

**Mobile-based personalized
advisory with insurance
component helps in reducing
agriculture risks**



**Selected
Case studies**



MOBILE-BASED PERSONALIZED ADVISORY WITH INSURANCE COMPONENT HELPS IN REDUCING AGRICULTURE RISKS

SELECTED CASE STUDIES

Picture Based Insurance bundled with Picture Based Advisories for Sustainable and Scalable Risk Management Services



Project Partners:

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PRELUDE

Smallholder farmers in India are increasingly exposed equally to both abiotic risks (climate change and extreme weather events) and biotic risks (pest and disease infestations). The increased exposure to risk (weather, pests, diseases, nutrient disorders, weeds etc.) and accompanying agricultural income losses make small farmers more vulnerable. Such vulnerability further discourages farmers from investing in both productivity enhancing innovations as well as human capital, affecting growth prospects for existing and future generations. In

this context, there is ample scope in using innovative tools to improve agricultural risk management and reduce the burden of climate change. One such tool is picture-based monitoring of crop phenology to extend necessary advisory support and insurance services.

The concept of Picture Based Insurance (PBI) bundled with Picture Based Advisories (PBA) services for sustainable and scalable risk management solutions to the farmers in Tamil Nadu was piloted with the support from CABI and IFPRI from July 2019 to February 2021. The study found that remote mobile-based personalized advisory improved farmers' knowledge of productivity-enhancing and risk-reducing practices, and helped farmers reduce risk more than generic advisories. Bundling with insurance

significantly improved the number of pictures sent by farmers, satisfaction with the service, adoption of advisories and willingness to pay. In the Kharif, July to October 2020, MSSRF worked in two districts, Pudukottai and Thanjavur in the State of Tamil Nadu, India (Fig 1) which comprised of 70 villages and 350 farmers (~5 farmers/village) in Paddy and Groundnut. 50% of total villages were covered under PBI based on damages occurred during Kharif and Rabi seasons of 2019 (July and December).

Since it is a pilot testing phase, intervention on the insurance premium cost is covered by the project (5 identified farmers/village). IFPRI provided relevant support on PBI component with reference to policies, communication materials, protocols for document collection etc., required from compliance perspective. The

loss assessments activity by a panel of four experts was done for 175 field sites following the standard protocol. At the end of the assessment it was found that 136 sites showed a damage percentage of 21-50% and became eligible to receive the insurance payout of Rs. 10,500 per field site. This report is capturing the farmers perspectives and feedback on PBA, PBI and Plantwise (PW) interventions in the form of case studies from Pudukkottai and Thanjavur districts of Tamil Nadu.

The concept of Picture Based Insurance (PBI) bundled with Picture Based Advisories (PBA) services for sustainable and scalable risk management solutions to the farmers in Tamil Nadu



2 Districts
70 Villages

*Pudukottai &
Thanjavur*



350 farmers

*(~5 farmers/
village)*



Kharif Season of 2020

July - October



loss assessments
- 175 field sites



damage percentage
21-50%
in 136 sites

136 sites eligible to receive the insurance pay-out of Rs.10,500 per field site

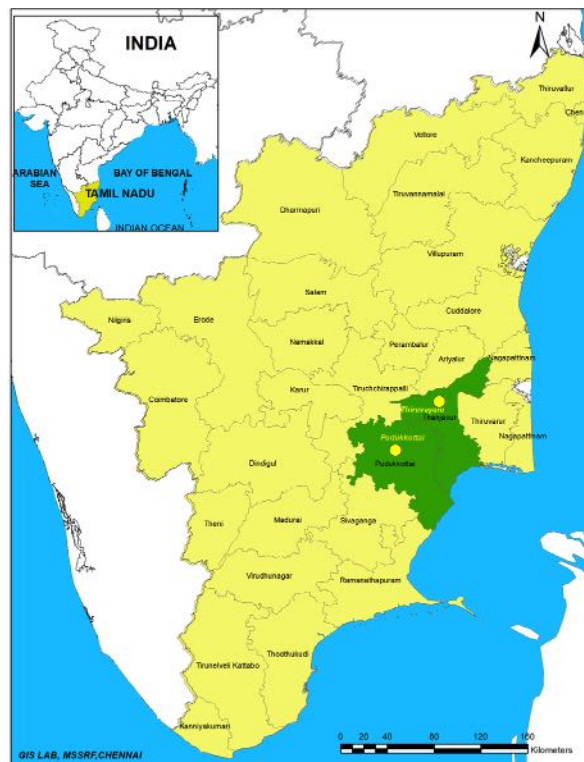


Fig 1: Locations of Project

Case 1: Mr. Mayalagu



54 years



Anavayal (V)
Thiruvarangulam (B)
Pudukottai (D)



