

Evaluating the efficacy of an app-based livestock insurance scheme in Gujarat, India

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About this formative study

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The 3ie technical quality assurance team comprises Bidisha Barooah, Stuti Tripathi and Deeksha Ahuja, with overall technical supervision by Marie Gaarder.

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1. Introduction

The overall coverage of livestock insurance in India is not more than 7% of cattle population, despite having the presence of a livestock insurance market from as early as 1970's. Evidence from various country contexts show that factors like high premium rates, and low levels of trust (Cole et al., 2013; Gine, Townsend & Vickery, 2008; Karlan, Osei, Osei-Akoto & Udry 2014), low product knowledge & lack of awareness (Cai & Song, 2013; Gaurav, Cole & Tobacman, 2011) about insurance have resulted in limited access, and take-up of agricultural insurance products for low income farmers. An additional challenge arises from the fact that the majority of livestock insurance is provided as a credit linked product. In India, Chand et al (2016) also find very low rates of renewal. The end result has been that the livestock insurance - though critical in providing financial security to low income households, has not had the expected outreach and penetration in India. In the absence of a holistic approach that addresses both supply and demand challenges, the potential impact of livestock insurance on improving welfare and livelihood opportunities will remain undermined. The proposed intervention addressing both supply and demand side challenges is expected to address this issue.

There has been a recent, and growing literature on livestock insurance products – in Kenya (Jensen et al., 2017, 2014, etc.), Ethiopia (Bageant, 2014) and Mongolia (Mahul & Skees, 2007) among others. The majority of this literature has focused on index based insurance – suggesting a focus on risk reduction and other such issues, and less thought around key drivers of demand amongst the rural poor. In fact, some evidence exists showing that index based insurance actually finds very low demand among farmers (Binswanger-Mkhize 2012). Additionally, there has hardly been any work focused on the improvement of processes related to the actual policy issuance and claims settlement . This represents a gap in the literature, as it is increasingly likely that product features are not as much as a concern for the rural poor, as are issues such as the actual cost of the policy, and other factors such as the time taken for policy disbursement, and claims settlement.

The proposed intervention addresses this gap, by leveraging online mobile technology to significantly improve the processes involved in a livestock insurance product. Thus, in addition to influencing lower premium rates, these improvements are likely to instil better trust among customers – due to highly improved policy processing and approval times - thereby improving livestock insurance penetration and uptake. It involves using mobile applications to collect, store and verify data of customers/livestock; thereby reducing manual interventions, operational costs turnaround time in issuance of insurance and claim settlement. The intervention involves using online mobile-app based platform, coupled with awareness programs will address these challenges effectively. The reduction in premium due to controlled loss ratios and low cost of operations will help the service providers to reach remote/not easily accessible areas and also bring lower income segment under the product scope. Online process will avoid adverse selection and ultimately ensuring that no genuine claims are ignored by the ecosystem.

The new online policy issuance & claims model will bring a paradigm shift in the way the livestock insurance sector has been functioning in the country. As mentioned earlier, challenges like extensive paper documentation, cumbersome processes, delays in claim

settlements and higher premiums have led to limited investment from insurance providers and farmers in this product. This has also prevented the insurance providers from reaching out to rural and remote areas and also led to the exclusion of more risk-prone segments of small and marginal farmers from the scope of livestock insurance. In addition to this, absence of financial literacy/awareness among low-income households has limited the uptake of livestock insurance mostly among high-income farmers and government scheme grantees. This innovative platform will help to revive the highly potential livestock insurance market by addressing these concerns, ultimately for the benefit of low-income households.

Thus in Phase 1, we adopt a mixed methods approach to evaluate the response to the improved livestock insurance scheme, and assess the potential for adoption and scale up. Phase 1 activities are situated in the Virpur and Balasinor blocks of Gujarat. A combination of quantitative data, obtained through household interviews, and qualitative information obtained from focus group discussions will form the core of the evaluation. We will also rely on secondary source and administrative data as required to further inform the study. Phase 1 will thus provide insights into the product acceptance and take up, while also providing information on lower premium prices.

Using these findings, the aim of phase 2 would be to rigorously evaluate the app-based livestock insurance model on a larger scale. Specific outcomes of interest would be (i) take-up, (ii) retention rate which speaks of how livestock farmers perceive insurance as a product, (iii) Life time value and so on. Gathering rigorous evidence on the acceptance and potentially improved uptake of a well-designed livestock insurance product would be primary to Phase 2. Furthermore, the findings from phase 2 will be crucial in supplying evidence as to the efficacy of a low-cost high-volume model of livestock insurance.

2. The Livestock Sector in India – a brief overview

India's livestock sector ranks among the largest in the world – over 512 million heads of livestock were counted in the 19th livestock census (2012). There are about 300 million bovines, 65.07 million sheep, 135.2 million goats and about 10.3 million pigs. In addition, the population of poultry in the country stood at 729 million (2012). The livestock sector is an important, and highly valuable component of the agricultural sector of the Indian economy. As per the estimates of the Central Statistics Office (CSO), the value of output from livestock sector at current prices was about INR 5,91,691 crore during 2015-16 - which is about 28.5% of the total value of output from agricultural and allied sectors. At constant prices, the value of output from livestock is about 29% of the value of the output from total agriculture and allied sector.

It is also one of the main income generating activities in rural areas. According to the NSSO 66th Round Survey (July 2009 – June 2010) on Employment and Unemployment, 15.60 million workers as per usual status (Principal status plus subsidiaries status) were engaged in farming of animals, mixed farming and fishing. A more recent estimate - NSS 68th Round (July 2011-June 2012) survey on Employment and Unemployment finds that 16.44 million workers as per usual status (Principal status plus subsidiaries status) were engaged in the activities of farming of animals, mixed farming, fishing and aquaculture. Overall, it is estimated that around 50 million households in the country are reliant upon the livestock sector, for their subsistence.

Thus, in rural areas in India, it is indisputable that livestock is one of the most important productive assets. It is a crucial mechanism for farmers to cope with household related shocks. Despite the need to thus protect livestock assets being apparent well before, the livestock insurance space in India only got a serious fillip when the Small Farmer's Development Agency initiated an organized cattle insurance scheme in 1971. Under the Integrated Rural Development Program, nationalized banks too began participating in this scheme, increasing its reach. Post this, livestock insurance has always remained in the government agenda, but it has not seen the aggressive pace of intervention that the crop insurance space has seen.

More recent attempts include the centrally sponsored Livestock Insurance Scheme that was piloted in 2005-06 and 2006-07 (10th Five Year Plan) and 2007-08 (11th Five Year Plan) in 100 selected districts. The scheme was being implemented on a regular basis from 2008-09 in 100 newly selected districts of the country, following which it was expanded to all districts. Under the scheme, the crossbred and high yielding cattle and buffaloes are being insured at maximum of their current market price. The premium of the insurance is subsidized to the tune of 50 percent, and the entire cost of the subsidy is borne by the central government. The benefit of subsidy is being covers a maximum of 2 animals per beneficiary for a policy of maximum of three years. The scheme is being implemented in all states except Goa through the State Livestock Development Boards of respective states. Since 2014-15, this scheme has been subsumed under the National Livestock Mission, and as per the latest available insurance, 35.64 lakh animals had been insured by July 2017¹.

3. Livestock Insurance in India – Issues and Challenges

While livestock rearing is an important source of household income in India, there are a substantial amount of inherent risks associated with the activity. Particularly, in India, unlike several other countries, the risks tend to be more idiosyncratic, than covariate. Covariate weather losses for instance, as seen in the case of harsh winters in Mongolia (dzuds) (Mahul & Skees, 2007) are less common in India. Disease is a major threat to having healthy and productive livestock, and any onset of morbidity results in a substantial loss to livestock owning households. Scarcity of inputs – water, fodder etc. are another major threat to the productive rearing of livestock, and given that farmers in India are especially vulnerable to the vagaries of climate change, this is a serious concern in the present context. Given the importance of livestock in rural households – especially for small and marginal cultivators, the biggest risk is death/ loss of the livestock itself.

Given these threats, the case for households to be adequately protected against such risks is self-evident. An obvious form of protection would be to ensure that households are sufficiently covered by insurance. Indeed, as mentioned above, livestock insurance has been available in the market in India for decades now. While the government's subsidized scheme is definitely available currently, various private providers also offer livestock insurance. However, two points need to be kept in mind while talking about available livestock insurance products:

- The coverage offered extends only to death – which “covers the cattle insured whilst within a geographical area specified in the policy schedule, in case of loss of

¹ <http://pib.nic.in/newsite/PrintRelease.aspx?relid=167397>

life accident or diseases contracted or surgical operation. The policy also covers death of cattle which are the subject matter of insurance occurring outside the said geographical area in the event of drought, epidemics and other natural calamities”.

- The premium rates are expensive: private providers are known to offer insurance cover at anywhere between 4-10% of the sum insured, which translates to a significant amount for the livestock rearer to bear.

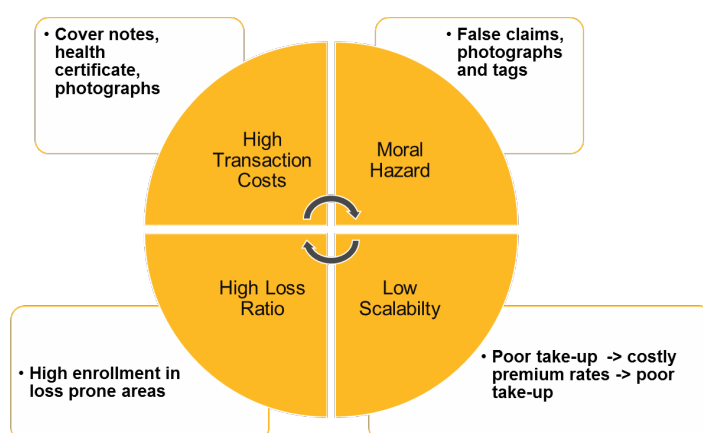
There are multiple reasons for this situation – the livestock insurance sector is rife with moral hazard, and adverse selection challenges, which translate into higher costs and losses for the providers. Additionally, given the lack of actuarial pricing information, arriving at a fair price for livestock insurance remains incredibly difficult to do².

Figure 1: Low-take up, and high premium rates



The livestock insurance sector is therefore caught in a vicious cycle (figure 1), wherein the currently expensive premium rates are definitely a deterrent to take-up, while the poor take-up (along with high risks and transaction costs) presents a barrier to providers from lowering their costs, and also exploring innovations in product design or delivery models. As summarized below, the other challenges that affect the supply of livestock insurance include moral hazard, and adverse selection. The insurer’s attempts to protect themselves against these kinds of issues has resulted in claim denial. Additionally, the livestock sector also has traditionally relied on a paper documentation/ offline model, which increases the transaction costs to the provider.

Figure 2: Supply Side Challenges



² see Carter et al, (2017) for a discussion on how premium rates can be driven up by such challenges.

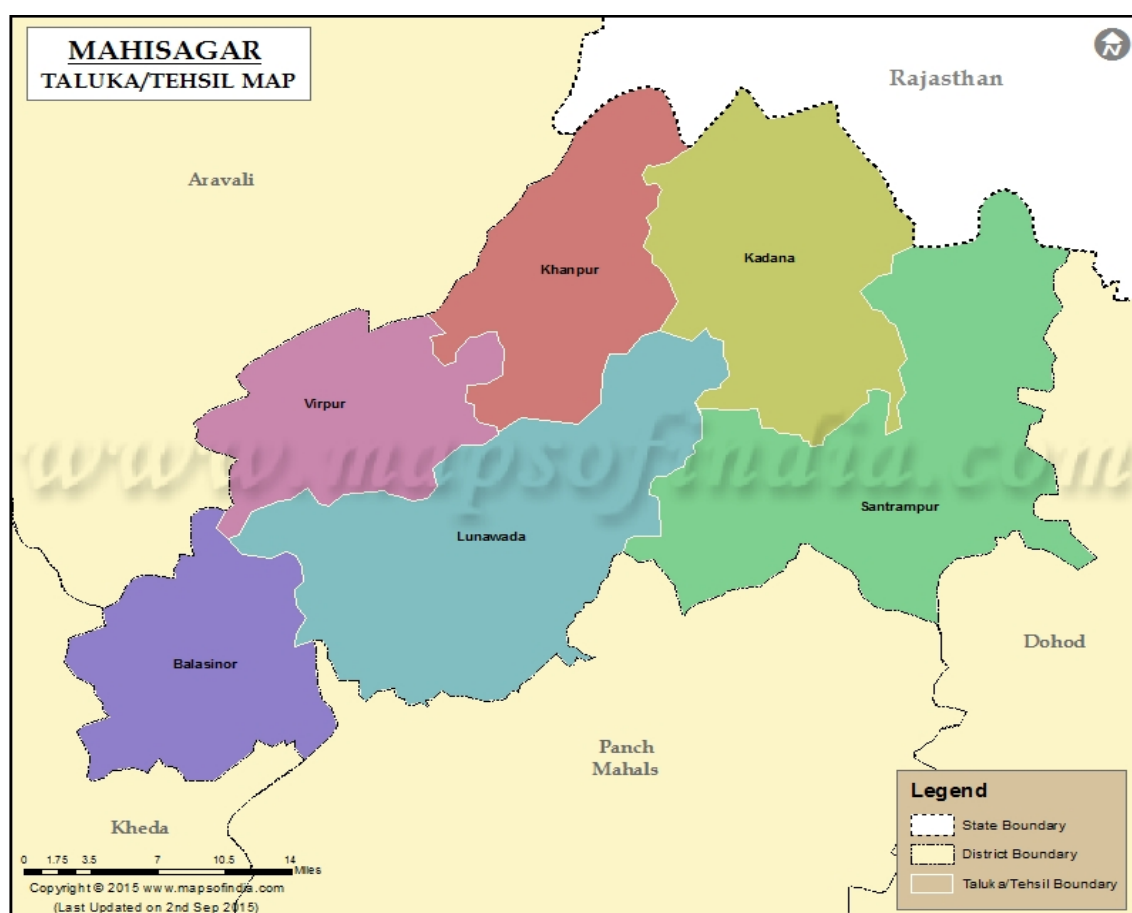
On the customer's side from the cost factor, low levels of trust (Cole et al., 2013; Gine, Townsend & Vickery, 2008; Karlan, Osei, Osei-Akoto & Udry 2014), low product knowledge & lack of awareness (Cai & Song, 2013; Gaurav, Cole & Tobacman, 2011) about insurance are major barriers to take-up.

