Collaborations during the times of COVID 19.

KISAN MITR

A POSITIVE MOVEMENT TO GARNER SCIENTIFIC COMMUNITY & TECHNOLOGISTS TO SUPPORT FARMER INCOME – AN ATTEMPT TO MAKE THEM SELF RELIANT (ATMANIRBHAR)

1. Background:

During the times of COVID India as a Nation had seen great difficulties related to imports of reagents and testing kits. This made the Government of India (GoI) realize the importance of import substitution and self-reliance. The same can be extrapolated to farmers. Hence from the office of the Principal Scientific Adviser to the Government of India we decided to work on this through our strengths of Science and Technologies. Meanwhile the other issue that was noticed during the pandemic was that migrants hadleft urban spaces and were being accepted by their villages after the quarantine period. Quite a few were not planning to return to urban areas, given their recent experiences and fear of the virus. Hence the challenges envisaged would be on engaging them when they move to their primary agricultural livelihood by supporting them with effective agricultural solutions. This is also due to the fact that the burden on the land will also need attention. It was important to ensure sustainable farm practices both through Agriculture scientific research output and technologies but most importantly with a digital backbone focusing on providing inputs to the farmers and on increasing yield through regenerative practices would be very essential. Further, it was felt migrant youth can either engage in farming or can be agriculture related entrepreneurs or change agents for hand holding their farmer communities. Large sections of farmers, even today have access only to basic fertilizers or pesticides and hence agricultural solutions i.e. scientific, deep technologies should reach them on an urgent basis along with farmer inputs lying in storage of databases that are in silos i.e. weather, water tables, moisture, pests, soil texture etc.

Meanwhile the startup ecosystem in India has geared up to meet social development challenges.These have mushroomed primarily because of the encouragement by Government of India. The startup founders focusing on Agriculture also need to be supported. Hence this movement for the farmers in a way to provide catalyst support to start ups. If start up efforts do not reach the ground; they may not be encouraged to keep developing newer agricultural solutions. India may face a brain drain of youth engaging in agriculture technologies or they may shift to easier ICT related technologies such as online gaming or mobileapplications etc. that help with faster and easier revenue generation.

The initiative was knowns as the Friends of the Farmers (Kisanmitr) as it required several collaborators and partners. During the pandemic we received support for development of the digital platform 'Friends of the Farmers' (Kisanmitr), app known as the self-reliant farmer (Atmanirbhar Krishi). In addition, we received support from Government Ministries as well as Private sector organizations and Foundations such as Nasscom Foundation, National Institute of Agriculture Marketing under Ministry of Agriculture, Indian Institute of Management, Bangalore (IIM,Bangalore) provided support by outreach and organizing presentations of the innovators/technologists. There was a requirement of a competent team of developers, creative thinkers and project management team that could develop the digital scope of work, architecture of each of these sections. Cabinet Secretariat, UMANG team underMinistry of Electronics and Information Technology offered movement from digital platform to their one stop app for all the agriculture technologies. Indian private sector Information technologies organization, Tech Mahindra offered pro bono services to develop the Atmanirbhar App for farmer inputs as well as developing the Non-farm platform separately. A founder of a start-up offered her services as a Project Manager. Indian Centre for Social Transformation (Indian CST), a Bangalore based Registered Public

Charitable Trust (Regd) developed the digital platform. Chevening alumnus from Future Group, Reliance retail, Big Basket offered to be the aggregators for purchases from the Mountain States. Several other Industry and incubator members came together to be the demand group. From the supply of Agriculture technologies, a National repository of about 1000 technologies was built. Indian Farmers Fertilizers Cooperative (IFFCO) funded Television episodes for these technologies of Doordarshan, an Indian National Television channel under a program known as 'DD Kisan". There was to be a section known as International Engagement, this was facilitated by Confederation of Indian Industries (CII). Flipkart technical team offered to evaluate the digital platform as a third party. An advisory committee with a farming expert, an ex-Indian Centre for Agriculture Research, Chief Technologist Officer (retired from WIPRO) ad a faculty from Indian Institute of Management, Kozhikode (co-author of this paper) was formed to steer the project and to bring our respective rich network to collaborate on the project

Digital platform and apps developed was to be for the citizens and without any costs to the farmers. The platform had to be unique in nature and could not duplicate existing digital platforms (including apps) hence a comparative study of the digital platforms of Agriculture Ministries, Ministry of Rural development and NABARD wasundertaken. The Digital platform was the primary phase of the movement, however engagement of demand and supply technologists for all the phases was also to be undertaken.Overall for the start up ecosystem structured inputs were to be provided for which again partners joined in pro bono and took sessions on Commercialisation, Patent filing, IPR, Structured innovations etc.

