PERFORMANCE OF AGRICULTURE INSURANCE SCHEMES IN INDIA

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Introduction

Weather is an important production factor in agriculture. Weather includes rainfall, temperature, humidity and other natural hazards such as floods, droughts, hailstorms, pest attacks and diseases etc. This factor is beyond the control of a farmer and therefore creates weather risks which are the main source of uncertainty in agriculture. The uncertainty of crop yields is one of the basic risks that every farmer has to face. The experiences of the past few decades have proved that no state is immune to natural calamities, no matter what the state of preparedness is. Natural hazards affect 1.42 million ha. crop area annually, 40 million hectares of landmass is prone to floods, and 68 percent of the total area is vulnerable to periodical droughts (Sarkar and Sarma, 2006). Natural calamities and adverse seasonal conditions are grossly impacting the level of agricultural productivity. In India, the volatility of weather and the occurrence of extreme weather events has increased. This leads to destabilization of farm incomes in developing countries like India. Crop failure can lead to economic downfall and make it difficult for a farmer to repay existing loans (Srijit Mishra, 2006). The worst affected are the small farmers, as they are more vulnerable to crop losses and prices fall. They find it extremely difficult to pay back the loans they have incurred to grow crops and survive (S. Mohankumar and R.K. Sharma, 2006). According to official statistics, there were 8,900 suicides by farmers between 2001 to 2006 in the four states of India (viz., Andhra Pradesh, Karnataka, Kerala and Maharashtra) (K.C. Suri, 2006).

After the implementation of AOA and liberalization, prices of agricultural commodities are determined increasingly by market forces and therefore, fluctuating demand and supply of agricultural commodities is expected to result in high price risk for agri-business. In the case of agricultural commodities, supply variability is generally high as production in a large geographical area could be affected by natural factors such as weather and incidence of pests and diseases. To help manage price risks, the central government has been encouraging revival of futures trading, which was initiated in India as early as 1921. But the Indian futures markets for agricultural commodities are yet to develop fully as efficient mechanisms of risk management. They are still not congenial markets for hedgers (Naik and Jain, 2002).

Sixty five percent of Indian agriculture is heavily dependent on natural factors, particularly rainfall. Studies have established that rainfall variations account for more than 50 percent of variability in crop yields. Crop losses can be reimbursed through proper weather risk management. Risk management should address yield, price, credit, income or weather related uncertainties among others. Management of weather risks deserves top priority in the government agenda. Several risk management tools such as agriculture insurance, calamity relief funds, minimum support prices etc. are available. Contract farming is now getting momentum as tool of price risk management in case of some exportable crops/commercial crops. Agricultural insurance exists in many countries as an institutional response to nature induced risk.

In India agriculture insurance is one of the instruments protecting farmers from agricultural variability. Agriculture instance is an important risk management tool that has the potential to provide financial security to the person engaged in agriculture and allied activities. For coping with natural risks, agriculture insurance is

the only mechanism available. It is an important instrument that protects agriculturists against uncertainties of crop production that are beyond their control. In a country like India, where crop production has been subjected to vagaries of weather and large scale damage due to attack of pests and diseases, agriculture insurance assumes a vital role in the stable growth of the agriculture sector.

In India, attention has been paid towards weather risk management in agriculture mainly through introducing agriculture insurance schemes. It has become a regular feature since 1985 during which Comprehensive Crop Insurance Scheme was started. This was later on replaced by National Agriculture Insurance Scheme (NAIS) in 1999. The NAIS was introduced on a large scale (in terms of crops and area covered) to provide insurance coverage to farmers against weather risk. It is, therefore, essential to evaluate the performance of crop insurance scheme in India and point out problems in its implementation. It is necessary to think on the schemes that are supplementary to this scheme. Can the rainfall and income insurance schemes introduced on a pilot basis be the good substitutes to crop insurance? This paper attempts to explain these issues. So the main focus of this paper is on discussing the role of agriculture insurance schemes in protecting farmers from agricultural variability.

This paper is presented in five sections. Section I gives a brief historical review of agriculture insurance schemes in India. Section II describes the operation of National Agriculture Insurance Scheme in India and Maharashtra state. Section III evaluates the rainfall insurance scheme introduced on pilot basis. Section IV evaluates income insurance scheme introduced on pilot basis. Section V gives the main conclusions of the present study and also makes some suggestions with regard to agriculture insurance in India.

