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Adaptability of Crop Insurance Schemes in Tamil Nadu

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Abstract

The experiences gained in the execution of various crop insurance products in India have been described along with the ways to redesign the strategies for effective implementation of such crop insurance products. The study is based on the data collected from 90 farmers covered under National Agricultural Insurance Scheme (NAIS) in three selected districts in Tamil Nadu, viz. Nagappattinam, Vellore and Madurai and 30 farmers covered under *Varsha Bima*, a weather-based insurance product in the Nagapattinam district. The major problems in the implementation of NAIS, as indicated by respondents, are: poor awareness about the scheme, delay in settlement of claims, complex procedure, high premium rate and wide variation between yields of actual and crop-cutting experiment farms. In the case of *Varsha Bima* scheme implemented in the Nagapattinam district, the major problems faced by the farmers are: non – availability of the benefit since the implementation of the scheme, poor awareness about the details of weather insurance schemes, high premium rate and wide variation in rainfall between the farm and the Reference Weather Station. The study has offered several suggestions, based on farmers' perceptions, to refine the existing crop insurance schemes in India.

Key words: Agricultural risk, crop insurance, weather-based insurance scheme, Tamil Nadu

JEL Classification: Q18, D62, G22

Introduction

Agricultural risk is associated with negative outcomes that arise from imperfectly predictable biological variables like outbreak of pest and diseases, adverse climatic factors like drought, flood and storm, resource risks like non-availability or poor quality of inputs, and price risks, which altogether are not within the control of farmers. Under such a situation, crop insurance protects farmers' investment in crop production and thus improves their risk-bearing capacity. It facilitates adoption of improved technologies and encourages higher investment, resulting in higher agricultural production. Further, it spreads the crop losses that occur due to uncontrollable natural factors, over space and time, and helps the farmers make more investments in agriculture. Crop credit insurance also reduces the risk of becoming a defaulter of institutional credit. The reimbursement of indemnities in the case of crop failure enables a farmer to repay his debts and therefore, he/she has not to seek loan from a private moneylender.

An agricultural insurance scheme is difficult and complex to execute. Even the private agricultural insurance has not been successful due to failures on the parts of market and government because of the following reasons (Mark Wenner and Diego Arias, 2003). First, private insurers have not been able to cope with systemic, non-diversifiable risks in assessing crop yields stemming from say, natural disasters, affecting a large number of farms, over a widespread region. Even with the possibility of re-insurance, it is hard to calculate a fair premium in order to develop sufficient reserves for low probability but high loss events.

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Second, the presence of asymmetric information, which can lead to adverse selection and moral hazard problems, raises the cost and risks of introducing crop insurance products more so than other types of insurance products available for the health and automobile sectors.

Lack of data on yield levels as well as risk position of individual farmers puts the insurance company in a disadvantageous position. The high premium rates discourage the majority participation and only high-risk clients participate, leading to adverse selection. Thus, the traditional agricultural insurance programmes are financial failures because of high administrative costs, adverse selection and moral hazard problems. Therefore, there is an urgent need to scrutinize the benefits of several of the crop insurance products being implemented in India, in general and Tamil Nadu, in particular. Hence, in the present study, an attempt has been made to discuss the experiences gained in the execution of various crop insurance products and to redesign the strategies for effective implementation of crop insurance products in India with the following specific objectives:

i) To assess the special features, methods of implementation and usefulness of the present crop insurance schemes in Tamil Nadu,

ii) To analyze the farmers' awareness about the crop insurance schemes and the extent of their adoption,

iii) To assess the constraints in adoption of crop insurance schemes, and

iv) To suggest suitable modifications in the existing crop insurance schemes for a higher adoption by the farmers.

Sampling and Data Collection

The present study is based on both primary and secondary data on various crop insurance products implemented in Tamil Nadu as well as in India. To study the issues relating to various crop insurance products implemented in the state and to incorporate the necessary changes in such schemes based on the suggestions put forth by the farmers, a sample of 120 farmers who had insured their crops under various crop insurance schemes in the three districts in Tamil Nadu, namely, Vellore, Nagapattinam and Madurai, was selected for the study.

The Nagapattinam district was selected purposively as there was a maximum number of crop-insured farmers in this district compared to other districts of the state. The percentage of sum insured and percentage of claims to their respective state totals were also highest in the Nagapattinam district. The percentage of number of farmers benefited to total number of farmers covered under National Agricultural Insurance Scheme (NAIS) and *Varsha Bima* schemes implemented by the public sector insurer (Agriculture Insurance Company of India Limited, New Delhi) was also high in this district. The other two districts, viz. Vellore and Madurai, were randomly selected from those districts of Tamil Nadu, where the NAIS was not popular among the farmers (only about one per cent of the total number of farmers covered under the scheme in the state was in each of these selected districts) (Table 1). Thus, 90 farmers who were covered under NAIS — 30 from each selected districts, and another 30 farmers covered under *Varsha Bima*, a weather-based insurance product in the Nagapattinam district — were selected for the study. The primary data collected from the sample farmers pertained to the agricultural year 2005-06.