2. Objective of the mouvement, Friends of the Farmers (Kisanmitr)

To provide solutions keeping in mind inclusivity (agriculture is becoming feminine and has huge percentage of small farm holding) and to focus on the farmer's balance sheet, making her self-reliant and last but not the least encouraging youth/startups by sustaining their operations & scaling up.

3. Methodology:

The entire movement of 'friends of the farmers" was supported through a robust digital backbone/platform. The ethos behind this is to focus on developing a centralized single point for a National repository of agriculture technologies, all inclusive animal husbandry (produce & technologies), Nutrition and regenerative farming to be a key focus and finally providing real time information that will be useful to the farmers. It was also to act as a centralized information provider on any hackathon/challenge that any of the demand group members would like to throw on the scientific community. Last but not the least it will be developed as far as possible with voluntary resources (minimum funding) and will be a free for all through personalized login. During the execution phase on a low price point ecommerce maybe thought of to make the platform sustainable. However this would be to those receiving the funds through the platform for sale of technology.The cost of usage of the digital platform will not be borne by the farmers at any point of time. The entire idea is to engage all Scientific research and Technology Institutes, National Incubators and their startups, MSME as well as private sector start up community to offer their technologies at a low cost and high-quality basis. Last but not the least, in terms of digital platforms for all the 4 phases (except 4th phase) ideally repurposing the existing open source platforms is preferred and not to develop from scratch.

Hence the methodology, of converting the movement of **friends of the farmers** into action was through four primary phases that are envisaged:

1. Technologies Information Exchange

An engaging exchange between Agriculture technologies & Scientific Research and Industry members/Incubators/Farmer Producer Organizations (FPO) /Women Self Help Group (SHG) that are interested in the Technologies. This would include competition/hackathons/challenges for the scientific community from Industry/Foundations/CSR organizations. This section would include chat platforms, dashboards, MIS, feedback (quality) a Rating System and ecommerce with payment gateway. Basically, to develop a National Repository of Scientific Research, Technologies, ICT and AI based user friendly platforms keeping Industry, Incubators, Venture Capitalists and Government as enablers and connecting to the farmers as end users.

Technology could be in the Idea stage for addressing specific problem statements obtained from specific farmers from certain geographies i.e. Lab work - R&D stage in the lab (TRL 3), R&D stage in the lab (TRL 4 to 9 – valley of death), Prototype and field trials stage, Commercialization stage, access to Investor network stage, acceleration stage, linkages to Government or NABARD for procurement, ensuring training and deployment, sustainable monitoring and feedback for improvement to flow back to the S&T start up or lab on an ongoing basis (detailed below). These would be followed by the demand side as per their own mission and processes. NABARD or PSA's office will not interfere in the Demand side group members and their processes however can organize road shows, webinars (in addition to the one being organized by NASSCOM Foundation). Facilitation expected from the demand side is to move the supply of technologies to its next level (either support with commercialization, funding, access to market/training) in order to finally provide access of quality & low-cost technologies to the farmers. Industry, Incubators, Government, NABARD to support technologies and solutions through evaluation for low cost, high quality, bankable, scalable projects. Funding for relevant R&D, facilitate commercialization, acceleration of startups, provide Government channels for purchases of effective agricultural solutions developed by the Scientific fraternity, connect the start up to the Industry for technology transfer if the founders wish to develop and transfer technology and not engage further. Deployment through existing Industry or Government partnerships, ensure training and monitoring as per respective mandates

