Modelling the Risk Factors in Agriculture

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ABSTRACT:

Purpose: The risk in agriculture is putting huge pressure on farmers life, which can be controlled with a proper risk management strategy. Therefore, this study aims to find out the key risk factors or drivers which affects the agriculture sector and how they are influencing each other.

Design/Methodology/Approach: By doing the extensive review of literature from various databases, we find out 12 risk factors involve in agriculture. Then, with the aids of empirical research by surveying farmers and experts, we validate the risk factors. Then, we develop a structure model with the help of interpretive structural modelling (ISM). The ISM model shows us which risk factors have the highest level of importance and needs to be controlled. Then, on the basis of their driving and dependency power, these risk factors are divided into four quadrants using the Matrice d' Impacts Croises – Multiplication Appliquee an un classement (MICMAC) method.

Finding: The ISM technique and empirical study help us to divide the risk factors on the basis of their driving power and dependency power. After that from continue analysis, we find out the interrelationships between these risk factors and how they affect the agriculture sector. Price variability is found to be a dependent risk factor while Climate, Environment regulations and Government policies and regulations are emerged as independent basic risk factors.

Research implications: This research will be very helpful for Agri business company in risk management strategy. This study is also helpful for Agri insurance company and Government while making the new policy for agriculture sector.

Originality/Value: For the first-time key risk factors related to agriculture is addressed by using theoretical review and interpretive structure modelling (ISM).

Keywords:

Risk, Risk factors, Risk management, Agriculture, Agribusiness, Interpretive structure modelling (ISM), MICMAC.

INTRODUCTION

Every business sector has risk, but Agriculture sector and farmers are exposed to more risk than any other sector. In agriculture, assessing and mitigating the risk is very difficult, because of the fact that agriculture production is highly depend on the natural resources and process (Girdžiūtė, 2012). If there is any natural calamity happen like flood, insect damage, or poor whether condition then the calamity not only affect the agriculture at that time but the effects may last for many years. Sometime the natural calamity not only affect the farmers but may impact the whole economy or every consumer of food.

So, managing the risk in agriculture become imperative to improve the condition of farmer and economy. Some risks are managed by making better production and financial decision while some are just added to the cost of production. Some risk can be managed by diversification of crop, government scheme or insurance scheme etc. However, some risks are non-diversifiable which are associated with personal life of farmer.

To manage the risk in agriculture, first we need to find out the key risk factors which affect the agriculture sector. Because if we have the list of key risk factors then, to work on them become easy and will be more productive. So, the main objective of this paper is to:

1. Determine the main risk factor in agriculture.
2. Develop a structural model for agriculture risk factors using the Interpretive Structural Modeling technique (ISM).
3. Discuss the practical implication of this study and make recommendation for the future studies.

A literature review is conducted to know the key risk factors in agriculture and then validate these risk factors by survey. Interpretative structure modelling (ISM) process has been used to know the contextual relation and make multi hierarchical level model of risk factors in agriculture. This study can be use by government or insurance company while making the new policy so that risk is can be mitigated and not affect the farmers life.

The later part of this paper is as follow: Part 2nd contain literature review, which focus on the key

risk factors of agriculture. Part 3rd contains research methodology. Part 4th discuss about the result and their implication. Part 5th conclude the study and give limitation and future scope of the study.

1. Literature review:

In this part we describe the various risk factors in agriculture by the review of literature. The keyword use for this were "Agriculture uncertainty", "Risk factors" or "Risk management" in various databases. Then various filter was applied to narrow down the search like; subject area – "Business management and accounting"; source type – "Journal"; document type – "Article" and language – "English". Then after abstract reading, the final papers were considered for the final literature review.

What is Risk? The meaning of risk is changing time to time. Initially we define the risk as danger or exposer to adverse condition, later it was connected with the loss occurrence (Jankelova et al., 2017). Most of time we considered the risk as negative side. But according to (Christensen, 2012) the risk has the broader understanding which considered both side of risk, i.e. positive and negative. The common definition is "Risk is chances of adversity or loss and refers to uncertainty that matter". The agriculture sector is full of risks which is affecting the life of farmer directly and also the consumer indirectly. Below are the various risk factors associated with agriculture sector.

These are the various risks identified:

1. Climate (RF1): The agriculture sector is highly depending on climate, whether and natural resources etc. So, climate risk can't be completely averted and it affects the farmer's life in many ways (Hanif et al., 2010). Sometime the impact of natural calamity lasted for many years in farmer life. The climate risk not only affect the farmer's life but it's also impacts the other consumer in one way or other because the climate change is reducing the agriculture output thus cause a threat to national food security. So, the climate risk can affect a single farmer to the whole world at the same time.

