

## Predictive Factors Affecting Indian Rural Farm Youths' Decisions to Stay in or Leave Agriculture Sector

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### ABSTRACT

Agriculture has been facing an increasing problem, worldwide, on account of farmers quitting agriculture; and India is no exception to it. In view of this, a study was undertaken to find out the factors predicting future decision(s) of rural farm youth, hailing from Eastern States of India, regarding 'Whether or not to remain engaged in the agriculture sector'. The data were collected through personal interview with 120 rural farm youth. The results showed that 41.67 per cent of the rural farm youth would leave farming in the future. Binomial Logit Model indicated that the factors like land-holding, entry to farming, attitude towards dairying and crop farming were significant, as far as decision on 'quitting the farming in the near future' was concerned. Apart from this, ensuring the 'Food Security for the Family' was found to be the main reason for choosing farming as an occupation, as reported by the rural youth engaged in farming. On the other hand, 'To bring stability in life' happened to be the prime reason cited by the rural youth that had moved into farming after having tried other occupation(s). Based on the quantitative results, coupled with qualitative information, two distinctive paradigms were developed to reflect 'How youth becomes a Farmer?' and 'How and Why the youth quits Farming?', with a view to enrich our knowledge on this subject via empirical evidences as obtained from the grassroots level, especially from the Eastern Part of India.

**Keywords:** Decisions for future, Factors for quitting farming, Rural youth.

### INTRODUCTION

Young farmers are an extremely important group among the farming community as they are the ones who would continue agriculture in the future. The global youth population is about 1.8 billion (United Nation Population Fund, 2014), which amounts to about 25% of the total global population. According to the latest population census of 2011, the total population of India is 1.21 billion and 66 per cent of them are up to 35 years of age. The latest survey of National Sample Survey Organization (NSSO, 2013) advocates a 64.1 per cent of rural people engaging in the agricultural sector. Worldwide, the youth are

three times more likely to be unemployed than adults, and there are an estimated 300 million youths who are part of the global working poor (Paul, 2010). In India, rural youth are less attracted to farming, thereby resulting in the declination of the number of farmers (Sharma, 2007); and many of those who are employed in this sector are also dissatisfied, and if given a chance, they would like to quit farming (Government Of India, GOI, 2005). This picture is common in many countries and raises questions such as: 'Who will take up farming in the future?' (Swarts and Aliber, 2013; Webster *et al.*, 2013), or 'What will be the fate of farming?' It is widely expected that strong demographic dividend of India would pay

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off if proactive measures are taken. Various studies (Kumar, 2010; Kumar and Subramanian, 2011) have discussed whether it is boon or bane; but it is certain that these youths can contribute, immensely, in the sustainable growth trajectory.

Of late, farming sector faces challenges from multiple fronts. For example, in India, more than 40 per cent of farmers expressed bitterness with their occupation, saying that, if given a chance, they would like to quit farming (GOI, 2005). Further, Mehta (2011) reported that about 27 per cent of farmers in India did not like the profession of farming because it was not profitable. As a whole, it has become a matter of concern for the policy-makers and planners, so as to engage, attract and retain the rural youth in the agricultural sector. However, in this study on rural youth *vis-a-vis* farming as an occupation, the focus was on predicting the future. Moreover, as several studies (GOI, 2005; Sharma, 2007; Mehta, 2011) have already pointed out that youth were leaving agriculture, the present study made an attempt to address the very basic question, that is, "What are the underlying factors associated with the future decision of rural farm youth to quit farming?"

## MATERIALS AND METHODS

The study focused on Eastern India, wherein the GOI has put in special focus to bring "Second Green Revolution" through *Rashtriya Krishi Vikash Yojana* (RKVY). Eastern India has some relative advantages over north-western India, which was the forerunner in bringing 'Green Revolution' to India. The states of Bihar and West Bengal from Eastern India were selected, purposively, as Bihar and West Bengal are the two states, where predominance of marginal land-holding prevailed (Agricultural Statistics at a Glance, 2011, MOA, GOI). Furthermore, both these states were the top ones among the six eastern states in India, in terms of Gross State Domestic Product resulting from agriculture

and allied sectors (2011-2012). Based on the percentage of rural population (of the total population), all the districts of the two states were classified into two categories, *viz.*, relatively high rural populated districts and relatively low rural populated districts, while taking 'median value' as the cutting-point. Afterwards, one district from each of those categories was selected, randomly. The classifying variable was selected because it would depict the picture of relatively more and less agricultural dependent districts of those two states, and this implied, general orientation of people towards farm-based and non-farm-based means of livelihoods. Accordingly, Coochbehar and Nadia districts from West Bengal, and Vaishali and Muzaffarpur districts from Bihar were selected, randomly. Two blocks were selected randomly, from each selected district. Hence, in total, 8 blocks were selected for the study. Respondents for the study were rural youth. From each block, 15 rural farm youth were selected randomly. Thus, in total, 120 rural farm youth were selected as the respondents of this study; and were personally interviewed for data collection. Rural Farm Youth was defined for the study as a male, aged between 18 to 35 years, who was a resident of village at the time of interview; and whose primary occupation was agriculture. In-fact, the study covered only male youth. It could be clearly visualized, from migration pattern of India, that mostly women migration takes place for marital arrangement where lifetime mobility of women from her parental home to in-laws (Rosenzweig and Stark, 1989) and intra-district and intra state analysis showed that women usually migrate as accompanists of men (Mitra and Murayama, 2009). Male migration is predominantly driven by economic force/livelihood opportunities (Mitra and Murayama 2009). Farming is predominant occupation in rural India (NSSO, 2013) and migration of male farmers resulted in feminization of agriculture (Jothilakshmi *et al.*, 2014; Ghosh and Ghosh, 2014). Thus, the study focused exclusively on male rural youth.

