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Impact
WITH RATHISH BALAKRISHNAN

DECODING IMPACT

DECODING AGRICULTURAL TECHNOLOGY WITH PARMESH SHAH

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Acknowledgements

Contributors

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Sattva Knowledge Institute (SKI), established in 2022, is our official knowledge platform at **Sattva.** The **SKI** platform aims to guide investment decisions for impact, shedding light on urgent problems and high potential solutions, so that stakeholders can build greater awareness and a bias towards concerted action. Our focus is on offering solutions over symptoms, carefully curating strong evidence-based research, and engaging decision-makers actively with our insights. Overall, SKI aims to shift intent and action toward greater impact by influencing leaders with knowledge. All of our content proactively leverages the

Introduction: *You are listening to Decoding Impact, a podcast by Sattva Knowledge Institute hosted by Rathish Balakrishnan.*

Welcome to Season Two of Decoding Impact. Every fortnight we will engage leading thinkers and practitioners to understand what it takes to solve systemic problems at scale. For all the curious changemakers committed to understanding the trade-offs and incentives to make this world a better place, this one's for you.

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Rathish Balakrishnan (RB): [00:00:48] Technology has the potential to revolutionise Indian agriculture, its productivity and farmer incomes. There are innovations in seed and bioengineering platforms, use of robots and AI and blockchain that are enhancing efficiency and transparency in the sector. India's agri-tech industry comprises over 1300 companies and is projected to reach over ₹1 trillion by 2025. The reason 2023-24 budget allocated 450 crore rupees to the digital agriculture mission and 600 crores for technology driven agriculture promotion. However, despite these promising tailwinds, the low adoption of technology by farmers remains a major challenge, and agri-tech penetration in India remains abysmally low at around 1%. In today's episode of Decoding Impact, we try to understand the potential of a platform-based approach for agri-tech. The importance of directing the right capital to address the right issues and how we can take a systems approach to identify key enablers for the successful scale up of agri-tech. Joining me to offer his insights and expertise for this discussion is Mr. Parmesh Shah, the global lead for data, digital agriculture and innovation at the Agriculture and Food Global Practice of the World Bank. Mr. Shah is currently managing a global programme on scaling up data driven digital agriculture, involving data platforms and establishing ecosystems for innovation, entrepreneurship and incubation across 38 countries. Thank you for joining us on Decoding Impact, Mr. Shah. I look forward to our conversation.

Parmesh Shah (PS): [00:02:25] Thanks Rathish for having me.

RB: [00:02:37] I wanted to start by first laying out the landscape for agri-tech, especially in India, and the potential that it has today. So maybe a few introductory remarks from your side on where are we today with respect to agri-tech, I think would be useful to set context for the conversation.

PS: [00:02:56] I think as you know, that there is a lot of innovation being tried out because of the techs. The government itself is also investing in a national digital agri stack, which means that it digitises all the farmers or in the country, it digitises also the plots so that the plots are geo tagged; and it's also digitising all the crop cutting experiments. So that's something which is happening on the data side quite a bit. Now individual start-ups and also some governments are investing in product innovations and also developing products related with access to services, extension, market access and also digital finance for small holders. So all this is we are at a phase at which many thousand flowers are blooming. But that doesn't mean that if 1000 flowers are blooming, it will read automatically scale. So I think we are seeing innovations on a daily basis on a lot of data analytics leading to development of innovative products and services. But, the bigger challenge is last mile service delivery, because ultimately all the products you develop have to be converted into either access to services, access to technology or access to finance, and that's where I think I see that a lot of physical and digital has to come together. And if you just do digital, it's not going to solve the physical problem.

PS: [00:04:37] And if you just do the physical in the old way, then you will do it very inefficiently, as has been the case for a long time. So I would say the glass is quarter full, not half full, and I think potential is very high. So I would say that there are a lot of good point solutions and small holders require not just point solutions. They don't want someone to come them to them for extension, other person to come for markets, another one for finance. So the inability to bundle solutions and only offer point solutions is the biggest challenge for all the start-ups which are in the country, able to then bundle it with physical and financial and and digital is also a big challenge because if you can see we have other efforts going on apart from Start-ups, you have large companies like ITC and lots of others also building their own digital platforms and trying to work on it so that all their catchment area farmers' data is digitised and they offer more digitally enabled service to that. I think you have a lot of things in play, but it is scattered and if it remains scattered it will not lead to scale. So data innovation platforms have to come together in order to achieve scale.

RB: [00:05:58] That's a lot of points. I think I want to unpack a lot of them. But I want to maybe ask a basic question first. Because when I talk about agri-tech different people consider the definition of agtech very differently. You've had a global view to the agtech landscape, is there a way you would sort of say these are the most priority, critical categories of solutions you would classify as agtech and what you would count as the agtech landscape overall from your perspective?

PS: [00:06:25] So there are 4 or 5 types if you look at it. One is the whole precision ag category, because contrary to understanding that only large landholders need precision, actually smallholders need more precision ag and it's costly to develop. So precision ag will include a lot of things like digital advisory services, digital extension services. Also having more climate advisory than precision fertilisation, precision irrigation because the resources are limited, so the more precise you are. So I would say precision agriculture for productivity increase and augmenting the asset, that's the first category. The second one is accessing markets, which is where you want to access markets, not just the proximate markets, but more higher value markets which are further from you and if you have advanced information about those markets like you have you know what prices are being offered at different places. So it's like market support kind of services. That's the second one in agtech, which is there. Third, I would say increasingly emerging is the whole area of, I would say the financial services, because in India, even if after all the priority sector lending and all only 12.5% smallholders have access to digital, the formal financial service.

