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Extent of relationship between the socio-economic characteristics of the beneficiary farmers with their perception towards development programmes in Kerala State

Darsana S and SV Suresha

Abstract
The agricultural scenario in Kerala is somewhat unique and distinct from many other states in India in terms of land utilization pattern and the cropping pattern. Even though, improved educational opportunities and overseas migration prospects adversely affected the agriculture, the agrarian distress. Government efforts should not only foster the production and productivity, but also needs to retain a competitive and enthusiastic community in farming for future generation too. The present research paper was focused on the assessment of the relationship of profile characteristic with welfare and perception of beneficiaries on the development programmes. The study was conducted during 2017-18 in the state of Kerala, India. Palakkad district of Kerala state was purposively identified among them Chittur and Kuzhalmannam blocks were selected based on the ratio of cultivator population to total population. Thirty each in seven combinations formed a total of 210 respondents. All the respondents availed the benefits of one or more development programmes. Multinomial logit model found that in very low welfare category: dependency ratio, risk orientation, scientific orientation and mass media participation and economic motivation, in low welfare category: age, political determinism and economic orientation, in medium welfare category: extension contact and economic motivation, in high welfare cateories: age, orientation towards incentives, farming commitment and economic motivation were significantly explaining the extent of relationship with respect to the very high category of welfare.
Multinomial logit model found that in very low perception category: age, extension contact, extension participation, scientific orientation, political determinism and information sharing behavior, in low perception category: extension contact, economic motivation and management orientation, in medium perception category: age, farming experience, orientation towards incentives, political determinism and information sharing behavior, in high perception category : innovative proneness and management orientation were significantly explaining the extent of relationship with respect to the very high perception category.

Keywords: welfare, perception, developmental programmes

Introduction
The agricultural scenario in Kerala is somewhat unique and distinct from many other states in India in terms of land utilization pattern and the cropping pattern. Agriculture in state is mostly performed by small farmers and practices homestead or mixed farming. The state which had been highly acclaimed for its high social and economic indicators, witnessed a significant decline in agricultural production in the last few decades. Kerala state planning board accounted that the share of agriculture and allied sectors in total Gross State Value Added (GSVA) of the State has declined from 13.70 per cent in 2012-13 to 10.50 per cent in 2016-17

(Anonymous, 2018) [2]. The situation assessment survey of agricultural households conducted by the National Sample Survey Organisation in rural India showed Kerala as having only 23.70 per cent of agricultural households, which is the least in India, while at the national level it was 53.80 per cent in the year 2013 (Anonymous, 2014) [1]. Even though, improved educational opportunities and overseas migration prospects adversely affected the agriculture, the agrarian distress that originated towards the late-1990s had also a major impact on the people to shift priorities. The resultant structural transformation had its foremost implication in the form of dependence of the state for food on the neighbor producing centres.

It's the call for the state to arrest the situation and must bring agriculture back on agenda. Government efforts should not only foster the production and productivity, but also should retain a competitive and enthusiastic community in farming for future generation too. The profile characteristics of the farmers who are the beneficiaries of different development programmes will have an impact on their welfare and perception.

Keeping all these in view, the present research paper was focused to find out the extent of relationship of these profile characteristics on welfare and perception of beneficiary farmers.

Scope

The research paper projects the extent of relationship of profile characteristics of farmers towards welfare and perception. This would provide an opportunity for the policy makers and executors in identifying the factors that can be manipulated and to enhance the welfare and perception variables.

Methodology

The present research paper was focused on the assessment of the extent of relationship of profile characteristics of farmers towards welfare and perception of beneficiaries on the development programmes. The study was conducted during 2017-18 in the state of Kerala, India. Palakkad district of Kerala state was purposively identified as the locale, as the district is agriculturally active in the state and ranks first in the total cropped area and total food crops area. The simulated research design with control-randomisation was used as the research design. It focused on assessment of perception of beneficiaries towards the development programme.

Sample and sampling procedure

Selection of blocks

Palakkad district comprises thirteen blocks among that Chittur and Kuzhalmannam blocks were selected based on the ratio of cultivator population to total population.

Selection of respondents

As most of the farmers in Kerala used to grow rice, coconut and vegetables in combinations, selection of a large number of respondents specifically from mono- cropping of the selected crops would be the challenging factor for the study. Thus the respondent selection considered farmers with the single crop, two crops and three crops combinations with rice, coconut and vegetables.

For the present study respondents under seven combinations were identified viz., rice farming, coconut farming, vegetable farming, rice-coconut combination, rice- vegetables combination, coconut-vegetables combination and rice-coconut-vegetables combinations. Simple random sampling was used for respondent selection. Thirty each in seven combinations formed a total of 210 respondents. All the respondents availed the benefits of one or more development programmes. Thus the 210 respondents could be renamed as beneficiaries of development programmes. The beneficiary in the study was operationally defined as those who availed the financial and technical benefits of the selected development programmes for rice, vegetable and coconut farming.

