Report II

Analysis of Samrakshane and Bhoomi data to examine farmer enrolment patterns and trends by landholding size, seasons, crops grown and farmer type across the three districts of Uttara Kannada, Gadag and Raichur

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Research Objective

To analyze farmer's enrolment patterns in crop insurance scheme (PMFBY) and trends across two main seasons (Kharif and Rabi 2016 and 2017), landholding size (total sown area and total insured area), crops grown and farmer types (loanee and non loanee, caste demographics) across the three districts of Uttara Kannada, Gadag and Raichur.

Introduction

The three districts of Gadag, Uttar Kannada and Raichur were chosen to understand in more detail the patterns and trends in enrollment for PMFBY scheme in Karnataka. These three districts were specifically chosen due to variations in both crops sown as well as agro-climatic conditions. More details regarding the rationale for selecting these three districts is briefly mentioned below.

On examining the enrollment data it was apparent that crops with the largest sown area in the state were Paddy and Maize, further, it was necessary to capture some of the variations in agro-climatic zones present. Moreover, enrollment in crop insurance in these three districts was comparatively higher; this ensured a large enough sample of enrolled farmers in each insured unit or GP, who grew the major crops i.e. either Paddy or Maize. These districts also represent some of the agro-climatic zones that dominate the state of Karnataka. A study of patterns in enrolment across these districts is expected to lead to an understanding of some of the variation and also some of the similarities in enrolment across the state of Karnataka.

The first section of this report provides a description of the three districts chosen for analysis, followed by a section on the operation of PMFBY in these districts, which will examine the patterns and trends in enrolment based on seasons, landholding size, crops grown and farmer type. The goal of this objective is to first document some of the patterns and trends and variations and similarities observed, across the three districts by using available data present in Samrakshane (crop insurance) and Bhoomi (Land Records) Portals. It is also hoped that Centre

for Budget and Policy Studies (CBPS) earlier study[1] which involved on- field interviews, observations, and interviews with officers and insurance companies would help in a more detailed understanding of these patterns and trends observed and hence suggest certain possible explanations.

Introduction to Samrakshane Portal

National Informatics Centre, Karnataka State unit has designed, developed and successfully rolled out an end-to-end e-Governance solution named SAMRAKSHANE (meaning PROTECTION) for Agriculture and Horticulture Department to handle crop insurance activities under both PMFBY & R-WBCIS.

Through this portal Agriculture/ Horticulture Department can generate crop insurance gazette notification and Banks, Insurance Channel Partners, Raitha Samparka Kendras (RSKs) can enroll farmers for crop insurance under PMFBY & R-WBCIS. Portal will enable Agriculture & Horticulture Department for issuing prevented sowing and Mid-term adversity notifications. Farmers can raise claims for localized risks and post-harvest losses themselves without calling help desk or visiting banks. The portal is also used for automatic generation and assignment of crop cutting experiment (CCEs) based on randomization technique to pick plots for conducting CCE along with recording geo-coordinates, photos and videos. Compensation calculation is fully automated using actual yield data obtained from CCEs after applying area discrepancy factor. Insurance companies have facility to acknowledge enrolments, view compensation details, approve the same and access various reports. Insurance companies have been provided with web service to update payment details back to Samrakshane. Term sheets have been captured digitally under R-WBCIS and compensation calculation automated using electronically received weather data from Karnataka State Natural Disaster Management Centre (KSNMDC). SMS sent to farmers at all important stages.

This study analyses Samrakshane portal data to examine the enrolment patterns in crop insurance scheme, trends across two main seasons, total insured area, crop covered under the scheme and farmer types.

[1] Understanding the potential of crop insurance in India: A study of the Pradhan Mantri Fasal Bima Yojana Scheme, CBPS, 2017.

Introduction to Bhoomi Portal

Revenue Department of Karnataka Government digitized all the land records through Bhoomi Portal in the year 2000. All land related documents such as Record of Rights, Tenancy and Crops (RTC) or Pahani, Mutation Report were digitized and made available to citizen/farmer through Kiosk Centres. All lands can be digitally mapped using Revenue Maps available in Bhoomi Portal. The Bhoomi (meaning land) is an online portal for delivery land records in Karnataka. Introduction of Bhoomi made the Government land records made it more transparent to the citizens. The Department of Revenue in Karnataka has computerised land ownership of farmers in this portal. Bhoomi portal is enhancing transparency and providing greater access to land record information.

This study analyses Bhoomi portal data to examine the landholding size of farmers and type of crops grown across these three districts to compare with insured area and crop cover under crop insurance scheme (PMFBY).

District Profiles

Gadag

Gadag is a relatively newly district, formed in 1997 when the District of Dharwad was partitioned. According to the 2011 census the total population of Gadag was 10644570 Crores people, who account for 1.7 % of the total population of the state of Karnataka. Agricultural laborers account for 40.4 % of the workforce and cultivators account for 25.7 % of the total workforce (Census, 2011). A number of small scale industrial units in the district are engaged in agriculture and food processing (*Karnataka at a glance, DIC- Gadag -2013-14).*

When the land use in the district is examined it is found that net sown area in the district is 84% (University of Agricultural Sciences, 2018) of the total land area. The taluks in the district can be classified under two agro-climatic zones namely the Northern Dry zone and the Northern Transition Zone (Centre for Ecological Studies, 2018). The rainfall in the Northern Dry zone ranges from 464.5-785.77 mm, and about 52% of this annual rainfall is received during the Rabi season(Government of Karnataka. 2018).Whereas, in the Northern Transition zone the annual rainfall ranges from 619.4- 1053.9 mm, and about 61% of the rain is received in the Kharif

season. The soils in these areas are variations of black clay and red sandy loam and facilitate the growing of cereals such as Wheat, Jowar and Maize, followed by pulses such as Bengal Gram and Green Gram (Government of Karnataka. 2018).