Section I

Historical Review of Agriculture Insurance in India:

Credit for pioneering work on crop insurance in India goes to S. Chakravarti, who in 1920, proposed an agricultural insurance scheme based mainly on the rainfall approach. The data on which the scheme was based pertained to the then Mysore state, though the scheme had an all-India perspective. This scheme consisted of a package that included insurance of buildings, granaries and agricultural implements; cattle insurance and insurance of crops (Vyas and Singh, 2006).

The issue of introduction of a crop insurance scheme was taken up soon after the Indian independence in 1947. Ministry of Food and Agriculture gave an assurance in the central legislature to introduce crop and cattle insurance in the country and a special study was commissioned in 1947-48. Both 'individual approach' and 'homogeneous area approach' as the basis for implementation of crop insurance were studied in detail. It was realized that the 'individual approach' indemnifies the farmer to the full extent of the losses and the premium to be paid by him is determined with reference to his own past yield data and loss experience. This approach necessitates reliable and accurate data of crop yields of individual farmers for a sufficiently long period, for fixation of premium on actuarially sound basis. The 'homogenous area approach' envisages that a homogeneous area comprising villages that are homogeneous from the point of view of crop production and whose annual variability of crop production would be similar, would form the basic unit. The study reported in favour of 'homogeneous area approach' even as various agro-climatically homogenous areas treated as a single unit and the individual farmers in such cases pay the same rate of premium and receive the same benefits, irrespective of their

individual fortunes. The Ministry of Agriculture circulated the scheme for adoption by the state governments, but unfortunately the states did not accept.

Later in 1965, the government introduced a crop insurance bill and circulated a Model Scheme of Crop Insurance on compulsory basis to constituent state governments for their views. The bill provided for the central government framing a reinsurance scheme to cover indemnity obligations of the states. However, none of the states was in favour of the scheme because of very high financial obligations. On receiving the reactions of the state governments, the subject was considered in detail by the Expert Committee headed by the then Chairman, Agricultural Prices Commission in July, 1970 for full examination of the economic, administrative, financial and actuarial implications of the subject. This Committee, headed by Dharam Narain, submitted its report in August 1971. This committee in its report concluded that it would not be advisable to introduce crop insurance in near future, even on a pilot basis (Sidharth Sinha, 2004). But thereafter, different experiments on crop insurance on a limited, ad-hoc and scatter scale were started from 1972-73.

In 1972-73, the General Insurance Department of Life Insurance Corporation of India introduced a crop insurance scheme for H-4 cotton. In 1972, general insurance business was nationalized and, by the Act of Parliament, the General Insurance Corporation of India (GIC) was set up. The new Corporation took over the experimental scheme in respect of H-4 cotton. This scheme was based on 'individual approach' and later included groundnut, wheat and potato and implemented in the states of Gujarat, Maharashtra, Tamil Nadu, Andhra Pradesh, Karnataka and West Bengal. This scheme continued upto 1978-79 and covered only 3110 farmers for a premium of Rs. 4.54 lakhs against claims of Rs. 37.88 lakhs.

An All-Risk Comprehensive Crop Insurance Scheme (CCIS) for major crops was introduced in April, 1985, coinciding with the introduction of the Seventh Five Year Plan. This scheme was optional for the state governments. It was linked to short term credit and implemented on 'homogeneous area approach' as the basis. 15 states and 2 union territories implemented the scheme until kharif 1999. The states where the scheme was introduced were Andhra Pradesh, Assam, Bihar, Goa, Gujarat, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Orissa, Tamil Nadu, Tripura, West Bengal, Pondicherry and Andaman and Nicobar Islands. The states of Rajasthan, Uttar Pradesh, Jammu and Kashmir, Manipur, and Delhi initially joined the scheme but subsequently opted out after few years due to financial obligations. But Rajasthan (Kharif 2003) and Haryana (Kharif 2004) have rejoined the scheme.   The most agriculturally developed Punjab State did not participate in the scheme. This scheme covered farmers availing crop loans from financial institutions for growing food crops and oilseeds on compulsory basis. The coverage was restricted to 100 percent of crop loan subject to a maximum of Rs. 10,000 per farmer. The premium rates were 2 percent for cereals and millets and 1 percent for pulses and oilseeds. 50 percent of the premium payable by small and marginal farmers was subsidized by central and state governments. Premiums and claims were shared by central and state governments in 2:1 ratio. Additional coverage was also provided later up to 150 percent of crop loan. The coverage particulars of this scheme until kharif 1999 since inception were as follows: This scheme covered 7,62,65,438 farmers and 12,75,70,282 hectares of area. The sum insured was Rs. 24,949 crores. The claims amounted to Rs. 2303.45 crores against premium of Rs. 403.56 crores. Thus the claims to premium ratio was 1:5.71.

