



Research Article

CROP INSURANCE IN NORTH EASTERN STATES OF INDIA: PERFORMANCE OF NATIONAL AGRICULTURAL INSURANCE SCHEME

THANGJAM DEEPA, OZUKUM LIMASUNEP* AND FEROZE S.M.

College of Post-Graduate Studies, Central Agricultural University, Umiam, 793103, Meghalaya, India

*Corresponding Author: Email - sunepzswaggyp@gmail.com

Received: April 22, 2018; Revised: June 10, 2018; Accepted: June 12, 2018; Published: June 15, 2018

Abstract: This paper assessed the performance of crop-based insurance scheme NAIS in north-eastern (NE) states of India. The secondary data for the study for 15 crop years since the inception of NAIS from the period 1999-00 to 2013-14 was collected from the Agricultural Insurance Company of India Limited (AIC). The performance indicators viz., area insured per farmer, percentage of farmers benefitted, ratio of claims paid over gross premium, claims paid per farmer and profit to companies were estimated. During the 1999-00 to 2013-14 only in five NE states viz., Assam, Meghalaya, Manipur, Sikkim and Tripura the scheme was implemented. In Mizoram, NAIS was implemented only in 2009-10 whereas; in states like Nagaland and Arunachal Pradesh it was not implemented. The total area covered and the number of farmers insured was not noteworthy. It was found that there was significant increase in trend of coverage of farmers and area insured for the state like Assam, but for states like Meghalaya and Tripura, the increase was marginal and negative for Manipur and Sikkim. Parameters like claims paid and farmers benefitted have a significant effect on the area insured and farmer's coverage over the years and play a vital role in increasing the area insured and farmer's coverage, ultimately deciding to participate in crop insurance.

Keywords: Crop insurance, performance, NAIS, North East India, AIC, claims paid, farmers benefitted

Citation: Thangjam Deepa, *et al.*, (2018) Crop insurance in North Eastern States of India: Performance of National Agricultural Insurance Scheme. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 10, Issue 11, pp.- 6325-6329.

Copyright: Copyright©2018 Thangjam Deepa, *et al.*, This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Introduction

Agriculture is a risky enterprise in India due to production as well as market risk. The production risk is linked with weather variability. Crop insurance is believed to protect the farmers against such misfortunes by covering risk. It is a form of risk management instrument which is purchased by agricultural producers, that ensures full or partial compensation for the loss or decline of crops due to natural disaster, such as flood, drought, hail etc. It also compensates the loss in revenue due to decline in the prices of agricultural commodities. Under it, the insurer indemnifies the agricultural producer (insured) within a specified period in lieu of a fee called premium is paid. The growing climate changes and sharp fluctuations in agricultural prices have underscored the risk due to unfavourable eventualities, where crop insurance is a mechanism to cover risk in agriculture. A number of policy-level experiments in crop insurance were initiated by Government of India to cover risk in agriculture. Agriculture insurance was first initiated in 1972-73 when the General Insurance Corporation (GIC) of India introduced a crop insurance scheme on H-4 cotton, which later included groundnut, wheat and potato. After gaining the experience, the Pilot Crop Insurance Scheme (PCIS) launched by the GIC in 1979 and Comprehensive Crop Insurance Scheme (CCIS) was introduced by the Central Government during the year 1985-86. CCIS was subsequently replaced by the National Agricultural Insurance Scheme (NAIS) owing to its various shortcomings and it became operational from 1999-2000 *rabi* season. These are crop based insurance schemes which indemnifies the cultivators against the shortfall in crop yields and where claim assessment is made for every individual insured farmer who has suffered a loss based on individual approach. On the contrary to these, Weather Based Crop Insurance Scheme (WBCIS) which was introduced in 2007-08, indemnifies against the crop loss due to adverse weather incidences and based on area approach where sum assured is pre-defined. India is emerging as one of the largest crop insurance industries globally with constant efforts from the government in offering an effective

