural farming (NF) practices and processes, the government of India has mandated introduction of NF course content in Agricultural Universities. Will the discussions on curriculum go outside state universities and draw from existing alternatives and innovations, especially from civil society organisations? Learning from a diverse set of practices and embedding them within the broader rubric of agroecological knowledge is what experts agree.

The converging crises of industrial farming systems, as manifested in the problems of excessive fertilizer and pesticide usage, runoff, groundwater depletion and depleting soil fertility is now well recognized by scientists and policy-makers. The imperative to move towards sustainable agricultural practices has taken on a more urgent tone following the Indian government's decision to allocate a whooping Rs 2.15 Lakh crores in fertilizer subsidies to meet the ever-growing demand of farmers. In a bid to decrease dependence on these inputs, the government has explicitly pushed for the uptake of alternate forms of farming, most notably 'natural farming' practices that broadly aim to revive soil health through mulching, adding microbial rich nutrients and maintaining crop diversity. Additionally, the government has also mandated setting up of a committee to formulate a curriculum on natural farming, which is supposed to be integrated into all the State Agricultural Universities (SAUs). While the explicit political will is appreciated by grassroots organisations working to promote sustainable farming practices, successful implementation of the desired change also needs to address and engage with the knowledge dimension of sustainable transition.

The formal knowledge architecture of Indian agriculture

The agricultural universities at the state level and the Indian Council of Agricultural Research (ICAR) at the federal level are the two main systems associated with agricultural education and research in India. Agricultural

education at state level, post-independence, was part of a mass education system with a rural development focus in the initial decades after India's independence.

Webinar discussion on Agroecology in University Curriculum : Opportunities and Challenges for Sustainable Transition

A significant expansion of educational institutions happened following the Green Revolution in the late 1960s. The institutional arrangements for agricultural research and extension were focused on the dissemination of knowledge and chemical input driven 'package-of-practices'. The curriculum emphasised increased technological specialisation centred around plant-breeding, genetic modification and a deemphasis of integrated farming systems. Over the years the gap between the knowledge of practicing farming communities and university agricultural graduates widened and there was little space in the curriculum for indigenous knowledge and most innovations from farming communities and civil society organisations were not part of university curriculum. For a profession that requires strong affinity towards the land and rural communities in order to facilitate meaningful and contextual interventions, the training received by the students does not actively promote a positive attitude towards agrarian realities. A preliminary mapping of relevant courses by IRMA of the top 27 State Agricultural Universities across 16 states revealed that they have little emphasis on practical experience for organic farming courses, which in itself just amount to a maximum of 4 credits out of the 161 credits that students need to complete. The live context of technology, policy, rural livelihood and entrepreneurship is thus missing from the curricula.

Learning by doing: A challenge and an opportunity

A key challenge that the entire agriculture ecosystem faces today is the lack of youth participation in agriculture. Tell-tale signs of the intergenerational gaps in knowledge are already visible in our field visits, where most farmers we have spoken to are at least 45 years or above, and rarely speak of any successor. The

government of India has launched several initiatives in the recent past, recognising the decline of youth involvement in farming, such as ARYA (Attracting and Retaining Youth in Agriculture) and MAYA (Motivating and Attracting Youth in Agriculture) which started in 2015 and 2018 respectively but have had limited success owing to top-down mechanisms that fail to address ground-level issues of degrading land fertility, lack of sustained field guidance, risky markets and impacts of climate change.

Agricultural museum at Anand Agricultural University

For a majority of the students taking up UG courses, agriculture is not their first preference. The overhauling process of agriculture curriculum offers an opportunity to also generate greater interest amongst the younger generations. Adopting a problem solving approach instead of the present prescriptive approach, in both theory and practice of agriculture university curriculum, could greatly generate interest amongst the younger generation. As Dr A R Vasavi, founder of Punarchith and Dr Ramanjaneyulu, Center for Sustainable Agriculture explained in a discussion panel (Agroecology in University Curriculum: Opportunities and Challenges for sustainable Transition), students need to spend considerable time of their course duration with local farmers, learn agroecological practices from them, understand the local ecology, wisdom and challenges faced by the farmers. This way student not only learn the farming practices but also understand how the different domains of agriculture are interconnected with the local ecology and the extension mechanisms.

A demo session by natural farmers in Ananthapur district

Beyond courses: Creating fertile grounds for knowledge exchange

Dr Kandarp Mevada, Director of Research at the Gujarat Organic Agricultural University (GOAU) has high hopes for meaningful inclusion of agroecological practices in universities. During the panel discussion he explained that the PG programme at GOAU has adopted research activities where the students conduct study on the existing organic farming and indigenous farming practices. From these studies they deduce agronomical practices. This helps the students develop deeper understanding and integrate existing curriculum and build evidence-based approaches in agroecology. Similarly, Anshuman Das described how an innovative 6-month course in agroecology offered by the University of Calcutta University in collaboration with Welthungerhilfe allows anyone with a bachelor's degree to learn about farm and food systems through action learning sessions with farmers and experts. Their narratives resonate with our study of Natural Farming Fellows, who are agricultural graduates taken onboard by the Andhra Community Managed Natural Farming initiative (APCNF) to help farmers transition from chemical to natural farming.

A Natural Farming Fellow working in the fields (source: APCNF)

Their narratives indicate that practical insights gained through farming and interacting with the community was not part of their undergraduate experience and helped them gain confidence and agency to explore newer practices through on-field collaborations. As part of the discussion panel, one of the discussants suggested that for the UG students' curriculum, one of the best ways to initiate the transition process in the present batches is to include organic farming practices are part of their final year Rural Agricultural Work Experience (RAWE) programme. This is an initiative carried out by some institutions such as Krishi Vigyan Kendra (KVK) Sindhudurg, Maharashtra. Here, the UG students participate in the natural farming training programmes that KVK conducts for the local farmers, and are offered opportunity to practice it on the field for one entire farming season while being mentored by the KVK scientists. Creating such communities for mutual support and learning can also break the disciplinary silos existing in the universities, to instead introduce ecology, soil health and systems perspectives as part of syllabi (as opposed to narrow focus on yields and inputs). Meanwhile, introducing organic farming practices in the school curriculum

through support of CSOs and social enterprises such as Centre for Sustainable Agriculture, Edible Routes etc offers exposure to the younger generations, thus creating a healthy interest and respect for the practices involved. Despite the manifold adversities, the farming crises also provide an opportunity to empower youth to see themselves as agents of change in the agrarian sector. One can hope that educational institutions play the transformative role of reimagining rural aspirations and livelihood options in India.

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Grounded and Practical: An alternative vision for agri-education at Lokbharti

Arnab Chakraborty and Chintan Patel

Many institutions, including the Indian Council of agriculture Research (ICAR), have schemes to attract the youth to agriculture. The Lokbharti Gramvidyapith, in Bhavnagar district, through innovative curriculum design has engaged rural youth to serve the large demand for grassroot experts in sustainable agriculture.

Anish's father owns a construction materials business in Bhavnagar. However, he does not intend to get into this business. Instead, he dreams of starting an agricultural enterprise. Rather than aiming for a job in the public sector, he wants to work in his village. We also heard stories of how students coming from farming families, who had abandoned farming are willing to get back to agriculture or allied activities. This is largely because, at Lokbharti the students are able to see agriculture not only as a remunerative vocation, but a socially relevant cause to be pursued through continuous engagement with ground realities.

Students sharing their personal aspirations

The Bachelor of Vocational Education (B.Voc) programme was started by the University Grants Commission (UGC) in 2018. The institutes can choose to run a B.Voc course on themes ranging from jewellery design to hospitality management. The attractiveness of these courses lies in the fact that, they provide an opportunity to pick up relevant skills, important for gaining employment in the respective sectors. Anish and his classmates, have also chosen the B.Voc program for this reason. They are enrolled in B.Voc in Organic Farming program designed at Lokbharti.

The small skilled workforce in the agricultural sector is inadequate to meet the requirements of the farmers. The knowledge related to sustainable agricultural practices available is even more limited. Recently, ICAR has formed a committee to design a curriculum on Natural Farming in 2022 to train a workforce capable of addressing the skill gap for sustainable agricultural practices. Lokbharti had adopted their B.Voc syllabus to this need back in 2019. They have taken support from locally successful natural farmers and experts to design the course and adapted it to the requirements of the region. The institutional legacy seems to have played an important role in their ability to cater to the local needs so effectively.

A need-based approach to education

The 160 acre campus of Lokbharti is filled with sparks of creativity like this

Lokbharti was established by Nanabhai, a well renowned Gandhian scholar following principles of Nai Talim, which values context relevance and practical experience for students. The campus is spread over 160 acres and houses a cattle-shed, several orchards and farm plots. The residential campus is totally maintained and managed by students with guidance from teachers.

Established in 1953, Lokbharti is well known for its Bachelor of Rural Studies (BRS) course. This course attracts students from all disciplinary backgrounds. The course is taught completely in Gujarati and provides opportunities to the students to not only

transcend disciplinary boundaries, but also provides abundant time on the field, for learning through hands-on work.

As Arun Dave, Managing Trustee and chair of the Community Science Center at Lokbharti stated, the courses, provided at Lokbharti have always catered to the needs and aspirations of the local youth. He remembers, his batch in 1966 was the first batch to get an official matriculation certificate, which was introduced to enable him and his peers to get into post-graduate programs.

Sticking to their strength, - community connect, Lokbharti has designed the two new B.Voc courses, mentioned above, in 2019. The teachers feel, these courses are able to further their goal of propagating socially relevant knowledge to address the needs of rural communities much better.

In conversation with Vishal and Virabhai, faculty members at Lokbharti

Virabhai, the faculty in charge of the B.Voc program noted,

"When the course was first advertised, many enthusiastic students and parents commended the initiative for making agricultural education more inclusive."

The students felt that while agriculture can be a low margin activity, it is potentially more remunerative for them, than spending years chasing jobs in the public sector or any other urban sector.

An interaction with the students of the B.Voc programs

Based on our interactions with the students at Lokbharti, we realized, most of the students who have opted for organic agriculture, do not have a background in science or a high score in the qualifying exams. These are often the factors which restrict them from getting into conventional agricultural programs, in spite of their willingness to be associated with the agrarian sector. In that respect the B.Voc program caters to the immediate needs of the community.

For the community, by the community

Talking about how their students are different from other agri-graduates, Vishal mentioned, students at Lokbharti may have limited technical knowledge, they have better understanding of the context. He said,

"While BSc. students may not be able to distinguish between seeds, our students can, even if they do not know the scientific name."

Here again, we see the social relevance of the curriculum, "Upyog" as Arun Dave called it.

A conversation with Arun Dave in front of the Community Science Center, his Residence

Virabhai explained, that their students learn directly from successful farmers and other informal groups, where they can get knowledge about the field. They spend about 12 months of the 3-year course with farmers. As a result, the students have already started receiving offers for jobs, while they are still a year away from graduation. The employers see, how new age farm managers can meet the demand of skilled professionals. But the students and teachers at Lokbharti have greater aspirations.

Towards a Gandhian vision of Rural Entrepreneurship

Autonomy of the village is a key component in Gandhian thought. Lokbharti has used this idea to inculcate an entrepreneurial spirit among the students. While the students do not mention "Swaraj" when describing their aspirations, they say they want to use natural farming to, *"build start-ups, which keep the money from the villages in the village and bring the money from the cities also to villages."* The question remains, do these students get the support necessary for building successful start-ups in the sector?

The teachers are confident that once the institution gets a private university status, they will be able to connect the School of Vocational Training with business incubators, enabling the students to fulfil their entrepreneurial dreams.

The legacy of the institution is well documented

Proper implementation of these plans requires support from industry experts, regular monitoring by the legitimate industry councils etc. They also need adequate connections with industries, for them to effectively carry out the process of internships and field engagement.

Lokbharti, despite its legacy of 60 years, and competent teachers, face bottlenecks with internship placements, and have not managed to create a proper start-up ecosystem. Therefore, while such initiatives for agroecological knowledge exist, they will require greater support and resources for scaling up.

Apart from civil society/ government departments, support can come from institutions like the State Agricultural Universities (SAU) or ICAR. Unlike autonomous institutes such as Lokbharti, SAUs have significant resources and exposure, therefore their support can be crucial. However, the apprehension about losing their autonomy is still keeping Lokbharti from seeking out such support. It remains to be seen if larger institutions will have the interest and capability of dislodging such anxieties and work together to build more inclusive institutions.

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Strengthen bridges: How can KVKs enable sustainable transitions

Arnab Chakraborty, Deborah Dutta and Chintan Patel

Krishi Vigyan Kendras (KVKs) set up in India since 1974 are a crucial source of knowledge for farmers and have promoted the extension of Green Revolution technologies. The KVK Gandhinagar of the Gujarat Vidyapith shows how they could contribute significantly to the spread of new knowledge on agroecology too.

Dr. KV Garg is the Principal Scientist at KVK, Gandhinagar

Bridging labs and farms: A brief history of KVKs

Until the 1960s, the agricultural extension and agricultural education were separated by departmental structures. While, Agriculture education came under the larger department of education, extension was the mandate of the Department of Agriculture (DoA). A new paradigm of agricultural education

emerged with the green revolution. The role of scientists expanded beyond scientific innovations to disseminating scientific knowledge. Therefore, the newly formed central agency in the early 60s, - Indian Council for Agricultural Research (ICAR) assumed both the functions of agricultural research, as well as extension. KVKs were formed as the extension agencies of ICAR, first in 1974, and soon became a crucial interface between the agricultural research community and the farmers. Now there are 731 KVKs across India, which promote scientific agricultural practices.

