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Performance Assessment of Crop Insurance Schemes in Odisha in Eastern India

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Abstract

Agriculture is a highly risky venture mainly due to uncertainty in crop production emanating from natural causes including unpredictable weather events and pest attacks, which leads governments to implement various crop insurance schemes in order to provide economic support to farmers in the event of crop failure. There are two major crop insurance schemes operating in Odisha state of India: National Agricultural Insurance Scheme (NAIS) and the pilot Weather Based Crop Insurance Scheme (WBCIS). NAIS provides compensation for yield losses due to natural causes and covers all food crops and commercial crops. WBCIS provides coverage for paddy crop yield losses due to rainfall only. Both schemes are compulsory for loanee farmers and are also available for non-loanee farmers on voluntary basis. In this study, we analyze and compare various indicators including their coverage, financial performance and operational efficiency in acting as a safety net to the farmers when they experience crop losses. The study uses both secondary data and primary data. While the secondary data on various performance indicators are for the state of Odisha as a whole, the primary data for the study come from the Bolangir and Kalahandi districts located in drought-prone western Odisha. Applying a multi-stage sampling method, the sample includes 100 households using WBCIS from the Bolangir district and 100 households using NAIS from the contiguous Kalahandi district. Primary data were collected using a structured household questionnaire via the direct interview method between October 2011 and May 2012. The results show that the area under crop insurance in these two schemes has increased from 10 to 16 percent of the gross cropped area in Odisha state during 2000-2012 but 84 percent is still not covered. This increase in coverage is mainly due to increase in the number of loanee farmers. The area under crop insurance by non-loanee farmers has substantially declined over time in the case of both NAIS and WBCIS. NAIS is a large insurance scheme which covers 96 percent whereas WBCIS being a pilot scheme covers only 4 percent of the area insured by these two schemes in 2012. The study reveals that WBCIS performs better than NAIS as indicated by the higher adoption rate, the higher percentage of farmers benefited, the lower premium, faster claim payment, and the frequent indemnity payment. However, WBCIS covers only paddy crop losses due to deficit or surplus rainfall. In a frequently disaster-affected state like Odisha, where reasons for crop failure are many, there is also a need for multi-peril crop insurance schemes like NAIS. Therefore, both the schemes should continue and complement each other. The public sector may address catastrophic risk and provide multi-peril insurance where the subsidy requirement is high while the private sector could be brought into to provide insurance products for less severe events and for individual, independent, idiosyncratic and localized risk.

Keywords

Risk in Agriculture, Adaptation, Crop Insurance Schemes, Weather, Performance, Odisha

Performance Assessment of Crop Insurance Schemes in Odisha in Eastern India

1. Introduction

Agriculture is a highly risky venture due to both uncertainty in crop production and volatility in prices. On the one hand, agricultural production depends on various climatic parameters like rainfall, humidity, sunshine and temperature; while variations in these weather indicators, from the requisite quantity needed for the plant at its various growth stages, adversely affect crop yield. The devastation caused to the agrarian economy due to the occurrence of weather-induced natural disasters such as drought, flood, hurricane, cyclone, and hailstorm are well known. Apart from weather risk, unforeseen contingencies like infestation of plant disease and pest attacks very often inflict huge crop losses. On the other hand, agriculture entails a substantial market risk due to wide variations in the input and output prices. For one, crop prices are more volatile because of difficulties in storage owing to the bulkiness and perishability of the products. For another, demand for agricultural products is relatively inelastic with respect to variations in price and income. As a result, supply shocks are manifested in wide variations in price. However, of all the risk factors affecting crop production, weather is typically the most significant (Miranda and Vedenov, 2001).

The Government of India has taken many measures to reduce risk and impart greater resilience to agriculture. These include promoting the diversification of cropping patterns, inter-cropping, flood-control, drought-proofing and watershed development for reducing the production risk, and price support through market intervention and futures trading for the purpose of stabilizing prices and hedging risks. However, in spite of the preventive measures in place, when there is crop failure, insurance is considered the most effective mechanism to compensate farmers for their losses.

Crop insurance is an ex-ante risk adaptation measure that transfers the production risk from the insured to the insurer and reinsurer. In areas where production risk is high, farmers need to insure their crops, so that in the event of crop failure due to occurrence of natural calamities such as drought, flood, cyclone, hailstorm, hurricane, etc., they would be adequately compensated through indemnity payment. Insurance provides farmers with economic support, stabilizes their farm income, induces them to invest in agriculture, reduces indebtedness and decreases the need for relief measures.

In recent times, climate change and globalization have emerged as two major threats to agriculture. Climate change, resulting in a gradual increase in temperature, greater variability in rainfall, a rise in sea level, and the increased frequency, intensity and duration of extreme weather events (IPCC, 2007), has increased the production risk in agriculture appreciably (Swain, 2014). Additionally, the accelerated pace of globalization has resulted in an increased integration of the domestic market with the world food market, thus amplifying substantially the price risk (Swain 2008). In India, large-scale farmer suicides during the last few years in states like Maharashtra, Karnataka, Andhra Pradesh and Odisha attest to the failure of public action in handling the problem of agricultural risk in the changed context of globalization and climate change. In this context, there is a need to assess the performance of existing crop insurance schemes, so that new innovative insurance products can be recommended to cater to the needs of farmers in the changed environment of today.

The major difficulty in implementing crop insurance schemes is asymmetric information between insurer and the insured regarding the cause of crop failure which may lead to the dual problems of moral hazard and adverse selection. Moral hazard occurs when an insurer deliberately alters his behaviour so as to increase the magnitude of

potential loss or the probability of loss. Adverse selection occurs when those purchasing insurance face higher risk than those who do not. As a result there is a need for monitoring and supervision which inflict high administrative and transaction costs on the insurer (Hazell *et al.*, 1986; Goodwin, 2001). To overcome these problems, governments in developing countries usually implement credit-linked and area-based index insurance schemes.

Realising the need for crop insurance, the Government of India has implemented various agricultural insurance schemes from time to time. The National Agricultural Insurance Scheme (NAIS), which is currently under implementation in 27 states of India, was launched in 1999. NAIS provides coverage for yield losses due to natural causes and covers all food crops and major crops. NAIS is compulsory for loanee farmers and is also available for non-loanee farmers. It is an area-based crop yield insurance scheme which, during 2011-12, covered 16.7 million farmers and a cultivated area of 23 million hectare. The Weather Based Crop Insurance Scheme (WBCIS), popularly known as rainfall insurance, was introduced in 2007 on a pilot basis and is currently executed in 19 states. WBCIS provides coverage for crop yield losses due to variation in weather and is available for all farmers. During 2011-12, the scheme covered around 11.6 million farmers and 15.6 million hectare of land area. In comparison with crop yield, rainfall as an index is more objective and easier to measure and verify. However, the penetration of insurance in India is less than 20 percent of total farming households, which is a major concern for the government. The present study attempts to critically examine the performance of NAIS and WBCIS in the state of Odisha, an agriculture-dependent poor state with high vulnerability to climate change in Eastern India.

The principal objectives of the study are (i) to make a comparative assessment of the performance of NAIS and WBCIS that are currently under implementation in the state of Odisha with respect to their coverage, financial performance, and operational efficiency as risk management strategies and (ii) to suggest measures to make them financially viable, administratively implementable, socially acceptable, and more efficient and effective in managing agricultural risk in the context of the increased vulnerability of crop production due to climate change.

The rest of the paper is organized as follows. Section 2 reviews the relevant literature on the performance of crop insurance schemes. Section 3 compares and contrasts the features of NAIS and WBCIS that are currently under implementation in the state of Odisha. Section 4 describes the study area and the methodology of data collection. Section 5 discusses the findings of the study based on secondary and primary data analysis. Section 6 concludes with a discussion of the major findings of the study and their policy implications.

2. Review of Literature

There has been an efflorescence in research studies on agricultural insurance in recent times assessing the feasibility and evaluating the performance of different crop insurance schemes. Divergent views have emerged from these studies on the appropriate modality and mechanism of crop insurance with respect to risk coverage (single/multiple peril), the level of application (area/group/individual), the basis (yield/rainfall/weather index/revenue), the mode of application (voluntary/compulsory), the implementing agency (public/private/public and private) and the premium setting (subsidy/no subsidy). Many such studies evaluating the performance of crop insurance schemes around the world have revealed that the schemes have become fiscally burdensome and unsustainable (Skees *et al.*, 1999). The main reasons adduced by economists for the disappointing performance of crop insurance in both developing and developed countries are that (i) it attempts to provide multi-peril coverage for the correlated and covariate risks which in fact cannot be pooled and thus not insurable; (ii) it has given rise to a moral hazard among insurers, who have had to rely on government bailouts within a subsidized premium-setting (Yaron *et al.*, 1997); (iii) it has given rise to a moral hazard either in relation to farmers or the region because of high-risk farmers/states/regions benefiting more from the scheme.

A number of studies have also explored the reasons for the low adoption rate of crop insurance schemes by farm households, trying to identify the determinants of participation in crop insurance schemes. The factors that influence the decision to buy crop insurance products may be studied under three headings: socio-economic characteristics, farm characteristics, and risk attitudes. Rydant (1979) has analysed several socio-economic and psycho-dynamic factors that might be expected to affect the decision to adopt crop-hail insurance among farmers in Illinois. He observed that the insurance adopter was a repeat buyer, with a higher income and a greater

awareness of the hail-hazard than a non-adopter. Sherrick *et al.* (2003) with data from the American Midwest have found that demand for revenue insurance is greater among larger farms, younger farmers and farms in more geographically dispersed locations. Marcel *et al.* (2002), with empirical data from the Netherlands, have shown that the participation decision in insurance programs is negatively and significantly associated with the producer's belief regarding the availability of disaster relief in the future.

Many studies have placed emphasis on the provision of government subsidy for agricultural insurance in the context of increased agricultural risk. Duncan and Myres (2000), for example, have developed an insurance model which shows that catastrophic risk increases the premium, reduces farmer coverage levels and, under some conditions, lead to a complete breakdown in the crop insurance market. According to them, reinsurance can increase participation if it is subsidized. On the other hand, Mcleman and Smit (2006) are of the view that government subsidization of insurance against risks associated with adverse climatic conditions and extreme weather events, such as flood damage, may lead to individual decisions that actually increase the susceptibility of people, property and economic activities to those risks. With examples from New Zealand, they illustrate how the removal of the subsidy in crop insurance reduced the moral hazard, with farmers taking adaptive actions to reduce the likelihood of crop losses. Also, the removal of the subsidy reduced the physical hazard as farmers stopped cultivating marginal lands where the production risk is more. However, we need considerable research and location-specific empirical studies to come up with appropriate agricultural insurance schemes in the context of increased agricultural risk that keep in view the interests of both the insurer and insured.

In the case of India, too, many empirical studies have attempted to evaluate the performance of crop insurance schemes and examine the adoption behaviour of insurance users. Analysing secondary time series data on the performance of NAIS, many such studies conclude that this scheme has failed to achieve its objectives owing to its low coverage, poor financial performance and low effectiveness (Sinha, 2004; Kalavakonda and Mahul, 2005; Vyas and Singh, 2006; Raju and Chand, 2008). WBCIS, on the other hand, is considered an improvement over NAIS because rainfall as an index, in comparison to crop yield, is easier to measure objectively and, hence, the process of data collection is more transparent and less time-consuming (Clarke *et al.* 2012). In turn, the administrative cost is low, thus facilitating quicker payment of indemnity to the buyers of insurance. Moreover, WBCIS eradicates the problems of moral hazard and adverse selection (Hess, 2003). Additionally, WBCIS allows reinsurance by the primary insurer as it is based on standardized/well-defined internationally verifiable data. The major drawback of WBCIS, however, is that it covers only the weather-related risk so that if there is crop loss due to any other reason such as plant disease and pest attack, the insured does not get any compensation. The most challenging disadvantage of WBCIS, however, is the basis risk, which refers to the variability between the value of losses as measured by the weather index and the value of actual losses experienced on the farm (Collier *et al.*, 2009) as the basis risk can result in a mismatch between the actual loss and payout. Furthermore, in WBCIS, the start-up cost is high as time series and historical data on rainfall and yield are required to define the trigger events that necessitate indemnity payment.

Some research studies have examined the determinants of participation of farmers in WBCIS. Gine, Townsend and Vickery (2008), who have examined the purchase behaviour of Indian farmers with regard to rainfall insurance, found that participation is negatively correlated with the basis risk between insurance payouts and income fluctuations, which vary directly with household wealth while being negatively correlated with credit constraints. Cole *et al.* (2013) have also analysed demand for rainfall index insurance in India by adopting an experimental design. They find that insurance demand is significantly price sensitive, which suggests that premium reductions generated through greater efficiency or competition, or subsidies, may significantly increase take-up. Their field experiments reveal that non-price frictions that further limit demand are limited trust and understanding of the product, product salience and liquidity constraints. Rainfall insurance markets are still in their infancy, and future improvements in insurance contract design may improve the adoption rate.