'Future decision' was taken as the dependent variable; whereas, the independent variables happened to be income diversification (Bragg and Dalton, 2004), land-holding (Pietola and Vare, 2003; Glauben *et al.*, 2003), and educational level (Bryceson, 1996; Juma, 2007). The positive effect of remittances provided by return migration was discussed by scholars like Schoch (2008), Agergaard and Broegger (2016). Moreover, circular migration and cosmopolitanism elaborated by Gidwani and Sivaramakrishnan (2003) showed that movements in geographic space including sensibilities and ideas, materials, and techniques enable transformation of social space in multiple worlds. Thus, variable named *Entry to farming* was used to capture its effect on future decision of rural youth. Dependency ratio increases economic distress level of household, resulting into abandoning farming (Möllers *et al.*, 2006) shift into non-farm sector (Möllers *et al.*, 2006; Jatav and Sen, 2013). Attitude of farmers is an important predictor for determining decision of farmers *vis-a-vis* multi-functionality of agriculture (Jongeneel *et al.*, 2008), whether or not to remain in farming (Singh and Gupta, 2014). The details about dependent and independent variables are described in Table 1.

To understand the effect of independent variables on the dependent variable, binomial logistic regression analysis was run in SPSS 16 to identify the logit coefficients. The logistic regression model helps in determining the influence of independent variables on dependent variables, when the dependent variable has only two groups (dichotomous) and the explanatory variables are continuous, categorical and dummy (Long and Freese, 2006; Tiwari *et al.*, 2008). Discrete choice econometric models have been widely used in estimating models that involve discrete economic decision problems (Guerre and Moon, 2006). Here, future decision of youth as dependent variable takes binomial values, so binomial logit is used. This model helps to explore the degree and direction of the relationship between dependent and independent variables. Logit and probit

analysis produces similar results (Greene, 2000) and, moreover, logit was also used by scholars like Nzomoi *et al.* (2007), Uzmay *et al.* (2009), Chang *et al.* (2011), Karkacier and Gokalp (2011), Lange (2012), and Ferjani *et al.* (2015) in exploring various behavioral issues of farmers like farm exit, transfer of managerial power to a successor, etc. So, a binomial logit model was used for understanding the effects of explanatory variables on future decision of youth.

The logit model based on the cumulative logistic possibility function is formulated as below (Gujarati, 1995)

$$P_i = F(z_i) = F(\alpha + \beta X_i) = \frac{1}{1 + e^{-z_i}} = \frac{1}{1 + e^{-(\alpha + \beta X_i)}} \quad (1)$$

The mathematical notation of logit model is:

$$\text{Logit}(p) = \log\left(\frac{p_i}{1 - p_i}\right) \quad (2)$$

$$\log\frac{\hat{p}_i}{1 - \hat{p}_i} = \alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_i x_i \quad (3)$$

Where,  $P_i$  = Possibility for  $i$  numbered individual to choose an option;  $F$  = Cumulative possibility function,  $\alpha$  = Constant coefficient,  $\beta$  = Parameter to be predicted for each explaining (independent) variable,  $X_i$  =  $i$  numbered independent variable.

The step-wise regression with backward selection procedure was used for this analysis. As the study wanted to explore the variables, step-wise logistic regression was preferred, instead of simple logistic regression. The step-wise regression procedure continued until no more variables could be removed.

A semi-structured interview-schedule was developed for the study. Some open-ended questions were incorporated to explore insight on the issue of rural youth *vis-à-vis* quitting farming. Open-ended questions were analyzed using summative content analysis. This analytic approach is used to identify key words and subsequent quantification to understand a particular

**Table 1.** Dependent and Independent Variables with their description.

Variables	Operational definition	Measurement	Level of measurement
Future decision (Dependent variable)	Decision of a farm-youth whether to continue farming as occupation or quit from it in future.	Direct Questioning	Nominal 0= Continuing farming 1= Quit farming
Income diversification	It was measured by Simpson Index of Diversification which takes into consideration the proportion of income from various sources.	Structured Interview Schedule	Ratio  Where, $P_i$ = Proportion of income coming from different sources
Land-holding	Total area of land owned (Including Leased out land) by the family of the respondents.	Structured interview schedule	Ratio
Entry to farming	Time of entry to farming as occupation by the youth as first choice or moved into farming after having tried other occupation(s).	Structured Interview Schedule	Nominal 0= First hand choice of farming 1= Moved into farming after tried other occupation(s)
Educational level	Formal education undergone by the respondents.	Structured Interview Schedule	Ordinal 0= Illiterate 1= Up to Primary 2= Beyond primary to secondary 3= Beyond secondary to higher secondary 4= Above higher secondary
Dependency ratio	It is the ratio of dependants to income earner within a household.	Structured interview schedule	Ratio value is always greater than 0.
Attitude towards dairying	Feelings associated with, and held by rural youth regarding dairying as an occupation.	Scale developed for the study	Ordinal
Attitude towards crop farming	Feelings associated with, and held by rural youth regarding dairying as an occupation.	Scale developed for the study	Ordinal

situation (Hsieh and Shannon, 2005). In this study, open ended questions happened to be: "Why did you choose farming as your occupation?" "Are you planning to change your current occupation? If yes, then give reasons". Have you moved into farming after trying other occupation? If yes, please cite the reasons. Did you ever migrate to other places/ will you intend to migrate for earning a

livelihood? If yes, then give a detail account; and "How do you see your future occupation?"

