



Research Article

STUDY ON VARIOUS RISK FACTORS AND ITS MANAGEMENT STRATEGIES ADOPTED BY FARM HOUSEHOLDS IN TAMIL NADU

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Abstract: Risk is seen as an important and ever present factor influencing the optimizing behavior of farm adjusting to disequilibria in agriculture. Farming in India is with risk and uncertainty. At micro level, risk in agriculture affects farmer's decision and often results in technical and allocative in efficient level of resource use. The main sources of risk and uncertainty prevailing in crop production are yield, price and gross income instability. The present study was undertaken in Krishnagiri and Ramanathapuram districts of Tamil Nadu to analyse the various risk factors in agriculture and its management strategies adopted by the farmers. The Primary data from 180 sample farmers were collected through personal interview method. It is found that majority of the crop damage in Krishnagiri and Ramanathapuram districts was mainly due to insufficient rainfall/ drought & drought like situation. Nearly 50 percent of the sources of market risk were due to Fluctuations in the prices of inputs and outputs in the market. Majority of the farmers in Ramanathapuram district adopt livestock management strategy as one of the risk management practices which include change in number and feed management. Most of the households from Krishnagiri district borrowed from their friends and relatives to manage the expenditure against risk.

Keywords: Farm risk sources, Coping mechanisms, Income management, Tamil Nadu

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Introduction

Risk is a condition in which there is a possibility of an adverse variation from a preferred outcome that is estimated or trusted for. The degree of risk referred to the likelihood of occurrence of an event. It is a measure of accuracy with which the outcome of a chance event can be predicted [1]. Agricultural business group and farmers are more possible to face risks than other business sectors owing to the fact that agricultural products and services are related to natural processes, biological assets, and plant and animal diseases. Agriculture is highly exposed to adverse natural events, such as insect damage or poor weather conditions, which have a negative impact on the production [2]. Risk is seen as an important and ever present factor influencing the optimizing behavior of farm adjusting to disequilibria in agriculture. It is manifested in the production process in two ways. One, it affects the level of output by influencing the levels of inputs used and second, it constrains the farm from realizing the full potential of the technology by influencing it not to follow the best method of input application. The former may be described as market (Allocative) risk and the latter as production (technical) risk. Farming in India is with risk and uncertainty. At micro level, risk in agriculture affects farmer's decision and often results in technical and allocative in efficient level of resource use. The main sources of risk and uncertainty prevailing in crop production are yield, price and gross income instability. In such conditions, producers do not only aim to maximize income but also to reduce the risk. Inefficient use of resources and agro-climatic conditions are mainly responsible for risk and uncertainty in agriculture. These variations consist of two elements, (i) quantifiable and (ii) non-quantifiable. The former can be measured through probability estimates and is called the "risk" which is influenced by factors like technical change, price cycles etc., which are generally recognized by the farmer. The latter is termed as "uncertainty" which is caused by such variables as unpredictable weather and attack of pests and diseases. In this case, the probability distribution cannot be established empirically [3,4]. There are five distinct risk factors in agriculture: production risk, marketing risk, credit risk,

personal risk, and environmental risk. Thus each of those risks play a role in the farmer decision making process and therefore it is crucial to evaluate and measure risks in agriculture in a competent way [5]. Management of risk in agriculture is one of the foremost concerns of the decision makers and policy planners, as risk in farm production is measured as the main cause for low stage of farm level investments and agrarian distress. Both, in turn, have implications for output growth. In order to build up mechanisms and strategies to mitigate risk in agriculture it is imperative to know the sources and degree of fluctuations involved in agricultural output. With this background, the present study is focused on following objectives, to identify and quantify the various risk factors in cultivating principal crops and to study the risk management strategies adopted by the farmers in the study area.