insurance to the farmers through improving and trying various crop insurance products since 1972. India stood eighth rank till last year in terms of volume of crop insurance but with the introduction of PMFBY, it jumped to third position [1]. The North East (NE) India comprising of Assam, Arunachal Pradesh, Nagaland, Mizoram, Meghalaya, Manipur, Tripura and Sikkim has a diverse agricultural production owing to its varied climatic condition. It is one of the most disaster-prone regions in the world owing to its physiological and climatic condition. Like the other parts of India, the region also suffers crop losses almost every year either due to flood or drought or frost/extremes temperatures or localized calamities such as hailstorm, landslides, cyclones etc. which ultimately leads to risk in agricultural production and farm income. Majority of the farmers in NE region practice subsistence farming as their operational holdings are small and marginal in size and they do not have access to credit too. At the same time the crop insurance schemes have not been able to make the expected impact much in NE India as these states are least insured [2]. In states viz., Arunachal Pradesh, Mizoram and Nagaland the scheme was not present, while in Manipur NAIS was implemented in all the districts of the state since the year 2009. Assam is the only state covered under NAIS totally since its inception. In Meghalaya, NAIS was implemented from 2000-01 and from the next crop year onward (2001-02), it was implemented in Sikkim and Tripura. The Pradhan Mantri Fasal Bima Yojana (PMFBY) which was launched during *rabi* 2016-17 in Assam does not cover all the states of NE India. The other states of NE India where PMFBY is implemented are Tripura and Manipur. Against this background, this paper aims to examine the performance of National Agricultural Insurance Scheme (NAIS) in NE states of India. For the present study NAIS has been undertaken due to the data availability for a comprehensive period. National Agricultural Insurance Scheme (NAIS) was introduced in 1999-2000 *rabi* season owing to its various shortcomings of CCIS. NAIS was made available to both the loanee and non-loanee farmers and