It is in this backdrop that our study attempts to critically examine and compare the performance of NAIS and WBCIS that are currently under implementation in the eastern Indian state of Odisha. To date, there are no empirical studies assessing the comparative operational efficiency of NAIS and WBCIS in India, more specifically in Odisha, using both secondary and primary data. The present study attempts to fill this research gap.

3. Crop Insurance Schemes in Odisha: NAIS and WBCIS

Realising the need for crop insurance for management of agricultural risk, the state of Odisha has introduced different crop insurance schemes at different points in time in accordance with the guidelines provided by the Government of India.

The Comprehensive Crop Insurance Scheme (CCIS) was launched in Odisha in 1985. In this scheme, the indemnification was on area basis with each insured farmer growing a particular crop in the defined area being eligible for indemnity if there was a shortfall in the actual average yield per hectare of the insured crop from the threshold yield. The scheme was a credit-linked insurance scheme and covered only those farmers taking crop loans from institutional agencies such as commercial banks, regional rural banks and cooperatives for the cultivation of food crops and oilseeds. However, critics of the scheme have described it as a loan insurance scheme as the scheme was compulsory for loanee farmers and not available to non-loanee farmers who self-finance their cultivation expenses. The financial performance of the scheme was also very poor, as the premium rates were highly subsidised. To improve the scheme performance, the Government of Odisha has implemented a broad-based National Agricultural Insurance Scheme (NAIS) since 1999, which covers all food crops (cereals, millets and pulses), cotton, sugarcane and potato in the 1st year and other annual commercial/horticultural crops within a period of three years from the start of the scheme¹. The new scheme allows non-loanee farmers growing insurable crops too to opt for the scheme, in addition to all loanee farmers who are compulsorily covered. The scheme provides comprehensive risk insurance against yield losses due to natural fire, lightning, storm, hailstorm, cyclone, typhoon, tempest, hurricane, tornado, flood, inundation and landslide, drought, dry spells, pests, diseases, etc. The sum insured extends to the value of the threshold/guaranteed yield of the crop, with an option to cover up to 150 percent of the average yield of the crop on payment of an extra premium. In the *Kharif*² season, the premium rate for bajra and oilseeds is 3.5 percent of the sum insured and 2.0 percent for other food crops. In the *Rabi* season, the premium rate is 1.5 percent for wheat and 2.0 percent for other food crops and oilseeds. Furthermore, a 50 percent subsidy in the premium is allowed to small and marginal farmers that will be shared equally by the Government of India and the State Government with the subsidy to be phased out within a period of 5 years. In Odisha, however, this subsidy has been reduced to just 10 percent of the sum insured. Like CCIS, NAIS operates on the basis of the area approach. If the actual average yield per hectare of the insured crop for the defined area, which may be *panchayat*, block or district (on the basis of requisite number of Crop Cutting Experiments) in the insured season, is lower than the specified threshold yield, all the insured farmers growing that crop in the defined area are considered to have suffered crop losses in their yield and thus the scheme provides compensation against such contingency. Indemnity claims per hectare are computed using the following formula (GoO, 2012):

$$\text{Indemnity claims} = \frac{\text{Shortfall in yield}}{\text{Threshold yield}} * \text{Sum insured for the farmer}$$

where Shortfall in yield = Threshold yield – Actual yield for the defined area. Threshold yield is the moving average based on past three years' average yield in case of rice and wheat and five years' average yield in case of other crops.

However, the scheme has provision to operate on an individual basis for localized calamities such as hailstorm, landslides, cyclone and flood. NAIS is considered as an improvement over CCIS in terms of extending the insurance facility to non-loanee farmers, setting higher premiums and including horticultural and commercial crops.

Since 2008, the state of Odisha has introduced an area-based rainfall insurance scheme, called the Weather Based Crop Insurance Scheme (WBCIS), in a few drought-prone blocks in the state on a pilot basis. During the study year of 2011, the scheme was in operation for *Kharif* paddy in 19 blocks of three drought-prone districts, namely,

1 For salient features of NAIS and WBCIS as implemented in Odisha, see Annual Activity Report: 2011-12, Chapter IV, Co-operation Department, Government of Orissa.

2 *Rabi* and *Kharif* are two types of crop seasons based on the time of sowing and harvesting. In the state of Odisha, the *Kharif* season starts from May and ends in October and the *Rabi* season starts from November and ends in April.

Bolangir, Nuapada and Baragarh, located in Western Odisha. Though, initially (i.e., during 2008), WBCIS was only available to non-loanee farmers, since the *Kharif* season of 2009, the government has extended it to both loanee and non-loanee farmers for the paddy crop. In these pilot areas, while for loanee farmers WBCIS is compulsory and NAIS is not available for them, for non-loanee farmers both NAIS and WBCIS are available.

WBCIS, as implemented in Odisha, is nothing but rainfall insurance and, under this scheme, the insured farmers are to be compensated against the likelihood of financial loss on account of an anticipated loss in crop yield resulting from adverse rainfall incidences such as deficit and excess rainfall. Pay-out will arise when there is deviation between the trigger weather parameter computed by Agriculture Insurance Company for paddy in the notified reference unit area and the actual weather data recorded at reference weather station during the specified time period. In case of adverse weather incidence (AWI), all the insured farmers in the reference unit area are to be deemed to have suffered the same level of AWI and crop loss, thus becoming eligible for the same level of pay-outs. Hence, if there is deficient or excess rainfall in the defined area, all the farmers cultivating the notified crop within the defined area will be eligible for compensation under WBCIS. The sum insured is based on the cost of cultivation, which was 20,000 Indian Rupees (INR) per hectare of *Kharif* paddy crop during 2008, and INR 12,000 during 2009 onwards. Under the scheme, premium is calculated on actuarial basis, which was 10 percent of sum insured but the insured farmer shall pay the normal rate of premium at the rate of 2.5 per cent (similar to NAIS) and the difference between the actuarial premium and normal premium will be subsidized by the State Government and Central Government on 50:50 basis.

NAIS covers various crops during both the *Kharif* and *Rabi* season. In Odisha, during the 2009–2010 *Kharif* season, out of a total insured area of 0.98 million hectares, the paddy coverage was as high as 0.95 million hectares, accounting for nearly 97 percent of the total cropped area. The other crops covered were maize (15,276 hectares), cotton (8457 hectares), ginger (1039 hectares), turmeric (767 hectares) and groundnut (140 hectares). During the *Rabi* season, too, paddy was the most important insured crop (112953 hectares) followed by groundnut (13611 hectares) and potato (8467 hectares). However, WBCIS covers only paddy during the *Kharif* season and does not cover any crop during the *Rabi* season since WBCIS has been designed only for paddy as paddy production crucially depends on rainfall. Moreover, while NAIS covers all types of production risk including various natural calamities, pest attacks, and plant diseases, WBCIS covers only crop losses due to rainfall deficit or excess.

4. Study Area and Data

Odisha is located on the eastern coast of India along the Bay of Bengal and has the dubious distinction of being the poorest state in India. Agriculture is the dominant sector of the state economy providing employment and sustenance, directly or indirectly, to more than 60 percent of total work force³. Paddy still constitutes about 90 percent of the total production of food grains and continues to be the dominant crop in Odisha. The state is well-known as the climate change hot spot in India due to frequent occurrence of drought, flood, cyclone and storm surge. Thus, the state's economy is extremely vulnerable to climate-induced natural disasters because of its tropical climate, monsoon-based rainfall, long coast line, high dependence on agriculture and paddy cultivation, mass poverty and low irrigation coverage.

In order to evaluate the functioning of NAIS and WBCIS in Odisha, we have collected data from both primary and secondary sources. From the regional office of the Agriculture Insurance Company of India Limited, Bhubaneswar, we have collected secondary data on the various performance indicators of these schemes such as the area and the number of farmers covered, sum assured, premium collected, claims paid, and farmers benefited for the Odisha state as a whole. We have collected data from the year of inception of the schemes in the State. Thus, while we obtained data for NAIS for the period 2000 to 2012, we have obtained data for WBCIS for five years only, i.e., from 2008 to 2012, because of the later date of inception of the latter scheme.

³ We collected data on the agrarian economy of Odisha from the Economic Survey 2011-12, Planning and Coordination Department, Directorate of Economics and Statistics, Government of Odisha.

For the purpose of collecting primary data through a field survey, we have included two districts, namely, Bolangir and Kalahandi, in our study. As discussed in the preceding section, NAIS is a universal scheme in Odisha which is being executed in all the thirty districts, whereas WBCIS is a pilot scheme operating only in the drought-prone districts of Bolangir, Baragarh and Nuapara. Of these three districts, we purposively selected the Bolangir district for the purpose of assessing the performance of WBCIS because it is the most vulnerable to the drought risk. In order to examine the performance of NAIS, we included the Kalahandi district, which is contiguous with Bolangir and has similar socio-economic and ecological characteristics (see Figure 1). These two districts constitute a part of the KBK (Kalahandi Bolangir Koraput) region of Odisha, the area which is known for its high incidence of mass and chronic poverty and high tribal population.

The economies of the Bolangir and Kalahandi districts are predominantly agrarian in nature with more than ninety percent of the households living in rural areas. Agriculture is their major source of income. The literacy rates for the Bolangir and Kalahandi⁴ districts are nearly 66 percent and 60 percent respectively while the scheduled caste (SC) and scheduled tribe (ST) populations together constitute 38 percent of the total population of Bolangir and 47 percent of the population of Kalahandi. Paddy is the major crop grown in the area during the *Kharif* season. More than eighty percent of cultivators belong to the marginal and small farmer category with most of them following mono-cropping due to inadequate irrigation facilities. Agriculture is, moreover, mostly rain-fed in these two districts. In the Kalahandi district, the percentage of gross irrigated area to gross cropped area is 26 percent whereas it is only 19 percent in the Bolangir district⁵. Agriculture in both the districts is prone to major contingencies like drought, flood, pests and disease outbreaks in addition to the occasional heat-waves.

We used a multi-stage sampling method to select the sample households. At the first stage, as discussed above, we selected Bolangir district for data from WBCIS users and Kalahandi district for data from NAIS users. At the second stage, from each district, we chose five blocks touching the border of the two districts. At the third stage, we selected from each block two villages touching the border. At the last stage, we randomly selected from each village 10 users of the insurance scheme from the list of total insurance users collected from the local bank and cooperative society. Thus, the study selected 200 households comprising 100 NAIS users and 100 WBCIS users (See Appendix A).

In order to examine the socio-economic characteristics of users of crop insurance schemes, we collected data on demographic characteristics, land holding patterns, asset positions, sources of income, indebtedness status, etc., by administering a structured household questionnaire (See Appendix B) via the direct interview method between October 2011 and May 2012. We also gathered data on the agrarian economy, including crop yield, cropping pattern, cost of cultivation and farm income for the 2011 *Kharif* season (May-October). We identified different sources of agricultural risk in the study area by asking the farmers to list the risk factors in order of importance. We interviewed the farmers regarding the adaptation measures that they use in order to manage agricultural risk and the importance of insurance as a risk management strategy in terms of farmer preferences. We measured the scale of satisfaction of farmers with crop insurance schemes by interviewing the users of the insurance schemes. We also elicited the opinions of the farmers on ways to improve crop insurance schemes.

5. Empirical Analysis

We discuss the empirical findings under two sub-sections. The first sub-section contains our findings on the coverage and performance of the crop insurance schemes based on the analysis of secondary data pertaining to the state of Odisha as a whole. The second sub-section deals with the survey findings on the functioning of the crop insurance schemes in the study area of Bolangir and Kalahandi districts.

⁴ We collected data on rural households, literacy rate, percentage of SCs and STs from the Population Census of Odisha, 2011.

⁵ This was computed from data collected from Agriculture Statistics 2011-12, Directorate of Agriculture and Food Production, Odisha, Bhubaneswar.

5.1 Key Characteristics of NAIS and WBCIS in Odisha

5.1.1 Trend in Coverage of Crop Insurance

To examine the adoption rate of crop insurance in Odisha, we have analysed the trend in coverage of NAIS and WBCIS. The area insured under NAIS during each of the *Kharif* and *Rabi* seasons has increased over the period 2000-2012, as shown in Figure 2 (See Table C.1 in Appendix C). The total area insured (including *Kharif* and *Rabi*) under NAIS has increased from 860 thousand hectares in 2000 to around 1344 thousand hectares in 2012. However, there has been substantial increase in number of non-loanee farmers and area covered by them in 2002 and 2011, as these two years were severe drought years. Farmers expecting crop losses due to deficiency in rainfall voluntarily came forward to insure their crops to get indemnity payment in case of crop failure. The figures also indicate that the area insured in *Kharif* seasons is much higher than respective *Rabi* seasons. During this period, area insured in *Kharif* seasons accounted for 87 percent of total area insured. The total area insured under NAIS as a percentage of the gross cropped area in Odisha state has increased from 10 to 15 percent during the same period. Area insured by pilot WBCIS has increased from 22 thousand hectares in 2008 to 52 thousand hectares in 2012 (See Figure 3). In 2012, total area insured by these two schemes was 1396 thousand hectares, which was 16 percent of the gross cropped area. Thus, around 84 percent of the gross cropped area in the state of Odisha is not yet covered under crop insurance, based on the data from these two schemes. Data show that NAIS is a large insurance scheme which covered 96 percent of total area under insurance under these two schemes in 2012, whereas WBCIS covered only the remaining 4 percent.