Materials and Methods

Among 33 districts of Tamil Nadu, Krishnagiri and Ramanathapuram districts were randomly selected for the present study. From each district three blocks and from each block, 30 samples were selected under different production environments and thus the total sample size was 180. Primary data from the sample farmers were collected with the help of a pre-tested interview schedule through personal interview. Various factors that influence crop production risks in the study area were identified and listed based on farmers opinion. The mean values for the risk sources or factors influencing risks in crop production were calculated. It was assumed that these factors were jointly accountable for 100 percent of crop damage in the study area. Similarly various coping strategies being adopted by the farmers in the study area were also identified and listed based on farmers' perception. The results were analysed and tabulated.

Results and Discussions

Factors influencing crop production risks

Risk components that influence the crop production risks in the study [Table-1].

Table-1 Factors influencing crop production risks in the study N=180

Risk Components	Particulars	Krishnagiri	Ramanathapuram
Production Risk	Pest and disease	18.89	20.00
	Insufficient rainfall/Drought & drought like situation	43.33	38.89
	Flood and Excessive rainfall	2.22	6.67
	Insufficient family labour and difficulties in finding labour	16.67	4.44
	Insufficient and non availability of farm machinery in time	3.33	11.11
	Changes in technology	5.56	2.22
	Climatic conditions	10.00	16.67
	Total	100.00	100.00
Price / Market Risk	Fluctuations in the prices of inputs and outputs	53.33	47.78
	Outside market competition	15.56	14.44
	Changing supply and demand	10.00	5.56
	Market imperfections	17.78	21.11
	Changing consumer preferences	3.33	11.11
	Total	100.00	100.00
Financial and Credit Risk	Credit and the high cost of borrowing	6.67	2.22
	Rising interest rates	23.33	11.11
	Prospect of loans being called by lenders	11.11	20.00
	Lack of access to insurance services	58.89	66.67
	Total	100.00	100.00
Institutional Risk	Changes in regulations	18.89	20.00
	Financial services	27.78	24.44
	level of price or income	53.33	55.56
	Total	100.00	100.00
Human/ Personal Risk	Damage or theft of production & equipment	31.11	20.00
	Health problem	68.89	80.00
	Total	100.00	100.00

In total 21 risk sources from five major factors that influence the crop production risks were identified and examined based on farmers perception. The mean values for the risk sources influencing agricultural crop production were calculated. It was assumed that these factors were responsible for 100 percent of crop damage in the study area. A calculated mean value under production risk factor shows that majority of the crop damage in Krishnagiri (43.33 percent), and Ramanathapuram (38.89 percent) districts was due to insufficient rainfall/drought & drought like situation. Other sources that influence the crop damage in Krishnagiri district includes pest and disease (18.89 percent); insufficient family labour and difficulties in finding labour (16.67 percent); climatic conditions (10.00 percent); changes in technology (5.56); insufficient and non availability of farm machinery in time (3.33 percent); and flood and excessive rainfall (2.22 percent). Similarly Pest and disease (20 percent); climatic conditions (16.67 percent); insufficient and non availability of farm machinery in time (11.11 percent); flood and excessive rainfall (6.67 percent); insufficient family labour and difficulties in finding labour (4.44 percent); and changes in technology (2.22 percent) were the other sources of production risk factor that influence the crop damage in Ramanathapuram district. The results also infer that labour prevails to be another predominant source of risk in Krishnagiri district. Also, climatic condition seems to have more impact in crop damage in Ramanathapuram district rather than Krishnagiri district. Another important factor that has high influence in the crop production risk is the price / market risk. The calculated mean values under price / market risk factor for Krishnagiri and Ramanathapuram districts were represented in Table 1. Nearly 50 percent of the sources of market risk in Krishnagiri (53.33 percent) and Ramanathapuram district (47.78 percent) were due to fluctuations in the prices of inputs and outputs in the market. Risk due to Market imperfections in Krishnagiri (17.78 percent) and Ramanathapuram (21.11 percent) district was another major factor that influences the market risk. Other sources of market risk includes outside market competition, changing consumer preferences and changing supply and demand. From the Table1, the mean value shows that among the sources of financial and credit risk; nearly 2/3rd of the risk was due to lack of access to insurance services in Krishnagiri (58.89 percent) and Ramanathapuram (66.67 percent) districts. About 23.33 percent and 11.11 percent of the production risk was caused by rising interest rates in Krishnagiri and Ramanathapuram district respectively. Percentage of risk caused due to prospect of loans being called by lenders was comparatively high in Ramanathapuram district (20 percent). Finally risk due to high cost of borrowing was found to be comparatively high in Krishnagiri (6.67 percent) district which was