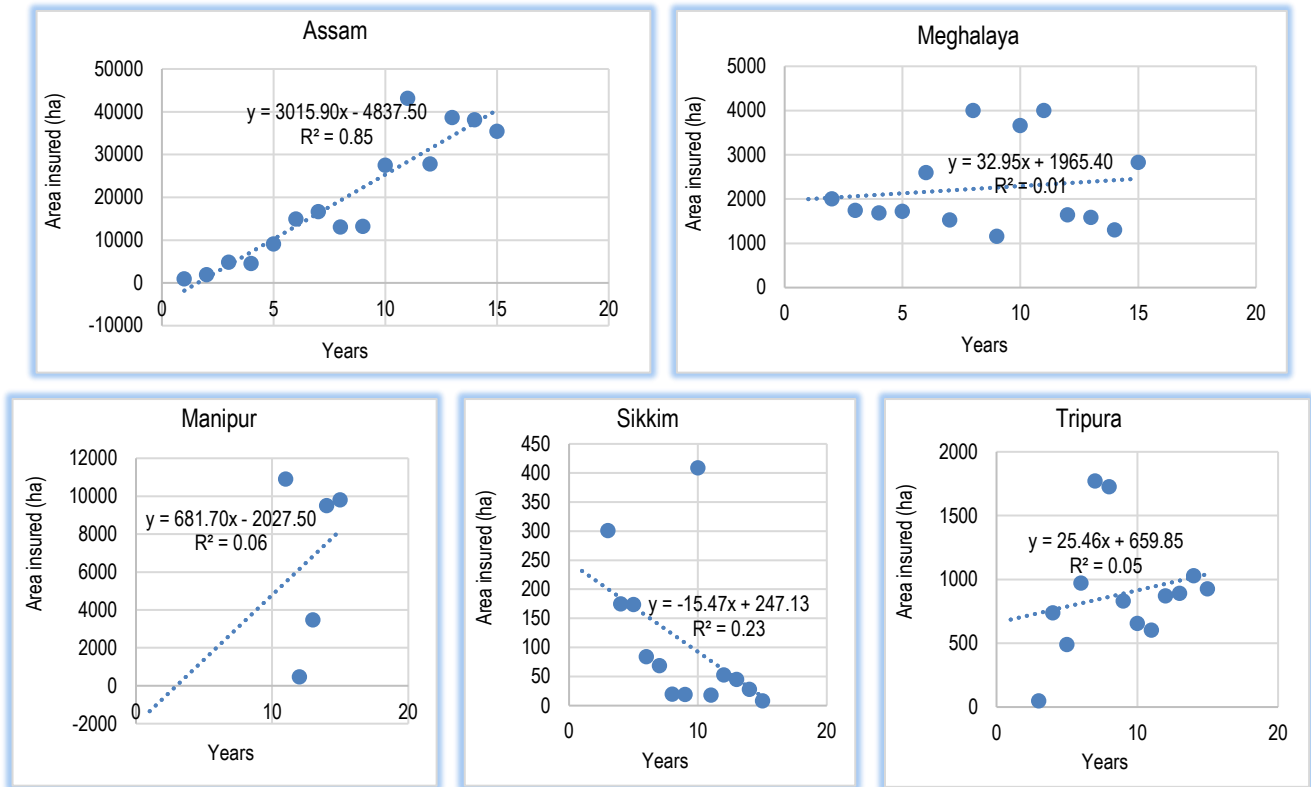


Fig-1 Area insured under NAIS in NE states

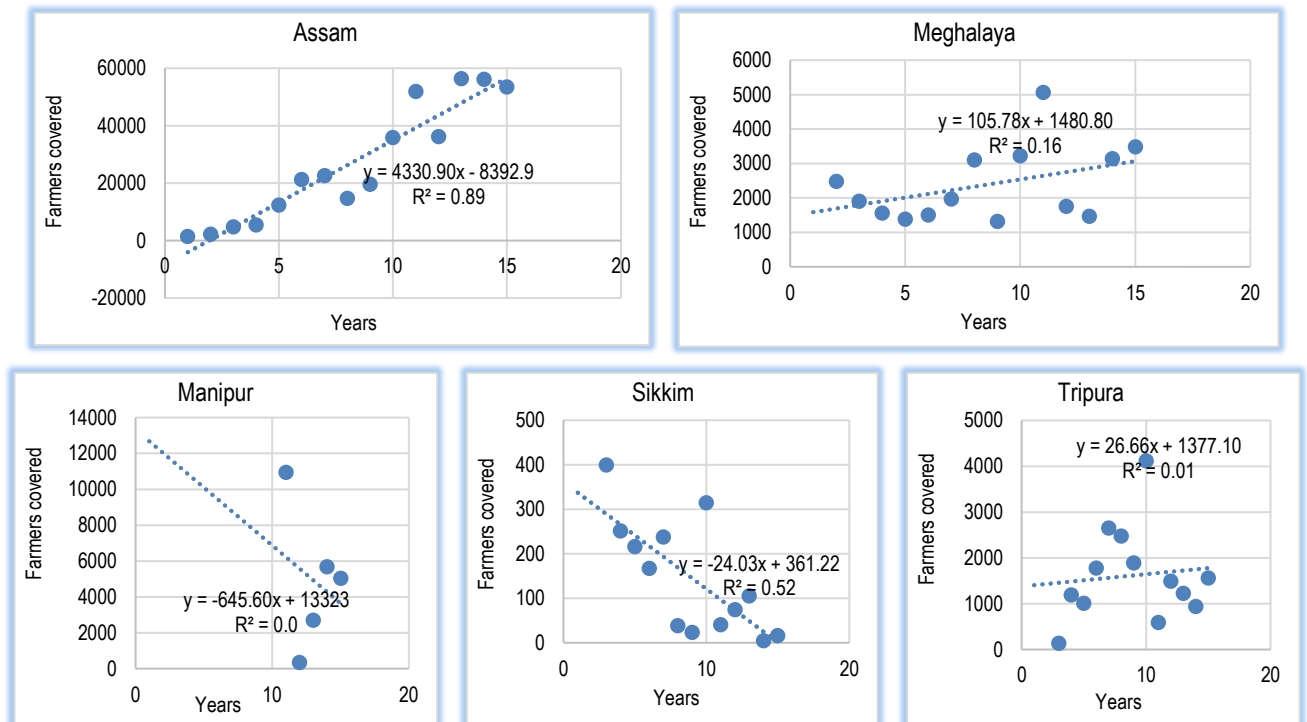


Fig-2 Farmers covered under NAIS in NE states

Table-1 Annual Growth of NAIS from 1999-2000 to 2013-2014

SN	Year	Area insured (ha)					
		Assam	Manipur	Meghalaya	Sikkim	Tripura	NE
1	TE 2003-04	6120.00	0.00	1715.33	216.67	425.67	8477.667
2	TE 2008-09	17886.67	0.00	2938.33	149.33	1071.33	22045.67
3	TE 2013-14	37363.33	7596.33	1903.33	27.00	949.67	47839.67
	CAGR	27.13	32.03	0.86	-18.57	10.62	25.84
SN	Year	Farmers covered (numbers)					
		Assam	Manipur	Meghalaya	Sikkim	Tripura	NE
1	TE 2003-04	7530	0	1613	289	775	10207
2	TE 2008-09	23350	0	2549	125	2826	28850
3	TE 2013-14	55267	4463	2693	42	1240	63704
	CAGR	28.44	13.76	3.97	-22.66	6.49	26.15