Data processing and analysis

The collected data was entered into the MS-Excel master sheets. The data was scored, compiled, tabulated and subjected to appropriate statistical tools to draw meaningful results and logical conclusion. Both parametric and non-parametric statistical tools were used for analysis. Statistical tools included mean, frequency, percentage, standard deviation, range, Spearman's rank correlation and multinomial logistic regression. The statistical analysis was done with the help of computer software, specifically MS-Excel Spread Sheet and SPSS version 20.

Multinomial logitstic regression

The multinomial logistic regression model was used to explain the extent of relationship of profile with welfare and perception. This model was developed by Walker and Duncan (1967) [7] and Cox (1970) [4]. Based on perception and welfare farmers were classified in to five categories with cumulative square root frequency method. The categories were very low, low, medium, high and very high. For both welfare and perception very high category was retained as the reference category.

Results and Discussion

Extent of relationship of profile at differential levels of welfare

Though outcome variable *i.e.* level of welfare was a purely ordinal in nature, proportional odds assumption was not satisfied, (Chi-square value for the test of proportional odds assumption was 40.516 and significant at $p< 0.01$) for the data set. Therefore, a less restrictive model *i.e.* multinomial logit (MNL) was used to assess (Maiti, 2013) [5] the extent of relationship of profile variables with the differential level of perception of beneficiaries. In this analysis, the last category *i.e.* very high level of perception was considered as the reference level. The statistical software SPSS version 20 has been used to calculate log it coefficients and results are presented in Table1and Fig1.

The result of MNL model explained that different socio-economic, psychological, communication variables affect the welfare of beneficiaries of the development programmes. The Table showed that, the likelihood ratio ($\chi 2$) value was 135.43, significant at one per cent level of probability, thus suggesting strong explanatory power of the model.

The basic form of logistic function is

$$P=P\left(Y=\frac{1}{X_1, X_2, X_3, X_4 \ldots\ldots X_K}\right)=\frac{e^z}{1+e^z}=\frac{\exp(z)}{1+\exp(z)}$$

$$Z=\beta_0+\beta_1 X_1$$

$$\frac{P_i}{1-P_I}=e^z$$

$$L_i=In\left(\frac{P_i}{1-P_i}\right)=Z_i=\beta_0+\beta_1 X_1$$

The quantity $\frac{P_i}{1-P_I}$ is called as odds and hence, In $\left(\frac{P_i}{1-P_i}\right)$, the log odds is logit. The coefficient β_0 and β_1 are logit regression coefficients. These coefficients are used to compute odds ratios, which give the ratio of two odds of an event occurring (Y=1).

Table 1: Estimation of multinomial logit model for the welfare of beneficiaries of development programmes

Dependent variable: Y (Y=Welfare; ordered variable: 1= very low, 2= low, 3= medium, 4= high levels of welfare)												
Xi	Very low			Low			Medium			High		
	Est. B (Probability)	P value	Odds ratio	Est. B (Probability)	P value	Odds ratio	Est. B (Probability)	P value	Odds ratio	Est. B (Probability)	P value	Odds ratio
X1	0.077 (0.493)	0.285	0.974	0.057 (0.514)	0.397	1.059	0.031 (0.507)	0.193	1.032	0.072*** (0.482)	0.008	0.931
X2	0.222 (0.470)	0.503	0.887	0.214 (0.553)	0.125	1.239	0.223 (0.555)	0.103	1.249	-0.090 (0.477)	0.664	0.914
X3	0.142* (0.897)	0.084	8.802	1.178 (0.764)	0.309	3.248	-0.663 (0.340)	0.630	0.516	-1.079 (0.253)	0.500	0.340
X4	0.079 (0.501)	0.771	1.006	0.001 (0.500)	0.951	1.001	-0.008 (0.498)	0.692	0.992	0.027 (0.488)	0.215	1.028
X5	0.026 (0.491)	0.193	0.967	0.000 (0.500)	0.990	1.000	0.003 (0.500)	0.922	1.003	-0.164*** (0.486)	0.009	1.179
X6	-0.094 (0.422)	0.143	0.731	0.065 (0.516)	0.691	1.067	-0.396** (0.597)	0.018	1.485	0.211 (0.552)	0.233	1.235
X7	0.059 (0.495)	0.674	0.983	0.068 (0.516)	0.121	1.070	0.075	0.756	-0.178 (0.455)	-0.004 (0.499)	0.932	0.996
X8	0.037 (0.511)	0.474	1.049	0.048 (0.511)	0.463	1.049	-0.021 (0.494)	0.742	0.979	0.125 (0.506)	0.100	1.133
X9	0.169 (0.483)	0.289	0.937	-0.035 (0.491)	0.573	0.966	-0.110 (0.472)	0.103	0.896	- 0.053* (0.531)	0.060	0.949
X10	-0.062*** (0.539)	0.005	1.172	0.069 (0.517)	0.183	1.072	-0.054 (0.486)	0.388	0.947	-0.046 (0.540)	0.534	0.955
X11	0.049 (0.499)	0.909	0.996	-0.004 (0.499)	0.901	0.996	-0.011 (0.497)	0.712	0.989	-0.007 (0.498)	0.859	0.993