low in Ramanathapuram (2.22 percent) district. More than half of the sources of institutional risk were dominated by level of price or income of the farmers in Krishnagiri (53.33 percent) and Ramanathapuram districts (55.56 percent). Factors such as financial services and changes in regulation also influence the production risk to certain extent. Some of the human or personal risk factors faced by the farmers include health problems (68.89 and 80 percent); damage or theft of production and equipment (31.11 and 20 percent) in Krishnagiri and Ramanathapuram districts respectively.

Farm risk minimization/ coping strategies followed by the farmers

Agricultural crop production is the main source of livelihood arrangement for farming households. When they experience production risk, it will directly affect their income. There are various coping strategies being followed by the farmers in the study area. They were identified and listed based on farmers' perception. Each farmer adopts multiple coping strategies in order to minimize the loss due to various sources of risk. Of the total sample farmers; percentage of farmers adopting each risk management strategy was calculated and presented [Table-2].

Table-2 Farm risk minimization/ coping strategies followed by the farmers

SN	Particulars	Krishnagiri	Ramanathapuram
1	Change in crop management	33.33	30.19
2	Change in livestock management	48.33	90.56
3	Change in land management	20.56	22.22
4	Incorporation of agro- forestry ecosystem	7.78	2.22
5	Water management	38.97	32.38
6	Input management	54.44	88.89
7	Diversification	10.83	37.50

The result shows that choice of crop, variety and cropping pattern; altering the sowing and harvesting date; application of farmyard manure/organic fertilizers and inorganic fertilizers; adopting crop rotation, mixed cropping; choosing drought resistant and short maturing varieties; growing vegetables in off season were some of the crop management strategies adopted by the farmers in Krishnagiri (33.33 percent) and Ramanathapuram (30.19 percent) districts. Majority of the farmers in Ramanathapuram district (90.56 percent) adopt livestock management strategy as one of the risk management practices which include change in number and feed management. While 48.33 percent of the farmers in Krishnagiri district adopt the same. Input management is the most adopted coping mechanism in both the districts.

Table-3 Income management tools adopted by the sample farmers

Particulars	Krishnagiri			Ramanathapuram		
	Yes (No.)	Percent	Rank	Yes (No.)	Percent	Rank
Savings (Bank savings, deposits, bonds)	19	21.11	7	21	23.33	7
Sale of stored produce	23	25.56	6	27	30.00	5
Sale of livestock	16	17.78	9	25	27.78	6
Sale of fixed assets	3	3.33	14	8	8.89	11
Borrowing from friends and relatives	58	64.44	1	14	15.56	9
Borrowing from money lender	48	53.33	2	11	12.22	10
Hypothecation of assets / Jewellery	7	7.78	12	6	6.67	12
Bank loan	42	46.67	3	63	70.00	1
Agricultural labour	37	41.11	4	49	54.44	2
MGNREGS	18	20.00	8	18	20.00	8
Non-farm employment	28	31.11	5	34	37.78	4
Migration	10	11.11	10	1	1.11	14
Government relief	0	0.00	15	4	4.44	13
Crop insurance	9	10.00	11	39	43.33	3
Livestock insurance	4	4.44	13	0	0.00	15