For loanee farmers taking crop loans from institutional sources such as commercial banks, cooperatives and regional rural banks, crop insurance is compulsory; but for non-loanee farmers, who have not availed themselves of any crop loans from institutional sources during the crop season, it is voluntary. Therefore, we have undertaken a break-up analysis of area and farmers covered according to loanee and non-loanee categories to examine the farmers' adoption rate of NAIS and WBCIS voluntarily. As WBCIS covers only the *Kharif* season, for purposes of comparison we have considered the adoption behaviour of NAIS users during the *Kharif* season only. The trend analysis reveals that over the 2000-2012 *Kharif* seasons, the number of non-loanee farmers availing themselves of NAIS has declined substantially from 81 thousand in 2000 to only 12 thousand in 2012 (See Table C.2, Figure 4). Likewise, the area covered by non-loanee farmers has declined from 79 thousand hectares in 2000 to only 18 thousand hectares in 2012. This suggests that the insurance scheme has gained only scant acceptance among non-loanee farmers for whom insurance is voluntary. We tried to explore the reasons for such non-adoption of NAIS through focus group discussions with the farmers and the implementing agency personnel. The discussions revealed that while cooperatives, regional rural banks and the State Bank of India extend insurance facilities to loanee farmers, for whom insurance is compulsory, they are reluctant to provide insurance services to non-loanee farmers due to the additional work burden and the shortage of manpower. Moreover, most of the farmers are unaware of the benefits of the insurance schemes, as no awareness campaigns have been conducted in the area by either the Agriculture Insurance Company or the banks.

The adoption of WBCIS by non-loanees voluntarily as presented in Figure 5 reveals that the number of non-loanee farmers has declined from 13 thousand in 2008 to only around two thousand in 2012 (See Table C.2 in Appendix C). Similarly the area of non-loanee farmers has decreased from 22 thousand hectares in 2008 to only 3.8 thousand hectares in 2012.

5.1.2 Key Performance Indicators of NAIS and WBCIS

In order to make a comparative assessment of the performance of NAIS and WBCIS, we have taken into account several other indicators in addition to coverage for only the 2008-2012 *Kharif* seasons as WBCIS was initiated in 2008 (See Table C.3 in Appendix C). However, for the purpose of comparison of performance, we have excluded the year 2008 from our analysis as WBCIS was offered to only non-loanee farmers this year. Since 2009 WBCIS has been made available to both loanee and non-loanee farmers like NAIS.

Analysis of the performance indicators reported in Table 1 shows that during the 2009-2012 period, the percentage of non-loanee insurance users and percentage of area operated by them were higher for WBCIS than that of NAIS

indicating higher adoption of WBCIS on voluntary basis (See Figure 6). Also, the insured area per farmer was greater in the case of WBCIS in comparison with NAIS for all the *Kharif* seasons (See Table 1). During the 2009-2012 period, it was 1.4 hectares for WBCIS whereas it was only 0.9 hectare for NAIS (See Table1). Moreover, the percentage of farmers who benefited out of the total number of insurance users was much higher for WBCIS than for NAIS. During the 2009-2012 period, the percentage of farmers who benefited was 67 percent for WBCIS whereas it was quite low at 19 percent for NAIS (See Figure 6).

The indicators of financial performance as shown in Table 1 and Figure 7 reveal that the per hectare sum assured, premium paid and claim received were higher for NAIS than for WBCIS during *Kharif* 2009-2012. To assess the financial performance, we computed the claim-premium ratio by dividing the indemnity claim or compensation payment by the insurance premium collected. If the claim-premium ratio exceeds one, it suggests financial loss on the part of the insurer in the insurance business whereas, from the point of view of the farmer, it suggests more compensation than the premium paid. During 2009-2012, the average claim-premium ratio was 3.6 for NAIS users and 2.1 for WBCIS users (Table1). According to the data, the claim-premium ratio exceeded one for all the *Kharif* seasons for WBCIS as well as for NAIS excepting 2010 *Kharif* for WBCIS and 2012 for NAIS (See Table C.3 in Appendix C). Thus, the farmers are benefited from insurance schemes as in most of the years, the farmers are receiving more indemnity than the premium amount paid by them. These benefits to farmers exist because of subsidy provided by the government.

The data suggests that WBCIS, on the whole, performs better than NAIS because of the higher adoption rate, the higher percentage of farmers who have benefited and the lower premium. However, the claim-premium ratio is higher in case of NAIS. As we have analysed data for only four years, the findings are not conclusive and may only be considered as indicative.

To further investigate the matter, during our field survey we elicited the views of the farmers on the efficacy of both the schemes through focus group discussions. In response to our query on the comparative performance of the insurance schemes, the insurance users said that the frequency of receiving compensation was higher in the case of WBCIS though the compensation amount was greater in the case of NAIS because of the higher sum assured.

5.2 Survey Findings

5.2.1 Socio-economic Profile of Sample Insurance Users

To assess the need for crop insurance, we examine in this section the socio-economic characteristics of the sample insurance users and their dependence of agriculture as a source of income (See Table 2). The caste configuration of the sample households reveals that only 5 to 6 percent of insurance users belong to the general (higher) castes whereas the remaining 95 percent of insurance users come under the socially and economically backward classes (SEBC), scheduled castes (SC) and scheduled tribes (ST). A majority of the WBCIS users (75 percent) belongs to the marginal and small farmer category owning land less than two hectares whereas a majority NAIS users (64 percent) are farmers falling under the medium and large farmer category owning land more than two hectares. Cultivation is the major source of income of farmers in the sample accounting for more than 40 percent of their total income. But we found that the crop yield of paddy was quite low and the net income from its cultivation (after deducting the operational cost of cultivation from gross income) was negative during *Kharif* 2011 due to the drought condition and erratic rainfall. In the study area, farmers face various risks in crop production as discussed in the next section.

5.2.2 Risks in Agriculture

Farm business faces various risks that affect farm income. Table 3 presents the ranking of various risk factors by the farm households using NAIS and WBCIS. During the survey, we asked the insurance users to rank the various risk factors that they face in cultivation as first most important, second most important, and third most important. The questions were open to the respondents, and they mentioned the three important risk factors that they encounter in cultivation. Table 3 presents the frequency of responses of the insurance users on several possible

risk factors in agriculture. According to the results, for both NAIS and WBCIS users, the percentage weighted score⁶ is the highest for drought followed by variability in rainfall and pest attacks. During the 2011 *Kharif* season, all the sample households had suffered more than eighty percent loss in crop yield due to drought conditions. Thus, the study area is extremely vulnerable to the drought risk and the concomitant crop loss. In the study villages, drought conditions are not created by just deficits in rainfall but also variability in rainfall. Drought is a chronic phenomenon in the area and occurs almost every other year.

5.2.3 Adaptation to Agricultural Risk

How do farmers cope with agricultural risk when there is a crop failure due to occurrence of natural calamities, pest attacks or plant disease? On questioning, the insurance users revealed that they usually take loans from cooperatives, banks, friends and relatives, and money lenders to tide over the difficult period in the event of crop loss. The next important coping behaviour is sale or mortgage of jewellery. Crop insurance is also important as an ex-ante risk adaptation option.

We also sought the opinion of farmers on the potential effects of different risk management tools on farm income. According to the farmers, the risk management tools that they considered important were diversification of farming enterprise, purchase of insurance, and becoming a low cost producer. Thus, crop insurance stands out as an important financial management tool and adaptation option in the drought-prone study area. In a risky environment, there is obviously a strong need for crop insurance to provide economic support to farmers in the event of crop failure.

5.2.4 Constraints on Adoption of Crop Insurance Scheme

The logical question stemming from the above is why farmers are not coming forward in large numbers to insure their crops if there is a need for crop insurance in the risky environment of the study area. To find an answer to this question, we assessed the efficacy of the existing insurance schemes by eliciting the satisfaction level of insurance users. We asked the farmers to rate their level of satisfaction with the insurance schemes on a scale, the results of which appear in Figure 8. The results show that out of a total 200 insurance users, only 7 NAIS users expressed satisfaction with the scheme. The remaining 193 insurance users were either strongly dissatisfied, dissatisfied or neither satisfied nor dissatisfied. Thus, excepting a few farmers, almost all users of both NAIS and WBCIS were dissatisfied with the schemes.

In order to find out the reasons for their dissatisfaction, we asked the insurance users to mention the three most important reasons as 1st, 2nd and 3rd. Table 4 and Figure 9 give the data on the frequency of responses and the weighted score on various causes of dissatisfaction. According to them, the two most important reasons for dissatisfaction, as adduced by both NAIS and WBCIS users, were that: (i) the loss assessment unit of the area was very large and (ii) individual and independent risk was not covered. As both NAIS and WBCIS are area-based schemes, they do not cover individual risk. Instead, they compute the claim amount on the basis of the average area yield/rainfall with the insured farmer receiving compensation only when the actual yield/rainfall of the defined area falls short of the threshold yield/normal rainfall of the area irrespective of the farmer's individual yield. However, when the loss assessment area is large, the area yield/rainfall may not reflect the actual individual crop loss of the farmer. Therefore, insurance users were of the view that the loss assessment area should be reduced from block⁷ level to *Panchayat* level in order to cover the actual crop loss of the farmers.

The third most important reason for dissatisfaction was different for users of NAIS as opposed to WBCIS users. Where the dissatisfaction for NAIS users arose from delay in compensation payment, for WBCIS users, it was the

⁶ We have computed the weighted score by assigning the value of 3, 2 and 1 to first important, second important and third important rank, respectively.

⁷ In Kalahandi district, on an average a block spreads over 609 sq km and covers around 30865 households, whereas a panchayat covers only 29 sq km and includes 1470 households. Likewise in Bolangir district a block covers 470 sq km and 29624 households, whereas a panchayat covers only 23 sq km and 1455 households.

lower amount of compensation (see Table 4, Figure 9). In the case of NAIS, there was a delay of more than six months in receiving compensation as the collection of yield data through the crop-cutting experiment takes time. However, in the case of WBCIS, since rainfall data is collected from weather stations, indemnity is paid within 45 days of receipt of rainfall data.

Moreover, the survey revealed that for WBCIS the percentage of repeat buyers (at 90 percent) during 2011 Kharif season was substantially higher than that for NAIS (at 10 percent). This indicates that WBCIS users are more benefited from the scheme due to payment of compensation in time, which enables them to repay the crop loan and again borrow the next crop season with insurance coverage.

But, in the case of NAIS, the compensation amount is higher as the sum assured is higher. Farmers reported that while they receive some amount of compensation almost every year from WBCIS, under NAIS they receive compensation only when an incidence of severe crop loss affects the entire notified area.

As regards the opinion of farmers on the amount of premium paid to insure their crops, most NAIS and WBCIS users (95 percent) were of the view that the premium is reasonable. This suggests that no further subsidy is required to incentivise farmer participation in the insurance market. Moreover, direct premium subsidies from the government may actually impede household adaptation to production risk. Indeed, subsidised insurance may cause economic inefficiencies by encouraging farmers to invest in production strategies that are not suited to the local environment.

Farmers also complained that for loanees, the last date for applying for crop insurance is 31st September while it is 31st July for non-loanees and, hence, only a short period of time is available to non-loanees to apply for crop insurance since they can apply only between the 15th and 31st of July. The difficulty arose from the fact that the time-period given was not sufficient for them to prepare the necessary documents since the Village Agricultural Worker has to recommend their names and issue a sowing certificate. Moreover, in the case of normal rainfall, farmers do not go for WBCIS waiting till they observe a shortfall in rain. They become interested in insuring their crops only after such an observation. However, by then, the deadline to apply for crop insurance by non-loanees is over so that they are unable to avail themselves of crop insurance.

In the case of loanee farmers, the amount of indemnity is adjusted towards the loan taken through a transfer voucher about which the farmer is usually unaware. Thus, the farmers are not adequately aware of the indemnity that they receive from insurance and, being ignorant of the benefits of insurance; they do not show much interest in insuring their crops.

Farmers also complained that some important agricultural risks are not covered by both NAIS and WBCIS. During 2010, for instance, due to heavy rains during harvest time, the harvested paddy of almost all the farmers in the study area got destroyed. However, they did not get any compensation under the NAIS/WBCIS schemes for this loss because these types of losses are not covered under the two schemes. Crop insurance schemes need to cover such risks to cater to the needs of farmers.

Interestingly, when the insurance users were asked to express their preference for three different types of insurance products, namely, crop yield insurance, rainfall insurance and revenue insurance, most of the NAIS users expressed their preference for WBCIS while most of the WBCIS users preferred NAIS. Thus, there is a need to create a variety of insurance products to cater to the needs of farmers under varied circumstances. WBCIS is particularly relevant to the scenario of climate change because it insures against weather risk and is considered a sustainable market mechanism to transfer weather risk.