4. Formative Evaluation – Geographical Context

The selected study location for this evaluation is Mahisagar district, in north-central Gujarat. The district was chosen based due to its high livestock density, availability of pastureland for grazing (Census of India, 2011) and lastly, low penetration of non-loan-linked livestock insurance (based on field scoping). Overall, the district ranks low on socio-economic indicators such as literacy, and has a high number of residents who fall into the ST category. Nevertheless, the district has had experiences with insurance due to the presence of a large number of mandlis, or cooperative societies focused on aggregating milk.

The predominant economic activities revolve around agriculture (paddy, maize), and animal husbandry (mainly dairy). The district has around 70 percent landholdings owned by small and marginal farmers, the average size of holding is 2 Ha (NABARD, PLP 2016-17). The district has suffered from weather uncertainties in the recent past, having erratic monsoons, long dry spells in rainy seasons. The study population broadly comprises low-income cattle owning households.

Figure 3: Mahisagar district



This district serves as an ideal setting for the study due to the high dependence of the people on livestock for their income. Additionally, the low literacy rates and other such socio-economic indicators provide an ideal setting to test the efficacy of the marketing activities. Scoping studies in the area have shown that despite there being such a huge dependence on livestock³ for income generation, the take up of insurance remains very low – additionally, we determine from scoping studies and additionally collected qualitative material that overall, trust remains a huge barrier to the take-up of insurance. This is driven mainly by poor experiences in the past with private providers – including slow processing times, and very low levels of satisfaction especially with the claim settlement process.

5. Intervention description and the theory of change

Currently the livestock insurance market operates on the conventional model of enrolment in an off-line manner, which increases the turnaround time and cost in terms of enrolment as well as claims. By instead digitizing the process onto an app-based platform used by HDFCs agents in the field, the enrolment process becomes almost real time. As per the current process all the data entry is manual, photos are printed and these details are again entered to the system once the person goes back to office for policy issuance. Same is the case at the time of claims as all the documents are entered manually, photos printed and then sent offline via courier which takes at least 7-10 days. The use of the app reduces turn-around time drastically, reduces cost, enhances scalability. Claims which usually take 15-20 days to settle can be settled within 2-3 days. Additionally, the manual processing of applications and claim settlement has led to great difficulties in separating genuine claims from fraudulent ones. The proposed changes are expected to bring in confidence in the system both at insured as well as the insurers' end-which is currently lacking in the eco system.

The current pricing of livestock insurance premiums significantly factors in operational costs incurred by the provider in disbursing, tracking and settling claims. An app-based approach is projected to drive these costs down dramatically. While there is a dearth of comparable research on the benefits of an app-based insurance approach currently, an exercise by another financial enterprise in using an app-based approach found close to 50% savings in claim disbursement/ settlement time alone, and increased customer satisfaction. (no information on cost savings provided). We expect similar reductions in costs, and intend to leverage these very significant reductions in operational cost to translate into a significant reduction in premium price. Overall, the long-term aim of the study would be to evaluate the efficacy of the mobile app based approach in combination with well targeted information and knowledge dissemination, in helping the livestock insurance sector transition from almost no penetration to a low-cost high-volume stage.

The proposed online/real time policy issuance module is thus the first of its kind in the Indian livestock insurance market, where in an online platform is used for policy issuance and claim settlement. It has the potential to cover the loop holes in the existing process, which is completely in the manual mode, involves considerable resources and time, and most importantly is prone to errors. Leveraging technology to bring in process/systems that has

³ Around 98% of the households in selected study villages report having some dependence on livestock for income generation.

the potential to alter the way the livestock insurance sector has been functioning has not been tested before. This innovative process is expected to help all stakeholders positively.

One of the biggest challenges faced by livestock insurance sector in an economy like India is lack of reliable historical data and studies to support proper product pricing, associated risks, fraudulent practices in field, general status of livestock etc. This evaluation will provide the industry with relevant information on various aspects of the product like operational costs, loss ratios, claim settlement, farmer perceptions and behavioural change. Evaluation results could be then used by insurance providers in product design and pricing.

Screen grabs of the mobile application are provided in the appendix. The application was used by the various agents at the time of enrolment and policy issuance.

In addition to the use of an app-based module, the project also focused on a significant amount of marketing. Marketing of the product was undertaken through the mandli secretary, mandli meetings and posters on mandli notice boards, and door-to door marketing (which is usually not done in cattle insurance products) with leaflets detailing the policy and premium details.

An illustration of marketing activities on the ground may be seen, through the example of Kasampura village in Virpur:

- The marketing staff from HDFC met with the secretary of this mandli. The total number of households in this village was around 400; out of which 350 households had cattle, of which around 280 households were part of the mandli (meaning these households provided milk to the respective mandli). The marketing staff detailed the policy to the secretary initially, explaining the policy coverage (scope and duration) and premium rates and amounts. Interestingly, the secretary got his cattle insured through this policy. Following this, the marketing team visited households with more than 1 to 2 cattle, introducing the cattle insurance policy offered by HDFC ERGO, detailing the policy features in terms of coverage and scope of insurance (only for death of cattle) as well as the premium rates and amounts.
- Along with these interactions/marketing sessions with the mandli secretary and individual households, posters and leaflets formed an integral aspect of the marketing campaign. Posters in Gujarati with details on the private insurer company (HDFC ERGO in this case), policy coverage in terms of scope and duration, exclusions involved along with the premium amounts were stuck on the mandli noticeboards. Leaflets detailing the above information along a separate sheet enclosing the premium amounts for different sum insured amounts were handed over to the individual households along with the required explanation.

Households interested to take up the cattle insurance policy were requested to contact their mandli secretary for enrolling themselves in this cattle insurance policy.

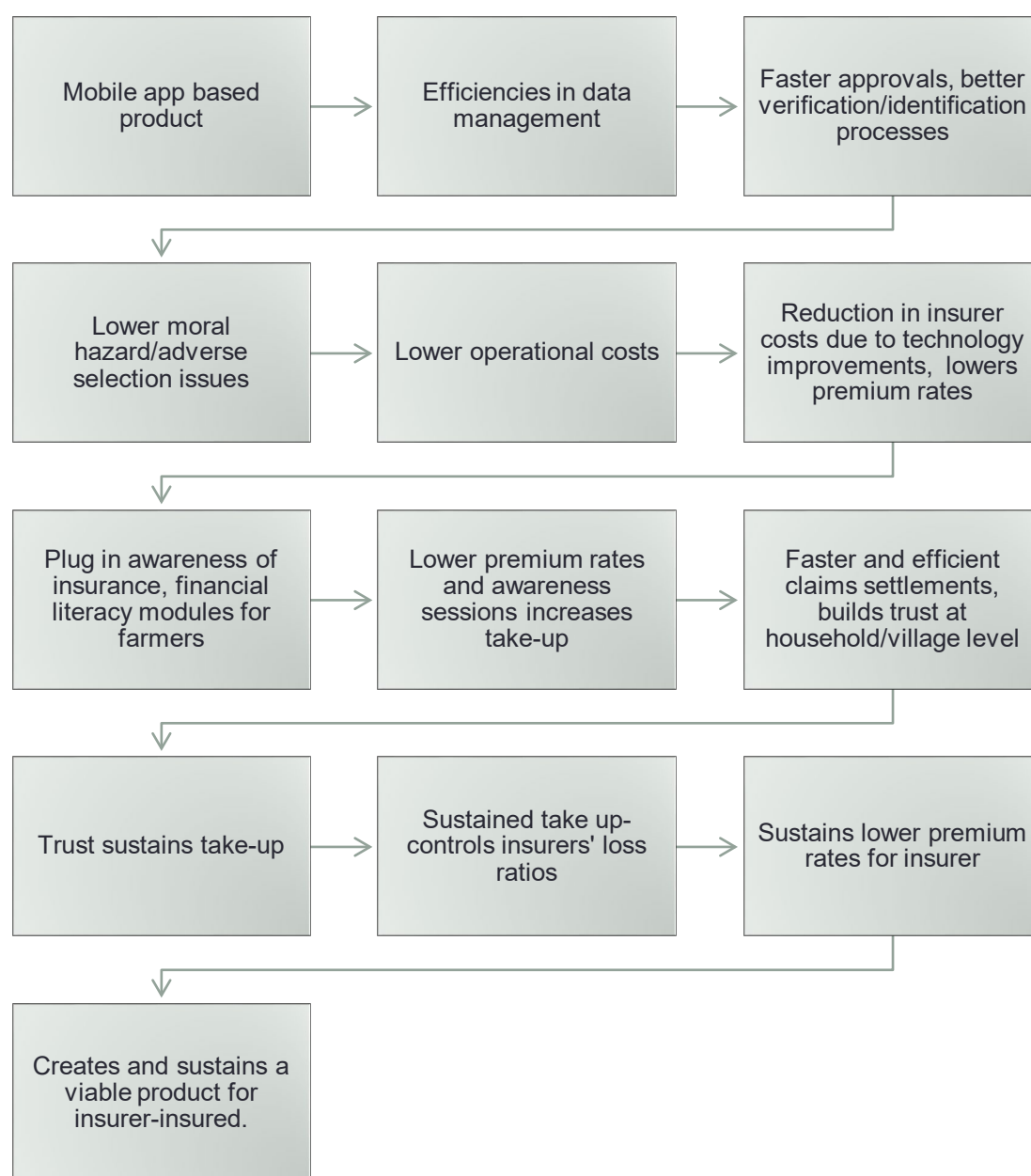
In the areas where the app-based scheme was not offered, the marketing activities continued, as did the usual manual process of enrolments. Data entry during enrolment and tagging were done via paper-based documents and the following processes of policy issuance and claims entailed manual procedures.

5.1 Theory of Change

At the onset, any theory pertaining to insurance take-up must address two issues – that of the costs, and the benefits of adoption. In a number of different settings, it has been shown that reducing the costs of adoption has the potential to significantly increase take-up (Cole et al. (2013)). Livestock insurance in India has been prohibitively expensive in the past. The reasons are many – given the absence of mortality risk data of cattle, actuarial pricing is extremely difficult. Furthermore, existing operational processes related to enrolment and claims settlement are labour-intensive and expensive. The process of verifying claims in remote rural areas for one to two insured animals can be a considerable transaction cost (Sharma and Mude, 2012). As a result, livestock insurance premiums have always been high – proving to be a considerable barrier to take up. While specifying costs is straightforward, for a product like livestock insurance, specifying the benefits of a livestock insurance remains a far more complex task. The lengthy processes utilized by insurers to curb adverse selection and moral hazard problems often act as a deterrent to interested parties. These problems are further compounded by challenges faced by insurers in valuing the livestock, and delays in verifying and settling claims. Addressing the cumbersome policy disbursement and claim settlement processes are therefore fundamental to increasing the adoption of livestock insurance products. These remain non-negotiable concerns from an insurer's side, given the high prevalence of fraud in livestock insurance schemes. Lastly, given a general lack of product awareness, it remains extremely difficult to market insurance products in rural India. Even if the pricing issues are addressed, spreading awareness regarding the need and benefits of a livestock insurance policy remain crucial to increasing adoption. Thus, any intervention or product seeking to increase the uptake of livestock insurance in rural India must address the aforementioned issues. Keeping in mind this simple understanding of adoption, HDFC-ERGO's proposed innovation in process seeks to improve the adoption of livestock insurance among livestock rearing households. There are two aspects to this innovation: - Shifting the policy approval, and claim verification onto a digital Android-app based platform. - Targeted awareness and knowledge dissemination program for non-loanee livestock owners.