Raichur

Raichur is a district located in the North Eastern part of Karnataka, and accounts for 3.2 percent of the total population of the state. A majority of the work force in this district is involved in the Agricultural Sector i.e Cultivators (27.2 %) and Agricultural labour (42.5%) (Census, 2011).

The net sown area in this district is 32.50% of the total land area (University of Agricultural sciences, 2018). Cereals such as Paddy, Bajra and Sorghum account for 45.58 % of the cropped area(University of Agricultural sciences, 2018). The agro- climatic zones in this region are the North- Eastern Dry Zone and the Northern Dry Zone. The North Eastern dry zone is one of the major agro climatic zones (Centre for Ecological Studies, 2018), in terms of area covered. The rainfall in this zone varies from 633.2 to 806.6 mm. In this zone 55% of the rainfall is received during the Rabi season. A part of the district is also categorized under the Northern Dry Zone, the annual rainfall in this region varies from 464.5-785.7 mm and around 52% of the annual rainfall, in this zone is received during the Rabi season (Government of Karnataka , 2018). The soil in this region is deep black clay and hence conducive for growing crops such as Rabi Jowar, Bajra, Pulses, Oilseeds and Cotton(Government of Karnataka , 2018). However, the building of a major dam has led to large tracts of Raichur being irrigated and hence irrigated Paddy has also emerged as a significant crop in this region.

Uttara Kannada

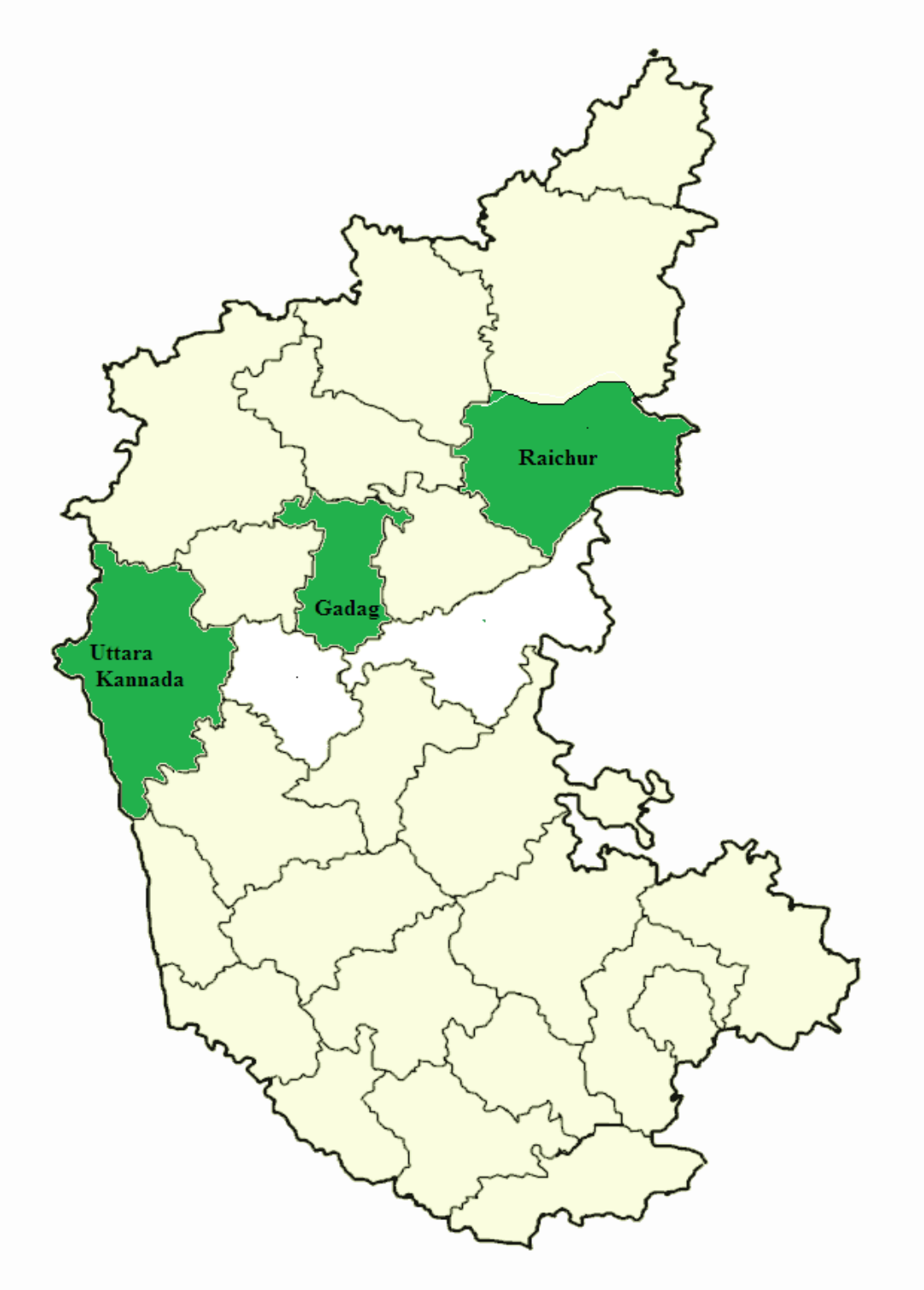
The total population of Uttara Kannada district is 1437169 Crores and accounts for 2.4% of the total population of the state(Census, 2011). The agricultural sector employs 37.4 percent of the total workforce, of which cultivators account for 18.3% and agricultural laborers 19.1 %. A majority of the land area in this district is forest. Net sown area accounts for 18.2% of the total land area (University of Agricultural Sciences, 2018). Cereals account for 88.42% of the total cropped area. The major cereals here are Paddy, Maize and Jowar (University of Agricultural sciences, 2018).

