

DECISION MAKING PROCESS OF FARMERS IN AGRICULTURE: AN EMPIRICAL STUDY IN SHIVAMOGGA DISTRICT

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Abstract

The decision of farmers depends on many variables which can be categorized as price and non-price factors. Within the given situation, how farmers make their decisions as to which crops to cultivate, what are the inputs to be used and their combinations, what quantity must be produced are the different parts of Decision Making Process. The Decision Making Process of farmers in agriculture consists of a variety of factors. The farmers choose within the household and it is naturally influenced by the needs, aims and resources available to the household. Total sample size of the present study is 240 respondents and sample households has been classified on the basis of landholding such as Marginal farm, Small farm Medium farm and Large farm. The study of decision making process assists in analyzing the system from the bottom and behavior of the representatives of the system. Decision making also helps policy makers to perceive the process and various element of decision making. Thus with the path of current study is contributing a lot to the farming community. This particular study is a venture to search out the effect of economic and non economic features on the decision making process of various categories of farmers in manifold situations. It is argued that the root cause of the crisis was that agriculture is no more a profitable economic activity when compared to other enterprises. It means that the income derived from these activities is not sufficient enough to meet the

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expenditure of the cultivators. And therefore, unless agriculture is made a profitable enterprise, the present crisis cannot be solved.

Key Words: Decision Making Process, Agriculture Activities, Farming Efficiency, Input Decisions.

Introduction

The problem of decision appears only when possible effects are very important and still a person is doubt of what is the best thing to do. When a person is uncertain about the effects of his decisions, it can be considered that it is a risky choice. This risky choice is inherently difficult to rationalize, but procedures have been developed to allow the process to be systematized (Anderson, 1977). These procedures are collectively called as decision analysis. It is an arbitrated question as to how decision analysis can be used to lead to better decisions in agriculture by farmers.

The Decision Making Process of farmers in agriculture consists of a variety of factors. The farmers choose within the household and it is naturally influenced by the needs, aims and resources available to the household. These resources include price factors such as land, labor, water, seed and fertilizers but also non-price factors like access to information about methods of farming, credit accessibility and other social factors. It is noticed that in most of the cases price policy alone is considered as the important agenda on which farmers take their decisions.

As observed earlier different factors influence independently the farmers Decision Making Process. Price related factors encourage the farmers to take their decisions with at most care to enhance production and to get more profit. Improvements in technology yields more output on a given land and generate maximum profit at given price. Obviously, this makes the farmers to cultivate their land with modern techniques of productions.

Apart from price the factors like political influence, environmental factors, and scattered information play major part in farmers Decision Making Process. The farmers are informed about different problems faced in farming activities. Once they are open-minded of effects of

poor farm land management, they adjust the input factors in such a way to improve the yield from land. They also gave importance to maintain fertility of the soil.

In high food drain economies (Parthasarathy and Mohinder.S. Mudhahar 1976) like India, food grain prices play an important role in determining the conditions of productions, level of production, marketing system, distribution of income and in turn growth of the economy. Higher prices for the farm produce promote the farmers to change their farm land with extra care to get more profits. This is because all the resources are owned privately by the farmers. According to Ricardo it is very needed to give emphasis on intensification of agriculture to exploit indestructible powers of the soil which persist in land and to get a good harvest.

By keeping in mind the aim of mobilizing the agricultural surplus, it is intended to study the “Decision Making Process of Farmers in Agriculture: An Empirical Study of Shivamogga District”. This particular study looks to analyze as to how the different factors influence the farmers to increase the production through increasing the farming efficiency in agricultural activities by taking appropriate decisions.

Theoretical Framework

The problem of decision making in agriculture has been mainly quantified with the help of six models like Expected Utility, Bayesian Safety First, Cautions Optimizing, Shackle’s Focus Loss and Pure Behavioral Models. These models can be grouped on the basis of three criteria.

1. On the basis of the assumption that the decision maker acts in accordance with personal probabilities.
2. On the specification of the decision making process.
3. On the basis of purpose of learning the model.

It is a generalized fact that farming is highly uncertain in many of its aspects. Making it predictable or accountable in one way or other is inevitably the concern of farmers as well as the economist, if he is to understand agriculture. It is hazardous, nevertheless, to think that the farmer’s decision strategies are the same as those used by sophisticated gamblers.

The dependence on uncertain weather, the inability to prevent crop disease and pest attack has the farmers at the mercy of an unpredictable environment over which he has little

control. In an environment where subsistence farms dominate, there is very little margin for error. It is because the outcome of the production decisions determines survival. Farmers cannot afford to be wrong; since the opportunity cost of an unfavorable outcome is very high. Therefore the farmer is likely to depart from the traditional method with a delay.