The practices such as seed treatment, altering the quantity and quality of fertilizers and manures, method of application and periodicity of application were followed by 54.44 percent and 88.89 percent of the farmers in Krishnagiri and Ramanathapuram districts respectively. Another important risk management strategy was water management. The mechanisms such as land preparation practices, deep tillage, altering the sowing method, growing cover crops, ridge cultivation, mulching, digging new bore wells, deepening the existing bore well, public irrigation system, runoff harvesting, installation of drip/sprinkler, infiltration ditches, water harvesting and reducing frequency of irrigation were adopted by the farmers of Krishnagiri (38.97 percent) and Ramanathapuram (32.38 percent) districts. Land management practices which comprises of soil bunding, bench terracing, strip cropping, hedge rows, mulching and fallowing were followed by 20.56 percent and 22.22 percent of the farmers in Krishnagiri and Ramanathapuram District respectively. Less than ten percent of the farmers in Krishnagiri district (7.78 percent) and Ramanathapuram district (2.22 percent) farmers follow incorporation of agro- forestry eco-system as a risk coping mechanism to avoid risk. Other diversification factors like carrying out business activities, professional employment, wage work and temporary migration were also adopted by the farmers in Krishnagiri (10.83 percent) and Ramanathapuram (37.50 percent) districts.

Income management against risk

Majority of the households has agriculture as a primary occupation. Hence they need to undergo several activities in order to manage their income during risky situations. The income management tools being adopted by the farmers in the study area were analysed and presented in the Table 3.

It could be observed from the Table 3, that most of the farm households from Krishnagiri district borrow from their friends and relatives (64.44 percent) to manage the expenditure against risk. Another most important income management tool against risk is borrowing from other sources. Nearly 50 percent of the people borrow from money lenders (53.33 percent) followed by availing bank loans (46.67 percent). Other management measures adopted by the farmers include serving as agricultural labour (41.11 percent); non-farm employment (31.11 percent); sale of stored produce (25.56 percent); utilizing their savings (21.11 percent); working in Mahatma Gandhi National Rural Employment Guarantee scheme (20 percent); sale of livestock (17.78 percent); migration (11.11 percent); crop insurance (10 percent); hypothecation of assets / Jewellery (7.78 percent); livestock insurance (4.44 percent) etc. Similarly it could be noticed that 70 percent of the farm households of Ramanathapuram district get bank loans to manage their income when farm risk arises. More than 50 percent of the household members (54.44 percent) work as agricultural labours to manage income against risk. Other income management tools include crop insurance (43.33 percent); non-farm employment (37.78 percent); sale of stored produce (30 percent); savings (27.78 percent); working under Mahatma Gandhi National Rural Employment Guarantee scheme (23.33 percent). In this district only 20 percent of the farmers borrow from their friends and relatives followed by from money lenders (15.56 percent). Some of the other tools were sale of fixed assets (12.22 percent);

government relief (8.89 percent); hypothecation of assets / Jewellery (6.67 percent) etc. None of the farmers use livestock insurance as a tool to manage risk.

Conclusion

The study on the various risk factors and its management strategies being adopted by farm households in Tamil Nadu can be concluded that; out of total 21 risk sources from 5 major factors; certain sources were found to be the major reasons for risk in agriculture. Of the various sources that influence production risk; majority of the crop damage in Krishnagiri and Ramanathapuram districts was mainly due to insufficient rainfall/ drought & drought like situation followed by damage due to pest and disease occurrence in both the districts. Nearly 50 percent of the sources of market risk were due to fluctuations in the prices of inputs and outputs in the market. Among the sources of financial and credit risk; nearly 2/3rd of the risk was due to lack of access to insurance services in the study area. More than half of the sources of institutional risk were dominated by level of price or income of the farmers in Krishnagiri and Ramanathapuram districts. Some of the human or personal risk factors faced by the farmers include health problems; damage or theft of production and equipment etc. Several coping mechanisms were being adopted by the farmers.

Application of research: Majority of the farmers in Ramanathapuram district adopt livestock management strategy as one of the risk management practices which include change in number and feed management. Other management strategies like input and water management were also commonly adopted in both the districts. Less than ten percent of the farmers in the study area followed incorporation of agro- forestry eco-system as a risk coping mechanism. Most of the households from Krishnagiri district borrowed from their friends and relatives to manage the expenditure against risk. But majority of the farm households of Ramanathapuram district got bank loans to manage their income against risk.

Research Category: Agricultural Economics

Abbreviations: MGNREGS- Mahatma Gandhi National Rural Employment Guarantee scheme

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