The first innovation is aimed at significantly reducing the time involved in the policy approval and claim verification process. Digitizing the entire process, and moving to an app based approach has the potential to reduce the processing time from a matter of days, to a real-time process in the ideal scenario. Furthermore, it will significantly reduce the operational costs to borne by the insurer. It is envisaged that this in turn will reduce the cost of insurance (premium), for the livestock owner. The second aspect seeks to disseminate knowledge regarding livestock insurance schemes, by providing livestock owners with an effective awareness module that sensitizes them towards the reduced costs, and improved benefits associated with the process innovation described earlier. The modules will be targeted at non-loanee farmers as well – thus improving the information flow to a segment of livestock owners often excluded from such activities.

Figure 4: Pathways of Change



6. Monitoring plan

In this case, the intervention involved using a mobile app for the enrolment and claim settlement process of cattle insurance along with the improved marketing strategies. The research team ensured the enrolment followed the app-based process through the set of relevant monitoring indicators that were collected during the data collection exercise, involving all households across the program and comparison villages. The second aspect of the intervention, the faster claims settlement process could not be captured nor analysed due to the time constraints of the formative evaluation. As of 10th December, the implementing partner has communicated to us that 2 claims have been raised in during the period 7th-9th December. Monitoring on the speed of processing, and performance of the app is underway.

However, we had integrated questions on the awareness of our specific product and door to door marketing into our survey instrument, and relevant data was collected across all households in our study area.

The relevant monitoring indicator for this intervention would be awareness on this specific cattle insurance product and its scope (including the coverage and terms of insurance) as well as the marketing processes involved. We had integrated questions on general awareness on cattle insurance products and farmers' perception on the adequacy of these products and their satisfaction with the same in our instrument.

Also awareness about this particular cattle insurance product, and understanding/comprehending the scope of this insurance product (coverage for death of cattle and terms of insurance) were integrated into the household surveys across the program and counterfactual villages. Questions on the awareness of marketing processes that were part of the intervention ie awareness on the door-to-door marketing and whether such marketing agents visited their households and the effectiveness of this marketing strategy.

The utility of the marketing intervention in improving farmers' awareness on cattle insurance, understanding the need for cattle insurance and the working of cattle insurance policy on the ground, awareness on the specificities on coverage/terms of insurance as well as the premium rates and amounts are also integrated into the questionnaire.

6.1 Mode of data collection

The mode of data collection for the above monitoring indicators were mainly through household surveys across the program and comparison villages in our sample. Focus groups also supplemented the data on general awareness and understanding of cattle insurance. Specific questions capturing the relevant indicators were designed, piloted and integrated into the questionnaire

6.2 Ensuring data quality

The data collection process was completely digitised through the software Survey CTO, that facilitated real time monitoring of individual surveys completed on the ground. Employing efficient and experienced surveyors from within the research organisation networks, who had previously worked across insurance studies in Gujarat, thorough training modules and sessions for these surveyors, training them on probing techniques for varied question types such as sensitive questions/ questions on preferences etc, accompaniments by the research team on the field for majority of the data collection phase, constructing and coding efficient forms with constraints and quality checks within the questionnaire that facilitated smooth data entry process and warned surveyors in case of wrong/unexpected entries. Time-stamp for the start and end of the survey as well as daily monitoring of the surveys submitted on the Survey CTO server and debriefing sessions with the survey team whenever needed to rectify issues facilitated the quality of data collection processes.

The main indicators as detailed above are awareness on about the HDFC ERGO cattle insurance policy and understanding the relevance and comprehension of the scope/term

and premium payments of insurance. One of the main assumptions of the ToC of the formative evaluation revolved around improved and targeted marketing strategies and its impact on facilitating awareness and understanding of cattle insurance, and uptake of the cattle insurance policy.

The main indicators that captured this included usefulness and quality of the door to door marketing, awareness on HDFC ERGO product, improved comprehension of the working of cattle insurance including coverage for death/term/ premium payments etc, and the intermediary outcome of one-time uptake of the product. We have not been able to isolate the impact of the regular and targeted marketing processes, as time constraints of the FE did not facilitate enrolment in the regular marketing program area/ program group 2 for the sake of this study and report.

7. Evaluation questions and primary outcomes

- a) What are the requirements (operational/ infrastructural) that need to be in place to ensure successful roll out of a mobile-app based insurance product?
- b) Compared to the traditional offline method, what savings in operational costs, and time (for client and provider) would a mobile-app based insurance system provide?
- c) What sort of reductions in premium could be expected by leveraging savings from operational costs? (*Administrative information provided by the partner – HDFC ERGO would be used to answer questions b and c.*)
- d) Would the promise of a fool-proof insurance policy system, that is capable of fast and fair claim settlement lead to an uptake in livestock insurance (with adequate marketing and knowledge dissemination? The take-up of the app-based cattle insurance product can be considered as the primary outcome of this formative evaluation.

8. Evaluation design, data and methods

For the purpose of the formative evaluation we broadly divide the study period into two phases:

- Phase 1: Scoping
- Phase 2: Intervention

Further details about the design and the data collection methods we employed in each phase follow below.

8.1 Phase 1: Scoping

Within Mahisagar district, we select two identical and neighbouring blocks of Balasinor and Virpur for the study, based on livestock density and lower penetration rates of insurance products that are not loan linked. Farmers with loans are offered mandatory insurance products, and their willingness to uptake hence cannot be accounted for. We select ten villages in Balasinor, and five villages in Virpur to be part of the study. We used criteria such as livestock density, proximity to each other (ensures proper marketing and operational convenience) etc. to select these villages.

A pilot testing of the app-based cattle insurance product was done in these villages, followed by a scoping exercise wherein 120 households were surveyed across the 15 selected villages, surveying 8 households per village. Through this scoping exercise, 8 households meeting the criteria of owning at least 3 to 4 cattle and an average annual income between 25000 to 4 lakhs were surveyed to understand indicators such as current take-up rates of insurance, and factors influencing the same. Data was also collected on product awareness levels etc. Four focus group discussions helped gain further insights into determinants affecting take-up, awareness and relevance of cattle insurance, previous experience and trust in insurance companies, challenges faced with respect to cattle insurance products. Findings from the scoping exercise are presented in section 1.8.

8.2 Phase II: Intervention

As described earlier, the intervention comprised of the improved app-based livestock insurance scheme, complemented with mandli-level, and door-to-door marketing. We also varied the details of the marketing information that was offered to the farmers, in order to understand the importance given to product features while considering take-up. In order to evaluate the efficacy of the app based livestock insurance scheme v/s the standard livestock insurance scheme, the following design was utilized:

- It was decided that the selected villages in Balasinor block would receive the app-based livestock insurance scheme with the lower premium rates, while the selected villages in Virpur block would receive the insurance scheme with standard premium rates.
- In Balasinor, we further randomly assigned 5 villages to receive mandli level and door-to-door marketing. Additional material outlining details about the app-based scheme, and the related benefits (cheaper premium, faster claims settlement, etc.) were furnished to the farmers.
- The other 5 villages in Balasinor received mandli level and door-to-door marketing, with the regular details about the insurance policy (only premium rates, coverage etc.), and no additional details.

Table 1: Evaluation Design

	T1	T2	C
Premium Rate	4.7 %	4.7%	5.9%
Marketing type	Mandli + Door to door	Mandli + Door to door	Mandli + Door to door
Marketing content	Policy rates, coverage, benefits of app-based policy (lower premium rate faster enrolment, faster claims etc.)	Policy rates, coverage	Policy rates, coverage

Figure 5: Virpur (C) Selected Villages

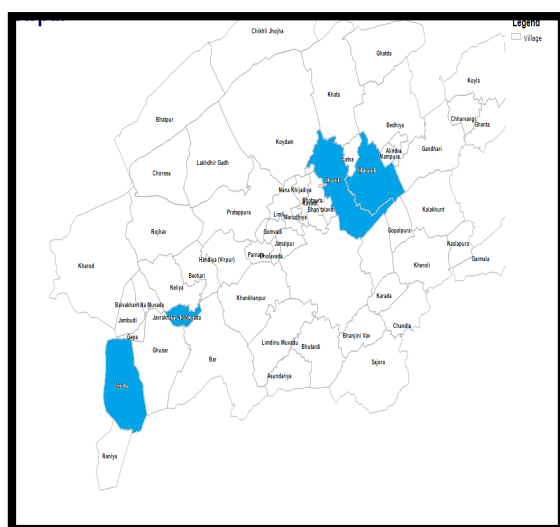
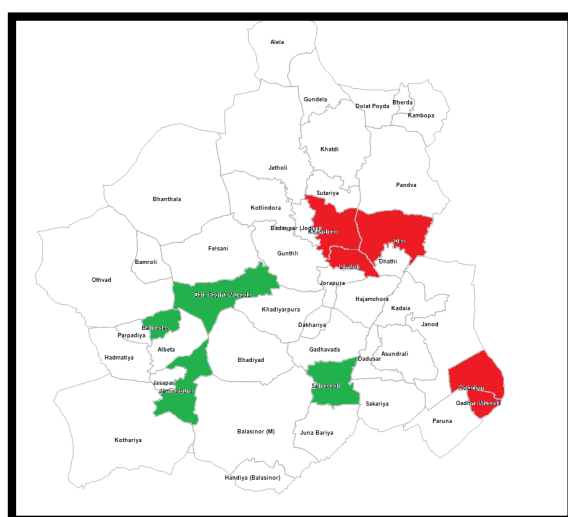


Figure 6: Balasinor (T1, T2) Selected Villages



Thus for this formative evaluation there were three specific groups in terms of the study implementation; two in Balasinor block (serving as program) and one in Virpur (which was the comparison/ counterfactual group). The innovative aspect of this study in addition to the app-based process for cattle insurance was mainly pertaining to marketing processes wherein we implemented door-to-door marketing – which are not usually utilised by private insurers. The marketing procedure is described in further detail above.

It must be mentioned that the marketing strategies remained the same in across all three arms - initial interactions with the mandli secretary, and posters detailing the policy and premium amounts for different sum insured on the mandli noticeboard. The experiment in varying the information content of the marketing material was mainly to assess farmers' decisions to uptake cattle insurance policy, and the determinants for the same over and above pricing. In other words, the aim was to evaluate the take-up on the provision of detailed information with regards to product features.

8.3 Note: Limitations to the study, and modifications to the design

As mentioned above, the study focused on 17 villages in the selected blocks. By the time the app-development was complete and the intervention phase was launched in September 2017, we quickly realized that the time required to set up the intervention, and get the additional permissions from the Mandlis was more than we had anticipated. It meant that certain decisions had to be made to ensure sufficient data was collected, for the purpose of the formative evaluation. Those decisions are summarized below:

- While the aim was to complete door-to-door marketing and enrolments for all the households in 17 villages, we were able to reach only around 1000 households across all selected villages in the study areas at the time we ended field activities (October 30th). The order in which the households were visited for door-to-door marketing was not randomized, as the aim was to reach every household in the village.
- Despite our best efforts, in the time frame we had, we were able to successfully begin enrolment in only 4 villages: 2 in the comparison group, 1 village in program group 1, and 1 village in program group 2. The enrolment in the village in program group 1 remained incomplete at the time the data collection was stopped (October 30th). Thus while we do capture some take-up in this village, it must be noted that this data is incomplete, and cannot be used to make a determination of the marketing
- All take up data is thus presented from these 4 villages only.
- The initial plan was to collect the data only from livestock owning households, we realized that almost all households owned livestock in our study area. We thus surveyed every household in every village. We find that only 6, out of the 3703 households surveyed, do not report owning any livestock
- As the enrolment activities were unable to begin in all villages the given time frame, we went ahead and collected willingness to pay data from the households, in the remaining villages.

We intend to analyse the differences in means for key indicators across program arms using t-tests. The difference in means between farmers in the program group, and farmers in the counterfactual gives us simple estimates of the effect of the lower priced product, on take-up rates. An initial discussion of results may be found in section 1.8.

8.4 Focus Group Discussions

Farmer selection for FGDs: 8 to 10 farmers were selected for the focus groups. The major inclusion criteria were income and size of landholding, as the aim was to cover as many small farmers as possible. Participating farmers had at least 4 adult cattle, incomes under to 4 lakhs etc. Also we conducted the focus groups in villages, wherein villagers or at the mandli-level had some overall experience with cattle insurance products, and the probability of farmers having insured cattle were high. But having insured cattle was not mandatory for the farmers in the FGD. Every FGD also had 2 to 3 women participants, to understand the role of gender in insurance (take up of insurance, avoidance of moral hazards and awareness of such insurance schemes).

The purpose of focus groups:

1. To understand the awareness of small farmers on cattle insurance products
2. The factors influencing their decision to take up cattle insurance

3. Their awareness of cattle insurance schemes that are not bundled with loans (more than 90 percent of the cattle insured are through loans).
4. The factors that influence their decisions to renew cattle insurance products, including experience with previous insurance schemes.
5. The composition of farmers who were aware of/ had taken up cattle insurance products (incomes, age, experience, gender etc)
6. Ways of disseminating knowledge on the relevance of cattle insurance products to small farmers

The collected data from 4 focus groups was coded and organized. The findings from the same are presented in section 1.8.