2. Price variability (RF2): After the harvesting of a crop what a farmer can expect is the good price of their crop and if they don't get the right price for their crop then they will suffer the losses. The price of agriculture commodity depends on many factors like inflation, world price volatility, Exchange Rate Fluctuations, Tariff Changes and openness of domestic market to international market etc. (Bathla, 2013). To mitigate the price fluctuation risk, government provides MSP support to farmer in some essential crop. So, it is important for the farmers to get a good price of their crop.

3. Production cost (RF3): In ancient time agriculture was mainly depend on the natural resources but now there are many other production costs involves like seeds cost, fertilizer cost, pesticide cost, insurance cost or machinery cost etc. fertilizer is one of the major costs in agriculture production cost and the fertilizer cost is likely to increase by 0.8-3.6% and the yield will reduce by 6-13% from year 2005 to 2050 (Brunelle et al., 2015).

4. Labor cost (RF4): After so many technology advances, still there are many crops (majorly fruit and vegetable) which have high input of labor cost. So, to increase the competitiveness of agriculture system, labor cost control is imperative (Baraldi et al., 2006).

5. Government policies and regulation (RF5): The government policies are also an important factor in agriculture. The unexpected change in government policies and regulation directly impact the agriculture sector (Harwood et al., 1999). On this risk factor farmers have limited control. For example, many farmers depend on the government procurement so in this case the government policies directly affect those farmers. The government intervention in regulating the sowing of paddy in northern region is also affecting the life of many farmers. The policies for the use of fertilizer, pesticide and Hybrid seed in farming are important part of agriculture risk.

6. Fuel price variability (RF6): Now the agriculture sector depends heavily on the machinery so the rising fuel price is one of the major concerns in agriculture. Nowadays many agriculture commodities are also used in ethanol production which is direct source of biofuel. The use of Agri commodity in biofuel production will directly affect the availability as food consumption and their price. According to economics theory,

through the higher input and transportation cost, the crude oil price is directly affecting the Agri commodity price variability (Gardebroek & Hernandez, 2013).

7. Concentration in market (RF7): The market concentration affecting a lot of factors like price, quality or ease of selling etc. which influence the farmer income. The farmer generally dislikes the high movement in Agri commodity but investor favor these movement by predicting the direction in which it goes (Thiyagarajan et al., 2015).

8. Financial risk (RF8): As for the other industries, finance is an important risk factor for the development of agriculture sector. the availability of finance help farmers to adopt the new technology (Gaur & Khatkar, 2010). There are many institutions like non-banking financial institution, regional rural bank and self-help group etc. which help to meet the farmer financial needs. Several initiatives like Kisan Credit card (KCC), establishment of National Bank for Agriculture and Rural Development (NABARD) and Micro Irrigation Fund Scheme etc. are launched to improve the lifestyle of farmer. The interest rate variability, credit availability, condition associated or debt restructuring is major financial risk involved in agriculture (Komarek et al., 2020).

9. Environmental regulation (RF9): The agriculture sector is subjected to various environmental regulation intervention to achieve some environmental objective (Troost et al., 2015). Sometime to fulfil these objective farmers have to scarified something. Like to save the air pollution, farmers can't burn the paddy, but to clean the paddy without burning for preparation of next sowing is not so easy.

10. Personal uncertainty (RF10): While doing the farming, farmer itself exposed to a lot of risk directly or indirectly. The personal risk includes health problem, accidental injuries or personal relationship which affect the agriculture output (Komarek et al., 2020). These risks may be caused while using the machine, pesticide or by transmissible disease from livestock etc. Farmers exposed to various aerosol and contaminant which increase the risk of respiratory disease among them (M. Christopher, 2016).

11. Technology change risk (RF11): We know that agriculture is heavily depends on the machinery and nowadays technology changes vary rapidly. The adoption the new technology is not easy for the farmer as it requires a lot of credit. A new technology creates a new problem and to solve that problem we need a further new technology and this goes on and on. The new transgenic agriculture impacts the health and environment but to fulfill the current requirement we are bound to use these technologies (Mariconda, 2014).

12. US Dollar index (RF12): In the international market, agriculture commodities are priced in US dollar so the variation in the US dollar index will directly impact the price of agriculture commodities. If the dollar becomes weak, the demand in foreign country increases which ultimately result in price hike (Sankararaman et al., 2018). Another reason for the inverse relation between the US dollar and Agri commodity price, is Inflation. Because when US dollar lose its value, then investors start investing in Agri commodity to overcome the inflation thus the price of Agri commodity increases.