Informal finance, microfinance and all is also coming up, but again, the services are offered not in a digital format with all the DBT and Aadhar and all being available. The potential for that is very high. So I would call that fintech 'ag-fintech' part. That's the third category. Fourth is the whole area of the climate smart services, which is basically, you know, where you are looking at rainfall weather and you are also looking at satellite data and all, and based on that, you are giving more developing more climate smart technologies and advisory to do that; and then apart from that, I would rate mechanisation and the various services which are being given. So like the concept of farming as a service, it's analogous to the software as a service. So the service delivery part of how you can unbundle that so that a smallholder has to get only 1/100th or 1/1000th of a tractor. But, there is also how do you develop pay as you go? Services and bundle unbundle, what will we even rate cooling, processing and all that. So I would bring food tech into agtech and food tech is a very important part of Agtech; and then finally, I think I would say energy tech, which is the whole thing about solar and other things, which really would reduce the cost of accessing energy, because energy is also a very big reason why people are not able to access irrigation and production and productivity there. So, I would say energy tech, but more the alternate energy part, and I would put

food tech also as part of the agtech there. But, clearly as we go, a lot of technological improvements are happening on process. There's food loss and waste where you are bringing a lot of biological solutions, where you mix a lot of biologicals in terms of storage and all, and your product stays for a longer period, and so we have seen a lot of cooling and storage solutions also coming in there. So I think there is a gamut of things, but all of them are offered as point solutions right now. That's why the small farmer starts something and then gives up because they get only one part of it.

RB: [00:10:03] Now, this is a very useful classification. Mr. Shah, I think it helps us to even understand just the range of solutions we are talking about and I think reinforces the point of point solutions you are talking about, because ideally a farmer wants all of this to converge for his needs and we are sort of talking about it as individual solutions; and before I come to some of the challenges, I just wanted to ask you, while the adoption of solutions has in general been low, are there some categories here that are doing better than other categories? For example, has this been the case, like typically, financial services uptake is higher because the need for credit is often the easiest thing to sell to. While advisory services are harder because the value is often seen later, that's my first principle hypothesis. But, I'd love to hear from you. Are you seeing some categories here moving faster than other categories? We'd love to hear your thoughts.

PS: [00:10:53] Definitely. I think the category on which input supply and digital extension services are bundled, that category is moving very fast. And I would say that if you make an analysis of the texts which have been more successful, you will find the people who are bundling input supply and digital extension services together, I think are able to have higher scale up there. That's one category. The second I would say is the market access services. If there is a good agribusiness company which is there at the end buying all this and it has digitised its value chain, then you are seeing that part also growing fast. And clearly you have some agri business companies even globally we see Olam and all those people developing their own digital platforms. There is a low carbon rice digital platform being developed for all rice producers. So I would say that this is happening on some places where commodity related services are being offered, along with market support, extension and input supply and they are bundled. This is growing faster and I would say now increasingly the digital finance part, particularly, I would say that people who are not providing solutions farmer by farmer but are developing more enterprise finance solutions with producer companies and NPOs because you cannot reach small farmers with individual solutions by farmer by farmer.

PS: [00:12:18] So I think those solutions, digital finance solutions, which are working with NPOs and offering more enterprise solutions, are also growing faster. I would say that, but India is a large country and a lot of solutions are available now, semi-commercial and commercial farmers on commodities when you take, you know, grapes and nashik and all producer companies there and then you will have very niche kind of successes on digitisation. So I think the small holder success is where people have stayed in one geography and expanded scale. So we see that in certain geographies where digitisation is better, where connectivity is better, where the kind of cost of acquiring connectivity, marginal cost is lower, and where already the farmers are organised. There you see the things spreading, places which are in the hinterland and all, will take a lot of time because you don't have even the basic physical solutions available there. So to me, I want to say that physical solutions and digital have to go together. So unless and until an Agtech becomes an input company or becomes an important part of an input company platform, the scale will not be achieved. So this is a very different animal in which a pure digital play will not give you revenues basically at this time.

RB: [00:13:53] You know, just to use an agricultural metaphor, I keep telling people that the agtech is playing at the top soil of the farmer ecosystem. It's really the 1% on the top who are digitally connected, digitally literate, have the cash flow, have the willingness to pay et cetera, and there is a certain risk taking ability because their cash flows are better. Who's investing in this, the huge soil below, which is all the farmers that we're talking about. I think there is a challenge and you're making a very important point, Mr. Shah, about this whole physical plus digital coming together. I've had a chance to look at the health care ecosystem, the education ecosystem, it's the same thing wherever we've just put edtech in the hands of a child and assumed that this motivated child will learn. That's one person of India, you know, which is a child who doesn't need any support and can read on its own. I mean, she doesn't need any support anyway. So tell us a little bit about the digital infrastructure, the physical plus digital infrastructure we truly need. Maybe an example from your side to say what aspects of physical, what aspects of digital that need to come together for this to work will be very useful.

PS: [00:14:58] I think clearly during the Covid period, what was the biggest extension approach which worked all over the world actually - it's WhatsApp, and I think clearly the solutions which will come now are not going to be the standard solutions. So I think the mobile based systems, I think I would say the mobile connectivity is increasing at a much faster rate than the Internet connectivity, and so I think the mobile based solutions are the ones which are reducing the digital divide quite significantly. That's what we have seen during the Covid period, that a lot of extension happened. Peer to peer, farmer to farmer, extension workers to others. They're all happening in the mobile world. If you had good content to back that up, you could spread anything almost ten times more faster than you have ever done before. So I don't see this as being that you have to have a physical connectivity, broadband access everywhere. That will definitely help because the data will travel faster and the people who are providing services at the last mile will have access to analyse data and it will become more customised and precision for people there. So I think the bigger breakthroughs where you need large processing of data and customisation will come when you have bigger broadband connectivity across the board. But the extension services and what I would call is a service delivery which is happening. Even e-commerce has reached almost the hinterland.

PS: [00:16:32] Now. It's not that difficult. I think we have not explored the full extent of WhatsApp, e-commerce models, which will I think spread faster in rural India and with even small holders. But as you rightly said, there is a facilitation required and the kind of facilitation you require is not only the digital, but it has to be digitally enabled, where we have a new kind of approach being tried. In many parts of India, it's more the agripreneurs, the new generation, young entrepreneurs coming and organising inputs for 1000 farmers, organising market access, creating a dedicated application which you are able to use. It becomes your way of doing things. You know, it becomes a second nature for people to interact with market and extension services in a digital way, but it would need a lot of younger people (to) help the average farmer whose age is 65 in our country, you know, there is a demographics concept involved here. So if you have average farmer is 65, the children not interested in agriculture, then you have to bring in that intermediary cadre of people who will make it simpler for people that they don't have to do everything digitally. They have a physical and digital both available there. So I would say the input supply is a very interesting case. So once you know where inputs are available, then someone has to help you make that transaction, and if you can make that digitally then you don't have to go to 100 places to do it and all the inputs get delivered at your home.