Experiences on Crop Insurance Models

A brief review on the nature and spread of various crop insurance schemes would be useful to redefine the strategies to be followed in the existing crop insurance products so as to make them more effective in the present context. Hence, the modalities of different insurance products executed, issues that were emerging out of them and strategies to make them effective are briefly described below:

Crop Insurance in India – Some experiences

The crop insurance is based on either 'Area Approach' or 'Individual Approach'. Area approach is based on 'defined areas' which could be a block / *mandal*, or a *phirka* or any other smaller contiguous area. In India also, the governmental efforts began in early-1970s to compensate the losses due to reduction in crop yields arising out of natural calamities.

The crop insurance programmes implemented from time to time by the Agriculture Insurance Company of India Limited in various states of India are:

(i) Crop Insurance Scheme on H-4 cotton (1972 – 1978),

Table 1. District-wise coverage of loanee and non-loanee farmers under NAIS in Tamil Nadu during 2008-09

District	Loanee-farmers covered				Non-loanee farmers covered				Per centage of loanee in total farmers				Percentage of insured farmers to total state farmers
	Number of farmers	Area covered (ha)	Sum insured (in lakh ₹)	Premium (in lakh ₹)	Number of farmers	Area covered (ha)	Sum insured (in lakh ₹)	Premium (in lakh ₹)	Number of farmers	Area covered (ha)	Sum insured (in lakh ₹)	Premium (in lakh ₹)	
Kancheepuram	6613	9849	1879.3	41.8	0	0	0	0	100	100	100	100	0.87
Thiruvallur	2997	4812	1010.8	22.6	1	2	0.5	0.01	99.97	99.96	99.95	99.95	0.4
Cuddalore	20965	25110	5043.6	105.8	5447	6653	1423.2	28.5	79.38	79.05	77.99	78.8	3.5
Villupuram	1480	1986	413.1	10	1200	768	193.9	3.9	55.22	72.11	68.06	72.13	0.35
Vellore	6345	7070	1295.6	29.6	1411	307	61.1	1.4	81.81	95.84	95.5	95.52	1.03
Thiruvannamalai	3915	4800	686.3	14	3493	2134	465.5	11.8	52.85	69.22	59.59	54.28	0.98
Salem	608	719	148.4	7	334	172	33.3	0.7	64.54	80.7	81.69	91.04	0.12
Namakkal	582	995	197.4	8.8	0	0	0	0	100	100	100	100	0.08
Dharmapuri	3025	2863	740.8	34.9	0	0	0	0	100	100	100	100	0.4
Krishnagiri	405	399	89.3	3.9	411	259	71.2	1.4	49.63	60.64	55.62	73.4	0.11
Coimbatore	48	76	29.5	1.6	0	0	0	0	100	100	100	100	0.01
Erode	2616	2659	695.7	27.2	542	124	32.6	0.7	82.84	95.54	95.53	97.49	0.42
Thiruchirapalli	9515	14223	1984.5	56.4	6657	5024	1271.6	25.5	58.84	73.9	60.95	68.87	2.14
Karur	3339	3496	817.0	36.3	2	3	0.7	0.02	99.94	99.91	99.91	99.96	0.44
Perambaluur	876	1240	179.8	6.5	32	37	9.4	0.2	96.48	97.1	95.04	96.89	0.12
Pudukkottai	523	986	142.0	3	56338	57139	14450	289	0.92	1.7	0.97	1.02	7.53
Thanjavur	21458	29596	4925.7	104	51590	54794	14150	288.4	29.38	35.07	25.82	26.5	9.67
Thiruvarur	37459	55551	9071.9	183.5	114769	128102	31940	657.3	24.61	30.25	22.12	21.83	20.15
Nagapattinum	38590	61110	9556.6	192.8	133410	131030	33550	686.3	22.44	31.8	22.17	21.93	22.77
Madurai	3229	6333	722.8	18.6	5769	4404	699.3	14.6	35.89	58.98	50.82	56.06	1.19
Theni	569	1552	169.7	9.6	602	666	86.8	2.2	48.59	69.97	66.16	81.51	0.15
Dindigul	354	312	41.9	1.2	310	240	38.7	0.8	53.31	56.52	51.98	59.69	0.09
Ramanathapuram	6790	11830	1390.0	29	116994	145969	36310	732.4	5.49	7.5	3.69	3.81	16.38
Virudhunagar	120	275	20.9	1.3	3789	8817	1189.3	23.9	3.07	3.02	1.72	5.08	0.52
Sivagangai	4847	4388	479.9	9.6	59527	60394	16150	336.8	7.53	6.77	2.89	2.77	8.52
Thirunelveli	2697	1881	443.6	16.7	2442	1753	423.5	8.9	52.48	51.76	51.16	65.24	0.68
Thoothukudi	161	187	55.3	4	6612	11537	713.9	23.4	2.38	1.6	7.18	14.7	0.9
The Nilgiris	56	96	41.9	1	0	0	0	0	100	100	100	100	0.01
Kanniyakumari	693	372	97.8	5.8	2859	607	88.9	2	19.51	38	52.4	74.2	0.47
Total	180875	254766	42371.1	986.5	574541	620935	153353.4	3140.1	23.94	29.09	21.65	23.91	100.00

Source: Agriculture Insurance Company of India Limited, Regional Office, Chennai.