Five of the taluks in Uttara Kannada are in the hilly agro-climatic zone and the remaining are in the coastal zone (Centre for Ecological studies, 2018). The annual rainfall in the hilly region varies from 904.4-3695.1 mm, and a majority of the rainfall is received during the Kharif season (75%). The soil found here is red sandy loam (Government of Karnataka, 2018).

The other agro-climatic zone in the district, the coastal zone is a major agro-climatic zone which covers a significant portion of the state (Centre for Ecological Studies, 2018). The annual rainfall in the coastal zone is very high and varies from 3010.9 - 4694.4mm. Most of the rainfall is received during the South West monsoon season (80%). The soil that dominate this agro-climatic zone are red lateritic and coastal alluvial soils (Government of Karnataka, 2018).

As seen in the map below the three districts chosen for the study are located in the central and northern regions of the state. These are the regions of the state in which enrollment in crop insurance has been historically high across all seasons. Further, these are also the regions of the state where a number of Rabi crops are grown.

Figure 1: Districts which are enrolled in Crop Insurance



Source: http://mapsof.net/karnataka/blank-map-of-karnataka

Enrollment footprint of Gadag, Raichur and Uttara Kannada

One of the goals of PMFBY is to insure maximum farmers and sown area in the state. Table 1 illustrates loanee and non-loanee farmers covered, insured and sown area across the four seasons for each of the three districts as a percentage of the entire state.

Table 1: Number of Farmers enrolled and insured and sown area

(In Percentage)

Season	Loanee Farmers Enrollment	Non-Loanee Farmers Enrollment	Insured area	Sown Area
Gadag				
Kharif 2016	13.03	12.79	9.23	4.41
Kharif 2017	8.39	10.29	8.44	4.09
Rabi 2016	5.28	18.38	15.21	10.65
Rabi 2017	17.27	3.44	8.02	14.82
Raichur				
Kharif 2016	7.05	0.48	5.87	4.49
Kharif 2017	4.54	0.11	2.05	3.53
Rabi 2016	12.36	9.21	8.85	9.01
Rabi 2017	0.03	0.00	0.02	0.003
Uttara Kannada				
Kharif 2016	12.43	0.33	3.57	0.98
Kharif 2017	17.24	0.28	2.47	1.09
Rabi 2016	0.76	0.23	0.07	0.09
Rabi 2017	0.00	5.93	0.41	0.09

Source: Department of Agriculture, Government of Karnataka

It appears that irrigation, climate and cropping season play a meager role in the percentage of the area insured. The Kharif season is the season in which most of the crops are grown and therefore across the years, both in percentage sown and number of farmers enrolment in Kharif season is significant. 2016 was a draught year and, therefore, we observe an unprecedented enrollment in the Rabi season of 2016. There appears little enrolment in Rabi 2017, possible explanations being firstly, the presence of good rainfall and climatic conditions and secondly, the delay in claims during the previous seasons led to a lack of enthusiasm among farmers to enroll for insurance.

In the district of Uttara Kannada enrollment and area insured was more in Kharif season than in Rabi. Most of the crops are rainfed and most of the farmers avail SAOL's from PACs, possibly,

leading to high enrollment in crop insurance. Our field work also suggested that PAC's in Haliyal are very active in encouraging farmers to enroll in crop insurance. A large portion of Raichur is irrigated; this could explain the low levels of enrolment during the Kharif season.

District-wise Enrollment Patterns

Caste wise enrollment across districts and seasons

There aren't any additional benefits for the SC & ST community in this scheme. This database is maintained by the state Government for analysis and to use in formulation of other schemes (Table 2).

Table 2: Caste wise enrollment details (2011 census data considered)

(In Percentage)

District	Caste	Kharif 2016	Kharif 2017	Rabi 2016	Rabi 2017	Summer 2016	Summer 2017
Gadag	Others	60.19	65.66	92.96	0.82	0.04	0.01
	SC	2.41	2.61	4.83	0.04	0.00	0.00
	ST	1.23	1.35	2.72	0.01	0.00	0.00
Raichur	Others	11.89	6.27	23.51	0.00	0.41	0.11
	SC	0.56	0.21	2.19	0.00	0.01	0.00
	ST	1.00	0.42	2.85	0.00	0.00	0.00
Uttara Kannada	Others	38.49	42.61	1.49	0.35	0.00	0.00
	SC	1.18	1.27	0.03	0.00	0.00	0.00
	ST	0.77	0.79	0.02	0.00	0.00	0.00

Source: Department of Agriculture, Government of Karnataka and census 2011

Using agricultural census data, we examined the percentage of farmers enrolled in insurance across the different castes, based on census data. It is apparent that a very small percentage of SC or ST farmers are enrolled in insurance. In addition we also observe that enrolment in insurance increased from Kharif 2016 to Kharif 2017. In Gadag, due to the severe drought larger percentages of farmers were enrolled during Rabi 2016. It is clear from the table above that the enrollment in crop insurance is more in the other caste category when compared to SC or ST category.