PS: [00:18:08] This is so fascinating, where we see the world working more innovatively than India. Like in Kenya, we have all agro dealers digitised, all farmer organisations digitised, and once you get soil data through a sensor where you have a start-up working on that, then that data goes straight away to a dealer who keeps a customised precision fertiliser ready. You have an option to either collect it yourself through an SMS, "Your fertiliser is ready, please come and collect it" or they will courier it by e-commerce to your doorstep. 48,000 farmers are getting doorstep delivery. This is the only example of smallholders getting. Why should smallholders not get doorstep fertiliser delivery in India? The e-commerce model is so spread out, but what agtechs don't do is that they don't utilise the functionality of WhatsApp and others. They are doing it, the good ones are doing it. But most of the agtechs are creating still the solutions in a standard way and not using the functionality of Aadhar, DBT and e-commerce and all. They have to be bundled to offer a solution to people. Imagine if someone picks your produce from your doorstep. That's what good traders have been doing for a long time. They pick your produce from the doorstep, give you 20% less prices and that's where arbitrage comes in and then you get money from that.

PS: [00:19:31] Now, I think you can do this more efficiently if you can deliver inputs and same way you can deliver finance, the finance has to become digital so that you don't have to walk into a physical bank facility or you work with a digital banking correspondent, which we are doing now in a very big way. World Bank is supporting a lot of women banking correspondents who delivered a lot of services during the Covid period at your doorstep. Pensions were provided at the doorstep. DBT benefits were provided. What stops for that DBT and pension at doorstep not happening for digital financial services the way agtech does it is still very routine and standardised. They don't look at digital public infrastructure already created in the country and base your business models and product models based on that. So think if you base it on that, then you're good. So that's what I think we are doing now in many countries is that we are enabling the guys'(people's) agtechs to take advantage of the digital public infrastructure, whether it's a farmer registry, geotag plots or digitisation of FPOs, and then use that as a given so that you don't end up collecting that data because 70% time is collecting the same data which is already available in the public domain. So if the public good investment is done properly and you have a platform to enable the agtechs to access that data and services, then they will spend more time on developing products and services of good quality, which are going to be more innovative, and then you will be able to get scale.

PS: [00:21:05] But if you continue to collect all the data which is already available in the public domain again and again, then you will never make scale and you will never become viable. So my hypothesis in this is that you need to invest in a platform which allows agtechs to access some amount of public data so that they spend more time on developing products and services and go to scale. In India, we have a good foundation, a lot of good foundation already. I think with e-commerce and eNAM and all, but really there is no one using those existing platforms. They are trying to create their own platform. That's why I feel that it needs facilitation to enable the agtechs to access the platform and that allows them, incubates and accelerates them to create better products and more products and service. So I think it needs this initial investment in digital public infrastructure, which our country has already done. It has to you know, we can do more actually. That's why we are supporting government of India's agri data stack, and we will take this to ten states and help convert that into use cases and all that. So that because if you just create a data stack and it doesn't get converted into products and services, it will rot and it ultimately doesn't change the lives of millions of farmers at all.

PS: [00:22:20] But I feel that also there is more work required with FPOs and co-operatives and all, think if we digitise them and this is our experience now in Africa, the moment we digitise these organisations which were considered to be suboptimal, inefficient and all, suddenly you have created the pull factor towards the market and you are seeing huge growth in turnover and farmer services happening at a much rapid rate basically. So I think I would say that digitising the data is an enabler, but it wouldn't stop at that. You will have to create a platform or an ecosystem and facilitate access to that and then also incubate and accelerate development of products and services. So right now, the business models which are being funded for agtechs, letting them do everything under the sun and then after sometime you will see that their valuations will not add up, and then you will say, "Okay, my God, why did we invest in that", right? But I'm optimistic that 20 of these solutions have already reached that scale in India. And I think those are the ones who have bundled or bought physical and digital together, and they are the ones who are using public infrastructure quite actively. So these are the characteristics of people I know that are doing better.

RB: [00:23:41] I think these are fascinating points and I want to segue to the platform piece that you talked about, I think. But I want to play back to you what you just said, because I thought it's a very important thing. I picked up at least five principles, Mr. Shah, as you were talking. One, of course, is this idea that you have to value the principle of providing a good, seamless experience to a smallholder farmer. I think if you first prioritise that to say it should be as seamless as us buying something on Amazon that the farmer has to experience. I think you design your solutions differently. And the second is leverage existing infrastructure, redoing data collection, redoing identification, etcetera I think is a significantly expensive task and an irresponsible use of market capital. So how do we look to build on existing digital public infrastructure and the underlying rails that we have to build I think is important. I think the third thing that you talked about is that there is a certain age and digital behaviour for farmers today that is going to take a while for us to address. But in the meantime, last mile catalyst who can actually solve for that digital divide and can actually provide that convergence to a farmer who hopefully the farmer also trusts, you know, because the person is from the locality of the farmer. So they probably have a greater trust relationship with the farmer as well, leveraging both the trust and the digital ability of this last mile catalyst, I think is going to be very, very important.

RB: [00:25:04] The fourth part of it is digitising cooperatives, you know, and because customer acquisition cost of every single farmer, as you highlighted, is just too expensive. Collective structures are critical, but digitally enabled collective structures are critical, and I think solving for that, I think, is going to be very, very important. Finally, to the point of hence separating what should a company do and not do, you know, and what a company should do is really do things that truly add value to the farmer. What it should not do is to do things that existing infrastructure like WhatsApp, for example, can actually enable.

RB: [00:25:46] It made me step back and look at why the penetration is not moving. I think: (1) We have highlighted that convergence from a farmer perspective is not happening. (2) Existing infrastructure is not being used because of which the cost of acquisition of a customer is extremely high. (3) Smallholder farmers today are so distributed and diffused, and that's the challenge that we have to solve for, especially in hinterlands and so on, is another important point that you made. Are there other systemic factors that are actually impacting adoption today of Agtech, because I wanted to come back to the platform with the full understanding of the challenges that we are facing as well.