Range of envisaged Science & Technologies – light equipment, scientific solutions and deep technologies that could be hired by FPOs from start-ups based on services rendered:

a) Soil & Water Conservation (Irrigation channels, rivers, ponds, check dams, water harvesting, water filtration landscapes)

b) Farm ecosystem machinery services (large equipment for FPOs) services or on hire

c) Organic inputs, seed production, weather, app-based inputs (some of these maybe evaluated to be used in phase 4 by ISRO and NABARD)

d) Energy related - Solar or wind mini grids

e) Logistics or supply chain applications or technologies

f) Cold storages

g) Processing related technologies

h) Mandi dashboards, real-time feedback on price, goods availability, demand, cultivation scheduling and planning, price forecast with mandi logistic and supply chain management

i) Drones on hire with services, data collection analysis through training of BDO and FPOs – could include drones for seed plantation, real time tracking, work assignment, digital payments and virtual approvals, mobile GPS.

j) Technologies for credit linkages, buybacks, branding and marketing

k) SEED related scientific research output

l) Farm practices related methodologies and output

Stages of Science & Technology solutions envisaged: a)

Idea stage

b) Lab work - R&D stage in the lab (TRL 3)

c) R&D stage in the lab (TRL 4 to 9)

d) Prototype and field trials stage

e) Commercialization stage

f) Access to Investor network stage

g) Acceleration stage

h) Linkages to Government or NABARD for procurement

i) Ensuring Training and Deployment

j) Sustainable monitoring and feedback and rating for improvising the technologies

Supply side: Institutes and Incubators that have been reached out and shared data: a)

All Indian Institute of Technologies (IITs)

b) All ICARs through ADG, ICAR

c) All IISERs

d) All CSIRs

e) Reputed Agriculture Universities (Punjab, Tamilnadu) – more could be added if anyone has suggestions.

f) State Government farm practices (ZBNF – to participate in National challenges, Sikkim organic farming etc)

g) Rice Institutes

Demand side:

Accelerators, Agri Innovators, Agri Incubators, Industry, Foundations, Large FPO communities that can fund ongoing research (pre commercialization), support commercialization, accelerate the startups, deploy the technologies and scientific research on the ground through FPOs, conduct training and manage sustainable agriculture practices through Science & Technology support. The confirmed list of members are as follows. There are several other FPOs that have not been captured however NASSCOM Foundation through the Presentation series will be sharing the final engaged demand members. The following are those that have been onboarded through detailed discussions. These organizations from the demand side are engaging with the supply side through the technology presentations and will be part of the digital platform.

Organizations onboarded are mentioned in annexure 1.0. In addition

We have collected information of technologies from various private and public research institutes, incubated startups. These include Indian Institute of Technology (IITs), Indian Institutes of Science Education and Research (IISERs), Council of Scientific & Industrial Research (CSIRs) and Indian Council of Agriculture Research (ICARs) and their respective incubated start-ups. In addition, we have also collected information from the Micro Small and Medium Enterprises (MSMEs). This data is uploaded in the system from the back end. We have also commenced presentations in partnership of NASSCOM Foundation (every Saturday of

the week) for the demand group members to evaluate the technologies. The recordings of these presentations in the format of a webinar will be uploaded against the technology presented. The information gathered includes name and coordinates of the FPOs that provided the problem statement to the technologists, the details of the technology and what aspect of the problem statement it addresses, details of similar technologies in the market, Unique Selling Proposition (USP) of the technology, at which stage is the technology (this information is sought so that the technology can be placed in an alphabetical order in the digital platform in this phase under segregated sections of R&D, prototype and ecommerce for marketable technologies).

On the demand side in addition to the members listed in the annexure we have also added 400 Nabard District Development Managers in the demand side and all their Incubators along with 60 demand Industry and Incubator members including TAFE, ITC, Coromandel, Tata chemicals, Rallis, Nagarjuna etc (the detailed list is provided as an annexure)

National Institute of Agriculture Markets (NIAM)*supported* Kisanmitr *(friends of the farmer) for 3 separate interventions i.e. for sale of agriculture technologies to farmers, for sale of farm produce of Nutrition Agriculture to mid-day meals operators and to the metro elite and non-farm ecommerce along with facility of quality check and onboarding on the platform of small farmers and off farm weavers). Second component of discussion is for NIAM to undertake webinars parallelly to NASSCOM Foundation for those technologies that they think will immediately help migrants and undertake those webinars with 20,000 of their FPOs, members and companies and help them onboard on Kisanmitr digital platform for records and future engagements through chatting platform, deep engagement and for tracking final impact of evaluation of technologies. Login was provided to the 20,000 members through an API integration.*

Doordarshan Kisan *has commenced to televise the agricultural technologies in order to increase visibility and adoption of modern farming techniques and technologies. The byte of PSA has been taken and planning for episodes has commence.*

Through the Panchayat Raj all Gram Panchayats will be trained on the digital platform and the various apps. The women and child anganwadi related food purchasing units will also be onboarded in the Himalayan Bazaar.