(ii) Pilot Crop Insurance Scheme (PCIS) (1979 – 1984),

(iii) Comprehensive Crop Insurance Scheme (CCIS) (1985 – 1999),

(iv) Experimental Crop Insurance Scheme (ECIS) (1997-1998),

(v) Pilot Scheme on Seed Crop Insurance (PSSCI) (1999-2000),

(vi) National Agricultural Insurance Scheme (NAIS) / *Rashtriya Krishi Bima Yojana* (RKBY) (from 1999-2000 onwards), and

(vii) Rainfall Insurance Scheme or *Varsha Bima* (from 2004 onwards).

The private insurers like ICICI-Lombard in association with non-governmental organizations (NGOs), namely BASIX in Andhra Pradesh and DHAN Foundation in Tamil Nadu, and IFFCO – TOKIO are implementing crop insurance schemes on a limited scale.

National Agricultural Insurance Scheme (NAIS)/ *Rashtriya Krishi Bima Yojana* (RKBY)

The major features of NAIS being implemented from *rabi* 1999-2000 are:

(i) Insurance coverage to farmers in the event of failure of any of the notified crops as a result of natural calamities, pests and diseases;

(ii) All farmers including share-croppers and tenant farmers growing the notified crops in the notified areas are eligible for coverage;

(iii) The sum insured (SI) may extend to the value of threshold yield of the insured crop at the option of the insured farmers. However, a farmer may also insure his crop beyond the value of threshold yield level up to 150 per cent of average yield of notified area on the payment of premium at commercial rates.

(iv) Premium rates for different crops will range from 1.5 to 3.5 per cent of the sum insured or actuarial rate, whichever are less.

(v) Fifty per cent subsidy in premium in the case of loanee farmers and 55 per cent in the case of non-loanee farmers is allowed in respect of small (≤ 2 ha) and marginal (≤ 1 ha) farmers, to be shared by the Government of India and the concerned state/ Union Territory (UT) government.

(vi) The scheme would operate on the basis of 'Area Approach', i.e., defined areas for each notified crop for widespread calamities; as well as on an individual basis for localized calamities such as hailstorm, landslide, cyclone and flood. The 'defined area' (i.e., unit area of insurance) may be a *Gram Panchayat, Mandal, Hobli*, Circle, *Phirka*, Block, *Taluka*, etc. to be decided by the state / UT government.

(vii) The state / UT government will plan and conduct the requisite number of crop cutting experiments (CCEs) for all the notified crops in the notified insurance units in order to assess the crop yield.

Coverage under NAIS

The coverage of farmers under NAIS from 1999 to 2007 revealed (Table 2) that Maharashtra was at the top in terms of the number of farmers covered with 17.2 per cent share in the total farmers covered in India. In this regard, the share of Tamil Nadu was only 0.9 per cent. In terms of claims made, Gujarat stood first with 24.9 per cent of the total claims settled in India and the share of Tamil Nadu state was only 1.5 per cent. The number of farmers benefited accounted for 26.3 per cent of the total number of farmers covered under the scheme in Tamil Nadu, while the corresponding figure for the country as a whole was 25.3 per cent. The shares of claims made to the sum insured during 1999 – 2007 were 9.4 per cent for Tamil Nadu and 8.9 per cent at all-India level.

In 2005-06, the number of farmers covered under NAIS was 167.2 lakhs in India, accounting for 13.8 per cent of the total farm households (1208.2 lakhs in 2000-01). In Tamil Nadu, the number of farmers covered under NAIS was 1.36 lakhs during 2005-06 and this accounted for 1.74 per cent of the total farm households in the state (78.6 lakhs in 2000-01), which was far below the national coverage.

It could be observed from Table 3 that the coverage of non-loanee farmers under NAIS during 2000 was only 0.81 per cent of the total farmers covered in Tamil Nadu and it increased to 64.42 per cent during 2007. During 2000-2008, the non-loanee farmers were 45 per cent of the total farmers in Tamil Nadu covered under NAIS. The share of claims settled to these

Table 2. State-wise coverage of National Agricultural Insurance Scheme (16 seasons from *rabi* 1999-2000 to *kharif* 2007)