The KVKs adopted the Training and Visit (T&V) method, propagated by the World Bank programs at the time since the 1990s. The T&V system was later criticized for standardizing the training modules across all agro-climatic regions and unsuitable for spreading agroecology. The lack of dedicated field staff often meant that KVK structure became more of Train and Vanish! Despite criticism, the strength of KVKs is the presence of multi-disciplinary scientific and trained manpower who are closer to farmers, unlike university or ICAR researchers and administrators. Farmers are able to access the in-house demo farms of KVKs with ease, and it helps them experiment on their own field sites. The KVKs provide basic services like soil testing, plant disease prevention and other forms of support to farmers.

Inside Gandhinagar KVK: Glimpse of a successful intermediary

The KVK at Gandhi Nagar has a 38 acre farm with only non-chemical crops.

Generally, ICAR institutions are involved in promoting Green Revolution technologies like chemical fertilizers, pesticides, etc. Diverging from this norm, KVK-Gandhinagar has been involved in organic agricultural practices since the last 12 years according to Dr. Garg. They not only have their 38 acre demonstration farm fully under organic agriculture, they also have started various initiatives to support organic farming among the local agrarian communities, like producing vermi-compost and distributing compost samples to farmers. These set ups are also used for training farmers.

The KVK has also built a high value oil extraction unit. The unit is mainly used for 1500 ppm, neem oil concentrates. Initially, the farmers were expected to bring the raw material to the unit and take the finished products. However, since the farmers did not require so much neem oil at a time, and were unable to dry and crush the neem fruits before bringing it to the KVK, the process was changed. Now KVK personnel source the raw material and produce neem oil inhouse, and distribute it to the farmers. Garg said, such initiatives can address one of the biggest barriers to natural farming-- quality of organic farming inputs. Apart from this, they also help farmers with marketing, by connecting them with different government as well as civil society initiatives for sustained livelihoods.

The neem oil extraction unit

Promoters of Natural Farming are talking about “Atmanirbhar Bharat", Gandhi’s idea of Gram Swaraj talked about autonomy to the villages. Gujarat Vidyapeeth

(GV) is the host organization for the KVK. GV is a teaching university, formed through the direct initiative of M.K. Gandhi. The university had been involved in creating more independent and empowered rural communities according to Dr. Garg. It is this influence of the host organization which sets the Gandhinagar KVK apart from other KVKs, mostly hosted within traditional State Agricultural Universities.

A sample of freshly laid vermi-compost bed.

However, the potential and reach of their work is constrained by limited staff. According to Garg, farmers often visit the KVK from far-flung places in Gujarat or even neighbouring states, and there is a lot of demand for practical know-how at the field level. Yet, reaching out to the farmers in a pro-active and sustained fashion is difficult without systematic and formal collaboration with ATMAs and other KVKs. Such partnerships have been limited or sporadic in nature till date.

Knowledge transfer will require institutional mechanisms

Like the KVK-Gandhinagar, other KVKs have been hosted by NGOs, and educational institutions which have over the years created knowledge on sustainable agricultural practices. On the other hand, the ATMAs and government line departments, which have a large field workforce, might often lack access to

information on cutting-edge scientific knowledge. So, what prevents these institutions to collaborate and share resources for wider reach?

The National Agricultural Research System (NARS) is a one-way information transfer system. And KVKs are meant as the extreme node at the end of the system, knowledge transfer upwards is prevented within the hierarchical structure. Therefore, for the knowledge on sustainable agricultural practices to be shared within various agencies, alternate platforms need to be created.

The informal alliances and civil society actors cannot alone take it forward, multi-stakeholder discussions. Scientists like Garg, as well as other similar institutions within the state system, as well as premier educational institutes like Gujarat Vidyapeeth, can take a lead. It will be more conducive to the veteran scientists, as clearly for them the rhetoric driven campaign for "natural faming" has been disenchanting. As increased awareness and circumstances are nudging farmers to adopt agroecological practices for financial and socio-ecological reasons, multiple actors are themselves exploring options to come together. Hopefully, the situation can lead to better convergence and collaboration between extension offices, CSOs and state agencies to work towards the common goal of farmer's welfare and the planet's wellbeing.

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Beyond schemes and projects: An ecosystem perspective for Gujarat's "100% organic district"

Arnab Chakraborty and Chintan Patel

Dang has been declared as Gujarat's first organic district. However, ground reality shows the institutional capacity to pull off such a huge district wide transformation is still lagging.

Dang: The first organic district

One of the many messages at the Krishi Vigyan Kendra, Waghai, Dang

The district of Dang is the first district in Gujarat to be declared 100% organic. This has been seen as a big step in revamping the agricultural system towards sustainable farming. In addition, the government has released many schemes like the Gaay Adharit Kheti Sahay Yojana to promote 'natural farming'. The state-led agenda for natural farming has been made explicit by the government officials and ministers at many forums like the pre-vibrant Gujarat summit on Food and Agro business in December 2021.

The district of Dang was chosen because farmers, predominantly people from Scheduled Tribes, have had conventionally less access to pesticides and mostly follow organic farming practices by default. The inhabitants reside in secluded settlements in remote undulating terrains. The relative remoteness has kept the farmers in the district beyond the reach of green revolution practices for a longer time. The distance has also impeded access to fertilizer and pesticide markets according to the locals.

The ATMA exhibit showing major agencies (from top: Gujarat agro Industries Corporation limited, ATMA, Guj. Organic Products Certification Agency, Department of Horticulture, Guj. State Seed Nigam Ltd. Deprtment and Animal Husbandry, Registrar of Cooperative Societies.) at Pre-vibrant Gujarat summit at Anand Agriculture University

In Dang as well as in other regions of Gujarat, the pivotal agency responsible for promotion of natural farming has been the Agricultural Technology Management Agency (ATMA). The ATMAs are located at the district level, but they are accountable to a state level nodal cell. Many schemes of the government are being rolled out through the ATMAs to promote "cow-based natural farming". It is however important to understand, if this single agency, with a state average staff size of 6 at the district level and 2 at the block levels, may not be adequately equipped to bring about a full-fledged transformation of the agricultural system.

Can farmers hope for an organic growth in livelihood?

Group discussion with farmers at Chiripada village

The ATMA also conducts periodic training sessions on natural farming practices across the district by recruiting hundreds of master farmers. A group of farmers in Dang, however, told us that there are only minimal changes in the overall agricultural processes in their field.

The village of Chirapada is located 30 kms of spiraling roads away from the administrative headquarters. The main settlement is about 4 kms from the highway. All the households in the village seem to be involved in poultry rearing. We were accompanied by Haresh Rangpara and Badal Dabhi, two students from Lokbharti University, Bhavnagar, who have been engaged in conducting a pilot survey in the village to understand farming practices as part of Verghese Kurien Rural Internship. The survey indicated that of the 20 households visited, most own two cattle on an average. These are not all desi-cow breeds. Of these households, only 3 households are receiving the 900 rupees monthly support for rearing Desi cows as per a government scheme to encourage rearing desi varieties.

Haresh Rangpara and Badal Dabhi interviewing farmers

In our conversation with the farmers, they explained that their biggest problems include lack of irrigational facilities because of which they are able to grow food only once a year. And as a result, despite the difficulty and expense in sourcing pesticides and fertilizers, these inputs are heavily used during the cultivation season; They simply can't afford any yield penalties during the only available window of cultivation. Farmers procure the inputs from Nashik, Maharashtra as no chemical fertilizers and pesticides are available in the markets at Dang.

Given these issues, proper training in agroecological practices like agro-forestry, or green manures can go a long way in improving the livelihood security of the farmers. For example, they can use their poultry waste to produce organic manure, or mulch the soil to retain moisture. They can also seek alternative livelihoods through horticultural products in the fallow season. However, in the present form of the ATMA schemes, there is limited scope for leveraging local resources or practices.

Nevertheless, it would seem that in more accessible areas, the farmers are able to use natural farming practices as prescribed by ATMA. There are even cases where they are sharing resources like cow urine and dung as the land-holdings are small. The NGOs have also been able to reach out more effectively to farmers closer to the district Headquarters. Therefore, while there is scope for adoption of agroecological practices through different arrangements, it will require

upscaling the process of spreading pluralistic ideas of natural farming grounded in local contexts, through concerted efforts of different actors and networks.

How to enable a convergence of actors and schemes?

Apart from the state government agencies like ATMA and line departments, the local KVK under the ICAR system along with several CSOs operate in the Dang. While they often work with the same communities, there still seems to be lack of convergence or collaboration in their program design.

The demonstrations on making natural farming concoctions at KVK, Waghai

According to the agricultural census of 2015-16 there are at least 12838 operational landholdings in the whole district of Dang with individual ownership. As was indicated by the ATMA staff, this does not account for further fragmentation of land. For this reason, individual farmers, who have been practicing farming on land which is not in their name, are supported with a monetary support of Rs. 50 per Guntha, every season upto 2 hectares under Dang Sampurna Rasayanmukt kheti yojana. So far, this scheme covers 13, 478 farmers. As the online portal has become functional, they expect the number of registrations to go up.

The Government has also started an organic market in Gandhinagar, which aims to provide forward linkage for organic products from organic districts like Dang and Valsad. The NGOs on the other hand are trying to create marketing opportunities by establishing an organic farmer producer company (FPC), independent of the government initiative. Similarly, the NGOs are also collaborating to create a Bio-input resource center at the state level. While, they can improve from the wide network of farmer friends associated with ATMA, there is no formal provision for such engagement. Similarly, the forest department, a major stakeholder in the socio-ecological system in the area is also absent from the schemes around natural farming.

Given the common goal of improving the livelihoods of the local farmers in a sustainable manner, there are several opportunities for synergy among different stakeholders at the regional level. The welcome push by the state government can gain mileage through initiatives and platforms to create convergence amongst key agencies, and through recognizing the farmer as a crucial knowledge partner rather than a passive beneficiary.

Acknowledgement: We are thankful to AKRSPI and NCNF for facilitating the field visits in Dang. We are also grateful to ATMA, Dang and KVK, Waghai for sharing their perspectives.

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Bringing it to the table: Regenerative Agriculture's generative challenge

Deborah Dutta and C Shambu Prasad

A recent consultative workshop by ICRISAT and DST brought together stakeholders from diverse backgrounds to brainstorm a feasible action pathway to scale Regenerative Agriculture (RA) practices. Integrating viewpoints held by knowledge institutions and practice communities might be RA's biggest challenge, and opportunity, in reimagining sustainable food systems in India.

"For the first time, I am thinking of what a plant breeder like me can contribute to the initiatives directed towards Regenerative Agriculture".

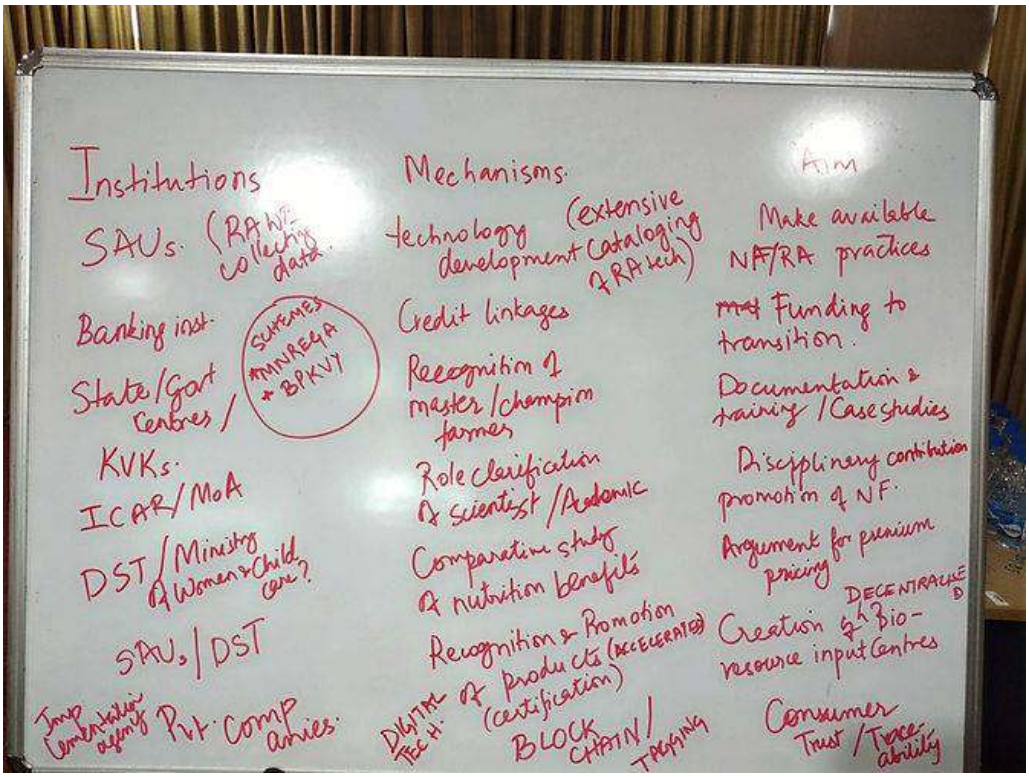
This comment by a senior ICRISAT scientist caught my attention. I was at a three-day workshop hosted by ICRISAT in collaboration with the Department of Science and Technology (DST). Titled **"Harnessing the Potential of Natural Farming (Regenerative Agriculture) as a Low-Emission Development Pathway for Improved Resilience, Soil Health, Livelihoods and Nutrition in India"**, the workshop brought together diverse representatives from academic institutions, private sector organisations and civil society actors to discuss several aspects of regenerative agriculture. The event was significant, with mainstream research institutions opening their metaphorical (and literal) doors to more comprehensive consultations and field experiences of non-scientists. The outcome of the intense discussions was reflected in the statement by the senior scientist, who found the space to ask how plant breeders could go beyond yield targets to breed varieties suitable for RA practices. Personally, this felt like a welcome shift in mindsets.