Source: Extracted from [3] and calculated by authors

Table-2 Year-wise performance of NAIS

SN	Year	Assam	Manipur	Meghalaya	Sikkim	Tripura	NE
Area insured per farmer (ha)							
1	TE 2003-04	0.85	0.00	1.08	0.75	0.49	0.85
2	TE2008-09	0.78	0.00	1.10	0.88	0.43	0.78
3	TE2013-14	0.68	1.64	0.77	2.64	0.55	0.75
	Overall	0.73	1.39	0.94	0.74	0.55	0.78
Percentage of farmers benefitted							
1	TE2003-04	20.74	0.00	17.79	11.42	26.71	21.83
2	TE2008-09	18.58	0.00	4.93	0.00	9.89	15.63
3	TE2013-14	15.65	75.08	4.83	0.00	0.00	18.68
	Overall	16.88	80.92	8.32	4.56	16.33	19.55
Claims paid per farmer (₹)							
1	TE2003-04	1358.75	0.00	1331.66	496.12	692.43	1474.34
2	TE2008-09	2211.91	0.00	17610.34	0.00	955.47	2205.68
3	TE2013-14	3291.38	3751.86	1804.96	0.00	0.00	4568.75
	Overall	2341.85	3870.45	1705.27	1488.37	1699.01	2635.79
Ratio of claims paid over gross premium							
1	TE2003-04	1.04	0.00	2.20	5.33	2.05	4.73
2	TE2008-09	2.89	0.00	2.24	0.00	1.27	3.29
3	TE2013-14	0.43	6.97	1.39	0.00	0.00	4.48
	Overall	0.70	4.98	1.42	5.33	1.17	5.39
Profit to companies (₹Lakh)							
1	TE2003-04	-0.67	0.00	-3.40	-0.12	-1.36	-5.54
2	TE2008-09	3.00	0.00	-2.20	0.30	8.46	9.56
3	TE2013-14	251.00	-133.92	1.09	0.44	5.20	123.82
	Overall	45.27	-111.75	-0.58	0.19	1.74	8.44

Source: Extracted from [3] and calculated by authors

Table-3 Effects of insurance characteristics on area insured and farmers covered

Dependent Variable (Y)	Constant	Independent variable			
		Claims paid		Farmers benefitted	
		Standardized Beta	Unstandardized Beta	Standardized Beta	Unstandardized Beta
Area insured	7063.30* (0.083)	0.549***	<0.00*** (0.002)	0.714***	1.721*** (<0.00)
R ² =0.803					
Farmers covered	9267.56 (0.80)	0.561***	0.001*** (0.002)	0.702***	2.170*** (<0.00)
R ² =0.799					

***&* indicate p<0.01 & p<0.10, respectively, Note: Figures in bracket indicate p-values

operates on both area approach and individual approach. Under this scheme, all food grains, annual horticultural/commercial crops and oilseeds were covered. The yield data for these crops were available for a sufficient number of past years. The average of last three years for wheat and rice and five years for other crops multiplied by the indemnity level is the threshold yield. The sum insured is equal to the amount of loan availed in case of loanee farmers and up to 150% of the average yield for non-loanee farmers. The premium rates applicable on the sum insured are different for different crops such as for bajra and oilseed the premium rate is 3.5%, other kharif crops is 2.5%, wheat is 1.5%, other rabi crops is 2.0% and for annual commercial/horticultural crops is the actuarial rate. Subsidized premium of 50 percent was charged to small and marginal farmers which were shared equally between central Government and State Government. At present only 10 per cent subsidy is available to small and marginal farmers. Past yield

data as well as actual yield data based on Crop Cutting Experiments (CCEs) is required for NAIS. Based on the final yield estimates submitted by States, the claims are settled and there is no provision to provide for in season / on-account settlement of claims.

Methodology

The study area includes all NE states where NAIS is implemented, namely Assam, Manipur, Meghalaya, Mizoram, Sikkim and Tripura. The secondary data for the study for 15 crop years since the inception of NAIS from the period 1999-00 to 20013-14 was collected from the Agricultural Insurance Company of India Limited (AIC) pertaining to NE states. The performance indicators viz., area insured per farmer, percentage of farmers benefitted, ratio of claims paid over gross premium, claims paid per farmer and profit to companies using the following formula:

$$\text{Area insured per farmer (₹)} = \frac{\text{Area insured (ha)}}{\text{No. of farmers}} \dots\dots (1)$$

$$\text{Percentage of farmers benefitted} = \frac{\text{No. of farmers benefitted}}{\text{No. of farmers insured}} \times 100 \dots\dots (2)$$

$$\text{Ratio of claims paid over gross premium} = \frac{\text{Claims paid (₹)}}{\text{Gross premium (₹)}} \dots\dots (3)$$

$$\text{Claims paid per farmer (₹)} = \frac{\text{Claims paid (₹)}}{\text{No. of farmers}} \dots\dots (4)$$

$$\text{Profits to companies} = \text{Gross premium (₹)} - \text{Claims paid (₹)} \dots\dots (5)$$