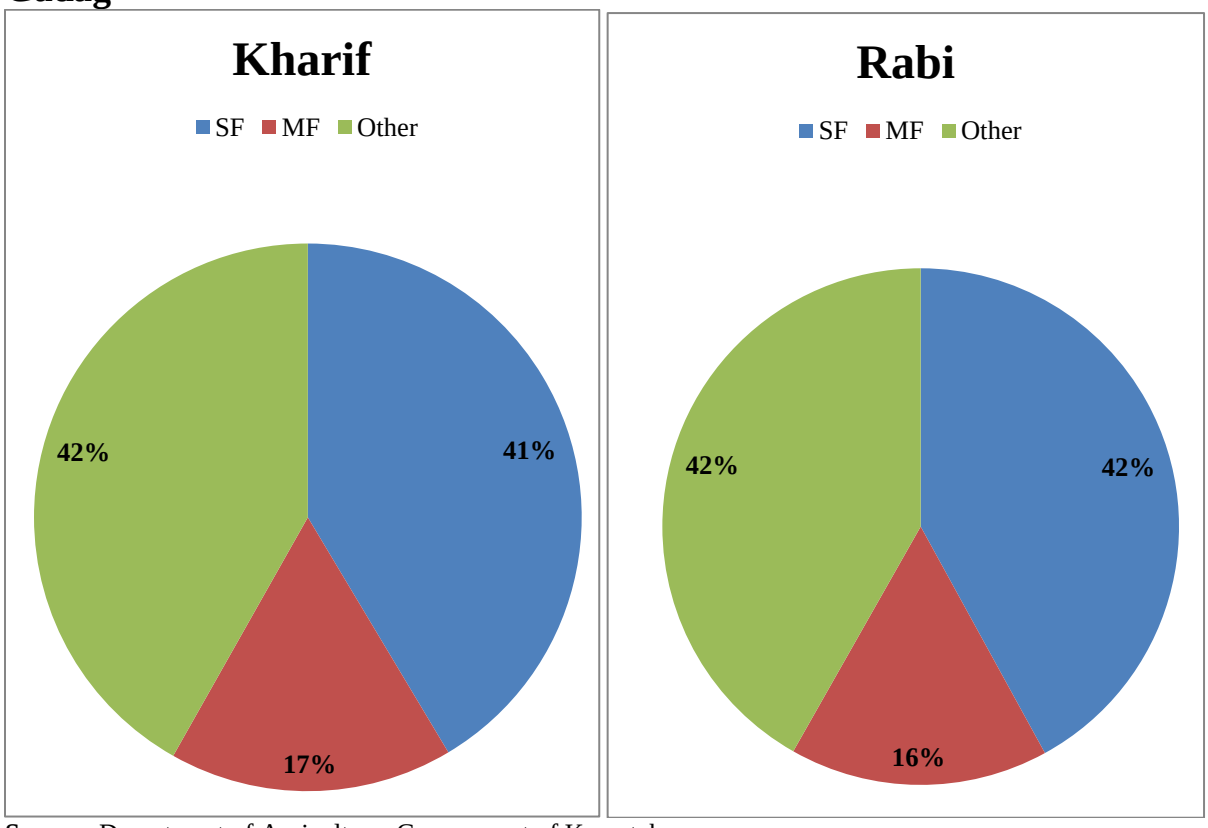
Landholdings

Landholding sizes among the enrolled: it was found that Landholding sizes across the three districts were more in Kharif season than in Rabi. Chart 1 below explains the farmer's category wise distribution (marginalized farmer, small farmer and others) of landholdings size among enrolled farmers for the 3 districts across both the seasons. .

Chart 1: Farmer Category wise landholding size

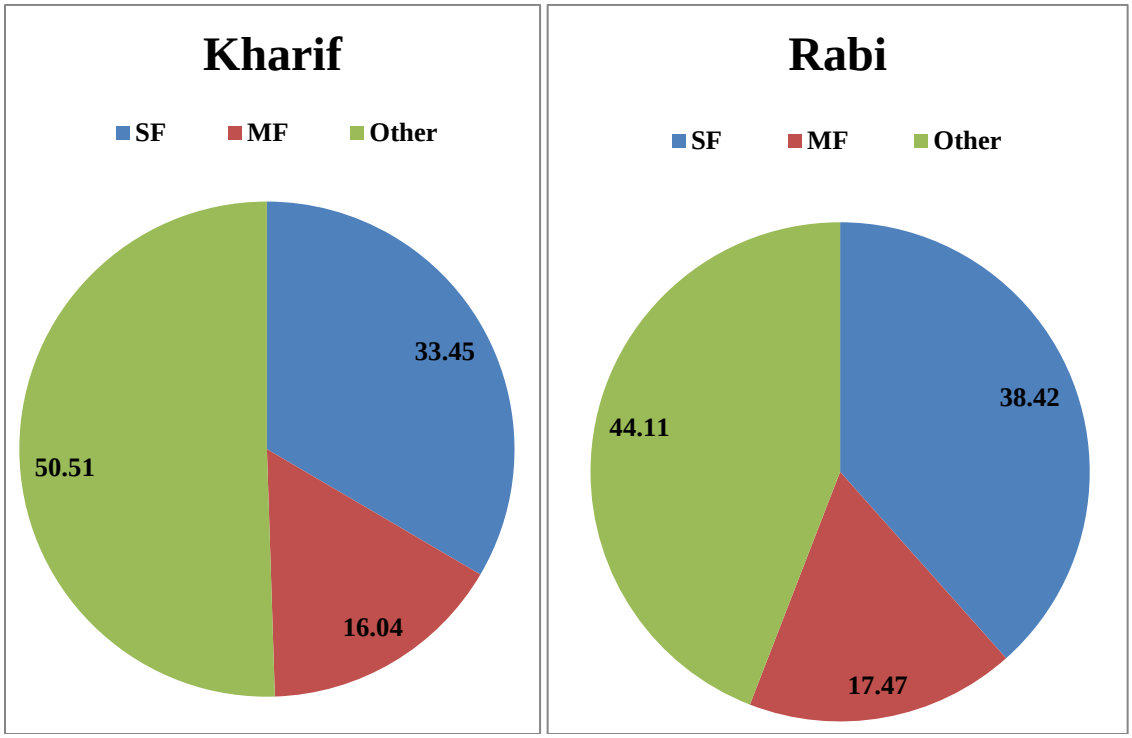
In Raichur and Gadag, the largest percentage of farmers who enrolled for insurance are both small landholding farmers and other farmers. In Uttara Kannada, small farmers dominate the enrolment across both the seasons.