Embracing the systemic nature of food security and sustainability

The emphasis on sharing diverse ideas rather than rigid ideologies allowed the participants to point out crucial gaps in the implementation of RA. While there was an agreement on the critical need to move beyond an input-heavy, yield-based food production system, speakers pointed out that there was no consensus on the measures and terminologies that would enable an average farmer to

transition from conventional to sustainable agriculture. For instance, the question of reliable bio-inputs for farmers led to a discussion on how decentralised bio-input resource centres (BRCs) could be designed in collaboration with Krishi Vigyan Kendras (KVKs) and operated through Self-Help Groups (SHGs). Such local and innovative solutions can address multiple concerns of input quality, accessibility, and livelihood. Real-time monitoring of evaluation criteria for RA and generating reliable data would require investing in institutional collaborations and innovations. These shifts are not simply technological in nature and would require a systemic rethinking of economic and social priorities. To illustrate, the idea of carbon credits came across as a potential solution to incentivise farmers to maintain soil fertility through RA practices. Renowned scientist Prof Rattan Lal argued that carbon should be seen as the most important crop that a farmer can harvest from the atmosphere through RA, and needs to be paid for it.

Listening to presentations at the workshop



Brainstorming on institutional contributions needed to further RA

Evidence counts. But what counts as evidence?

The lack of reliable data regarding the effects of RA practices across different agro-climatic zones in India was cited as a persistent pain point in furthering the agenda of RA implementation. However, a few participants also argued that the parameters being used to compare RA and conventional agricultural practices are too narrow, and newer metrics need to be developed to measure the impact on biodiversity, nutrition, health and cost reduction. A farmer practising RA in Maharashtra quipped that we need a *farmer's happiness index* to understand the full extent of any intervention. As the importance of collecting data, and experimenting on farmer field sites was emphasised, the idea of agricultural universities allowing farmers to conduct field trials on campus was also discussed. In an effort to walk the talk, a scientist at ICRISAT offered a piece of land on the campus to try out the techniques suggested by one of the farmer participants. Such institutional innovations could redefine the role of scientists and create level playing fields through co-creating knowledge instead of assuming farmers to be passive 'beneficiaries'. The recently established Indo-German Global Centre

for Agroecology Research and Learning by the Govt of Andhra Pradesh can offer more collaboration opportunities for farmers and institutions alike.

Implementing RA practices thus also requires an investment in the design of appropriate technology to support the production and post-harvest processes in multi-cropping, low-tillage systems. While some innovative designs to automate the process of making microbial solutions (like *Amrut Jal*), and harvest crops such as millets exist, a range of such products need to be made accessible to the farmers. Recognising the high percentage of female labour on farms, the technologies being developed should also be gender sensitive.

Investigating a field site at the ICRISAT campus to begin some activities proposed by a farmer

The task of listening better: Ground-up policies

The workshop resulted in several suggestions being tabled for policy recommendations, and it was heartening to see all voices being given due recognition. More importantly, the platform allowed for the possibility of building 'learning alliances', such that stakeholders with divergent views could also find some common ground to think together. For instance, both sceptics and those

practising or supporting RA agreed on the following points to further RA research and implementation –

A. Need for dedicated funding to support research and extension services, preferably on farmers' fields
B. Recognising RA as a philosophy and approach rather than limiting it to the implementation of specific practices, thus allowing for context-specific innovations to develop.
C. Working with private sector players and civil society organisations to develop decentralised models of agri-food production and distribution.
D. Recognising the role of gender empowerment and land-lease policies in creating a supportive ecosystem for RA practices.
E. Collaborating with educational institutes to involve youth in various aspects of sustainable food systems.

Overall, it is clear that empowering farmers to adopt Regenerative Agriculture is as much a cultural shift at a community level as it is a technological shift at the field level. One can only hope that the progressive ideas and optimism shared on such platforms translates into political will and collective action on the ground.

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Missing neither the forest, nor the trees: Efforts in co-creating knowledge for sustainable food systems

Arnab Chakraborty and C Shambu Prasad

Agroecology has not garnered serious academic interest in India, despite interesting practices on the field. The absence of collaboration between civil society organisations practicing agroecology and state agencies keen on promoting natural farming is hindering the wider acceptance and scaling of agroecology. A workshop that presented farmers perceptions on agroecology in 13 districts of Gujarat indicated reskilling by farmers and a reduction in usage of chemical inputs and water but a significant lack of local capacities for community-based extension and farmer field schools in the state.

Co-creating knowledge: Working with Civil society and rural youth

On October, 2021 the Small Farm Incomes team held its first workshop on the challenges and opportunities for scaling agroecology in Gujarat. It was followed by a national workshop, where participants from across the country shared their experience of implementing interventions for promoting agroecology. The state and national level discussions brought together multiple stakeholders and their diverse perspectives to the table.

There are individual initiatives of farmers, entrepreneurs, who have had success in practicing sustainable agriculture in Gujarat. Successful farmers like Sarvdaman Patel or Bhaskar Save are known across the world. Civil Society organizations and activists had also created an organic movement in the state. Gujarat's government agencies like Krishi Vigyan Kendras (KVKs), the Agricultural Technology Management Agencies, and the agricultural line departments have been involved in the process of promoting agroecological. Nevertheless, the collaboration across institutions to scale up agroecology had been limited.

Purushottam Patel talking about his farm

Shilpa Vasavada and Kandarp Mewada as part of a discussion on agroecology in Gujarat

Following field visits, interactions with stakeholders and based on the interest of the coalition it was felt that a joint survey with the National Coalition for Natural Farming and Aga Khan Rural support Program-India (AKRSP-I) could help us understand how the farmers were engaging with these initiatives, and what kind of practices are prevalent across Gujarat as this could provide a common agenda for collaboration across sectors.

We decided to work with students of B.Voc Organic Farming from Lokbharti Gramvidyapith in Sanosara. Most of these students are from rural backgrounds from various regions of Gujarat, and through their education, understand the local agriculture well. Six students interned with us to implement the survey. To select the regions to study and reach out to the farmers, we leveraged NCNF's network of civil society organisations (CSOs).

Students from Lokbharti talking about their experience after Pilot phase in presence of Kapil Shah

CSOs work with small farmers, those from remote regions, especially women, who often fail to be included in the government extension system. These organisations nurture their capabilities and improve their access to knowledge and techniques. We were interested in understanding the specific role of these organisations in promotion of agroecological practices. Twelve CSOs, which are part of the alliance, helped us reach 288 farmers across 13 districts in the state of Gujarat. The CSOs not only identified farmers, but also supported in designing the questionnaire, mentoring and training the Lokbharti students in conducting surveys and field studies. The process also helped the students from get exposed to a wide array of practices and institutional structures which determine the choice of agricultural practices of farmers. Further the students also got an opportunity to exchange some of their knowledge and experiences with the farmers they met during this survey.

Farmers in transition: Opportunities for out-scaling

The survey highlighted that, there are disparities based on gender and geography in the levels of experience. Nearly 84% pioneer farmers, with more than 10 years of experience come from Kutch, and only 2 women had similar years of experience in the whole sample. Similarly, these farmers also had larger land holdings.

The survey pointed out how certain practices have had greater uptake among the farmers, while practices which require greater physical labour and/or expertise like preparation of Jeevamrut and Ghan-jeevamrut, remain marginal. In terms of marketing practices, the survey highlights that very few farmers could invest in value addition activities. Although, all the farmers sell their products in the market, but only 36% get premium price in the market.

Nevertheless, the findings point out there are several perceived benefits of all different agroecological practices like health benefits, reduction in water conservation and decrease in input costs. The farmers also mentioned improvement in soil biodiversity after transitioning.

The findings also provide insights on how the extension systems can be improved further. Peer-to-peer learning among the farmers emerged as one of the most important channels for access to information (with about 33% farmers first hearing about agroecological practices from other farmers and with about 30% depending on other farmers for regular information on practices) apart from CSOs who act as the primary source of information for more than 50% of the farmers. Extension systems should work on leveraging these. Many CSOs have established community institutions like FPOs, which can cater to the most

marginal sections within the agrarian communities. Moreover, the farmers interviewed, have very little access to government schemes and other kinds of trainings. Creating linkages within the government extensions system, agricultural research system, CSOs can provide the farmers a more supportive institutional setup.

Students implementing survey questionnaires in various locations

Recognizing the need for collaborative knowledge

A booklet with some interesting stories of farmers was released in Gujarati- written by the students of Lokbharti. The booklet was released by Naveen Patidar from AKRSP-I and Mohan Sharma from DSC.

On 29th September 2022, the results of the study were presented at a multi-stakeholder workshop. The aim of the workshop was to promote a dialogue among various stakeholders and identify future goals for engagement between the multiple stakeholders.

The workshop was attended by 26 participants representing 9 civil society organizations, 3 academic institutions, and 1 government agency. Such a platform for open dialogue, helped us with critical feedback of the study, while also underscoring the need for greater academic involvement.

Veteran social activist Kapil Shah noted that, *"no other academic institution I know, has done a study on this topic in Gujarat".*

The discussions brought out several contentious issues within the practitioners. For instance, some of them commented on how various terminologies related to agroecology is confusing for farmers and researchers alike. While some wanted to use the principle of exclusion, to arrive at a category of farming – like "non-chemical, non-GMO", others looked for established definitions from institutions like FAO. The survey created newer questions that participants felt would help foreground issues of small and marginal farmers, as well as women farmers who are often the least likely to receive benefits from government schemes and non-profit interventions. The representatives from the Gujarat Organic and Natural Farming University pointed out the need for greater focus on the technical aspects of agriculture. Interestingly, the discussions also helped CSOs highlight

their individual contributions and ideas, such as designing game-based instruction manual for farmers, or a catalogue of farm work done exclusively by women.

As the dialogue highlighted, there is a lack of common grounds for collaboration among the stakeholders, fuelled by contesting interests, and absence of definitive evidence. A process of collective knowledge generation can help in bringing together the divergent interests. Documenting and synthesizing the outcomes of such dialogues can help create sustainable institutions for capacity building of the farmers.

From conversations with different stakeholders, we realized that, although there are many disparate initiatives, the farmers of Gujarat are caught between competing streams of information vis-à-vis sustainable agricultural practices. Initiatives mentioned above create spaces for collaboration between these groups can help build local institutions, which is crucial for the scaling of agroecology-based practices through empowering transitioning farmers.

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Building Institutions from Below

Maati Maange More: Can 3M bio-input resource centres (BRCs) meet farmers' needs?

Pramel Kumar Gupta and Deborah Dutta

Sustainable agriculture is critically dependent on soil health, but often ignored in comparison to the focus on inputs and yields. Recent efforts in building and managing bio-input resource centres through farmer participation offer promising ways of building land stewardship and scaling agroecological practices.

In his 2020 world food prize acceptance speech, Prof Rattan Lal explained that agriculture must prioritise soil health to face the twin challenges of climate change and food security. According to his studies, fertile soil, which is decomposed plant matter teeming with microbes, can sequester or store nearly 180 gigatons of carbon from the air. To put that in perspective, the total fossil fuel emissions each of the last few years have been ten gigatons. However, the combined pressure of soil erosion and heavy use of chemical fertilisers and pesticides have depleted the soil cover to the extent that Rattan Lal describes as a peak soil threshold. Without concerted efforts to rebuild soil health, we are effectively losing the chance to mitigate climate change and secure sustainable food production systems for the entire planet.

Recognising the significance of soil

Most interventions today are geared towards markets and crop productivity, and soil health is often discussed as an afterthought. Farmers have an intuitive sense of the interdependence of soil fertility on the overall farm ecosystem but are unable to find relevant support. GREEN Foundation's campaign, 'Matti Mange More (3M)' is aimed at restoring living soils by promoting a soil farm card participatory assessment. The participatory approach would allow farmers to categorise their farms based on organic carbon content present in the soil and work with a network of civil society organisations to improve the quality of their farm soil. While working on the campaign, GREEN Foundation realised that farmers need support to develop natural inputs for the soil, as well as access to quality materials to change their behaviour of excessive reliance on market-based chemical inputs. To address the knowledge-practice gap, they collaborated with

the National Coalition for Natural Farming (NCNF) to develop bio-input resource centres.

Natural farming plots with minimal tillage, bio-mulching and bio inputs from Bankhedi Block, Hoshangad district, Madhya Pradesh

Creating multiple paths for transition

Currently, the foundation is working on natural farming with nearly 625 farmers spread across three blocks (Bankhedi, Pandhurna, Sausar) in Madhya Pradesh, and garnering an enthusiastic response from the agrarian community. They have focused on three types of farmers, to begin with:

A. Those who don't have the finances to buy chemical fertilisers,
B. Those who have grown tired of using chemical inputs and are looking for alternatives, and
C. Those who have already begun experimenting with alternative forms of input.