Results and Discussion

Trends and annual growth in area insured and farmers covered

During the entire period from 1999-00 to 2013-14, only five states viz. Assam, Meghalaya, Manipur, Sikkim and Tripura of NE India participated in NAIS. In Mizoram, NAIS was implemented only in 2009-10 whereas, states like Nagaland and Arunachal Pradesh it is even not implemented. The coverage of farmers and area insured under NAIS are represented in Fig-1 and Fig-2. A significant increase in trend of coverage of farmers and area insured for the state Assam was observed. The numbers of farmer covered and area insured during 1999-00 was 1400 and 880ha, respectively which increased to 53420 and 35410ha, respectively during 2013-14. For the states like Meghalaya and Tripura, the increase in coverage of farmers and area insured was marginal. In Meghalaya, the coverage of farmer and area insured was 2474 and 2000ha during 2000-01 which increased to 3478 and 2830ha, respectively during 2013-14. While in Tripura, the coverage of farmer and area insured was 131 and 48ha during 2001-02, which increased to 1556 and 927ha, respectively during 2013-14. There was negative trend in coverage of farmers and area insured in Manipur and Sikkim. The coverage of farmers and area insured under NAIS in Manipur was 10930 and 10907ha, respectively in 2009-10 which declined during 2013-14 to 5030 and 9802ha, respectively. Mizoram had only implemented NAIS during 2009-10 in which the coverage of farmers and area insured was 121 and 133ha, respectively (Annexure I). This indicates that NE states are lacking behind all other states of India regarding risk management in agriculture.

[Table-1] illustrates the growth of NAIS from 1999-2000 to 2013-14 in NE India. Assam exhibited a significant growth of 27.13 per cent and 28.44 per cent for area insured and farmers covered, respectively. The state has the highest coverage of farmers and area insured among all the NE states. The average area insured increased almost thrice that in TE 2003-04 (6120ha) during TE 2008-09 (178867ha) and further it increased approximately twice during TE 2013-14 (37363ha) from TE 2008-09. The average number of farmers covered during TE 2003-04 was 7530 which increased to almost three times to 23350 during TE 2008-09. This again increased to double fold during TE 2013-14 than that of TE 2008-09. In Manipur, the growth rate in case of area insured was higher (32.03%) in relation to farmers covered (13.76%) in between 2009-10 to 2013-14. The average area insured and number of farmers covered for the state during TE 2013-14 was 7596.33ha and 4463, respectively. On the contrary to this, the growth rate in area insured and coverage of farmers was marginal over the years in the states like Meghalaya and Tripura. A decreasing trend in growth in area insured (-18.57%) and coverage of farmers (-22.66%) can be observed for the state of Sikkim during 2001-02 to 2013-14. With all this said, the overall growth of NAIS in the NE states since its inception in 1999-00 to 2013-14 remains to be 25.84 per cent in case of area insured and 26.15 per cent in case of farmers covered, but this growth seems to be skewed across the states and hence, efficiency of NAIS is not observed equally in all the states of NE India.

Performance indicators

[Table-2] captures the performance of NAIS over the years in the NE states of India. The area insured per farmer under NAIS was largest in Sikkim (2.64ha) during TE2013-14, followed by Manipur and Meghalaya. On the contrary to increasing growth over the years both in coverage of farmers and area insured per farmer, area insured declined in Assam in between TE 2003-04 and TE 2013-14. Overall, the triennium average area insured per farmer under NAIS in NE India is 0.78 ha/farmer. This clearly indicates that the growth of NAIS in NE India is static. Manipur tops in case of percentage of farmers benefitted during the TE 2013-14. A decreasing trend of percentage of farmers insured can be observed in all the states of NE. Claims paid per farmer was highest during TE 2008-09 in case of all