5.2.5 Improving Scheme Performance

During the survey, we asked the insurance users to express their views on ways to improve the operational efficiency of both the schemes. Some important suggestions made by them were: (i) assessment of individual crop loss and the devising of a compensation payment thereof; (ii) making the scheme voluntary for loanee farmers; (iii) taking the gram panchayat as the unit of loss assessment instead of block; and (iv) speedy processing and

settlement of claims (see Table 5, Figure 10). Thus, one major reason why farmers show little interest in crop insurance has to do with the fact both NAIS and WBCIS are area-based schemes that do not cover individual, independent and idiosyncratic risk. Also, as the unit area is very large, the area-based yield and rainfall data do not accurately represent their individual yield loss or the amount of rainfall received in their micro environment, thus depriving farmers of the right amount of compensation commensurate with their individual loss.

Many economists also attribute the low coverage of insurance to the insufficient attention paid by insurance agencies to awareness generation activities. The state government does not allot any funds to the Agriculture Insurance Company to undertake awareness generation activities. According to the insurance users, the major sources of information on insurance schemes were bank representatives, progressive farmers, and friends and neighbours. They expressed their preference in fact for different types of media for the dissemination of information on the schemes, such as farmers' meeting (*kisan sabha*), the village fair and television. The survey also asked questions about their preference for service providers for information dissemination on insurance schemes, in response to which they identified rural agents at their door step, rural agent at the village level, and the cooperative bank.

6. Conclusions and Policy Implications

In this study, we have analysed and compared various performance indicators of NAIS and WBCIS under implementation in the state of Odisha in Eastern India by using data collected from both primary and secondary sources. The results show that the area under crop insurance in these two schemes has increased from 10 to 16 percent of the gross cropped area in Odisha state during 2000-2012 but 84 percent is still not covered. This increase in coverage is mainly due to increase in the number of loanee farmers. The area under crop insurance by non-loanee farmers has substantially declined over time in the case of both NAIS and WBCIS. NAIS is a large insurance scheme which covers 96 percent whereas WBCIS being a pilot scheme covers only 4 percent of the area insured by these two schemes in 2012.

The study reveals that WBCIS performs better than NAIS as indicated by the higher adoption rate, the higher percentage of farmers benefited, the lower premium, faster claim payment, and the frequent indemnity payment. However, WBCIS covers only paddy crop losses due to deficit or surplus rainfall. In a frequently disaster-affected state like Odisha, where reasons for crop failure are many, there is also a need for multi-peril crop insurance schemes like NAIS. Therefore, both the schemes should continue and complement each other.

The distinct advantage of WBCIS is the speedier processing of claims and payment of indemnity, which is usually within 45 days of receipt of rainfall data. In the case of NAIS users, on the other hand, there is undue delay in compensation payment, which can take up to a year or more, as the collection of yield data via the crop cutting experiment takes time. Thus, the performance of NAIS in Odisha is not satisfactory due to low coverage and the delay in compensation payment. Moreover, the operational modality of WBCIS is better understood by farmers and, consequently, it is a more popular scheme. Since there is less scope for manipulation in the calculation of indemnity because rainfall is measured by rain-gauge stations in each block, farmers consider it a more transparent scheme.

However, of the total 200 insurance users of NAIS and WBCIS that were surveyed, only 7 farmers expressed complete satisfaction with the schemes. Most of the insurance users were either dissatisfied with the scheme or remained neutral expressing no strong opinions on the schemes. Therefore, to increase the coverage of the schemes, policy makers would need to create awareness about the benefits of such schemes among farmers. They should take steps to explain the operational mechanisms of different insurance schemes to farmers in simple terms in their local language. There is also a need to engage in education, training and capacity building among local insurance service providers and bank officials as well as the consumers of insurance products.

We also found the arguments put forward by farmers for the adoption of the *gram panchayat* instead of the Block as the reference unit both in the case of NAIS and WBCIS convincing. Moreover, the study showed the importance

of making the procedure for applying for crop insurance simple for non-loanee farmers, for whom insurance is voluntary. Furthermore, policy makers should take steps to appoint insurance agents such as Life Insurance Companies to provide insurance services at the doorstep of farmers, thereby saving valuable time for farmers who could use that time for land preparation and sowing. Speedy payment of compensation should be made a priority to stabilise farm income.

As both NAIS and WBCIS are area-based agricultural insurance schemes, they do not cover independent, idiosyncratic and individual risk. For the farmers, the most important reason for not insuring their crops, however, was that. Further, in a frequently disaster-affected state like Odisha, where reasons for crop failure are many, there is a need for multi-peril crop insurance schemes like NAIS. To make this possible, the public sector could undertake to address catastrophic risk and provide multi-peril insurance where the subsidy requirement is high while the private sector could be brought into to provide insurance products for less severe events and for individual, independent, idiosyncratic and localized risk. The private sector may meet the insurance needs of commercial, capitalist farmers and large scale contracting agencies on payment of actuarial premium. This means policy makers taking steps to create an atmosphere conducive for the promotion of private sector participation in agricultural insurance. The government can encourage private participation by providing subsidies, guarantees and reinsurance facilities. But the government should first provide technical assistance to build capacity in the private sector. Additionally, there is a need to develop an appropriate regulatory framework to monitor private participation in agricultural insurance.

Insurance providers should also be ready to provide varied insurance products like crop yield insurance, weather index insurance, single peril insurance and revenue insurance to meet the needs of different farmers in different areas while making sure that premium rates are set that are commensurate with risk and making judicious use of premium subsidies (Swain, 2013). However, providers should avoid premium subsidies as they may slow household adaptation to agricultural risk. Instead, the government should encourage private participation to provide varied products with actuarial premium rates for commercial farmers on an individual basis. At the same time, the policy designers and makers could encourage micro-insurance, i.e., insurance for the poor, through the participation of banks, non-governmental organisations and microfinance institutions. Self-help groups and micro-finance institutions can also play an important role in educating people about the need for and benefits of agricultural insurance. At the same time, it would be wise to integrate micro-insurance with microfinance in order to manage the risk of default and enterprise loss in a more proactive manner. The government can encourage farmers to insure their crop, as insurance acts as a guarantee for investment and can serve as collateral when obtaining credit from institutional sources.

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Tables

Table 1: Performance indicators of NAIS and WBCIS in Odisha during the 2009-2012 *Kharif* seasons

Performance Characteristics	Unit	NAIS	WBCIS
Total Number of Insurance Users per year	Thousands	1266.4	75.3
Number of Non-loanee Insurance Users per year	Thousands	58.1	5.5
Percent of Non-loanee Insurance users	%	4.6	7.3
Total Area Insured per year	Thousand Hectares	1187.0	108.6
Area Insured of Non-loanee Insurance Users	Thousand Hectares	92.0	12.1
Percent of Area of Non-loanee Insurance Users	%	7.7	11.1
Area Insured per farmer	Hectares	0.9	1.4
Percent of Farmers Benefited	%	19.2	66.9
Sum Assured	(INR/ Hectare)	19878	12000
Premium Paid	(INR/ Hectare)	507	300
Claim Received	(INR/ Hectare)	1841	644
Claim/Premium	Ratio	3.6	2.1

Source: Computed from data collected from the Regional Office of National Agriculture Insurance Company of India, Bhubaneswar

Table 2: Socio-economic profile of insurance users

Characteristics	NAIS	WBCIS
Total Households	100	100
Caste (in %)		
General	5	6
Socially and Economically Backward Classes	81	55
Scheduled Castes	5	5
Scheduled Tribes	9	34
Education Level (in %)		
Below Primary	13	26
Primary and above	87	74
Family Size (Member/Household)	5	5
Farmer Category (in %)		
Marginal and Small Farmer	36	75
Medium and Large Farmer	64	25
Land Area (Hectare/Household)	3.0	1.7
Area Operated (in %)		
Marginal and Small Farmer	15	56
Medium and Large Farmer	85	44
Annual Income (INR/Household)	102236	56942
% of Income from Cultivation	48	41
% of Income from Agricultural Wages	2	2
% of Income from Non-Agricultural Wages	7	11
% of Income from Other Sources	43	46
Paddy Yield and Net Income		
Yield of Paddy (Qtl/Hectare)	10.5	6.5
Gross Income/Hectare(in INR)	9601	5778
Paid out Cost of Cultivation/Hectare(in INR)	11828	11543
Net Income/Hectare(in INR)	-2227	-5765
Imputed Value of Family Labor (INR/Hectare)	2743	6516

Source: Field Survey

Table 3: Ranking of risk factors by insurance users: Frequency of responses

Risk Factors	Number of Households							
	NAIS-Rank				WBCIS-Rank			
	1 st Important	2 nd Important	3 rd Important	Weighted Score in %	1 st Important	2 nd Important	3 rd Important	Weighted Score in %
Flood	3	20	4	8.8	3	12	10	7.2
Drought	93	5	1	48.3	97	3	0	49.5
Variability in Rainfall	1	55	10	20.5	0	69	9	24.5
Pest Attack	1	12	58	14.2	0	12	59	13.8
Plant Disease	1	1	4	1.5	0	0	3	0.5
Fire	0	1	0	0.3	0	0	0	0.0
Untimely Irrigation	0	1	2	0.7	0	0	1	0.2
Inadequate/ Surplus Irrigation	0	0	1	0.2	0	0	1	0.2
Decline in Crop Prices	0	2	7	1.8	0	0	0	0.0
Failure of New Technology	0	0	0	0.0	0	0	0	0.0
Unsuccessful Investment	1	3	13	3.7	0	3	16	3.7
Loss of Livestock/ Disease	0	0	0	0.0	0	0	0	0.0
Any Other (Specify)	0	0	0	0.0	0	1	1	0.5
Total	100	100	100	100.0	100	100	100	100.0

Source: Field Survey

Table 4: Reasons for dissatisfaction with crop insurance scheme: Frequency of responses of insurance users

Reasons	Number of Households							
	NAIS-Reason				WBCIS-Reason			
	1 st Important	2 nd Important	3 rd Important	Weighted Score in %	1 st Important	2 nd Important	3 rd Important	Weighted Score in %
High Premium	0	0	0	0.0	0	0	0	0.0
Delay in Compensation Payment	17	15	44	22.4	3	2	15	4.7
Loss Assessment Unit is Very Large	45	31	14	37.8	23	42	28	30.2
Individual, Independent Risk is not Covered	27	40	22	32.8	21	48	22	30.2
Proper Facilities are not available at Financial Institutions	1	7	12	5.2	2	7	24	7.3
Payout is Very Low	3	0	1	1.8	51	1	11	27.7
Others	0	0	0	0.0	0	0	0	0.0
Total	93	93	93	100.0	100	100	100	100.0

Source: Field Survey

Note: The total number of dissatisfied NAIS users is 93 as shown in Table 6

Table 5: Suggestions for improving agricultural insurance scheme: frequency of responses of insurance users

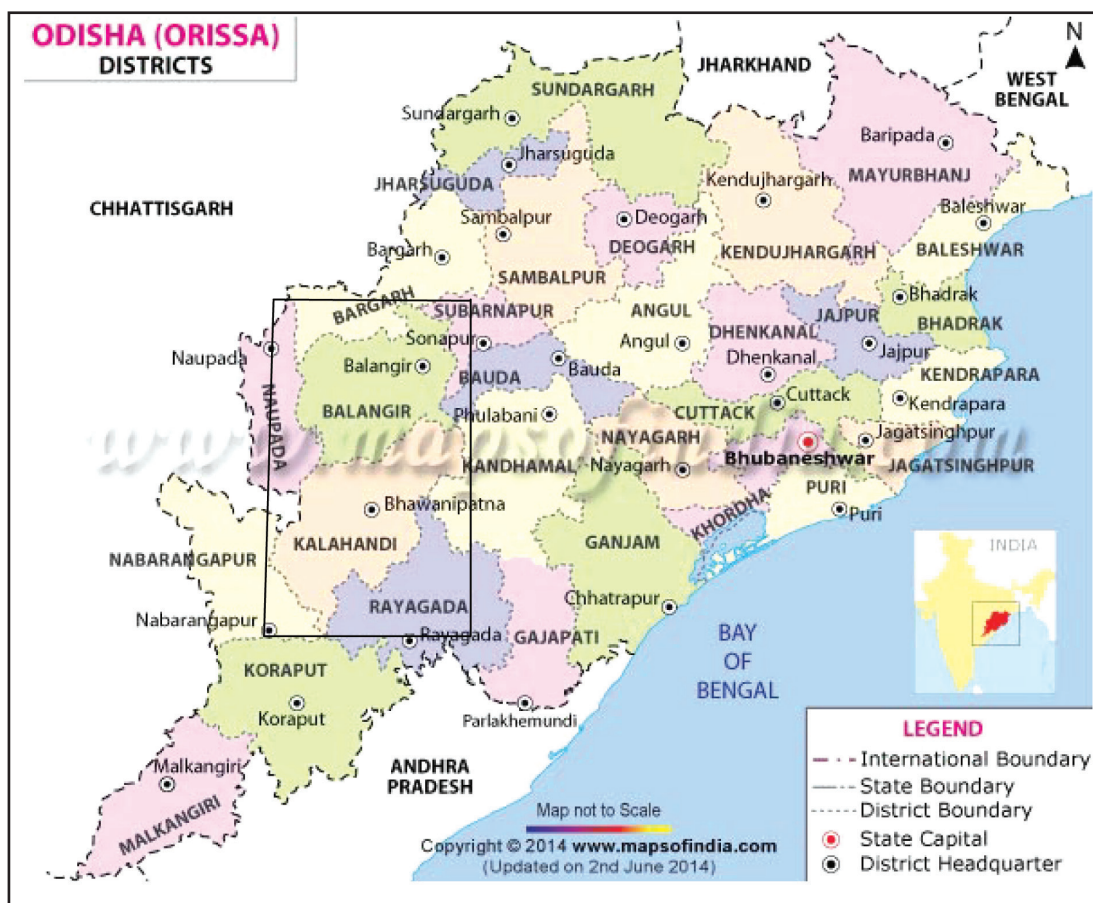
Suggestions	Number of Households							
	NAIS-Rank				WBCIS-Rank			
	1 st Important	2 nd Important	3 rd Important	Weighted Score in %	1 st Important	2 nd Important	3 rd Important	Weighted Score in %
Cover More Crops	4	1	3	2.8	2	1	4	2.0
Individual Assessment	47	26	12	34.2	35	22	19	28.0
Reduce Premium	0	0	0	0.0	0	0	1	0.2
Quick Settlement of Claims	1	21	17	10.3	2	7	5	4.2
Making Scheme Voluntary	20	18	15	18.5	37	27	19	30.7
<i>Gram panchayat</i> as Unit of Loss Assessment	11	25	27	18.3	8	32	19	17.8
Insurance Service at Doorstep/at Village Level	4	4	6	4.3	5	6	10	6.2
CCEs to be Conducted in the Presence of Villagers / Insurance Company's Representatives	9	4	12	7.8	7	2	16	6.8
Raise the Indemnity Level Percentage from 60% to 80-90%	0	0	0	0.0	1	2	1	1.3
Others (specify)	4	1	8	3.7	3	1	6	2.8
Total	100	100	100	100.0	100	100	100	100.0