Gadag



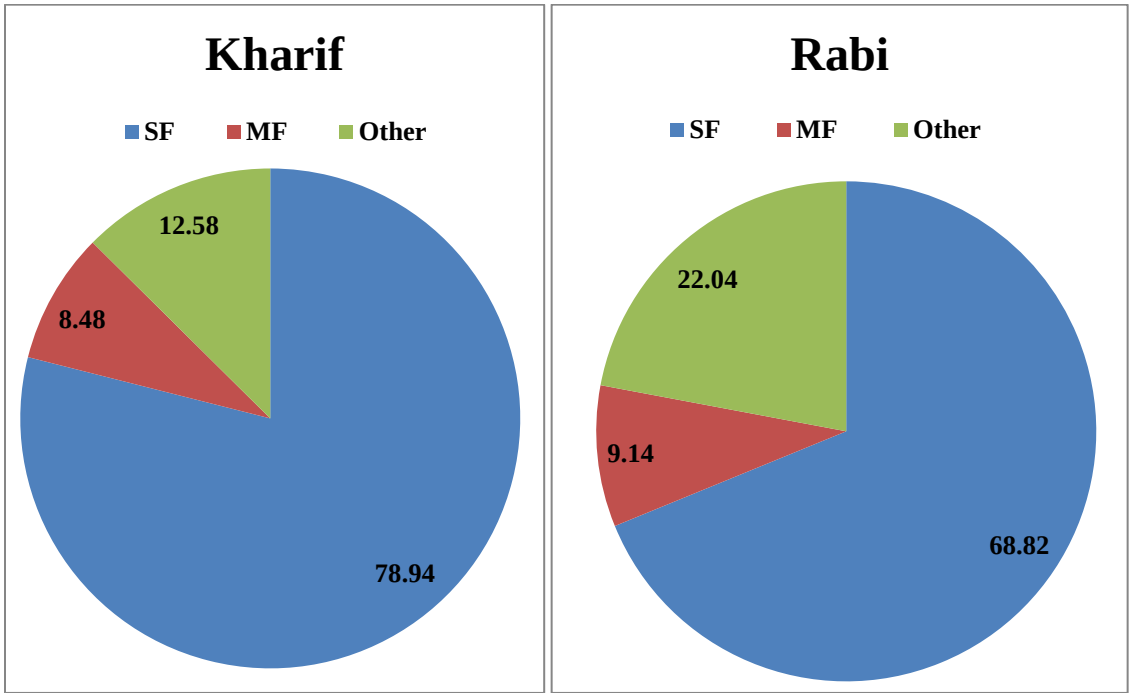
Source: Department of Agriculture, Government of Karnataka

Raichur



Source: Department of Agriculture, Government of Karnataka

Uttara Kannada



Source: Department of Agriculture, Government of Karnataka

Patterns in crop enrollment across districts and seasons

Karnataka is one of the few states in which a large number of crops have been notified. When we examine the number of crops notified across the three districts we observe a large variation in this number across the districts. The largest numbers of crops were notified in the district of Raichur during the Kharif 2016 and Rabi 2016 seasons. However, the number of crops notified falls rapidly during the Kharif 2017 season, one of the possible reasons could be that there might not have been sufficient areas sown under the other crops.

Chart 2: Top 5 Crops Insured across the districts

Gadag

An analysis of the area insured was conducted across all four seasons. During Kharif 2016 the top five crops in terms of area sown were, in descending order, Maize (Irrigated), Cotton (Rainfed), Red Chilies (Rainfed), Onion (Rainfed) and Green Gram (Rainfed). Among, these crops only Green Gram (Rainfed) is a crop that appears in the top twenty crops in terms of area insured.