Mr. Mayalagu

“a self-motivated farmer – keen to switch over to alternate technologies, information seeking behaviour and practice them at crucial conditions”



Mr. Mayalagu S/o Sivasamy, aged 54 years is a self-motivated farmer from Anavayal village, Thiruvarangulam block, Pudukottai district, Tamil Nadu. Mayalagu’s family have been engaged in farming for four decades. He has own 1.60 ha land and leased another 0.4 ha. The major crops he cultivated during July 2020 are groundnut, banana, chillies and marigold.



He also has coconut grove. As a small farmer in the semi-arid agroecosystem, he faced problems in the cultivation of both annual and

perennial crops due to unreliable rainfall and a wide array of insect pests and diseases. In the past, he used to spray more chemical pesticides. He normally gets the advice from the fellow farmers and agro dealers. It used to cost him approximately Rs 6250(USD89) per spray covering one ha of land. Normally in a crop from planting to harvesting he sprays 2 to 3 times based on the incidence of the pest and diseases. He gradually realized that he spent more money for the chemicals



¹ The VKCs are computer based knowledge centres with Internet connection and provide need based static and dynamic information. A set of VKCs operating in a region are connected with a ‘hub’ in the centre as nodal point referred as Village Resource Centre, which receives the generic information and adds value by converting it to locale-specific information. The local community manages the VKCs; access is ensured to all irrespective of caste, class, gender and or age. Need-based content creation is regularly done on the basis of the need assessment and feedback from the local women and men who visit the centre. The local village people are trained in the management of modern ICT like operating the computers and hardware maintenance.

however, could not achieve the expected level of pest control. It was through his friend in Neduvasal (nearby village in the district) he visited the Village Knowledge Centre (VKC¹) at Pullanviduthi facilitated by MSSRF. The knowledge worker of the VKC, Ms. Sumitra explained to him about the plant clinic. On her advice, Mayalagu went with the affected groundnut leaf sample to plant clinic conducted in his village. The Plant Doctor diagnosed the sample and confirmed that it is tikka leaf spot. The Plant Doctor recommended the farmer to spray either Copper oxy chloride 50% WP 1250 g or Propiconazole 25% EC @ 500 ml or Chlorothalonil 75% WP@ 1000 g per ha. He sprayed Propiconazole and found that the problem was solved and also realized that cost of plant protection also reduced to a tune of Rs 250-300 (USD 3.6-4.3) per spray. Henceforth, he no longer depends on the input dealer for getting crop advisories. He could observe the difference in the advisories provided by the Plant Doctor and input dealers. He expressed that the plant doctors trained by Plantwise program, CABI always recommend chemicals which are locally available, environmentally safe and effective in action. In addition they share helpline number which is very useful to solve the problems and get clarifications instantly and solve the problems post plant clinic sessions.

In July 2020, when the PBA experiment started he registered himself to understand how farmer-centered insurance can be done. He cultivated groundnut variety - Gujarat-local in 0.4 ha and he

took initial picture followed by repeat pictures at weekly intervals. He didn't observe any pest or disease during the initial stages. However, there was heavy downpour of 139.2 mm rainfall within 18 rainy days during September 2020. This continuous rainfall led to water stagnation in the field and increased the soil moisture that affected flower formation and peg initiation. The farmer got frustrated and decided to plough the field. In the meantime, he took the close-up image of the field and sent to the experts for a second opinion. The experts advised him to drain the excess water and wait for a couple of days. He followed their advice and could able to harvest at least 300 Kg pods as against 3000 Kg/ha under normal condition with minimum investment on management practices.

He found that the problem was solved and also realized that cost of plant protection also reduced to a tune of Rs 250-300 (USD 3.6-4.3) per spray

He realized that the picture based advisory was helpful in taking the right decision and he was able to get the above yield which he used for home consumption for oil and stored good kernels for seed purpose. If he would have taken decision on his own he would have lost the crop completely. With reference to the use of mobile phone for capturing images, though he experienced challenges in using the app and taking photos regularly at weekly interval, the advisory service using this new technology was very useful to him, particularly in the lock down period.