Source: Field Survey

Note: CCE refers to Crop Cutting Experiments

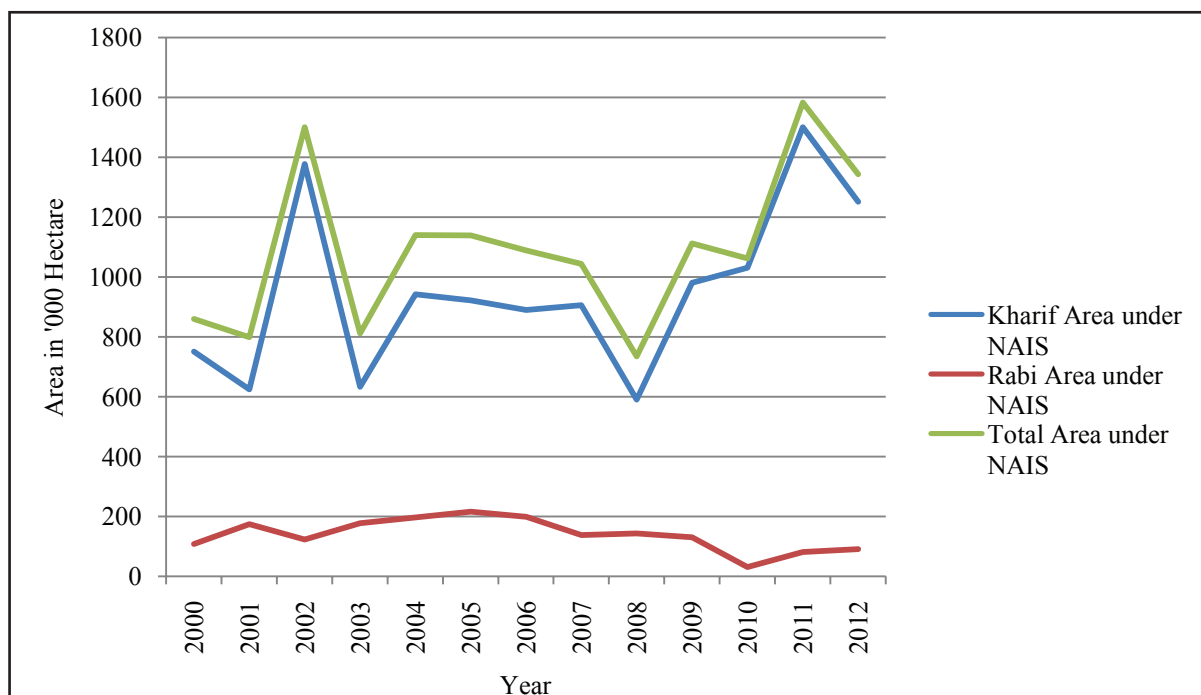
Figures

Figure 1: District map of Odisha



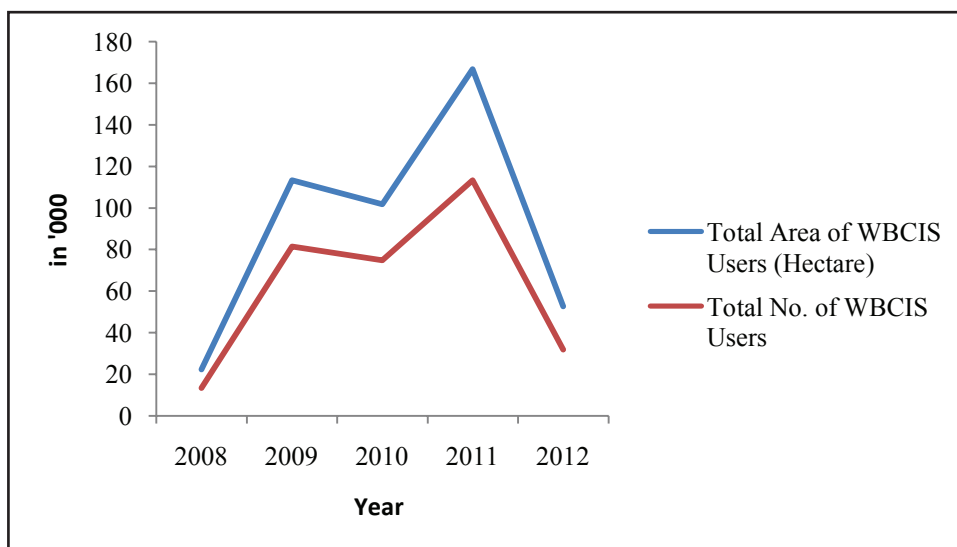
Note: The name of the state of Orissa has been changed to Odisha from November 2011

Figure 2: Kharif and Rabi area under NAIS in Odisha during 2000-2012



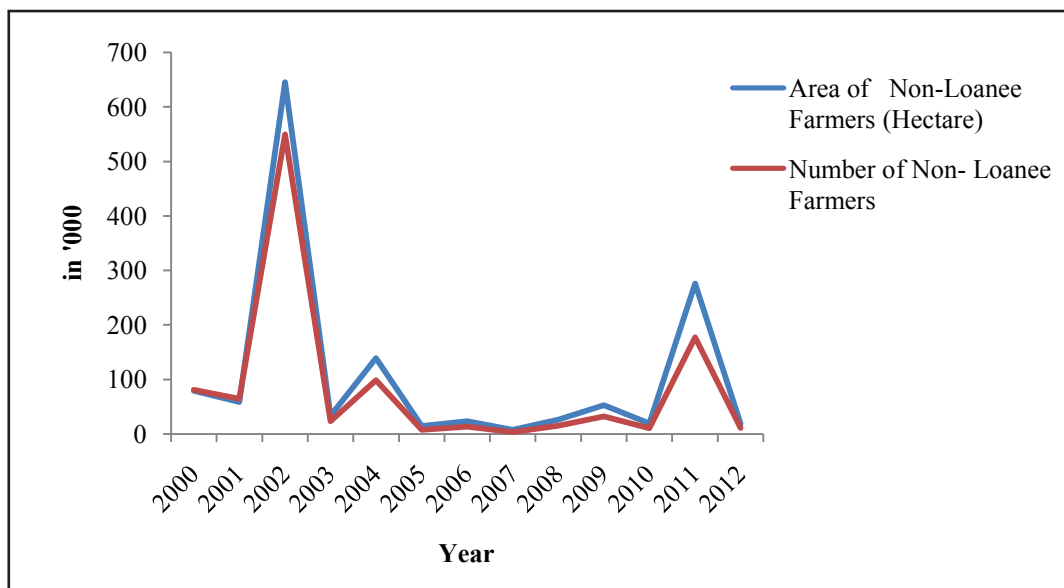
Note: Based on Table C.1 in Appendix C

Figure 3: Number of farmers and area covered under WBCIS in Odisha during 2008-2012



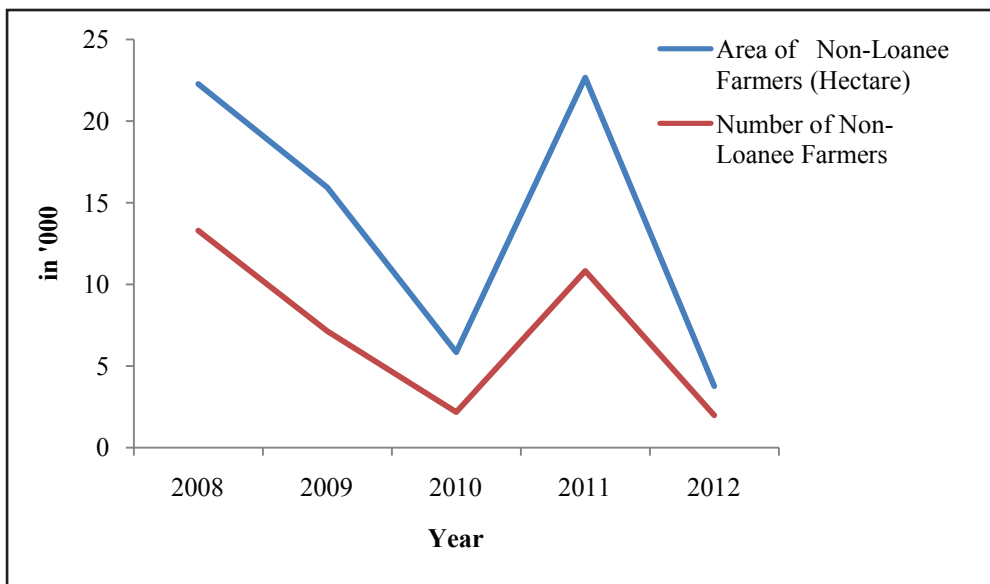
Note: Based on Table C.2 in Appendix C

Figure 4: Number and area of non-loanee farmers under NAIS in Odisha during 2000-2012



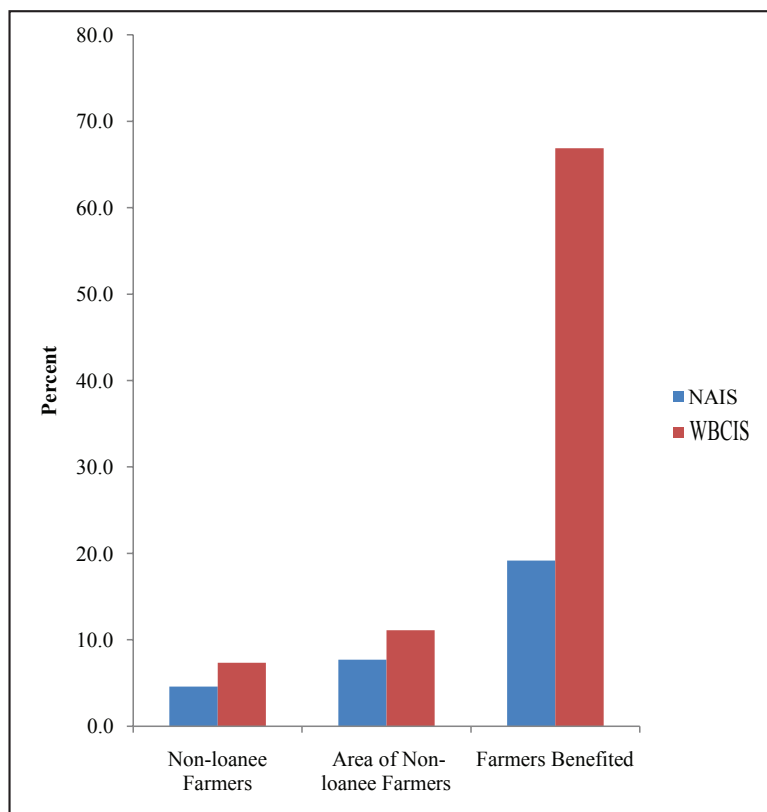
Note: Based on Table C.2 in Appendix C

Figure 5: Number and area of non-loanee farmers under WBCIS in Odisha during 2008-2012