While, CCIS was still being implemented, attempts were made to modify the existing CCIS from time to time as demanded by the states. During 1997, a new scheme, namely, Experimental Crop Insurance Scheme (ECIS) was introduced during 1997-98 season which was implemented in 14 districts of five states. This scheme was similar to CCIS, except that it was meant only for all small / marginal farmers with 100 percent subsidy in premium. The central and state government shared the premium subsidy and claims in 4:1 ratio. The scheme was discontinued after one season due to its many administrative and financial difficulties. It covered 4,54,555 farmers for a sum insured of Rs. 168.11 crores and claims paid were Rs. 37.80 crores against a premium of Rs. 2.84 crores. The CCIS scheme was subsequently replaced by the national agricultural insurance scheme (NAIS) with effect from 1999-2000.

Section II

Performance of NAIS in India:

Agriculture Insurance Company of India (AIC) Limited has been formed by the Government of India to subserve the needs of farmers better and to move towards a sustainable actuarial regime. AIC has taken over the implementation of NAIS which until financial year 2003 was implemented by General Insurance Corporation of India. Its authorized share capital was Rs. 1500 crores and the public insurance companies and NABARD are the share holding agencies. The AIC aims at to provide financial security to persons engaged in agriculture and allied activities through insurance products. The main aim of the NAIS is to protect the farmers against losses suffered by them due to crop failure on account of natural calamities, such as droughts, flood, hailstorm, cyclone, fire, pest diseases etc. The NAIS scheme envisages coverage of all the food crops, oilseeds and annual commercial and horticultural crops of which past

yield data is available for adequate number of years. The scheme is being implemented by the 21 states and 2 union territories.

The data on the performance of NAIS at all-India level for thirteen seasons cumulative totals (rabi 1999-2000 to rabi 2005-06) are presented in table 1. This table indicates that the claims to premium ratio was 3.11 in India. A study by Sinha covering seven seasons cumulative totals had shown that the claims to premium ratio was 1:4.27. It means that the ratio has declined for a longer period. The claims to premium ratio has been very high in case of Jharkhand (12.59), Bihar (11.49), Tamil Nadu (6.22), Karnataka (4.86) and Himachal Pradesh (4.21). It was below one in the states of Assam, Goa, Haryana, Jammu and Kashmir, Meghalaya, Sikkim, Tripura, Uttaranchal and Andaman and Nicobar islands. It is also seen that Gujarat accounts for 26.89 percent of total claims, followed by Andhra Pradesh (16.35 percent), Karnataka (13.45 percent) and Maharashtra (10.58 percent). There are five states with a loss-cost ratio of 10 percent or more. Eight out of 25 states / UTS had a loss-cost ratio of below 2 percent and another 2 states had a ratio of 2 to 4 percent. A recent NSSO report (2005) reports a coverage of 4 percent of the farmers under the crop insurance scheme. Further, only in three states, Andhra Pradesh, Madhya Pradesh and Maharashtra, 10 percent or more of the farmers had the benefit of crop insurance over the whole period. The top five states that availed the bulk of the subsidy are Andhra Pradesh, Maharashtra, Gujarat, Orissa and Uttar Pradesh. The dominating crops covered under this scheme were summer paddy, wheat and groundnut and recently gram.

The districtwise data on the performance of crop insurance scheme in Maharashtra for 14 seasons cumulative totals (rabi 2000 to rabi 2006) are presented in table 2. The data shows that the claims to premium ratio was 2.07 at the Maharashtra

state level. There were four districts (Solapur, Sangli, Osmanabad and Ahmednagar) where the claims to premium ratio was higher than 5. Further, there were 16 districts (out of 33 districts) where this ratio was less than unity. In another 8 districts, the ratio ranged between 1 and 2. The four districts where the claims to premium ratio was higher than 5, accounted for 42.27 percent of all the claims. The loss-cost ratio (claims as percent of sum insured) was 7.89 at the Maharashtra state level. It was 10 or higher in six districts (Solapur, Osmanabad, Sangli, Ahmednagar, Latur and Satara). There were five districts (Bhandara, Raigad, Ratnagiri, Sindhdurg and Wardha) where the lost-cost ratio was below one.

The cropwise cumulative data on crop insurance scheme in Maharashtra State (1999-2005) given in table 3 shows that the claims to premium ratio was 10 percent or higher in case of Bengal gram (16.71) and wheat (10.24) only. It was below one in case of cotton (0.35) and between 1 and 2 in case of groundnut, nigerseed, onion, sesamum and redgram. The data indicates that wheat and Bengal gram together account for 11.23 percent of all the claims.