Dependent variable: Y (Y=Welfare; ordered variable: 1= very low, 2= low, 3= medium, 4= high levels of welfare)												
Xi	Very low			Low			Medium			High		
	Est. B (Probability)	P value	Odds ratio	Est. B (Probability)	P value	Odds ratio	Est. B (Probability)	P value	Odds ratio	Est. B (Probability)	P value	Odds ratio
X12	-0.018 (0.514)	0.734	1.062	0.356** (0.411)	0.022	0.700	-0.228 (0.443)	0.108	0.796	0.007 (0.501)	0.969	1.007
X13	-0.314 (0.477)	0.400	0.914	-0.138 (0.465)	0.155	0.871	0.099 (0.524)	0.352	1.104	-0.151 (0.462)	0.205	0.86
X14	-0.036* (0.508)	0.059	1.034	-0.280* (0.430)	0.076	0.014	-0.129** (0.467)	0.027	0.837	- 0.399** (0.401)	0.031	0.671
X15	-0.004** (0.450)	0.012	0.821	-0.058 (0.485)	0.353	0.944	0.110 (0.527)	0.086	1.116	-0.079 (0.480)	0.279	0.924
X16	2.212* (0.535)	0.071	1.152	-0.060 (0.485)	0.347	0.942	-0.093 (0.476)	0.110	0.911	-0.041 (0.489)	0.567	0.960
X17	-0.123 (0.553)	0.205	1.240	-0.081 (0.479)	0.562	0.922	-0.169 (0.457)	0.222	0.844	-0.004 (0.499)	0.980	0.996
X18	-0.026 (0.517)	0.372	1.071	-0.040* (0.490)	0.070	0.961	-0.065 (0.483)	0.375	0.937	-0.015 (0.496)	0.851	0.985

The reference category – Very high level of welfare (5)
-2 Log likelihood - 258.196 Mc Fadden R- square - 0.267
LR chi-square (72 df) - 135.43*** Probability (LR chi-square) - 0.000

No. of observations – 210
***Significance at 1 % level
** Significance at 5 % level
* Significance at 10 % level

Age (X1), Family size (X2), Dependency ratio (X3), Farming experience (X4), Farming commitment (X5), Extension contact (X6), Extension participation (X7), Assistance from external agency (X8), Orientation towards incentives (X9), Risk orientation (X10), Deferred gratification (X11), Political determinism (X12), Innovative proneness (X13), Economic motivation (X14), Scientific orientation (X15), Mass media participation (X16), Information sharing behavior (X17), Management orientation (X18)