2. Livestock

All-inclusive of Livestock breeding, produce and technologies. It will include ecommerce, knowledge management and dashboards.

This includes produce and technologies of private and incubated startups These are consolidated along with e-Paashuhaat web portal launched by the Ministry of Agriculture and Farmers Welfare, Government of India, under the Department of Animal Husbandry, Dairying and Fisheries (DADF) to boost dairy

productivity in India by organizing the livestock market so that there is a consolidated repository of produce and technologies of private and public startups and MSMEs. Dashboards and MIS is being tested out. User Interface and front end is being reworked based on inputs provided so far. E-paashuhaat was developed by the same digital platform developers and hence repurposing the same made sense to include livestock technologies.

3. Scientific Research

All ICAR and CSIR scientific research output and challenges was part of this section so that it is segregated and clear for everyone to engage in a sharper manner

To ensure the platform takes off, the engagement is planned in a meticulous manner. The engagement is being undertaken through different segments of demand i.e a Foundation, Industry, Farmer Producer Organizations. Their requirements are being met through screening and internal evaluation of the technologies and being provided to them for purchase on the digital platform

4. Himalayan Bazaar

One of the authors of the paper had worked extensively in the Mountain States of India. Nutrition agriculture includes cultivation, forest produce, grass root innovators (e.g. honey, nutrient candies and so on), aromatic plants, medicinal local plants, local crops, unique and highly nutritious. This section is not for the elite to sell their produce but for local village level produce as supply to those who need nutrition agricultural produce. In the demand side, it would include local Mid-day Meal implementation partners (Akshaya Patra, State Government Schemes), women and child SHGs so that they could let malnourished children consume the village level high nutrition crops through Government or Foundation sponsors. The grid of demand and supply was mapped through the FPOs and by reaching out to the State Governments for real on the ground upload of data and produce as well as local demand data.

A competent team of agriculturists, ecommerce chains through a group of Chevening alumni have come together to discuss a model of using their respective local collection centers to collect information of micro farmers with high nutrition cultivation produce in the Mountain States and remote areas. The Chevening alumni included a Chief Technology officer of Reliance Retail, Supply Chain head of Big basket, Future Group (for onboarding micro farmers and GI tagging, quality check inputs to be uploaded on the platform etc.), Akshaya Patra network of India and a Rotarian (for demand of mid-day meals program). These would generate the demand for the local produce of Mountain States and Tribal areas supplying Nutrition Agriculture through FPOs. Once it was made available and hosted on Indian CST platform the demand side i.e. Akshaya Patra, Rotary mid-day meals, Child SHGs, Ministry of child and women welfare angawadi procurement teams can purchase using the payment gateway of pay.gov. IKEA Foundation, ICICI Foundation, AKSHAYA Patra, and Rotary for malnourishment programs are beign onboarded.

Further, Farmer Producer Organizations (FPOs) were onboarded from Ministry of Agriculture, since we were particular about the buyers, some of them will be handpicked during the course of the engagement stage of the platform and this section was largely meant for the undernourished children and women to be provided nourishment from the Mountain States through charitable trusts Both the supply and demand side were to register on the platform and purchase directly through the payment gateway of Government provided on the platform. Those retail chains were also demand aggregators for the produce

Further, this section was to include technologies for Mountain States,an ex ISRO, HAL senior resource along with mentoring by IISc and Horticulture department (ICAR) will be developing hybrid'autonomous vehicles" for transportation of agriculture produce from the fringes. The proposal has been submitted to Ministry of DONER. The same will be onboarded in the platform of NIC when produced in quantities just as trucks can be onboarded for scheduling distribution on the app.