States	Farmers covered (in thousands)	Area ('000 ha)	Sum insured (in crore ₹)	Premium (in crore ₹)	Subsidy (in crore ₹)	Total claims (in crore ₹)	Farmers benefited (in thousands)
Andhra Pradesh	16536.8	25702.1	24486.1	692.0	82.5	1749.3	3122.0
Assam	93.5	73.3	91.3	2.1	0.3	4.2	19.4
Bihar	2688.7	3192.4	3911.0	90.6	9.9	518.0	821.3
Chhattisgarh	4919.4	10343.2	3241.8	84.1	5.5	174.6	992.6
Goa	6.2	10.1	2.2	0.0	0.0	0.0	0.7
Gujarat	8342.1	19866.3	16066.6	683.0	41.9	2537.3	3102.0
Haryana	392.9	440.9	317.7	10.2	0.3	17.6	58.2
Himachal Pradesh	139.5	97.4	83.3	1.9	0.3	6.0	70.1
Jammu & Kashmir	18.0	23.9	13.8	0.3	0.0	0.1	1.4
Jharkhand	2963.1	1403.9	866.0	22.0	1.3	127.2	747.9
Karnataka	7770.1	13316.4	8803.7	283.6	17.9	1227.6	3434.2
Kerala	273.0	229.8	344.1	7.2	1.5	19.0	55.9
Madhya Pradesh	13642.4	36229.1	12619.4	395.0	18.2	519.8	2710.9
Maharashtra	18959.5	18765.5	10782.0	399.8	46.8	1007.8	5530.4
Meghalaya	14.2	17.0	14.5	0.9	0.2	0.3	1.4
Odisha	8202.4	8426.8	7964.5	200.1	31.2	446.7	1526.9
Rajasthan	9107.2	20394.5	8768.6	244.9	4.4	765.5	1859.0
Sikkim	1.4	0.8	1.5	0.0	0.0	0.0	0.1
Tamil Nadu	1027.3 (0.93)	1659.4 (0.94)	1665.5 (1.46)	36.1 (1.04)	3.8 (1.25)	156.5 (1.54)	270.7 (0.97)
Tripura	9.7	6.0	10.1	0.3	0.0	0.5	2.6
Uttar Pradesh	9724.0	12525.8	9945.9	205.0	21.8	514.8	2536.5
Uttarakhand	69.6	73.7	104.3	1.8	0.2	5.2	18.7
West Bengal	5535.5	2864.2	4031.6	104.9	17.4	377.7	1075.3
Andaman & Nicobar Islands	1.0	1.5	1.2	0.0	0.0	0.0	0.1
Pondicherry	20.7	31.1	41.2	0.8	0.1	1.5	3.8
Total	110458.2	175695.1	114177.9	3466.6	305.5	10177.2	27962.1

Note: Figures within the parentheses indicate percentages to total.

Source: Agriculture Insurance Company of India Limited, Regional Office, Chennai.

non-loanee farmers to total claims for this period was 58 per cent. This shows the increasing participation of the non-loanee farmers in the crop insurance scheme.

A perusal of Table 4 reveals an increase in all the parameters like number of farmers covered, area coverage, sum insured, premium collected, claims settled and number of farmers benefited in Tamil Nadu under NAIS during 2000 to 2007. Overall, the share of number of farmers benefited in the total number of farmers covered under NAIS since its inception was 36.2 per cent and the share of claims settled to sum insured was 17.4 per cent.

In Tamil Nadu, the number of farmers covered under NAIS from 2000 to 2006 was highest in the Nagapattinam district (18.0% of the total farmers covered in the state), followed by Thiruvarur (17.4%) and Thanjavur (11.9%), districts. These three districts were much benefited from the Cauvery canal irrigation system, which however, largely depended on the magnitude and distribution of north-east monsoon. As the supply of canal water is quite uncertain, a higher risk is involved in rice cultivation which is a major crop grown in these districts and hence, the farmers preferred to insure their crops to a large extent.

Table 3. Coverage of loanee and non-loanee farmers under NAIS in Tamil Nadu from 2000 to 2008

Year	Category of farmers	Farmers covered (Numbers)	Area (ha)	Sum insured (in lakh ₹)	Premium (in lakh ₹)	Claims (in lakh ₹)
2000	Loanee	109416	231228	14091.90	292.14	59.74
	Non-loanee	898	880	109.42	2.23	0.00
	Sub-total	110314	232108	14201.32	294.37	59.74
2001	Loanee	163285	248209	19574.13	391.04	1656.13
	Non-loanee	441	725	73.72	1.40	5.01
	Sub-total	163726	248934	19647.85	392.45	1661.14
2002	Loanee	87135	146438	12722.35	257.85	3282.12
	Non-loanee	184	204	38.12	0.76	31.33
	Sub-total	87319	146642	12760.47	258.61	3313.45
2003	Loanee	64768	101525	10158.37	207.09	704.32
	Non-loanee	1196	1286	262.60	5.27	190.16
	Sub-total	65964	102811	10420.97	212.36	894.48
2004	Loanee	142103	243139	28490.50	604.29	3459.13
	Non-loanee	3536	3953	819.86	16.43	324.15
	Sub-total	145639	247092	29310.36	620.72	3783.29
2005	Loanee	104829	196238	22727.19	491.81	4215.19
	Non-loanee	15138	16299	2819.31	57.33	612.15
	Sub-total	119967	212537	25546.50	549.14	4827.34
2006	Loanee	225150	351621	39443.38	938.90	524.06
	Non-loanee	90294	88622	11000.00	224.79	419.55
	Sub-total	315444	440243	50443.38	1163.69	943.61
2007	Loanee	198335	325549	42056.96	995.94	4126.40
	Non-loanee	359146	532052	53030.00	1070.78	23830.00
	Sub-total	557481	857601	95086.96	2066.71	27956.40
2008	Loanee	180875	254765	42374.41	986.49	61.45
	Non-loanee	574541	620937	153319.31	3140.09	NA
	Sub-total	755416	875702	195693.72	4126.58	61.45
2000-2008	Loanee-total	1275896 (55.0)	2098712 (62.4)	231639.19 (51.1)	5165.55 (53.3)	18088.54 (41.6)
	Non-loanee- total	1045374 (45.0)	1264958 (37.6)	221472.34 (48.9)	4519.08 (46.7)	25412.35 (58.4)
	Grand total	2321270	3363670	453111.53	9684.63	43500.89