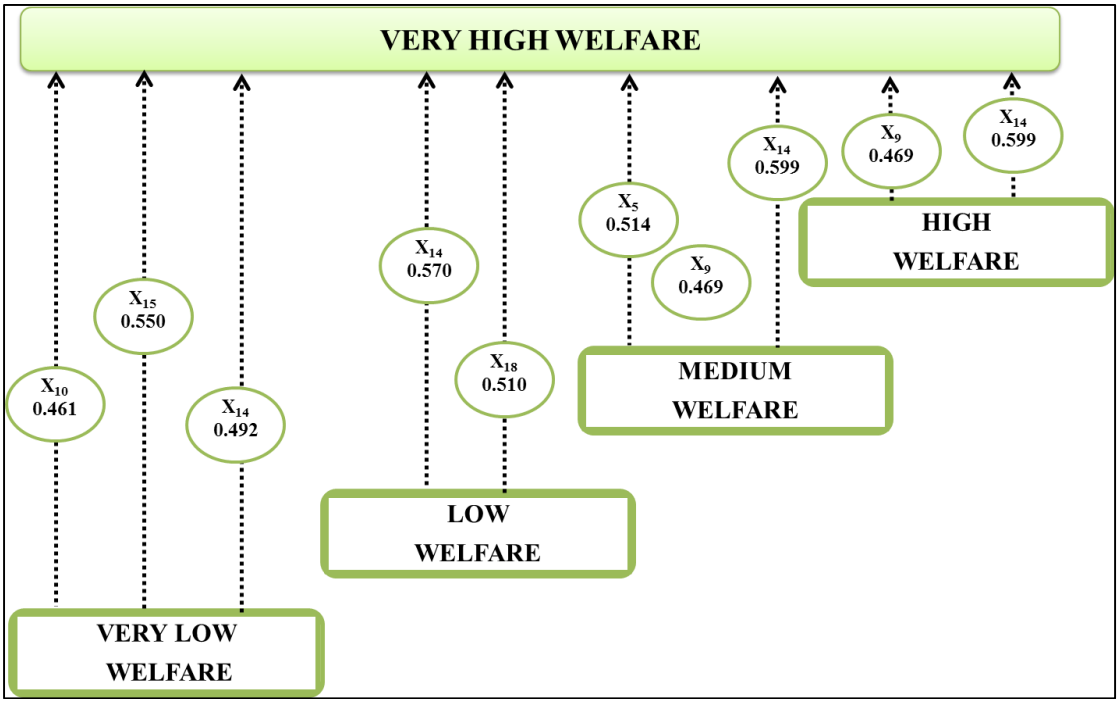

Fig 1: Variables with their probable shift to the very high level of perception

Age (X1), Family size (X2), Dependency ratio (X3), Farming experience (X4), Farming commitment (X5), Extension contact (X6), Extension participation (X7), Assistance from external agency (X8), Orientation towards incentives (X9), Risk orientation (X10), Deferred gratification (X11), Political determinism (X12), Innovative proneness (X13), Economic motivation (X14), Scientific orientation (X15), Mass media participation (X16), Information sharing behavior (X17), Management orientation (X18)

The test result confirmed that all the slope coefficients were significantly different from zero. The McFadden's pseudo R2 value was found to be 0.267, which reconfirmed that all the slope coefficients were not equal to zero (Ojo *et al*., 2013) [6]. This would prove that the independent variables were collectively significant to explain the differential levels of welfare of selected respondents. Literatures of Maiti (2013) [5] with pseudo R2 value of 0.220 and Budry (2006) [3] with pseudo R2 as 0.25, represented the relatively good fit for the MNL model in the present study. The estimated coefficient (Est. B) of MNL model would give the direction effect of independent variables on welfare. The study has considered the probability values to measure the magnitude of change in welfare at differential level with the one-unit change in each independent variable. Probability is given along with the estimated coefficient of MNL model in the parentheses. The results are discussed using the probability values of each variable to remain in the same category and to shift to the reference category. Probability is the ratio of odds to (1+odds).

Significant explanatory variables at very low welfare category

It was found that, if dependency ratio of the beneficiary increases by one unit, the log of odds ratio, probability of very low category to probability of very high category, increases by 0.142, *i.e*., the probability of beneficiaries with increasing dependency ratio to be in very low welfare category is 0.897, with that of very high welfare category. If the dependency ratio of farmer is found to be increased, keeping all other variables constant, it would affect the welfare indicators like household annual income, household annual expenditure, food security etc. and thus being the reason for retaining the respondents in the very low category.

As the risk orientation score of the respondents increases by one unit, the log of odds ratio, probability of very low welfare category to probability of very high welfare category decrease by 0.062 units. In other words, the probability of the respondent with increasing risk orientation score, to be in the very low welfare category is 0.539, when compared with the reference category. That is, the respondent with high risk orientation is less likely to be in the very low welfare category, with reference to the very high welfare category. The reason might be the increase in risk orientation would further motivate the farmer to practice new techniques in the farm which would enhance the index ranges of technology adoption, farm practices and there by farm income per acre. Also higher risk taking ability would influence the human indicators like self-acceptance and personal growth.

Result revealed that increase in scientific orientation by one unit would decrease the probability of very low welfare to the probability of very high welfare by 0.004, thus the probability of individual to remain in the very low category falls by 0.450 or the probability to move to the very high level of welfare rises by 0.550. This proved that active participation of beneficiaries from very low category of welfare in development programmes cause higher scientific orientation scores, which would reflect on various dimensions of welfare and thus an improvement in overall welfare index.

The estimated coefficient of multinomial logit for mass media participation was found to be 2.212 (probability of very low welfare category to very high welfare category). With an increase in the mass media participation by one unit, the probability of respondents to remain in the very low category would increases by 0.535 and the probability to move towards the reference category would decrease by 0.465. Thus conclusions can be drawn as even though mass media participation increases it will not influence the farmers in the low welfare category to move toward the reference.

The estimated coefficient of multinomial logit for economic motivation was found to be 0.036 (probability of very low

welfare category to very high welfare category). With an increase in the economic motivation by one unit, the probability of respondents to remain in the very low category would decreases by 0.508 and the probability to move towards the reference category would increases by 0.492. Thus conclusions can be drawn as increase in unit of economic motivation, the farmer shows a tendency to move towards the reference level of welfare.