## RESULTS AND DISCUSSION

More than half (53.33%) of rural farm youth had low income diversification;

whereas, a vast majority of the rural farm youth (84.17%) had marginal land-holdings (Table 2). The fact that Bihar and West Bengal are two states with the highest population density among Indian states (Census, 2011), also justifies the results regarding marginal land-holdings under the possession of a vast majority of the respondents. Traditionally, Bihar is mostly rice-based rural economy; and integration of different enterprises in farming is on the

lower side, so, income diversification is low. Farm-youth who had chosen farming directly as an occupation were 76.67 per cent of the total respondents, as against 23.33 per cent of the farm youth, who had moved into farming after having tried other occupation(s), since such respondents had family tradition of farming. A huge majority (94.17%) of farm youth was found to be literate, although the overall literacy rate of Bihar was only 63.08 per cent (Census,

**Table 2.** Distribution of Rural Youth on the basis of general indicators treated as variables in the study.

Variables	Rural youth (n= 120)	
	Categories	Frequency <sup>a</sup>
Income diversification	Low (0 to 0.199)	64 (53.33)
	Medium (0.2 to 0.499)	41 (34.17)
	High (0.5 to 0.699)	15 (12.50)
Land-holding	Marginal (< 1 ha)	101 (84.17)
	Small (1-2 ha)	17 (14.17)
	Semi-medium (2-4 ha)	2 (1.66)
Entry to the farming	Directly chooses farming as an occupation	92 (76.67)
	Moved into farming after having tried other occupation(s)	28 (23.33)
Educational level	Illiterate	7 (5.83)
	Primary	33 (27.50)
	Secondary	51 (42.50)
	Higher secondary	23 (19.17)
	Degree and above	6 (5.00)
Attitude towards dairying	Highly favorable attitude	50 (41.66)
	Favorable attitude	44 (36.67)
	Unfavorable attitude	26 (21.67)
Attitude towards crop farming	Highly favorable attitude	47 (39.17)
	Favorable attitude	47 (39.17)
	Unfavorable attitude	26 (21.67)
Types of Occupation	Only crop farming	14 (11.67)
	Crop farming+Dairying	82 (68.33)
	Crop farming+Poultry	3 (2.50)
	Crop farming+Dairying+Poultry	13 (10.83)
	Farming+Business	8 (6.67)
	Mean	1.87
Dependency ratio	Standard deviation	0.886
	Range	3.667

<sup>a</sup> Figures in parenthesis indicate percentage.



2011).

Further, the results showed that 41.66 per cent and 36.67 per cent of farm youths were having highly favorable and favorable attitude towards dairying, respectively; whereas 78.34 per cent of farm youth had favorable to highly favorable attitude towards crop farming. This is evident from the distribution of occupation, which showed crop farming, and dairying happened to be the major occupation of the farm youth, as reported by more than two-third (68.33%) of the respondents. So, the results depicted that the farm youth had positive attitude towards crop farming and dairying both, which could be attributed to the fact that they were 'practicing farmer' at that time.

#### Farm Youth *vis-à-vis* Decision to Quit Farming in Future

The percentage of farm youth, who wanted to quit farming in the long run, stood at 41.67 per cent (Table 3). But, a contrasting view was also present, as 23.33 per cent of farm youth did not choose farming directly; rather they moved into farming after trying other occupation(s). This shows two different trajectories: many of the existing farmers were ready to quit farming, whereas many of the farmers left other occupation(s) in order to enter farming. Interestingly, further exploration of data showed that only 14.29 per cent farm youth among those who moved into farming were ready to quit farming.

Some of the important reasons for choosing farming as an occupation happened to be (see Table 4): 'Ensures family food security' (53.33%); and 'Farming being a family occupation' (46.67%). Open-ended questions were asked to find diverse reasons of moving into farming after having tried other occupation(s); and the most noted reasons were found to be 'Bringing stability in life' (67.86%), and 'At least no worry about food' (35.71%).

In order to find out the response to the query: 'What are the factors that compel farm youth to quit farming?', Binomial Logit was run. Overall, the model was a good fit, as the results of Hosmer and Lemeshow Test showed the acceptance of null hypothesis (Chi-square value= 8.578, P value= 0.379). The classification rate indicated 86.70 per cent correct classification, which was fairly good too. Four variables were included in the final model (Table 5). These were: land-holding, entry to farming, attitude towards dairying, and attitude towards crop farming. The logistic regression coefficient  $\beta$  only depicted the direction of change; albeit, in this case, all were found to be negative. In the Logit model, odds ratio was calculated by Exponential of  $\beta$ . The odds ratio 'greater than one' showed positive change, 'equal to one' showed no change, and 'less than one' showed negative change. But, according to Osborne (2006), to simplify, interpretation of the values less than one must be converted into their corresponding ratio counterpart above 1.0 by taking the inverse of the odds ratio.

$$\text{Logit (P)} = 10.104 - 0.521X_1 - 1.595X_2 - 0.101X_3 - 0.128X_4 \quad (4)$$

Where,  $P$  = Probability of decision to quit farming;  $X_1$  = Land holding;  $X_2$  = Entrance to farming;  $X_3$  = Attitude towards dairying, and  $X_4$  = Attitude towards crop farming.