2. Methodology:

To achieve the objectives of this study, both primary and secondary research is performed. The entire research methodology is broken down into three parts, as follows:

3.1 *Identification of key risk factor:*

Risk factors involve in the agriculture sector were identified from the literature review of various articles. This help us to form a comprehensive list of risk factors which is concerned with agriculture sector. A survey was conducted to confirm the risk factor whether these are valid or not, which is addressed in the next part.

3.2 *Validation of identifies risk factors:*

The survey was conducted in various part of Haryana as it has a strong pillar of agriculture development (Sharma, 2014). The respondents are connected to agriculture directly or indirectly. In the survey risk factors are rated using five-point Likert-scale. In total, 150 responses are collected with no missing value. The mean score of risk factors is calculated and each factor is ranked based on their mean score (Table 1). The risk factors were assigned a serial number for the easy referencing in ISM. All the risk factors have mean

score below 3 is removed and the remaining is used in ISM technique in the next part.

Figure 1 - Flow diagram for ISM technique

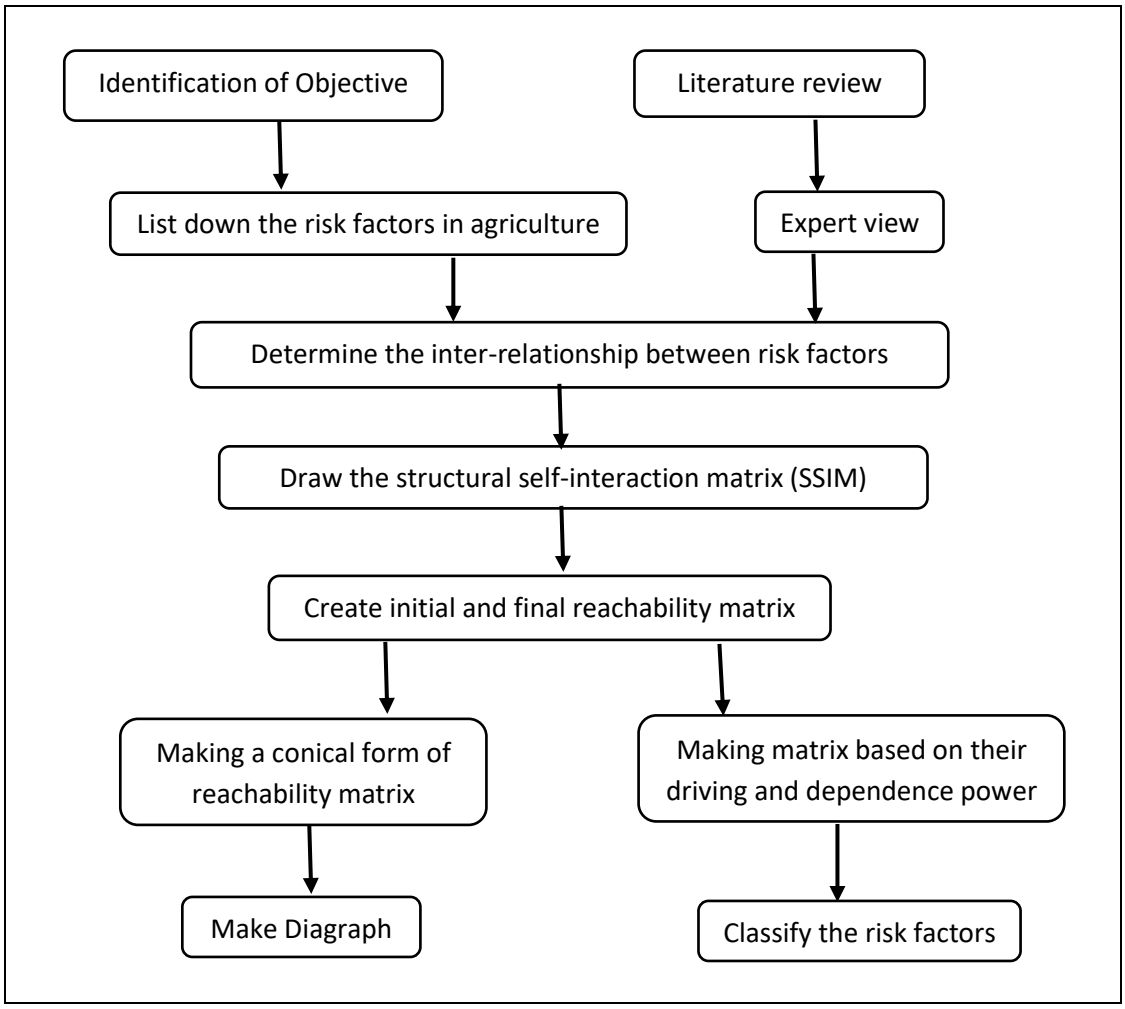


Table 1- Risk factors

S. No.	Risk Factors	Mean Score	Rank
RF1	Climate	4.03	1
RF2	Price variability	3.64	4
RF3	Production cost	3.66	3
RF4	Labor cost	3.49	7
RF5	Government policies and regulation	4.01	2
RF6	Fuel price variability	3.63	5
RF7	Concentration in market	3.24	9
RF8	Financial risk	3.45	8
RF9	Environmental regulation	3.14	10
RF10	Personal uncertainty	3.54	6
RF11.	Technology change	2.29	11
RF12.	US Dollar index	2.15	12

3.3 *Interpretive structural modelling (ISM)*

The ISM technique is very helpful to Identify and summaries the relations between the different factors related to issue (Warfield, 1974). It can be use in various study like construction (Khaba &

Bhar, 2017), consumer behavior (Sheoran & Kumar, 2020), rural livelihood interventions (Kumar et al., 2019) and risk in supply chain management (SCM) (Pfohl et al., 2011) etc. The steps involve in ISM technique (Figure 1) with respect to risk factors in agriculture is given in next parts of this paper.

2.3.1 *Structural self-interaction matrix (SSIM).* In order to construct a SSIM matrix, first a contextual relation between risk factors (Table 2) is determined and a pair wise comparison is done with every two-factors. To define the relation between two factors V, A, X or O symbol are used. Where V denotes when only i influences j; A denotes when only j influences i; X denotes when both j and i influence each other and O denotes when j and i have no relationship. for example, concentration in market will influence the price variability ["A" in (2,7) cell].