In terms of impact on the land, the foundation is working at three levels:

A. Supporting farmers to create inputs for personal consumption with coverage of ~5 acres,
B. Providing technical and infrastructure support to farmers interested in selling bio-inputs at a small scale, thus covering an area of roughly 50 acres, and
C. Collaborating with Farmer Producer Organisations (FPOs) to help create larger clusters and markets to sell bio-inputs, thus covering an area of nearly 500 acres.

Young farmers learning bio-mulching on Mango plant at Junawani Dhana village, Bankhedi block, Hoshangabad district, MP.

Using multiple approaches is helping them reach out to the marginalised as well as rich farmers, as behaviour shifts amongst the latter category can also enable change in social perceptions. This involved process seems to garner better response from farmers' in terms of working towards improvement of their farm

lands, as compared to the government issued soil health cards that are not equipped to provide any support beyond basic information of their soil quality. Creating bridges from information to motivation is often a challenge, and is one that GREEN foundation has been able to engage with heads on.

From transition to transformation – farmers share their stories

Mohan Singh from Keshala village depends on his 3 acres of agricultural land for his livelihood. He had been finding it increasingly difficult to make ends meet with the rising cost of urea and DAP on the one hand and decreasing soil fertility on the other. With loans piling up, he was looking for alternatives and contacted GREEN foundation staff. With their help, he developed the skills to prepare *Jeevamrut*, waste decomposer (developed by a KVK) and vermi-compost. With regular use, he found his soil becoming softer and more cultivable. According to him, his wheat crop looks more beautiful and attractive. His cost of cultivation has come down from Rs 14230 to 8300, with the added benefits of growing chemical-free food. His experience has motivated farmers in nearby areas to switch to bio-inputs too.

Similar reasons had prompted Marhesh Manmode in Raybasa village, Pandhurna block, to start natural farming on 1.25 acres of his six acres land nearly two years ago. Following the training support provided by the GREEN foundation, he was able to witness a significant increase in fruiting and flowering of crops and has enhanced his income by nearly Rs 18000. The promising results have motivated him to take up natural farming practices over the entire land gradually.

An indication of soil health improvement

Some small farmers like Purshottam Kushwaha of Bankhedi village in the Hoshangabad district of Madhya Pradesh have been able to establish bio-input resource centres on their farms and combine them with other practices of seed-saving. Purshottam's interest grew rapidly after he attended a seven-day training on Bio-Resource Inputs Center (BRC) at the Krishi Vigyan Kendra(KVK) at Kurnool, Andhra Pradesh organised by the National Coalition of Natural farming (NCNF). He saw the methods as offering him a solution to improve the soil quality on four-acre land that had become nearly uncultivable after years of application of chemical fertilisers. So now he is making bio-inputs such as *Jeevamrut, Das parniastra, Neemastra, Ghana jeevaamrit*, etc. and applying the same in his field regularly. He also opened a local seed bank, so nearby farmers are able to contact him and learn more about regenerative agricultural practices.

Savita Bai from Maidakhera village, Bankhedi for the first time cultivated moong crop using only locally prepared bio-input in her one acre farm.

A persistent concern regarding an uncritical promotion of bio-inputs has been its impact on women, fearing that they would bear the brunt of such labour-intensive processes. However, these can also become remunerative options for self-help groups interested in running bio-input centres. Moreover, women are also keenly aware of the immediate health benefits experienced by the farmers, as they stop using chemical inputs and have been vocal in their support for natural-farming practices. Engaging with women to promote equitable production and consumption of bio-inputs thus seems a promising path to follow.

BRCs managed by champion farmers level

Such narratives signal the potential of a systemic change in farming practices, led by farmers and grounded within the rural community. The initiatives by GREEN Foundation can provide the much-needed nudge in the direction of sustainable transitions and create the base for local economies focussed on the effective use of bio-inputs, thus supporting the Centre's push for natural farming practices across the country.

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Legitimising grassroots efforts: How frontline workers became certified agriculture extensionists

Saswatik Tripathy

Krishi Mitras in Odisha have been able to build on their experience to gain certification as agricultural extensionists through newer institutional arrangements between OLM, FES and ASCI.

Capacity building at the grassroots – Becoming a Krishi Mitra

Women like Gita Satpathy might look like any other ordinary village women, but their work and contribution as a Krishi Mitra in the region of Nayagarh, Odisha, has been unique. The Krishi Mitras are the selected members of the SHGs of Odisha Livelihood Mission(OLM) who are responsible for the agricultural development in their gram panchayat. In a gram panchayat, three Krishi Mitras divide the villages among them and promote different agrarian approaches. In Nayagarh, for the past two years, Krishi Mitras have been promoting sustainable agriculture among the farmers of four blocks amid of COVID 19 pandemic.

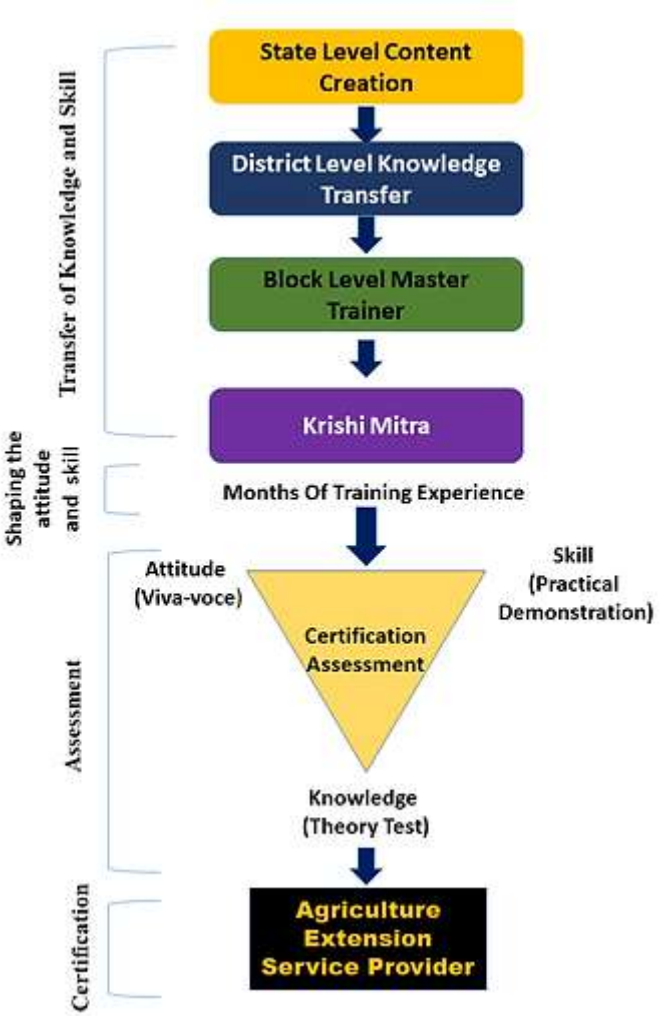
They have been able to develop their skills and knowledge through participating in several capacity building programs organised by Odisha Livelihood Mission (OLM) and the Foundation for Ecological Security(FES) on sustainable agriculture practises as a part of the OLM and FES partnership in the state. Hindustan Unilever Foundation and Socion partnered with FES in the two year long initiative. The pandemic severely disrupted physical training and workshops, but the women were motivated to overcome obstacles and learn through online mode. Women who had never used an app before learnt how to operate Zoom platforms and attend programmes. They now get digital attestations with the PDA Participant app, where they quickly access the reading materials used in training to enhance their knowledge in the sector. The Master trainers of FES handhold the Krishi Mitras and help them during the activity at the grassroots level to improve their training skills. It was challenging for them to convince the community with their leadership positions as knowledge experts during the initial period because the community felt that they did not have enough experience, training, or a certificate from a formal institute.

During the two-day training session

To solve this issue, FES collaborated with the Agriculture Skill Council of India(ASCI) to certify them under the Recognition of Prior Learning (RPL) as an Agriculture Extension Service Provider, a nationally recognised job role under the Skill India initiative of the Government of India. These training programs are based on Government of India approved qualifications followed by assessment and certification.

Recognising the skills and knowledge of Krishi Mitras

Among the 108 Krishi Mitras working in the Nayagarh district, 25 were selected for the first phase of the certification process. Specific parameters like their performance over the last two years, the rate of adoption of the farming approaches in their area, and the level of participation during the training sessions, amongst other factors, were considered. After the registration in the ASCI portal for the certification process, a two-day long training was organised to share the certification process and provide them with a quick refresher on the relevant topics for the certification process. During the certification process, the external assessors selected by ASCI assessed the attitude, skill and knowledge of the Krishi Mitras through Viva-voce, practical demonstration, and a theory test.



Newfound confidence based on the certification process

The selected Krishi Mitras are from 4 blocks of Nayagarh, *i.e.* six each from Daspalla, Nuagaon and Ranpur block and seven from the Odagaon block. Among the Krishi Mitras, there are 11 Krishi Mitras who have an educational qualification of class 10th, eight of them have completed their 12th, and three have completed graduation. Among the 25, three had not completed their 10th class qualification. For them, the certification process was a novel experience. After the assessment process, the Krishi Mitras shared that they are habituated to give training in a known circumstance in or near their village, but as an agriculture extension service provider, they need to be prepared for everything. They were very clear about the "What" and "Why" part of their training sessions, but after the

certification process, they understood the strength of a trainer lies in the "How to deliver" content to the audience. Their testimonials indicate the significance of the certificate for their professional identity.

Theory Test Using AI in-build TABS from ASCI

Viva-Voce of the individual candidate

Guluri Swin (Krishi Mitra, Ranpur) explained,

"I left school after class eight at the age of 14. This certification process is my first experience of any type of examination out of my village. Without even experiencing the 10th board exam, appearing for a national-level job role certification made me nervous. The master trainer of my block (Babula Rana) constantly encouraged and motivated me. I was so nervous that even after getting ready at home, I could not step out of the door. For the first time, my husband dropped me at the examination centre. My in-laws who were initially skeptical of my work brought sweets after I successfully secured the certificate."

Jita Khamari (Krishi Mitra, Daspalla) shared,

"On the day of certification, it was my sister's marriage. When the certification date was announced, I was very sad and decided not to go for the exam. When I told my sister about my decision, she said, 'we women barely get any recognition, you should go. I will wait until you come back' and I went for the certification process. Now my sister will be delighted to know that I have secured the certificate."

All 25 Krishi Mitras secured the certificates from the ASCI as an agriculture extension service provider, and the recognition might go a long way in bolstering their capacity as well as legitimacy as a knowledge provider.

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From Personal Transformation to Social Change: Initiatives of Shri Ram Krushna Trust

Aneesh Mohan and Arnab Chakraborty

Shri Ram Krushna Trust, founded by Manoj-bhai Purushottam Solanki believes that 'uttam kheti' (superiority of agriculture as a profession) can make a comeback if the farmers truly understand the purpose and intent of farming. The organisation has played an active role in supporting chemical-to-organic transitions.

The entrance to Shri Ram Krushna Trust's Campus at Kukma, Kachchh

Finding his feet at the farm

"Main unhe koi recipe nahi sikhana chahta. Kisaan khud samjhe ki koi cheez kaam karti hai toh kyu karti hai aur woh khud kya kar sakta hai zameen ko behtar banane mein"

("I don't want to teach them a recipe. I want the farmers to understand that if something works well, why does it work well? What can they do themselves that will make their soil better?") explains Manoj-bhai

Purshottam Solanki on the reason for starting his monthly 3-day workshop on cow-based organic farming.

Manoj-bhai recalls that it all started when his mother, unfortunately, found herself partially blinded which led to him realising that one can only lead a healthy life if one has the absolute necessities *i.e., hawa, paani aur ann* (Air, water, and food) as pure as possible.

Simultaneously, he was maintaining accounts for his family's business. He did not find his life in his family-business satisfactory. In search of satisfaction and health, he found himself in a farm-field that he believed gave him both.

Hence, in 1995, he started farming, albeit using chemical means.

The Inception of Shri Ram Krushna Trust

He came across an interesting conversation at a shop. A farmer was looking for pest-control, and the shopkeeper suggested him a particular pesticide. Upon being asked, "Where does the pesticide come from and how it works?", the shopkeeper replied that he had no idea but that it works like magic. Not knowing what is going into his food troubled Manoj-bhai, and that it wreaks havoc to the earth and its beings further agitated him. He wanted to be in harmony with "*Samaaj Sangat, Dharm Sangat,* and *Prakruti Sangat,* (the company of Society, Faith, and Nature)". Hence, in 2002, it was the first time he picked up organic farming.

This, in 2006, led him to discover Kutch Sajeev Kheti Manch (now registered as Satvik), a forum for organic farmers mobilised by an NGO called Sahjeevan. Through the forum, he came across 5 famous figures in organic farming lifestyle, each of whom inspired him differently, namely

- Sarvadaman Patel from Anand, with expertise in biodiversity and husbandry
- Kapil Shah from Baroda, on Gandhian philosophy with respect to farming
- Bhaskar Save from Valsad who protested against and discarded the use of urea
- Dhirendra and Smita Soneji, who decided to start their own 2-acre farm after living with *Adivasis* to understand their farming and also make value-additions.
- Mahendra Bhatt, who made a *chulha* and refrigerator from earthen clay.

Influenced by their ideas, he wanted to start something of his own. In 2007, he ideated the Shri Ram Krushna Trust Foundation which he finally registered in 2010. By 2012, his own farms had become fully organic. Out of the total 80 acres he now owns, a quarter of the farms are rain-fed.

