**MCKINSEY INSTITUTE SPECIAL PRESENTATION**
***Mr. Pradeep Prabhala***
**October 18, 2018 – 10:45 a.m.**

*Introduction*

**Ambassador Kenneth M. Quinn**
President - World Food Prize Foundation

Next time you 're in Boston or Cambridge on Sunday, I want to recommend to you that you go to Henrietta's Table in the Charles Hotel for brunch. It's the best brunch in Boston, and this is not a paid commercial. This is to tell you that's where the next panel came from. So I was at something called the Pap Sack Conference, and Neil Jayne was here, was at it, as was Marshall Bouton, a dear friend who I've known for 20+ years when he was Executive Vice President of the Asia Society and we traveled in Asia together. Then he became President of the Chicago Council and turned it into this dynamo that's having influence every year. The Chicago Council Conference in Washington is a must do. And he said, "I've got an idea for a panel. I know some people in India. I want to get them together, bring them here, and we're going to add to it a presentation from McKinsey, who is my favorite organization with a standing invitation to be here. So, Marshall, I want to invite you to the stage and Pradeep Prabhala with a briefing from McKinsey, and then the Panel is over to you. And Marshall will introduce everyone that he's brought here.

**McKinsey Institute Special Presentation**

**Mr. Pradeep Prabhala**
Associate Partner, McKinsey Center for Agricultural Transformation

Good morning. It's a pleasure to be here, and thank you for having this. I'm going to spend the next 15 minutes talking about a topic that I'm deeply passionate about, and there are a couple of reasons why. I think one is I'm an Indian and Indian agriculture is such a mainsail, driving prosperity in the country that it's going to be really important to talk about agriculture. The second one is, I've been doing a lot of work on thinking about how technologies could transform agriculture at large, and we've been sort of serving a lot of clients of late, and we think it's something that has tremendous promise for inclusive agriculture in India. So I think both the topics are things that I'm deeply passionate about, and I look forward to spending the next 15 minutes talking about why do we think these are important and what do we see as some of the trends in the space.

When you talk about India in agriculture, it's often full of contradictions. On one hand I think we've had an extremely successful Green Revolution in the '60s. We are the second-largest producer of fruits and vegetables and the largest processor of fruits and vegetables globally. We are one of the largest producers of cereals globally, which includes crops like wheat and rice.

And we also sort of provide livelihoods for 60% of the population from an agriculture sector perspective.

But the other side of the story is that not all is great, because you actually find that we also contribute to the majority of the poverty in the country, as a sector. And we also sort of think that some of the poverty metrics are not trending the right way. For instance, for the last decade, the debt that farming households do take on have increased fourfold, and incomes have plummeted by 300% on an average. Now, does it mean that all is doom and gloom? No. In fact, there are sections of farmers in India who are extremely successful, people who are growing horticulture crops, cash crops. But there's also a section of India with farmers who don't actually make enough incomes to have their livelihoods being met in a way that they would aspire.

So how do we really achieve an inclusive agriculture sector in the country? What do we think are some of the structure and constraints? So effectively we think there are a few issues that effectively preclude farmers from making more money, and I think the government of India has prioritized doubling farmers' incomes is a big priority. And we think there are a few things that need to get done.

One is you need to be able to have a line of sight from the market supply for all the growers, and today I think that's a broken system. That's because a lot of procurement in the country is actually controlled by government in fields. And in a lot of the places, you don't have enough demand to sustain the 70 million odd farmers who currently just grow staple crops. And added to that, not only are the demand and supply signals flowing through the system, you also have an issue of intermediation that a lot of benefits that the farmers are rightfully owners of wouldn't come to them because you have a system that's highly intermediated.

And the second issue is, even assuming that you've got it right, I think, you have farmers actually buying inputs and other services being available to them. I think the story here is there's a very high cost to serve. We've seen that about 45% of land holdings in India are actually small and marginalized in the country. Smallholders typically incur 10 to 20% more costs and actually incurring the same services that typical mid-size to large farm would incur. And then there are other issues such as lack of sophistication in farming practices and limited ability to manage risks.

So where does technology come in? It's true that a lot of these challenges…, and we understand conceptually that a lot of these challenges could be addressed by using technology. And we've seen that typically when digital technologies or data comes in, your cost to serve goes down and your ability to manage risk because data improves significantly. You could actually work with farmers to improve their farming practices and so on.

But what's happening on the technology front? In general I think we're seeing a huge revolution of technology in India. I think obviously a lot of people here know about the stereotype of Indian ID services sector and how that's been the mainstay for a lot of the technology revolution imaging markets. But we also see that a lot of farmers, for instance, today own mobile phones. There are 155 million farmers and laborers in the country today who own mobile phones and can meaningfully engage with them and are fairly literate. And about 4 million farmers who actually have used electronic applications to conduct transactions in the country.

Now, added to that, I think, with things like unique identity being done by the government of India provides a huge technology platform on which a lot of solutions could be built that could effectively address the challenges. And we think that this is still early stages. I don't know how many of you know, by 2029, machines would actually match the intelligence of humans. And by 2050 they actually think that the machines would be at a point where they could progress technology at a pace that the human mind would not be able to fathom, which all means that in the next 10, 20 years you would actually see a huge proliferation of some of these technologies, and what they could do to the agriculture sector could be quite substantial.