Farmer's information about outcome is derived from long experience and is based upon an ultimate knowledge of the environment. The farmers are aware of the survival value of traditional method. So, the marginal pay off between traditional methods and new methods should be large for farmers to change. Farmers must have confidence based on experience of his own or successful neighbors as to justify modifying traditional models of behavior.

Review of Literature

Some of the important studies relating to decision making at the farm level are reviewed below. The review works are classified on the basis of the methodology, objectives and findings of the studies. The major **methodology based** classifications are, 1. Expected utility based models, 2. Security based models, 3. Game theory and 4. Others.

The following are the review of studies based on their **objectives and findings** given in order.

I Acreage Decision Making

II Dynamic Decision Making Process

III Particular Impact Decisions for a Crop or Season

IV Farm Planning under Risk and Uncertainty.

Many studies show the influence of different economic and non economic factors for devoting more acreage under a particular crop in farmers' decisions. The major economic incentives which stimulate the farmers to devote more acreage under particular crop are price incentives and subsidies on seeds and inputs. The important non economic factors are education, traditional beliefs and environment. These are all based on neo classical views of profit maximization with the limited resources. But later on studies are based on rational expectation principle analyze that the decision makers always select the prospects with the highest expected value. They select regardless of dispersion among the various outcomes involved by following rules of thumb with safety first models (Marc Nerlove 1956); (Venkata ramanan, L.S, 1969); (Roumasset J.A, 1976).

Many of the researches on acreage decision of farmers have relied on time series analysis besides the studies which focus their attention on dynamic decision making process of farmers utilize data on field production. The modern researches have shown that farmers use their observations of stages of production to make input decisions. These input decisions in each stage are correlated with the random component of output. Linear and non linear system of equations can be used for consistent estimation of production parameter. Each system includes the production functions for intervening inputs. The dynamic production models contain eight stages of production within a single agricultural season. As many as sixty decision alternatives are available to the decision maker at some of the stages.(Hatchett, Stephen Alan, 1984); (Robert Neil Collender and James A Chalfant, 1986); (Mjelde, James William 1985).

Optimal i.e. profit and utility maximizing input levels are computed based on normative decision guides developed from experimental data as well as subjective data derived from many farmers regarding their expectations of yields and prices. Therefore, many of the studies highlight on suggesting an analytical framework which could integrate weather conditions into the decision making on the use of inputs such as irrigation, fertilizer, seeds and pesticides. The procedure is based prominently on game theory. While weather conditions are expressed as states of nature with a given probability distribution, input treatments would be the possible strategies the decision maker could adopt in his “game against nature”. In many cases, the inputs are correlated with the random component of output and found that yield response was more to fertilizer in the second stage of production whereas irrigation in the initial stage. The excess of water in the middle period would be favorable to weeds that are more tolerant to soil saturation and would decrease the competitive capacity of wheat by keeping its root system near the surface (Sivaromaratnam S 1985).

The farm planning problems under uncertainty added constraints are convenient in representing resource limitations, technical relations and other relevant farm constraints. The farmers are also instrumental in incorporating whatever information is available to the farmers regarding the relative strategy frequencies of nature. They are rarely at the stage of ‘complete ignorance’ that is assumed in game theoretic models. The minimum data required for a reasonable estimation of

probability distribution under risk efficient decisions is also mentioned in studies through a Monte Carlo study of rule for smoothing spare data into cumulative distribution function (Jock R Anderson, 1976); (Hans P Benswanger and Donald A Sillers, 1983).

A few studies have been based on statistical analysis of the underlying infrastructure affecting the farmers of different nations or different commodities. In a changing environment with imperfect information, education contributes to production as an “allocative effect”, arising from enhanced ability to acquire and process information, as well as “workers effect”. Few studies forward the hypothesis that farmers’ price responsiveness can be expressed as a function of a number of quantifiable social variables like environment, education, family size, government intervention and extension programmes. That is proved with the help of regression analysis. In few studies, the communal framework of living as the major factor influencing the decision making process of farmers is also explored (Ntalaja, Kalanji, 1973); (Cummings, John Thomas, 1974); (Thomas O Knight, 1987).

Few studies argue that marketed surplus falls up to a certain size and then it increases. Thus, there is a ‘U’ pattern of marketed surplus, some other studies bring out that there is a direct relationship between the size of holding and marketed surplus. Few studies which have went into the details of various systems conclude that it differs from system to system (Dharm Narain, 1961); (Rajkrishna, 1965); (Ramaiah, 1981).