All the relations were finalized after confirming with 10 Agri expert in a personal interview. If at least 50% of the respondents were agree then final relation is assigned. Based on the final responses from experts the final SSIM matrix (Table 3) of risk factors affecting Agriculture sector is formed.

Table 3 - structured self-interaction matrix (SSIM)

S.No.	Risk factors in Agriculture	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
RF1	Climate		V	V	V	X	O	V	O	X	O
RF2	Price variability			O	O	A	A	A	O	O	O
RF3	Production cost				A	A	A	V	A	A	A
RF4	Labor cost					A	A	O	O	O	O
RF5	Government policies and regulation						V	V	V	V	O
RF6	Fuel price variability							O	O	A	O
RF7	Concentration in market								O	A	O
RF8	Financial risk									O	V
RF9	Environmental regulation										O
RF10	Personal uncertainty										

2.3.2 *Reachability Matrix*. Now the structured self-interaction matrix (SSIM) is converted into initially reachability matrix (Table 4) by using the rules of (Attri et al., 2013). For this, the binary number (0 or 1) replace the four symbols (i.e., V, A, X and O). The rules for this conversion are as follow:

(a) If the SSIM (i, j) entry is V, then the reachability matrix (i, j) entry come as 1 and the (j, i) entry come as 0.

(b) If the SSIM (i, j) entry is A, then the reachability matrix (i, j) entry come as 0 and the (j, i) entry come as 1.

(c) If the SSIM (i, j) value is X, then both the reachability matrix (i, j) and (j, i) entry come as 1.

(d) If the SSIM (i, j) value is O, then both the reachability matrix (i, j) and (j, i) entry come as 0.

Table 4 - Initial reachability matrix

Risk factors	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
RF1	1	1	1	1	1	0	1	0	1	0
RF2	0	1	0	0	0	0	0	0	0	0
RF3	0	0	1	0	0	0	1	0	0	0
RF4	0	0	1	1	0	0	0	0	0	0
RF5	1	1	1	1	1	1	1	1	1	0
RF6	0	1	1	1	0	1	0	0	0	0
RF7	0	1	0	0	0	0	1	0	0	0
RF8	0	0	1	0	0	0	0	1	0	1
RF9	1	0	1	0	0	1	1	0	1	0

RF10	0	0	1	0	0	0	0	0	0	1

With the help of transitivity rules the initial reachability matrix (table 4) is transformed into the final reachability matrix (Table 5). If in the initial reachability matrix X is influencing Y and Y is influencing Z then in the final reachability matrix X must be influencing the Z. for example, in our study climate (RF1) is influencing government policies and regulations (RF5) and the government policies and regulations (RF5) is influencing the fuel price (RF6) so the climate (RF1) is influencing the fuel price (RF6) and transitivity (1*) is added to (1,6) cell of final reachability matrix (Table 5). All the transitivity relation are derived in the same way. A risk factor's driving power is determined by adding all 1 and 1* entries in a particular row, and the dependency power is determined by adding all 1 and 1* entries in a particular column.