8.4.1 Scoping Survey

The scoping survey collected data on the following:

- Demographics, socio-economic status
- Land ownership, cultivation, income
- Livestock ownership (number, breed, etc.)
- Insurance penetration (take-up, awareness, understanding of terms, and specific product details)
- Non-loan linked insurance

Summary statistics from the collected data are presented in section 1.8.

8.4.2 Post-Intervention Survey

The post-intervention survey collected data on:

- Demographics, socio-economic status
- Land ownership, cultivation, income
- Insurance:
 - o Take-up
 - o Awareness
 - o Details on interaction with marketing (if any)
 - o Documentation/ costs involved.

Statistics from this survey are also presented in section 1.8

8.4.3 Data Collection:

As mentioned, we collected relevant data during both phases of the study mentioned above. A summary of the data we collected is presented in table 2.

Table 2: Modes of Data Collection

	Data Collected	Electronic v/s digital
Phase 1: Scoping	Focus Groups	Paper
	Scoping Survey	Electronic
Phase 2: Intervention	Monitoring (Marketing)	Paper
	App- metadata	Electronic
	Intervention Survey	Electronic

All electronic data was collected using SurveyCTO, on tablets. The data was securely uploaded from the field to the server. The data was further downloaded, cleaning and then analysed. All data analysis was conducted in STATA, and visualizations were

produced in STATA or MS Excel. At all points in time, the data was encrypted, and all PII data was either masked, or removed.

For the data collection purposes experienced IFMR field personnel were engaged. The field team was thoroughly trained on the various questionnaires, and were also given a thorough briefing on ensuring that the various consent forms were explained to the respondents. Emphasis was maintained on surveying only those respondents who gave consent to participate, with the understanding that participation was fully voluntary – with the right to opt-out, and to refuse to answer any specific questions.

9. Study timeline

Table 3: Timeline

	Feb	Mar	Apr	Jun	Jul	Aug	Sep	Oct
Lit Review								
App Development								
Partner Engagement								
FGD instrument design								
Scoping survey instrument design								
App Piloting								
FGDs								
Scoping Survey								
Marketing								
Enrolment								
Instrument Design								
Post-Intervention Survey								

The study began with a detailed literature review, as a means to inform the next steps. The literature review was instrumental in narrowing down the study locations, while also providing a lot of context on marketing approaches etc. The app development began in parallel. However, the development of the app took far longer than expected. The completed, and fully error free app was ready only in the beginning of September. The app was pilot tested in June, but at the time of pilot testing, several small bugs that hindered smooth functioning were identified.

Focus group discussions, and the scoping survey were conducted in June/ July. These activities proceeded as expected, and provided a great amount of detail that allowed us to further refine the design of the formative study, and plan the next activities. As per original timeline, the app was to have been made ready by the end of Jun, so that the marketing and enrolment activities could begin. Instead, due to the delay, the marketing and enrolment could begin only in September, the post-intervention survey could begin only in the middle of September.

Due to these delays, the study design was significantly affected. While the marketing could happen as planned, enrolments have only partially begun as of the end of September. Specifically, for an entire program group (T2 – details in previous section), the enrolments had not begun till the end of September. As a result, data from these areas is not available for the purpose of this report.

10. Findings from the evaluation

Through this formative evaluation, we aimed to assess the take-up and understand the factors determining the same for an indemnity and app-based cattle insurance product among smallholder farmers in Gujarat. This cattle insurance product is indemnity based, being the most suited to the context of India as well as Gujarat, unlike in Africa etc. where-in index-based insurance is more prominent due to the pastoralist nature of the livestock economy. This HDFC ERGO cattle insurance product is not linked to loans, and covers the death of milk cattle (cows and buffaloes) for one year.

This app-based cattle insurance product attempts to plug in the inefficiencies in the cattle insurance space, created through challenges of adverse selection and moral hazards, poor data on cattle mortality rates and otherwise, resulting in the absence of actuarial pricing, challenges in valuation and identification of cattle (between enrolment to claims), lengthy claim settlement processes etc. Through this intervention of an app-based product offered at lower premiums (accounting for time and cost savings) and improved, targeted marketing strategies we aim to assess awareness levels among farmers on the product, any increase in uptake and their perceptions about the product.

We aim to understand the constraints impacting take-up of cattle insurance products through pricing (across program and comparison groups), experimental marketing strategies (along with mandli⁴-level engagement and in the longer run estimate actual savings in turn-around time and costs for the insurer and insured owing to a process innovation through an app-based insurance product. While we have been able to estimate the time savings for individual cattle tagging and enrolment processes in the Phase 1, the duration of the study has been inadequate to assess the long-term costs savings. Claims have not been reported within the study period and hence cost efficiencies that could be created for the insurer-insured in the longer run due to better identification of cattle during deaths (app usage), improved management of claims data through the app and real-time data transfer onto the company server, improved supervision of moral hazard issues and fake claim requests have not been accounted for in this phase.

10.1 Insights from the Focus Group Discussions

The major aims behind the focus group discussions was to gather a detailed understanding of the study areas, and also to capture information on details that would be difficult to capture in a survey – such as the past experience with insurance products. Some insights gained from this exercise are:

- Premium rates were around 7% or higher for private insurer policies, while with the government subsidy, rates would drop to around 3% to 3.5 %
- In terms of cattle breeds, there is a mix of breeds that are owned by farmers in our study areas, ranging from native breeds, to hybrids and imported breeds such as Jersey cows, etc. Breeds insured: Holstein Fresian (44 percent), Jersey (42 percent) and indigenous, Mehsana buffaloes (17 percent) and Desi buffaloes (26 percent).

⁴ Mandlis are milk collection centres in the context of north India, Gujarat, and every mandli has a secretary. The secretary is responsible for the day-to-day functions of the mandli, including the milk collection and maintaining the accounts of farmers enrolled within the mandli.

- The average value of the livestock reported was on average around INR 50,000. This translates to a premium amount of around INR 3500, at a 7% premium rate – which is a significant expenditure for the farmer, especially small and marginal farmers.
- Previous experience with agricultural insurance (particularly livestock insurance) has not been the best – several instances of huge delays in claim settlement came to light during the course of these discussions. In some areas however, reports of a good private insurance policy were recorded (the policy had been since discontinued).

10.2 Socio-economic characteristics of Study Area and Farming Households

The selected study blocks of Balasinor and Virpur (Mahisagar district) serve as ideal study sites due to the socio-economic characteristics of the population. Informal interactions with the partner and their staff on the field further validated the selection of this study site. Almost 90 percent of these populations fall under the category of Other Backward Castes, have poor literacy rates compared to the state average, with a larger proportion of small holder farmers (average land owning size of 1.6 acres) with lower mean income levels compared to other districts of Gujarat, in spite of considerable livestock assets. Such small-holder farmers comprise the targeted populations of our study. Livestock farming forms the main economy of these blocks. Balasinor, which serves as the program or intervention arm for the purpose of this study has lower cattle insurance penetration rates⁵ than Virpur.

Given the socio-economic backwardness of this block, and the lower insurance penetration rates in the context of considerable livestock density/ land used for livestock, the study site provides the best environment to pilot an app-based product, and understand uptake and comprehension of such insurance products among small holder farmers. Some key insights include:

- Around 25 percent of the sample comprises of women farmers. An interesting aspect that emerges is the higher proportion of women farmers within the Program 2 group. It would be worth exploring if this influences the higher take up rates in the group. The interactions between gender and take-up are interesting questions that could be pursued further in the Phase 2 of the study.

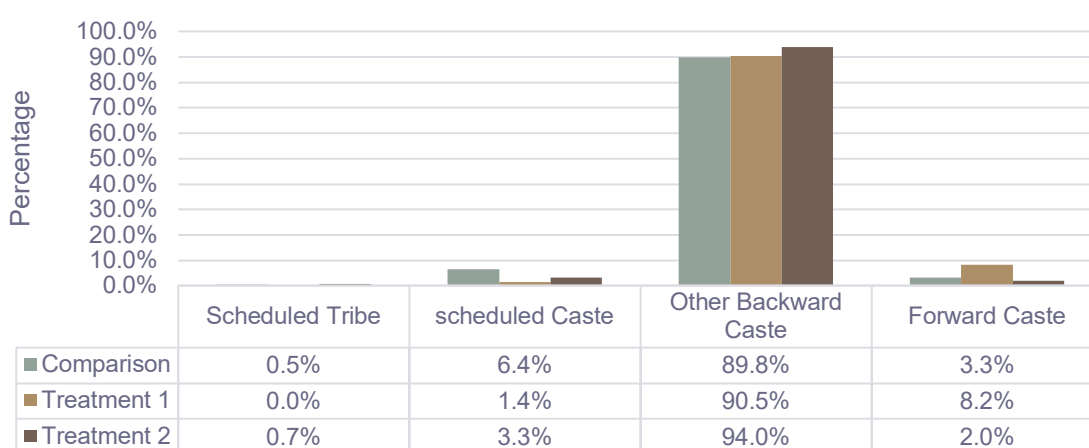
Table 4: Gender distribution

Gender	Comparison Group	Program 1	Program 2	Total
Male	660	695	1,349	2,704
%	74.58	72.02	73.04	73.14
Female	225	270	498	993
%	25.42	27.98	26.96	26.86
Total	885	965	1,847	3,697

⁵ As understood through interactions and interviews with HDFC ERGO staff, field personnel etc and validated through the data collection exercise on the field.

- 85 percent of our sample had not studied beyond class 12, and further details demonstrating the educational attainments of the sample are presented in the charts in the appendix section. These charts reveal that across the three groups, the trends of highest education attainment are similar, and around 90 percent of the sample had not studied beyond class 12.
- 50 percent of our sample were in the age group of 40 to 60 years with more than 10 years' experience in cattle rearing.
- The study populations across the three groups are mainly from the Other Backward caste, around 90 to 94 percent, clearly projecting the caste compositions of these villages.

Figure 7: Sample Composition - Social Groups



10.3 Income, Livestock Ownership, Livestock Insurance, and Renewals

- Livestock farming is the main income source for these farmers (Table 6), with an average land size of 1.6 acres.
- The average monthly income (last 30 days, self-reported) is higher in the comparison group, than in the program groups⁶.
- We find that income from livestock rearing forms a significant part of the household's income basket. It must be noted that the period of data collection would have been just before the planting of rabi crops – it is therefore possible that the data represents the income basket of the households in the lean period.
- The table below demonstrates that the mean income of households in the last 30 days as well as the average monthly estimates were lower in Balasinor (Program group) than in Virpur (Comparison group), affirming our earlier observations.
- The average land size owned by farmers varied between 1.7 acres (Virpur) to 2.7 acres (Balasinor), average cultivated land in acres were in the range of 1.1 (Virpur) to 2.1 acres (Balasinor) and the average land under livestock varied between 0.5 acres (Virpur) to 0.6 acres (Balasinor).

⁶ We find significant variation in the income data, and this is a result of the choices we made in terms of the method of income data collection. These choices were mainly driven by time constraints on the questionnaire. Box-plots of the income variables are presented in the appendix, to showcase the variation in the data.

Table 5: Summary Statistics: Study Sample

	Mean (C)	Mean (T 1)	Mean (T 2)
A. Average Income per month (Average Annual Income/ 12)			7527.8(6759.4)
	9625.35 (12745.65)	7681.25(7491.4)	
B. Monthly Average Income	9516.20 (13348.91)	7827.05 (7393)	7211.1 (6929.73)
C. Income of HH last 30 days	9923.70(14602.08)	7842.07(7398.5)	7297.5(7766.5)
D. Total land in acres owned	1.61(1.59)	1.7 (1.45)	1.91(2.37)
E. Cultivated land in acres	1.20(1.27)	1.27 (1.15)	1.52(2.08)
F. Livestock land owned	0.54(0.53)	0.53 (0.44)	0.53 (.53)
N	885	965	1,847

Table 6: Self-reported Income (Last 30 days) by Category

	C		T1		T2	
	<i>Mean (SD)</i>	<i>% of total</i>	<i>Mean (SD)</i>	<i>% of total</i>	<i>Mean (SD)</i>	<i>% of total</i>
Non-agricultural Sources	2957.18 (7930.20)	29.6%	2115.13 (5508.45)	27.0%	2619.92 (5915.69)	35.9%
Cultivation (Own Land)	402.84 (2393.4)	4.0%	764.28 (2336.58)	9.7%	406.44 (2836.99)	5.6%
Cultivation (Leased Land)	6.22 (102.10)	0.1%	26.43 (198.7413)	0.3%	6.50 (112.64)	0.1%
Cattle Farming	5973.67 (12209.55)	59.8%	4292.87 (4823.88)	54.7%	3586.58 (3862.54)	49.1%
Other Livestock Farming	5.77 (105.19)	0.1%	48.20 (1038.18)	0.6%	2.44 (74.48)	0.0%
Agri-Labour	645.32 (1138.98)	6.5%	595.18 (1185.42)	7.6%	677.46 (1026.25)	9.3%
N	885		965		1,847	

- The per capita cattle ownership varied between 0.8 (Balasinor) to 1 (Virpur) and mean of total cattle owned per household was higher in the Comparison group (5.7) than the Program 1 and 2 (4.5)
- As Table 6 suggests, the buffaloes (milch/ non-milch and offspring), and adult cows (milch/ non-milch) were the most commonly reported animals to be owned by the households.