5. Self-Reliant Farmer – Atmanirbhar APP for farmers

In India there are several databases relevant to farmers (environmental) i.e. quality of soil, weather, moisture, water tables, air pollution (through sensors if not readily available). Most of the data are housed in multiple National & International databases. This data could be very relevant to the farmers however it is found to be in multiple databases.

Top down approach:

The data requirement for the farmers needs to be determined with the help of NABARD. The same has to be sourced from different National and International databases. An application needs to be developed using Artificial Intelligence to source the data, mine the data, analyze the data, convert into vernacular language and provide as inputs to the end user i.e. farmer. Further modeling of few decisions based on permutation and combination of the data should also be provided to the farmers for him to determine the cropping pattern and to take necessary decisions on farm practices. This modeling needs to be undertaken through consultative processes with agriculture experts of NABARD and its FPOs.

- Listed down the environmental inputs to be provided to a typical farmer (tentative list provided above). It can be made sharper with inputs from NABARD

- Mapped it with databases - National (ISRO - majority of the parameters will be covered), GKVK, ICAR and International - USDA/FAO (Discussion is on in terms of what they plan to launch through Land PKS application and its usage for our project – since ISRO and MNCFC have developed an equally good app we may not be particular about using the USDA-FAO app. Decision to be taken collectively by the advisory committee)

- To validate it with NABARD, Aajeevika Bureau through their FPOs to do a reality check on whether these inputs would really be useful

- Approached the database owners for accessing the databases and understanding the structure of these databases or tools/application

- Parallel activity for the digital partners of IT- ISRO team along with Indian CST to prepare the exact work flow, digital scope of work, and development efforts for preparing the data structure architecture, accessing key fields from differently formatted databases, extracting the required data, using AI platform to analyze and provide inputs in a format that is acceptable to farmers and conversion to regional language for their BASIC phone

- Modelling the inputs received for geographies and providing solutions to them with the help of consultations with NABARD FPOs/Agriculture experts, providing that as an output in vernacular language

- ISRO has as a satellite database and a list of databases have been prepared

- Launching the final solution on Indian CST platform and provide services through UMANG

- Preparing similar models for other countries for Indian CST to sell through Foundations or Government as an application and digital platform. In India the farmers to get this data without costs

(Refer Annexure 2.0 for Mapping of farming inputs to databases**)**

List of databases and data relevant to each of the databases has been developed. The APIs for the databases mentioned below have commenced. Tech Mahindra is developing the app along with a startup founder taking into account all the databases. The app will be known as " Atmanirbhar Krishi" (Self Reliant Farmer) and will include the inputs as provided below.

The engagement in this section would be through pilot testing of accuracy of data through Hindustan Unilever or NABARD to check on whether advisory inputs and framework of possible decisions on cropping based on the inputs are possible to be provided.

6. Agri-Fin Tech phase:

This phase will provide details of Agri-Fin tech that will be useful to both Farmers managing their own accounting and financial statements, helping them understand in simple terms their ledger and books of accounts and how to keep the records as well as technologies that will help any network of Non-Banking Finance Corporations (NBFCs) to monitor FPO financial progress. Start ups have a lot of financial technology products that can be showcased here

7. Off Farm Platform– Creative Handloom/Textiles

This would be a separate platform on off farm. Tech Mahindra is developing the platform as a CSR activity. Technologies related to Textile and Creative Manufacturing - including leather ,carpets , gems and jewelry will be brought into the repository.Technologies would be largely from RUTAG of PSA's office, Access Livelihood – Hyderabad, Access Group – Delhi, Development Alternatives,UNDP, ECO Tussar, Pradaan,

Resham Sutra on the supply side and on the demand side those that would be onboarded are Aditya Birla Group - Rajasthan Spinning Mills, IkaiAsai- Aditya Birla Group, Tanishq, Carat Lane - Titan, Taneira, Tata exports, Hi Design, Farida Group. Discussions at a later point of time with Ministry of Textiles.

Horizontal axis:

While the vertical phases are provided above, the horizontal sections would include Knowledge Management (KM), E-commerce (through E-NAAM), Rating System, Agriculture technologies, Livestock technologies and Scientific research Feedback and Dashboards/MIS for each of the phases (wherever applicable)

International Engagement will also be a Horizontal axis that will include start ups collaboration through GITA (CII's portal) as well as all enquiries to replicate the platform internationally.