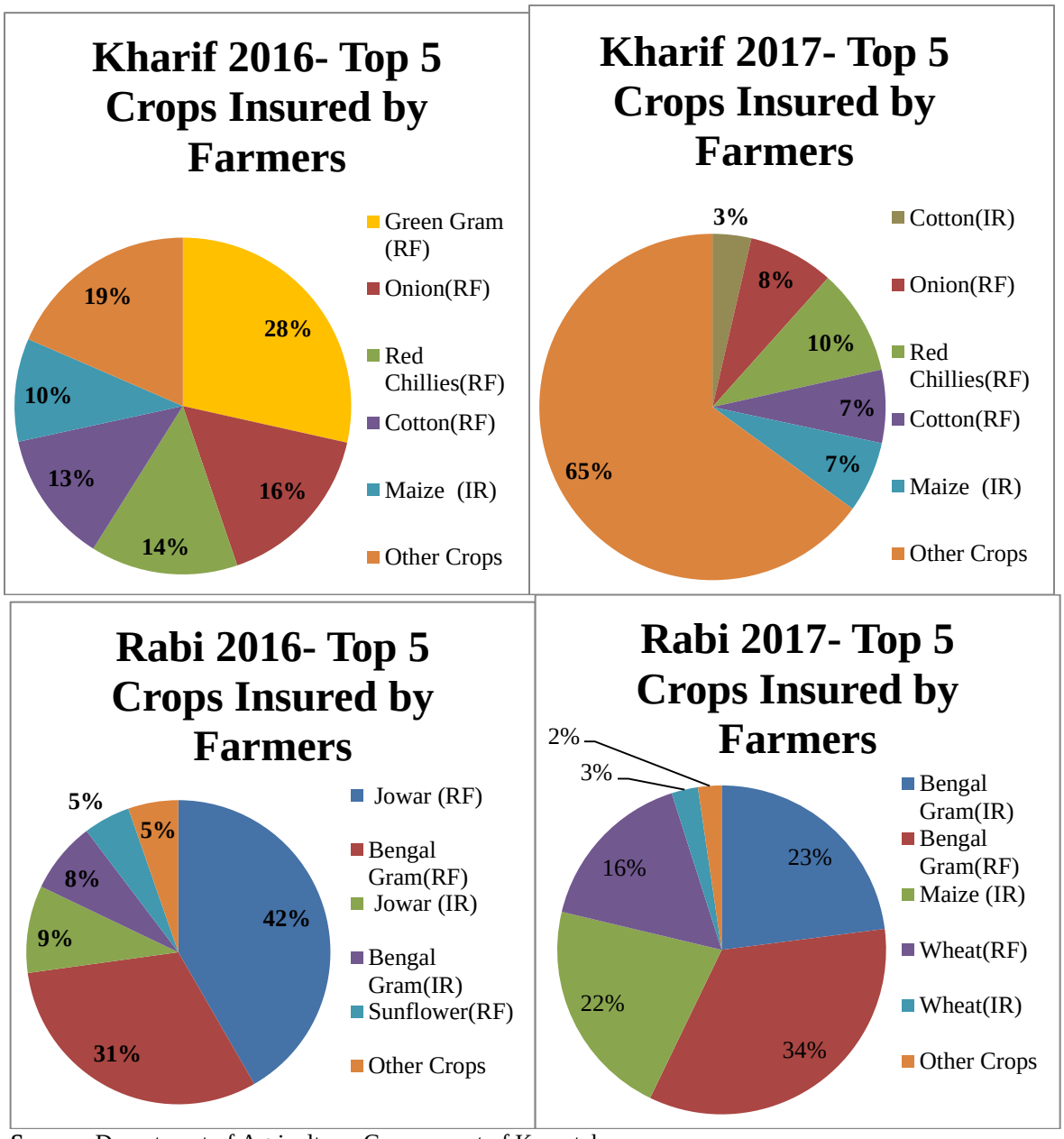
In Kharif 2017, Red Chilies (Rainfed) was the crop with the largest insured area, followed by Onion (Rainfed), Cotton (Rainfed), Maize (Irrigated) and Cotton (Irrigated). Therefore in Kharif 2016 we observe greater correlation between percentages of crop area insured.

The drought in Rabi 2016 appears to have ensured that there was significant enrolment, in terms of area insured. The top five crops are Jowar (Rainfed), Bengal Gram (Rainfed), Jowar (Irrigated), Bengal Gram (Irrigated) and Sunflower (Rainfed).

During Rabi 2017, the enrollment was also less compare to other seasons because of good rainfall and climatic conditions. Bengal Gram (Irrigated), Bengal Gram (Rainfed), Maize (Irrigated), Wheat (Rainfed) and Wheat (Irrigated) are the top five crop having largest insured area.

In our consultations, various stakeholders told us that farmers who have irrigation are less likely to opt for insurance, however in the district of Gadag; the canal has been dry for a number of years. Therefore a possible explanation for high enrolment for crops that are irrigated is that many of these crops no longer receive water from the canal and are in fact for all purposes