Table 5 - Final Reachability Matrix

Risk factors	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	Driving Power
RF1	1	1	1	1	1	1*	1	1*	1	0	9
RF2	0	1	0	0	0	0	0	0	0	0	1
RF3	0	1*	1	0	0	0	1	0	0	0	3
RF4	0	0	1	1	0	0	1*	0	0	0	3
RF5	1	1	1	1	1	1	1	1	1	1*	10
RF6	0	1	1	1	0	1	1*	0	0	0	5
RF7	0	1	0	0	0	0	1	0	0	0	2
RF8	0	0	1	0	0	0	1*	1	0	1	4
RF9	1	1*	1	1*	1*	1	1	0	1	0	8
RF10	0	0	1	0	0	0	1*	0	0	1	3
Dependence Power	3	7	8	5	3	4	9	3	3	3	

2.3.3 *Level partitioning*: The final reachability matrix (Table 5) is used to create the reachability sets and antecedent sets for each of the risk factors. The reachability set is made up of the risk factor itself and the other risk factors which are influenced by it, whereas the antecedent set is made up of the risk factor itself and the other risk factors which influence it. Then, the intersection of these sets is calculated for all the risk factors and the levels of each risk factor are determined. The top level in the ISM hierarchy (Table 6) is given to risk factor for which reachability set and the intersection set are the same. The top-level risk factors will not influence the other risk factors above their own level in the ISM hierarchy. When first level (top level) risk factor is defined then, it is removed from the further consideration. Then, to calculate the next level risk factors, the same process is repeated. This process remains continue until the levels of all risk factors are determined. The levels defined in the iteration matrix helps us to construct the hierarchy diagraph and ISM model.

Table 6 - Level Partitions - Iteration I

Iteration I				
Level	Risk factors	Reachability set	Antecedent set	Intersection set
	1	1,2,3,4,5,6,7,8,9	1,5,9	1,5,9
1	2	2	1,2,3,5,6,7,9	2
	3	2,3,7	1,3,4,5,6,8,9,10	3
	4	3,4,7	1,4,5,6,9	4
	5	1,2,3,4,5,6,7,8,9,10	1,5,9	1,5,9
	6	2,3,4,6,7	1,5,6,9	6

	7	2,7	1,3,4,5,6,7,8,9,10	7
	8	3,7,8,10	1,5,8	8
	9	1,2,3,4,5,6,7,9	1,5,9	1,5,9
	10	3,7,10	5,8,10	10

Table 7 - Level Partitions - Iteration II

Iteration II				
Level	Risk factors	Reachability set.	Antecedent set	Intersection set
	1	1,3,6,5,4,8,7,9	1,5,9	1,5,9
	3	3,7	1,3,4,5,6,8,9,10	3
	4	3,4,7	1,4,5,6,9	4
	5	1,3,4,5,6,7,8,9,10	1,5,9	1,5,9
	6	3,4,6,7	1,5,6,9	6
2	7	7	1,3,4,5,6,7,8,9,10	7
	8	3,7,8,10	1,5,8	8
	9	1,3,4,5,6,7,9	1,5,9	1,5,9
	10	3,7,10	5,8,10	10

Table 8 - Level Partitions - Iteration III

Iteration III				
Level	Risk factors	Reachability set	Antecedent set	Intersection set
	1	1,3,6,5,4,8,9	1,5,9	1,5,9
3	3	3	1,3,4,5,6,8,9,10	3
	4	3,4	1,4,5,6,9	4
	5	1,3,4,5,6,8,9,10	1,5,9	1,5,9
	6	3,4,6	1,5,6,9,	6
	8	3,8,10	1,5,8	8
	9	1,3,4,5,6,9	1,5,9	1,5,9
	10	3,10	5,8,10	10

Table 9 - Level Partitions - Iteration IV

Iteration IV				
Level	Risk factors	Reachability set	Antecedent set	Intersection set
	1	1,4,5,6,8,9	1,5,9	1,5,9
4	4	4	1,4,5,6,9	4
	5	1,4,5,6,8,9,10	1,5,9	1,5,9
	6	4,6	1,5,6,9	6
	8	8,10	1,5,8	8
	9	1,4,5,6,9	1,5,9	1,5,9
4	10	10	5,8,10	10

Table 10 - Level Partitions - Iteration V

Iteration V				
Level	Risk factors	Reachability set	Antecedent set	Intersection set
	1	1,5,6,8,9	1,5,9	1,5,9