Knowledge Management:

Monitoring of the impact will not only be through the platform but also through case studies to be written by Dr Sapna Poti from the office of the PSA and Prof Simy from IIM Kozhikode. Idea is to motivate all concerned positively rather than through monitoring.

Promotion and Training on usage of Agriculture Technologies:

As an attempt to reach out to the farmers, not only through NRLM or Nabard but also through the ITI network is being explored. Evaluation of the agriculture technologies could be undertaken through the ATMA network under Ministry of Agriculture. Once the platform is onboarded on UMANG we will commence the training.

Annexure 1.0 – Demand Side

S.No.	Name of the Person	Organization	Title
1	Mr. Venkadri	Tata Chemicals	Head R&D
2	Mr Ramanthan	Rallis	CTO
3	Mr. Raghuandan	MCRC, Murugappa Group	CEO
4	Mr. NagarajaPrakasam	Acumen Fund	Advisor
5	Ms. Mukta Sharma	NSRCEL, IIM-B	Incubation Manager
6	Mr. Srinivas Ramanujam	Villgro	CEO
7	Mr. Abhishek Srivastava	NABARD	FPOs and Government interface
8	Mr. Rajesh Ranjan	NABVENTURES	CEO/Venture Capitalist

9	Mr. Venkatesh Panchapagesan	NSRCEL, IIM-B	Chairperson, NSRCEL
10	Mr. Vijay Nadiminti	a-IDEA	COO
11	Mr. Vipul Patel	CIIE, IIM-A	VP-Investments
12	Ami Patel	Industree Crafts Foundation	Project Lead (Design & Market)
13	Simy Joy	Prof.IIM K	Research
14	Mr. Ramanjaneyulu GV	CSA	Executive Director
15	K C Devansenapathi IAS	IAS, Raipur, Chattisgarh	Additional Chief Electoral Officer
16	Neelam Chhiber	Co-founder and Managing Trustee	Industree
17	Ms.PoojaKukreja	Marico India - Chairman's office	Manager
18	Mr. Raghunandan K – CEO – MCRC	EID Parry	President
19	Krishna Kumar G	ITC	VP Crop Operations & Sustainability
20	Mr Chandra Mohan	TAFE	President, CFO
21	Aswathaman Vijayan	ITC	Mananger sustainability
22	LakshmanSJ-	EID Parry	AVP&Head-R&D and CaneExtension
23	Kalpana S Regulagedda	Former JD, ICAR-NAARM	Lakshman SJ-SUG-PUG-EID
24	Sri Ram Bhagavatula		

25	Sivakumar P	MABIF (Madhurai)	CEO
26	Dr. K. Srinivas	a-IDEA, ICAR-NAARM	CEO, a-IDEA
27	Prof.Trilochan Sastry	IIM-B, Social Alpha Board	Prof. in Decision Sciences, Centre for Public Policy

28	Prof. Shambhu Prasad	IRMA	Professor-IRMA Coordinator, I Seed
29	Rajneesh Kumar	Pusa Krishi Incubator	COO, Pusa Krishi Incubator
30	Dr.NeeruBhooshan	Pusa Krishi Incubator	CEO, Pusa Krishi Incubator
31	Navrun	Industree	
32	Hemendra Mathur	Bharat Fund	Venture Capitaiist
33	Rajendran Ramasami	Rasi seeds, Cotton	Managing Director
34	Suresh Babu	Rasi seeds, Cotton	National Manager
35	Prabhaka Rao	Nuziveedu seeds, Cotton & Field crops	Managing Director
36	Venkat rao K		Sr.Vice President
37	Vamshidhar	Kaveri Seeds	Director Sales
38	Yogesh chandra	Tulasi seeds	Managing Director
39	Dharma Charan	Veda Seeds	Managing Director
40	Raju Barwale	Mahycoseeds(Cotton, Field crops and Vegetables	Managing Director
41	Gurpreet Bhattal	PHI Seeds (Maize seeds)	Sales Director
42	Mukesh Mittal	Tierra Agrotech, Cotton, Field crops	CEO
43	Ram Jangeed	Ajeet Seeds(Cotton)	Vice president
44	Prof. Sridhar Vishwanath	IRMA	Asst. Prof. Strategy band Policy, Chair Iseed& MDP
45	Ms Gayathri Vasudevan	Labour net	Founder and MD
46	Mr Ram	Rangde India	NBFC-P2P Lending