PS: [00:26:21] I think if you look at the systemic factors, one is that we need pluralistic service provision in agriculture, we have been long dependent that an extension worker at the village level will provide the interface with everything and that extension worker has to be coded on that. But, our informal data shows that the worker sometimes is only working for the input companies and a particular input company as a kind of flat (?)... So it gets additional incentives because the incentive structure is not very well developed. So I would say that I think also developing more pluralistic models of service delivery and really coming with a public private partnership on service delivery, not just digital but on range of services is very, very important and new models will emerge which will be more digitally enabled. I personally feel that for a country like India, you just need a million agripreneurs who work with 1000 farmers each, you know, and provide customised hand-holding services where they have data about these and doing that. We are trying to do this in many countries and there are parallel projects going on and we find that model really solves the problem of demotivation of the agriculture extension worker and also solve the problem of in time delivery of services as it also allows to be, as you rightly summarised earlier, that you need a very customer facing orientation for this, and currently the current agriculture service is not farmer facing. It is very much, you know, the extension messages get decided, but you still have the old training and visit model in which you go and visit. The Government of India is trying to develop a digital extension backbone system where you're going to put a lot of content and videos and all and then we'll put the farmer data and then when extension worker posts eight videos, which will be the most useful, will open up and you will be able to really show a customised kind of thing using whatever methods you are using, whether you are an iPad or you are using a Pico projector or whatever it is.

PS: [00:28:32] But that's not going to be enough. You have to have finance, market support extension all bundled into one. You can't have now an extension, say no, I've only learned this in my training visit system. I'm going to tell you about how you get these services and how you get finance - you could talk to someone. Now that functionality of last mile delivery I think could be brought through a digital platform analogous to an e-commerce platform, because in China, if you look at Pinduoduo and all the large players who are in the rural space in agriculture, they are bundling extension, finance, e-commerce, all in one place, even allowing farmers to make videos of their produce and show it to everyone that we have this produce, this kind of melon, which is a very unique one produced by them, and even getting export orders out of that. A remote farmer is able to produce a video and then put it out there. That is the kind of functionality you need to create a platform.

PS: [00:29:27] In my mind, if you bring in the functionality of e-commerce, WhatsApp, all these three four platforms which are there and offer a service to a farmer, it doesn't have to run from pillar to post to that, like I get an SMS from my bank now in India, it says that your transfer has been done, we have kept this ready. But the farmer never gets those kinds of SMS on finance and financial services. Why shouldn't "Your inputs are ready, please come and collect.", "Your inputs are ready, do you want to have them delivered?" So you need to work back end service delivery. Unfortunately, because you have a lot of people working in agriculture who think farmers can get suboptimal services - second best or third best. You (should) look at the pain points of the farmer and solve the pain points. If you solve the pain points, the scale will be automatic. So I would say that the reason it's not happening is because we haven't still customised our products. Second is we do the digital part. We don't do the physical part, and the farmer is still stuck in spite of getting information. What is he going to do with the information if he has to still travel 20km and spend half a day in getting products and services. Those products and services and inputs and everything

has to reach them. Similarly, we are doing a project with start-ups in Kenya, who've really developed a 1 by 100 model of a solar pump. So you'd say I need a solar pump, and someone is there available. Just go there and put the solar pump in your place. Use it, and then he takes it somewhere else; and through the M-Pesa payment system, the money gets transferred in the company's account. So you need to come out with business models which divide assets quite significantly. Take another example with Hello Tractor in Kenya and Nigeria. I think the fact that they have uberized the tractor and fitted it with the GPS device and all the smallholders can requisition tractors, like Uber is requisition. In the same way, a lot of smallholders are able to, for the first time, use tractors before the sowing date and their productivity increases by 50% by just that interaction. So I think we have a lot of smallholders. We have not built a digital service delivery platform for them. At the same time, all the assets we have which are being used, I mean assets, agro dealers, you know, the equipment and all, they are not digitised. So you are not able to really get the handshake done between the people. But, I also feel that individual farmer smallholders might find still difficult to do it in many areas. So I think you need intermediaries like agripreneurs or farmer organisations to play the role, or an agripreneur appointed by a farmer organisation which solves the problem of facilitation until you've arrived at the best fit between the product and the farmer. So I think we need to invest in that and I feel personally that India should really look at the digital skills part and entrepreneurship part and have almost like million entrepreneurs working on the last mile service delivery.

PS: [00:32:26] I think if you have a million farmers working, each of them covering 100 farmers each, 100 million is done. We have no problem of scale and it is not difficult to do it because people have demonstrated it with 5000 entrepreneurs and million farmers. So, you have a lot of million farmer models available in the country already. We have to learn from them and why they worked and learn from the global examples and then build a platform at the country level. Platforms have been built. Don't get me wrong, eNAM is a platform and all, but they just put the information there and leave people to chance, to go and interact with each other. The success rate or what I call is the convergence rate in baseball terms is low for eNAM. Out of every 100 things you have bought on the platform, only one is getting converted into a handshake. So it means there's something else required after creating the platform. To do that thing, in agriculture, you require more facilitation. I would call them digitally enabled facilitation. So you have new kinds of extension entrepreneurs required, not the extension workers which are taking the job because of getting a government job, but because they are, you know, they want to deliver turnover to farmers and incentivise that differently. So if you bring that entrepreneurial culture, digital platform bundling all these things together, you will be able to create a very different dynamics, same solutions will be able to deliver infinitely.

RB: [00:33:49] You know, the point you made reminded me of a point that Joe Madiath once made too, you know, in a conference, and he said this notion of poor solutions to poor people is so embedded in our thinking and I think getting out of that is very, very important; and I'm just as you were speaking, I was thinking that if we had an ideal farmer environment as in where a farmer is either collectivised into an FPO or working individually has a choice of a few agri entrepreneurs in his own locality so that there is market pressure for those agri entrepreneurs to provide the best service; and there is an entire stack that enables the agri entrepreneur to deliver the value to the farmer, focusing on customer intimacy and all of that stuff. Like you said, the experience of the farmer is that I get a notification, I can go pick up my stuff, and there is the agri entrepreneur who is able to sort of enable that value for me, and that sort of brings me to the question of the platform itself. Mr. Shah, so we've used the word platform multiple times, and as we were talking, you know,

we were talking about data being a part of it, services being a part of it, and that enabling for other people. And you also referred to the agri stack, something that the World Bank is supporting as well. Tell me your vision of how you see the platform and how that platform should actually play out. I'd have a few follow up questions, but I'd love to ask that after you've sort of shared your view.