An alley of semi-traditional Bhunga houses of Kutch at the campus that are resilient during earthquakes and are climate responsive. These serve as guest-homes for volunteers

Taking the 'Trust' forward

With the inception of his Trust, initially being taken care of by his father and other family members, he toured the country to learn the principles of farming from the experience of farmers. He believes that certificates can be fudged, but one cannot fudge 'experience'. Rather than teaching marketing or recipes for organic farming, he wants to teach principles so farmers can innovate themselves. He does not want farmers to switch to organic methods based solely on external incentives, as those parameters can change with market and policy priorities. Instead, he envisions a value-shift amongst farmers so that they are motivated to practice sustainable farming irrespective of external factors.

Based on his learnings from exposure visits to various places, he designed a 20–30-day long training programme to propagate organic farming which was later sub-divided into many courses, including an introductory, highly condensed 3-day course that acts as a primer for future courses. The principles he picked up through Kutch Sajeev Kheti Manch are embedded in the course elements. The Trust's campus architecture also reflects his idea of rural self-sustainability. He sees a footfall of 20-50 people for his 3-day workshops which are routinely held each month. The trust lays its objectives in spreading the principles of organic farming and animal husbandry, researching and developing new innovations in agriculture and, promoting rural self-sustainability.

The 3-Day Workshop includes people from all backgrounds including home-gardeners, farmers, even IT Professionals and more.

To encourage attendance, he used to go to different villages once a week and 'advertise but not coerce' farmers to join his trainings He used his contacts from Rashtriya Swayamsevak Sangh (RSS) to reach a larger audience. He is now a central figure in the network of organic farmers of Kutch and has mobilised a few who now act as valuable knowledge resources to others.

Expanding scopes for self and society

Manoj-bhai attended the 7-day Vishva Gau Sammelan, an international conference held in Hosanagara, Karnataka in 2007 to celebrate, promote, and improve Indian breeds of cows. Post the sammelan, he wanted to work on cow-based farming and productions in Kutch, which is home to 'Maaldharis', a group of pastoralist communities who for centuries have been masters of rearing cattle and have bred them for vigour.

Over time, his organisation developed various products for retail sale, using *panchagavya* (milk, urine, dung, *ghee* and curd derived from cattle) like the many ayurvedic concoctions that include *gaumutra*, *gobar* craft. The sale helps in running his Trust.

Gobar Ganesh: Crafts made from cowdung

A firm believer in the spiritual and cultural power of engagement with cows, he comments,

"All communities in this world are directly or indirectly dependent on cows. There is something unifying about them. Isn't this Sanathan Dharm after all?"

His work illustrates the general tendency of combining ideological beliefs with agroecological practices.

He is also a member of Indian Council for Agricultural Research (ICAR) and has given his recommendations routinely, one being that the panel must also include farmers.

At present, his trust is running an *Akshay Krushi Parivar* project wherein the major programmes shall be increasing awareness of one's own surroundings, revitalising soil, seed banks, and teaching value addition. He wants to design this entire project with people who are related to agriculture in manner possible - be it policy makers, farmers, investors, scientists or anyone.

Aneesh Mohan is a Research Associate in the 'Living Farm Incomes' project at IRMA.

Arnab Chakraborty is a Research Associate in the 'Living Farm Incomes' project at IRMA.

Of Humus and Humility – An earthy journey at the Bhaikaka farm

Deborah Dutta and Vandana Ravichandran

Bhaikaka Krishi Kendra, located in Ravipura, Gujarat is an organic farm and outreach centre. Here, Mr Sarvadaman Patel has been farming 40 acres of land using biodynamic principles for the past 20 years. His love for the land is only matched in his enthusiasm to teach others, as evident in his larger vision for the space as a vibrant community hub for farming using biodynamic principles.

70 going on 30 – the youthful spirit of Sarvadaman Patel

"I'll be at the back side of the farm doing some work, please join me there directly"

These were the first words we heard when asking for directions to his farm. Sure enough, we found him bent over, examining the ground. His cheerful voice and stamina belie his age, as he immediately began showing us around the place, patiently answering our volley of questions.

Shahzad, an intern working with him for the past three months, accompanied us as we began walking in the farm, explaining Mr Patel's painstaking and careful efforts to rejuvenate the land. Mr Patel, affectionately known as *Mota Bhai* began by showing us a shaded semi-circular sitting area, where a lot of workshops and talks take place. *"These benches are made from the branches of a tree more than 100 years old, and are made of hardwood... Peter took many classes right here."* He was fondly referring to Peter Proctor, widely considered as the father of modern biodynamic farming. He stayed on the farm for almost a year in 2005 and helped it align with biodynamic principles along with other experts such as Rachel Pomeroy. *Mota Bhai* has conducted a number of training programs since 2006 for a variety of audiences ranging from officials of different institutions, national and international individuals, as well as tribals from remote areas. Till date, over a 1000 individuals have been trained in organic and biodynamic farming as a result of his steady efforts.

A ground-up transition – building soil organic matter

Highly qualified in the prevailing knowledge forms of the time, *Mota Bhai* did his Bachelors from G B Pant Agricultural University followed by a Masters in Agronomy at University of Wisconsin Madison, USA.

Eager to put his knowledge into practice, he bought 32 acres of land at Ravipura with the help of his father, started farming on the land using chemical methods in the late 1970s. However, by the late 1990s he realized that the farm yields were falling despite increased use of pesticides and fertilisers. He intuitively knew that he had to change his methods. He had grown elephant yams in a small patch of neglected land, and had got a good harvest. So, he thought of simply expanding the area under elephant yam with minimal input but failed to get a decent harvest. Similar experiments of trying to grow vegetables on a larger patch of land using organic methods also didn't pan out well, so he decided to undergo formal training and began reading about various organic practices seriously. Slowly he began seeing results and has been constantly building on his learnings and experiences at the farm, eventually increasing the land size to 40 acres. Drawing our attention towards the soil he commented,

"The organic Carbon content, or Soil Organic Matter (SOM) in the soil has fallen below .5 per cent in many areas in India, with it being as low as .3 per cent in Punjab. After several years of following ground cropping techniques, and mulching the soil the SOM here is about 1.42 percent. Every .5 percent rise corresponds to approximately 4 times increase in water absorption. Increasing water holding capacity and microbial content in the soil marks the beginning of a healthy farm."

Dr Rattan Lal, who recently received the prestigious World Food Prize, commented on the fact that we are entering a 'Peak Soil' moment, where it may be impossible to revive soil fertility unless concerted efforts are made to increase organic matter in soil. In recent years, methods of land management to increase SOM have been argued to be one of the most effective ways to store atmospheric carbon. 40 acres of diverse vegetation and rich soil stand testimony to *Mota Bhai*'s intimate understanding of these interconnections. Apart from farming, *Mota Bhai* has also overseen the plantation of over five Lakh native trees across Gujarat and Rajasthan to prevent soil erosion.

Tending the land is a full-time occupation

He showed us the variety of cover crops (Sunhemp, Clusterbeans, Sorghum, Cowpea amongst others) grown throughout the year, to help in nitrogen fixing, and add biomass to the soil in the form of mulch when these crops are cut at different stages. Each patch of land seemed to have a unique microclimate depending on the arrangement of crops growing in the area. Despite a number of unwanted visitors on the farm in the form of raiding groups of monkeys, wild pigs and even neighbouring farmers looking for fodder, *Mota Bhai* has devised ways of growing some crop on almost every inch of the land, using even the borders and trenches. This work is labour-intensive and requires close attention to the varying soil conditions on the land.

While the full-time staff of 12-15 people (mostly tribals from Madhya Pradesh) is quite satisfied with the fair working and living conditions, finding labour has been a constant challenge for him, *"Over the years, a lot of helpers left the farm in search of better opportunities. We also had to shut down a small shop we had opened on the main road to sell our produce... So, I have opted for more woodlands, fruit orchards rather than having too much area under vegetables and grains... ". Mota Bhai* also has 30-35 cattle and he grows nutritious fodder for them on the farm itself. He hasn't bothered to certify the farm as organic, but has developed a loyal clientèle over the years who are quite satisfied with the produce and the milk quality.

Many followers but uncertainty of a successor

Mota Bhai's vision has been to eventually convert the entire farm into a *Gurukul*. According to Ashish Gupta, co-founder (and student of BKK), of Gram Disha Trust, "*A lot of us owe our entire perspective of farming systems to him. It is not just about techniques. He teaches you about the culture in agriculture.*"

Senior apprentice Mr Ravi Kaushik has been instrumental in enabling short and long-term internships at the farm and helping establish the *Gurukul* system. Organisations such as IFOAM-Asia conferred the "Lifetime Achievement" award to *Mota Bhai* in 2016 in recognition of his sustained efforts to create a new generation of farmers practicing regenerative agriculture. Yet, it remains uncertain if anyone would be able to continue the mentoring role of *Mota Bhai*.

"*We are concerned about how to keep this wonderful and important space active... Mota-Bhai created one of the best examples of a farm ecosystem in India, or even globally. We need to figure out how to build on his work from this point on.*" says Ashish.

Despite the looming uncertainty - exacerbated by the COVID-19 pandemic, *Mota Bhai* is intent on carrying on for as long as he can. Ever willing to teach, he generously welcomed us to return to the farm as weekend volunteers, and we

can't wait to get our hands dirty. Hearing of the vast alumni and network of learners further his teachings in different ways, I am reminded of Andy Dufresne's immortal words, *"hope is a good thing, maybe the best of things, and no good thing ever dies."* We hope *Mota Bhai's* farm remains a fertile ground for ecological ideas and practices for all time to come.

A version of this article was published at Village Square

Deborah Dutta is a Senior Research Fellow in the 'Living Farm Incomes' project at IRMA.

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Engaging Youth in Sustainable Transitions

Verghese Kurien Rural Internships: Creating pathways for empathy and empowerment

Deborah Dutta

A path forged by fateful encounters

In an interesting set of interviews, a batch of students from the Institute of Rural Management Anand (IRMA) spoke to some of their alumni working in the development sector, asking them a deceptively simple question – "What motivated you to join this sector?" How does one walk away from plush salaries that MBA graduates garner, to spend time in villages convincing farmers to adopt sustainable practices? Are there options beyond the binary of the 'jolawala' and the 'briefcasewala', as one remarked? What did it take to continue to work in their respective fields, taking tough times for granted while celebrating every minor change that their efforts had enabled? Most of the alumni traced their initial inspiration to work on societal issues to their village field exposure and summer (then development) internship segment, designed as part of the IRMA curriculum to ground students' ideas in the rural context.

"If students can be brought into direct contact with the rural poor, especially women and children, it will motivate them to work for them... in the efforts to rise out of poverty they will discover in themselves, unknown corners of their own humanity and develop a determination to do something effective about it."

Fr. Bogaert, had reflected in 1997, on motivating professionals for rural India.

Youth is not wasted on the young

Young people are uniquely positioned to empathise with others' situations. Unlike, the older generation who tend to be more cynical or disaffected, studies show that given relevant exposure, young people are more willing to engage in civic issues, even at a personal cost. The emotions underlying the general brashness and risk-taking behaviour associated with the youth also power incredible passion and tenacity for purposeful action. The 'rebel without a cause' exists when appropriate direction and experiences are lacking. Conventional educational systems often lack the pedagogical interventions that could help students find agency, purpose and satisfaction in ways that contribute to societal good. Field exposures offered by various development institutes are one way in

which this gap is partially addressed. Most learning, according to Ivan Illich, "is not the result of instruction. It is rather the result of unhampered participation in a meaningful setting." Along with formal education in classrooms youth need wider societal exposure through learning opportunities from multiple disciplines.

IRMA interns participating in a training session for farmer producer organisations (FPOs)

Youngsters working hard at the fields along with farmers.

‘The fellow without a ship’

Discussion and engagement sessions of India Fellows

In recent years, several public and private investments have made available various internship and fellowship opportunities for youngsters to gain exposure to the rural areas. These include opportunities such as Young India, Buddha Fellowship, NABARD, Gandhi Fellowship, India Fellow, Prime Minister’s Rural Development Fellowship, Mahatma Gandhi National Fellowship, Earth Ambassadors Fellowship to mention a few. These are welcome developments that have enabled young people to engage with ground realities and explore meaningful career options. However, they are too few to capture India’s demographic dividend. Moreover, as Dr Ajit Kanitkar has pointed out, the lack of proper guidance and mentorship can leave students without a sense of direction during their internship. This is also a loss for the development sector, as the human potential remains underutilised. More importantly, Dr Kanitkar writes, *“The young entrants are coming with fresh perspectives and are not constrained by circumstances, hierarchy and past baggage that sometimes can be limiting factor.”*

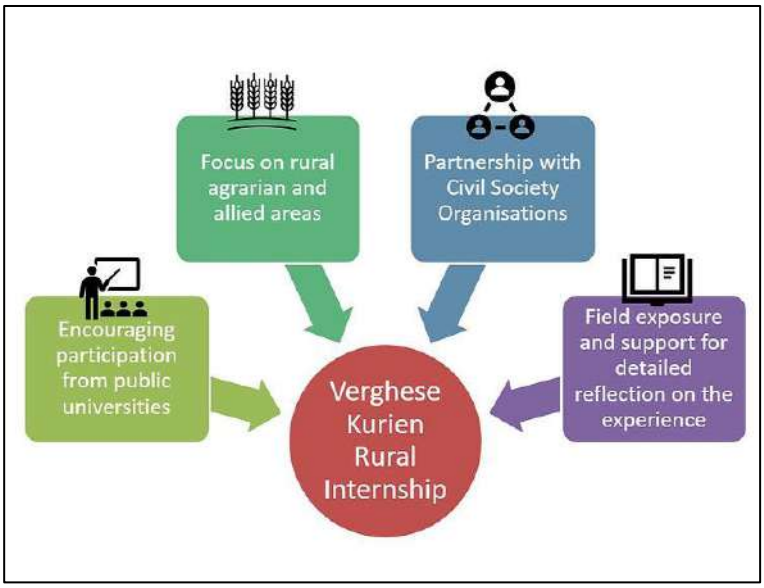
In the absence of adequate attention by the host civil society organisations, they lose out on the interns’ enthusiasm and initiative. Adequate handholding and guidance must accompany students’ foray into rural issues.