Research gaps

The present study, tries to fill in some of the below mentioned research gaps.

- Very limited studies have concentrated on this complex issue of decision making process of farmers in a dynamic agriculture. In agriculture input decisions in different groups play a role on output mainly on various agricultural activities.
- Very limited studies have tried to study the issue that instead of economic incentives in the form of price to maximize farmers’ objective variable, it would be better to make use of a proper subsidy policy for inputs, seeds, etc to materialize farmers’ objective function. This will reduce the cost of cultivation and generate more profits to the farmers.

- Only a few have tried a comparative study on farmers' decision making process in two different situations of various agricultural activities.

Importance of the study

The current study needs to analyze how the decision maker determines his/her choice under uncertain conditions at a particular point of time on a given piece of land. On a given piece of land, different categories of farmers cultivate their farms with various intensity and various intensive cares. The study looks to prove the Decision Making Process of different categories of farmers i.e. marginal, small, medium and large farmers in diverse situations i.e. irrigated or developed region and rain fed or under developed region. This problem is identified because in nations like India, the demand for agricultural produce increases with increasing population. In contrast the growth in agricultural production does not increase correspondingly to meet the increasing demand of the nation. In the same manner the growth in yield per hectare of cereals is also very low when compared to other countries.

Economists have tried to develop concepts and tools which may help a rigorous analysis of the decision-making process in the context of supply and demand considerations and political scientists have tried to study the decision making process in the context of the general relationship of the individual and the group with the state. But attempts made so far to study in depth the interaction of the decision making process of those who are actually engaged in agricultural operations and of others at different levels in the market and in the government dealing with agricultural problems (in functional, planning or general policy formulation capacity) have been very inadequate.

Statement of the problem:

The substance of the problem is simple to state. A choice must be made from a set of acts $A_1, A_2, A_3, \dots, A_m$. But the relative desirability of each act depends upon the prevailing "state of nature" S_1, S_2, \dots, S_n . As the decision makers are aware of that one of several possible things is true, which one of it is relevant choice. (Luce, R Duncan and Raiffa Howard 1957). In general, to each pair (A_i, S_j) , includes an act and a state; there will be result or outcome. The decision makers' choices among these outcomes are consistent.

Objectives of the study

1. To review the status and performance of agricultural development in India and Karnataka.
2. To examine and to develop theoretical background for the study.
3. To understand and study the background of farmers who are involved in decision making process on various agricultural activities at different stages.
4. To analyze, how farmers take decisions during crisis on various agricultural activities.
5. To understand the various methods/strategies adopted by the farmers to overcome agricultural crisis.
6. To find solutions to overcome the crisis found by farmers while taking decisions on various agricultural activities.
7. To suggest policy measures to strengthen agricultural activities.

Hypotheses

1. There is a relationship between risk and uncertainty with agricultural production.
2. The small and marginal farmers are highly prone to agricultural crisis (Risk and uncertainty).

Research Methodology

Methods of Data Collection

The present study is a comparative study of two dimensional in nature i.e. comparison of irrigated area and dry area and within the area a comparison of decision making process of Marginal, small, medium and Large farmers. The study is based on both primary and secondary data. With the help of the primary data, the individual farmer's decision making process is studied. With the help of secondary data the agrarian structure are studied.