Logit of decision to quit farming was calculated through odds ratio by taking the decision to continue farming as a reference. The reverse odds ratio for significant factors, *viz.*, land holding, entry to farming, attitude towards dairying, and attitude towards crop farming happened to be: 1.684, 4.926, 1.106, and 1.136, respectively. Odds of future decision to continue farming with one unit increase of land holding is 1.684 times, keeping other variables constant. Clearly, large land holding implies more opportunity to farm commercially, which would result in more profitability. Thus, rural farm youth

**Table 3.** Distribution of farm youth, based on entry and exit *vis-a-vis* farming.

Farm youth (n= 120)		Youth who wanted to exit from farming	
		Yes	No
Entry to farming	Directly choosing farming	46 (50.00)	46 (50.00)
	Moved into farming after having tried other occupation(s)	4 (14.29)	24 (85.71)
	Total	50 (41.67)	70 (58.33)

**Table 4.** Reasons of choosing farming as occupation by rural farm youth.

Choosing farming as occupation	Reasons	Farm youth	
		Frequency <sup>c</sup>	Percentage
Directly <sup>a</sup>	Family occupation	56	46.67
	Not able to get other jobs	34	28.33
	Ensures family food security	64	53.33
	Reasonable, profitable occupation	22	18.33
Moving into farming after having tried other occupation(s) <sup>b</sup>	Bring stability in life	19	67.86
	At-least not worried about food	10	35.71
	Commercial farming	5	17.86
	Dissatisfied with previous job	15	53.57

<sup>a</sup> Here, n= 92, as 92 farm youth directly took up farming as occupation; <sup>b</sup> Here, n= 28 as 28 farm youth had moved into farming after tried other occupation(s), <sup>c</sup> More than one reason were cited by many youth.

**Table 5.** Estimated binomial LOGIT coefficients of factors determining the future decision of farming as occupation among rural farm youth.

Variables in the Equation	B	SE	Wald	df	Sig	Exp(B)	1/Exp(B)	95.0% CI for EXP(B)		
								Lower	Upper	
Land holding	-.521	.162	10.384	1	.001	.594	1.684	.433	.816	
Entry to farming	-1.595	.776	4.221	1	.040	.203	4.926	.044	.929	
Attitude towards dairying	-0.101	.028	13.154	1	.000	.904	1.106	.856	.955	
Attitude towards crop farming	-0.128	.039	10.553	1	.001	.880	1.136	.815	.951	
Constant	10.104	1.821	30.795	1	.000	2.445	-	-	-	
The reference category for the Entry to farming		Directly choosing farming as occupation (0)								
Observation		120								
Nagelker R Square		0.628								

who are possessing less land holding are more probable to quit than others. The findings are in line with those reported by Pietola and Vare (2003) and Glauben *et al.* (2003). The odds of taking decision to continue farming were 4.926 times greater in youth who came to farming having tried

other occupation(s) than those who came directly. This may be because farm youth who have greater exposure may find relative advantage of farming, scope to diversify income, etc., as compared to other occupations. The probability of continuing farming increases with the favorable attitude

**Table 6.** Description of oral histories of farm youth.

Farm Youth	Location	Possession	How did he involve in farming	How does he see his future occupation
Youth A 26 year old (Moved into farming)	Dakshin Chadamari village of Nadia district	6 Bigha <sup>a</sup> land	<ul style="list-style-type: none"> <li>• After graduating, started some (undisclosed) other occupation, after facing dire experience, came to farming occupation</li> </ul>	<ul style="list-style-type: none"> <li>• Farming has become more challenging because of reduction of income due to increased cost of production as well as volatile market</li> <li>• 'Farming has no life' today</li> <li>• Focus in future too would be on crop farming only</li> <li>• He will reduce his scale of farming, and would look for some jobs in organized sector in addition to this.</li> </ul>
Youth B 25 year old (Involved in off-farm income)	Dakshin Chadamari village of Nadia district	3 Bigha of land (own) and 1 bigha land in lease	<ul style="list-style-type: none"> <li>• Started farming at a very young age in form of helping father in farming.</li> <li>• After completion of study, migrated for working in glass factory, then moved into own village for starting sugarcane juice selling.</li> <li>• Started cultivating sugarcane in part of his family land</li> </ul>	<ul style="list-style-type: none"> <li>• Not to involve himself in the farming in future</li> <li>• Plan to shift his business in non-farm sectors, as sugarcane juice selling requires much human energy</li> <li>• Farming could be a lucrative occupation and major hurdle is the unstable market of the produce</li> </ul>
Youth C 27 year old (Directly entered into farming)	Dakshin Chadamari village of Nadia district	6 Bigha of land	<ul style="list-style-type: none"> <li>• Associated with the farming from his childhood</li> <li>• Ready to take up training and challenging task in farming</li> </ul>	<ul style="list-style-type: none"> <li>• Profitability of farming was major hurdle</li> <li>• Would start some business or work under someone to supplement income from farming</li> </ul>
Youth D 28 years old (Involved in dairying)	Pakhai village in Muzaffarpur district of Bihar	8 Bigha of land and 4 cattle	<ul style="list-style-type: none"> <li>• After graduation degree he got associated with milk collection centre.</li> <li>• Trying to get training in different aspect of consultancy services of dairying</li> </ul>	<ul style="list-style-type: none"> <li>• Wants to become Para-veterinarian</li> <li>• Continue to be associated with milk collection centre as well as providing consultancy services</li> </ul>
E 33 years of old (Moved into farming)	Ambari village of Coochbehar district in West Bengal	3 Bigha of land and 2 holds 2 goats, 3 cattle	<ul style="list-style-type: none"> <li>• From the beginning, he was associated with the farming by providing helping hands to his father</li> <li>• First associated with tobacco business</li> <li>• Shifted himself from tobacco business to farming</li> </ul>	<ul style="list-style-type: none"> <li>• He will continue farming</li> <li>• Claimed marginal farmers were always marginalized with respect to access to different services</li> <li>• Low market price was resulted into low profit.</li> </ul>

<sup>a</sup> 7.5 Bigha= 1 hectare.