The farmer said that he had also attended the plant clinic sessions in person and virtual. He expressed that the online plant clinic was very useful when he could not meet the plant doctors in person due to COVID-19 lockdown situation. However he felt that online plant clinics had few

disadvantages when the network is a problem.

He further added that compared to online plant clinics, remote-based advisory received in his mobile through PBA services was more useful. He also understood the principles behind each of the practices and how different pest management practices worked in the field. In addition, he expanded his

He could observe the difference in the advisories provided by the Plant Doctor and input dealers.

institutional linkages for accessing relevant and timely plant health information beyond input dealers and changed his information seeking behaviour to take informed decisions in pest management. The farmer expressed that activities of MSSRF along with CABI and IFPRI is more supportive to him and fellow farmers of his village in the lock down period.



He expressed that the plant doctors trained by Plantwise program, CABI always recommend chemicals which are locally available, environmentally safe and effective in action

The advisory service using this new technology was very useful to him, particularly in the lock down period

Case 2: Mr. Govindan



46 years



Kammanakadu (V)
Pudukottai (B)
Pudukottai (D)



Mr. Govindan

“a positive thinker who wants to avail insurance –
an optimistic change in the mindset”



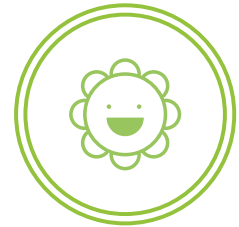
Mr. Govindan S/o Karuppudayar, aged 46 years is an enthusiastic farmer from Kammanakadu village, Pudukottai block, Pudukottai district, Tamil Nadu. Govindan's family have been engaged in farming for more than two decades. He has 4 hectares of land and the major crops cultivated are paddy, banana, groundnut, sesame and black gram. However, paddy is his major crop. He has been facing challenges due to prolonged drought as well as pests and diseases. He told that during 2018-19 in paddy crop, he harvested the maximum grain yield of 6000 Kg in ha.



In July 2020, he registered his site under PBI project as it

provided insurance coverage for the loss due to pests and diseases.

He cultivated Paddy (Ponni variety) in 0.4 ha during July to October 2020 and the crop growth was normal in the vegetative phase. Subsequently, at the time of tiller initiation phase, suddenly, he found characteristic burnt-like appearance in circular patches which was clearly visible from a distance. When he observed the shoot portion closely, he found group of tiny insects very near to the water level on the base of the stem. He understood that this may be due to insect pest but was not sure of the exact pest name and severity of the damage it cause. He recalled the picture based advisory program and



took close up views of the images of the affected plant using his android mobile and uploaded in the UzhavarCam app². Within a day, he received the notification in the app as well as SMS, describing the problem and management measures. The experts confirmed him that it was an insect pest locally called as “Pugaiyaan” (brown plant hopper, *Nilaparvata lugens*) and advised him to spray Pymetrozine 50% WG @ 125 g/ha at stem base after draining the water in the field. He followed the recommendation and observed that there was no further multiplication of the pest population. If the farmer would not have followed the advice, the crop loss would have been 60%. This incident helped him to realize the benefit of mobile technology and shared the information and experience with fellow farmers.

Normally he used to harvest 6000 Kg in ha. But unfortunately due to the brown plant hopper attack the farmer got only 50% of the regular grain yield i.e. 3000 Kg only. The damage

level recorded due to the insect pest alone was 30%. The periodical close-up images helped the panel of experts to do the loss assessment and recommended an insurance amount of Rs 10500/-. The farmer expressed that the insurance component for pests and diseases is a required risk management service to the farmers. He admitted honestly that he may not be able to take images consistently at weekly intervals but was willing to pay premium amount of up to Rs. 2500 per ha in the upcoming season to avail the insurance coverage for such biotic risks.

Within a day, he received the notification in the app as well as SMS, describing the problem and management measures.

The farmer attempted to avail PMFBY during Kharif June-September 2019 but missed that opportunity due to the delay in submission and verification of the land and personal documents. In contrast, PBI was very user-friendly and the field agents collected all the necessary documents at his doorstep making the process easy. Such close support services are necessary for the small farmers to access the entitlement schemes and services.