Table 7: Livestock ownership - type of animal

	C		T1		T2	
Adult Cows (Non-milch)	0.70	(1.05)	0.27	(0.78)	0.16	(0.48)
Milch Cows	1.03	(1.47)	0.45	(0.81)	0.24	(0.59)
Female Calves and Heifers	1.09	(1.36)	0.46	(0.82)	0.32	(0.79)
Stud Bulls (for breeding)	0.00	(0.048)	0.00	(0.064)	0.00	(0.18)
Bullocks	0.61	(0.768)	0.34	(0.59)	0.50	(0.69)
Male Buffaloes	0.01	(0.28)	0.02	(0.15)	0.02	(0.14)
Milch Buffaloes	0.57	(0.72)	0.83	(0.81)	0.91	(0.84)
Non-Milch Buffaloes	0.73	(0.94)	0.82	(0.92)	0.93	(0.96)
Buffalo-offspring	1.06	(1.16)	1.33	(1.14)	1.51	(1.20)
N	885		964		1846	

- According to the scoping surveys, insurance penetration within the overall sample including products bundled with cattle loans was 19 percent. Among those farmers with insured cattle, only 27 percent were aware of insurance products offered separately from loans and 10 percent of the overall sample had taken up such non loan-linked insurance products.

Table 8: Cattle Ownership

Comparison	Mean (C)	Mean (T 1)	Mean (T 2)
Total cattle (per HH)	5.7 (3.65)	4.5(2.55)	4.5(2.6)
Per capita cattle(per HH)	1.07(0.68)	0.87(0.54)	0.87(0.58)
Number of Cattle Insured	.54 (1.3)	.17 (.56)	.11 (.49)
N	885	965	1,847

- Our post-intervention survey shows a lower insurance penetration, with an average of around 13.3%. As displayed in table 6, the number of cattle insured in the comparison group is significantly higher than in the program groups. Of the households who reported having their cattle insured, the proportion of insured cattle to owned cattle is displayed below.

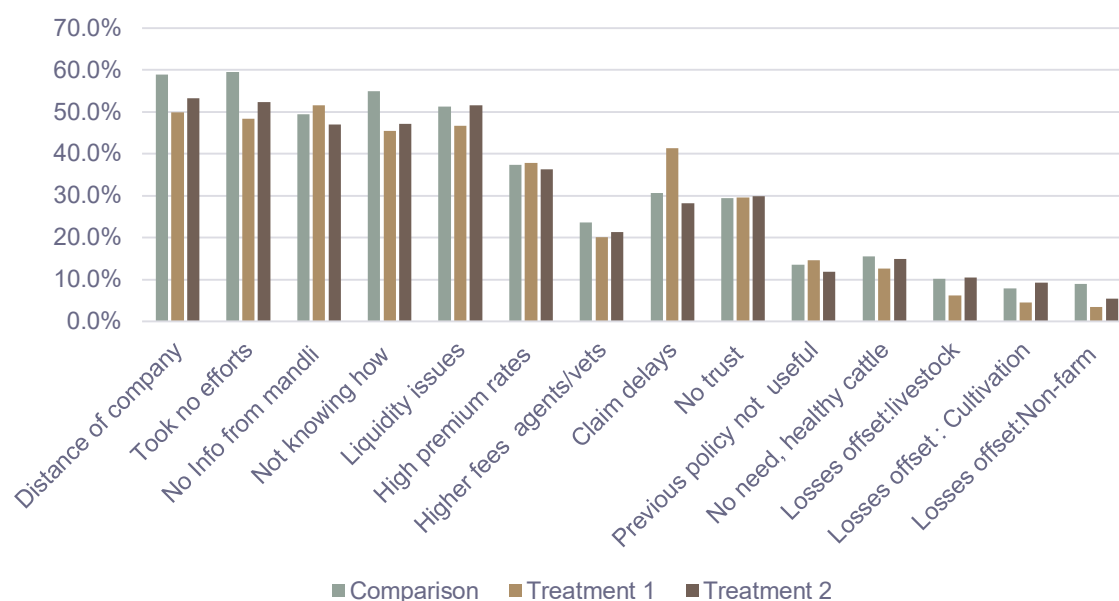
Table 9: Proportion of livestock insured, for HH self-reporting livestock insurance

Comparison	Mean (C)	Mean (T 1)	Mean (T 2)
Proportion of cattle insured	0.31 (0.19)	0.35 (0.24)	0.4 (0.24)
N	246	112	128

Focus groups conducted with farmers along with insights from the Intervention survey reveal that renewals of past insurance policies have fallen over the years, for significant reasons that could be attributed to pricing issues not related to pricing.

- Lack of access appears to play a crucial role, as distance to the insurer is among the foremost reasons cited.
- The mandli secretary plays a pivotal role in knowledge dissemination and finalising the operations of a private insurer within his mandli (as the premiums are paid by the mandli, and later deducted from the individual farmers' milk collection accounts at the mandli).
- Liquidity constraints are clearly a huge barrier to policy renewals, along with pricing related issues. Given the importance of the mandli here, it would be crucial to determine arrangements that allow farmers to adjust premium payments against incomes from the mandli, which could prove crucial to boosting renewal rates, as it reduces the actual out-of-pocket expenditure

Figure 8: Reasons for Not Renewing Insurance Policy



Note: Select multiple variable used

- In addition to all the complaints with regards to pricing, observing that respondents claimed delay in claims' reimbursements, as well as a lack of trust in the insurer as reasons for not renewing their cattle insurance policies helps validate our initial assumptions with regards to these two barriers.
- It is to be noted that around 15 percent of farmers suggested that they did not need cattle insurance as they had healthy cattle. This highlights a lack of understanding, with regards to concept and need for insurance as a risk management strategy, among the rural poor. This also highlights the significant amount of work that needs to be done in order to improve the understanding of the concept of insurance among the rural poor.

10.4 Trust, the role of the Mandli, and Marketing Strategies

Addressing the trust deficit of rural households through mandlis and communities can go a long way in increasing demand for cattle insurance and ensuring renewals of existing policies. Focus group discussions with farmers and mandli secretaries have thrown light on instances wherein an entire village had decided to opt out of any cattle insurance policies, owing to previous bad experiences at the village level. 92 percent of the farmers in our study villages sold milk on a regular basis to mandlis (village-level milk collection co-operatives, similar to the Primary Agricultural Societies) and only the rest to private dairies. This emphasises the role of mandlis in creating trust and building awareness about cattle insurance products as well the mandli secretary in the uptake of insurance.

- Our scoping study, and focus group discussions suggest that of the farmers who reported having an insurance policy, 15-25 percent were unclear about the scope, on the exact coverage of cattle insurance policy, and also about exclusions. About 30 to 40 percent of the farmers were also unaware of the exact premium amounts.

Hence these observations make a case for improved marketing strategies that could increase their awareness about the such aspects of a cattle insurance policy. Through this intervention we experimented using door- to door marketing in addition to the regular marketing strategies employed by private insurers on the field through mandli networks.

Observations from Mandli marketing: Channelizing the social networks of mandlis (milk collection centres) and mandli secretaries who regularly briefed farmers about developments affecting them in their daily milk collection routines or during their mandli meetings was the primary marketing strategy. Posters in Gujarati about the specific cattle insurance product were displayed at the mandli notice boards along with information on the annual premiums for varied sum insured amounts. These networks of mandlis and influential people within the community enable better information dissemination on the ground, due to their awareness of the local context, personal relations and immense trust and respect enjoy within the community. In contexts wherein farmers were not educated enough to comprehend the working of insurance, these networks could be instrumental in educating them about the relevance and the know-hows of cattle insurance, means of assessing the same and even influencing their decisions to take-up a new cattle insurance policy.

Observations from Door- to door marketing helped target individual households and as well as market the product directly to the farmer, who could seek for on the spot clarifications and increasing his awareness about the features of the product.

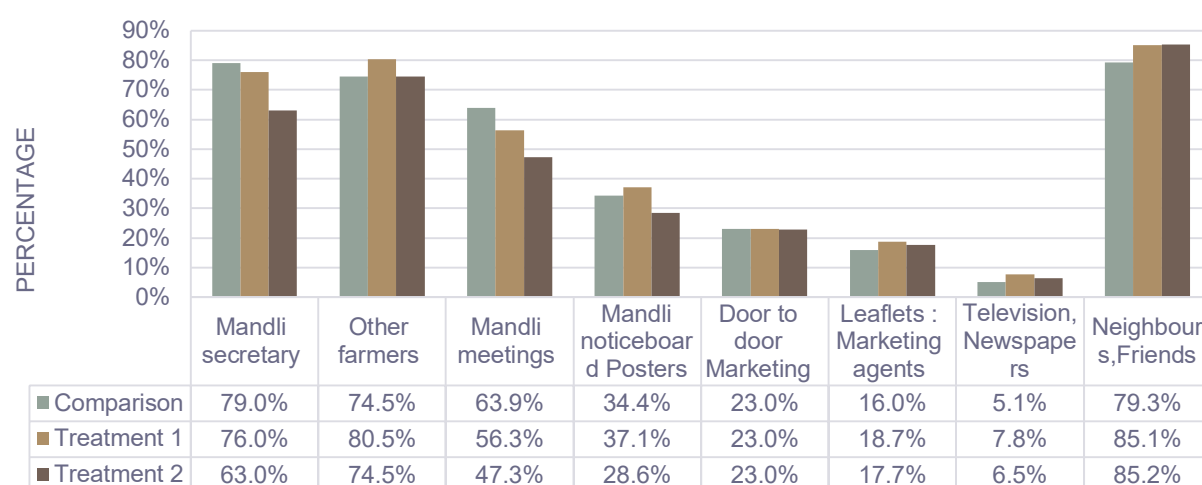
10.5 Monitoring Indicators and Primary Outcomes:

The indicators facilitating the monitoring of the intervention across the three groups are:

1. Post Marketing: Farmers' awareness about cattle insurance policies (sources of awareness about HDFC ERGO cattle insurance product)
2. Post Marketing: Awareness about the coverage, and premium amounts/rates.
3. Quality of marketing strategies and its effects on take-up across the three groups (this would be the primary outcome of the intervention)

10.6 Awareness about HDFC ERGO cattle insurance product

Figure 9: Post Marking Awareness on Intervention

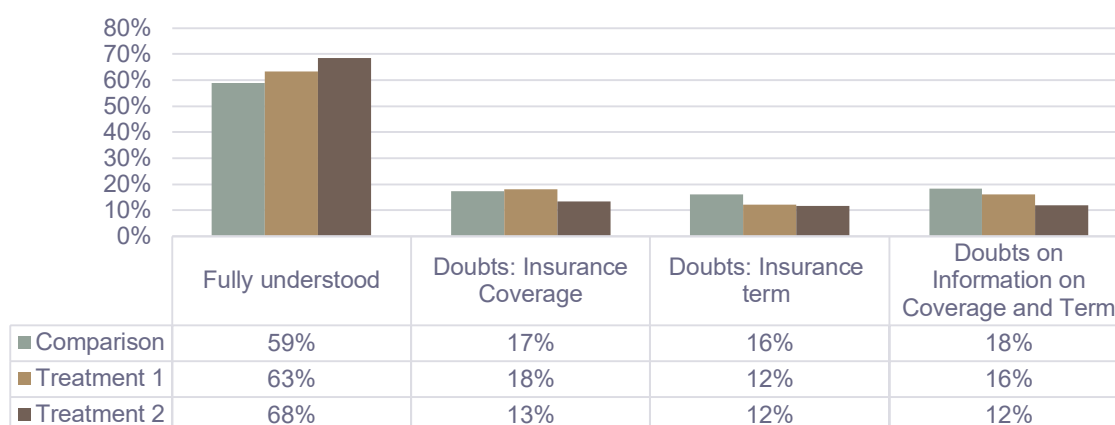


Note: Select multiple variable used

- **Mandli Secretary/ Mandli Networks:** Majority of the farmers' report awareness about the intervention (or any other cattle insurance schemes engaging in marketing at the time) through the Mandli secretary/Mandli networks including other farmers in the Mandli (Option 1,2 and 3). This again adds to the point about the importance of these networks in improving insurance take-up.