Significant explanatory variables at low welfare category

Increase in the management orientation of the respondents by one unit, the log of odds ratio, probability of low welfare category to the very high welfare category decreases by 0.040. That is the probability of respondent to remain in the low category falls by 0.490 and the probability to move to the reference category increases by 0.510. Result explains that increase in management orientation would be a cause for the probable shift in respondents from low category to reference category of welfare.

The log of odds-ratio, probability of low welfare category to that of the very high welfare category increases by 0.356, with reference to political determinism of respondents. With a one unit increase in the political determinism, the probability to remain in the low welfare category would increase by 0.411. The result showed that for the respondents in low welfare category, political determinism could not be considered as a factor to cause the shift to reference category of welfare.

Similarly, if economic motivation increases by one unit, the log of odds ratio, probability of low welfare category related to very high welfare category decreases by0.280. Thus the probability of beneficiary to remain in low welfare category fallsby0.430 and probability of shifting to very high category rises by 0.570. Increase in economic motivation of farmers in low welfare category would motivate for effective farm practices and thus improving the welfare in farm and financial dimensions.

Significant explanatory variables at medium welfare category

With one unit increase in extension contact the log of odds ratio, probability of high welfare category to very high welfare category decreases by 0.396. The probability of beneficiary to remain in the high category would falls by 0.597 and probability of shifting to reference category rise by 0.403. This says that with increase in the extension contact by one unit, the farmer in the high welfare category shows the tendency to shift to the higher category. Higher the extension contact, higher will be the awareness on development programmes and also knowledge on crop aspects. This might impact on good participation on programmes and to avail the benefits in an effective ways.

In case of economic motivation, if the respondent were to increase the score by one units, the multinomial log of odds ratio, probability of high welfare category related to probability of medium welfare category would be expected to decrease by 0.129. It could be further explained as the probability to remain in the third category decreases by 0.467 and the probability to move towards the reference category increases by 0.533.

Significant explanatory variables at high welfare category

Age of respondents in high welfare category showed the increase in probability to remain in the category and not to move to the very high welfare category. Probability to remain in the high category would rise by 0.482 and probability to shift to the very high category falls by 0.512. This represents, increase in age for respondents in high welfare category does not cause farmer to move to the reference category or age has no influence on farmer welfare for very high category.

A unit of increase in farming commitment would cause the log of odds ratio, probability of high welfare category to probability of very high welfare category to decrease by 0.164. That means the probability of beneficiary to remain in forth category decreases by 0.486. Thus unit increase in farming commitment of respondents in high welfare category would cause the shift to the reference category of welfare. Increase in farming commitment will improve the farm practices, technology adoption and further farm income also which improves the overall welfare.

Beneficiaries' increase in orientation towards incentives by one unit, decreases the log of odds ratio by 0.053, thus decreases the probability to remain in high welfare category by 0.531and increases the probability to shift to very high welfare category by 0.469. If the orientation towards incentives increases, the farmer dependency to external support would also tremendously increase. It might badly influence the innovative and self-oriented farm and household activities and thus affecting the welfare in different dimensions. There comes the probability of farmer to show the tendency to shift from very high welfare category to reference category.

The estimated coefficient of multinomial logit for economic motivation was found to be 0.399. With an increase in the economic motivation by one unit, the probability of respondents to experience in high welfare category decreases by 0.401 and the probability to shift towards the reference level would increases by 0.599. Thus the farmer in the high welfare category would frame a tendency to shift towards the reference category with an increase in the economic motivation. Economic motivation would positively influence the farm activities and improvement in farm dimension is assured. This can further cause the rise in financial and physical dimension indices, and thus overall welfare.

Thus the variables which were significant for the shift of an individual from lower categories to the reference categories were identified. The result highlighted the importance of economic motivation, as it was found to be the significant variable causing the upward shift in all the categories. Thus extension activities could be oriented to improve the economic motivation of farmer, which would further influence the improvement in welfare. The Fig. 2 has depicted the significant variables in the differential categories of welfare that trigger the movement to reference category.

Contribution of independent variables at differential levels of perception

Though outcome variable *i.e.* level of perception was a purely ordinal in nature, proportional odds assumption was not satisfied, (Chi-square value for the test of proportional odds assumption was 72.490 and significant at $p< 0.01$) for the data set. Therefore a less restrictive model *i.e.* multinomial logit (MNL) was used to assess (Maiti, 2013) [5] the extent of relationship of variables in the differential level of perception of beneficiaries. In this analysis, the last category *i.e.* very high level of perception was considered as the reference level. Statistical software SPSS version 20 has been used to calculate logit coefficients and results has been presented in Table 2, Fig. 2.