Discussion and engagement sessions of India Fellows

At a recent meet up with the current batch of India Fellows, I got a glimpse of the extensive guidance provided to them through fortnight-long contact sessions with seasoned academics and practitioners. Most of the fellows felt that such sessions had helped them navigate dilemmas and problems encountered in the field as part of their fellowship.

Verghese Kurien Rural Internships: A step in facilitating meaningful, guided exposure

In an attempt to support such initiatives, IRMA intends hosting the Verghese Kurien Rural Internship (VKRI), which aims to provide youth from public (central and state) universities an opportunity to intern with CSOs working on agriculture and allied issues. The sectoral focus seeks to break silos with more youth without agricultural backgrounds seeking to be part of India's farming futures often after their stint in the software industry. Farming connects social, economic and ecological dimensions in fundamental ways. In partnership with outreach platforms, the project will be reaching out to host CSOs who are actively involved in the rural sector and have a clear agenda/ work plan to engage the students.



Overview of the VKRI project initiative

Based on their experience and work with the organisation, students will be encouraged to share reflective articles. These could form a repository of 'authentic student voices' embedded in their perceptions rather than formal reports usually drafted by researchers. The efforts made towards informing students about the internship through curated talks and presentations at the universities would hopefully generate wider awareness about agriculture, sustainability and livelihood issues. This can lead to collaborations between academics and practitioners to co-create knowledge and policies for ground-up, social transformations. In the face of unprecedented and dynamic changes in society, there is an urgent need for empathetic and inclusive innovations to create equitable, sustainable and flourishing environments. Relevant internships can provide young people with the impetus and ideas to spearhead such initiatives. Nurturing such kinds of grounded learning and the motivation for action is a worthy cause to pursue.

If you are an organisation interested in hosting interns, or a student looking for meaningful internship opportunities, please visit https://www.smallfarmincomes.in/internship for more details. You can also write to us at farmincomes@irma.ac.in to explore collaborations and internship projects.

Deborah Dutta is a Senior Research Fellow in the 'Living Farm Incomes' project at IRMA.

Understanding land, livelihood and labour - my internship experience in rural Karnataka

Joshua Lobo

Getting introduced to Punarchith

I did my internship with Punarchith, an organisation that is trying to reconceptualize small farming as potential centres of economic and ecological sustainability. The study aimed at understanding the eroding and contested history of agroecological practices in the semi-arid District of Chamarajanagar, Karnataka. Over the next few months, I was introduced to a variety of topics on Indian agriculture and gained some practical experience in the area. My assignment was to investigate 'Dry Grain Complexes', a concept developed by Dr. A.R. Vasavi, my mentor for the internship. The concept derives its name from the dry ecological zone and the types of crops which are a combination of rainfed cereals and pulses/legumes and vegetables that are grown under rainfed conditions and are based on dry cultivation practices and methods.

Angarike Maala – A space for collective experimentation and learning.

Dr. Vasavi introduced me to exciting literature on climate change and agroecology that gave me a much-needed base for the study. I was also given opportunities to sit in at farmer's meets and many other online conferences. I attended an eye-opening lecture by the Teachers Against Climate Change collective which attempted to reconceptualize climate change in the context of environmental justice. Around this time, I sat in on a public hearing of a farmers collective wherein I got to hear first-hand accounts of farmers who were dispossessed of their land. Later, I travelled to Nagavalli in Chamarajanagar where I stayed for a month in the Punarchith headquarters. Punarchith cultivates a large piece of land called 'Angarike Maala'. The purpose is to make it a space for community experimentation and learning. Through years of hard work, the team has cultivated chemical-free, organic produce using dry land farming methods. I regularly visited the land, helping the experienced Mr. Badri and Mr. Muthu with the farm work.

Exploring the field with Mr Badri and Mr Muthu

I was able to participate in the team's current projects such as awareness for the upcoming panchayat elections and cultivation demonstrations at Angarike Maala. I was also acquainted with the precise art of soap making by assisting the young and energetic members of Honneru, the youth collective of Punarchith.

Soap making at the Honneru collective

I familiarized myself with the rural settings; how people lived with little and worked hard for the little they had. Walks with Dr. Vasavi through the village brought about revelations in my understanding of caste in rural India specifically about the relationship of caste to land ownership, and the invisible territorial lines drawn across the village occupancy. This combined with conversations with Dr. Dwijendranath Guru, a core team member at Punarchith, helped me see that dry grain farming was as much about people, as it was about the ecology. Discussions with him allowed me to appreciate the study with new depth. Most days were a combination of field visits, research and formulating how to take the study forward with the new information that came in every day. I conducted detailed interviews to gain insight from various individuals belonging to different castes and classes. Although mainly concentrated in Nagavalli, members from 4 other villages also

participated in the study. I learned so much from the interactions I had with team members of Punarchith. Their life stories and views on the world radically differed from my own and helped expand my perspectives.

A pumphouse in Angaarike Maala which is no longer used for irrigation.

A newfound respect for work

The experiences that impacted me the most, came from the time I physically spent at Punarchith. Having lived all my life in a metropolitan city, staying in a village revealed the inconsistencies in the world I lived in. Often the urban is taken for granted as a uniformly global culture based on principles of commerce. It was the small things like noticing the differences in language, observing rituals, the connection of land to food, land to livelihood and how diverse communities lived in close quarters. It gave me a glimpse of the roots of India's people and my own and how they manifest themselves even in modern urban settings. My other learning was a visceral understanding of what constitutes work. When I was at the farm, at one point the cow-pea fields were ready to be harvested. Each of us, some of the team members and I, carried a bucket to the field. Squatting the entire time, it was three hours of grueling effort plucking the mature fruits from the plant. Of course, I speak only on my behalf since the others were racing through rows of crop, talking about their daily ongoings, and village affairs. What I understood however though is how difficult the work really was. To toil this much, produce nutritious food and then be exploited by market forces, either at the point of sale or cultivation, was abysmally unfair. Dragging heavy buckets of water from the happenstance farm pond just to throw a little water on a tree

sapling. A sapling that did not promise fruit and had a long way to go before it did. The young trees that needed to be pruned regularly.

A tree sapling covered with mulch

The neat meshes of coconut branches had to be coiled around its branches so other animals would not eat its leaves. It became more and more relevant that physical labour involves a lot of skill and knowledge; one might argue much more than what is formally taught to us! Demand and supply seem so logical when processed as an intellectual exercise. However, physical experience says otherwise, overruling the narrow premise of economics. The actual experience, and the personal accounts of farmers, fill in the logical gaps that free-market and tech-based economics leave out. I learned how farmers were accounting for the decreasing fertility of the soil, depleting groundwater levels, and climate change through their practices. Whether it was through efficient use of every piece of biomass on their land for irrigation, natural fertilizer or through a primordial understanding of working within the limits of their ecology that maintained a delicate balance.

An end that marked a beginning

I found the internship to be a deeply enriching experience. It has inspired me to go on and investigate various facets of rural India. Currently, I am pursuing a job that allows me to travel to 60 villages within the Bijapur district. Here I am hoping to uncover the dynamics of social relationships with regards to gender and property. I am sure, as I have learned through this internship, the social is fundamentally intertwined with the economic. Through my experience, I feel more motivated to engage with the agrarian crisis in India.

Joshua Lobo was an intern under the project - 'Living Farm Incomes" project at IRMA. He did his Masters in Development Studies from Azim Premji University.

Towards A Greener Revolution: Redefining Agriculture in Post-COVID era

Sital Kumar

Sital Kumar, a student at Ashoka University shares his Verghese Kurien Rural Internship experience, where he interned with the National Coalition for Natural Farming (NCNF) and explored narratives of small-scale farmers practicing natural farming.

Why the internship?

In the Spring of 2020 at Ashoka University, I took a course on Agriculture, Food and Sustainability. The course delved deep into agro-economy, supply chains, food processing, and Agro systems. While doing the course, I realised that the present system is unsustainable, with devastating environmental impacts. As a political science student, interested in the intersectionality of agriculture, food systems, and state regulation, I was drawn towards the Verghese Kurien Rural Internship.

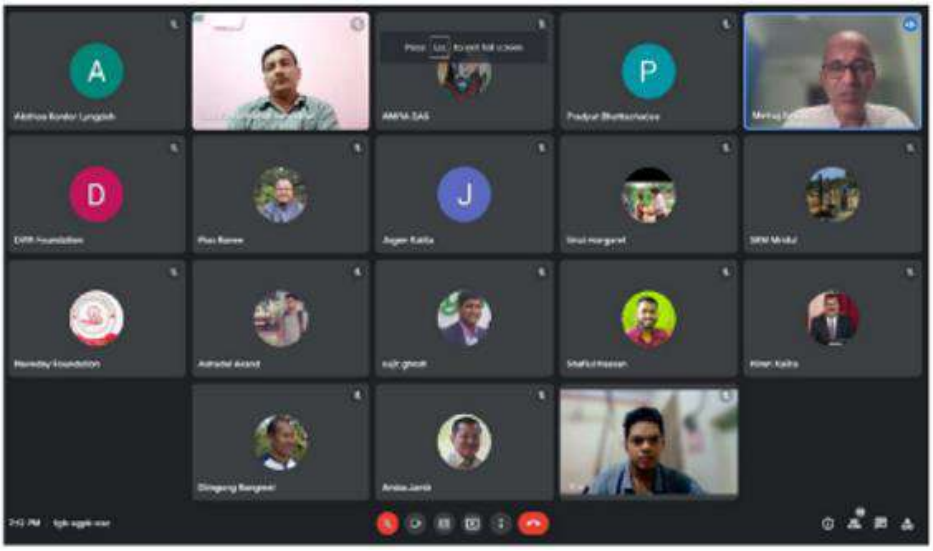
My deep dive into natural farming

My internship was with the National Coalition for Natural Farming (NCNF), a network of different stakeholders engaged in the practice, promotion, and scaling of natural farming in India. Working as a research intern, in the first few weeks, I went through materials related to agriculture, agroecology, food chains, markets, and the undercurrents of the natural farming movement. I was supported and mentored by many team members during this process. Following the introductory phase, I worked with all team members on various projects, with each project presenting a unique learning opportunity.

Understanding the role of networking in creating solidarity

Natural farming is supported by pioneering individuals- farmers, activists and spokespersons, and organisations that support the cause. To transform the grievances into a widespread mobilisation of demands, networking, exchange of resources, information, documentation and cooperation among the stakeholders

are essential. NCNF anchors itself with this task of coordinating and collaborating at a national scale. In the initial part of the internship, I assisted in creating a national database of natural farms and farmers, which could act as a communication template.



Meeting with Organisations from the NE Region for 23rd Event organisation

Similarly, the NCNF team is working to create a state-wise compendium of practices, taking into account the various ecological zones and cropping patterns. I documented the stories of different farmers who have succeeded in their transition to natural farming. These stories act as inspiration for new farmers. Later, I engaged in networking activities by initiating interaction between different organisations in three different regions -- East, North-East, and South.

This was the most important and demanding part of my internship. Coordinating with senior members who have worked longer than my life in such sectors was intimidating and tricky. However, the coordination process was an immersive learning experience. I could engage in interactions on wide-ranging topics, including lively discussion about farmers, working structure, policy mapping, challenges on the field, and the states' impact on all these junctures. Hosting the North-Eastern regional event on 23rd July provided a platform for collaboration, resource sharing, mobilization, and celebration of Natural Farming practices. When tasked with collecting and curating audio-visual inputs for the anniversary event, I was exposed to multiple languages, cultures, and livelihoods. On a personal level, it sensitized me towards my consumption patterns and ideas of modern living.

How are champion farmers practicing natural farming?

My internship allowed me to witness different facets of natural farming as a social movement. In my understanding, the natural farming movement is a response to the current crisis of agriculture. Many of the farmers I conversed with, both on and off the field, expressed their willingness and interest in shifting to natural farming if provided with relevant support (knowledge and finances). Farmers actively participated in learning, creating innovations, sharing resources and taking initiatives to promote natural farming. They realised, natural farming can potentially challenge prevalent farming systems that are dependent on chemical inputs, capital investment, land ownership, gender norms and exploitative labour.

In conversation with Farmers exhibiting her field with a Multi-Layer Farming set-up

Pointed Gourd ready for harvest.