Awareness about Product Features

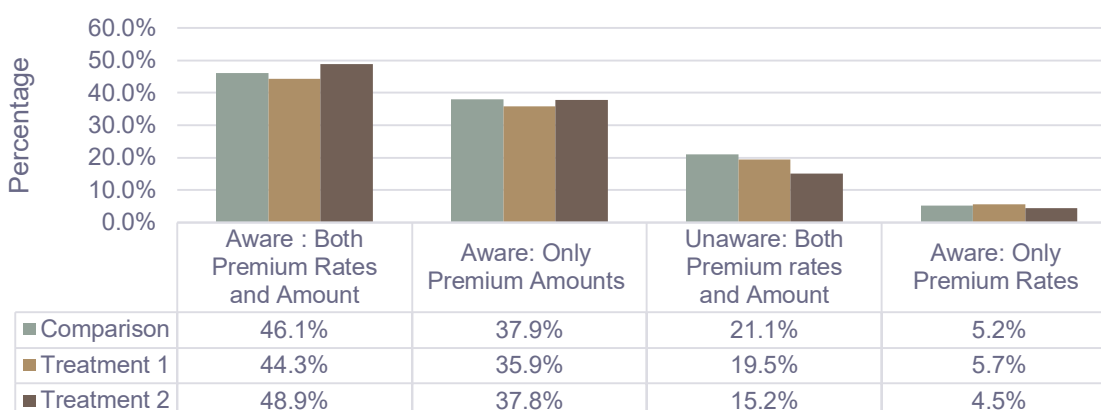
Figure 10: Post-marketing Awareness on Scope/ Term of Insurance



Note: Select multiple variable used

- Around 63 percent and 68 percent farmers in the T1 and T2 groups respectively were aware of the scope of insurance (for deaths of cattle for the HDFC ERGO product) and the duration of the same. 59 percent farmers in the Comparison group had fully understood the above.
- Around 12 percent farmers had doubts both about the coverage of insurance as well as the terms of insurance in T2. 18 percent and 17 percent farmers had doubts on the coverage of insurance in T1 and Comparison group respectively.
- 12 percent farmers had doubts about the term/duration of insurance across T1 and T2. This suggests a sizeable reduction in the percentage of farmers who had no information about policy coverage and terms of insurance policy, compared to the data in the scoping survey.

Figure 11: Post Marketing Awareness on Premium Rates/ Amounts

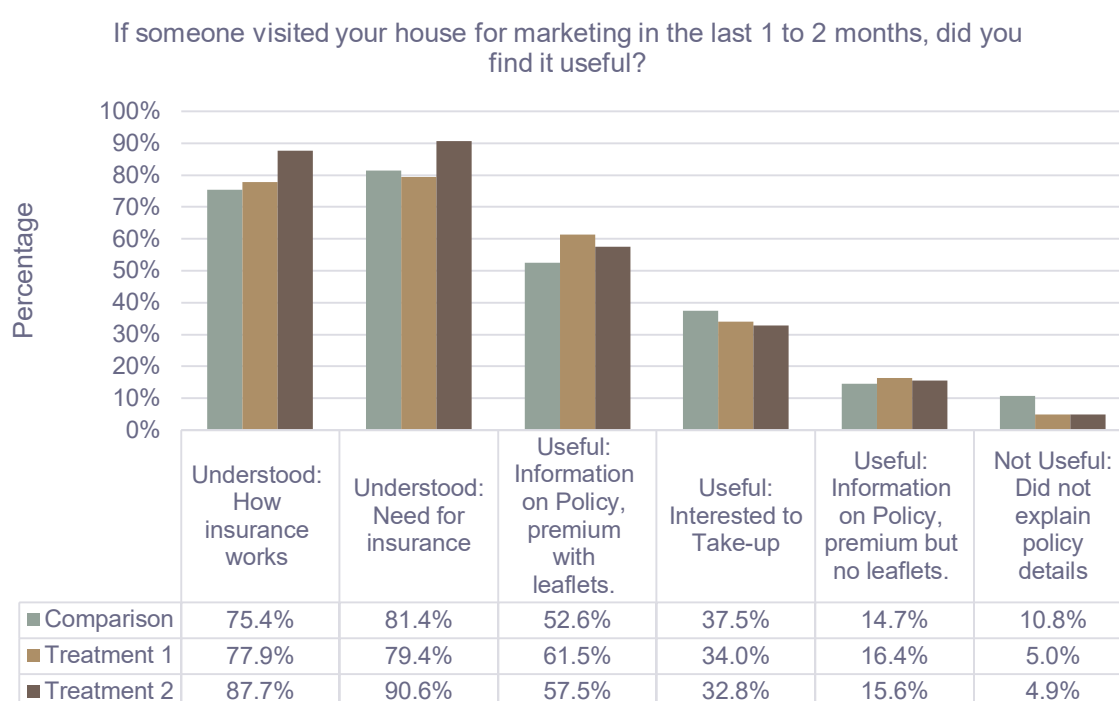


There has been a significant increase in the number of farmers reporting awareness about both premium rates and amounts as a result of the marketing activity.

Quality of marketing strategies and its effects on take-up across three groups

Overall around 94 percent of those households surveyed across the three groups found that the marketing provided to them in the last one to two months have been useful, with the assumption that no other companies had visited their households for marketing during this period. Among those households that reported marketing in the last one to two months by HDFC or in cases where they were unaware of the company, we asked them further questions about the quality of the marketing, for which the results are presented below.

Figure 12: Quality of marketing



Note: Select multiple variable used

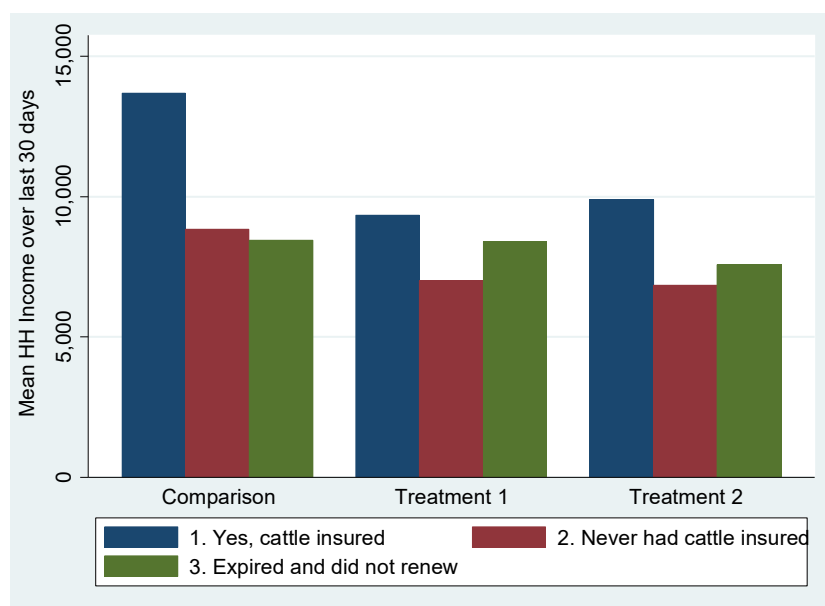
While Balasinor (T1 and T2) are markets with lower insurance penetration rates, the marketing seems to have improved farmer's awareness about how cattle insurance policies work on the ground, to a significant extent in these villages. It remains difficult to isolate the impact of marketing on the actual take-up as the marketing strategies remained the same across the three groups.

Who takes-up Livestock Insurance?

All of those who had cattle insured, currently across the three groups, had a higher mean HH income over the last 30 days compared to those households who had never insured their cattle. It is worth considering whether this suggests that insurance is still too expensive for the poorer households – who would actually stand to benefit from it the most.

An analysis of the data from Saliyavadi – the village where there is sufficient data on take-up, to conduct meaningful comparison between group that take up the product v/s groups that opt to not take up the product is presented below (table 10). We see that the income of those households opting to take-up the livestock insurance product is on average INR 2041⁷ more, than households who have not opted to take-up the product. A t-test shows this result to be highly significant. Results for other variables are presented below

Figure 13: Variation of Income, by Insurance Take-up Status



Initial analysis as presented below shows that the households who take the livestock insurance product being studied own a significantly larger number of cattle. We also find significantly larger productivity, and overall larger number of cattle insured among this group. There are no differences on land ownership, and also we see no differences arising on the basic demographic variables. We do not show the tables for religion, or social group, and also education level of the respondent as there is little to no variation in our study areas for these characteristics. We see in our data that the households reporting take-up of insurance significantly more likely to have the respondent as the head of the household; this is plausible, as more often than not the head of the household is the decision maker in such cases, especially when it comes to expenditure on a product such as insurance. This also raises the possibility that there is some underreporting in the cases where we have been unable to survey the head of the household, due to his or her unavailability. Further investigation is pending.

Overall, more than 95 percent considered insurance as providing a safety net, extremely useful during immediate shocks. Around 80 percent wanted to buy new cattle with the claims money. The data from this section suggests that it is definitely the farmers who have opted to take-up the livestock insurance product are significantly earning more than those who did not opt for the take-up. However, it must be noted that even for the set of farmers who took up the product, the average land owned is under 2 acres – thus these

⁷ We top-code the income for this analysis, in order to prevent outliers from skewing the data.

farmers are also definitely in the small/ marginal farmer category. It must be mentioned that the income data is likely to be under-reported across all data points – the lack of time prevented more rigorous income data from being collected, and this is definitely something that can be addressed in a longer term study. It also emerges from the qualitative data we collect, that the take-up rate is heavily influenced at the mandli level - farmers are reluctant to pay the premiums through their cash on hand. Given that they are low on liquidity it appears to be a strong preference to have the premium amounts deducted from their milk collection accounts.

Table 10: Preliminary analysis - T-test results

Variable	Mean (Did not take up insurance)	Diff (SE)	N
A. Household characteristics			
Respondent age	42.97	1.48 (2.41)	137
Household size	6.51	0.33 (0.47)	137
Respondent gender	0.65	0.1 (0.09)	137
Respondent is Hoh	0.52	0.24*** (0.09)	137
B. Income and Land Ownership			
Income - last 30 days	6902.11	2040.75** (1007.29)	137
Total land owned (acres)	1.25	0.18 (0.18)	137
Livestock land owned (acres)	0.39	0.05 (0.05)	137
Cultivated land owned	0.95	0.15 (0.15)	137
C. Livestock ownership and milk production			
Total livestock owned (cows, bulls and buffaloes)	4.88	1.23** (0.48)	137
Total cattle insured	0.12	1.79*** (0.14)	137
Daily milk production by milch cows (litres)	2.61	4.84*** (1.2)	137
Daily milk production by milch buffaloes (litres)	2.1	1.85*** (0.57)	137

Notes: A- The column 'mean' (column 2) refers the mean values for the group who did not take up the intervention, in Saliyavadi village.

B- The column 'diff' refers to the difference in outcomes between the set of people who took up the livestock insurance product, and the set of people who did not (column 2). Standard errors are presented in parentheses.

C - Significance levels are presented as follows: * - $p < 0.10$, ** - $p < 0.05$, *** - $p < 0.01$

D- Income values are top-coded at the 5th and 95th percentile

10.7 Enrolment and Take-up Statistics

The enrolment process happened only in one village, Saliyavadi in Program group 2; 2 villages Kasampura and Rasulpura in Comparison, and one village (Dev) from Program Group 1. The take up rates are calculated on the number of households that were marketed to within these villages. It must be mentioned that overall, in the two weeks (since mid-September), when the marketing was completed and enrolments began, HDFC-ERGO's admin data reports having enrolled 156 households (close to 270 cattle), into their app-based livestock insurance scheme – displaying a very high initial pace of adoption. The data from Program Group 1 is incomplete, and does not represent the true take up rate for the that program arm.

Table 11: Take-up Rates from Survey Data

	Program Group 1	Program Group 2	Comparison
No of HHs reporting marketing by HDFC (Self-Reported)	91	137	152
No of HH reported taking up HDFC product	5	45	6
Take-up rate	5.5 %	32.8 %	3.9 %

10.8 Willingness to Pay

As mentioned, for the areas that we were unable to set up enrolment, hypothetical willingness to pay data was collected. The bidding game was designed to determine the maximum price (premium) that a respondent will be prepared to pay for a livestock insurance scheme, assuming that an animal of market worth INR 40,000 had to be covered. Households were given a brief introduction regarding the scheme, potential coverage, and brief details regarding its benefits.

It must be noted that given time and budget considerations, only a very basic bidding game was conducted. Data on why a particular price level was being rejected⁸ was not collected, as the overwhelming response from piloting suggested that high cost was the major reason for higher price levels being rejected. The data from the 2 program arms, and the comparison arm is presented below:

Table 12: Hypothetical Willingness to Pay - results

Amount	Hypothetical premium rate	T1	T2	C
3960	9.9%	-	-	1%
3560	8.9%	2%	1%	2%
3160	7.9%	4%	3%	5%
2760	6.9%	10%	9%	16%
2360	5.9%	25%	21%	31%
1960	4.9%	48%	43%	50%
1560	3.9%	66%	63%	73%
1160	2.9%	82%	85%	89%
760	1.9%	94%	95%	98%
360	0.9%	97%	98%	-

⁸ As seen in Ahuja et al, 2001 for instance

As can be seen, between 40-50% of the households were willing to pay a premium of around 4.9%, while an overwhelming majority of the households were willing to pay the lowest rates of 1 or 1.9%. In terms of next steps, calculating an average willingness to pay, and following this, estimating a probit model to determine relationships between the income, wealth, and other demographics are pending.