Now, what can they do? What can these technologies actually do for the sector? There are often people who tell me that, "Listen, these technologies are all great, but agriculture is too complex. There's a lot of technical understanding, and it's really hard for digital technologies to meaningfully change ways in which growers could do things." But in places like the U.S. we've seen medical systems being disrupted by technology. Today a lot of people in this room would be comfortable going to Zocdoc and actually figuring out who's the doctor that they should go to, but actually doctor on demand to get medical advice. Right? So I mean that's a far more technical sin. It's pretty unusual for people to visit bank branches in developing markets, which used to be a highly personal interaction with a financial advisor.

So we don't think that any of the barriers in agriculture are insurmountable. In fact, we think that all of the challenges that people talk about in the sector could be addressed quite meaningfully using technology. There's some applications that we think could pave the way for improved agricultural productivity, these include things like providing better financing, because you can do credit risk now using digital technologies and find it far more effectively to check credit for people. You can actually do insurance by using tons of data that's available using satellite imagery. There are actually companies that are pioneering this.

You could figure out ways to sell farm inputs online. Now, this is something that I get a lot of flak for—can this really be done? I don't know how many are tracking the Alibaba revolution in China, for instance. Alibaba is actually growing e-commerce for agricultural inputs at a tremendous pace, obviously with support from the government. But it can be done. And then there are things like precision agriculture services that improve the farming, that actually e-market places are changing the way selling and distribution could be done in agriculture in India.

And we see a lot of these solutions being pretty promising. In fact, we think that the amount of value that can be unlocked through these technologies could be as high as about 10 to 30 billion dollars by 2020. We just took three examples of precision agriculture, agriculture to marketplaces, and farm financing and insurance. And even these places with the assumed penetration, I think these numbers roughly correspond to about 10 to 20% penetration in the rural country, which is not actually a lot. And even at those levels, we find a significant value could be unlocked by all of these technologies moving forward.

So not surprisingly, you have a lot of digital players who are… We call them "digital innovators" because these tend to be innovators who are innovating on a lot of solutions for agriculture in India and are focused on leveraging some of these technologies. Now, not many of them have scale. In fact, we have a person on the panel who is working in one of the technologies here. But essentially I think we see innovation in broadly five or six places in India.

One is we're seeing a lot of work in establishing market linkages using digital platforms, and this mostly is happening in the horticulture sector. We're seeing a lot of use of precision farming, which could hold tremendous promise; because an it not onlyreduces the cost of inputs but effectively has farmers apply technologies better. We see a lot of cheap services for smallholders, but these are the companies that are using Uber-like model to provide tractors. It's effectively lowered your cash, I mean, which lowers your cash situation of the growers. You also have traceable solutions. You have personalized on-demand services, etc. So there's a lot of innovation that's going on. But I think the key question is—Are they at scale and what would it require to scale them?

And similarly the government has been investing in these technologies and leveraging these technologies as well. For instance, I think there's an initiative at the government that's focused on developing online trading platforms for e-aps, which is fairly ambitious, as it already connects about 585 APMCs, which are agriculture-produced marketing centers in each of the states. And the ambition is to link those with village level markets by using a platform called Gramin. In addition, I think the government is also using technologies to drive things like subsidy management of fertilizers, developing insurance services, and so on.

So all to say there's a lot of activity, and all this activity is relatively in the nascent stage—not a lot of it at scale. So the next question is—What would it take to scale some of these technologies as you move forward?

We originally did a work with the World Economic Forum that is focused on understanding—What would it take to actually scale technologies? And I think the big realization is you need a vibrant innovation ecosystem as we call it to drive scaling of these technologies, which effectively means that you need base infrastructure that allows a lot of these companies to leverage these technologies, this infrastructure building through things like having basic network infrastructure, mobile connectivity. You want to make sure that there's some soft infrastructure like investments in fundamental research, there's actually opportunities or platforms for innovators to be able to translate some of the research ideas into products.

The second area which is very important is you need to be able to develop company value proposition to consumers and farmers. And the reason this is important is a lot of people fail because they think if you have a product in your mind that's going to work and farmers are going to adopt it. But the issues we've seen time and again even in developed markets, products are not offered to consumers unless you have a hook that brings them together. And these hooks come in the form of either aggregating services or figuring out a way in which you are able to attach the service to the social context in which these consumers are living, and so on. But I think that's going to be pretty critical.

And also it's not very simple to connect the last mile to the consumers and farmers, especially when you have such a fragmented setting in the country. So we think that's sort of a second key important part where you need to think through—how can you work with the consumers.

The third part which is important is—What is the operating model for some of these technologies that make it viable? Often I think this is the place where often the arguments are most fraught in our view, because people tend to classify certain goods as private and certain goods as public. But in reality a lot of public-private collaborations are required for you to effectively run a viable model.

So, for instance, let's say that you are running a database platform that provides precision agriculture services. Now, for that platform to be effective, what you need to be able to do is to get a lot of people to work on that platform—right? Because data is power, you need to get a certain scale of data for you to be able to then provide advice based on the data and so on. But getting that first level, critical level of data is really the most challenging part. And companies often are not able to invest enough to be able to get that. So that's where the public financing and the donor financing becomes pretty critical as you move forward.

And the last one is—I can't overstate how important regulations are. Often governments are very quick to regulate these sectors or too late to regulate the sectors, and often the timing is inaccurate. And government is increasingly trying to understand, how do these technologies scale? What is required from a government perspective? What do you need to do to effectively to try to change?

So all to say that I think these are critical parts, and as we look forward, we need to make sure that we're working through—how could we scale some of these technologies to harness the potential of technologies in agriculture in the country?

Thank you.

**Marshall Bouton**

Thank you so much, Pradeep.