Note: Figures within the parentheses indicate percentages to total.
Source: Agriculture Insurance Company of India Limited, New Delhi.

In the implementation of NAIS, certain limitations relating to unit area of insurance, calculation of guaranteed income, low indemnity level, and delay in settlement of insurance claims were observed. Keeping in view these limitations in the existing scheme, a modified draft with improvements suggested by a Joint Group constituted by the Government of India is under consideration.

Rainfall Insurance Scheme or *Varsha Bima*

"*Varsha Bima*" introduced during 2004-south west monsoon, covers anticipated shortfall in crop yield on account of deficit rainfall. It is voluntary for all classes of cultivators who stand to lose financially upon adverse incidence of rainfall. It is based on rainfall index, that is 100 years' average rainfall data are compared with the current year rainfall data and the

Table 4. Performance of NAIS in Tamil Nadu — Year-wise data

Year	Farmers ('000 No.)	Area ('000 ha)	Sum Insured (in lakh ₹)	Premium (in lakh ₹)	Claims (in lakh ₹)	Farmers benefited ('000 No.)
2000	105.0	232.1	14202.5	279.2	50.6	3.4
2001	163.7	248.9	19648.1	392.4	1661.0	69.2
2002	87.3	146.6	12767.7	258.6	3313.4	61.5
2003	66.0	102.8	10421.0	212.4	894.5	16.4
2004	145.6	211.2	24461.8	620.7	3783.3	46.5
2005	120.0	178.1	22061.0	549.2	4827.3	44.4
2006	315.4	440.3	50442.3	1163.7	943.6	22.9
2007	557.5	857.6	95084.3	2066.7	27955.5	300.5
Total	1560.5	2417.6	249088.7	5542.9	43429.2	564.8

Source: Regional Office, Agriculture Insurance Company of India Limited, Chennai.

Table 5. Progress of *Varsha Bima* – 2008 in three selected districts of Tamil Nadu

Reference weather station	Number of farmers	Area insured (in ha)	Pay-out (₹ per ha)	Total pay-out (₹)
Nagapattinum district				
Mayiladuthurai Revenue Department	90	99.6	2955	294216
IMD Nagapattinum	42	96.9	4386	425112
Sirkazhi Revenue Department	71	76.9	1878	144400
Thalanayiru PWD	8	13.5	5080	68670
Vedaranyam Revenue Department	4	5.3	2555	13442
Thanjavur district				
Thiruvaiyaru Revenue Department	9	8.6	5330	45857
Thanjavur Revenue Department	2	1.2	1483	1800
Orathanadu AH Department	2	0.8	4043	3272
Thiruvarur district				
Thiruthuraipoondi Revenue Department	41	49.2	2903	142762
Mannargudi PWD	4	10.0	4334	43148
Needamangalam Revenue Department	3	2.7	6425	17524
Valaigaiman Revenue Department	5	4.5	6425	28600
Thiruvarur Revenue Department	1	0.8	6425	5200
Nannilam Revenue Department	7	25.5	6165	157509
Total	289	395.4		1391512

Source: Agriculture Insurance Company of India Limited, Regional Office, Chennai.

shortfall or deficiency in terms of percentage is the criterion for compensation.

In Tamil Nadu, 320 farmers were covered under *Varsha Bima* during 2005-06 with ₹ 60.7 lakh of sum insured and ₹ 4.9 lakh of premium (Table 5). Under *Varsha Bima – 2008*, some 289 farmers spread over three districts, namely Nagapattinam, Thanjavur and Thiruvarur, were covered. Premium collected was at the rate of 7 per cent of the sum insured. A service tax of 12.36 per cent was also added. The details of *Varsha Bima – 2008* implemented in Tamil Nadu are given in Table 5.