The farmer expressed that the insurance component for pests and diseases is a required risk management service to the farmers

In contrast, PBI was very user-friendly and the field agents collected all the necessary documents at his doorstep making the process easy

² Mobile app developed to upload the images and receive the advisories

Case 3: Mr. Padmanabhan



27 years



Periyalur (V)
Aranthangi (B)
Pudukottai (D)



Mr. Padmanabhan

**“an energetic youth who solved crop problems
by effectively using PBA and PBI”**

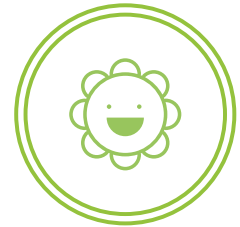


Mr. Padmanabhan S/o Viswanathan, aged 27 years is an energetic youth farmer from Periyalur village, Aranthangi block, Pudukottai district, Tamil Nadu. He has completed diploma in mechanical engineering. He owns 1.2 ha of land and the major crops cultivated by him includes groundnut (0.4 ha) and coconut (0.8 ha).

He has participated in the plant clinic sessions whenever it was conducted in his village. He has not availed PMFBY earlier and hence was very hesitant to participate in PBI project. He also pointed out that the insurance pay-out from PMFBY was given at village level in case if there is any severe economic loss due to abiotic risks such as flood or drought. The



farmer appreciated the concept of PBI, since it was different from other insurance schemes as this cover the economic loss due to insect pests and diseases, which is very useful to the small and marginal farmers. He was interested in the experiment and took the photos regularly at weekly intervals. During the Kharif season (July to October 2020) on groundnut he noticed an insect pest which started spreading to other crops very quickly when the crop was at the vegetative stage. He uploaded the image of the damaged crop and the experts diagnosed the problem as groundnut leaf miner (*Surulpoochi*) *Aproaerema modicella* and recommended 1000 ml of Profenophos 50 EC per ha.



Similarly at a pod development phase, the crop had numerous leaf spots. The farmer sent both long and close-up view of the problem. The plant doctors confirmed that it is tikka leaf spot caused by a fungal pathogen, *Cercospora arachidicola* and prescribed 250 ml of Dificonazole 25% EC per ha.

The farmer received both the recommendations quickly after uploading the image. The recommendation was in simple vernacular language with clear description. However, the farmer shared his view that while giving the recommendation he suggested to give the name of the chemical pesticide in English also so that it will be useful while purchasing from the agro-inputs dealer. Similarly, he suggested that the recommendation sent as SMS should be in English and Tamil which will be more helpful to follow. He followed the advisory and was able to realize the recovery of the crop. The leaf miner population did not proliferate at the vegetative phase further as well as the new flush of leaves did not have tikka spots

when the crop is at pod formation phase. He also used to attend the plant clinic at fortnightly interval. He felt that the plant clinics when attended in person was very useful as there is a good interaction with the experts.

During the lock down he participated in the virtual plant clinics and the experts gave the recommendation by seeing the crop damage. However, the farmer felt that network fluctuation hinders better interaction with the plant doctors.

The farmer expected 1625-1700 Kg from one ha. However, due to the 30% damage caused by leaf miner and tikka leaf spot he was able to obtain only 900 Kg from one ha. He admitted that if the recommendation was not received, the damage would have exceeded 50% leading to overall loss in the income. However, the loss assessment based on the images fetched him an opportunity to receive an insurance amount of Rs 10500 in 0.4 ha of land he cultivated. This encouraged the farmer to pay a premium of up to Rs 1000 to avail the insurance schemes in the future.

He suggested that the recommendation sent as SMS should be in English and Tamil which will be more helpful to follow



Farmer appreciated the concept of PBI, since it was different from other insurance schemes as this cover the economic loss due to insect pests and diseases

The loss assessment based on the images fetched him an opportunity to receive an insurance amount of Rs 10500 in 0.4 ha of land he cultivated

Case 4: Mr. Maniyan



62 years



Keelapunalvasal (V)
Thiruvaiyaru (B)
Thanjavur (D)



Mr. Maniyan

**“an experienced farmer who realized
the benefit of mobile technology”**



Mr. Maniyan S/o Ramachandran, aged 62 years is a passionate farmer from Keelapunalvasal village, Thiruvaiyaru block, Thanjavur District, Tamil Nadu. He owns 0.8 ha of land and the major crops

cultivated by him includes paddy, black gram and sesame. He participates in the plant clinics regularly and get advice for the problems noticed in his crop.