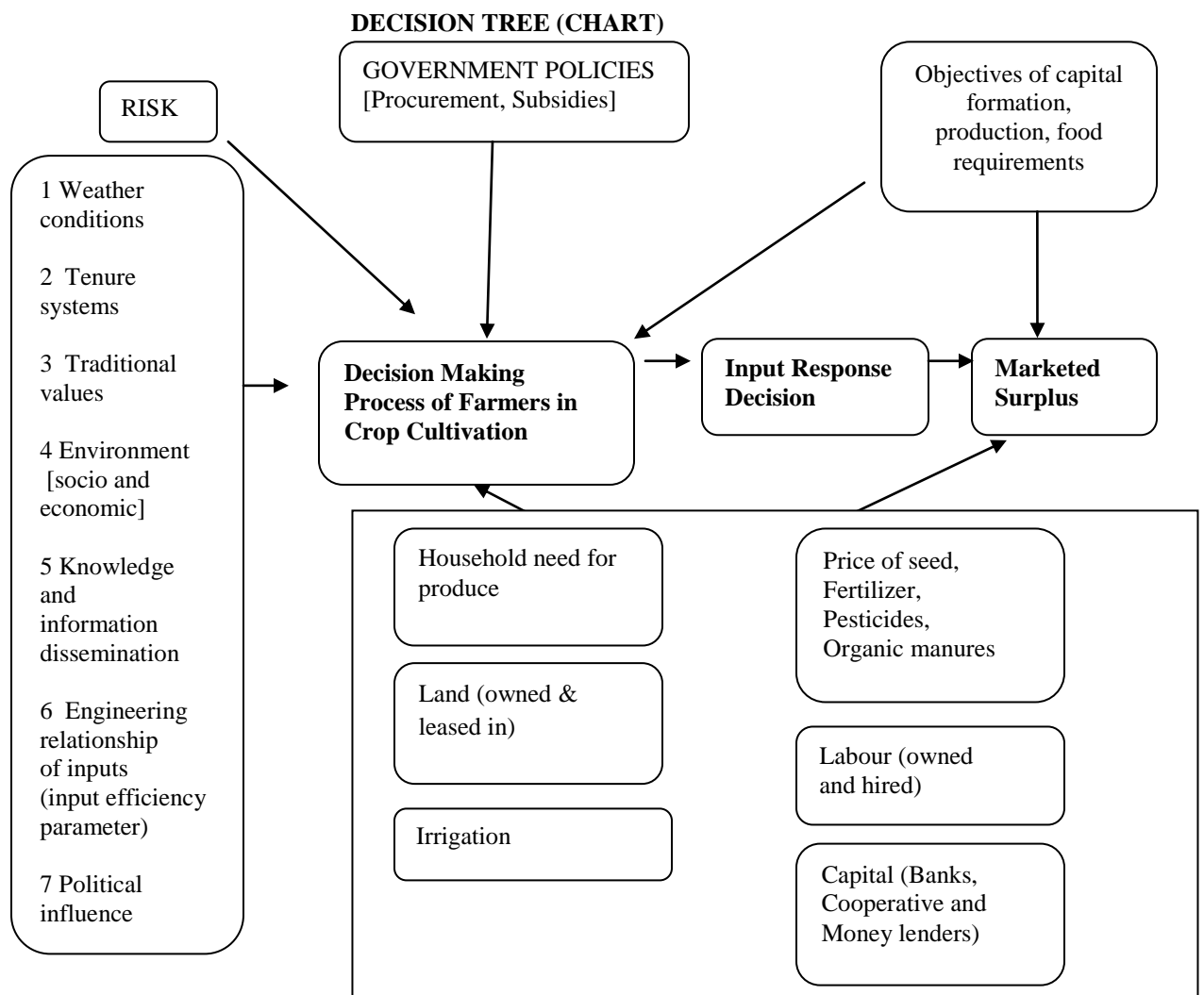
Sample Framework

The study area is identified by taking into consideration of the features like geographical area, productivity, irrigation facility and cropping pattern to cultivate more crops. The study area is selected objectively keep in view the main focus of the study. In order to achieve the set in objectives for the study, two taluks have been selected (Shikaripura and Shivamogga) from Shivamogga district. The villages like Taralaghatta and Gajanur have been purposively selected respectively from the above mentioned taluks. From each village 120 sample households have

been selected for collecting primary data and sample households has been classified on the basis of landholding such as Marginal farm, Small farm Medium farm and Large farm. Total sample size of the present study is 240 respondents. For the purpose of analysis, logical tools and techniques have been used.

Method Analysis

The statistical techniques like Multivariate Linear Regression, Stepwise Regression, Double-Log Function and Crop Diversification index are used to analyze the data. The current study is both quantitative and qualitative in nature based on primary data from two villages of Shivamogga District in Karnataka. Karnataka has been selected as agriculture activities in the state has gone through big changes during previous decades towards transformation with the help of technology.