47	Vipin Kumar	National Innovation Foundation-India, Gandhinagar	Director and Chief Innovation Officer
48	Kshama Patil	Department, GoK	Deputy Director, Horticulture

49	Siddharth	Portfolio & Innovation	Social Alpha
50	Mahesh Yagnaraman	Acumen Fund	MD, India
51	Nagarajan M	IAS, Govt. of Gujarat	Director, Higher Education, GoGujarat
52	Siddharth Chaturvedi	World Bank	Consultant

Annexure 2.0 – Farming Inputs mapped to Databases

Farming Inputs								
Organization	ICAR - NBSS & LUP	MAFW - INM	MAFW	ISRO	ISRO NRSC	MJS - DWR,RD ,GR	MJS- CGWB	MES
Database	Bhoomi	Soil Health Card	MNCFC	Vedas SAC	Bhuvan FDC	India WRIS	India WRIS	IMD
Static Land Information								
Soil texture	Yes	Yes						
Soil color	Yes	Yes						
Soil identification	Yes	Yes						
Soil nutritional value	Yes	Yes						
Moisture level	Yes	Yes	Derived			Yes	Yes	
Land Cover								
Crop type	Yes		Bottom up					
Crop map (geography of which crop grows where typically)	Yes		Yes					
Crop condition (Vegetation Index)	Yes		Yes	Yes				
Ecology								
Weather	Aggregated							Yes
Precipitation	Aggregated		Yes	Yes				Yes
Water table						Yes	Yes	
Pests					Yes			
Wild animals	Basic							
Animal husbandry	Basic							
Socio-Economy								
Land holding size	Yes							

Good to have (Optional)								
Crop photos					Yes			
Vegetation present (True/False)			Yes	Yes				
Vegetation monitoring (vegetation composition, plant height, canopy/basal gaps)								

Annexure 3.0 – Comparison of tech platforms offered by other Ministries and bodies.

- **Ministry of Agriculture and Farmers Welfare**
    1. **Kisan Rath**
        - Connect farmers and traders with transporters.
        - List of leading transport aggregators and individual transporters.
        - Wide range of transport vehicles available on required date and place.
        - Does not yet allow filtering trucks based on cost.
    2. **e-NAM**
        - Trading portal with a network of existing mandis.
        - Traders can do remote bidding.
        - Farmers get info about arrivals and prices.
        - Facilitates on-ground weightment, quality checks, and eNWR.
- **CSIR**
    1. **Kisan Sabha**
        - Eliminate the need for middlemen by connecting farmers to supply-chain and freight transportation management system.
        - Single stop for all 6 entities related to agriculture:
            1. Farmers who need better price for their crops.
            2. Mandi Dealers who want to connect to more farmers.
            3. Transporters who invariably go empty from the mandis.
            4. Mandi Board Members.
            5. Service Providers.
            6. Consumers.
        - Includes many features such as Freight estimation, Toll calculation, Mandi price updates, Multisided marketplace, and Transportation requests.
- **NABARD**
    1. **eShakti**
        - Digital Bookkeeping app for Self Help Groups.

- Improves quality of data, which is shared among members and banks.
- Improves transparency of transactions.
- Tracks credit history of members which helps in securing loans.
- Converges SHG with other government programs.

- **Ministry of Rural Development**

1. **Gram Samvaad**
    - Information dissemination - Citizens at Gram Panchayat level get access to information on various Rural Development programs.
    - Transparency & Accountability - Access to information on grants to local bodies and 7 programs of the Ministry of Rural Development.
2. **Mission Antyodaya**
    - Only for officials of MoRD for field data collection at village level for data related to infrastructure and economic activities.
    - Information is used for ranking Gram Panchayats and monitoring progress in villages. 3.

GeoRurban

- Monitor physical progress of the works under SPMRM.
- Users can upload Geo-tag enabled images of the physical status of the works being executed on the ground in the clusters.