During Kharif, June to September 2020, he registered himself in the PBA project. He became aware of the project concept and services. He



realized that he can get suitable advisory within a short span of time by uploading the image of the crop damage whenever he observed without waiting for his turn to attend the plant clinic. He cultivated Paddy BPT 5204 variety.

He observed sudden abnormality in his crop. Papery like structures on the leaves was visible even from a medium distance when the crop is at active tillering phase. He took the image and uploaded in the Uzhavarcam app. Within a day, he received the recommendation in his app as well as SMS. The plant doctors



diagnosed the image and confirmed him that the problem was rice leaf folder (Ilai suruttu puzhu) - *Cnaphalocrocis medinalis*. The experts requested the farmer to spray Profenophos 50 EC @ 1000 ml or Flubendiamide 39.35% SC @ 50 ml per ha. He sprayed Profenophos and realized reduction in the insect damage and the crop recovered well. He admitted that if the recommendation was not received, the damage would have exceeded 50% leading to overall loss in the income. He appreciated this effort as it was very useful during the lockdown period. He further added that he attended the plant clinic after a week and got an opportunity to explain about the advice received from PBA project. The plant doctors

in the plant clinic told the farmer that the recommendation was correct and he could realize the effect within a couple of days.

In addition, during his visit to plant clinic he was advised to spray 2.5Kg of Potassium Nitrate, 625g of Boron and 250ml of sticking agent per ha to boost the grain production. This particular case confirms how plantwise and PBA services compliment each other.

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After applying the recommendation, there was good grain development.

The farmer harvested 5400 Kg in one ha of land which was 10% higher yield than the previous record, since he systematically followed all the advices.



He realized that he can get suitable advisory within a short span of time by uploading the image of the crop damage whenever he observed without waiting for his turn to attend the plant clinic

The farmer harvested 5400 Kg in one ha of land which was 10% higher yield than the previous record, since he systematically followed all the advices

Case 5: Mr. Sivamaruthavanan



38 years



Vilangudi (V)
Thiruvaiyaru (B)
Thanjavur (D)



Mr. Sivamaruthavanan

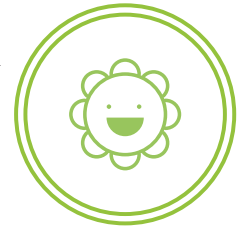
“an eager farmer who has opted
for crop insurance”



Mr. Sivamaruthavanan S/o Govindarajan aged 38 is from Vilangudi, Thiruvaiyaru Taluk, Thanjavur District. He owns 0.8 ha of land. He cultivates paddy, black gram and sesame. He along with his mother is involved in active farming by following good agricultural practices which he learnt through trainings. He also has five cattle and two goats, which helps him to get additional income for his family. During Kharif, June to September 2020, he transplanted Paddy - ADT 43 variety in 0.4 ha and registered himself in PBI project.



He is also very sincere in attending the plant clinics and has never missed even a single plant clinic. He interacts with the experts and follow their advices in his field. Under PBA project, he learnt uploading the images of crop as well as damages if any at weekly interval and used to regularly check for the advisories in his mobile. He was satisfied as the crop was good and expected a bumper yield. However, suddenly he found the crop was unhealthy, but was not sure of the reason. He took the image of the damaged crop



and uploaded in the app. On the next day, he received brief explanation about the problem and the recommendation on both app as well as SMS to his registered mobile. The experts confirmed that it was rice stemborer (Nell thandu thulaippan) - *Scirpohaga incertulas* and requested him to spray 750 g of Cartap hydrochloride 50% SP in one ha. He sprayed Cartap hydrochloride and was able to get a yield of 5250 Kg in one ha. However, the 27.5% damage confirmed through his images made

him eligible to receive an insurance coverage of Rs 10500 for an area of 0.4 ha.

He is also very sincere in attending the plant clinics and has never missed even a single plant clinic

He opined that during the pandemic situation, the remote-based advisory coupled with insurance coverage has given him confidence and satisfaction that both biotic and abiotic risks in crop production can be handled by availing such schemes carefully. He also admitted that he will continue to opt for insurance scheme and willing to pay a premium amount up to Rs 2500 for one ha.