the states, except Manipur and Sikkim where no claims were paid in TE 2008-09. The average claims paid per farmer was only ₹2206 in TE 2008-09 and increased to ₹4569 in TE 2013-14 in NE. However, the ratio of claims paid over gross premium is highest for the state Manipur (6.97) during TE2013-14 compared to all other states. In Assam, the ratio of claims paid over gross premium over the years is found to be maximum during TE2008-09 (2.89). While for the remaining states, there is a decreasing trend in the ratio of claims paid over gross premium over the years. As a whole, NE states have a meager increase in this ratio from TE2008-09 (3.29) to TE2013-14 (4.48). It may be interesting to know that over the years the profit to companies for NE has increased from a loss of ₹5.54 lakh during TE 2003-04 to ₹123.82 lakh during TE2013-14. This is because of the fact that over the years the profit to companies is improving steadily in all the states of NE except in Manipur. Despite the fact that there is a risk of crop failure due to certain unavoidable eventualities, it is explicitly understood from the above discussion that farmers are not invigorated to insure their crops. This may be due to lack of awareness about the insurance scheme and high premium rates.

Further, we ran a regression model to determine the effect of claims paid and farmers benefitted on the area insured and farmers covered of the scheme NAIS. The approach to understand the relationship is depicted in equation (6) and (7) below.

$$\text{Lagged value (Area insured under NAIS)} = \alpha + \beta_1 * \text{lagged value (claims paid)} + \beta_2 * \text{lagged value (farmers benefitted)} + \epsilon \dots\dots (6)$$

$$\text{Lagged value (Farmers covered under NAIS)} = \phi + \lambda_1 * \text{lagged value (claims paid)} + \lambda_2 * \text{lagged value (farmers benefitted)} + \mu \dots\dots (7)$$

Where ϵ and μ are the error terms.

The results indicate that both claims paid and farmers benefitted have a significant effect on the area insured and farmers' coverage over the years [Table-3]. It can be noted that claims paid and number of farmers benefitted play a vital role in increasing the area insured and farmers' coverage, ultimately deciding to participate in crop insurance.

Conclusion

This paper with a clear objective illustrated the performance of crop-based insurance scheme NAIS with respect. It is evident from the results that despite launching the NAIS in NE states as a means of risk management, it has served very limited purpose. The coverage in terms of area and number of farmers is very limited. The penetration of NAIS is very inadequate as can be observed from the indicators such as area insured per farmers, percentage of farmers benefitted, claims paid per farmer, ratio of claims paid over gross premium and profit to companies. The insurance schemes are generally forcefully sold along with the crop loans. The obvious reason may be due to lack of awareness about the insurance schemes or high premium. As a means to increase the coverage of area and number of farmers, claims paid and number of farmers benefitted plays a vital role. The Government of India has also introduced PMFBY recently as a complementary scheme covering both areas leased crop yield and weather-based insurance with certain innovative measures and improved premium price. However, the problem is that this scheme has penetrated in some of the NE states and not all. It is also clear that NAIS alone is not sufficient to cover all the risk and so, penetrations of all other schemes are also equally important. If crop insurance is to be made an important tool for risk management in NE region then, the present level of coverage of crop insurance will have to be improved by many folds.

Application of research: This study will be helpful to understand the penetration of the NAIS scheme in the NE region and to identify the key parameters influencing the success or failure of this scheme in the region.

Research Category: Crop insurance, NAIS

Abbreviations

AIC	:	Agricultural Insurance Company
CAGR	:	Compound Annual Growth Rate

CCEs	:	Crop Cutting Experiment(s)
CCIS	:	Comprehensive Crop Insurance Scheme
GIC	:	General Insurance Corporation
IANs	:	Indo Asian News Service
NAIS	:	National Agricultural Insurance Scheme
NE	:	North East
PCIS	:	Pilot Crop Insurance Scheme
PMFBY	:	Pradhan Mantra Fasal Bima Yojana
TE	:	Triennium
WBCIS	:	Weather Based Crop Insurance Scheme

Acknowledgement/Funding: Author thankful to Central Agricultural University, Umiam, 793103, Meghalaya

***Research Guide or Chairperson of research: S.M. Feroze**

University: Central Agricultural University, Umiam, 793103, Meghalaya

Research project name or number: MSc Credit Seminar

Author Contributions: All author equally contributed

Author statement: All authors read, reviewed, agree and approved the final manuscript

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

References

- [1] IANS (2017) *Indo Asian News Service*, 24th May 2017.
- [2] Dey K. and Maitra D. (2017) *Economic & Political Weekly*, 52(52).
- [3] AIC (2018) *Agricultural Insurance Company of India Ltd, New Delhi*, accessed on February, 2018.