Problems in Crop Insurance Scheme:

The claim payments are delayed in many states due to the delays in the payments by the State governments. However, there are some states, namely, Himachal Pradesh, Jharkhand, Maharashtra, Orissa, Uttaranchal and the union territories of Pondicherry and Andaman and Nicobar islands, where the payment of claims was made promptly. Delays in payment of claims was significant in the states of Andhra Pradesh, Bihar, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. This problem can be handled in two ways. First, the premium rates should be charged on actuarial basis so that the claims to premium ratio may decline and the AIC would find it more easier to disburse the amount of claim. But this may reduce the

affordability of small and marginal farmers to insurance coverage. Second, the AIC may maintain a reserve fund for the operation of agriculture insurance schemes. The budgetary provision for crop insurance by the states will also help in solving the problem of delay in claims payment.

Crop insurance should be kept as a separate programme. Further, it should cover all foodgrains and small farmers. At present the notified areas are up to either taluka or district or block level. In order to cover localized perils like hailstorm, landslides etc. the state government is required to notify smaller defined areas such as a village for various crops. The state government is expected to furnish the final yield data in the standard format for all unit areas for notified crops for the crop season to implementing agency within the stipulated time/date. The yield data are generated through the crop cutting experiments conducted in villages by the revenue officer. The problems such as delay in the timely availability of yield data and time lag between crop cutting experiments and release of official figures are observed. The present system of using three or five year moving average results in significant estimation errors in yield and hence threshold yields ought to be based on long-term yield data. Deshpande's survey study (2005) has shown that the scheme of crop insurance is not popular with the farmers and almost 57 percent do not know that such schemes exist. Hence implementing agencies and Nodal bank are expected to create awareness among farming community about the crop insurance. It is suggested that to make NAIS financially viable actuarial rates should be charged and they may be different in different states as the uncertainty varies from state to state. The policy sales closing be set at between four and six weeks prior to planting. These dates need to be different in different regions / states.

Section III

Rainfall Insurance:

Nearly two-thirds of Indian agriculture is heavily dependent on natural factors, particularly rainfall. Studies have indicated that rainfall variation accounts for more than 50 percent of variability in crop yields. It is known that yields are variable, however it is now being realized that the weather, particularly rainfall is also becoming increasingly unpredictable and uncertain. Although there is no way of controlling weather factors, there is now a hope of mitigating the adverse financial effects that rainfall can have on the farm incomes. Agriculture Insurance Company (AIC) of India has introduced Rainfall Insurance Scheme on pilot basis in select areas of the country. This scheme was initially introduced in 27 districts of four states from the rabi 2004 season. Later on it was extended to 142 districts in ten states. It was introduced in 10 districts of Andhra Pradesh, 8 districts of Gujarat, 26 districts of Maharashtra, 31 districts of MP, 19 districts of Karnataka, 11 districts of Orissa, 8 districts of Tamil Nadu, 21 districts of Uttar Pradesh and 4 districts each of Chattisgarh and Uttaranchal.

AIC has been providing the following three options under this insurance scheme.

Option I   : Seasonal Rainfall Insurance

Option II : Rainfall Distribution Index

Option III : Sowing Failure

Rainfall insurance covers anticipated shortfall in yield on account of deficit rainfall. It is voluntary for all classes of farmers who stand to lose financially upon adverse incidence of rainfall can take insurance under this scheme. This scheme is implemented through the existing network of rural financial institutions, particularly

cooperative sector institutions. The cultivators proposed for insurance under this scheme is required to have bank account at the rural finance institution. A cultivator can buy this insurance only up to 15th June for sowing failure option and 30th June for other options.

Though the AIC has offered three different options under rainfall insurance scheme, the state government of Maharashtra has accepted only two options i.e. seasonal rainfall insurance and sowing failure, for its implementation through the District Central Cooperative Banks from kharif 2005 season. Aurangabad district of the Maharashtra state has been chosen for the case study of rainfall insurance scheme for the kharif 2005 season. The notified areas for rainfall insurance scheme in this district are Aurangabad, Phulambri, Khultabad and Gangapur talukas which are located around the Chikalthana IMD station (notified rain-gauge station). The crops notified were green gram, tur, soyabean, bajra and kharif jowar. The farmers cannot insure a crop under more than one scheme. The indemnity period varied from crop to crop. The pay structure is devised in such a way that the yield is correlated to various ranges of adverse deviation in rainfall in case of option I preferred by all farmers in Aurangabad district. The results of this case study are summarized below:

The number of farmers participated in the scheme was 44 during the kharif 2005 season. Further, all the farmer participants had opted for seasonal rainfall insurance only. The crops for which this type of insurance taken were green gram, bajra, tur and soyabean. Except one, all the insurers were small and marginal farmers. They were from Aurangabad and Gangapur talukas (notified areas) and none was from the remaining two notified areas (Phulambri and Khultabad). The sum insured per hectare varied between Rs. 5000 in case of green gram and bajra to Rs. 7000 for tur during kharif 2005 season. The farmers have paid premium at actuarial rates and

also paid service tax at the rate of 12.24 percent on the amount of premium. There was no subsidy in premium. Premium rates varied between 5 percent in case of green gram to a little over 7 percent for soyabean under the seasonal rainfall insurance option. The indemnity was payable if the deficit in actuarial rainfall is 20 percent and beyond under this option. The indemnity period was from 1 June to 30 November in case of tur and soyabean and 1 June to 30 September for green gram and June 1 to October 31 for bajra. Area covered under this scheme was 10.65 ha in case of tur, 16.01 ha. for soybean, 6.31 ha for bajra and 1 ha in case of green gram. Out of 44 participating farmers, 28 had taken insurance for soyabean and 16 farmers had insured tur crop. 7 farmers had taken insurance for bajra crop.

Monsoon rains of 2005 has proved its unpredictableness and erratic nature, as these notified areas (Chikalthana IMD station) had received excess rains during the kharif 2005 season. The rainfall during this season for the predetermined insurance period had exceeded the assured rainfall of that period in case of all the four crops in Aurangabad district, hence indemnity claims were not payable.

On the basis of the design of the scheme by the AIC and the results of the case study (in Aurangabad district) allows us to point out the following drawbacks of the rainfall insurance scheme (Option I).

This scheme does not cover rabi, summer and annual crops. To be more specific, this scheme is meant for kharif crops grown during the rainy season. The rainfall registered at the notified IMD station do not represent all the areas notified (talukas) in that district but indemnity claims are based on the rainfall at the single notified IMD station, which needs correction. The rainfall insurance scheme does not cover risks arising out of other weather factors such as pest attacks and diseases, hailstorms and floods. The study indicated that most of the farmers participated in

this scheme are small and marginal and they paid premium at actuarial rates and also borne the burden of service tax on amount of premium. At least they can be waived from the service tax. Monsoon rains of 2005 have again proved the need of different types of rainfall insurance covers i.e. catastrophic cover and excess rainfall cover and rainfall distribution cover. The AIC is of course thinking to introduce such additional rainfall covers to the farmers, and to implement this scheme at tehsil level. The case study also indicated that the indemnity period in case of soyabean and green gram is faulty. It should be June-August in case of green gram and June-September for soyabean.

Section IV

Farm Income Insurance Scheme (FIIS):

Farm income insurance scheme was introduced by the AIC as pilot project with the following objectives. This scheme aims at to provide support to farmers in the event of loss of income from adverse incidence of crop yield (on account of natural calamities, pests and diseases) and market price fluctuations. Further, it aims to encourage the farmers to adopt prudent and progressive farming practices, both in terms of agricultural technology and market economies. This scheme enhances food and livelihood security of the farming community and help stabilize farm incomes, particularly in disaster years.

The scheme was introduced in few districts of selected states. However, it is being implemented only in those states which gave their consent thereto. At present this scheme is confined to rice and wheat. This scheme is compulsory for loanee farmers and voluntary for non-loanee farmers. The scheme provides 'comprehensive risk insurance' against loss in farm income (short fall in actual income over guaranteed income in a notified area arising out of adverse fluctuations in yield due to

occurrence of any one or combination of non-preventable natural perils such as flood, inundation, storm, cyclone, hailstorm, landslide, drought, dry spells, large-scale outbreak of pests / diseases, and adverse fluctuation of market prices, as measured against minimum support price (MSP). Guaranteed income per hectare is calculated as average yield of past seven years multiplied by indemnity level multiplied by minimum support price of current year. The sum insured will be guaranteed income per hectare multiplied by the number of hectares sown with the crop. Actuarial premium rates are fixed statewise and cropwise by the company every year. The premium subsidy allowed is 75 percent of premium in case of small and marginal farmers and 50 percent for other farmers. The entire premium subsidy is borne by the Government of India, and is released to AIC at the beginning of the season based on estimates. The scheme is made operative on area approach basis and yield is calculated at the district. The market price is measured at district / state level.

