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Socio-Economic Factors Influencing the Participation of the Marginalized and Vulnerable Farmers in the Ifad – Community Based Agriculture and Rural Development Programme in Katsina State, Nigeria

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Abstract
The objective of the study was to evaluate the socio economic factors influencing the participation of the marginalized and vulnerable farmers in the IFAD – Community Based Agriculture and Rural Development Programme in Katsina State. Multistage sampling technique was used in selecting 432 respondents for this study. Primary data were collected using a structured questionnaire and data collected was based on 2002 and 2015 cropping seasons, the year for before was 2002 and after was 2015. The structured questionnaire was pre-tested before it was administered to the farmers that were sampled. The tools of analysis employed to analyze the data were descriptive statistics and probit model. It was identified that there were 29% unemployed youth among the participants, while there were 47% elderly among the non-participants of the IFAD-CBARDP. It was found that (32% and 31%) of the participants and non-participants respectively of the IFAD-CBARDP were within the age bracket of 31– 40 years while majority (97%) of both categories of farmers in the study area had some form of educational qualification. It was discovered that age, gender and household size were the significant factors that influence farmer's participation in the IFAD-CBARDP at 1% and 5% levels of significance. It was concluded that the IFAD-CBARDP has achieved its goal of increasing the farm incomes of the participants in the period of study and has succeeded in targeting the marginalized and vulnerable participants in its farm technical efficiency.
Keywords: Socio economic, IFAD-CBARDP, farmers, katsina

INTRODUCTION

Over the past two decades, several intervention programmes have been embarked upon by the government and in conjunction with International agencies such as the International Fund for Agricultural Development (IFAD) to tackle the problems of poverty, food insecurity and also improve the quality of life of the rural people. The first phase of IFAD assisted Agricultural and Rural Community Development project covered Katsina and Sokoto States in North-West of Nigeria (IFAD – CBARDP, 2012). The concern of the government in embarking on the IFAD assisted projects is to reduce poverty among rural Nigerians by increasing their income (IFAD, 2010). The Katsina State Agricultural and Community Development Project (KSACDP) was an IFAD assisted pilot project funded by the World Bank from 1994 – 2001. The project was highly specific in targeting the poorest sectors of the landless and small farmer communities. One of its aims is to alleviate rural poverty and food insecurity amongst the most deprived families in the environmentally sensitive areas of northern Katsina State through participatory process (KSACDP, 1998). The impact assessment and project completion report (PCR) confirmed that the participation process has provided quantifiable economic and social benefits as well as significant qualitative improvement in the well being of the rural poor who participated in the project (IFAD, 2009).

The IFAD assisted project phase (I) did not cover much states and areas in the Northern Sahel of Nigeria and did not include all stakeholders such as the Marginalized and Vulnerable Groups in its execution. The benefits of the project and the need to cover more areas and also include those excluded necessitated for IFAD's enhanced collaboration to sustain, replicate and improve on the community demand driven approach (IFAD, 2010). It is against this background that the Community Based Agriculture and Rural Development Programme (CBARDP), was introduced as the second Phase (Phase II) of the IFAD programme in Nigeria.

In recognition of the economic challenges the rural poor face in Nigeria, the Federal Government of Nigeria approved IFAD loan of $29.9 million for establishment of CBARDP effective from January 31, 2003 and with completion date of September 2013 after an extension in 2010. The general objective of the programme was to improve the livelihoods and living conditions of the rural poor, with an emphasis on women and other vulnerable groups. The programme covered 69 Local Government Areas (LGAs) and 207 Village Areas (VAs) across the seven participating states of Borno, Jigawa, Katsina, Kebbi, Sokoto, Yobe and Zamfara states in the different agro-climatic zones in North-West and North East Nigeria (IFAD-CBARDP, 2013). From inception in 2003, IFAD-CBARDP became a landmark in addressing rural poor communities in these states. The direct target beneficiaries were 400,000 rural households and the programme was to impact on about 12 million people in the long run. With the buy in and expansion during its implementation, it is estimated that it will directly benefit 720,000 rural households and impact on about 18 million people in the long run (CBARDP, 2013).

