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RESEARCH ARTICLE

THE MARKETABLE SURPLUS IN SMALL FARM ECOLOGY: AN ESTIMATION FROM AGRO-ECOLOGICAL AND SOCIO-ECONOMIC FACTORS

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ABSTRACT

Agriculture in India presents the world's largest private sector investments for 125 million farm families, and most of which are being organized in a natural set of with both bliss and risk offered by climate, market and technology itself. The agriculture of west Bengal is enormously dominated by small, marginal and fragmented holding as well. To generate marketable surplus especially from small and fragmented holding is really a difficult proposition. The task has gone further complicated with the rise of input prices and risk in accessing uncertain market prices of the market produces. For the mere survival of the rural mass, 90 per cent of the rural mass ,does not have any fixed income; the small farmers have to have generate some marketable surplus after meeting their subsistent requirement. The present study "The Marketable surplus in Small Farm Ecology: An Estimation from Agro-ecological and Socio-economic Factors" is envisaging an objective estimation of the level of marketable surplus as the dependent variable in respect of an 18 number of socio-economic and techno-managerial factors. The study reveals that, the variables Education (x2), Family Size(x3), Income(x4), Size of Holding(x5), Economic land(x6), Irrigation Index(x7), Electricity Consumption(x8), Market interaction(x10), Group Interaction(x11) and Risk orientation(x18) have significant bearing on generating marketable surplus by the farm entrepreneurs of the research locale, village Bhanderkola of Bongaon block in the district North 24 Parganas, West Bengal. All the independent variables have undergone step-down regression analysis to isolate the factors having critical contribution for generating ,marketable surplus and these are Education (x2), Family Size(x3), Income(x4), Size of Holding(x5), Irrigation Index(x7), Orientation towards Competition(x14), Marketing Orientation(x15), Decision Matrix(x16), Idea Exchange Index(x17) and Risk orientation(x18). Entrepreneurship analysis in small holding can also be replicated to conclude whether agriculture or fishery or cattle enterprises can be comparable with each other or can these enterprises be complemented to develop a complex model for agri-preneurship, so as to attain a profitable venture for farmers which could be socially as well as ecological resilient.

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INTRODUCTION

The growth and sustainability of agriculture depend on the kind of entrepreneurship is being created and managed in agriculture, especially in small and fragmented holding of Indian agriculture. For farmers of small holding, enterprise comes later subsequent to its to the fulfilment of its requirement for food security. Of one hundred twenty five million small and fragmented holding of India, 70 percent and more are suffering from issues of food security, entrepreneurship as a proposition is both critical and challenging to them. The process of transforming biological produces in to entrepreneurial product needs change in attitude, support from organization and of course in change in policy formulation. The presents study has been organised in selected village i.e. Bhanderkola of Bongaon block of west Bengal. Where in an agri-preneurship in small and fragmented holdings have started showing indication of success and accomplishment. The pace of modernization in cultivation of paddy and vegetables has been characterised with dicta of small and medium entrepreneurship. Even the marginal farmers have started creating marketable surplus in this area after satisfying their subsistent need has been a good indication for driving a low key traditional agriculture to a surplus generating farm enterprise. The present study has been conducted to elucidate the level of farm entrepreneurship in the form of

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marketable surplus which has to be estimated in terms of agro-economic and socio-ecological factors.

The objectives of the study are as follows

- To identify and estimate the level of marketable surplus as the dependent variable, a score of agro-economic and socio-personnel variables
- To estimate and analyze the nature and direction of interaction among the independent and dependent variables
- To delineate a micro level policy, so much so, the constrains and prospects of marketable surplus can be analyzed and intervention programs can be operationally described.

METHODS

The present study was conducted in districts North 24 Parganas. The village Bhanderkola of Bongaon block in North 24 Parganas district of the state West Bengal were selected for the study. Purposive as well as simple random sampling techniques were adopted for the study. For selection of state, district, block and gram panchayat purposive sampling techniques was adopted because the area was ideal for entrepreneurship study, convenient for researcher to access and having the infrastructural facilities and in case of selection of villages and respondents simple random sampling technique was taken up. Before taking up actual fieldwork a pilot study was conducted to understand the area, its people, institution, communication and extension system and the knowledge, perception and attitude of the people towards farm entrepreneurship concept.