Major Findings

- The ability of families to meet their most basic needs is an important measure of economic stability and well-being. The families with 2 to 4 members and 5 to 7 members found to be large in Gajanur village about 18.33% and in Taralaghatta village 11.6% of families found to consists of more than 8 members.
- Gajanur village which is irrigated, 20 % of population were illiterate, but in Taralaghatta village 13.33% were illiterate.
- It is quite interesting to note that 24.17 % of population have educational level up to pre-university level in Taralaghatta and whereas 18.33 % of population in Gajnur village had education level upto fourth standard.
- Less than 2.5 % in Gajanur and 1.66% in Taralaghatta village have entered into post-graduation level. Despite, having schools in both the villages, but people have not given any importance to acquire more degree/education.
- Out of the selected households 59% of households in Taralaghatta and 67.52% in Gajnur village have educational level of nearly 10th standard.
- The occupational structure of India clearly reflects a high degree of backwardness prevailing in Indian economy. It is observed that 50 % of the households in Gajanur and 48.33 % in Taralaghatta village work as cultivators and the remaining households /persons were involved in business, dairy farming, poultry, sheep rearing, cattle rearing, government services etc., It was noticed that majority of the households considered agriculture (cultivation) as a source of main occupation; this can be attributed to irrigation.
- When we interacted with respondents, came to know that people have not shown interest to get government job rather they prefer to work in agriculture itself because of various factors. For this irrigation and economic better off can be attributed.
- It is quite interesting to know that a large number of cultivated area has been covered under various sources of irrigation. This has resulted in the improvement of the households on various fronts. Nearly 56.67% cultivated area covered under canal irrigation in Gajanur village and the remaining cultivated area is being covered under other sources of irrigation. In Taralaghatta village a large number of cultivated area in being covered under tank irrigation followed by tube/bore well irrigation with a percentage of 35.83.

- The data reveals that the both the villages of the selected taluks and districts have been growing different crops despite having good irrigation system. In Gajanur only 14.17% of the total cultivated area covered under paddy crop, but major area is covered under maize crop with a percentage of 29.17, similarly in Taralaghatta major area is covered under Ragi followed by jowar and sunflower with a percentage of 27.5% 21.67% and 20% respectively maize crop is also grown in 19.17% area under irrigation provided by tube well and tank.
- Drinking water is largely provided through taps by Gram Panchayat in both the villages. Other major sources of drinking water was from tube well/bore well in both the villages.
- Major source of agricultural credit was from institutional finance rather than non institutional finance. Out of institutional finance commercial banks contributing largely than cooperative and RRBs, commercial banks have extended agricultural loans to the farm house holds to the extent of 40% and 38.33% respectively in Taralaghatta village and Gajanur village. Cooperative banks have extended agricultural loans with a percentage of 32.50% and 28.33% in Gajanur and Taralaghatta village respectively.
- The role of women related to the spending of money on purchasing of machines has been found quite minimal as 6% women have found taken decision independently regarding the purchase of machine .The role of women regarding the money spend to be on purchase of seeds, money to be spending on purchase of implements and paying wages to labour can also not be appreciated.
- In respect of the money spent on the purchase of implements and paying money to the laborers, 42 percent women have accepted the fact that they have not even consulted while making decision related to this item.
- The study shows that opinion of 34%, 20% and 14% of women considered while making decision to spend money on purchase of machine, seeds and paying wages to labourers respectively
- The position of women in Gajanur village has once again found very worse as very minimal proportion of women's accepted the fact that they have been able to convert their views into final decision in the family regarding expenditure aspects of different items in the family. The study reveals that 22%, 32%, 30% and 56% of women in Gajanur villlage are consulted while making decision to spend money on purchase of machine, seeds, implements and paying wages to labourers respectively. Acceptance of women opinion is still low. So, the minority of

the respondents have reported to have strong decision –making power in the spending of money in Gajanur village.

- Participation in decisions related to the expenditure activities in Shivamogga district: The role of rural women in Shivamogga district once again noticed insignificant as only 6% of women take final decision to spend money on purchase of machine. 32%, 31%, 17% and 16% of women play key role while making decision to spend money on machines, seeds, implements and paying wages to labourers. but as far as considered to the money spend to be on purchase of implements, the respondent's role has been considered quit minimal. So, almost same picture has been emerged at district Shivamogga as found earlier for Taralaghatta and Gajanur villages.
- Participation decision related to the buying activities in Taralaghatta Village: It is observed that 4 per cent women have observed to take final decision regarding purchase of lands independently, 2 per cent women have taken final decision in respect of the purchase of land independently.
- In case of decision related to the purchase of small type of agricultural implements and purchase of insecticides and weedicides, no respondent has observed to take final decision independently. 70% of women respondents have no role in decision making in purchase of insecticides and weedicides. No single woman has to be noticed to taking final decision regarding purchase of insecticides and weedicides.
- As far as the purchase of lands is considered of Gajanur village of Shivamogga taluk in Shivamogga district, 10% have full authority, 12% opinion is considered, 22% consulted and 52% no role in making decision to purchase of land respectively.
- Participation in decisions related to the buying activities in Gajanur village: Only 10% of women in Gajanuru village take independent decision on type of land to be purchased and majority of women are not involved in the decision related to quantity of land, type of machine, and type of of small implements to be purchased.
- Participation in decisions related to the buying activities in Shivamogga district: 68% of the respondents have nil decision making power related to purchasing of insecticides, weedicides, purchase of land, machine and small agricultural implements. 30% women have been consulted while making decision related to purchase of land in Shivamogga district. Women participation in decision making process in the study area is insignificant.