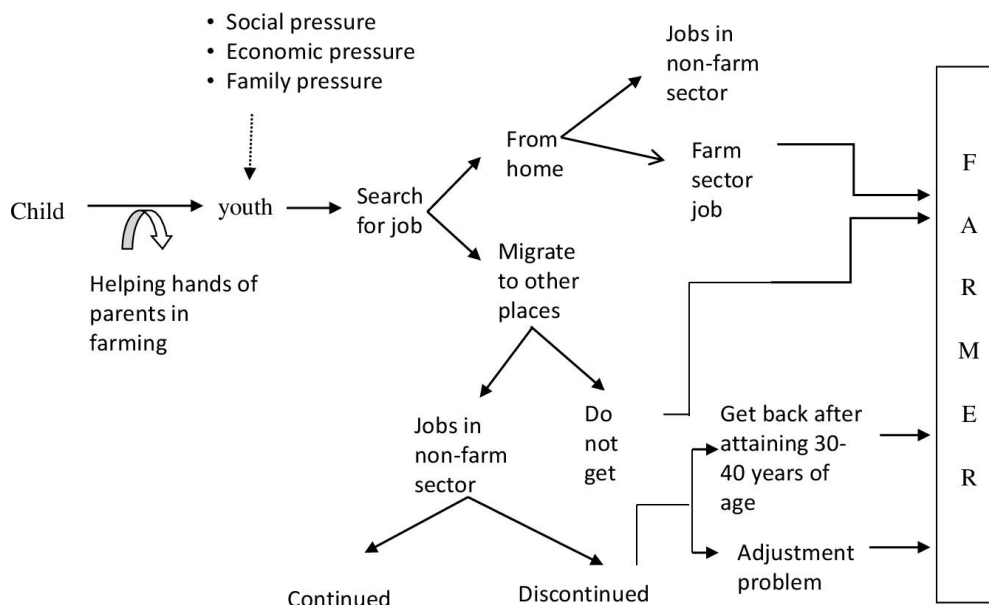


Figure1. Empirical model describing youth becoming farmer.

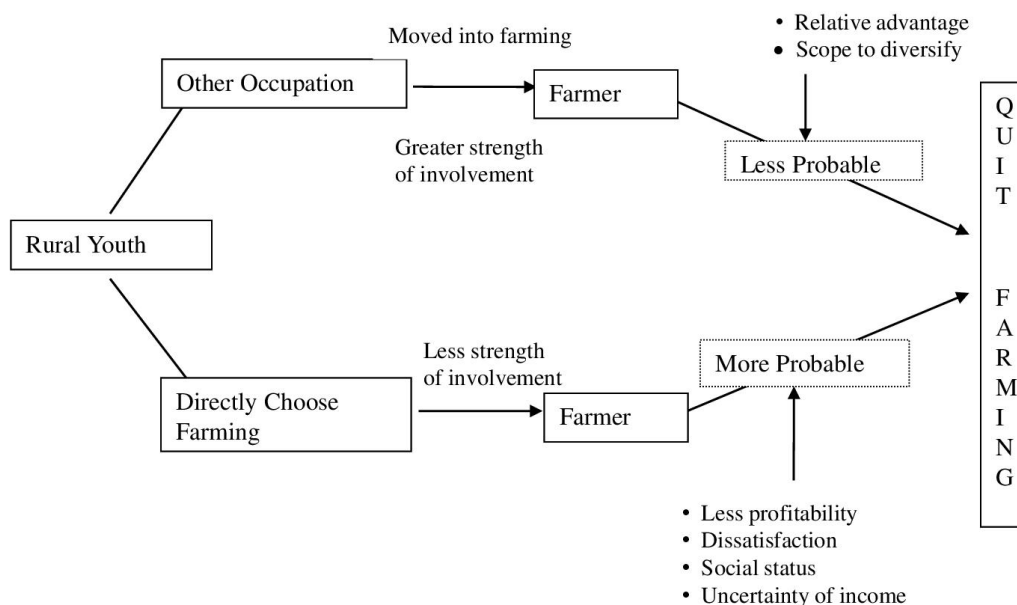


Figure2. Empirical model describing quitting farming by rural youth.

towards dairying and crop farming. Findings are in line with those indicated by Aphunu and Atoma (2010). However, the results showed that the education level, income diversification, and dependency ratio were

not included in the final model. Rise in level of education results in increased farm income (Panda, 2015) and, at the same time, it may also produce negative attitude towards working in the field. Income



diversification was also non-significant, as non-farm income may have stabilizing effect on income, resulting in farming being continued. At the same time, association with other non-farm occupations depended on the risk taking capability of rural youth as well as the inability to find non-farm income opportunity, also, compelling them indirectly to continue farming.

### Qualitative Information about Farm Youth

Qualitative information of the five farm youth was documented (Table 6) for better understanding of involvement in farming and decision regarding future occupation.

Empirical Model Description: (Figure1-2)

The insights that could be drawn from both quantitative and qualitative analyses for two issues:

- A. Becoming farmer, and
- B. Quitting farming.

A. Becoming Farmer

This has been discussed in the following broad stages:

#### 1. Child as helping hands in farming:

From the very early period of life, as a growing child in farm family, children are used to provide a helping hand to their parents. As they are grown to youth, they increasingly face pressure from social, economic, and family fronts; and soon start to think for jobs.