On the basis of the findings of pilot study, a preliminary interview schedule was formed with the help of literature review and by the assistance of Chairman of Advisory Committee. The interview schedule consisted of three major parts according to the specific objectives of the study i.e., agro-economic, socio-personal and techno-managerial. Pretesting or preliminary testing is the process of an advance testing of the study design after the schedule/questionnaire has been prepared. The object of pretesting is to detect the discrepancies that have emerged and to remove them after necessary modification in the schedule. It also helps to identify whether the questions are logically organized, the replies could properly recorded in the space provided for or there is any scope for further improvement. After conducting pretesting appropriate changes and modification of the interview schedule have been made. The individuals who responded in pretesting have been excluded in the final sample selected for the study. The respondents were personally interviewed during festival vacations (Durga Puja) and summer vacations. The items were asked in Bengali as well as English version in a simple terminology so that the members could understand easily. The entries were done in the schedule by student investigator himself at the time of interview. The following statistical tools were used for analysis of data viz. Correlation of coefficient, Multiple regression analysis and Path analysis.

Education, Family size, Income, size of holding and economic land have rightly influence of the marketable surplus generation of respondent farmers. These imply that with the importance of socio economic character and the improvements of socio economy, the entrepreneur efficiency of farmers have also been increased, which is reflected in the significance values. The other agro economic variables i.e. irrigation index has also been responsible for generation of marketable surplus. So, irrigated agro eco system is not only characterized with higher yield but also higher marketable surplus. Like previous results electricity consumption, market interaction, group interaction and risk orientation are basic indicators for enterprising agriculture. This also recorded as significant and positive influence on the marketable surplus.

Table 1. Coefficient of Correlation (r) between marketable surplus(Y) and 18 Independent variables (X1-X18)

Variables		Correlation coefficient (r)
X1	Age	0.131
X2	Education	0.289*
X3	Family size	0.567**
X4	Income	0.762**
X5	Size of Holding	0.888**
X6	Economic Land	0.757**
X7	Irrigation Index	0.767**
X8	Electricity consumption	0.370**
X9	Fuel consumption	-0.189
X10	Market Interaction	0.754**
X11	Group Interaction	0.613**
X12	Distance Matrix	0.070
X13	Innovation Proneness	-0.012
X14	Orientation Towards competition	-0.003
X15	Marketing Orientation	-0.084
X16	Decision Matrix	0.060
X17	Idea Exchange Index	-0.023
X18	Risk Orientation	0.363**

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

The model shows the entry of10 variables closest to the domain of dependent variable, marketable surplus. Size of holding has the most dominating impact on marketable surplus to justify that the process of generating surplus has not been yet scale neutral; it needs resource, technology and access. Table-2 Presents the step down regression analysis to step wise drift out the trivial variables and ultimately to relation the most contributing attributes or causal variables exerting direct effect on the consequent variable marketable surplus.

Model-1: Coefficient of Correlation Between Marketable Surplus(Y) and 18 Independent Variables