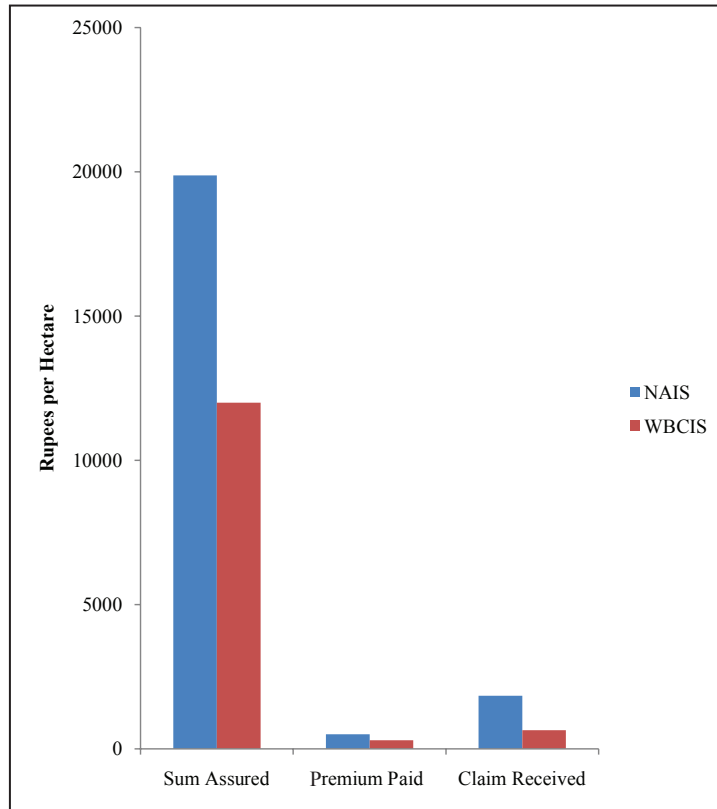
Note: Based on Table C.2 in Appendix C

Figure 6: Performance indicators of NAIS and WBCIS in Odisha (2009-2012)



Note: Based on Table 1

Figure 7: Sum assured, premium paid and claim received under NAIS and WBCIS in Odisha (2009-2012)



Note: Based on Table 1

Figure 8: Level of satisfaction of NAIS and WBCIS insurance users

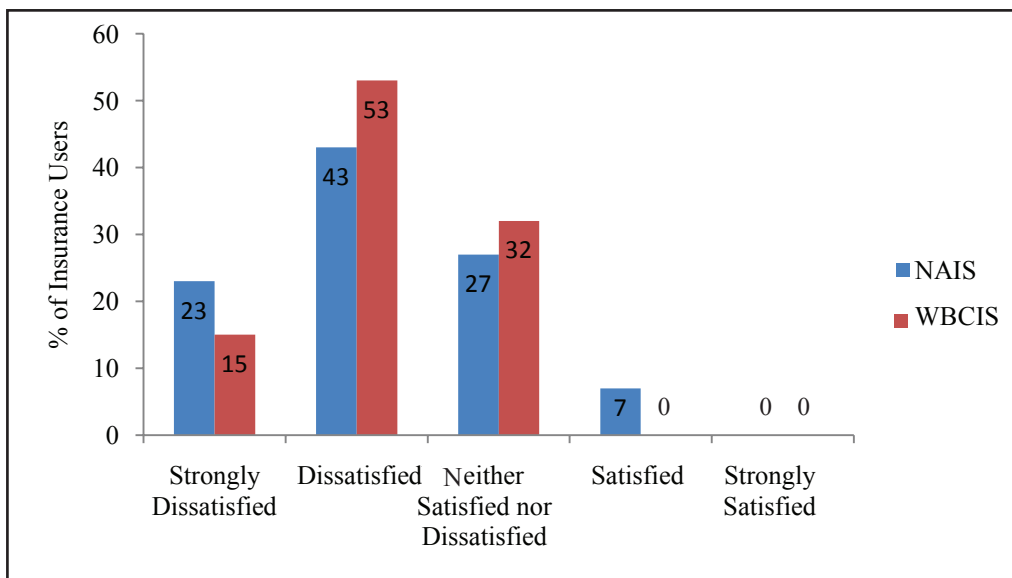
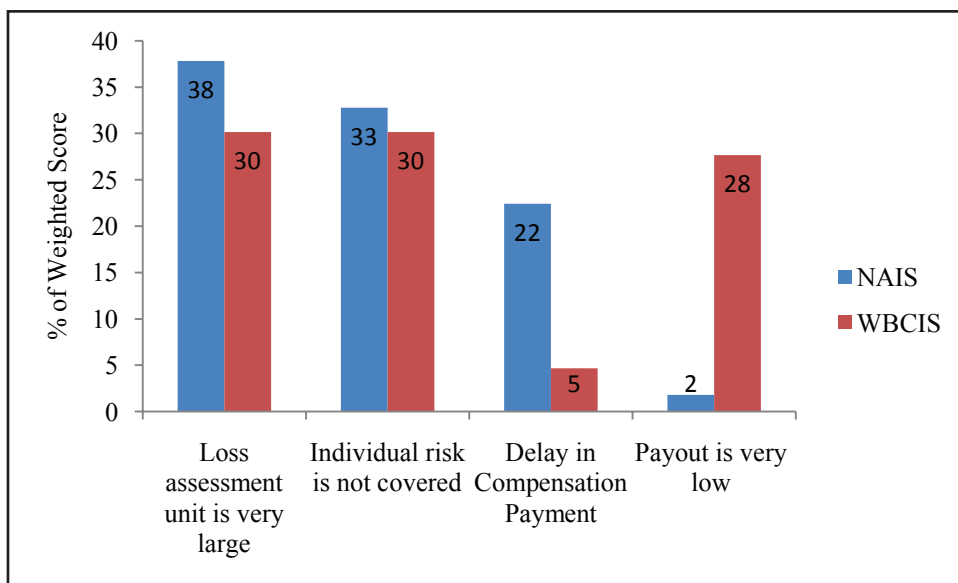
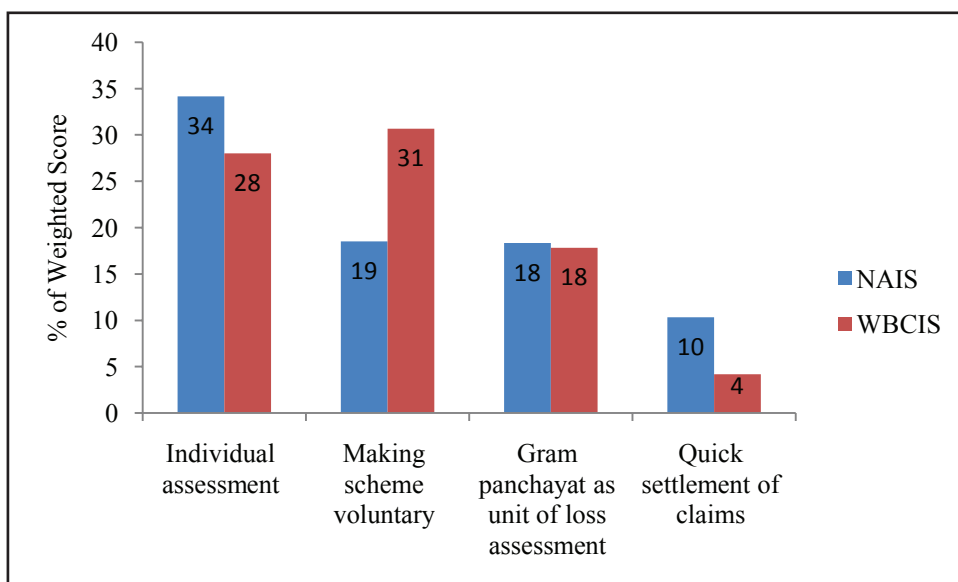


Figure 9: Important reasons for dissatisfaction of insurance users with NAIS and WBCIS



Note: Based on Table 4

Figure 10: Important suggestions by insurance users for improving NAIS and WBCIS



Note: Based on Table 5

Appendices

Appendix A: Distribution of sample households

Kalahandi District		
Block	Village	Number of NAIS Users
1. Karlamunda	1. Kansil	10
	2. Budhipadar	10
2. Madanpur Rampur	1. Sikelkupa	10
	2. Telkuna	10
3. Golmunda	1. Kendumundi	10
	2. Mahaling	10
4. Kesinga	1. Pasurpada	10
	2. Kinerkela	10
5. Bhawanipatna	1. Karlapita	10
	2. Burda	10
Total	5	100

Bolangir District		
Block	Village	Number of NAIS Users
1. Titilagarh	1. Kursel	10
	2. Kuskela	10
2. Bangamunda	1. Chandatora	10
	2. Tureikela	10
3. Muribahal	1. Patrapali	10
	2. Dandra	10
4. Tureikela	1. Dholmandal	10
	2. Baddokola	10
5. Saintala	1. Belgaon	10
	2. Siskela	10
Total	5	100

Appendix B: Household Survey Schedule (Questionnaire) for Insurance Users

**Performance of Area-Based Crop Yield and
Rainfall Insurance Scheme in Odisha**

Funded by South Asian Network for Development and Environmental Economics (SANDEE)

HOUSEHOLD SURVEY SCHEDULE

SI No:

Village ID:

HOUSEHOLD CONTACT ATTEMPTS

	DAY	MONTH	YEAR	INTERVIEW START TIME	INTERVIEW FINISH TIME
1 st Contact Date					
2 nd Contact Date					
3 rd Contact Date					

Signature of Field Investigator

DEPARTMENT OF ECONOMICS

RAVENSHAW UNIVERSITY

CUTTACK-753003

I. Identification Particulars:

1.1 Name:

1.2 Father's Name:

1.3 Village: Panchayat: Block: District:

1.4 Caste - SC-1 /ST-2/SEBC-3/General-4: (Specify)

1.5 Age (in years):

1.6 Education: A

1.7 If "Just Literate", then

(i) Are you able to read and understand a newspaper? 1. Yes 2. No (ii) Are you able to write a formal letter? 1. Yes 2. No

1.8 If literate, mention no. of years of education

1.9 Experience in cultivation (no. of years):

1.10 Membership in any association/cooperative (specify):

1.11 Training in Agriculture (if any): (a) Theme:

(b) Year:

(c) Duration: From To

1.12 Size of Family:

Adults (above 14)			Children		
Male	Female	Total	Male	Female	Total

1.13 No. of working members (staying in village):

Name	Age	Sex B	Education A	Occupation		Annual Income (INR)
				Main C	Subsidiary D	

Codes for I:

Code A: 1. Illiterate 2. Just Literate 3. Lower Primary 4. Upper Primary 5. Middle 6. High School 7. Plus2 8. Plus3
9. M.A./M.Sc 10. Technical & Other:

Code B: 1. Male 2. Female

Code C: 1-Cultivation, 2- Dairy, 3- Poultry, 4-Business/trade, 5-Small Scale/cottage industry, 6- Salary, 7-Others (specify)

Code D: 1-Cultivation, 2-Dairy, 3-Poultry, 4-Business/trade, 5-Small Scale/cottage industry, 6- Salary, 7- Agricultural Labor, 8-Non-farm Labor, 9.Other (specify)

1.14 For how many weeks in total have you been able to work during 1st June 2010 to 31st May 2011?

i) on farm— own farm.....

other farm.....

ii) off farm—

II. Land Holding Particulars (in Acres):

Type of land	Irrigated	Non-irrigated	Total
Owned			
Leased in			
Leased out			
Operational Holding			

III. Agricultural Land Use:

Tell about each plot of land owned by you or used by you. (Plot No./ Description)	Area of the plot (in Acres)	Use of Plot A	Kharif			Rabi			What is the source of irrigation for the plot besides rain? D
			Crop B	Area Acre	Output Qtl	Crop C	Area Acre	Output Qtl	

Codes for III:

Code A: 1.Owned, 2. Leased in, 3.Leased out

Code B: 1. Paddy, 2. Pulses, 3. Mustards

Code C: 1. Paddy, 2. Pulses, 3. Mustards

Code D: 1. Tubewell, 2. Dugwell, 3. Tank, 4. Canal, 5. River, 6. Only rain

IV. Input Use: For Paddy

Season A	B	Area (Acre)	Seed		Labor hired		Labor family		Tractor/ Power Tiller		Bullock Labor		Fertilizer		Pesticide		Water Charges	Other
			Kg	Rs	Day	Rs	Day	Rs	Days	Rs	Days	Rs	Kg	Rs	Kg/ Lt	Rs	Rs	Rs

Codes for IV:

Code A: 1. Kharif, 2. Rabi

Code B: 1. HYV, 2. Local

V. Crop Output and Disposal: Paddy only (For Last 3 Years) :

Season/Year	Area (Acre)	Output (Qtl)	Value (INR)	How much was kept for household consumption (Qtl)	How much was given out as gift, payment in kind or rent in total (Qtl)	How much was stored for seed, food grain and other uses in total (Qtl)	How much was sold in total (Qtl)	What price did you receive (INR/Qtl)	Who did you sell it to A
<i>Kharif</i> 2011									
<i>Kharif</i> 2010									
<i>Kharif</i> 2009									
<i>Rabi</i> 2010									
<i>Rabi</i> 2009									
<i>Rabi</i> 2008									