**2. Searching job:** Once the youth were ready to work, they started searching for job opportunities. In most of the cases, the first decision they make is whether to earn an occupation at home or to migrate to other places for occupation.

**3. Jobs from home:** Broadly, two categories of occupation were considered, farm occupation (including both on farm and off-farm) and non-farm occupation. So, clearly, some of farm youth directly choose farming (Group A Farmers). Another portion of youth, who go into non-farm occupation, may continue to do so or else can revert to farming occupation. Thus, a

category of farmers is formed who initially tried non-farm occupation from home but later moved into farming occupation (Group B farmers).

**4. Migrate to urban places:** After taking decision to migrate for seeking occupation, they either get opportunity for employment or not. Youth who gets the employment opportunity may continue that and ultimately become non-farm occupants. Some of them may discontinue the occupation, due to temporary adjustment problems or even many come back after attaining 30-40 years of age, to bring stability in life. After returning, some of them start farming (Group C farmers) as occupation and others involve themselves in non-farm occupation(s).

#### B. Quitting Farming

The decision to quit farming by rural farm youth is very much dependent on the situation of each farm youth. Although various factors may be responsible for such decision, an empirical model was developed from the perspective of youth's entry into farming *vis-à-vis* decision to quit farming.

**1. Farm youth who directly chooses farming (Group A farmers):** This group showed less strength of involvement and members were more probable to quit farming; the reasons cited were less profitability, dissatisfaction, lack of social status, uncertainty of income, etc.

**2. Farm youth who moved into farming after trying other occupations (Groups B and C Farmers):** These groups of farmers showed greater strength of involvement in farming, as they saw relative advantage of farming and also scope to diversify their occupation. So they were less probable to quit farming in long run.

### CONCLUSIONS

The present study was designed to understand the behavior of rural farm youth *vis-à-vis* decision to quit farming in future. The study was carried out in the Eastern States of India, i.e. West Bengal and Bihar.

Data from the field study were analyzed through logit model to find out significant factors for predicting decision to quit farming. Moreover, qualitative responses from rural youth were also documented in order to derive few insights of how a child becomes farmer, and how youth quit farming? It may be concluded from the study that rural youth having small and marginal land holding may quit farming in the long run as principle of economies of scale may force them to do so. But, additional off-farm and non-farm income opportunities may bring agricultural prosperity (Binswanger-Mkhize, 2012) which in turn can help in retaining them in agriculture-based occupation. Moreover, the importance of farming could be seen in their perception that farming can bring stability in life. This perception occurs at a later stage of life. It has also happened that people who used to do agriculture in the past and discontinued and tried other profession changed their perception and believed that agriculture may bring stability in their life. So, a new type of farmer is arising who move into farming after trying other occupation(s) and the number of returned migration is sizable (Chandrasekhar and Sharma, 2015). They usually possess one added advantage of becoming more cosmopolite with an experience or exposure of the other places, markets, functions, industries, etc. over the usual farm youth. Thus, the shift of subsistence farming to commercial farming is likely to happen. Vertical and horizontal study in China also showed return migrants have more entrepreneurial ability (Démurgera and Xu, 2011). The process of moving into farming at later stage may also initiate ageing of farming population. Feelings of rural farm youth towards crop farming and dairying remains an important predictor of future decision whether to quit or continue farming. The more the positive feelings (or attitude), the more rural youth will be attracted or retained in the farming occupation. Here, multiple strategies like eradication of social stigma about farming

and farmers, as against the 'assault on rural culture' that is prevailing in modern day's practice (White, 2012); helping vulnerable farmers to overcome production constraints (Agarwal and Agarwal, 2016), recognition of farming skills at larger societal level, institutionalizing the level of remuneration (in both monetary and non-monetary terms) for acquiring farming skills (White, 2012) may play vital role in achieving sustainable engagement of human resource in farming. Thus, the present study, although limited to the locale of study, brings out a detail account of decision to exit farming by rural youth as farmers. This may be used by the policy planners for identification of premises on which youth farmer related policies might be drawn.

The results of the study may have implications for future line of work too. The future studies can focus on describing trade-off among different factors related with the decisions to engage in farming, and in-depth economic analysis of all such impacting factors may bring out some much-needed significant findings in order to have an appropriate policy in this regard, in the long run.

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#### REFERENCES

1. Agarwal, B. and Agarwal, A. 2016. *To Farm or Not to Farm? Indian Farmers in Transition*. Global Development Institute Working Paper Series: 001.
2. Agricultural Statistics at a Glance. 2011. *Directorate of Economics and Statistics*. Department of Agriculture and Cooperation,