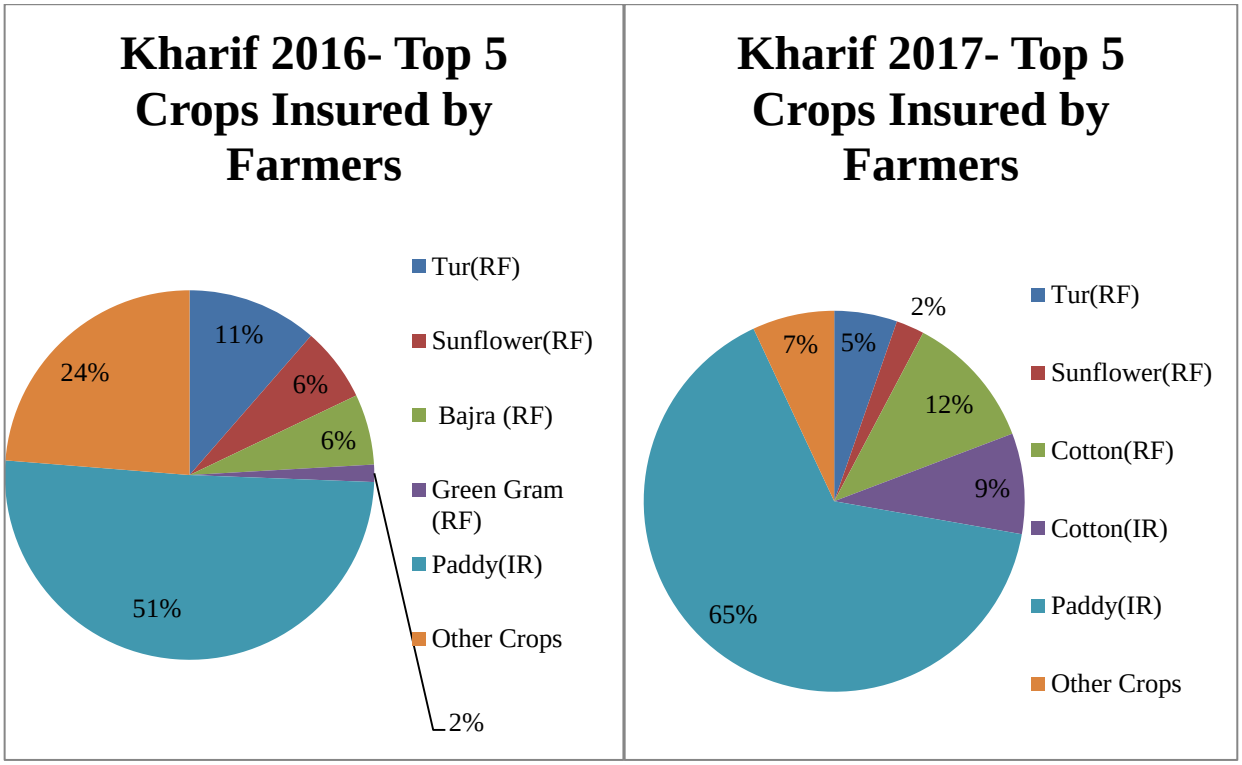
rainfed. It is also surprising that crops that are classified as rainfed and account for the largest percent of the sown area do not have the highest percentages of sown area under insurance.

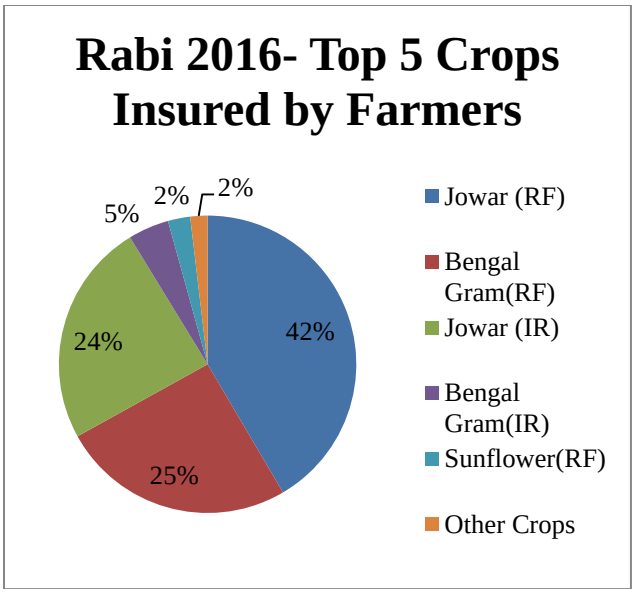


Source: Department of Agriculture, Government of Karnataka

Raichur

The building of the canal in Raichur has led to wide- scale cultivation of paddy in the region. Therefore during Kharif 2016 it is perhaps not-surprising that the largest area sown is irrigated paddy (Irrigated) , followed by Tur (RF), Sunflower (Rainfed), Bajra (Rainfed) and Green Gram (Rainfed). During Kharif 2017 also Paddy (Irrigated) was having largest insured area. Followed by Cotton (Rainfed), Cotton (Irrigated) Tur (Rainfed) and Sunflower (Rainfed). There appears to be correlation in the rankings. During Rabi 2016, the maximum cropped areas were Jowar (Rainfed), Bengal Gram (Rainfed), Jowar (Irrigated), Bengal Gram (Irrigated) and finally Sunflower (Rainfed). But in Rabi 2017 the insured area was less only Jowar (Irrigated) and Sunflower (Rainfed) was insured.