The IFAD-CBARDP is the second phase of the IFAD-ACDP which commenced in Katsina State in 2003 and with completion date of September, 2013. The general aim of the programme is to improve the livelihoods, living conditions and reduce poverty of the rural poor. From inception of the programme in 2003 to date, it became landmark mandate in addressing rural poor communities in the state. This study was conducted to assess the socio economic factors influencing the participation of the marginalized and vulnerable farmers in the IFAD – Community Based Agriculture and Rural Development Programme in Katsina State.

MATERIALS AND METHODOLOGY

Study Area

Description of the Study Area

The study was conducted in Katsina State, Nigeria. The global location of the state is between longitude $6^0 52^{/}$, $9^0 20^{/}$E and latitudes $11^0 8^{/}$, $13^0 22^{/}$N, covering a land area of about twenty four thousand, one hundred and ninety four square kilometres (24,194km^2), with an estimated population of five million, eight hundred thousand, six hundred and seventy two (5,800,672) people comprising of 2,947,639 males and 2,853,033 females (NPC, 2006).

There are two seasons in the state which include wet and dry seasons. The wet season starts from the months of June to September and the dry season from October to May. The dry season is usually dominated by the north-east trade winds which are dry and dusty, popularly called the *"harmattan"*. The mean daily temperature ranges between 16^0C to 40^0C while the annual rainfall ranges between 300 – 400mm in the sahel, 600 – 800mm in the Sudan savannah and 900- 1100mm in the northern guinea savannah (KTARDA, 2014). There is an available farmland area of about one million, six hundred and forty thousand hectares (1,640,000 ha) with an identified *"Fadama"* land area of thirty six thousand, one hundred and thirty nine thousand hectares (36,139 ha) out of which twenty five thousand hectares (25,000 ha) are irrigatable "*Fadama*" areas. "*Fadama"* is the Hausa name for describing irrigatable lands that are underlined by shallow aquifer (Bello, 2006).

The main occupation of the people in Katsina State is farming, cattle rearing and crafts. Apart from crop farming, livestock are also reared such as cattle, sheep, goats, camels, poultry, etc. It is worthy of note that there are other income earning activities carried out by the people in the state such as government work, trading, crafts work (blacksmithing, basket and mat weaving, wood carving etc.) trading, hunting and fishing. The state is currently made up of thirty four Local Government areas out of which twelve (12) Local Government Areas participated in the IFAD-CBARDP. The participating LGAs are Danja, Bakori, Musawa, Kusada, Dutsin-ma, Dutsi, Bindawa, Baure, Kurfi, Batsari, Jibia and Kaita. According to IFAD-CBARDP (2012), the marginalized and vulnerable groups identified in the study area are women, widows, elderly, youth, hunters, pastoralists and people living with HIV/AIDS. Population of this study is made up of the crop farmers in the IFAD –CBARDP participating Local Government Areas in Katsina State.

Sampling Technique and Sample

The study was carried out in all the three agro-ecological zones of Katsina State namely: Southern (Northern guinea), Central (Sudan Savannah) and northern (Sahel) zones. Two sample groups were drawn from the marginalized and vulnerable crop farmer population; a sample of participants and non-participants. Multistage sampling technique was used in selecting 432 respondents for this study. The first stage involves the selection of six LGAs out of the 12 participating LGAs in the state. This study took into consideration the difference in the agro-ecological zones in the state. The state has three distinct agro-ecological zones with marked differences in rainfall and crops grown. As such the state was stratified into three according to the agro-ecological zones. Two LGAs with high concentration of Community Development Associations (CDAs) and farmers' associations were then purposively selected in each agro-ecological zone with the help of IFAD desk officers in the state programme, making a total of six LGAs. The LGAs selected for the study were; Jibia and Batsari in the northern zone (sahel), Dutsin-ma and Musawa in the central zone and Bakori and Danja in the Southern zone.

The second stage included the random selection of two villages from each of the sampled LGAs making a total of twelve villages respectively. The twelve (12) villages were: Farfaru, Daga, Ruma, Kasai, Shema, Sanawa, Garu, Sako, Kakumi, Jargaba, Kahuta and Tandama. The third stage involves the random selection of 216 M & V respondents for the participants and non-participants groups. The non-participants were selected to serve as the control group. Thus, a total of 432 farms were sampled for the study which represents 10% of the population of the study. Table 1 shows the distribution of farmers according to Villages.