The result of MNL model explained that different socio-economic, psychological, communication variables affect the

perception of farmers towards the development programmes. The Table result showed that, the likelihood ratio ($\chi 2$) value was 128.05, significant at one per cent level of probability, thus suggesting strong explanatory power of the model. The test result confirmed that all the slope coefficients were significantly different from zero. The McFadden's pseudo R2 value was found to be 0.225. It would also confirm that all the slope coefficients are not equal to zero (Ojo *et al*., 2013) [6].

Table 2: Estimation of multinomial logit model for perception of beneficiaries of development programmes

Xi	Very low			Low			Medium			High		
	Est. B (Probability)	P value	Odds ratio	Est. B (Probability)	P value	Odds ratio	Est. B (Probability)	P value	Odds ratio	Est. B (Probability)	P value	Odds ratio
X1	-0.098*** (0.524)	0.007	1.102	0.032 (0.507)	0.340	1.032	-0.057* (0.514)	0.070	1.059	0.070 (0.517)	1.073	1.003
X2	-0.253 (0.437)	0.296	0.776	-0.272 (0.432)	0.257	0.761	-0.243 (0.439)	0.290	0.784	0.048 (0.511)	1.049	0.652
X3	-0.339 (0.415)	0.863	0.712	-1.35 (0.205)	0.468	0.259	-0.223 (0.444)	0.898	0.800	0.242 (0.560)	1.274	0.028
X4	-0.023 (0.494)	0.561	0.977	-0.002 (0.499)	0.961	0.998	0.060* (0.485)	0.094	0.942	-0.075 (0.481)	0.928	0.859
X5	0.000 (0.500)	0.990	1.000	0.007 (0.501)	0.851	1.007	0.006 (0.501)	0.858	1.006	-0.004 (0.498)	0.996	0.921
X6	-0.526* (0.321)	0.055	0.591	-0.527** (0.371)	0.034	0.591	-0.312 (0.422)	0.150	0.732	-0.100 (0.475)	0.905	0.564
X7	-0.182** (0.371)	0.018	0.834	-0.106 (0.473)	0.139	0.899	-0.064 (0.484)	0.349	0.938	-0.083 (0.479)	0.920	0.793
X8	-0.043 (0.454)	0.717	0.958	0.012 (0.503)	0.915	1.012	-0.025 (0.493)	0.816	0.975	0.165 (0.541)	1.179	0.922
X9	-0.130 (0.489)	0.202	0.878	-0.050 (0.487)	0.603	0.951	-0.312** (0.501)	0.015	0.812	-0.079 (0.480)	0.383	0.924
X10	-0.064 (0.467)	0.473	0.938	-0.060 (0.484)	0.479	0.941	-0.034 (0.491)	0.670	0.967	-0.082 (0.479)	0.921	0.774
X11	0.002 (0.483)	0.969	1.002	0.011 (0.502)	0.852	1.011	0.069 (0.517)	0.204	1.071	0.093 (0.523)	1.098	0.977
X12	0.497* (0.500)	0.095	1.644	0.268 (0.566)	0.347	1.307	0.491* (0.620)	0.074	1.634	0.471 (0.615)	1.602	0.897
X13	0.234 (0.6210)	0.168	1.263	0.167 (0.541)	0.302	1.182	0.067 (0.516)	0.662	1.069	0.455* (0.573)	0.067	1.372
X14	0.422 (0.558)	0.127	1.525	0.464* (0.613)	0.079	1.590	0.204 (0.550)	0.417	1.226	0.220 (0.554)	0.917	0.701
X15	-0.182* (0.603)	0.097	0.834	-0.094 (0.476)	0.351	0.910	-0.119 (0.470)	0.225	0.888	-0.067 (0.483)	0.935	0.756
X16	-0.021 (0.454)	0.854	0.980	-0.074 (0.481)	0.486	0.928	-0.037 (0.490)	0.715	0.964	-0.038 (0.490)	0.963	0.779
X17	-0.540* (0.368)	0.057	0.583	-0.446 (0.390)	0.107	0.640	-0.492* (0.379)	0.064	0.611	-0.759 (0.318)	0.468	0.267
X18	-0.189 (0.452)	0.149	0.828	-0.304** (0.424)	0.014	0.738	-0.166 (0.458)	0.847	0.656	-0.237** (0.441)	0.042	0.789

The reference category- Very high level of perception (5)
-2 Log likelihood -493.882 Mc Fadden R- square- 0.225
LR chi-square (72 df) 128.05*** Probability (LR chi-square) 0.000
No. of observations- 210
***Significant at 1 % level
** Significant at 5 %level
* Significant at 10 %level

Age (X1), Family size (X2), Dependency ratio (X3), Farming experience (X4), Farming commitment (X5), Extension contact (X6), Extension participation (X7), Assistance from external agency (X8), Orientation towards incentives (X9), Risk orientation (X10), Deferred gratification (X11), Political determinism (X12), Innovative proneness (X13), Economic motivation (X14), Scientific orientation (X15), Mass media participation (X16), Information sharing behavior (X17), Management orientation (X18).