Deficit Rainfall Insurance Scheme

This scheme was introduced during 2007-08 in the state in seven districts, namely, Salem, Thanjavur,

Madurai, Nagapattinam, Ramanathapuram, Vellore and Virudhunagar, to cover the risk against deficit rainfall. The scheme covered paddy in all the seven districts and groundnut in three districts, namely, Salem, Thanjavur and Pudukkottai. The indemnity was based on the deficit rainfall during three phases of crop growth.

The Pilot Weather Based Crop Insurance Scheme (WBCIS) was implemented by AICIL in Tamil Nadu during *rabi* - 2008-09 for maize, groundnut, gingelly (sesame), sunflower, paddy (*Navarai / Kodai*), tomato, chillies, onion, cotton and mango in five districts, viz. Dharmapuri, Perambalur, Ariyalur, Salem and Virudhunagar. It aims to mitigate the hardships of the insured farmers against the likely financial loss on account of anticipated crop loss resulting from incidence of adverse weather conditions.

The Agriculture Insurance Company of India Limited (AICIL) will implement scheme for loanee and non-loanee farmers, whereas private insurance companies, viz. ICICI-Lombard and IFFCO–TOKIO General Insurance Company will implement the scheme for the non-loanee farmers only.

Results and Discussion

Landholding

The share of average size of wet land to total land area was highest (80.80 %), followed by dryland (9.59%) and garden land (7.93%) (Table 6). The average total area covered under *Varsha Bima* Scheme (Nagapattinam district) was more (4.3 ha) than that of NAIS farm holdings (2.6 ha). In *Varsha Bima* area, there was only wet land. Crop loans were issued mostly for irrigated crops and hence, 83 per cent of the NAIS (Yield-based insurance) area was under irrigated condition.

Cropping Pattern

The area under different crops grown in the study area, presented in Table 7, reveals that the percentage of area under cultivation to the net farm area was higher in *Varsha Bima* (200%) than in NAIS (128%).

In the Nagapattinam district, invariably all farms cultivated paddy, followed by rice–fallow-black gram or green gram and hence, the share was 200 per cent. In all the selected districts, paddy was largely grown and the area under paddy to total cultivated area was higher in *Varsha Bima* (50%) than in NAIS (48.5%).

The area under the crops for which insurance was made by the sample respondents in different districts are given in Table 8. Paddy was insured under both NAIS and *Varsha Bima* schemes, in all the three districts and the area under paddy accounted for 99 per cent, 92 per cent and 39 per cent of the total area under paddy in the NAIS- covered areas of Vellore, Nagapattinam and Madurai districts, respectively. Area

Table 6. Average size of holdings in selected farm households

(area in ha)

District	Net operated area				Uncultivated land	Total area
	Wet land	Garden land	Dry land	Totaloperated area		
			NAIS			
Vellore	0.95	0.47	0.26	1.68	0.20	1.88
Nagapattinam	2.50	0.00	0.00	2.50	0.00	2.50
Madurai	2.01	0.49	0.90	3.40	0.00	3.40
Sub-total	1.82	0.32	0.38	2.52	0.07	2.59
Percentage to total	70.28	12.28	14.84	97.40	2.60	100.00
			Varsha Bima			
Nagapattinam	4.26	0.00	0.00	4.26	0.00	4.26
Percentage to total	100.00	0.00	0.00	100.00	0.00	100.00
All schemes	2.43	0.24	0.29	2.96	0.05	3.01
Percentage to total	80.80	7.93	9.59	98.32	1.68	100.00

Table 7. Average area under different crops cultivated by sample farm households

Crops	National Agricultural Insurance Scheme								*Varsha Bima* scheme		All schemes	
	Vellore district		Nagapattinam district		Madurai district		All districts		Nagapattinam			
	ha / farm	% to total	ha / farm	% to total	ha / farm	% to total	ha / farm	% to total	ha / farm	% to total	ha / farm	% to total
Paddy	0.80	52.4	2.49	51.5	1.52	42.9	1.61	48.5	4.26	50.0	2.27	49.22
Black gram	0.00	0.0	2.27	46.9	0.12	3.4	0.80	24.1	4.23	49.7	1.65	35.90
Green gram	0.00	0.0	0.07	1.6	1.28	35.8	0.45	13.6	0.03	0.3	0.34	7.47
Sugarcane	0.45	29.1	0.00	0.0	0.00	0.0	0.15	4.5	0.00	0.0	0.11	2.42
Chillies	0.00	0.0	0.00	0.0	0.01	0.4	0.00	0.1	0.00	0.0	0.00	0.07
Onion	0.00	0.0	0.00	0.0	0.13	3.5	0.04	1.3	0.00	0.0	0.03	0.68
Groundnut	0.28	18.5	0.00	0.0	0.00	0.0	0.09	2.9	0.00	0.0	0.07	1.54
Cotton	0.00	0.0	0.00	0.0	0.50	14.0	0.17	5.0	0.00	0.0	0.12	2.71
Total cultivated area	1.53	100.0	4.83	100.0	3.56	100.0	3.31	100.0	8.52	100.0	4.61	100.00
Net area available	1.88	81.7	2.50	193.0	3.40	104.8	2.59	127.6	4.26	200.0	3.01	153.21

*Note:** Percentage of total cultivated area to the net area available.