Method of Data Collection

Primary data was used for this study and were collected for the 2002 and 2015 cropping seasons through the use of structured questionnaire and oral interview schedule administered on both programme participants and non-participants. Specific information that was collected included the socio-economic characteristics of respondents such as sex, gender, age, marital status, household size, educational level, years of experience in farming and years of experience in IFAD-CBARDP programme. Others include: access to basic infrastructure, credit, inputs, crops

grown, yield per hectare and income generated. Data on factors that influence respondents' participation in IFAD-CBARDP programme, access to the programmes facilities and problems encountered by the participating farmers were also collected. On the course of conducting this study, secondary data were used. The data were sourced from appraisal reports, mission reports and other vital IFAD-CBARDP documents.

Analytical Techniques

The following analytical and statistical tools were utilized to capture the stated objective of the study:

Probit Model

Participation could be described by the utility maximization theory. It is expected that a respondent will desire to participate in the IFAD-CBARDP programme if the utility derived from the participation in the programme ranks highest compared to the utility derived from not participating in the programme. A marginalized group is one that has been relegated to the background due to selection bias in the selection exercise of those participating in the programme. In this study, participation is assumed to be binary choice such that a respondent is expected to either participate in the IFAD-CBARDP programme or not. The preference of the i-th respondent to participate in the programme is therefore given by the difference between the marginal utility derived from the participation in the programme against the marginal utility forgone. The farmer is therefore expected to adopt the technology with the highest marginal benefits.

Since the respondent can either be in a state of participation or not, let the status of his participation be represented by Pr, where Pr = O for non-participation and Pr = 1 for participation. If it is assumed that the error term follows a probabilistic distribution, then the estimation can be achieved by using a probit distribution model.

According to Musa (2011), probit model is a model that emerges from normal cumulative distributive function. It is useful in regression that involves dichotomous dependent variables or binary choice response variables. The dependent variable takes values that lie between 0 and 1. It was used to achieve objective of the study. Specifically the model takes implicit form as follows:

$$Pr = \left(Y = \frac{1}{x}\right) \emptyset(\varphi^1 \beta) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (iv)$$

Where Pr denotes probability and $\emptyset$ is the probability distribution function of the standard normal distribution. The parameters β are typically estimated by maximum likelihood method. Motivating the probit model as a latent variable model, the equation above becomes:

$$Y^{*} \varphi^1 \beta + \epsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (v)$$

Where

$$\in \sim N(0, 1). \text{Therefore } Yi \text{ becomes } \sum\_(0 \text{ Otherwise })\hat{}(1 \text{ if } Y\hat{} * > 0 \, (-\in < X\hat{}1\beta)$$

Therefore applying the normal CDF, the first equation becomes explicitly written as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \epsilon_1 \ldots\ldots$$

Where

Y_i = Participation in the programme or not (value = 1 if participated and 0 if not)

$X_1 - X_6$ = Socio-economic variables as defined below:

X_1 = Age of respondents (years)

X_2 = Gender

$X\_(3)$ = Marital status (married = 1, single = 2, divorced = 3 and widowed = 4

X_4 = Household size (number of person)

X_5 = Educational status (primary =1, secondary = 2, tertiary = 3, quranic = 4 and non-education = 0)

X_6 = Farming experience (years)

$\beta_1 - \beta_6$ = Estimates of respondents' socio-economic characteristics

$\in$ = Error Term

The maximum likelihood method was used to estimate probit parameter because it ensures that the parameter test will be consistent and the appropriate statistical test can be performed. The maximum likelihood method was used to estimate the parameters; the model indicating the log of the maximum likelihood is specified as follows:

$$\text{Log } L = \sum \log [(1 - \Phi\_i) +]\sum \log[1/(1/2\,(2n\sigma\hat{}2))] - \sum \log 2\pi\sigma\hat{}2 \; (f\_(i-)\,X\_(i)\,\beta) - (f\_i - X\_i\,\beta) - 16 \ldots (vii).$$

RESULTS AND DISCUSSION

Socio-Economic Characteristics of the Farmers in the Study Area

Age

Age is an important socioeconomic characteristic of farmers as it influences the active involvement or otherwise of farmers in the day to day farming activities especially in traditional agriculture where most of the farm operations are performed manually using hand tools. Age distribution of the farmers in Table 2 shows that participants within the age group of 31-40 years constituted about 32%, 51-60 years were 30%, while only 6% were ≥ 61 years. However, for non-participants those within 31-40years constituted 31%, 51-60years were 27%, while only 10% were ≥ 61 years.