- Participation in decisions related to opting measures to Increase production in Taralaghatta village: Only 4% of women take final decision to raise the level of crop production. 44% consulted during decision making process. 54% respondents consulted with regard to method of sowing, using plant protection measures, type of fertilizers to be used, installation of tube wells. So, the male dominants in decision making process related to opting different measures of increasing production in agriculture sector in Taralaghatta village of Shikaripura taluk of Shivamogga District.
- Participation in decisions related to opting measures to increase production in Gajanur village: Women's participation in decision-making related to the opting measures to increase production in Gajanur village is nil. No women have shown power to take final decision independently regarding all the components except for the new implements to be used for production.
- 2% of women found to take independent decision regarding implements to be used for production. 72% of women play no role in type of fertilizers to be used. 56% of women do not have decision-making power for dig tube well. 48% of women's opinion is considered while making decisions related to the cropping pattern of the agricultural lands of the Gajanur village in Shivamogga taluk of Shivamogga district.
- Participation in decisions related to opting measures to increase production in Shivamogga district: 21% women respondents admitted they have no role, 40% of women said they are consulted, 38% of women replied they influence their husbands in decision-making process related to increase level of crop production.
- Almost same picture has emerged in case of the cropping pattern, method of sowing but the situation have become more depressed in case of plant production measures, type of fertilizers to be used and new implements to be used for production as 53%, 68%, 52% of women responded that they have no role in the decision making process of cropping pattern, method of sowing, plant production measures respectively. 55% said they have consulted for method of sowing in Shivamogga District.
- Participation in decisions related to the livestock management activities in Taralaghatta village: A better situation has been observed in this area of decision making. More than 50% of women found to have full control on decision on livestock to be kept and to sell. 12% respondents said they have no control over decision on live stock and 8% on decision relating to

sell livestock. 6% of women respondents take independent decision on fodder for livestock. 40% respondents have been consulted in the decision making process with respect to cultivation of fodder for livestock but, 38% respondents opinion given consideration decision making.

- Participation in decisions related to the livestock management activities in Gajanur village: All the respondents said to have positive role in decision making process with respect buying, keeping, and selling of livestock. Only 5% respondents have no role in the decision making process of cultivation of fodder for livestock. 50% of the women said to have taken independent decision on buying and keeping of livestock.

- Participation in decisions related to the livestock management activities in Shivamogga district: 47% of women take independent final decision while 37% of women respondents' opinion considered by husband in relation to the decisions to be considered to buy livestock.

- 12% of women have taken independent decision to cultivate fodder for livestock. 44% of women opinion considered by their husband at the time of selling livestock. So, the main conclusion can be drawn for the decisions regarding livestock management activities that women have performed well under this head, in comparison to the decision-making in respect of different crops production activities.

- Participation in decisions related to storage activities in Taralaghatta village: 18% of women respondents found to participate actively in decision making process with regard to quantity to be stored. 54% of women respondent's opinion considered in selling activities. Men dominated in the decision making process in the areas related to where to store, what crop to store and method of storage. So, the decision has once again been taken by males and the same holds true for the place selection where the crop should be stored and the decision related to the method of the storage has been no exception of it.

- Participation in decisions related to storage activities in Gajanur village: 24%, 20%, and 26% of women respondents independently take decision on quantity, place and crop to be stored respectively, in Gajanur village. 50 %, 36% and 24% respondent's opinion has been considered by their male partners. 2% of women respondents have no role in the decision making process in the area like quantity, crop and place of storage in Gajanur village.

- Participation in decisions related to storage activities in Shivamogga district: 21%, 18%, 23%, and 11 % respondents have been shown engaged in the decision- making power related to the quantity to be stored, crop to be stored, about the place and method of the storage. 52%

respondents opinion has been considered in the decision making in respect of quantity to be stored. But this percentage has been decreased as 50 % women's views have been considered while selecting the crop which has to be stored, the number has fallen by more margin for the place as only 36 % women have accepted the fact that their opinion has been considered by their spouse.