Actual income is calculated as current season's actual yield multiplied by current season's market price. Market price of a crop is the current sales price of its common variety in the market. Agricultural Produce Market Committees (APMCs) are asked to record these prices and also daily modal price of grain. This exercise is done for 8 weeks. This daily modal price (DMP) with quantity transacted is sent to AIC on a weekly basis. Agricultural Marketing Board (AMB) works out the APMC-wise weighted average of the DMP (weighted with quantity transacted) for the entire 8 weeks. Finally, AMB submits the market price of the district based on weighted averages of all APMCs in the district. To limit the effects of external pressures on the market prices, a capping and cupping range of 20 percent is applied on the current season's market price.

Claim is equivalent to the difference between the guaranteed income and actual income. This scheme is new with unforeseen financial liabilities, as the actual income is based on market price, while guaranteed income is based on minimum support price (which is a notional price without a link to market price). Moreover, appropriate rating methodology is also not available at this stage. In view of the above, all claims exceeding 100 percent of premium are borne by the Government of India. This pilot programme was launched during rabi 2003-04. This scheme was introduced in ten states (Bihar, Chattisgarh, Gujarat, Jammu and Kashmir, Jharkhand, Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh and Uttaranchal) and 18 districts in case of wheat and in one district each in three states (Assam, Karnataka and Tamil Nadu) in case of rice.

Income insurance scheme was implemented in Parbhani district of Maharashtra state for wheat crop during the rabi season 2003-04. 981 wheat growers from nine blocks of this district had participated in this scheme (see table 4). The total sum insured stood at Rs. 33.56 lakhs and area covered was 462.41 ha. The net premium paid by the farmers amounted to Rs. 93,396. It was found that 124 (12.64 percent) farmers from Jintur block of this district had got indemnity of Rs. 1,24,934.47 during this season. Thus the claims to net premium ratio for the district as a whole was 1.34. The claims were paid immediately.

Section V

CONCLUSIONS

The study showed that claims to premium ratio was 3.11 at all-India level and 2.07 at Maharashtra state level. The four states (Gujarat, Andhra Pradesh, Karnataka and Maharashtra) accounted for 67.27 percent of all the claims. This scheme has covered 10 percent or more farmers in only three states (Andhra Pradesh, Madhya

Pradesh and Maharashtra). The dominating crops covered under this scheme were paddy, wheat, groundnut and recently gram. Loss-cost ratio was 9.56 at all-India level and 7.89 at Maharashtra state level. It was 10 percent or higher in six districts (Solapur, Osmanabad, Sangli, Ahmednagar, Latur and Satara). The four districts where claims to premium ratio was higher than five, accounted for 42.27 percent of all the claims. Wheat and Bengal gram were the main crops accounting for 11.23 percent of all the claims. A case study of rainfall insurance scheme revealed that rainfall during insurance period had exceeded the assured rainfall of that period in case of all the four crops in Aurangabad district, hence indemnity claims were not payable. Income insurance scheme for wheat in Parbhani district was well received by the farmers and claims to premium ratio was 1.34.

On the basis of our study it can be suggested that there is need of a transition to actuarial rates. The implementing financial agencies may be compelled to share risk with the government. There is need of increasing the accuracy and timeliness of crop estimation methods. The problems in rainfall insurance scheme need to be urgently attended.

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Table 1. Statewise Total for 13 Seasons, Rabi 1999-2000 to Rabi 2005-06.