Codes for V:

Code A: 1. localmarket/mandi, 2. govt agency, 3. middleman/trader, 4. convenient store, 5. others (specify)

VI. Harvest: Paddy only (last year)

Seasons A	Yield (Qtl/Acre)	Was the harvest yield in the last year, above or below normal? B	What is the normal yield rate? (Qtl/Acre)	What was the reason for the damage? C

Codes for VI:

Code A: 1. *Kharif*, 2. *Rabi*

Code B: 1. above normal, 2. below normal, 3. normal

Code C: 1. pest infestation, 2. insect attack, 3. plant disease, 4. drought, 5. flood, 6. other (specify)

VII. Asset Ownership:

Sl. No	Types of Asset	Owned		Purchased during last 5 years			Sold during last 5 years			
		No./ Unit	INR	No./ Unit	INR	Year	No./ Unit	INR	Year	Purpose B
1	House/Building (Rooms) A									
2	Homestead Land (Acre)									
3	Land Owned (Acre)									
4	Livestock									
	Cow (Crossbred)									
	Cow (<i>Desi</i>)									
	Calf									
	Bullock									
	Buffalo									
	Goat									
	Sheep									
	Poultry									
5	Farm Equipment									
	Tractor/Power Tiller									
	Thresher									

	Bullock cart									
	Sickle									
	Spade									
	Yoke									
	Others (specify)									
6	Irrigation Asset									
	Well									
	Tube Well									
	Tanks									
	Bore wells									
	Pumpset (diesel/ electrical)									
	Others									
7	Consumer Durables									
	Cycle									
	Motorcycle									
	TV									
	Refrigerator									
	Furniture									
	Others									
8	Jewellery/Ornaments									
9	Savings									
10	Total Value									

Codes for VII:

Code A: 1. Thatched, 2. Asbestos, 3. Tile, 4. Concrete, 5. Mud, 6. Others (Specify)

Code B: 1. Crop loss, 2. Maintenance 3. Ceremonial expenses 4. Medical expenses 5. Education of children,
6. Marriage of daughter 7. Agricultural investment 8. Investment in business or trade 9. Any other (Specify)

VIII. Sources of Household Income:

Sl. No.	Source	No. of Members Engaged	Monthly Income (INR)	Annual Income (INR)
1	Cultivation			
2	Dairy			
3	Poultry			
4	Fishery			
5	Small Trade (Specify)			
6	Cottage/Small Scale Industry (Specify)			
7	Salary			
8	Agricultural wages			
9	Non-agricultural wages			
10	Wages from public relief work e.g. food for work			
11	Rent/Interest			
12	Remittances			
13	Benefits from govt. schemes such as welfare programs			
14	Pension			
15	Others			
16	Total Income			

IX. Savings:

Does your household keep any of the following kinds of savings?		Money value (INR)	What are your most important reasons for saving? D	Why do you not save? E
1. Deposits	A			
2. Cash at home	B			
3. Any type of fund	C			
4. Others, specify				

Codes for IX:

Code A: 1. Deposits with commercial bank, 2. Regional Rural Bank, 3. Cooperatives, 4. Post Office, 5. Others (Specify)

Code B: 1. Yes, 2. No

Code C: 1. SHG, 2. Chit fund, 3. Others (specify)

Code D: 1. Crop loss, 2. Maintenance 3. Ceremonial expenses 4. Medical expenses 5. Education of children, 6. Marriage of daughter 7. Agricultural Investment 8. Investment in business or trade 9. Any other (Specify)

Code E: 1. Low income, 2. Indebtedness, 3. Crop loss, 4. High expenditure 6. Others, specify

X. Cash Availability and Need: Rank: 1. 1st Highest 2. 2nd Highest 3. 3rd Highest

In which month do you have most cash available and in which are you in need of cash?								
Month	Cash Available (Rank)	Cash Need (Rank)	Tick Reasons For Cash Need A					
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								

Codes for X:

Code A: 1. Agriculture, 2. Livestock, 3. Living Expenses, 4. Education, 5. Ceremonies, 6. Others (specify)

XI. Indebtedness:

11.1 Particulars of loans taken during last five years and outstanding loan if any:

Financial Year	Month	Amount Borrowed	Sources of Finance A	Rate of Interest per Annum	Duration of Loan in months	Purpose of loan taken B	Amount Repaid	Source of Repayment C	Year Repaid	Amount Outstanding
2006-2007										
2007-2008										
2008-2009										
2009-2010										
2010-2011										

Code A: 1. Commercial Bank 2. R.R.B. 3.Cooperatives 4. SHG 5.Private Moneylender 6. Friends and relatives
7. Any other (Specify)

Code B: 1. Crop loss 2. Maintenance 3. Ceremonial expenses 4. Medical expenses 5. Education of children
6. Marriage of daughter 7. Agricultural Investment 8. Investment in business or trade 9.Any other (Specify)

Code C: 1. Farm income 2.Wage income 3.Selling land 4.Selling other assets 5.Borrowing 6.Any other (specify)

1. Suppose the bank is willing to lend you more money at the current rate of interest, are you willing to borrow more?	1. Yes <input type="checkbox"/> If Yes, How much?
	2. No <input type="checkbox"/>
2. Suppose the money lender is willing to lend you more money at the current rate of interest. Are you willing to borrow more?	1. Yes <input type="checkbox"/> If Yes, How much?
	2. No <input type="checkbox"/>

11.3 What are the problems you face in getting a loan from institutional sources?

- (1).....
 (2).....
 (3).....

11.4 What are the problems you face in repayment of loan?

- (1).....
 (2).....
 (3).....

1. Crop loss 2. Maintenance 3. Ceremonial expenses 4. Medical expenses 5. Education of children
6. Marriage of daughter 7. Agricultural Investment 8. Investment in business or trade 9. Any other (Specify)

XII. Ranking of Risk Factors:

12.1 What are the risk factors that you face in agriculture?

Rank in order of Importance: -

- 1. 1st Most Important
- 2. 2nd Most Important
- 3. 3rd Most Important

Rank	Risk
<input type="text"/>	a. Flood
<input type="text"/>	b. Drought
<input type="text"/>	c. Variability in rainfall
<input type="text"/>	d. Pest attack
<input type="text"/>	e. Plant disease
<input type="text"/>	f. Fire
<input type="text"/>	g. Untimely irrigation
<input type="text"/>	h. Inadequate/surplus irrigation
<input type="text"/>	i. Decline in crop prices
<input type="text"/>	j. Failure of new technology
<input type="text"/>	k. Unsuccessful investment
<input type="text"/>	l. Loss of livestock/disease
<input type="text"/>	m. Any other (Specify)

12.2 During the last agricultural year which risk factors did you face? Narrate.

.....

.....

.....

12.3 What preventive measures have you taken this year to tackle such risk?

.....

.....

.....

XIII. Evaluation of Risk:

In terms of their potential to affect your farm income, how would you rate the following sources of risk? (Circle the no. which best represents your answer).

Risk Source	Potential Effect				
	Low			High	
a. Crop yield variability	1	2	3	4	5
b. Crop price variability	1	2	3	4	5
c. Changes in input costs (Seed, pesticides, etc.)	1	2	3	4	5
d. Changes in government farm programs	1	2	3	4	5
e. Changes in type of land rents (Share crop/fixed kind/fixed cash)	1	2	3	4	5

XIV. Attitude towards Risk:

14.1 How much do you agree with the following?

		Strongly Agree		Strongly Disagree	
1. I like experimenting with new ways of doing things	1	2	3	4	5
2. I am willing to take a higher risk than others	1	2	3	4	5
3. I have to take a risk in order to realize higher returns	1	2	3	4	5
4. The only way to make money is to take more risks	1	2	3	4	5

**14.2 How would you describe your willingness to accept risk in your farm business?
(Circle the no. you choose).**

Much less willing			Much more willing	
1	2	3	4	5

XV. Risk Adjustment Mechanism:

- 15.1 Have you experienced any crop loss (paddy) in the last 5 years?** 1. Yes
2. No

15.2 If yes, please give details:

Year	Season	Area Affected (Acre)	Normal Yield Rate (Qtl/Acre)	Actual Yield Rate (Qtl/Acre)	Crop Loss (in INR)	Cause of Crop Loss, if any
	A					B
2006-07						
2007-08						
2008-09						
2009-10						
2010-11						

Codes for 15.2:

Code A: 1.Kharif 2. Rabi

Code B: 1.Flood 2 Drought 3. Variability in rainfall 4. Pest attack 5. Plant disease 6. Fire 7. Untimely irrigation
8. Decline in crop prices 9. Failure of new technology 10. Unsuccessful investment 11. Loss of livestock/
disease 12. Any other (specify)

15.3 In case of crop loss, what adjustment mechanisms do you usually adopt?

- Rank in order of Importance: -
1. 1st Most Important
 2. 2nd Most Important
 3. 3rd Most Important

Rank	Adjustment Mechanism
<input type="checkbox"/>	a. Sale/mortgage of land
<input type="checkbox"/>	b. Sale of livestock
<input type="checkbox"/>	c. Sale/mortgage of jewellery
<input type="checkbox"/>	d. Borrowing from friends and relatives
<input type="checkbox"/>	e. Bank loan
<input type="checkbox"/>	f. Borrowing from money lender
<input type="checkbox"/>	g. Government relief
<input type="checkbox"/>	h. Crop Insurance
<input type="checkbox"/>	i. Loan from Co-operative society
<input type="checkbox"/>	j. Lease of land
<input type="checkbox"/>	k. Others (specify)

15.4 Why do you prefer certain channels/agencies to others? Pl. Explain.

.....

.....

XVI. Adjustment Mechanism in Case of Rain Failure:

If it has not rained during the normal sowing season what do you/your household do?

- Rank in order of Importance: -
1. 1st Most Important
 2. 2nd Most Important
 3. 3rd Most Important

Rank	Adjustment mechanism
<input type="checkbox"/>	a. Wait for rain before sowing
<input type="checkbox"/>	b. Refrain from sowing
<input type="checkbox"/>	c. Sow less
<input type="checkbox"/>	d. Sow substitute crops
<input type="checkbox"/>	e. Seek non-agricultural work
<input type="checkbox"/>	f. Migrate to urban area
<input type="checkbox"/>	g. Invest in livestock/poultry
<input type="checkbox"/>	h. Use less pesticide/fertiliser
<input type="checkbox"/>	i. Send children for fostering
<input type="checkbox"/>	j. Take children out of school
<input type="checkbox"/>	k. Others (specify)

XVII. Risk Management Tools:

Consider the following Risk Adaptation Actions before the occurrence of crop loss and indicate how effective you believe each is in reducing your risk. (Circle the no. which best represents your answer).

Risk Source	Potential Effect				
	Low		High		
a. Diversification of farming enterprises	1	2	3	4	5
b. Being a low-cost producer	1	2	3	4	5
c. Forward pricing of all or part of production	1	2	3	4	5
d. Crop yield insurance (NAIS)	1	2	3	4	5
e. Rainfall insurance (WBCIS)	1	2	3	4	5
f. Revenue Insurance	1	2	3	4	5
g. Off-farm investments	1	2	3	4	5
h. Off-farm employment	1	2	3	4	5
i. Maintaining financial/credit reserves	1	2	3	4	5

XVIII. Insurance:

Did you have any of the following insurance last year?	Last Year						Last 5 Years		
	Sum insured (INR)	Amt. of Premium of the insurance (INR)	Mode of payment				Which years did you have the following insurance?	How many times did you actually get payout from this insurance?	How much did you get in total?
			Monthly	Quarterly	Biannual	Annual			
1. Govt.crop insurance									
2. Other crop insurance									
3.Weather or rainfall insurance									
4. Life insurance									
5. Health insurance									
6. Fire insurance									
7. Vehicle insurance									
8.Livestock/ Poultry insurance									
9. Others (specify)									

XIX. Sources of Information and Purchase of Crop Yield/Rainfall Insurance:

1. Which crop yield/rainfall insurance products have you heard about and who provides them?			
2. When did you first hear about the crop yield/rainfall insurance?			
3. Did you hear about a meeting where crop yield/rainfall insurance was being explained and sold?	1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/>		
4. From which source did you get this information?	1. It was announced with loudspeakers 2. From friends/neighbors 3. From progressive farmers 4. From bank representative 5. Saw information in ropaganda leaflet 6. Radio 7. Newspaper 8. Others (specify)	1st	
		2nd	
		3rd	
5. Have you attended a meeting where crop yield/rainfall insurance was being explained and sold?	1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/>		
6. Why did you decide to attend the meeting?	1. Progressive farmers were going 2. Headman recommended that I go 3. I like local bank 4. I saw/heard good advertisement 5. Want to learn about insurance 6. Friends were going 7. Relatives were going 8. Curiosity 9. Other, please specify	1st	
		2nd	
		3rd	
7. Why did you/your household buy the Insurance?	1. Premium was low 2. Payout is high 3. Advice from village officials 4. Advice from progressive farmers 5. Other farmers that I trust bought the insurance 6. I could not afford to lose the harvest income 7. The product was well explained 8. Security/risk reduction 9. Luck	1st	
		2nd	
		3rd	
8. What do you think was good or bad about the information and explanation you received about the crop yield rainfall insurance?	Good	Bad	

XX. Crop Insurance:

20.1 Details of Crop/Rainfall Insurance purchased for paddy (During last five years):

Year/ Season	NAIS/ WBCIS	Agency	Area (Acre)	Sum Insured (INR)	Actual Yield Rate (Qtl/ Acre)	Normal Yield Rate (Qtl/ Acre)	Crop Loss (INR)	Cause of Crop Loss	Date of crop loss	Premium Paid (INR)	Indemnity received (INR)	Date of receipt
	A	B						C				
2006- 07												
2007- 08												
2008- 09												
2009- 10												
2010- 11												

Code A: 1. NAIS, 2. WBCIS

Code B: 1. Commercial Bank 2. R.R.B. 3.Cooperatives 4. SHG 5. Any other (specify)

Code C: 1. Flood 2. Drought 3. Variability in rainfall 4. Pest attack 5. Plant disease 6. Fire 7. Untimely irrigation
8. Decline in crop prices 9. Failure of new technology 10. Unsuccessful investment 11. Loss of livestock/
disease 12. Any other (specify)

20.2 Did you face any problem in receiving compensation in case of crop loss? 1. Yes
2. No

20.3 If yes, give details:

.....