Table 8. Paddy area covered under different insurance schemes in the study districts

District	Area covered under insurance (ha)	Sum insured (₹/ha)	Premium (₹/ ha)	Percentage of insured area to total area under the crop (%)	Percentage of insured area to total cropped area	Cost of cultivation (₹/ha)	Percentage of sum insured to cost of cultivation (%)
			NAIS				
Vellore	0.80	9884	178	99.2	52.0	24536	40.3
Nagapattinam	2.29	14826	267	91.9	47.3	26432	56.1
Madurai	0.60	17297	400	39.4	16.9	29101	59.4
			Varsha Bima				
Nagapattinam	2.36	14826	1063	55.5	27.7	29199	50.8

under paddy, that is area covered under crop insurance, accounted for 52 per cent, 47 per cent and 17 per cent of the total cultivated areas of the sample farmers in the above districts, respectively.

In the Nagapattinam district, the paddy area insured under *Varsha Bima* to the total paddy area and the total cultivated area was 56 per cent and 28 per cent, respectively. Thus, the farmers insured their paddy crop ranging from 39 per cent to 99 per cent of the total area under the crop.

Further, one of the complaints against crop insurance schemes by the farmers was that the scale of finance which would be equivalent to the sum insured was far less than the cost of cultivation. Hence, the data on cost of cultivation of different crops cultivated by the sample farmers were collected and the results are given in Table 8. The cost of cultivation included the value of all owned and purchased inputs and also the interest on working capital (@ 7%). The shares of sum insured for paddy to the cost of cultivation in NAIS

Table 9. Problems faced by farmers covered under NAIS in the study districts

(No. of respondents)

Problem faced	Vellore district	Nagapattinam district	Madurai district	Total
Details about NAIS not known	10 (33.33)	25 (83.33)	22 (73.33)	57 (63.33)
Complex procedure / Provisions of the scheme do not address practical problems	9 (30.00)	15 (50.00)	7 (23.33)	31 (34.44)
High premium rate	15 (50.00)	6 (20.00)	8 (26.67)	29 (32.22)
Wide variation between the yields of actual farm and crop cutting experiment	8 (26.67)	12 (40.00)	6 (20.00)	26 (28.89)
Delayed settlement of insurance claims	15 (50.00)	26 (86.67)	5 (16.67)	46 (51.11)

Note: *****Figures within the parentheses indicate the percentages to total.
*Total number of farmers was 90 at the rate of 30 in each district.

implemented districts of Vellore, Nagapattinam and Madurai were 40 per cent, 56 per cent and 59 per cent, respectively. The share of scale of finance for paddy in *Varsha Bima* area of Nagapattinam district was 51 per cent of its cost of cultivation.

Problems Faced by Farmers Covered under NAIS in Study Districts

The problems faced by farmers covered under NAIS, given in Table 9, revealed that major problems were: lack of awareness about the scheme, followed by delayed settlement of claims, complex precedure, perceived high premium and wide variation between the yields of actual farm and that of crop cutting experiment. During personal interaction, many loanee-farmers indicated ignorance about the coverage of their crops under crop insurance. Further, since the compensation was deposited with the borrowers' bank accounts, the farmers did not know whether they were covered under crop insurance scheme, what was the compensation paid to them and when it was deposited. They also expressed problems like wide differences between loss and compensation, delay in payment which was often more than one year, etc.

In the case of *Varsha Bima* scheme in the Nagapattinam district, the major problem faced by the farmers was non-availability of the benefit since the implementation of the crop insurance scheme, which was followed by lack of awareness about the weather insurance schemes, high premium rate, and wide variation in rainfall between the farm and the Reference Weather Station (RWS) (Table 10). The *Varsha Bima* farmers expressed that the product covered only risk againist deficit rainfall and they were not safeguarded against the loss due to inundation of paddy fields caused due to unusual heavy down pour during 2005-06. Consequently, they were not benefitted out of the insurance product during the study period. Further, the rainfall received in the Nagapattinam distirct during the years 2003-04, 2004-05 and 2005-06 was 1406 mm,1661.4 mm and 1622.3 mm, respectively, which was higher than the normal rainfall of 1341.7 mm. Thus, farmers felt that they needed a multi-peril insurance product which could cover both deficit as well as excess rainfall. They also indicated that their location, namely, Kilvelur block was about 10 km away from the Reference Weather Station located at Nagapattinam.

In other research studies also, many problems in the implementation of different insurance products have been indicated and some of them are summarized below.