PS: [00:35:02] I'll describe it through an example of where we are. We are now almost reaching 4 million farmers, which is almost 80% of the Kenyan farmers in Kenya, and what did do there is that we went to the farmers first, asked them about what their pain points were, what solutions were there, and then we offered a challenge to all the innovators. Tech space innovators said, "You have to respond to these challenges, not the ones which you think are the challenges and then creating there." We brought them together and 24 innovators were selected through a very rigorous vetting process in which even the farmers were voting for the guys who will be selected for this platform, and then the farmer organisations, the entrepreneurs and then the government and the counties - because it's a federal thing, like in India, we have 40 counties, you know, who are really taking decisions about the public infrastructure - and then all the institutions which were in the private and public sector, whether they are the banks or what you call it, the data kind of agencies who are registering farmers and all. So we continuously facilitated the interaction between them until they found what value they will bring to the platform, and it was not called the platform, but it became a platform. The platform was called Million Farmer Platform because it was obsessed with farmers. So I think if you bring everyone and create a pull factor towards the farmers after keeping that into account, then we have now almost like 48 new solution providers coming saying we want to join the platform, we understand what the value is.

PS: [00:36:37] So what does the platform do? It makes them access data, which is the registry of digital registry of farmers, geotagged plots of the farmers, it also has weather data and satellite data being collected systematically. So you get micro weather advisory also available through that. So there are three, four, five services which are available to anyone who wants to join the platform, and the guys are then told to go and develop products and services, and they are also told that we will also facilitate the mobilisation of the farmers in that area through FPOs and all that. That's what the World Bank project does. So what happens is that you get a catchment of 50,000 farmers, the data is available to you, they are already mobilised and you say "Now you focus on your core strength, which is products and services", and then we agree on some performance indicators. That's what I talked about in the pluralistic models of extension. Then, they are given some incentives for service delivery, which is like not ridgid, but if you achieve 25% increase in productivity, you get 30% market prices increase per unit farmer, or per FPO, you will get this kind of a thing that is monitored rigorously and shared there. Now what it does? 2 or 3 things it does - it gives data available to everyone, the public infrastructure data available to everyone.

PS: [00:38:00] Second is acquisition cost per farmer, it gets reduced by almost 70% because someone is doing that work for you, because that's not the strength of a techie - to acquire a farmer. They do it, in fact very inefficiently sometimes I must say, and then you also are building a platform to incentivise them initially so that this new service delivery model is used, because no one has seen the service delivery model where entrepreneurs are delivering services, getting productivity increase and all at the same time, they also get access to KALRO, which is a research organisation of all the research agencies wherein we have already digitised all the data on 19 commodities and everything. So you don't have to reinvent that and do that all the time. They have customised data on commodities and all you look at would be which commodities are in their own area and do you have a relationship with them by which they provide you technical assistance. So

technical assistance, data and mobilisation and then the learning part. So they are now coming together because it's not that one guy is going to produce all the solutions. So they have now made consortia where they are working with each other to deliver end to end painless services to farmers. It's not by one start-up, rather it's three, four, start-ups coming together and then Equity Bank or someone from Kenya coming together and saying 'Okay, we'll fund whatever comes out of this" and all that.

PS: [00:39:19] So the platform requires a continuous incubation of ideas and then linking them with other people. So now on the platform has 4 million farmers, about 1000 farmer organisations, 58 Start-ups, 45 counties, 9 banks, 8 agribusiness companies and even technology companies like Microsoft and Google and everyone, because everyone is looking at scale. So if you are going to continue to work in your own enclave as a CSR project or something, you're not going to go anywhere. Till now, technology companies do you know small things here and there, but once you have a platform, you know that someone is going to do the heavy lifting on some of the things which are very difficult for product service innovator because what is technology company and what is agtech good at? Developing products and services. If you don't spend your 80% time on that, then you're never going to reach your scale. So we started this in 2019 and during Covid, this thing didn't stop. That's the best part of it because it was already digitised. So I think in 2022, government said, "Okay, we now go to all the 4 million farmers" and now we are going from 1 million to 4 million. So within, I would say five years, six years, seven years, we would have reached 100% saturation coverage in the country. Now, Kenya is a smaller country than India, but the principle is the same. In my mind, the platform requires people who normally don't come together, we bought out some essential services, which are the pain points for start-ups, pain points for farmers to be removed and someone is helping facilitate and orchestrate.

PS: [00:40:55] Now, in this case, we had Mercy Corp's fintech accelerator, you know, working to do this in Kenya because you need a dedicated entity. World Bank cannot do this. World Bank can ideate, finance, convene, but we cannot do. So now the government itself has set up a digital transformation office. They have a chief data officer. So it is like you have to also change the institutional framework within the government and have a policy to support this kind of a data policy, ex data access policy, start-up encouragement policy, public private partnership for service delivery policy. There are a lot of policies which need to change as a result of that, but informed by proof of concept, at a smaller scale. So we did everything with 50,000-100,000 farmers. Once this was demonstrated, I said take it to scale. I still believe that it's not enough to invest in digital public infrastructure, but it is important to invest in platform and ecosystem, and I think platform and ecosystem has to be invested by the government. It cannot be invested by a private player who is interested in point solution or something because you need some amount of convening and facilitating there. So platform is providing services. It's a knowledge and learning platform and also incentive platform, and it's also a policy platform. I think these three four things come together on a platform.

RB: [00:42:20] As you were talking, I was layering it like a cake. Just to say that there is the first layer that is really the data layer, which is, are you able to identify every farmer? Are you able to identify every piece of land? Are you able to identify every facility potentially? The point that you made earlier, even a tractor can potentially be identified as an asset. So that data layer is the starting point. And then there is the advisory layer, which is the intelligence, like can you get some existing researchers to sort of pull in the existing intelligence that can be leveraged? That is the second layer. Third is really the product layer. Can we get product companies to sort of come in, you know,

embed and focus really on their core strength? Like you said, 80% of the time is spent on making a good product. Fourth is a discovery and incentive layer, which is how are other people able to discover them who are in the platform and so on. And the fifth layer is really the agripreneur layer people layer who are then finally offering the service and facilitating that digital enablement to the farmer, and then on top of it, as the farmer who is able to sort of benefit from all of these systems and I think, as you said this, I also realised how important it is to demonstrate this for the government to take it.