Sl. No.	State	Farmers covered	Area (in Hectares)	Sum insured (Rs.)	Premium (Rs.)	Subsidy (Rs.)	Total claims (Rs.)	Claims paid (Rs.)	Claims payable (Rs.)	Claims to premium ratio	Loss-cost ratio
1.	Andhra Pradesh	12169257	18529227.10	1607806.56	44383.58	6689.06	118543.98 (16.35)	98382.74	20161.24	2.67	7.37
2.	Assam	69944	52726.12	6001.54	149.83	24.89	121.92	111.04	10.88	0.81	0.20
3.	Bihar	1362630	1528948.45	156269.59	3398.84	551.05	39048.21 (5.38)	28979.61	10068.60	11.49	24.99
4.	Chattisgarh	3490161	7624459.23	197123.42	5098.11	413.06	16991.71	16967.13	24.58	3.33	8.62
5.	Goa	5214	8477.68	200.86	3.53	1.01	2.24	2.23	0.01	0.63	1.11
6.	Gujarat	6639321	16221732.67	1169444.08	51857.16	3681.15	195035.60 (26.89)	194728.27	307.33	3.76	16.68
7.	Haryana	289983	362980.94	23800.24	749.54	18.93	199.58	133.35	6t8.23	0.27	0.84
8.	Himachal Pradesh	113800	70257.99	5522.29	126.44	25.02	531.70	531.70	0.0	4.21	9.63
9.	Jammu & Kashmir	8987	11372.97	550.01	10.34	0.75	0.00	0.00	0.00	0.00	0.0
10.	Jharkhand	996059	557338.20	38731.22	939.81	72.85	11827.66	11827.66	0.00	12.59	30.54
11.	Karnataka	5858156	9117331.31	619507.91	20073.13	1495.24	97559.07 (13.45)	97156.84	402.23	4.86	15.75
12.	Kerala	225654	191651.58	25513.83	533.82	129.56	1445.28	1421.27	24.01	2.71	5.66
13.	Madhya Pradesh	10391719	28084752.87	821582.17	1486.39	1486.39	44583.27 (6.15)	44544.49	38.78	1.78	5.43
14.	Maharashtra	15390583	16237977.98	907400.82	32969.53	3680.07	76743.61 (10.58)	76743.61	0.00	2.33	8.46
15.	Meghalaya	10687	12496.81	981.63	61.97	17.03	28.81	10.80	18.01	0.46	2.93
16.	Orissa	6281414	6431035.39	550669.38	13909.59	2628.48	39255.12 (5.41)	39255.12	0.00	2.82	7.13

Table 1 Contd.

Sl. No.	State	Farmers covered	Area (in Hectares)	Sum insured (Rs.)	Premium (Rs.)	Subsidy (Rs.)	Total claims (Rs.)	Claims paid (Rs.)	Claims payable (Rs.)	Claims to premium ratio	Loss-cost ratio
17.	Rajasthan	4341226	10528341.00	446822.68	12395.89	266.80	35955.58 (4.96)	33417.35	2538.23	2.90	8.05
18.	Sikkim	1370	802.53	134.73	1.48	0.33	1.28	1.28	0.00	0.86	0.95
19.	Tamil Nadu	673094	1188649.80	112010.13	2324.16	251.44	14456.61	9923.30	4533.31	6.22	12.91
20.	Tripura	6747	40191.34	676.64	19.49	2.62	12.88	10.82	2.06	0.66	1.90
21.	Uttar Pradesh	6668713	9940917.24	611539.08	11999.62	1630.90	22000.97	20140.99	1859.98	1.83	3.60
22.	Uttaranchal	34752	37613.27	3311.78	51.67	61.42	46.87	46.87	0.00	0.91	1.42
23.	West Bengal	4077158	2130806.64	273386.82	7090.71	1403.12	10689.26	7334.13	3355.13	1.51	3.91
24.	Andaman & Nicobar Islands.	772	1198.00	88.52	2.05	0.49	0.61	0.61	0.00	0.30	0.69
25.	Pondicherry	17221	26556.28	3356.33	64.43	9.13	144.37	144.37	0.00	2.24	4.30
	All-India	79155722	128901671.39	7582432.26	233241.83	24485.76	725226.18 (100)	681815.58	43410.61	3.11	9.56

Source : Agriculture Insurance Company, Mumbai

Table 2. Districtwise Total for 14 Seasons in Maharashtra State, Rabi 1999-2000 to Kharif 2006.

District	Farmers covered	Sum insured (Rs. in crore)	Premium (Rs. in crore)	Total Claims (Rs. in crore)	Claims to premium ratio	Lost-cost ratio
Ahmednagar	1441911	582.56	16.30	88.18	5.41	15.13
Akola	447132	263.75	13.34	15.26	1.14	5.78
Amravati	278569	171.05	9.06	5.05	0.55	2.95
Aurangabad	656082	542.71	16.04	39.37	2.45	7.25
Beed	839523	604.78	18.70	17.54	0.93	2.90
Bhandara	124258	129.17	3.31	0.17	0.05	0.13
Buldhana	658607	350.11	17.52	17.37	0.99	4.96
Chandrapur	244530	251.39	9.14	15.43	1.68	6.13
Dhule	452947	262.67	14.28	11.61	0.81	4.41
Gadchiroli	37714	389.12	0.98	2.19	2.22	5.62
Gondia	155495	177.49	4.64	12.03	2.59	6.77
Hingoli	457556	164.20	7.44	9.38	1.26	5.71
Jalgaon	509378	419.02	20.46	18.57	0.90	4.43
Jalna	235534	173.95	7.79	3.42	0.43	1.96
Kolhapur	4789	6.24	1.00	0.09	0.87	1.40
Latur	2628256	984.90	32.95	122.15	3.70	12.40
Nagpur	175076	173.56	6.21	5.18	0.83	2.98
Nanded	601784	472.56	20.76	21.46	1.03	4.54
Nandurbar	159095	112.25	5.23	4.17	0.79	3.71

Table 2 contd.