According to Sobha Muduli, a farmer from the Khordha district of Odisha, whom I interviewed during my field visits, Natural farming provided her with safe and nutritious food which she can proudly feed to her 3-year-old grandson. To other farmers, it means a stable income. For Pranati Nayak, a widowed farmer, natural farming is a low investment pathway of steady income for her family of two children even during the most uncertain times of the pandemic. For some others, natural farming harks back to a pre-Green Revolution period, with both aesthetic

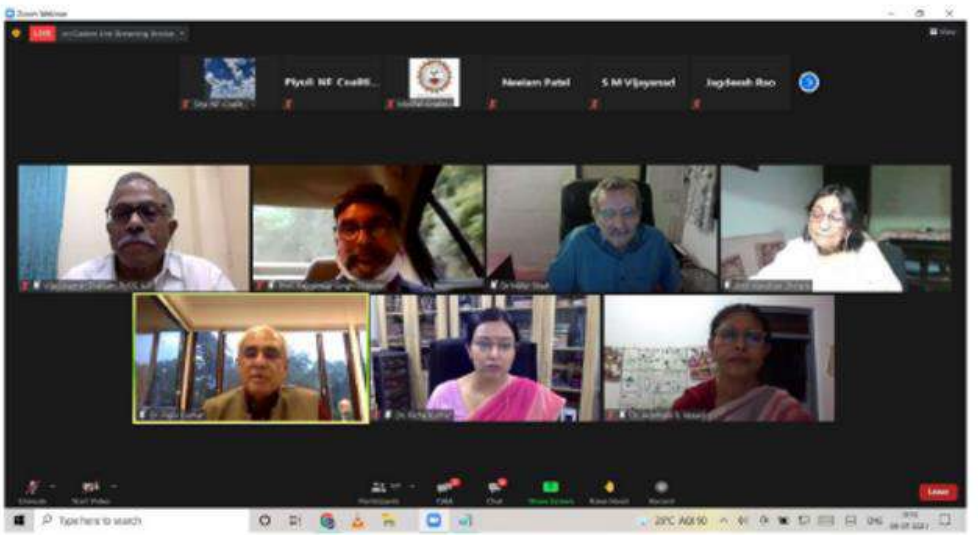
and cultural significance attached. Mrs Sulochana Parida, a 60-year-old farmer, fondly remembers the taste and aroma of unique recipes from her childhood that she can recreate, thanks to the naturally grown local varieties of cereals, pulses and vegetables.

Crop Diversity supports local fauna.

Preparation of a hybrid fertilizer Handi

Working towards amplifying state support

As part of the internship, I was also able to witness first-hand the kind of discussions necessary to catalyse state support. As a moderator of the Regional Meetings on natural farming, I collected data on grievances and demands of different NGOs. Big steps in generating traction among the upper echelons of the bureaucracy were two events. The first being - Seeds for a vegetable garden, chaired by Ram Mohan Mishra, secretary of the Ministry of Women and Child Development. The event was aimed at the promotion of natural farming and nutritional security via Kitchen Gardens (Poshan Garden). The second event was the Policy Consultation event organised as a part of NCNF's first-anniversary celebration. The panelists were many notable Policy Makers including Dr. Rajiv Kumar, the vice-chairman of NITI Ayog. The meetings concluded with brilliant insights on the policy front at different levels of production and consumption. I was tasked with the social media coverage and post-event record-keeping for these events, which allowed me a deeper insight into significant comments by the advisors.



The Panel Discussion on Policy Consultation organised on 9th of July

Towards a Greener Revolution

Towards the end of the internship, especially while writing this blog, I began to reflect on the significance of natural farming. What was the role of natural farming for the people engaged? While I framed natural farming as a social movement in the making, it might be different altogether for people. For the farmers, it was an alternative for better livelihood; for women in the households, it meant empowerment; for some activists it meant an active resistance while for others it was something else. With my continuous engagement with different stakeholders on and off the field for the last three months, I concluded that irrespective of the nature of engagement, Natural farming is a revolutionary change in our food production and consumption paradigm. Natural farming alters the nature of humans and labour by bringing us closer to our food systems and nature.

Sital Kumar is a student at Ashoka University

Natural Farming in unnatural times: Creating self-sufficient communities during the pandemic

Anjali

Anjali, a student at Ashoka University shares her Verghese Kurien Rural Internship experience, where she interned with the National Coalition for Natural Farming (NCNF) and explored narratives of small-scale farmers practicing natural farming in rural and urban areas.

Sameet from Uttar Pradesh distributing plants to build community

Why this internship?

We are facing one of the most dangerous global health crises- one that is spreading human suffering and disrupting lives. The Covid-19 pandemic is not only a health issue but also impacts the economic and social lives of the people largely. The pandemic has also impacted the Indian agricultural system. To understand these factors, I did a course on Political Ecology on Agriculture where I learned about the different aspects of the agricultural economy and farmers'

social lives. Fortunately, during my college internship fair, I came to know about an internship opportunity at National Coalition for Natural Farming. NF Coalition is a network and a collaborative platform that connects different organizations and local farmers and many individuals whose motive is to accelerate the agroecological farming practices in India.

I found this was a great chance to continue with my learning in the same field. In this internship, I got the opportunity to interact with the individual farmers, farm groups and many organisations to get hands-on experience and know about their challenges behind the transition to natural farming. I did this internship with a positive attitude and an open mind which held me in good stead because not only did I make good connections with my mentors, but was also given the opportunity to get involved beyond my expectations.

Growing food locally and organically

Kitchen Garden maintained by Anju, an enthusiast kitchen gardener

When I look back into the past 3 months of my internship, I realise that I was able to pick up diverse skills and experiences. I stepped into this internship with the project 'Poshan Garden' which is an initiative taken by the Coalition for inspiring urban and rural people towards kitchen gardening. The COVID-19 pandemic has

led to a renewed interest in food and vegetables grown locally and organically. Hence, the purpose of this project was to motivate people to develop some self-reliance and avoid consuming food grown using chemicals and pesticides. I interviewed many kitchen gardeners from different states of India who have succeeded in growing fruits and vegetables at home. Listening to different techniques, challenges and progress was really helpful in disseminating their success stories to inspire others for adapting to kitchen gardening.

Shilpi, a kitchen gardener from Haryana

Deepak's mother helping him in kitchen gardening

There was one gardener, Nilesh from Rajasthan who started kitchen gardening in order to consume a hundred percent naturally grown food after his mother suffered from cancer. Another gardener, Shilpi from Haryana said that growing vegetables and fruits enhances oxygen in the air, improves the quality of soil, reduces the carbon footprint of transporting fruits and vegetables, and helps in rainwater harvesting. Many gardeners could minimize their consumption from markets for the daily use of vegetables and fruits to fifty percent on average. Apart from this, many gardeners mentioned that their family's health was improved with healthy and nutritious food, many told that they could reduce the monthly bills on vegetables and could use the time during lockdown productively. It was exciting to know that kitchen gardening came out as a stress reliever and a way to exercise during the lockdown.

Championing Natural Farming

After this project, I got the opportunity to engage with another project 'Champion Farmers' which identifies the champion farmers across India who are successfully leading a sustainable life by doing agroecological farming. This was also similar to the Poshan Garden project in terms of the work required. I

interviewed some farmers from different states of India to know more about their journey of bringing transition to their farms.

In this period, I interviewed Santosh Didi from Madhya Pradesh. Her story of struggle not only constitutes the challenges in practicing natural farming but also the difficulties faced by women in India when they wish to put a step forward in society. Her husband criticised the idea to practice Natural Farming and did not support Santosh didi's will to bring transition to their farm. Santosh didi against his will took a step forward by unlearning the societal fundamental beliefs about women's abilities and skills. Santosh didi has come out as a change-maker for many farmers in her village.

Santosh Didi helping women to make manure

Another farmer I interviewed, Ahmad Basarahat from Uttar Pradesh mentioned that though natural farming is labour intensive he has decided to produce healthy, eat healthy, and serve healthy. He shared, when he adopted natural farming he was mocked by other farmers and was called 'Pagal'(mad). There were challenges faced by most of the farmers, like not being able to get markets to sell their produce at the appropriate prices, not able to get traditional seeds, and specifically the negligible governmental support to natural farming.

Ahmad Barasat in his organic farm

Call for Action to accelerate Natural Farming

My engagement as a volunteer in the Coalition partner event hosted by the NF Coalition helped me to broadly recognize some solutions to the challenges faced by diverse groups of farmers practicing in natural farming. Firstly, investments and technical support are needed to diversify and boost agricultural economies by integrating traditional knowledge and traditions with modern techniques. For example, return to bullocks which can be subsidised instead of power tiller- development of appropriate technology/ tools for bullocks and other small scale tools. Natural farming can be accelerated with government support in terms of making policies providing market access for local food systems, traditional seeds, agroecological practices and training. MSP setting/ implementation for organic produce and other crops may be a stepping stone to get recognition for such efforts.

As Natural farming is labour intensive, it needs to be subsidised, if required through existing schemes like MGNREGA. As women farmers remain largely invisible despite playing a critical role, policies should focus on building the entrepreneurial skills to promote and strengthen women's collectives for market access, land-holding and title access, fair trade business practices, equal pay policies, and value chains that promote gender-inclusive entrepreneurship. Moreover, private sector partnerships sensitive to fair trade, equity, and agro-

ecology are needed. Investing in sustainable, diverse local food systems rather than corporatization of agriculture is the way forward.

Santosh didi with other women from her village who practice natural farming.

Anjali is a student at Ashoka University.

A GLIMPSE OF RURAL आत्म निर्भरता

Arnab Hui, Rahul Raj S, Shubham V. Kulkarni

It is often said that trying to find happiness in monetary items is an illusion. True happiness lies in the fruits of hardworking efforts. We experienced this firsthand when we met Shri Niranjanbhai, a humble and hardworking person in the village of Vaghpur. Located in the Aravalli district of Gujarat and Rajasthan border, Vaghpur is a village of about 96 households, with a population of 533.

Encountering Niranjanbhai's transformational journey

Meeting with Niranjanbhai

Our acquaintance with Shri Niranjanbhai Hirabhai Khokar came through the organization, Development Support Centre (DSC), Meghraj during our Village Field Segment module of the Post Graduate Diploma in Rural Management course from Institute of Rural Management Anand (IRMA). During our visit to Vaghpur and subsequent discussion with him, we learnt about the implementation of natural farming methods and how it helped him become self-reliant. Shri Niranjanbhai, a middle-aged resident of Vaghpur village, also doubles

up as a Local Resource Person (LRP), demonstrating and disseminating information about the work of DSC among his fellow village residents. Educated until high school, he possesses five bighas of land where he cultivates various crops to support his family of seven. Niranjanbhai talked about his previous occupation, regarding how he had to leave his construction activity work because of the manual labor taking a toll on his body (he used to hammer and break large stones into smaller ones which are further used in construction of houses and buildings). Later on, he took up farming activities and animal husbandry to sustain himself and his dependent family of his spouse, parents and three children.

His house is located beside a narrow stream which gets filled only during the monsoon. The area being a rain-fed region, water scarcity is a major issue that also calls for judicial use of water for all household activities as well as irrigation purposes. The stream had entirely dried up during the time we had visited. Being near a flowing stream, they often face problems of flooding during high rains causing crop losses too. What caught our attention is his willingness to explain his practices and hardworking nature.

Learning from field experience to become a Local Resource Person

The LEPNRM (Livelihood Enhancement through Participatory Natural Resource Management) project of DSC aims to impart holistic knowledge towards agricultural development by enhancing productivity, mitigating cost and taking up value addition activities. Niranjanbhai had tried natural farming in his farm on an experimental basis with support from DSC. The first trial was a loss-making venture because nobody in his area was doing natural farming and no prior knowledge was available to him. However, with his resilience and determination, he tried again. With encouragement and technical support from the staff of DSC he doubled his efforts and took it upon himself to manually remove the weeds, and even sleeping in the farm to protect the crops against predators. His persistence brought results and he could grow a number of crops such as Tomato, Watermelon, Okhra (Lady's Finger), Green Chillies, Cluster Bean (Guvar) and Brinjal in his second attempt.

Niranjanbhai was chosen as a LRP to transfer knowledge in his community and to give a demonstration of growing crops in his field using natural farming techniques. From his total five bighas of land, he planted maize in one bigha, wheat in three bigha, and chickpea in one bigha. He also chose to grow various fruits and vegetables such as brinjal, lady's finger, chilli, watermelon. He was given four kgs of corn seeds, vermicompost, neem oil, azotobacter and other organic fertilizers to perform the experiment. He devised a method of drip

irrigation where he made the water flow from a storage tank near his house through inclined pipes to his farm, about 1-1.5 km away. The tubes were connected to a device from where the water flow rate could be controlled by valves.

A glimpse of the landscape

Niranjanbhai's lush organic field

Niranjanbhai on his farm

Organic tomatoes from his field

Niranjanbhai explained that no kind of fertiliser or pesticides were used during the process. Weeding and other methods to remove unwanted growth were done timely. Some part of the produce, fruits and vegetables were kept for his family's consumption and the remaining part was sold off through a very basic marketing strategy of posting videos on social media platforms about his organic kitchen garden. He underlined the importance of hard work, dedication and patience that goes into undertaking this practice.

Aspirations based on innovative ideas

However, as we saw the results of his hard work, we realized the amount of chemically induced ripening of fruits and fertilizer loaded vegetables that we consume in metro cities. Also, during our conversations with him, we found out about his aspirations of starting pisciculture (the breeding, hatching, and rearing of fish under controlled conditions) in his area and a biogas bottling plant. Both the ideas were related to diversifying his incomes along with meeting the demand of fish consumers and providing biogas bottles at a cheaper rate than the LPG cylinders. Though he might not be in a good financial position to work on his neatly designed short term goals, he seems to be very content and happy with his achievements so far. He is proud of the fact that he only needs to buy sugar, salt and tea powder from shops, while rest of the food requirements are met by what he grows on the farm. He is keen to teach other farmers so that they can also contribute to soil fertility, while growing nutritious and safe produce for themselves and other consumers.