RB: [00:43:19] The point you made about when the government takes over, the policy landscape has to be changed, the institutional structures have to be changed. But since you have piloted it, you're able to show what really is required there to be changed. Otherwise, it's very expensive to make those changes when you don't know what is going to work. Right.

RB: [00:43:35] One of the related questions I had here was also that how do you see the different types of capital? Because there is a type of capital that World Bank was able to provide, which is probably the highest risk capital here. When you don't know what is going to work, etcetera. Then there is a public capital that came in, but I'm sure there is also a market capital that this is attracting - the start-ups are interested in attracting market capital. How did you see the capital, different types of capital play out and also look for what type of problem should what type of capital solve for.

PS: [00:44:13] I think the early stage and up to a seed stage, you need more patient capital there because there's risk involved. The cost acquiring per farmer is higher when you are building the business model. So I think that requires some kind of hybrid patient capital there. It could be a grant plus some capital, it could be incentives, it could be, you know, debt also sometimes rather than equity, because equity is really biasing a lot of things. People are looking at returns which will never be possible, actually. So all the numbers get inflated and all that kind of thing. So if you are not really clear about what problem you're going to solve, what risks are there, how will you go to scale, so that requires patient capital. Still, if you look at the issue we are facing now is that the people who are able to go to Series B and C are hardly 1% or 2% of the total active. You don't have the incubation accelerator platform for the start-up - the initial ones because then we straight away go to the equity forms of capital without going through the phasing part of it. So I think there is a lot of innovation required in customising delivery for product development, financial investment for idea stage and seed stage in start-ups, and that's where you need patient capital to come in.

PS: [00:45:43] I think there are agencies which specialise in that. We have almost like 16 agencies in Kenya who specialise in that, and those are the carriers which are developing them; and in fact, for small holders, that's the kind of capital which will be required on larger scale. Then the conversion rate from seed and series A to B and C could increase significantly because it will be based on scale, end points and all that kind of thing. So I would say that you need - apart from the public capital which we are putting in, so that it becomes very attractive for more entrepreneurs to come into this sector - you will need patient capital, you will need hybrid forms of capital, also some amount of risk capital in the initial stages. After that, I think the commercial capital can kick in and help them probably, but even our sister organisation, IFC, is struggling with this. It's not able to fund series A and seed funds because their risk threshold is so high that those people will not pass their muster. So I think we are looking at those agencies or asking IFC to create another, which really takes a different kind of calibre, more hybrid form of, you know, investments to be done.

PS: [00:46:57] So I think this will emerge. It has already happened in fintech and I think I would say in case of fintech, the work you are seeing being done with SMEs and micro enterprises and all is increasing significantly where these kinds of capitals have been used, and now in Agtech, I think since it's considered high risk threshold, we haven't seen those players coming into that. But, I think we are also going to launch an Africa Enabler fund for this category and we are also going to launch an innovation accelerator with WFP on food systems shortly, where we will specialise in the first stage, because I think what we find is the number of people who have started the start-ups and have done reasonably well, up to 5000 farmers is staggering. We have almost like 690 scalable start-ups in Africa and we are able to work with only 60 or 70 of them or 100 at the most. So I think we need that incubation patient capital for the early stage people and then an accelerator for the people who want to go to scale. I think we will invest in platforms in many countries. Now that's what our idea is, that eventually we will move to platform investments as opposed to making point investments.

PS: [00:48:14] The governments normally, in absence of that, they say, "Can we develop 100 apps or something like that?" In Indonesia, there are 690 applications developed by government not reaching anywhere. So I call this like Coleridge's thing, water, water everywhere and not a drop to drink. It's like app app everywhere, but not a farmer to reach, you know? So something like that is happening, you know. So people develop applications because there is a lot of young people who are able to do that. But, platform requires research, background work, data to be brought in, products to be developed, facilitation and I think there is a case that good quality start-ups in India from the numbers we have, could reach 500 if we do this investment in a platform kind of way, and that's my hypothesis for India and for a lot of other countries. In India, I think there are some states where we see a lot of traction, so it will not happen in India across the board, it's a large country. There are certain states where the government is more enabling, the ecosystems already created and I think we will see a huge kind of scaling up happening in those states.

RB: [00:49:22] I want to bring the conversation back to India. You know, just following your narrative as well, you talked about the agri stack, Mr. Shah and India, as you know, as you rightly said, is a very large country. How do you assess our readiness for a platform-based approach like this? I mean, we have a thriving agtech ecosystem today, and we have, as you rightly said, the digital public infrastructure like Aadhar and multiple other pieces that are coming together, but, what are some of our enabling conditions? What are some of the biggest challenges we face in platformization of service delivery approach for farmers here?

PS: [00:49:55] Clearly, if you see in India, all of these initiatives get driven by the centre, but I think they will only work at the state level where the state governments are in agriculture, and it is a state subject you know, that all the things - it's not just about digital, it's the inputs, the markets, commodities and you know, from the MSP, dialogue debate that we will have to develop a customised solution at the state level. Now, I can see a lot of states developing and enabling data policy, digital registry of farmers having a lot of extension services. They have all the ingredients which I talked about in Kenya. So I would say that first is we need a uniform data policy and something which I think we are working with Government of India on developing a data policy at the state level, you know, kind of a template and that really then builds capacity of the states to be an enabler of that data, to be accessed and made available to a lot of innovators and start-ups. So I would say that a uniform enabler policy on data is still required. I think with data stack coming in, it might be easier to do that, but still it will require facilitation to do that. The second feel is the digitisation, the government digitised farmers, plots and crop cutting experiments, but I think we

need to digitise farmer organisations - and I think with the cooperatives and all, a lot of impetus of cooperatives coming in - I think the digitisation of FPOs and co-operatives. If it's done, I think we will reach significant scale. So, in a sense we are talking about digital enterprise-based solutions, where a co-operative is able to deliver 80% of its services digitally to its members and also access inputs and markets because they are either doing inputs business or market access business and all that, but they're doing it still in a very traditional kind of a way.