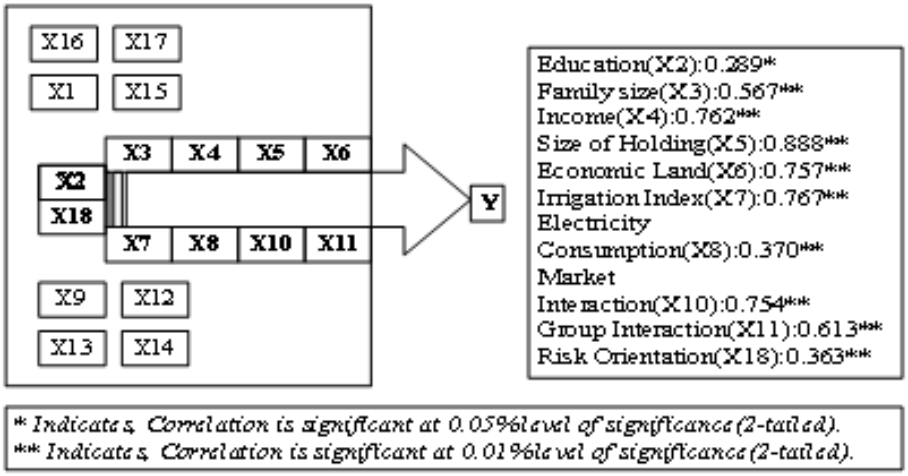
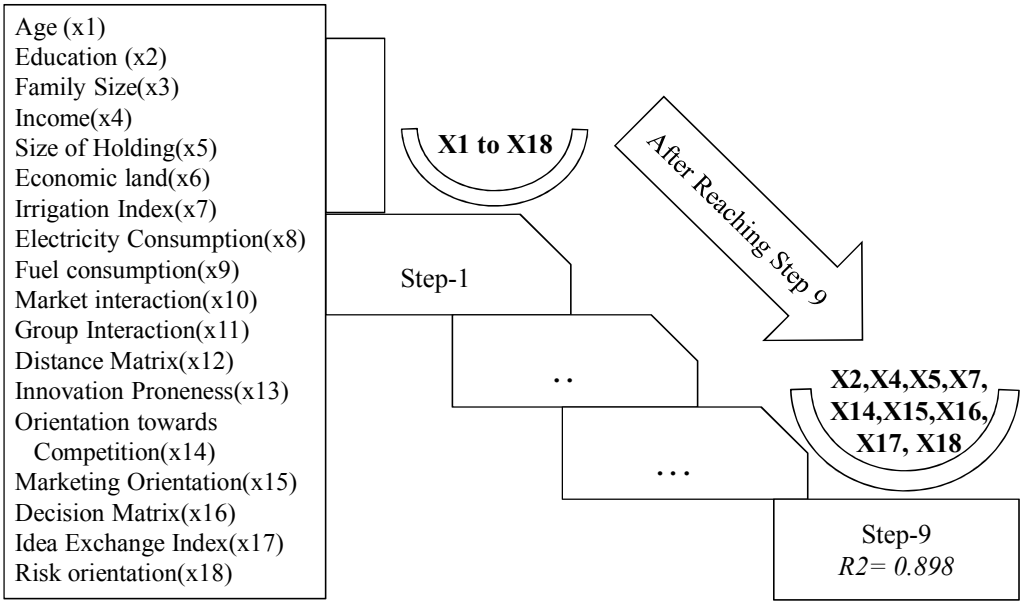


Table 2. Step-down Regression analysis of marketable surplus and 18 independent variables, The causal variable selected at the last step (Step 9)

At step 9	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-20.616	17.703		-1.165	0.251
x2	0.763	0.284	0.169	2.689	0.010
x4	-0.005	0.002	-0.330	-2.293	0.027
x5	3.135	0.376	0.854	8.340	0.000
x7	9.847	2.687	0.346	3.665	0.001
x14	-5.633	1.727	-0.200	-3.262	0.002
x15	5.031	1.694	0.162	2.970	0.005
x16	-3.375	1.732	-0.110	-1.948	0.048
x17	-4.125	1.650	-0.156	-2.500	0.017
x18	7.773	2.706	0.266	2.873	0.006

Dependent Variable: Y2; R = 0.947, R2 = 0.898, Adjusted R2 =0 .875
Predictors: (Constant), x18, x16, x15, x2, x14, x7, x17, x4, x5

Model-2: Step Down Regression Analysis between Marketable surplus(Y) vs. 18 Causal Variables



After reaching the step 9, the following variables have been retained to operationally characterize the consequent variable (Y). The variables are education (X2), income (X4), size of holding (X5), irrigation index (X7), orientation towards competition (X14), Marketing orientation(X15), decision matrix (X16), idea exchange index (X17) and risk orientation (X18).