The Situation Assessment Survey of Farmers done by NSSO in 2003 revealed that at the all-India level, only 4 per cent of the farmers' households reported having ever insured their crops. Among those who had never insured their crops, a very high percentage (57%) was unaware about the practice of crop insurance. Out

Table 10. Problems faced by farmers covered under Weather Based Crop Insurance scheme in Nagapattinam district

(No. of respondents)

Problem faced	*Varsha Bima* scheme-Nagapattinam	Percentage to total
Details about weather insurance scheme not known	27	90.00
Complex procedure / Provisions of the scheme do not address practical problems	15	50.00
High premium rate	20	66.67
Wide variation in rainfall in crop location and rain gauge location	19	63.33
Not availed the benefit, so far	30	100.00

of the remaining 43 per cent, as many as 16 per cent were not interested, 24 per cent believed that the facility was not available to them and 3 per cent expressed that they could not pay the premium. In Tamil Nadu, the percentage was maximum of farmers who did not insure because of lack of awareness (56 %), followed by lack of interest to insure (33 %) and inability to pay premium (2 %). Thus, lack of awareness and interest to insure constitute a large percentage (about 90%) of the population.

A study conducted in the Kanyakumari district by Santhi (1991) had revealed the following problems: (i) the entire block was treated as the homogeneous area for conducting crop cutting experiments; (ii) threshold yield was taken as the normal yield which, however, rarely indicated the yield levels of the areas affected by adverse climatic conditions; (iii) high rate of premium; and (iv) delayed settlement of indemnity.

Dhan Foundation with its experience in implementing weather-based insurance product has indicated the following problems: (i) wider variations in rainfall even within the zone of the rainfall station (30-40 km radius); and (ii) very high premium rate, ranging from 15 per cent to 38 per cent along with a service tax of 10.2 per cent in the case of private insurance agency. It has also suggested to install more number of automatic weather stations for the effective and purposeful implementation of weather-based insurance schemes.

Suggestions of Farmers to Refine the Existing Crop Insurance Schemes

The interaction with farmers covered under different insurance products indicated that both yield as well as weather based insurance products were more useful to them. However, these schemes need to be refined to be more effective.

(a) Suggestions to Refine Yield-based Insurance Products

- A permanent cell or office may be established by AICIL at the district level for effective planning, monitoring and development of crop insurance schemes. A wide publicity should be given by the insurance agency on specific features of crop insurance schemes to generate awareness among the farmers.
- To reduce yield difference, between the yield of insured farm and threshold yield, a village / contiguous area (irrespective of its location in a specific *phirka* or block) in which a crop is cultivated in more than 20 ha, may be considered for notification and a crop cutting experiment may be conducted in that area.
- The task of conducting the crop cutting experiments may be entrusted to a committee consisting of officials from the Department of Agriculture, Department of Economics and Statistics, nationalized banks and non-governmental organizations (NGOs).
- There is a provision under NAIS to insure individual farms against localized risks, namely, hailstorm, landslide, cyclone and flood. Banana or any other perennial crop should also be insured and the loss assessment could be done based on head count method, i.e. the percentage of number of banana plants / tree crops lodged due to heavy winds can be assessed. However, this insurance facility is not popular among farmers. Therefore, efforts need to be initiated to popularize crop insurance scheme that covers all cash crops or perennial crops and also the coverage of individual farms against the localized perils under NAIS.

- The delay of 9-12 months in the settlement of indemnity in case of yield loss to the farmers should be minimized by intimating the yield data of Crop Cutting Experiments to AICIL within one month after the conduct of the experiments.
- Premium may be fixed at a uniform rate of 2 per cent, irrespective of crop or season or category of farmers as against the current practice of fixing premium rate ranging from 1.85 per cent for potato to19.35 per cent in the case of maize, depending upon the type of crops.
- Fifty per cent of the premium paid by the farmers may be returned to them, if they did not realize any indemnity during the past three years.
- Actuarial premium rate may not be fixed for any crop or any category of farmers, as only a few farmers opt for higher indemnity level which warrants higher actuarial premium. This is also because not all the farmers are currently opting to insure their crops. It is an evolving process. When all the farmers or most farmers come forward seeking coverage on a continuous basis, raising premium or charging premium on actuarial basis may be adopted.
- The scale of finance should be enhanced by the financial institutions as it accounts for only 40 – 60 per cent of the cost of cultivation for different crops.

Suggestions to Refine Weather-based Crop Insurance Products

(i) To address the problem of difference between the rainfall received in the village and at the Reference Weather Station, an automatic rain gauge station may be installed to cover an area of 3- km radius, to start with.

(ii) Premium rate may be slashed down to 2 per cent from the current rate of 7 per cent plus a service tax of 12.36 per cent on premium collected.

Conclusions

Although several attempts have been made by various crop insurance agencies to address the crop insurance related issues faced by the farmers, the success has been limited. The experience shows that agricultural insurance has fared poorly, at least in part, because of problems related to moral hazards and adverse selection resulting from asymmetric information. Therefore, better information dissemination is required to control the adverse selection and moral hazards and access to such information should be at a nominal cost. Traditional crop insurance based on individual yields and field inspections are expensive to administer in India due to a large number of marginal and small farms. Appropriate measures should be adopted to refine and update the existing insurance products so as to make them more effective and useful under different farming situations.

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