10.9 Mobile Application – Infrastructure requirements, time and cost savings.

The mobile-app for tagging, enrolments and claims settlements were administered through veterinarians/para-vets appointed by HDFC ERGO on the ground, and the design of an extremely efficient application is instrumental to this process. The application has been designed, tested and modified to the local contexts (in vernacular for the ease of administering along with proper dropdowns for breeds specific to the area etc.). Sufficient checks and balances have been hard coded (eg. coding constraints that allow only certain ranges of values to be entered) facilitating a speedier and more efficient data entry processes.

Broadly, we made the following observations with regards to the infrastructure/ functioning of the application:

- We find no gaps in terms of infrastructure, for the implementation of the app based insurance process. Network connectivity was good at all points of observation.
- Basic smart phones sufficed for all the enrolment processes. Other issues like availability of electricity to keep the phones charged etc. did not prove challenging; however, given that the application has been on the field for only two weeks in terms of real usage, more data on these aspects are awaited.
- In terms of training and usability, the changes in process required additional training of about two days. The para-vets/ agents were able to adapt to the new processes fairly quickly, and the implementing partner ensure that the training was thorough and rigorous.
- ***The app-based cattle insurance product brought down the time for tagging and enrolment of an individual cattle from an average of twenty minutes to half an hour (in the manual process) to less than 5 minutes*** (based on observations on field during enrolment/tagging processes). The additional documentation costs during tagging and enrolments such as paper proposal forms and courier expenses have thus been eliminated at a larger scale, which could also translate into considerable savings for the insurer. As the enrolments and data collection are still ongoing, metadata on the average enrolment time through the application is unavailable at the time of submission of this report.
- In terms of cost savings, while all details of the implementing partner's underwriting are available to be shared publicly, it can be mentioned here that simply digitizing the various paper-based processes had an impact on the following factors:
 - i. Reduction in errors in data entry/ matching of photos to respective policies
 - ii. Complete elimination of paper documentation and associated costs
 - iii. Improvements in the assumptions made with regards to expected loss ratios

These reductions in cost were in part offset by some initial costs, including that of developing and maintaining the technology, charges incurred in servicing, internet connection costs etc.

Overall, the net premium rate reduction as a result of all these changes were about 1.25%, with further scope being available.

11. Implications of study findings

11.1 Implications for the intervention

Despite the delays in implementation, the study has several valuable insights and findings that will influence the design of the intervention in the coming months. Some of the key implications are:

- Importance of mandli-level marketing: While we find some weak evidence to suggest that the individual level marketing approach leads to improvements in the awareness regarding insurance, particularly with regards to premium rates etc. Nevertheless, it remains very important to have the buy-in of the mandli secretary, as in many of our study areas (as in most parts of Gujarat), there are strong networks between the mandli secretary and the farmers who supply milk to that specific mandli. This is an important addition to our theory of change, as the phase 1 theory of change assumes that the individuals' decision to take-up is independent of a key stakeholder, such as the mandli secretary.
- Farmers prefer not to pay out of their pocket, as far as possible: Another feature of the mandli level organization is that the farmer's income from milk production is routed through the mandli – which aggregates the milk, and transfers the respective amounts to each farmer. Due to this arrangement, the formative study revealed that most farmers preferred not to pay an amount out-of-pocket, and instead have it adjusted against their income from the mandli. Utilizing this channel will be crucial to improving the uptake of any insurance program going forward, for livestock farmers.
- Sufficient time to be given to marketing: In the course of the formative evaluation, due to various delays, the marketing activities began only in September, and had to be rushed due to the paucity of time. Ideally, a minimum of 15-20 days should be set aside to ensure that the selected villages/ areas are covered thoroughly, and all the information in the marketing content is properly explained and disseminated.
- Implications for frequent information dissemination: It has been a long held theory, that a single round of marketing is unlikely to result in any sustained improvements in financial literacy, or specifically insurance related knowledge. The data from the field shows that insurance awareness is on the lower side in these areas. While time-consuming and expensive, an important point to consider moving forward would be to engage with the partners and ideate regarding sustainable means to ensure that the gains from a single marketing campaign are not lost due to a lack of follow-ups.
- Overcoming behavioural biases: Despite a door-to-door marketing approach, and detailed information dissemination, it is observed that while take-up rates do improve, the gains are not tremendous. We attribute this to various behavioural

biases, ranging from biases arising out of the previous experience the study population has had with insurance, to biases arising out of the fact that for a lot of farmers, insurance remains an intangible concept as the value is not realised till a loss of livestock is suffered. It is important to keep this in mind while designing the long term evaluation, as there is a lot of scope for innovation and creative thinking in terms of the contract offering itself. In various other contexts, opt-outs have been successful in overcoming such biases, and boosting the enrolment in pension and healthcare programs. However, opt-outs have been criticised for various reasons. Recent literature suggests an alternative – an active choice structure, that makes it clear to the farmer what the losses are, if he/ she does not choose to take-up and insurance product, while also making the exact benefits or gains as explicit.

11.1 Implications for further research

The formative evaluation has led to several interesting insights, and several interesting questions that would require a longer term evaluation to answer.

Broadly, it has been shown that it is possible to underwrite a cheaper premium rate by merely smoothening out process inefficiencies through digitisation. While a premium rate reduction of around 1.25% has been made possible in phase I, a longer term study at a larger scale would be required to see how much more this can be reduced, conditional upon the take up. Thus in terms of simply understanding whether it is possible to transition the traditionally cumbersome livestock insurance process to a digitized app-based process, the formative evaluation has definitely demonstrated this successfully. To a certain extent, given the limited timelines, the study has also demonstrated the differences in take-up due to the reduction in premium pricing.

The benefits of a targeted marketing strategy are evident – in phase I, the mandli level marketing, and engagements with the mandli secretary proved to be crucial in influencing the take-up rates, while individual marketing contributed to weak improvements in product awareness. While the data to fully assess take-up rates from our study areas is not available yet due to the delays in implementation, there is anecdotal evidence to suggest that this extra bit of outreach did influence farmer's thoughts and perceptions about the service provider, and helped address various trust issues we had highlighted earlier. However, the actual determinants of a successful intervention will only be observable after a couple of cycles of claim settlements. Crucial data points that have not been captured yet, and would ideally need to be captured over the course of multiple seasons include the actual improvements made in claim processing, and also the number of renewals we see in the formative evaluation areas. For reliable data on these fronts to be captured, a longer term evaluation is a must.

While the formative evaluation has thus provided some results in this regard with regards to pricing and trust, it has also highlighted various improvements that can be made to our intervention in order to boost take-up, as highlighted in section 1.9.1. Foremost, the role of various behavioural biases in hindering individual take-up has been outlined. This offers tremendous scope for research and innovation, as addressing these biases could be crucial to improving product take-up in the long run. In terms of marketing approaches, rigorous evidence to support the efficacy of marketing at the mandli level,

and involving the mandli secretary in information dissemination and outreach has several cost implications, and other such considerations for insurance providers.

One interesting area that has not been the focus of this formative evaluation, but is nevertheless important in answering the broader questions about product take-up, and benefits, is heterogeneity analysis. Given that we see limited product uptake, despite a very detailed information dissemination campaign, and involvement of the key stakeholders at the mandli level, it is indeed possible that for a number of rural low-income households, the product being offered still does not meet the actual needs. There is a body of evidence showing that index based insurance actually finds very low demand among farmers (Binswanger et al, 2012) - being able to conduct such analysis would allow us to better understand to whom the actual benefits of a livestock insurance product accrue – and further evaluate various determinants of take-up (gender, socio-economic status, etc.). From a broader perspective, this analysis is extremely relevant, given that questions have been raised regarding the importance and relevance of crop, and livestock insurance as risk mitigation solutions for low-income farmers.

As discussed earlier, livestock insurance remains expensive and inaccessible to many low-income households in rural India. Furthermore, current insurance policies that are available cover only death, while completely overlooking permanent, and total disability (PTD), and even disease or morbidity related risks. From a provider's perspective, providing cover against these risks is far too costly to bear. Thus it may very well be the case that the low-income farmer does not see value in paying for such a policy, given that he or she faces several other immediate risks that remain uninsured. It must be noted that the death of a head of cattle, or any other livestock asset, is likely to impact any low-income household far more adversely than other short term issue. For the rural low-income household, it is therefore possible that other solutions and risk mitigation strategies might be far more relevant, and might find more uptake

A potential solution to these problems may be found in the examples of a dairy model⁹ where-in in addition to collecting milk from the farmers, the dairy also provides access to better feed, veterinary services (including de-worming and artificial insemination), and training to the farmers. Such solutions offer an alternative to insurance, in the manner of the complementarities suggested by de Janvry, Carter and Sadoulet (2017). In other words, by providing a host of services aimed at the overall well-being of the livestock, a number of production risks are mitigated. There exists scant information and evidence currently regarding the cost effectiveness of such models, vis-à-vis the cost of insurance, for small and marginal farmers. This is indeed an area that is worth exploring to make a determination on the most cost-effective means to ensure that farmers are well protected.

These points need to be considered in the following context:

- Awareness and knowledge regarding livestock insurance is still a serious issue
- While the government has made very cheap crop insurance available through the PMFBY, a similar scheme for livestock insurance has not yet been launched.

⁹ See for instance: <http://sahayogdairy.com/>

It may well be the case that addressing these points results in a significant improvement in the uptake of livestock insurance. Further research on these areas hold several implications for policy makers and practitioners, as it will allow focused and better product design, and improved targeting of schemes and policies in the future, hopefully tailoring to the different needs of different segments of the population. In conclusion, it can be said that this formative evaluation showcases an approach to livestock insurance that integrates several key stakeholders, and also integrates a technological solution that allows some reduction in costs. While the formative evaluation provides some answers with regards to the initial questions raised in this agricultural window, there remains a lot to be done in order to generate rigorous evidence that is scalable, cost-effective, and policy relevant. Only a longer term evaluation can address this.

This study also holds major implications for the livestock sector in India, as a whole. It is well known that India has a vast network of cooperatives, across every region of the country. Currently, it is estimated that there are over 75,000 cooperatives in India, serving 10 million farmers in over 80,000 villages¹⁰, across 22 states and union territories. The model that is the subject of this formative evaluation is an easily scalable one, and replicable one. It is indeed acknowledged that a significant amount of time and effort is required to put in place a system that sees cooperation between farmers, dairy cooperatives, and private insurance providers. The argument that several states may not have functional milk societies and cooperatives must also be taken into consideration here - but this suggests that more research and testing is required to understand how a model as is proposed here can be modified to suit those circumstances. The fact that However, the benefits of such an arrangement are indeed evident – while a rigorous cost analysis is yet to be done, and a longer term evaluation is indeed necessary to test and validate the experiences presented above, the integration of strong local social networks, with a technologically efficient service provider has definitely addressed some of the major issues faced by the rural customer, with regards to livestock insurance.

Table 13: States with Dairy Co-operatives in India

Andaman & Nicobar	Karnataka	Pondicherry
Andhra Pradesh	Kerala	Punjab
Assam	Madhya Pradesh	Rajasthan
Bihar	Maharashtra	Sikkim
Goa	Mizoram	Tamil Nadu
Gujarat	Nagaland	Tripura
Haryana	Orissa	Uttar Pradesh
West Bengal		

Various questions remain to be tested and studied further – for example, how can the mandlis be incentivized to do good quality book-keeping, regarding the various cash flows that are now involved? Will there be rent seeking behaviour from some of the key stakeholders involved, given that significant sums of money are involved? Nevertheless, it must be recognized that the intervention proposed is a model that is easily replicable, scalable, and relies on very little infrastructure over and above the development of an app, and the time costs involved in coordinating with various mandlis and their

¹⁰ http://www.indiadairy.com/tech_list_dairyplants_cooperatives.html

secretaries. Moreover, it results in a significant amount of savings for the insurer – flagging the hope that with the scale-up of such models, it will be possible to drive down premium rates even further, while at the same time significantly improving customer experience.

12. Major challenges and lessons learnt

Lack of time: The major challenge was the paucity of time for a detailed formative evaluation – as a result, we are constrained by the amount of data we present in this report. The time constraints also influenced the choice of survey instrument, and the manner in which certain crucial data – such as income – was collected.

Mandli level involvement: While it was evident from all our scoping exercises that the mandli level stakeholders controlled cash flows, it was not foreseen how much this would influence the individual take-up rates.

- Additionally, this also had implications for the actual policy terms, since the involvement of the mandli made it mandatory for the partners (HDFC-ERGO) to create a master policy with the mandli, and then separate individual contracts with the farmers who opted to take-up the policy. While this is a fairly standard procedure, the amount of time taken to put the mandli policy in place, and secure the required approval is fairly large. Every effort had to be taken in order to ensure that the gap between marketing and enrolment was too long for the effects to be lost.

Delayed timelines due to various issues with application etc.: As discussed above, there were various delays that arose as a result of rigorous app-piloting and testing. For the phase II study, a major take-away would be to plan sufficiently ahead in order to minimize delays as much as possible.