Limitations of the study

- The present study is conducted for two distinct conditions in Karnataka. The two taluks are selected from the selected district with entirely different conditions of agriculture activities i.e., irrigated and rain fed agriculture. A village from each of the selected taluk is selected for intensive study.
- The period of the study is restricted to one agricultural year (2016-17) which includes one Khariff and one Rabi season. This is because farmers have limited memory power to give authentic data.
- The variables are restricted according to their availability which was studied with the help of pilot survey.

Conclusion

The study of decision making process assists in analyzing the system from the bottom and behavior of the representatives of the system. Decision making also helps policy makers to perceive the process and various element of decision making. Thus with the path of current study is contributing a lot to the farming community. This particular study is a venture to search out the effect of economic and non economic features on the decision making process of various categories of farmers in manifold situations. It is argued that the root cause of the crisis was that agriculture is no more a profitable economic activity when compared to other enterprises. It means that the income derived from these activities is not sufficient enough to meet the expenditure of the cultivators. And therefore, unless agriculture is made a profitable enterprise, the present crisis cannot be solved.

The only remedy to the crisis is to do all that is possible to make agriculture a profitable enterprise and attract the farmers to continue the crop production activities. As an effort towards this direction, the government should augment its investment and expenditure in the farm sector.

Investment in agriculture and its allied sectors, including irrigation, transport, communication, rural market, rural infrastructure and farm research, should be drastically increased, and the government should aim at integrated development of the rural areas. Implementation of National Rural Employment Guarantee Scheme can also become a means of revival of the rural economy. The solution of the problem is not in a few “packages” but in drastic changes in the present economic policies related to agriculture. No other sector’s growth and development must be at the cost of agriculture. All farmers, agricultural labourers, societies, Government and People’s Organisations should work collectively to revive agriculture and “**Save India from Agriculture Crisis**”.

References

1. Adams, John et al., (1981)- “*The pattern of Agricultural Development in Tamil Nadu in the 1970s; A district wise disaggregation*”, *The developing Economics*, 20(2): 161-168.
2. Anderson, J R (1977) - “*Agricultural Decision Analysis*”, IOWA State University press, IOWA.
3. Balakrishnan, Pulapre, Ramesh Golait and Pankaj Kumar (2008) –“*Agricultural growth in India since 1991*”, Development Research Group (DRG), Study No.27, Reserve Bank of India, Mumbai.
4. Bhat KS and S.Vijaya Kumar (2006), “*Undeserved Death: A Study of Suicide of Farmers of Andhra Pradesh (2000-2005)*”, Allied Publishers Private Ltd, New Delhi.
5. Bingswanger, H P and Sillers, D.A (1983) - “*Risk aversion and credit constraints in farmers. Decision making: A reinterpretation*”, *Journal of development studies*, 20(1): 5-21.
6. Burton, R. (2004), “*Reconceptualising the ‘behavioural approach’ in agricultural studies: a socio-psychological perspective*”, *Journal of Rural Studies* 20: 359-371.
7. Cummings, John Thomas (1974), Supply response in peasant agriculture: Price and Non-Price factors, unpublished Ph D thesis submitted to Agricultural Economics Department. Tufts University November 1973.
8. Das Gupta, S (1970) – “*Agricultural producers’ rationality and technical change*”, Asia publishing House, Bombay.
9. Day, R.H and Singh, Inderjit (1977) – “*Economic Development as an adaptive process: The green revolution in the Indian Punjab*”, Cambridge university press, Cambridge.