20.4 Did you know that your crop has been insured? 1.Yes 2. No

20.5 If Yes, what was the motivation for buying crop/rainfall insurance?

1. Banks/Financial Institutions compelled me to insure
2. As protection against risk
3. Knew about the benefits of insurance from other farmers insuring their crop
4. Low premium
5. Any others (specify)

20.6 Impact of Insurance:

	For the Kharif paddy that just ended, did the decision to buy the yield/rainfall insurance in any way affect ...	In what way did it change ?		COMMENTS ?	
		YES	NO		MORE
a.	... the amount of agricultural inputs that you applied for? i) HYVseeds ii) FYM iii) Fertiliser iv) Pesticide				
b.	... the amount of land you cultivated in total?				
c.	... the amount of land you leased for cultivation?				
d.	... the amount of cultivated land devoted to cash crops?				
e.	... how much you decided to save?				

XXI. Attitude towards Availing yourself of Insurance Next Year:

21.1 Will you insure your crop next Kharif ? 1. Yes 2. No

21.2 If yes, rank in order of importance: 1st, 2nd and 3rd

Why will you/your household buy the insurance for next Kharif?			
DON'T PROMPT			
	1.	it paid out this year	
	2.	it paid out last year	
	3.	good way of securing income if it doesn't rain	
	4.	high payouts	
	5.	premium is low	
	6.	advice from village officials	
	7.	advice from <i>panchayat</i> members	
	8.	other farmers that I trust bought the insurance	
	9.	security/reduce risk	
	10.	try my luck	

21.3 If yes, what is the maximum premium you are willing to pay?

Percentage of sum assured A

INR per Acre under the crop B

Codes for 21.3:

Code A: 1-Upto 2%, 2. 2-3 %, 3. 3- 4%, 4. 4 - 5%

Code B: 1. Upto 200,2. 200-300, 3. 300-400, 4. 400-500

21.4 If No, Rank in order of importance

Why will you/your household not buy the insurance next <i>Kharif</i> ?	too expensive no need no cash/credit to pay the premium payouts too small rain gauge too far away	1 st	
	bought insurance last year, but not satisfied bought insurance in the last 5years, but didn't get payout don't understand the product don't trust Banks to give payout	2 nd	
	do not like insurance others (please specify)	3 rd	

XXII. Trust towards Agencies:

Do you trust		1. Yes	2. No
	Bank officials		
	Co-operative officials		
	Panchayat office bearers		

XXIII. Understanding of Crop Yield/Rainfall Insurance:

23.1

1. What crops is the crop yield/ rainfall insurance linked to	1.paddy 2.cash crop 3.others (specify)
2. What are the trigger-levels of rainfall that generates a payout for the crop yield/rainfall insurance for paddy in this village?	
3. What is the pay-out linked to?	1.individual yield 2.area yield 3.accumulated rainfall 4.crop prices 5.don't know 6.others (specify)

4. When you buy any type of insurance will you always be able to get the premium back?	1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. Don'tknow <input type="checkbox"/>
5. How much is the premium per Acre?	
6. Do you feel you have a good understanding of the crop yield/ rainfall insurance product?	1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/>
7 Do you know under what situation you will be able to get compensation NAIS WBCIS	1) Shortfall in area yield <input type="checkbox"/> 2) Shortfall in individual yield <input type="checkbox"/> 1) Deficiency in rainfall <input type="checkbox"/> 2) Excess rainfall(1D) <input type="checkbox"/>
8. How is the compensation calculated?	
9. How far away do you think the rainfall gauge is from your house?	KM
10. Do you think the rains by the rainfall gauge and here are (...) ?	1. the same <input type="checkbox"/> 2. similar <input type="checkbox"/> 3. different <input type="checkbox"/> 4. very different <input type="checkbox"/>

23.2 Are you satisfied with the current crop insurance scheme?

Strongly Satisfied

5

Satisfied

4

Neither Satisfied nor Dissatisfied

3

Dissatisfied

2

Strongly Dissatisfied

1

23.3 Reasons for dissatisfaction (if any). Rank in order of importance 1, 2, 3

Rank	Adjustment mechanism
<input type="checkbox"/>	a. High Premium
<input type="checkbox"/>	b. Delay in Compensation Payment
<input type="checkbox"/>	c. Loss assessment unit is very large
<input type="checkbox"/>	d. Individual, independent risk is not covered
<input type="checkbox"/>	e. Proper facilities are not available at financial institutions
<input type="checkbox"/>	f. Payout is very low
<input type="checkbox"/>	g. Others (specify)

23.4 Whether the premium you are paying is

Very High	High	Reasonable	Low	Very Low	<input type="checkbox"/>
5	4	3	2	1	

23.5 What are your suggestions for improving agricultural insurance?

- (Rank in order of importance):-
1. 1st Most Important
 2. 2nd Most Important
 3. 3rd Most Important

Rank	Suggestion
<input type="checkbox"/>	a. Cover more crops
<input type="checkbox"/>	b. Individual assessment
<input type="checkbox"/>	c. Reduce premium
<input type="checkbox"/>	d. Quick settlement of claims
<input type="checkbox"/>	e. Making scheme voluntary
<input type="checkbox"/>	f. <i>Gram panchayat</i> as unit of loss assessment
<input type="checkbox"/>	g. Insurance service at your doorstep/at village level
<input type="checkbox"/>	h. CCEs to be conducted in the presence of villagers/insurance company's representatives
<input type="checkbox"/>	i. Raise the indemnity level percentage from 60% to 80-90%
<input type="checkbox"/>	j. Others (specify)

XXIV. Preference for Media and Insurance Provider:**24.1 Through which media would you prefer to know about agricultural insurance?**

Rank in order of preference: -

1. 1st Preference
2. 2nd Preference
3. 3rd Preference

Rank Media

- | | |
|----------------------|-----------------------------|
| <input type="text"/> | a. Kisan sabhas |
| <input type="text"/> | b. Village melas |
| <input type="text"/> | c. Radio |
| <input type="text"/> | d. Television |
| <input type="text"/> | e. Newspaper |
| <input type="text"/> | f. Film show in the village |
| <input type="text"/> | g. Road shows |
| <input type="text"/> | h. Others (please specify) |

24.2 Which insurance service provider (s) would you prefer for availing yourself of agricultural insurance?

Rank in order of preference: -

1. 1st Preference
2. 2nd Preference
3. 3rd Preference

Rank Insurance Provider

- | | |
|----------------------|--------------------------------------|
| <input type="text"/> | a. Rural agent at your doorstep |
| <input type="text"/> | b. Rural agent at your village level |
| <input type="text"/> | c. Commercial bank |
| <input type="text"/> | d. Co-operative bank |
| <input type="text"/> | e. Regional rural bank |
| <input type="text"/> | f. Self-help groups |
| <input type="text"/> | g. NGOs |
| <input type="text"/> | h. Post office |
| <input type="text"/> | i. Others (specify) |

XXV. General Conclusion:

25.1 To what extent are you willing to bear agricultural losses (%), beyond which you want the insurance company to pay losses?

25.2 Do you think crop insurance is a better risk management strategy than waiting to receive disaster relief after the occurrence of the disaster?

1. Yes 2. No

25.3 Please give reasons for your answer.

25.4 (i) Do you think fluctuation of crop prices is a risk factor in agriculture? 1. Yes 2.No

(ii) How do you rate the price risk ? 1. Very High, 2. High, 3. Medium, 4. Low, 5. Very Low

25.5 Do you feel the need for revenue insurance to cover price risk? 1. Yes 2.No

25.6 PI. Rank the insurance products in terms of preference: 1, 2, 3

- 1) Crop Insurance
- 2) Rainfall Insurance
- 3) Revenue Insurance

25.7 On what terms would you like your crop to be insured?

Crop	Term
1.	
2.	
3.	
4.	

Appendix C: Time Series Data

Table C.1: Coverage of NAIS in Odisha State during the 2000-2012 Kharif and Rabi Seasons

Year	Gross Cropped Area (Hectare)	Area Under NAIS (Hectare)			Percent of G.C.A. under NAIS
		<i>Kharif</i>	<i>Rabi</i>	Total	
2000	8526000	751595	108810	860405	10.1
2001	7877960	625098	174899	799997	10.2
2002	8798610	1377756	123475	1501231	17.1
2003	7852560	633977	178181	812158	10.3
2004	8638000	943212	198026	1141238	13.2
2005	8718000	922854	216780	1139634	13.1
2006	8928000	890122	199725	1089847	12.2
2007	8960000	905934	138534	1044468	11.7
2008	9014000	590932	144564	735496	8.2
2009	9071000	981287	131502	1112789	12.3
2010	9075000	1031185	31705	1062890	11.7
2011	8801080	1501147	82333	1583480	18.0
2012	8879030	1251910	91931	1343841	15.1

Source: Computed from data collected from the Regional Office of National Agriculture Insurance Company of India, Bhubaneswar

Table C.2: Percentage Distribution of Insurance Users and Area Covered under NAIS and WBCIS according to Non-Loanee Category in Odisha (Kharif 2000-2012)

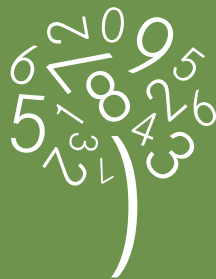
Season	No. of Insurance Users in <i>Kharif</i>			Area Covered in <i>Kharif</i>		
	Total No. of Insurance Users	No. of Non-loanee Insurance users	% of Total	Total Area of Insurance Users	Area of Non-loanee Insurance Users	% of Total
NAIS						
2000	681010	81253	11.9	751595	79205	10.5
2001	627568	65017	10.4	625098	58883	9.4
2002	1204849	549209	45.6	1377756	644933	46.8
2003	638303	24015	3.8	633977	33169	5.2
2004	872551	98688	11.3	943212	139012	14.7
2005	900022	8080	0.9	922854	14341	1.6
2006	880330	13731	1.6	890122	23491	2.6
2007	840727	3973	0.5	905934	7583	0.8
2008	611477	15619	2.6	590932	26530	4.5
2009	1068687	32588	3.0	981287	52986	5.4
2010	1107710	11106	1.0	1031185	19403	1.9
2011	1443203	177718	12.3	1483538	275577	18.6
2012	1445986	11835	0.8	1251910	18462	1.5
WBCIS						
2008	13289	13289	100.0	22278	22278	100.0
2009	81429	7146	8.8	113266	15934	14.1
2010	74734	2177	2.9	101718	5841	5.7
2011	113305	10820	9.5	166649	22667	13.6
2012	31732	1988	6.3	52580	3766	7.2

Source: Computed from data collected from the Regional Office of National Agriculture Insurance Company of India, Bhubaneswar

Table C.3: Performance Indicators of NAIS and WBCIS in Odisha (Kharif 2008-2012)

Season	Area Insured (Hectare/ Farmer)	Sum Assured (INR/ Hectare)	% of Farmers Benefited	Premium Paid (INR/ Hectare)	Claim Received (INR/ Hectare)	Claim/ Premium
NAIS						
2008	1.0	14235	9.1	368	514	1.4
2009	0.9	16054	9.3	405	478	1.2
2010	0.9	18161	19.3	456	1333	2.9
2011	1.0	19099	39.6	502	4235	8.4
2012	0.9	25212	6.0	635	488	0.8
WBCIS						
2008	1.7	20000	100.0	500	1862	3.7
2009	1.4	12000	67.3	300	662	2.2
2010	1.4	12000	18.6	300	123	0.4
2011	1.5	12000	92.5	300	993	3.3
2012	1.7	12000	87.9	300	506	1.7

Source: Computed from data collected from the Regional Office of National Agriculture Insurance Company of India, Bhubaneswar



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