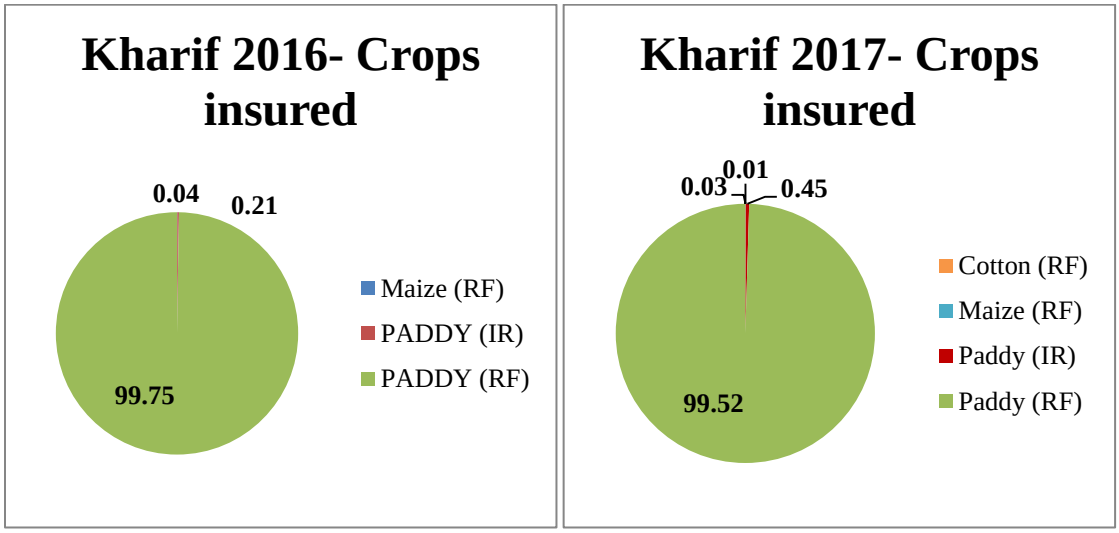




Source: Department of Agriculture, Government of Karnataka and

Uttara Kannada

In Uttara Kannada, during Kharif 2016, only three crops enrolled for insurance namely Paddy (rainfed), Paddy (Irrigated) and Maize (rainfed). Out of these crops Paddy (rainfed) dominates.. A small percentage of the area appears to be cropped the Rabi season in Uttara Kannada. Green gram is the most prevalent crop in this district during the Rabi season. The two other crops grown during this season are Groundnut (rainfed) and Horse gram (rainfed). Out of these three crops the largest percentage of crop area insured is horse gram.



Source: Department of Agriculture, Government of Karnataka

Table 3: Claim Status across the districts

(Rs. In Crore)

Seasons	Gross premium	Claim Amount Initiated	settled claim amount	Pending claim amount	Claims ratio
Gadag					
Kharif 2016	86.20	47.11	47.11	0.00	0.55
Kharif 2017	139.25	55.57	40.61	14.96	0.40
Rabi 2016	90.02	154.35	153.51	0.84	1.71
Raichur					
Kharif 2016	34.51	5.63	2.53	3.10	0.16
Kharif 2017	17.92	27.67	11.60	16.07	1.54
Rabi 2016	46.50	43.54	35.88	7.66	0.94
Uttara Kannada					
Kharif 2016	11.56	66.35	49.32	17.04	5.74
Kharif 2017	64.10	31.52	30.40	1.11	0.49
Rabi 2016	0.23	0.28	0.23	0.04	1.19

Source: Department of Agriculture, Government of Karnataka, (As on 31/08/2018)

When examining the claims amount across the three districts for the Kharif seasons, farmers in Uttar Kannada appear to have reaped the greatest benefits from the insurance, during the Kharif 2016 season. In the Kharif 2017 season Uttara Kannada, the claims ratio as a percentage is much lower, this could be due to a smaller amount of shortfall in yields during the Kharif 2017 season. Among the three districts only the district of Raichur exhibits a significant increase in percentage of beneficiaries from Kharif 2016 to Kharif 2017 seasons. Similarly, the claims amount also reflects these trends; it is greater than the gross premium on three occasions, during Kharif 2016 in the case of Uttara Kannada, during Kharif 2017 in the case of Raichur and during Rabi 2016 in the case of Gadag. In all these cases, as mentioned earlier, the insurance companies are required to pay out a greater amount in claims compared to the amount of premium they have collected both from the farmers as well the Central and State Governments.

Conclusion

By analyzing the two cycles of the PMFBY scheme, it can be concluded that irrigation, climate, cropping season and claim settlement play a major role in farmer's enrollment. Compared to all seasons, Rabi 2016, had a high enrollment in all the selected districts and it drastically started to decrease after Kharif 2017 because in 2017-18 period the state received very good rainfall. Delay in claims payment during Kharif 2016 and Rabi 2016 had a negative impact on farmers' enrollment for the next following seasons. Speeding up the claims settlement process may increase the farmer's participation in this scheme.

Most of the farmers depend on rainfall for crop cultivation. During 2016 rainfall was below normal. Due to this reason as compared to Kharif 2016 enrollment in Rabi 2016 was more. In summer most of the area is irrigated. There is protective irrigation hence very less enrollment is observed in summer season.

When we observed the claims ratio, for the 3 selected districts during 2016 season (Kharif & Rabi) insurance companies paid more than the gross premium collected. Due to this, an increase in enrollment can be observed in Kharif 2017 season but the delay in claims settlement of Kharif and Rabi 2016 negatively influenced the enrollment in Rabi and summer 2017. By this it can be concluded that if claims are settled on time, it may lead to increase in the enrollment.

References

- Government of India. (2011). Primary census abstract.
- Government of Karnataka Agro--climatic zones of Karnataka retrieved from http://raitamitra.kar.nic.in/stat/kacz.htm
- Centre for Ecological Studies (CES), 4.4 Climate and rainfall retrieved fromhttp://wgbis.ces.iisc.ernet.in/energy/paper/TR109/tr109_std2.h
- University of Agricultural sciences e _Krishi UAS Gadag- retreived from http://e-krishiuasb.karnataka.gov.in/ItemDetails.aspx?DepID=14&cropID=0&SubDepID=8#
- University of Agricultural sciences e _Krishi UAS Uttar Kannadahttp://e-krishiuasb.karnataka.gov.in/ItemDetails.aspx?DepID=14&cropID=0&SubDepID=10#
- University of Agricultural sciences e _Krishi UAS Raichur http://e-krishiuasb.karnataka.gov.in/ItemDetails.aspx?DepID=14&cropID=0&SubDepID=6#
- Government of Karnataka 2014, Karnataka at a Glance- Gadag, 2013-2014