	5	1,5,6,8,9	1,5,9	1,5,9
5	6	6	1,5,6,9	6
5	8	8	1,5,8	8
	9	1,5,6,9	1,5,9	1,5,9

Table 11 - Level Partitions - Iteration VI

Iteration VI				
Level	Risk factors	Reachability set	Antecedent set	Intersection set
6	1	1,5,9	1,5,9	1,5,9
6	5	1,5,9	1,5,9	1,5,9
6	9	1,5,9	1,5,9	1,5,9

ISM based multilevel hierarchy Digraph: Using these iteration level tables 'Multilevel hierarchy diagraph' (Figure 2) of 10 risk factors affecting agriculture sector has been developed. The diagraph highlight that Price variability (RF2) is a top-level risk factor (Table 6) in agriculture. The top-level risk factor is influenced by the second level risk factor (Table 7), i.e., concentration in market (RF7). Production factor (RF3) is third level risk factor (Table 8). Labor (RF4) cost and personal uncertainty (RF10) are fourth level risk factors (Table 9). Fuel price and variability (RF6) and Financial risk (RF8) are fifth level risk factors (Table 10). Environmental regulation (RF9), Climate (RF1) and Government policies and regulation (RF5) are the basic level factors (Table 11) and they are very important to manage the risk in agriculture sector.

The arrows are assigned in the Multilevel hierarchy diagraph (Figure 2) using the initial reachability matrix (table 4). For example, in Table 4 government policies and regulations (RF5) is influencing Climate (RF1) and vice-versa ["1" in (1,5) and (5,1) cell of Table 4], thus, there is a double-sided arrow between these two risk factors. An arrow between two risk factors shows the inter-relationship between them. For example, in Table 4, concentration in market (RF7) is influencing Price variability (RF2), ["1" in (1,7) cell], so, we assigned a single-sided arrow between these two risk factors. A multilevel hierarchy model is made in the same way.