This is the evidence for that the independent variables were collectively significant to explain the perception level of farmer beneficiaries towards development programmes. In the literature, Maiti (2013) [5] obtained pseudo R2 value of 0.220 and Budry (2006) [3] reported pseudo R2 as 0.25, thus representing a relatively good fit for the MNL model in the present study. The estimated coefficient (Est. B) of MNL model gave the direction effect of independent variables on the perception.

The results are discussed using the probability values of each variable to remain in the same category and to shift to the reference category. Probability is the ratio of odds to (1+odds). The probability values measured the magnitude of change in perception with one unit change in each independent variable.

Significant explanatory variables at very low perception category

It was found that, if age of the beneficiary increases by one year, the log of odds ratio, probability of very low perception to probability of very high perception for the age, decreases by 0.098, *i.e*. the probability of beneficiary with higher age group to remain in very low perception level is 0.524 and probability of shifting to very high perception level is 0.476. Thus, the probability of increase in perception towards development programmes would increases with increase in age of the beneficiaries at very low category.

Similarly, in extension contact, increase by one unit, the log of odds ratio, probability of very low perception to very high perception for the extension contact, decreases by 0.526,*i.e*. the probability of beneficiary to remain in very low perception level falls by 0.321 and probability of shifting to very high perception level rise by 0.679. Thus, the probability of increase in perception towards development programmes would increases with increase in extension contact of the beneficiaries at very low category. Extension officials act as the key informants for development programmes. Improvement in extension contact would thus enhance the farmers' perception.

A unit of increase in extension participation would also decreases the probability of very low to very high level by 0.182. That means the probability of beneficiary to

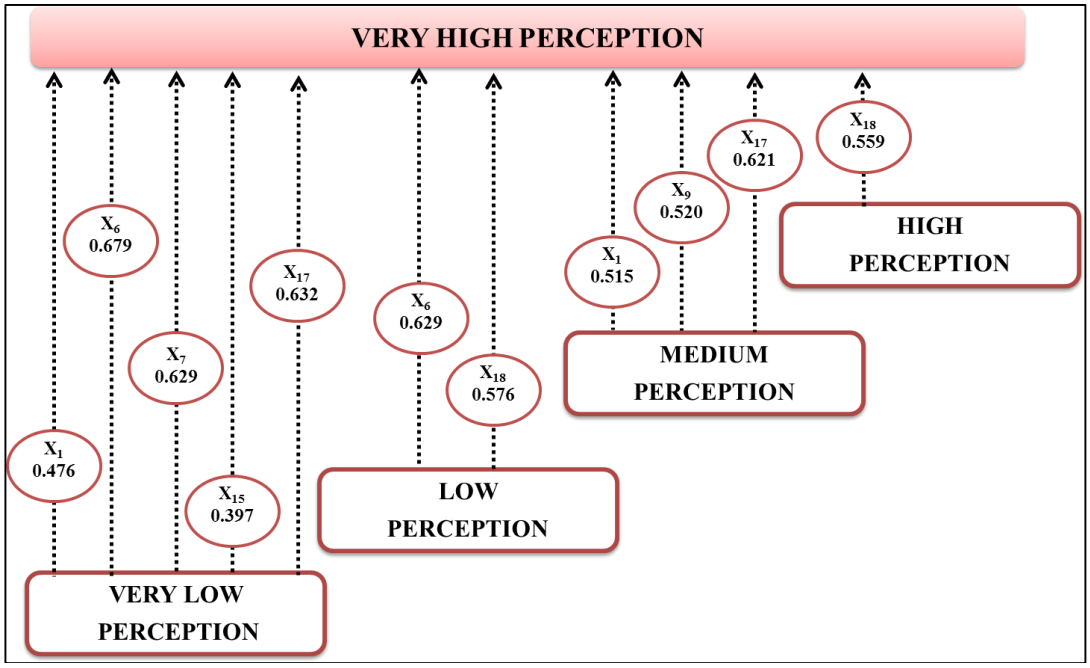

Fig 2: Variables with their probable shift to the very high level of welfare

Age (X1), Family size (X2), Dependency ratio (X3), Farming experience (X4), Farming commitment (X5), Extension contact (X6), Extension participation (X7), Assistance from external agency (X8), Orientation towards incentives (X9), Risk orientation (X10), Deferred gratification (X11), Political determinism (X12), Innovative proneness (X13), Economic motivation (X14), Scientific orientation (X15), Mass media participation (X16), Information sharing behavior (X17), Management orientation (X18) remain in first category falls by 0.371 and probability to move towards reference category increases by 0.629. Thus increase in participation of extension activities like trainings, seminars, filed visit etc. would impact on perception was proved.