- Ministry of Agriculture, Government of India.
3. Agergaard, J. and Broegger, D. 2016. Returning Home: Migrant Connections and Visions for Local Development in Rural Nepal. *Geogr. Tidsskr-Den.*, **116** (1): 71-81.
  4. Aphunu, A. and Atoma, C. N. 2010. Rural Youths' Involvement in Agricultural Production in Delta Central Agricultural Zone: Challenge to Agricultural Extension Development in Delta State. *J. Agr. Ext.*, **14**(2): 46-55.
  5. Binswanger-Mkhize, H. P. 2012. India 1960-2010: Structural Change, The Rural Non-farm Sector, and the Prospects for Agriculture. Stanford Symposium Series on Global Food Policy and Food Security in the 21st Century. Center for Food Security and the Environment, Stanford University, Stanford.
  6. Bragg, L. A. and Dalton, T. J. 2004. Factors Affecting the Decision to Exit Dairy Farming: A Two Stage Regression Analysis. *J. Dairy Sci.*, **87**(9): 3092-3098.
  7. Bryceson, D. F. 1996. Deagrarianization and Rural Employment in Sub-Saharan Africa: A Sectoral Perspective. *World Dev.*, **24**: 97-111.
  8. Census of India. 2011. New Delhi: Registrar General of India.
  9. Chandrasekhar, S. and Sharma, A. 2015. Urbanization and Spatial Patterns of Internal Migration in India. *Spatial Demography*, **3**(2): 63-89.
  10. Chang, K. L., Langelett, G. L. and Waugh, A. W. 2011. Health, Health Insurance, and Decision to Exit from Farming. *J. Fam. Econ. Iss.*, **32**(2): 356-372.
  11. Demurger, S. and Xu, H. 2011. Return Migrants: The Rise of New Entrepreneurs in Rural China. *World Dev.*, **39**(10): 1847-1861.
  12. Ferjani, A., Zimmermann, A. and Roesch, A. 2015. Determining Factors of Farm Exit in Agriculture in Switzerland. *Agr. Econ. Rev.*, **16**(1): 59-72.
  13. Ghosh, M. and Ghosh, A. 2014. Analysis of Women Participation in Indian Agriculture. *IOSR J. Human. Soc. Sci.*, **19**(5): 1-6.
  14. Gidwani, V. and Sivaramakrishnan, K. 2003. Circular Migration and Rural Cosmopolitanism in India. *Contrib. Indian Soc.*, **37**(1-2): 339-367.
  15. Glauben, T., Tietje, H. and Weiss, C. 2003. *Agriculture on the Move: Exploring Regional Differences in Farm Exit Rates*. Working Paper EWP 0308, Department of Food Economics and Consumption Studies, University of Kiel.
  16. Government of India (GOI). 2005. *Situation Assessment Survey of Farmers: Some Aspects of Farming*. NSS 59th Round, Report No. 496 (59/33/3), NSSO, Ministry of Statistics and Programme Implementation, New Delhi.
  17. Greene, W. H. 2000. *Econometrics Analysis*. Prentice Hall, Englewood Cliff, NJ.
  18. Guerre, E. and Moon, H. R. 2006. A Study of a Semiparametric Binary Choice Model with Integrated Covariates. *Econ. Theory*, **22**(04): 721-742.
  19. Gujarati, D. N. 1995. *Basic Econometrics*. 3<sup>rd</sup> Edition, Mc Graw Hill Inc, NY, USA, 570 PP.
  20. Hsieh, H. F. and Shannon, S. E. 2005. Three Approaches to Qualitative Content Analysis. *Qual. Health Res.*, **15**(9): 1277-1288.
  21. Hummon, D. M. 1986. City Mouse, Country Mouse: The Persistence of Community Identity. *Qual. Sociol.*, **9**(1): 3-25.
  22. Jatav, M. and Sen, S. 2013. Drivers of Non-Farm Employment in Rural India. *Econ. Polit. Week.*, **48**(26-27): 14-21.
  23. Jongeneel, R. A., Polman, N. B. and Slangen, L. H. 2008. Why Are Dutch Farmers Going Multifunctional?. *Land Use Policy*, **25**(1): 81-94.
  24. Jothilakshmi, M., Thirunavukkarasu, D. and Sudeepkumar, N. K. 2014. Exit of Youths and Feminization of Smallholder Livestock Production: A Field Study in India. *Renew. Agric. Food Syst.*, **29**(02): 146-150.
  25. Juma, A. 2007. *Promoting Livelihood Opportunities for Rural Youth: Some Lessons from Tanzania*. Paper for IFAD Governing Council Roundtable: Generating Remunerative Livelihood Opportunities for Rural Youth.
  26. Karkacier, O., and Gokalp Goktolga, Z. 2011. A Case Study Investigating Farmers' View Regarding Soil Analysis: Estimates Using a Logit Model. *J. Agr. Sci. Tech.*, **13**(4): 467-476.
  27. Kumar, U. 2010. *India's Demographic Transition: Boon or Bane? A State-Level Perspective*. MPRA Paper, University Library of Munich, Germany, <http://EconPapers.repec.org/RePEc:pra:mprapa:24922>.