In the two groups, there were more farmers between the ages of 31-40years. This implies that both groups of farmers were within energetic middle-age cohort, characterized with strength and commitment. This finding agrees with the findings of Ogunniyi and Ajao (2011) who reported similar finding that most of the farmers in their study were in their productive age and therefore they could participate actively in various agricultural production activities. This finding agrees with Food and Agriculture Organization (FAO, 1997; 2005) that the respondents were within the age range of 30-50 years are productive.

Gender

Gender is social differentiation of an individual into either muscularity or feminity. It is an important variable as far as participation in agricultural programme is concerned depending on the geographical location. Gender distribution of the farmers in Table 3 revealed that 69% and 31% among the participating farmers were males and females respectively, whereas they were 64% and 36% among the non-participants respectively. This implies that the majority of the farmers were males which could be attributed to the current practice of "*purdah*" (women in seclusion) as the people in the area are predominantly Muslims. Women in seclusion do not engage in direct agricultural production. The dominance of males in farming agrees with Musa (2011). It also confirms the findings of Onuk (2008) which found that males constitute the majority in rice production because females are mostly involved in domestic work. However, the findings revealed that there were more females among the non-participants than within the participants.

Marital Status

Marital status distribution of the farmers in Table 4 shows that almost all the farmers in the study area were married at one time or the other. 78% and 82% whereas about 7% and 5% were still single and about 8% and 10% were widowed of the participants and non-participants respectively. This implies that IFAD-CBARDP in the study area were largely targeted at married farmers and this could be due to the immense responsibilities of married farmers towards meeting the income needs of their household members.

Household Size

Household size distribution of the farmers in Table 5 shows that 34% and 38% of the participants and non-participants had more than 10 members, about 28% and 24% had between 7-10 members, while only 15% and 12% had between 1-3 members in the household, respectively. Majority (62% and 65%) of the participants and non-participants had 7-10 members and above 10 members. This implies that each household therefore has sufficient number of people and consequently sufficient work force to enhance their agricultural production which in turn can guarantee steady income flow and consequently improved level of living. This finding therefore corroborates with the findings of Ejembi and Ejembi (2005) who discovered that most families use their family members as labourers for working in their farms and or for further agricultural development and or expansion of farms.

Educational Status

Educational distribution of the farmers in Table 6 shows that majority (48%) of the participants had qur'anic education, 25% has primary education, 21% had secondary school education, and about 3% had tertiary education while only 3% had no education. Similarly, for non-participants 50% had qur'anic education, 26% has primary education, 14% had secondary school education, and about 7% had tertiary education while only 3% had no education. This means that most farmers among the two groups had attained certain level of education. Education is important for easy understanding of improved methods of agricultural production and makes farmers more receptive to advice from extension agencies or be able to deal with technical recommendations that require a certain level of numeracy and literacy (Musa, 2011).

Farming Experience

Farming experience is very vital in the profile of farmers as cognate experience in any field of endeavour can lead to expertise. The result of farming experience in Table 7 shows that 35% of the participants had experience between 2-10 years in farming, about 34% had between 11-20 years of experience in farming business with only about 12% had ≥ 31 years of experience, Similarly, about 37% of the non-participants had between 11-20 years of experience in farming, 25% had between 2-10 years while 19% had ≥ 31 years of experience in farming. Majority (69% and 62%) of the participants and non-participants had between 2-10 years and 11-20 years' experience in farming. This finding implies that the farmers have been into farming over a long period of time and it is in agreement with Galadima (2014) who posited that, with many years of farming experience, farmers will be able to make sound decisions as regards to resources allocation and management of their farms.