It was quite interesting to observe that one unit increase in political determinism would increases the probability of very low to very high by 0.497. This implies that probability of beneficiary to remain in low level increases by 0.500, and thus the beneficiary finds comfort in very low perception. Low level perception of majority of beneficiaries was reported in the profile analysis (Table 6) of the present study. MNL results could be viewed in light of farmers dislikes for further interference of politics in development programmes.

In case of scientific orientation, multinomial log of odds ratio for very low level perception relative to high level perception was expected to decrease by 0.182 units, for one unit increase in the score of the variable. This would motivate the beneficiary farmer to improve their perception and to move towards reference category with a probability of0.397. As development programmes promote the scientific ways of farming, farmers' eager towards scientific farm practices would improves the scores of variable and thus their level of perception.

Increase in one unit of information seeking behavior of beneficiary would reduce the probability to be in the very low category by 0.368 and cause the departure to very high category by the probability value of 0.632.

Significant explanatory variables at low perception category

Regarding to extension contact, increase of one unit would attract the beneficiaries in low level of perception to move towards reference category. The probability to remain in the same level decreases by 0.371 and to move towards very high-level increases by the probability of0.629.

One unit increase in economic motivation would increases the log of odds ratio between Low to very high by 0.464, and beneficiary tries to remainin the low category.

The probability of beneficiary to remain in very low perception level rise by 0.613 and probability of shifting to very high perception level fall by 0.387. The result showed that probability of increase in perception would decrease by unit increase in independent variable. Beneficiaries remaining in low category might be interested to approach farming as a commercial venture, than the ways of subsistence. This would motivate farmer to be more innovative and risk oriented than mere dependents to Government.

Beneficiary's increase in management orientation scores by one unit, decreases log of odds ratio by 0.304, decreases the probability to remain in low category by 0.424 and increases the probability to shift to very high category by 0.576. Better orientation to planning. production and marketing influence their perception towards various programmes for crop production.

Significant explanatory variables at medium perception category

If the beneficiary is having higher age, logs of odds ratio, (probability of very high category to probability of very high category (P (very high) / P (very high)) decreases by 0.057, or in other words, the probability that they move to reference category is more (0.514).

Result showed that increase in farming experience by one unit will increase the probability of medium to very high category by 0.060, thus the probability of individual to remain in the very high level is found to be 0.515. This would highlight that probability of being in different levels of perception was not attributed to farming experience.

If the beneficiary has increased its orientation towards incentive with a single unit, log of odds ratio decreases by 0.312, and this would decreases the probability to remain in medium category by 0.501 and increases the probability to shift to very high category by 0.499. Mean score of the

perception statement, 'financial support from development programmes attracts the farmers more' was given the first rank among the eighteen. This would high light the importance of financial interventions in development programmes and the reason for shift in perception level with a unit increase in the variable.

As noted earlier for very low categories, one unit increase in political determinism would increases the probability of medium to probability of very high perception by0.491. This implies that probability of beneficiary to remain in medium level increases by 0.620, and thus the beneficiary finds comfort in medium perception.

Increase in one unit of information seeking behavior of beneficiary would reduce the probability to be in the medium category by 0.379 and cause the departure to very high category by the probability value of 0.621. Increase in information seeking behavior would increase the awareness on programmes, and thus participation. Finally perception to programmes will also get improved.

Significant explanatory variables at high perception category

A unit of increase in innovative proneness would increase the probability of high perception to probability of very high level by 0.455. That means the probability of beneficiary to remain in fourth category increases by 0.573 and probability to move towards reference category decreases by 0.427. Thus unit increase in innovative proneness in high level perception would not cause any change to the higher category of perception level.

Beneficiary increase in management orientation by one unit, decreases log of odds ratio by 0.237, decreases the probability to remain in high category by 0.441 and increases the probability to shift to very high category by 0.559. Better orientation to planning, production and marketing influence their perception towards various programmes. Thus increase in for crop production. Thus the probability of increase in perception towards development programmes would increases with increase in management orientation of the beneficiaries at very high category.

Conclusion

Rice-coconut-vegetable combination had the higher level of perception towards development programmes. This implies that the better perception would result in better welfare of the farmers. Hence, there is a need to increase the perception of the farmers of different crop combinations on developmental programmes. It could be recommended that the farmers who have better perception could be selected as reference leaders to promote the development programmes. Set of significant explanatory variables as age, extension contact, extension participation, scientific orientation, information sharing behavior, management orientation, orientation towards incentives in different perception levels predicted the probable shift to the high level of perception. This would be the reference for the extension professionals to manipulate through various extension activities for the farmers.

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