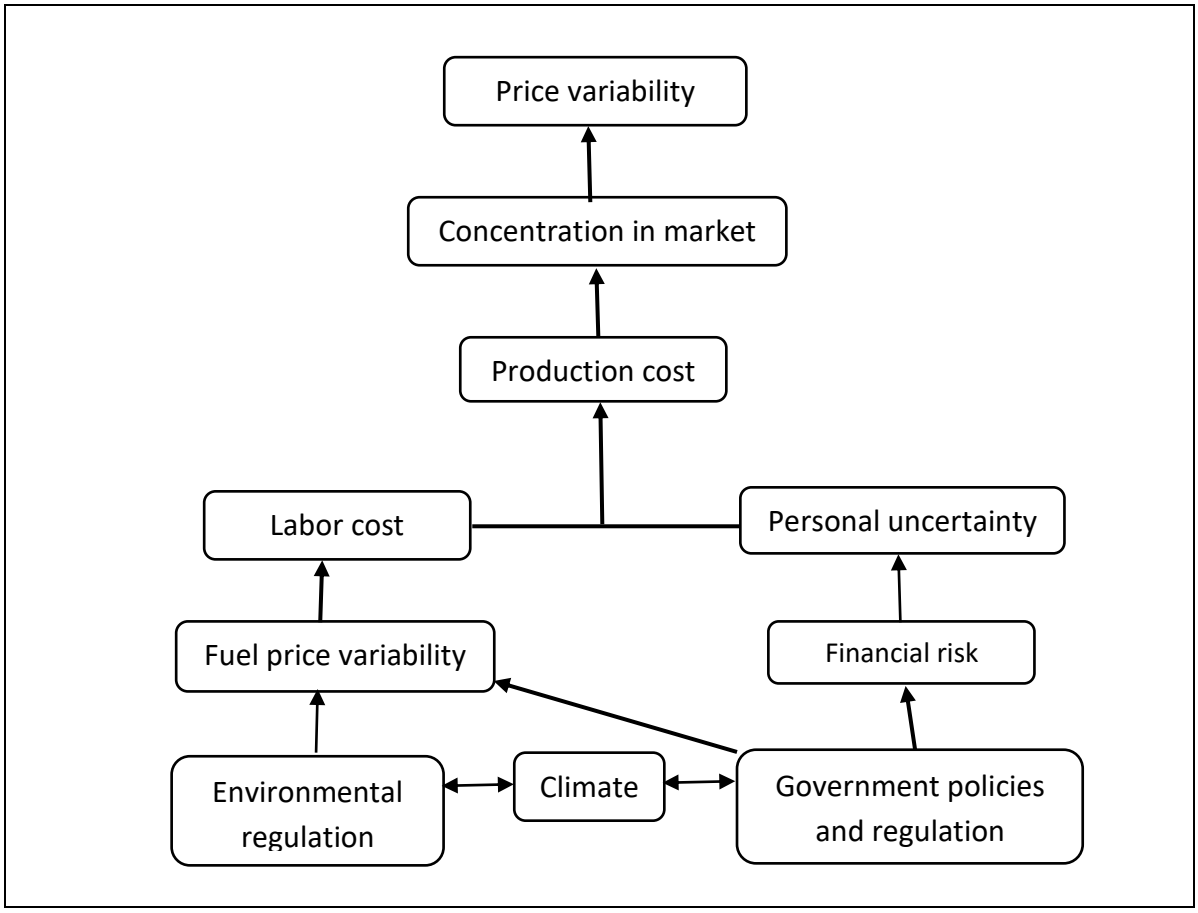


Figure 2 - Interpretive structural model showing the levels of Risk factors

2.3.4 *Matriced' Impacts Croise's Multiplication Appliquée a UN Classement (MICMAC) Analysis*. The total number of risk factors that a risk factor influences is known as its driving power and the total number of factors influencing it is known as its dependence power. Risk factors are represented in MICMAC analysis graph (Figure 3) based on their driving and dependence power. For example, Price variability (RF1) has driving power of 9 and dependence power of 3, so in the MICMAC analysis graph it will come in (3, 9) cell. In the same way, we arranged all the risk factors based on their driving and dependence power.

As shown below all the risk factors are divided into four quadrants:

(1) Autonomous risk factors: Autonomous risk factors are those which have both weak driving and weak dependence power.

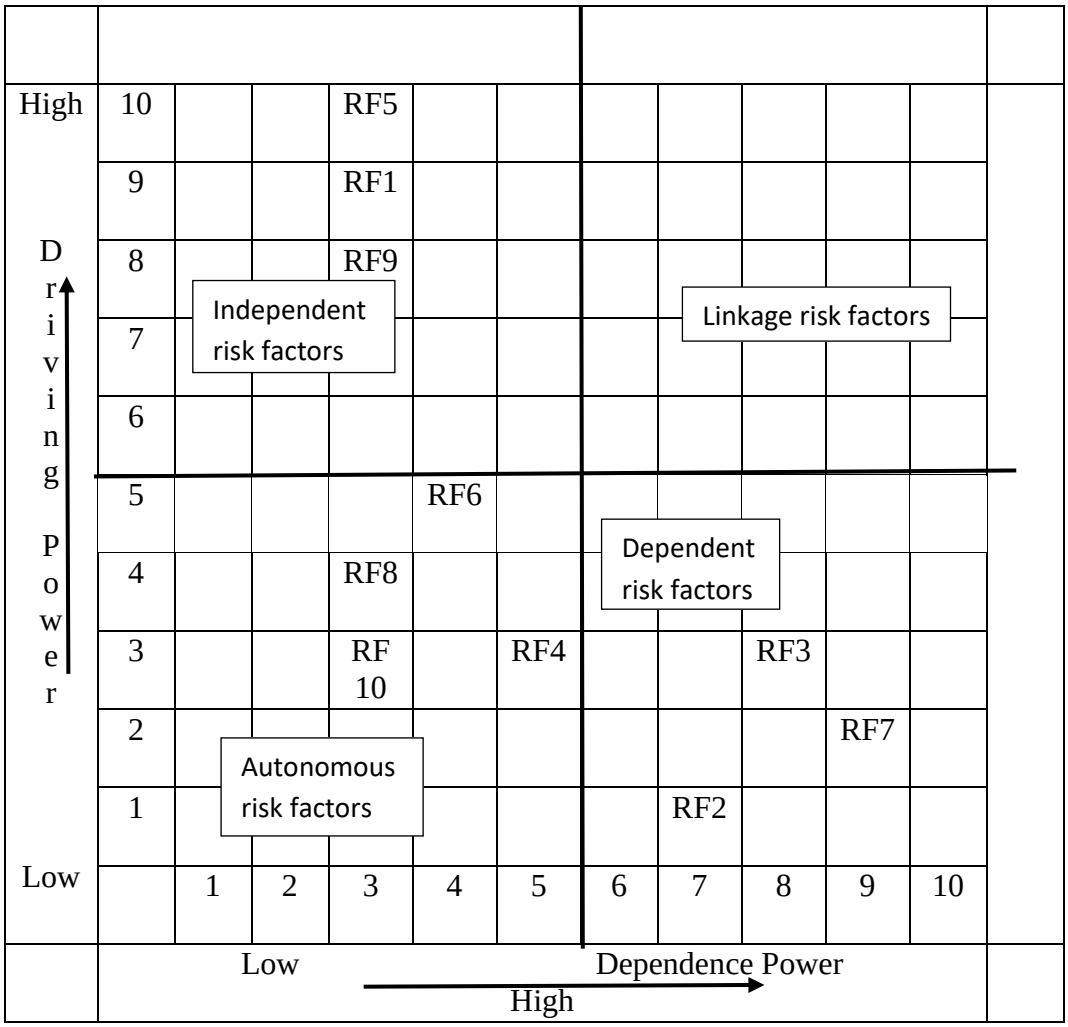
(2) Dependent risk factors: Dependent risk factors are those which have weak driving but strong dependence power.