PS: [00:51:54] So you need to improve efficiencies and effect. So there could be a policy on that because government has a 10,000 FPOs program, it's again implementing it in a very standard kind of way, make it digitally enabled from day one, and similarly, the co-operatives, the re-energisation they are doing of tax and all that could also be done through more the digital parts of it to really build some kind of digitisation of the distribution network. All the dealers are still not digitised, input dealers are not digitised. Ultimately they are delivering. All said and done. So if you had the dealers digitised, I find that once we did it in some countries, I think the efficiency of input supply and the cost of access to smallholder dropped considerably. Efficiency increased significantly. I think we need to bring an e-commerce policy for smallholders, agriculture, digital portal. There is no policy. Everyone is doing their own thing and all. There are some enablers which encouraged people to develop e-commerce portals which are dedicated to co-operatives or certain commodities and all. If you had those portals, then one portal is not enough.

PS: [00:52:59] You have to come with many portals, but an e-commerce policy, for agriculture, which is not just e-NAM - which is a good thing because at least it bought a lot of people under one platform - but how do you convert from access to market information to transactions and really have a more of a kind which is business driven. Then comes the whole thing about the advisory services and all, digitising those advisory services, so that no extension worker could go to a farmer without a digital device or something. Like in Ethiopia, we have 9500 extension workers are using iPads to deliver videos and services. So, sometimes we think that countries which we think about can't do it. I think you can always do it - digitising content and digitising farmers. If you do that, you have to change the last mile service delivery model. So we need to have a policy for digitised, digitally enabled last mile service delivery. We don't have that kind of thing. Every state goes and does their own thing and maybe the state needs to do it. There could be certain templates which could be provided at the national level for states to, you know, go faster into that policy rather than discover it after endless amount of back and forth there. And then finally, I think I would say that digital skills and entrepreneurship, I think is a very big policy. You know, the whole skills program - we have so many skills programs - just change it to this entrepreneurship, agripreneurs: entrepreneurs for digitally enabled delivery, many nodes of entrepreneurship, which will then have to be supported. And finally, the incubator. We don't have a good accelerator on agtech in the country. Thousands of guys, but not a good incubator and accelerator. Whereas, in Africa we are reaching almost three accelerators in every country now and I think I have advised the government to think about this critically. See even the innovation guys - The Innovation Mission, NITI Aayog - they come to agriculture in the end because they are going to the governments sectors where there is more demand. So unless or until Agriculture Ministry, which is asking us, wants to set up a digital transformation office in the Ministry of Agriculture - very good quality professionals to be able to nurture this kind of system - come with policies, create platforms, work with states to do that, I think it can't happen. I think we have to develop a combination of certain states which I would say that already Orissa, Maharashtra, a lot of states are going in the direction of. We have supported a lot of livelihood programs. Even in 2009, I started a maize producer company of woman in Khagaria, to work with NCDEX; and then you have a lot of silos, national collateral management, all of them

came there. The pull factor? So I think there is a continuous pull factor to be created to get a lot of people who would love to work in agriculture, but there is no platform. To me, I think we are committed as The World Bank to work with Government of India and with certain state governments to create proof of concept of what that ecosystem and platform would look like.

PS: [00:55:57] We don't know where it will work and what will not work because it gets politicised. Agriculture gets politicised very quickly. Start saying, okay, these guys want to bring the private sector in and all that. Ultimately, if we keep the farmer at the centre and design something, then we will be sure that we are looking at farmer interest from day one. That's very, very important. Is inclusion an agenda? So inclusive innovation is more difficult to do, and so I think Precision Agriculture Platform - my global role right now is to create a precision agriculture platform for 100 million smallholders globally - because I feel that smallholders need precision agriculture even more badly in climate change and all the resource constraints then what we have had in the past. So I think that's something which I think we can keep on working on. As you rightly said, that we have an age gap between the farmers and all agriculture is going to go through transitions. What part of agriculture will survive; what part of smallholder agriculture will survive? We don't know. But let's give more power to smallholders and their organisations to be part of that change as opposed to being roughshod supply driven kind of solutions thrown at them all the time. We have too much supply tension in Agtech right now. We have to change that to the demand orientation.

RB: [00:57:25] As I'm hearing you speak, the incentive for the agri entrepreneur is clear because they're going to get livelihoods. The incentive for agtech is clear because their customer acquisition cost comes down. Incentives for farmers is very clear because they get to get good benefits. The two stakeholders I am a little iffy about and you know, I feel there might be challenges are - One is the big businesses. The traditionally big businesses might see this as a big threat and say, "Hey, listen, I have the customer, you're taking the customer away from me." and they are fairly powerful players in the ecosystem. So your experience of working with them and second is, from the state point of view, not as much an incentive problem, but a capacity problem. I mean, what we're imagining the state to do, it's a lot of effort and it is involving capacity at every level of the state to be able to do this right from the policymaker at the state, right down to the KVK, you know, the the last mile. How do you see these two challenges play out? Am I right in sort of calling these two out as well?

PS: [00:58:17] They are important challenges. You see, even in the US, when Farmer Business Network, which is one of the kind of very important start-ups that brought all the input supplier data of what cost they were providing inputs for and they gave farmers the choice between the 16 input companies, and so all the input companies got very flabbergasted because a lot of things they were doing were exposed to farmers for the first time. So, it is definitely you are democratising a part of business which has never been democratised and made transparent in that sense, that challenge. But ultimately, I think the way the large agribusiness CEOs whom I talk to, they look at that as if they do this, they will reach the segments of agriculture, which they have never reached. So I think the business will grow in short term. You might have a lot of people, the farmer himself or herself might get things at lower cost. There will be intermediaries like agtechs and all who will disintermediate the existing channels and all. But if you look at the agribusiness companies, they are also finding it difficult to reach scale through their existing models. So I think that's where you can see even ITC and you know, and Olam and all these large agribusiness companies looking at a digital channel of their own. Now they may start a digital channel on their own on the same principles with agripreneurs and all, and not work with agri-techs, but they will soon realise that it

will be difficult to house all the expertise at one place. You can see that initial model that agtech was started in US and Europe - Monsanto's and Bayer's wanted to do everything and they also acquired agtech start-ups thinking that they should be doing that. All this collapsed, completely collapsed. So it means that you will have to come with a different model now so that you become a member of a platform and you grow your business by becoming a member of it. Ultimately, the start-ups also need market outlets for the produce to be bought by someone and if I'm only procuring from 10% of the villages right now which are producing, say, take the case of maize and 90%, you are not able to reach it, how are you going to reach them? You're going to reach them through platforms. I think that is why there is a little bit more effort required to bring some of the large agribusiness who have the wherewithal to really develop the market side of it into the platform. Initially, they don't come. That's our experience. But once the platform is established, they want to come and join the platform. So you have to make the platform so robust, organise the producers, organise the innovators, have a lot of, you know, service delivery happening on the ground. Then people see the proof of concept and they will also come. But in short term a lot of agri businesses lose margins and so that's why it's a difficult one. Essentially, they have been making money through these margins very inefficiently, often giving a very raw deal to farmers. In this case, we are reversing it in a way. But overall, the pie will increase so much because if you see agri business exports in India, they have grown astronomically in the last three, four years.