28. Kumar, U. and Subramanian, A. 2011. *India's Growth in the 2000s: Four Facts*. No WP11-17, Working Paper Series, Peterson Institute for International Economics. <http://EconPapers.repec.org/RePEc:ii:wpaper:wp11-17>.
29. Lange, K. 2012. Succession in Multi-Generational Family Farm Businesses. Doctoral Dissertation, Texas Tech University.
30. Long, S. T. and Freese, J. 2006. *Regression Model for Categorical Dependent Variables Using Stata*. A Stata Press Publication, Collage Station, Texas.
31. Mehta, R. 2011. *Statistics on Farmers and Farm Management for Furthering Synthesis of Agricultural Development and Related Policy Analysis*. Paper for 4<sup>th</sup> Meeting of Wye City Group on Statistics on Rural Development and Agriculture Household Income, 9<sup>th</sup> 11<sup>th</sup> November 2011, Brazil.
32. Mitra, A. and Murayama, M. 2009. Rural to Urban Migration: A District-Level Analysis for India. *Int. J. Migration Health Soc. Care*, **5(2)**: 35-52.
33. Möllers, J., Heidhues, F. and Buchenrieder, G. 2006. Non-Farm Diversification Decisions of Rural Households in Macedonia. *2006 Annual Meeting, International Association of Agricultural Economists*, August 12-18, 2006, Queensland, Australia 25402.
34. National Sample Survey Organization. 2013. Key Indicators of Employment and Unemployment in India 2011-2012. *NSS 68<sup>th</sup> Round*, July 2011–June 2012.
35. Nzomoi, J. N., Byaruhanga, J. K., Maritim, H. K. and Omboto, P. I. 2007. Determinants of Technology Adoption in the Production of Horticultural Export Produce in Kenya. *Afr. J. Bus. Manag.*, **1(5)**: 129-135.
36. Osborne, J. W. 2006. Bringing Balance and Technical Accuracy to Reporting Odds Ratios and the Results of Logistic Regression Analyses. *Pract. Assess. Res. Eva.*, **11(7)**. Available from: <http://pareonline.net/genpare.asp?wh=0&abt=11> (accessed 2014 July 1).
37. Panda, S. 2015. Farmer Education and Household Agricultural Income in Rural India. *Int. J. Soc. Econ.*, **42(6)**: 514-529.
38. Paul, B. 2010. *Investing in the Future: Creating Opportunities for Young Rural People*. International Fund for Agricultural Development, Rome, Italy.
39. Pietola, K. and Vare, M. 2003. Timing and Type of Exit from Farming: Farmer's Early Retirement Programmes in Finland. *Eur. Rev. Agric. Econ.*, **30(1)**: 90-116.
40. Rosenzweig, M. R. and Stark, O. 1989. Consumption Smoothing, Migration, and Marriage: Evidence from Rural India. *J. Polit. Econ.*, **97(4)**: 905-926.
41. Schoch, N. 2008. Impacts of Labour Migration on Livestock Farming in Rural Kyrgyzstan. Master Thesis, University of Zurich, Switzerland.
42. Singh, R. and Gupta, K. 2014. Attitude of Male Adolescents towards Family Occupation of Farming: Management Perspective for Indian Policy Makers. *Purusartha: A J. Manag. Ethic. Spir.*, **6(2)**: 106 - 119.
43. Sharma, A. 2007. The Changing Agricultural Demography of India: Evidence from a Rural Youth Perception Survey. *Int. J. Rur. Manag.*, **3(1)**: 27-41.
44. Swarts, M. B. and Aliber, M. 2013. The 'Youth and Agriculture' Problem: Implications for Rangeland dDevelopment. *Afr. J. Range Forage Sci.*, **30(1 and 2)**: 23-27.
45. Tiwari, K. R., Sitaula, B. K., Nyborg, I. L. and Paudel, G. S. 2008. Determinants of Farmers' Adoption of Improved Soil Conservation Technology in a Middle Mountain Watershed of Central Nepal. *Environ. Manag.*, **42(2)**: 210-222.
46. United Nation Population Fund. 2014. The Power of 1.8 Billion: Adolescents, Youth and the Transformation of the Future.
47. Uzmay, A., Isin, F. and Koyubenbe, N. 2009. Farmers' Behaviors Regarding the Decrease in the Area of Cotton Plantations of Turkey; Izmir Case. *Span. J. Agric. Res.*, **7(2)**: 248-256.
48. Webster, N., Ganpat, W. and Chester, C. 2013. Toward a Model of Promoting Youth Development in the Caribbean through Agriculture Investment. *Vulnerable Child Youth Stud.*, **8(4)**: 366-374.
49. White, B. 2012. Agriculture and the Generation Problem: Rural Youth, Employment and the Future of Farming. *IDS Bull.*, **43(6)**: 9-19.



## عوامل پیش بینی کننده موثر در تصمیم جوانان روستایی و کشاورز هند برای ماندن یا نماندن در بخش کشاورزی

ا. نگ، س. کومار جها، ا. محمد، س. مایتی، ج. گوپتا، د. ک. گوساین، ک. ک. داتا، و ت. ک. مهانتی

### چکیده

بخش کشاورزی در سراسر جهان و به گونه ای روز افزون با مشکل خروج کشاورزان از فعالیت کشاورزی روبه رو شده است و در این مورد هندوستان هم استثنا نیست. در این زمینه، این مطالعه انجام شد تا عوامل پیش بینی کننده تصمیم های آینده جوانان روستایی در ایالت های شرقی هند در باره " ماندن یا نماندن در بخش کشاورزی " شناسایی شود. داده های پژوهش با انجام مصاحبه با ۱۲۰ جوان کشاورز روستایی به دست آمد. نتایج نشان داد که ۴۱/۶۷٪ از جوانان کشاورز این بخش را در آینده ترک خواهند کرد. نتایج مدل دو جمله ای Logit چنین اشاره می کرد که عواملی مانند مالکیت زمین، ورود به فعالیت کشاورزی، و نگرش در مورد دامداری و کشت محصول بر تصمیم در باره " ترک کردن فعالیت کشاورزی در آینده نزدیک " تاثیر معناداری داشت. جدا از این مطلب، طبق اظهار جوانان روستایی کشاورز پیشه، موضوع تضمین " امنیت غذایی برای خانواده " دلیل اصلی برای انتخاب شغل کشاورزی بود. از سوی دیگر، آن دسته از جوانان روستایی که بعد از آزمودن شغل های دیگر به بخش کشاورزی رو آورده بودند، موضوع " پایدار کردن زندگی " را دلیل اصلی خود عنوان کردند. بر مبنای نتایج کمی و همراه با اطلاعات کیفی، دو پارادایم متمایز که منعکس کننده پرسش های " چگونه جوانان کشاورز می شوند " و " چگونه و چرا جوانان کشاورزی را ترک می کنند " ایجاد شد تا با شواهد تجربی به دست آمده از سطح مردمی، به ویژه در مناطق شرق هندوستان، آگاهی در باره این موضوع ها را غنی سازد.