District	Farmers covered	Sum insured (Rs. in crore)	Premium (Rs. in crore)	Total Claims (Rs. in crore)	Claims to premium ratio	Lost-cost ratio
Nasik	597122	395.54	16.13	19.55	1.21	4.94
Osmanabad	1608815	747.01	18.82	117.11	6.22	15.67
Parbhani	866440	466.15	187.87	20.00	1.06	4.29
Pune	267939	2672.69	7.01	100.17	1.42	3.74
Raigad	39852	6.90	0.16	0.057	0.35	0.82
Ratnagiri	216102	8.38	2.99	0.34	0.16	0.48
Sangli	423222	17.43	4.04	2.71	6.71	15.53
Satara	665640	247.13	7.95	29.28	3.68	11.84
Sindhudurg	104084	52.51	1.31	0.06	0.04	0.11
Solapur	415595	180.74	5.18	82.93	16.01	45.88
Thane	143053	116.38	3.20	43.80	1.50	4.11
Wardha	177459	122.71	6.60	0.58	0.08	0.47
Washim	465316	238.61	13.60	4.04	0.29	1.09
Yavatmal	535876	476.28	30.04	21.41	0.71	4.49
Maharashtra state	16635662	9456.62	359.11	745.86	2.07	7.89

Source : Agriculture Insurance Company, Mumbai

Table 3. Cropwise Totals for 14 Seasons in Maharashtra, Rabi 1999-2000 to Kharif 2005-06.

Crops	Farmers Covered	Sum insured (Rs. in crore)	Premium (Rs. in crore)	Claims (Rs. in crore)	Claims to premium ratio	Lost-cost ratio
Bajra	1086323	313.11	11.69	35.85	3.06	11.45
Bengal gram	410865	161.97	3.74	62.56	16.71	38.62
Black gram	817259	258.87	8.45	49.00	5.79	18.93
Cotton	2887535	2331.11	162.56	58.11	0.35	2.49
Green gram	834680	2.32	7.26	27.31	3.76	11.78
Groundnut	1577900	870.60	30.69	36.90	1.20	4.23
Jowar	2707783	874.59	22.14	163.60	7.38	18.70
Maize	12087	2.67	0.07	0.05	2.27	5.77
Niger	19814	1.55	0.05	0.11	1.90	6.95
Onion	254044	2.64	17.22	18.44	1.07	6.99
Orange	4	0.007	0.001	0	-	-
Paddy	1790018	1203.87	30.94	73.12	2.36	6.07
Ragi	15390	100.82	0.26	0.81	3.08	8.05
Safflower	111780	24.56	0.73	4.13	5.63	16.80
Sesamum	127143	20.13	0.74	1.32	1.78	6.54
Soyabean	1536232	973.44	30.48	100.82	3.30	10.35
Sugarcane	1164164	1754.00	24.65	59.63	2.41	3.39
Sunflower	276673	8.58	0.27	9.72	3.61	11.32
Tur	1088750	376.04	10.27	19.46	1.89	5.17
Wheat	293733	132.25	2.07	21.19	10.24	16.01

Source : Agriculture Insurance Company, Mumbai

Table 4. Seasonal Rainfall Insurance in Aurangabad District During Kharif 2005 Season.

Crop	Normal rainfall index (mm)	Assured rainfall (mm)	Actual rainfall (mm)	Farmers covered	Area covered ha.	Sum insured (Rs.)	Premium less sales tax (Rs.)	Shortfall / Excess Rainfall (mm)
1. Green gram	597.6	478.08	915.4	1	1.00	5000	280	+91.47
2. Tur	698.7	558.96	973.9	16	10.65	74550	4153.50	+ 74.27
3. Soyabean	698.7	558.96	973.9	28	16.01	102480	7404.50	+74.27
4. Bajra	668.8	535.04	973.9	7	6.31	31550	1583.81	+82.02

Source: Annual Report, Aurangabad District Central Cooperative Bank Ltd., Aurangabad, 2005-06.