The null hypothesis which states that there is no significant difference between the socio-economic

characteristics of participants and non- participants of IFAD-CBARD was subjected to paired t-statistic. Results indicated that t-value was highly significant which means there were significant differences between participants and non- participants of IFAD-CBARD with respect to socio-economic variables such as age, gender, household size and farming experience while marital status and educational status were not statistically significant. The difference in age between two groups are found to be highly significant (t = 2.164**) at P<0.05. The difference in gender between two groups are found to be significant (t = 2.124**) at P<0.05. The difference in household size between two groups are found to be significant (t = 2.215**) at 5%. The difference in farming experience between two groups are found to be highly significant (t = 2.580*) at P<0.01. So, there is quest to know that how far IFAD-CBARD affects age gender and farming experience. Therefore, based on the result the null hypothesis that there is no significant difference between the socio-economic characteristics of the participants and non- participants of the IFAD-CBARD is rejected in favour of hypothesis that there is significant difference between the socio-economic characteristics of the participants and non- participants of the IFAD-CBARD.

Socio-Economic Factors Influencing the Participation of Farmers in the IFAD-CBARDP

The result in Table 8 shows the probit estimates of the determinants of participation of farmers in the IFAD-CBARDP. The Log likelihood ratio is significant at 1% probability level and this indicates the joint significance of the independent variables included in the model. The Maddala R squared of 0.511 implies that 51% of the farmers decision to participate in IFAD-CBARDP is explained by the explanatory variables of the model. With regards to the accuracy of the model in prediction of the participation of farmers, the overall percentage of the farmer's participation that is correctly predicted by the model seems good at 74.2% in comparison to the 100% prediction of a perfect model. Age, Gender and Household size were the significant factors that influence farmer's participation, indicating a rather strong relationship with farmer's participations in IFAD-CBARDP.

The coefficients for age (0.360) was positive and significant at 1% level of probability. This implies that as age increases, the probability of participating in the IFAD-CBARDP increases. The respective studies of Asante *et al.* (2011) and Gbetibouo (2009), established a positive relationship between age and adoption of improved agricultural technologies. According to them, older farmers are more experienced which allows them to assess the attributes of an improved technology relative to younger household head. In addition, since adoption pay-offs occur over a long period of time, while costs occur in the earlier stages, age (time) of the farmer can have a profound effect on participation and technology adoption (Bonabana-Wabbi, 2006).

The coefficient for gender (0.302) was positive and significant at 1% level of probability, indicating that males participated more in the IFAD-CBARDP than their female counterparts. This is confirmed by earlier finding in Table 7 that the majority of the farmers were males. This is because agricultural activities are laborious and most of the activities such as ploughing, harrowing, sowing and harvesting are meant for male. Male headed households tend to involve in the farming activity as long as they have the required area of land.

The coefficient of household size (0.176) was positive and highly significant at 5% level of probability. It implies that household size increases, the probability of participating in the IFAD-CBARDP increases. This could be due to the fact that large household size makes sufficient availability of labour for farm production. This is in harmony with findings of Galadima (2014), which revealed that there is a positive and significant relationship between household size and farmers' efficiency in production, thereby increasing farer's income.

The result of the test of the hypothesis that there is no significant relationship between the socio-economic factors influencing the participation of the marginalized and vulnerable farmers in the IFAD-CBARD is presented in Table 8. The results revealed that three independent variables significantly influenced the farmer's decision to participate in the IFAD-CBARD. The significant variables were: age, gender and household size. This therefore implies that the socio-economic factors have significant influence on farmer's participation in the IFAD-CBARD. Since the result in Table 8 was significant at 1% and 5% levels of probability, the null hypothesis which says that there is no significant relationship between the socio-economic factors influencing the participation of the marginalized and vulnerable farmers in the IFAD-CBARD was therefore rejected and alternative hypothesis accepted.

CONCLUSION AND RECOMMENDATION

Based on the empirical evidence emanating from the findings of this study, it was discovered that age, gender and household size were the significant factors that influence farmer's participation in the IFAD-CBARDP at 1% and 5% levels of probability. About 29% of the participants were identified as the unemployed youth, while about 47% of the non-participants were elderly people. It was also discovered that there were more farmers between the ages of 31-40years among the two groups, although they are within the range in agricultural productive age in Nigeria, yet the fact still remains that Nigerian farming population is ageing.