10. Economic survey 2008-09,2014-15 and Previous years.
11. Frankel, Jeffrey (1986) – “*Expectations and commodity price dynamics. The overshooting model*”, American Journal of Agricultural Economics 68(2) : 344 – 47
12. Hatchett, Stephen Alan (1984) – “*Dynamic Input Decisions: An Econometric Analysis of Crop Response to Irrigation*”, Unpublished PhD Thesis, University of California, Davis.
13. Hazell, P.B.R and Scandizzo, P.L (1971)–“*Farmers expectations, Risk aversion and Market equilibrium under risk*”,American Journal of Agricultural Economics,59(1):204-9
14. Herath, H.M.G (1982) – “*Decision making models with special reference to application in agriculture: A review and a critique*”, Oxford Agrarian studies, 11:139 – 57.
15. Kapila, Rak and Uma Kapila (2008), “*Indian Economy: A Journey in Time and Space*”, Academic Foundation, New Delhi.
16. Kavita (2006), “*A study on the women participation of farm operations and decision making in agriculture*”, Extension Education and Management. 15(4):26-30.
17. Khare,N.K. and Manisha Jaiswal (2002), “*Role of Farm Women in Decision Making related to Farm Practices*”, Madhya J Exten Educ. 12(4&5):32-34.
18. Kolli, N Rao (2008), “*Risk Management as a Pillar in Food Security Policy: India Case Study*”, Report Food and agriculture organization of the United Nations, FAO.
19. Krishna Raj (1965) – “*Marketable surplus function for a subsistence crop: An Analysis with Indian data*”, Economic weekly 17 (Annual number).
20. Kumari, Anita (2002), “*Role of rural women in monetary decision making*”, Journal of Extension Education. 13(4):3418-3421.
21. Minaxi, P. And Lopamudra, R.P (2000), “*Role of farm women in decision making process related to post harvest activities*”, Research Highlights, JADU. 10(2):64-68.
22. Moscardi, Edgardo and Alan de Janury (1977) – “*Attitudes towards risk among Peasants: An Econometric Approach*”, American Journal of Agricultural Economics, 59(3): 710-16.
23. Muth, John F (1961) – “*Rational Expectation and price movements*”, Econometrica 29(2), p.316.
24. Narain, Dharm (1961), Distribution of the marketed surplus of agricultural produce by size level of holdings in India. : 1950 – 51. Asia publishing House, Bombay.
25. Narlove, Marc (1956), Estimates of supply of selected agricultural commodities, Journal of Farm Economics, 38(May) : 496 – 509.

26. Neef, A. and Neubert, D. (2011), "*Stakeholder participation in agricultural research projects: a conceptual framework for reflection and decision making*", Agriculture and Human Values 28: 179-194.
27. Neumann, Von and Morgenstern, Oskar (1953), Theory of games and economic behavior, Princeton university press.
28. Ntalaja, Kalaniji (1973), Decision making process of African farmers : A theoretical approach, unpublished Ph D Thesis, university of Missouri, Columbia.
29. Parthasarathy, G and Mohinder S. Mudhahar (1976), "Food grain prices and Economic growth", Indian Journal of Agricultural Economics, XXXI (2), pp.17-30.
30. Patil, V.G. and Sawant, A.G.(1996), "*Decision making pattern to farm families*", Maharashtra Journal of Extension Education. 25:6-9.
31. Premavathi,R. and R.N.Seetharaman (2002), "*Problems faced by women in farm and home decision making*", Journal of Extension Education. 13(4):3451-3452.
32. Raitramitra.kar.nic.in – website URL.
33. Rajasekaran, N(1993), "*Decision Making Process of Farmers with respect to Price And Non-Price Factors in Crop Cultivation*", Thesis Submitted to The Bangalore University through The Department of Economics for The Degree of Doctor of Philosophy in Economics, Institute for Social and Economic Change , Bangalore.
34. Ramaiah P (1981), Tribal Economy in India, Light and Life Publishers.
35. Rowmasset, James A (1977), Risk and uncertainty in Agricultural development, seminar report No. 15, October 1977, The Agricultural Development Council, Lagane, Philippines.
36. Sheffrin, Steven N (1983), "Rational Expectations", Cambridge university press, Cambridge, chapter I.
37. Sillers, David L (1968) (Ed), International Encyclopedia of the social sciences, Mac Millan company and Free press ,Vol4, pp.35-54.
38. Singh, I.J (1979), Utility approach to the analysis of risky farm decisions, Indian Journal of Agricultural Economics, 34(1) : 68 – 78.
39. Singh, S. N and Reddy S.K. (1965), Adaption of Improved agricultural practices by Farmers, quoted in Srinath Singh (1976), Modernisation of Agriculture: A case study in Eastern Uttar Pradesh, Heritage publishers, New Delhi p. 10.

40. Sivaramaratnam S (1985), Texas coastal Bendgrain sorghum producers fertilizer decisions under uncertainty, Ph D Thesis, Texas and Am University, Abstracted in Dissertation Abstracts International 46(10) : 31111.
41. Somani, Z Z and Tikka, S .B. S (1984), Dictionary of Agriculture, Agricole Publishing Academy, New Delhi.
42. Susheela and Prasad , R.N (1991), “ *Overall decision making by women in related to farm aspects*”, Journal of Extension Education. 6(1):13-15.
43. Swarnkar and Kushwah (1997), “*Role and socio –personal characteristics of farm women of Rewa district (Madhya Pradesh) in decision making process*”, Madhya Pradesh. Journal of Social Sciences. 2(1):34-46.
44. Venkataramanan, L.S (1979), Report on price spreads of Agricultural commodities in recent years, Indian Journal of Agricultural Economics, conference number , 34(4) : 227 – 41.