(3) Linkage risk factors: Linkage risk factors are those which have both strong driving and strong dependence power.

(4) Independent risk factors: Independent risk factors are those which have strong driving but weak dependence power.

From the MICMAC analysis it is found that risk factors such as Labor cost (RF4), Fuel price variability (RF6), Financial risk (RF8) and Personal uncertainty (RF10) are classified into Autonomous risk factors. These risk factors have weak driving and weak dependence power. The risk factors are comparatively less connected to agriculture. Price variability (RF2), Production cost (RF3) and Concentration in market (RF7) are the dependent risk factors. We should give attention to these kinds of risk factor. Climate (RF1), Government policies and regulation (RF5) and Environmental regulation (RF9) are the independent risk factors. These are very important risk factor which have very high driving power.

Figure 3 - MICMAC analysis



3. Results and implications:

By identifying the correct relationship among the risk factors, we can implement the right kind of agriculture management policy for farmers. A proactive management approach is more efficient that reactive management approach to implement the risk management strategy in agriculture. This study highlights the following risk management strategy to reduce the risk in agriculture.

The analysis result show that government policies have a significant role to mitigate the risk in agriculture. It has an effect on all other agricultural risk factors, either directly or indirectly. For example, Pradhan Mantri Fasal Bima Yojana (PMFBY) help to reverse the risk averse nature of farmers and provide assure return. Therefore, government though its policies can averse the risk in agriculture and improve the life of farmers.

The government has a major role in implementing the policies for agriculture in every country. As discussed earlier, Environment regulation, Climate and government policies are the key risk factor in agriculture. Government's policies and regulations are adequate to mitigate the risk in agriculture and improve the farmer's life. Sufficient funds and resources are very important for the development of agriculture sector. So, the top policy maker should ensure sufficient funds and better resources to implement modern technologies and machines so that they can fulfill all farmer's needs. Government should also try to continuously invest in research and development works so that new risk management strategy can be implemented from time to time.

The government should take initiative to increase farmers' understanding and knowledge of agriculture risk management by conducting training and development programs. This will help farmers in mitigating the agriculture risk instead of conservative traditional agriculture.

Climate is also an important risk factor in agriculture. The increasing technology and

pollution are worsening the climate day by day. Therefore, it becomes vital to take care of climate and give it higher significance to save the future of agriculture sector. Adaptive measures are required to mitigate the climate risk by developing the new variety and technology. This also influence the government to make more stringent environment law.

The findings of this study have wide range implications. Through this study we find out the key risk factors involve in agriculture. This paper further helps us to understand the role of Climate, Government policy, Personal uncertainty or Production cost etc. in the agriculture risk management. Findings of this study can assist the government to make better policies and help to know which risk factor need to give more weightage. Though this paper, farmers can have a better idea about the interdependence of risk factor in agriculture.

4. Conclusion, Limitation and Future scope:

This study helps to find hierarchy levels and relations among the major type of risk factors involve in agriculture. Key risk factors were identified to manage the risk in agriculture through the literature review, survey and expert view. All the 10 risk factors were then further analyzed using ISM technique to understand the multilevel hierarchy diagraph. Price variability is the top-level risk factor in hierarchical diagraph which has high dependence power. "Environment regulation", "Climate" and "Government policies and regulations" are basic level independent risk factor with strong driving power. So, it can be concluded that agriculture risk can be mitigated by controlling these risk factors. This study can be helpful while making new policies and insurance plans for the agriculture sector.

The ISM methodology is not customizable in nature because while applying the ISM analysis it became very difficult to add, delete, or change elements to incorporate the minor viewpoint. In the ISM technique, we can select the limited number of variable because with the more number of variable the ISM process become very complex (Attri et al., 2013). The risk associated in agriculture is varies with respect to the type of crops so, we can't make a generalize statement (Toledo et al., 2011).

The ISM technique explains only the level of risk factors but it doesn't consider the relative weightage of factors (Kannan et al., 2008). So, we can assign the relative weightage with help of analytic network process. In future this type of study can be done for a specific crop to know the risk factors for that crop.

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