Appendix A

Figure A1: Respondent Gender (Farmer)

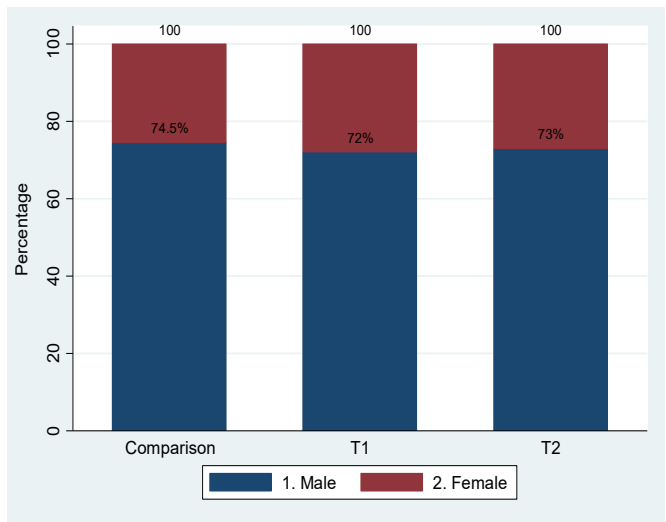


Figure A2: Highest Educational Levels (across 3 groups)

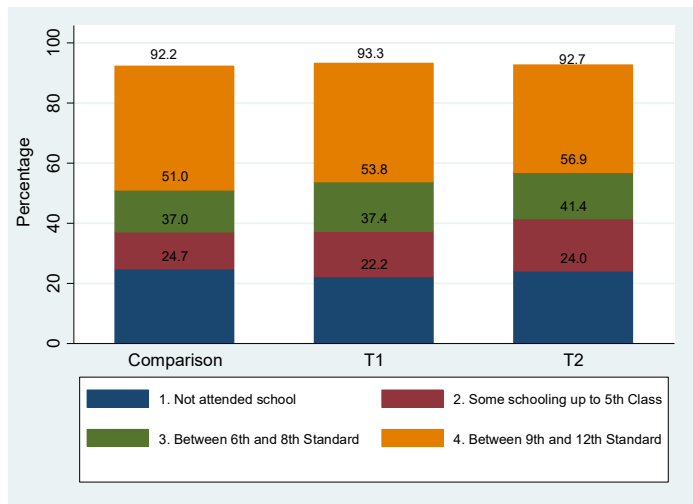
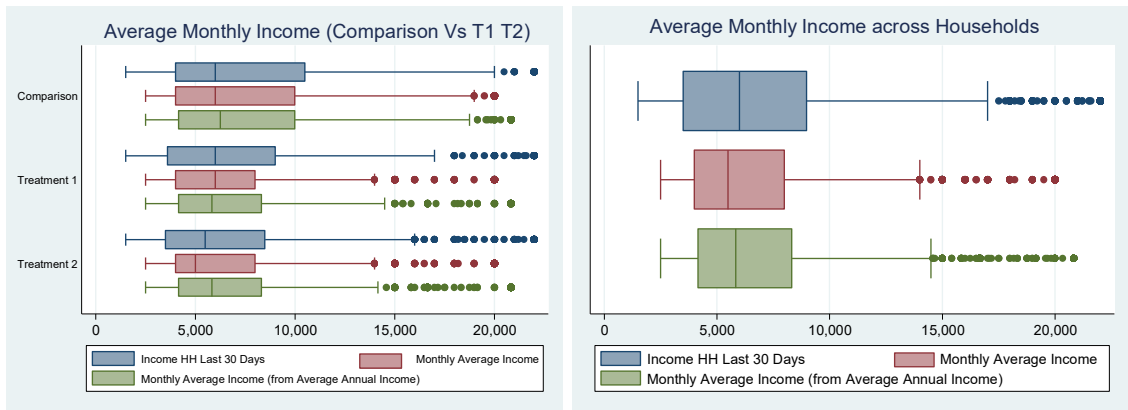


Figure A3: Average Monthly Income



Appendix B

Figure B1: App Screenshots (1/2)

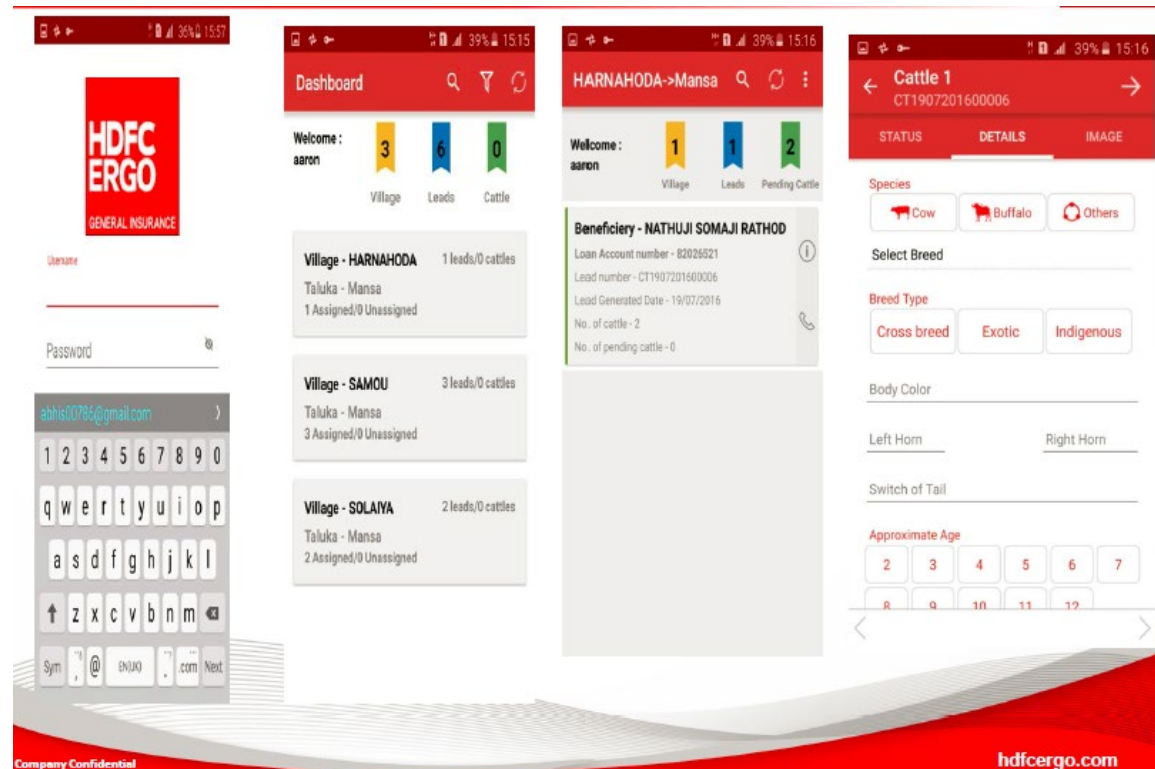


Figure B2: App Screenshots(2/2)

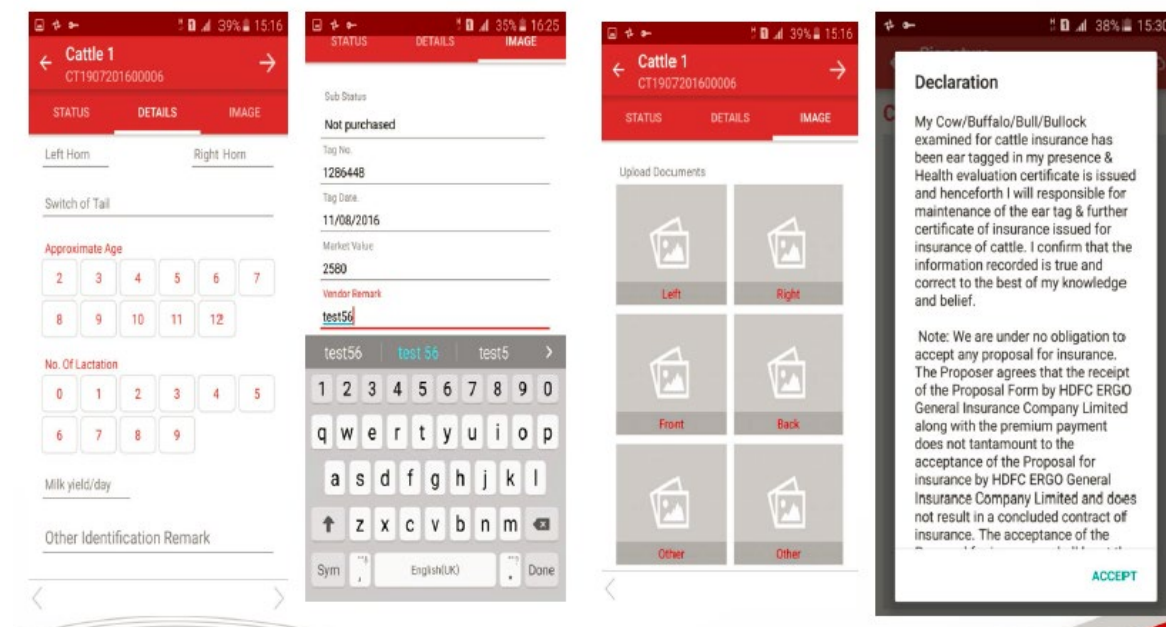



Figure B3: Marketing Poster 1



HDFC ERGO
GENERAL INSURANCE
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Cattle Insurance

Coverage
Death of Cattle - The policy covers the cattle insured whilst within a geographical area specified in the policy schedule, in case of loss of life accident or diseases contracted or surgical operation.
The policy also covers death of cattle which are the subject matter of insurance occurring outside the said geographical area in the event of drought, epidemics and other natural calamities.
Sum Insured - Market value for non-Loanee / Loan Amount for loanee.

Exclusions

- Malicious or wilful misconduct or neglect, overloading, unskilled treatment, intentional acts or gross negligence
- Use of animal for purpose other than stated in the proposal form without the consent of the Company in writing
- Accidents occurred or diseases contracted prior to commencement of risk. Disease contracted within 15 days from commencement of policy period
- Theft or clandestine sale, missing of Insured animal
- Acts of terrorism, war, radioactivity and nuclear perils, consequential loss

To intimate the claim on event of death of your cattle or to request re-tagging of your cattle, please contact us through your registered mobile number

Toll Free : 1800 2 660 700

Documents required for claims

1. Duly completed claim form
2. Identification tags of insured cattle
3. Postmortem report from Veterinary doctor containing the name of disease and reason for death
4. Two photographs of cattle are needed from veterinary doctor:
 - a. A photograph of minimum 6" X 4" size of the insured cattle wherein identification tag no. should be clearly visible.
 - b. One photograph showing full cattle body for identification of cattle
5. In case of death due to vehicle accident, FIR, spot panchnama, closing report from the police is required
6. Valid vaccination certificate in case of death due to diseases as follows (diseases such as rinderpest, black quarter, hemorrhagic septicemia, foot and mouth disease, anthrax, theileriosis etc.) treatment details in case of other diseases

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Figure B4: Marketing Poster 2

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GENERAL INSURANCE
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Cattle Insurance

First time usage of Mobile app in enrollment and claims settlement for cattle insurance in India

- Real-time flow of cattle details
- Transparent process for claims settlement
- No manual intervention
- Paper-less Claims settlement process

- Effective reduction in transaction time for policy issuance
- Effective reduction in turn around time for claims settlement
- Toll free no 1800 2700 700

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Figure B5: Marketing Poster 3

Size: A2 (16.535 inch X 23.386 inch)



Cattle Insurance

Securing every shed with our promise of protection!

Cattle are a very important means of livelihood for many farmers and families dependent on an agrarian income. A sudden death or disability can cause unforeseen financial loss and hardship to these families. Now, with HDFC ERGO's Cattle Insurance we secure life by protecting one of rural India's most important means of livelihood.

Coverage:

Death of Cattle - The policy covers the cattle insured whilst within a geographical area specified in the policy schedule, in case of loss of life accident or diseases contracted or surgical operation.

The policy also covers death of cattle which are the subject matter of insurance occurring outside the said geographical area in the event of drought, epidemics and other natural calamities.

Optional Benefits:

-  **Permanent Disability Cover** - Covers the risk of permanent and total disablement of cattle.
-  **Sum Insured** - Market value for non-Loanee / Loan Amount for loanee.

Exclusions:

- Malicious or wilful misconduct or neglect, overloading, unskilled treatment, intentional acts or gross negligence
- Use of animal for purpose other than stated in the proposal form without the consent of the Company in writing
- Accidents occurred or diseases contracted prior to commencement of risk. Disease contracted within 15 days from commencement of policy period
- Theft or clandestine sale, missing of Insured animal
- Acts of terrorism, war, radioactivity and nuclear perils, consequential loss



First time usage of Mobile app in enrollment and claims settlement for cattle insurance in India

-  Real-time flow of cattle details
-  Transparent process for claims settlement
-  No manual intervention
-  Paper-less Claims settlement process



Effective reduction in transaction time for policy issuance



Effective reduction in turn around time for claims settlement



Toll free no 1800 2700 700



GENERAL INSURANCE

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