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Table 1: Distribution of farmers according to Villages

Zone	LGAs	Villages	Participants	Non-participants
	Jibia	Farfaru	18	18
		Daga	18	18
Northern Zone	Batsari	Ruma	18	18
		Kasai	18	18
	Dutsima	Shema	18	18
		Sanawa	18	18
Central Zone	Musawa	Garu	18	18
		Sako	18	18
	Bakori	Kakumi	18	18
		Jargaba	18	18
Southern Zone	Danja	Kahuta	18	18
		Tandama	18	18
Total	**6**	**12**	**216**	**216**

Table 2: Age distribution of sampled farmers in the study area

Variable	Participants		Non-participants		t-value
	Freq.	Percentage	Freq.	Percentage	
Age					
<31 years	19	8.8	19	8.8	2.164**
31-40 years	68	31.5	66	30.6	(1.96)
41-50 years	52	24.1	50	23.1	
51-60 years	64	29.6	59	27.3	
≥61 years	13	6	22	10.2	
Total	216	100	216	100	

**P<0.05. Figure in parenthesis is the t-critical value

Table 3: Gender distribution of sampled farmers in the study area

Variable	Participants		Non-participants		t-value
	Freq.	Percentage	Freq.	Percentage	
Gender					
Male	150	69	139	64	2.124**
Female	66	31	77	36	(1.96)
Total	216	100	216	100	

**P<0.05. Figure in parenthesis is the t-critical value

Table 4: Distribution of farmers according to marital status in the study area

Variable	Participants		Non-participants		t-value
	Freq.	Percentage	Freq.	Percentage	
Marital status					0.291^{ns}
Single	16	7	11	5	(1.96)
Married	168	78	178	82	
Divorced	15	7	6	3	
Widowed	17	8	21	10	
Total	216	100	216	100	

ns= not significant. Figure in parenthesis is the t-critical value

Table 5: Distribution of farmers according to household size in the study area

Variable	Participants		Non- participants		t-value
	Freq.	Percentage	Freq.	Percentage	
Household size					**2.215****
1-3	33	15	25	12	(1.96)
4-6	48	23	51	24	
7-10	61	28	57	26	
More than 10	74	34	83	38	
Total	216	100	216	100	

Note: **P<0.05. Figure in parenthesis is the t-critical value

Table 6: Distribution of farmers according to educational status in the study area

Variable	Participants		Non- participants		t-value
	Freq.	Percentage	Freq.	Percentage	
Educational status					**0.503^{ns}**
Primary	53	24.5	56	25.9	(1.96)
Secondary	46	21.3	30	13.9	
Tertiary	7	3.2	16	7.4	
Qur'anic	103	47.7	107	49.5	
No-education	7	3.2	7	3.2	
Total	216	100	216	100	

ns= not significant. Figure in parenthesis is the t-critical value

Table 7: Distribution of farmers according to farming experience in the study area

Variable	Participants		Non-participants		t-value
	Freq.	Percentage	Freq.	Percentage	
Farming experience					2.580***
2-10 years	76	35.2	53	24.5	(1.96)
11-20 years	73	33.8	80	37	
21-30 years	42	19.4	42	19.4	
≥ 31* years	25	11.6	41	19	
Total	216	100	216	100	

*** P<0.1. Figure in parenthesis is the t-critical value

Table 8: Estimates of probit model for socio-economic factors influencing participation in the IFAD - CBARDP

Variable	Coefficient	Std. error	T-value
Constant	0.698	0.142	4.927
Age	0.360***	0.008	2.975
Gender	0.302***	0.074	4.078
Marital status	0.466	0.115	0.404
Education	-0.017	0.049	-0.352
Household size	0.176**	0.072	2.433
Marginalized and Vulnerable group	-0.077	0.072	-1.072
Maddala R-square	0.511		
Log likelihood function	-297.07***		
Correction prediction (%)	0.742		

***P<0.01 and **P<0.05