He learnt uploading the images of crop as well as damages if any at weekly interval and used to regularly check for the advisories in his mobile

The 27.5% damage confirmed through his images made him eligible to receive an insurance coverage of Rs 10500 for an area of 0.4 ha

Case 6: Mr. Sukumar



62 years



Sirupuliyur (V)
Thiruvaiyaru (B)
Thanjavur (D)



Mr. Sukumar

**“a fervent farmer who realized
better results from plant clinics”**



Mr. Sukumar S/o Govindaraj aged 62 hails from Sirupuliyur, Thiruvaiyaru Taluk, Thanjavur District. He normally cultivates paddy, black gram and sesame in his 1.6 ha of land.

He has not registered himself in PBA/PBI project. This farmer is a regular attendee of the plant clinics and has very good opinion about the Plantwise program. During Kharif

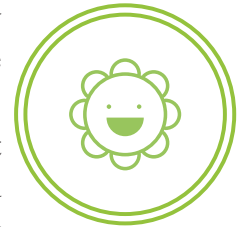
season (June – September 2020), he cultivated Paddy ADT 46 variety and followed the conventional farming. At the tillering stage, the leaves

suddenly turned yellow in colour as well as had folded appearance. He visited the plant clinic and discussed with the plant doctors by showing the affected crop sample.



He also explained to the experts clearly about the previous crop, the last spray and fertilizer application.

The plant doctors diagnosed the affected crop sample and confirmed the farmer that it was due to leaf folder and blast (Ilai suruttu puzhu and Kulai Noi – vernacular). Since it was a twin problem of an insect



pest and a disease, the experts requested the farmer to spray Profenophos 1000 ml or Flubendiamide 50 ml and Tricyclazole 75% WP 500 g with sticking agent 250 ml in one ha. They also suggested the farmer to spray Potassium Nitrate 2.5 Kg for one ha.

The farmer sprayed the recommended chemical in the evening while the

field had sufficient moisture. He observed that after spraying the crop was free from the insect as well as the disease causing pathogen.

This farmer is a regular attendee of the plant clinics and has very good opinion about the Plantwise program

The grain setting was good and he was able to harvest 5250 Kg in one ha. The farmer felt that plant clinics is very useful and the services helped him to prevent the loss and boost the crop yield.



He observed that after spraying the crop was free from the insect as well as the disease causing pathogen. The grain setting was good and he was able to harvest 5250 Kg in one ha

The farmer felt that plant clinics is very useful and the services helped him to prevent the loss and boost the crop yield

Key learnings

In Plantwise the farmer receives advisory for the crop health issues whereas PBA farmer received advisory through web portal. In addition, 50% of the PBA farmers received the insurance for the crop loss due to biotic/abiotic factors as reflected in the pictures

In both PBA and PBI villages, farmer preferred virtual plant clinics followed by field visits by the plant doctors if necessary

Particularly PBI + PW farmers had an opportunity to express to plant doctors about the quantitative crop loss due to abiotic factors during their visit to plant clinics in addition to the relevant images uploaded in the SIB portal

The synergy of PBA + PW helped the farmers to confirm the problem and follow the subsequent recommendations at closer time interval

Farmers who visited the plant clinics have more chance to share their feedback on the advisories during their subsequent visits, which was not possible through Uzhavarcam app

Mostly the advisory given by experts synchronized and was in harmony in both through portal as well as in plant clinics

Respondents appreciated both plant clinic and PBA services and stated that both services had advantages. Plant clinics were preferred in terms of ease of access, usefulness of advisories and ease of understanding and PBA in terms of timely provision of advisories

The bundling of insurance with advice increased the interest of farmers in the uptake of the advice

A synergy between Picture Based Insurance advisory with Plant Clinics help farmers in diagnosis of the problem and timely consideration of experts recommendations is getting popular among farmers of Tamil Nadu. This pilot study conducted between July 2019 and February 2021 with support of CABI and IFPRI, finds remote mobile-based personalized advisory improved farmers knowledge of productivity enhancing and risk-reducing practices. This report captures farmers' perspectives and feedback on picture-based insurance and advisory, and plant wise interventions in the form of case studies from Pudukkottai and Thanjavur districts of the State.