Arnab Hui, Rahul Raj S and Shubham Vaijinath Kulkarni were participants of the 41st batch of Institute of Rural Management Anand (IRMA). They wrote this article based on their field experience during the Village Fieldwork Segment of the PGDM (RM) programme of IRMA.

સિદ્ધાંતો ના અર્ક – નરેશભાઈ ની કહાની

ભોલાભાઈ ડાભી અને અનીશ મોહન

While it is usual for farmers to switch from chemical to organic farming by seeking and utilising knowledge resources, the story of Nareshbhai is of innovation. Upon initial failure with organic pesticides, using his understanding of principles of organic farming, he innovated his own extracts for successful growth and warding off pests.

જ્યારે જ્ઞાન સંસાધનોની શોધ કરીને અને તેનો ઉપયોગ કરીને ખેડૂતોના રાસાયણિકમાંથી સજીવ ખેતી તરફ વળવું સામાન્ય છે, ત્યારે નરેશભાઈની વાર્તા નવીનતા અને કોઠાસૂઝ ની છે. શરૂઆતમાં જૈવિક જંતુનાશકો સાથે નિષ્ફળતા પર, સજીવ ખેતીના સિદ્ધાંતોની તેમની સમજનો ઉપયોગ કરીને, તેમણે સફળ વૃદ્ધિ અને જીવાતથી બચવા માટે પોતાના અર્કની રચના કરી.

એક સમય એવો હતો જ્યારે રાસાયણિક ખેતીમાં કોઈ ખેડુત અવનવા પ્રયોગ કરે તો આસપાસનાં ખેડૂતો તે ખેતરની મુલાકાત લઈને માર્ગદર્શન મેળવી ખેતી કરતાં પરંતુ હવે તેમાં બદલાવ આવ્યો છે. ખેતીમાં રાસાયણિક ખાતરનો ખૂબ જ ઉપયોગ કરવાથી જમીન બંજર બની ગઈ છે. આથી ઉત્પાદનમાં પણ ઘટાડો આવ્યો છે. ખેડૂતને જેટલી આવક થાય એટલો તો તેનો ખર્ચ થાય છે. આથી ખેડુત દેવાદાર બન્યા છે. આથી છેલ્લાં બે વર્ષમાં ગુજરાતમાં પ્રાકૃતિક ખેતીનો વ્યાપ વધ્યો છે. જે ખેડૂતો પ્રાકૃતિક ખેતીમાં સફળ થયા છે. તેની માહિતી અને મુલાકાત લઈને ખેડૂતો સજીવ ખેતી કરતાં થયા છે. તેવા જ એક ખેડુત જે અમરેલી જિલ્લાના ખાંભા તાલુકાના નાના એવાં ઇંગરોળા ગામનાં જેવો કશું જ ભણેલા ન હોવા છતાં પણ ખેતીમાં સારી એવી સફળતા ધરાવતા ખેડુત **નરેશભાઈ રાદડીયા** પોતાની કોઠાસૂઝ દ્વારા વનસ્પતિના પાંદડા, ફૂલ, ફળ, ગૌમૂત્ર, ગાયનું છાણ વગેરેમાંથી વિવિધ અર્ક અને જૈવિક ખાતર બનાવીને તેનો ખેતીમાં ઉપયોગ કરીને ખૂબ જ સારું એવું ઉત્પાદન મેળવી રહ્યાં છે. આ ખેડુતની સફળતા જોઇને ઘણા ખેડૂતો અને યુનિવર્સિટીના (જૂનાગઢ, આનંદ) માણસો તેમની મુલાકાત લઈ રહ્યા છે. આ અંગે માહિતી આપતાં નરેશભાઈ રાદડીયા જણાવે છે:

પરિચય

મારી સજીવ ખેતીની સફળતા એ છે કે પહેલા જ્યારે હું આ વનસ્પતિનાં અર્ક બનાવીને ખેતીમાં ઉપયોગ કરતો હતો ત્યારે ગામનાં લોકો મને ગાંડો સમજતા હતાં. પરંતુ ત્યારબાદ મારી ખેતીમાં સફળતા અને વધુ ઉત્પાદન અને ઓછા ખર્ચ ખેતી જોઈને ખેડૂતો મારા ખેતરની મુલાકાત લઈ રહ્યા છે. મારે રાસાયણિક ખેતીનાં ઉત્પાદન કરતાં અત્યારે સજીવ ખેતીમાં ઉત્પાદન વધુ મળે છે. ખર્ચ પણ ખૂબ જ ઓછો થાય છે. હું મગફળીની ખેતી કરું છું અને તેનું મૂલ્યવર્ધન કરીને મગફળીનું તેલ બનાવું છું. આથી મારે ક્યાંય પણ માર્કેટિંગ કરવાં પણ જવું પડતું નથી. અને મારા આ મગફળીનાં તેલનાં ભાવ બજારભાવ કરતાં પણ 30% વધુ ભાવ મળી રહે છે. મારે આ ઓર્ગેનિક મગફળીનાં તેલનું એક વર્ષ પહેલાં જ તેના ઓર્ડર આવવાનું ચાલુ થઈ જાય છે.

હું છેલ્લાં 6 વર્ષથી સજીવ ખેતી કરું છું. મારી પાસે 5 એકર જમીન છે. અને તેમાં મગફળી, કપાસ, ચણા અને ઘઉંનું વાવેતર કરી રહ્યો છું. પહેલાં જ્યારે અમે રાસાયણિક ખેતી કરતાં ત્યારે પહેલા ઉત્પાદન તો સારું એવું મળતું પણ ખર્ચો પણ એટલો જ થતો અને સરવાળે કશું જ ન મળે. ત્યાર બાદ ધીમે-ધીમે ખાતરનો ઉપયોગ વધતો ગયો અને શરૂઆતમાં જે ઉત્પાદન આવતું તેમાં પણ ધીમે ધીમે ઘટાડો થવા લાગ્યો.

સજીવ ખેતી તરફ પગલાં

આવી પરિસ્થિતિ જોઈને મને ખેતી ઉપર અરૂચી આવી ગઈ હતી. ત્યારબાદ અમે સજીવ ખેતી કરવાનું શરૂ કર્યું. મારી દીકરીએ અને મેં પોતાની કોઠાસૂઝ દ્વારા વનસ્પતિના પાંદડામાંથી ફળ, ફૂલ અને ગ્રોથ માટેનો અને જંતુનાશક એવો મહુડાનો અર્ક બનાવ્યો. અને સલ્ફર યુક્ત ખાતર અને

પોટાશ યુક્ત ખાતર બનાવ્યું અને જીવામૃતનો ઉપયોગ કરવાનું ચાલું કર્યું. આ પદ્ધતિમાં જો મહેનત કરીએ તો ઉત્તમ પરિણામ મળે. સજીવ ખેતીમાં કૃષિ-પેદાશોની ગુણવત્તા સારી હોવાથી આરોગ્ય પણ સારું રહે છે. જમીનમાં અળસિયા ખૂબ જ પ્રમાણમાં જોવા મળે છે અને ઉનાળામાં પણ અળસિયાં જોવા મળે છે. જમીન પોચી અને ભરભરી બની છે. સીંચાઈનું પ્રમાણ પણ ઘટાડો થયું છે.

અર્ક ની સફળતા

મારું એવું કહેવું છે કે સુભાષ પાલેકર પદ્ધતિ દ્વારા જે દશપર્ણી અર્ક બનાવવામાં આવે છે, તે કાચું અર્ક છે. મેં આ દશપર્ણી અર્ક એક પંપમાં 1 લીટર નાખીને છંટકાવ કર્યો હતો છતાં પણ મને તેનું પરિણામ મળ્યું ન હતું. આથી હું પોતાની રીતે અર્ક બનાવવું છું અને ઉપયોગ કરું છું. આ અર્ક બનાવવા માટે હું મારાં શેઢે સિતાફળી, લીંબડો, નગડ વગેરેનું વાવેતર કરું છું.

હવે રાસાયણિક ખેતી અને સજીવ ખેતી ખર્ચ અને ઉત્પાદનની તુલના કરીએ તો. મારા ભાઈ જે 12 એકરમાં રાસાયણિક ખેતી કરે છે અને તેઓ એકરે 2 થેલી યુરિયા અને DAP નાખે છે. અને હું 5

એકરમાં આ મારી રીતે બનાવેલ જૈવિક ખાતર અને અર્કોનો ઉપયોગ કરું છું. છતાં પણ તેના 12 એકર માં જેટલું ઉત્પાદન મેળવે છે એટલું જ ઉત્પાદન હું 5 એકર માંથી મેળવું છું. મારે એક વીઘામાંથી મગફળી 35-40 મણ, એક વીઘામાંથી કપાસ 45 મણ અને ચણા 38 મણ ઉત્પાદન મળે છે. મારા ભાઇને આ રાસાયણિક ખાતર અને જંતુનાશક દવાઓનો ખર્ચ 35-40 હજાર જેટલો થાય છે. જ્યારે મારે આ અર્ક અને ખાતર બનાવવા માટે 15-18 હજાર સુધીનો થાય છે. અને મારી વાર્ષિક આવક 5.5-6 લાખ છે. (1 મણ (40 શેર) -37.324Kg)

મારી આ પ્રાકૃતિક ખેતીમાં સફળતા એ છે કે લોકો (ખેડૂતો) પહેલાં મને ગાંડો માનતા હવે ખેડુતો મારી મુલાકાતે આવે છે અને માહિતી મેળવે છે. માત્ર પહેલા બે વર્ષ માટે થોડું ઉત્પાદન ઘટયું. જમીન ફળદ્રુપ બની છે. હવે જો ખેડૂતોએ ખેતીને ટકાવવી હોય અને માનવજાતને નવા

નવા રોગોથી બચાવવા હોય તો રાસાયણિક ખાતર અને જંતુનાશક દવાઓથી ખેતીને મુક્ત કરવી પડશે અને તે માટેનો માત્ર સજીવ ખેતી જ વિકલ્પ છે.

ફાલ, ફૂલ અને ગ્રોથ માટેનો અર્ક - દ્રાક્ષ અને ખજૂરનો અર્ક.

સામગ્રી

- ખજૂર અને સૂકી દ્રાક્ષ,
- લીંબોળીના ઠળિયાનો પાઉડર,
- સીતાફળના ઠળિયાનો પાઉડર અને પાન
- પાકી લીંબોળી

આ સામગ્રીને 30L થી 35 L પાણીમાં મિશ્રણ કરવું અને બરાબર હલાવવું. અને જ્યારે 8 થી 10 માં આથો આવે ત્યારે તેને ગરમ કરવું (ભઠ્ઠી દ્વારા) વરાળ નીકળે ત્યાં સુધી ગરમ કરવું અને જ્યાં વરાળ ઠરે એ પ્રવાહી એક પાત્રમાં એકઠું કરવું. આ છે દ્રાક્ષ અને ખજૂરનો અર્ક.

ઉપયોગ

આ અર્ક સિઝનમાં ત્રણ-વાર છંટકાવ કરવું જોઈએ. પહેલા છટકાવમાં પંપમાં 50mL, બીજા છંટકાવ 100mL, ત્રીજા છંટકાવ 150mL નો કરવો. જ્યારે પાક ફૂલ અવસ્થાએ આવે છે ત્યારે આનો છંટકાવ કરવાથી પાકમાં ફ્લાવરિંગ અને પાકનો ગ્રોથ ખૂબ જ સારો થાય છે.

જીવાત ખિલાફ અર્ક - મહુડાનાં અર્ક

સામગ્રી

- 15Kg મહુડાનાં ફુલ,
- 2Kg ગોળ, ધતુરાના ફૂલ, ડોડવા અને પાન
- 2.5Kg સીતાફળના પાન
- 2.5Kg નગડ
- 2.5Kg લીંબોળી
- 2.5Kg લીમડાના પાન

આ સામગ્રીને 35L થી 40L પાણીમાં મિશ્રણ કરવું. અને 8 થી 10 દિવસ આથો લાવવા માટે મૂકી દેવું. આથો આવ્યાં પછી તેને ભઠ્ઠી દ્વારા ગરમ કરવું. વરાળ નીકળે ત્યાં સુધી. આ વરાળને ઠારીને

પ્રવાહી એકઠું કરવું. અને તેનો સંગ્રહ કરવો. આ અર્કનો સ્પ્રે કરવાથી સૂચિયા પ્રકારની જીવાત અને દરેક પ્રકારની જીવાત પર નિયંત્રણ મેળવી શકાય છે.

ઉપયોગ

આનો છંટકાવ માટે એક પંપમાં 75 mL મહુડાનો અર્ક નાખવો. જ્યારે કોઈ કુદરતી આફતની આગાહી થાય છે કે કોઈ આફત આવે છે ત્યારે આ સ્પ્રેનો જો અગાઉથી છંટકાવ કરેલ હોય તો નુકશાન પણ ખૂબ જ ઓછું અને નહિવત થાય છે.

ભોલાભાઈ ડાભી લોકભારતી ગ્રામવિદ્યાપીઠ ના છાત્ર છે અને *IRMA* ***સાથે*** *Verghese Kurien Rural Internship* ***માં ઇન્ટર્ન પણ હતા.***

આ બ્લોગ અનીશ મોહન દ્વારા સંપાદિત કરવામાં આવ્યો છે. તે લિવિંગ ફાર્મ ઇનકમ પ્રોજેક્ટમાં *(IRMA)* ***રિસર્ચ એસોસીએટ રીતે છે.***

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