PS: [01:01:18] So previously you never looked at export of agri business. Now it's almost like $25 billion exports happening from India, which was just hardly 3 billion. So how is that growing? Because you are sourcing now good quality producers and making them part of the network. Now the second thing which you talked about was related to the government, and I think the government is also not a monolith. Clearly this old model of having a lot of extension workers was already collapsing. The number of extension workers we have now per capita population, 20% of what we had ten years back. So the government is already downsizing that part. But downsizing is not enough. You need to make the existing guys more efficient and you need to bring in new providers and incentivise them. Not investing in incentivising digitally enabled service delivery will be a mistake. So to shift your subsidies to more I would call an incentive based system as opposed to blanket subsidies. So if the farmer increases productivity, you should give the service provider an incentive. Currently, there is no correlation between the farmers impact and the subsidy. So you can see that even after the fertiliser subsidies we are giving India, 38% of soils are phosphorus, acidic. We still dump DAP because we don't have precision information. We had soil carbon data being collected through satellite and other kinds of sensors and all. We could come with something and we are doing this now in Maharashtra in a project with IIT, Bombay and Institute of Science, where they are advising farmers if the groundwater is going down and soil is there.

PS: [01:02:52] They say, okay, grow only three acres so if you grow more, you will lose money. That kind of customised advisory is coming because you have a network of sensors set up across villages in Maharashtra and data is being processed by IIT Bombay allowed us to convert that. So we have a lot of technical expertise in the country dying to be used, but no platform for that to use it. Once you create a platform, a lot of such people will come. As you rightly said earlier, research data and all and a lot of expertise we have. Even the tech expertise, data analytics, expertise will come there. So will say the government's role will change. But ministries of agriculture generally all over the world are the last to change, they are more rigid. So there is this curriculum thing also we are working on, right? So we are now working on how do we change the curriculum to include courses on data and digital agriculture, decision making, new approaches of extension, we have offered an open learning campus course in the bank on that so that a lot of universities which want to change

the curriculum of their agriculture, people who get recruited from the agriculture sciences should also get a way. It is a fundamental change because the curriculums have not changed for donkey's years. You know, we have to change that also if we want to bring the new generation people to think differently.

RB: [01:04:09] The choke is not in the capability, the choke is not in the clarity. The choke is really in this part where the discovery and the last mile of the farmer can be enabled and the platform is the right way to do it. The last question Mr. Shah, given the enormity of what we are looking at and also given the value that we can potentially unlock, you're talking about 51% of India's population. What do you think should be the role of philanthropy, because philanthropy has been increasingly looking at agriculture. As you said, the current mindset is I'll do 1000 small things to do something at large that never happens. So what would you advise anyone from a philanthropic space looking at agriculture to do in the light of this thought?

PS: [01:04:45] Think philanthropy has to pick certain big ideas and then create more kind of investment in the back end, the capacity, the platform and all that. I think even if the platform can fund an incubator and accelerator, that is good enough at this stage rather than fund individually everyone you know. So that's what I would advise, that pick a topic like precision agriculture for smallholders - topic big enough, and what do you do for that, also don't reinvent everything again, look at the best solutions and then work with them to create a scaled up solution. So, the problem is, I mean that everyone goes and finds their own scattered niche. So if everyone keeps on doing it never comes on a platform. It was very difficult in Kenya. I must tell you, Kenya is a minefield of 150 donors working on this agenda. But initially you work with some then root capital, village capital, all the philanthropic donors also come in there and discover their niche. Basically, this is such a big area that you have to select a topic and you select your niche. But the days by which you just do your own thing, I don't think that will work. You have to show, you know, results and I think we have to bring in some concepts of social impact investing into agriculture very, very strongly and create a social impact investment fund, which really allows us too - you know, because the problem is the commercial capital is not going in that direction - so I would ask the philanthropics to work with seed and early stage and not big ones. Seed and early stage need a lot of investment that to of patient capital and others because we are not able to grow the pipeline because we are not able to work with that segment. The pipeline becomes smaller because we have continued to work only on the people who grow. So I have 780 in Africa, maybe 1000 in India, in Middle East - Jordan, Lebanon, Egypt there are 250. So if I look at the scalable start-ups, considering the ideas which they have, there must be at least 5000 globally. They don't have any platform. The funding for them is so abysmal. So, I would say take early stage, but pick an idea. It could be creating a credit score, digital credit score for smallholder farmers. We are launching this challenge in Africa. Imagine if everyone had a credit score in the bank. Just had to look at the credit score and just transfer money. The whole thing would change drastically. So we have to get ten banks agreeing for a digital score or something. So we have to pick one good idea and then work around that is my advice to philanthropy. Rather than take everything under the sun and not achieve anything.

RB: [01:07:20] It takes a farmer to sustain a village, and what you're saying - it takes a village to sustain a farmer. You know, it is not something that one person can do. Mr. Shah, thank you so much for your time. I took a lot of valuable lessons from our conversation today. The first principle is to, like I said, to not do 1000 small things to create impact at scale, but look at that one choke in the system, which is really the platform-based approach to say, how can we bring multiple stakeholders to collectively solve the problem and that multiple stakeholders need an architecture

that brings them together. It also needs financial structures that bring them together. But more importantly, it requires that mindset to say the farmer deserves a high-quality experience of engaging with us, and I think that's very, very critical. I know we are out of time, so I really want to thank you for your valuable time with us and at some point want to do another podcast with you just to talk about innovating financing structures, because the financing structures here I think are fascinating, but that's for another day. Thanks again for your time.

PS: [01:08:13] Thank you very much.

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