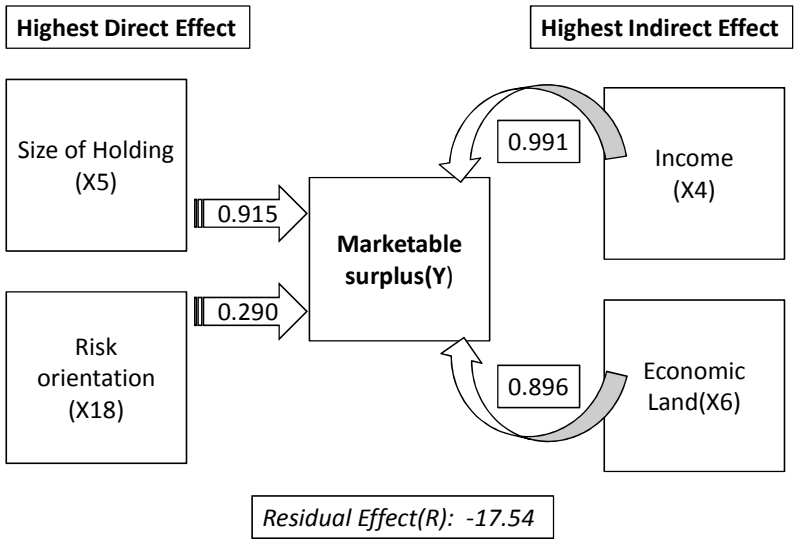
variables are retained here at the 9th step to contribute to the variance in marketable surplus, the consequent variable, to as high as 89.80 per cent. So the variables selected from the performing social ecology, have gone substantially to recognize system function as well through the economic product, marketable surplus.

Table 3. Path Analysis between marketable surplus (Y2) and all 18 independent variables (X1-X18)

Sl. no.	Variables	Total effect®	Direct effect(DE)	Indirect effect
x1	Age (years)	0.131	-0.091	0.222
x2	Education (year of schooling)	0.289	0.275	0.014
x3	Family Size(No. of Family members)	0.567	-0.051	0.618
x4	Income(family income/month/head)	0.762	-0.229	0.991
x5	Size of Holding(homestead +cultivable in Bigha)	0.888	0.915	-0.027
x6	Economic land(Land under economic activity per head in Bigha)	0.757	-0.139	0.896
x7	Irrigation Index(Land under full irrigation per head in Bigha)	0.757	0.139	0.618
x8	Electricity Consumption(Rs. Per month per head)	0.370	-0.244	0.614
x9	Fuel consumption(Rs. Per month per head)	-0.189	-0.215	0.026
x10	Market interaction(no.)	0.754	0.275	0.029
x11	Group Interaction(in 10 point scale)	0.613	0.097	0.516
x12	Distance Matrix(in KM)	0.070	0.027	0.043
x13	Innovation Proneness(in 10 Point Scale)	-0.012	0.039	-0.051
x14	Orientation towards Competition(in 10 Point Scale)	-0.003	-0.212	0.209
x15	Marketing Orientation(in 10 Point Scale)	-0.084	0.108	-0.192
x16	Decision Matrix(No. of cases help to take decision)	0.060	-0.116	0.176
x17	Idea Exchange Index(No. of cases help to take idea)	-0.023	-0.152	0.129
x18	Risk orientation(the degree you overcome the risk in 10 Point Scale)	0.363	0.290	0.073

Residual effect(R): -17.54

Model-3: Operational and Conceptual Model on Path Analysis: Marketable Surplus(Y) vs. 18 Independent Variables



The change in education, income, size of holding, irrigation index, orientation towards competition, decision matrix, idea exchange index and risk orientation have all contributed to assess higher level of consumable farm product and that is why they have exerted the precise effect on Marketable surplus (Y2). The r^2 value been 0.898, it is in far that the combination of these 9 variables has been able to explain 89.80 % of variance embedded with marketable surplus. Ten causal

Table 3 Presents the path analysis Marketable Surplus and18 independent variables and it has been found that the variables, size of holding and risk orientation have exerted dominant effect on Marketable surplus by the operating farmers. Interestingly, the variable income and economic land have substantive indirect effect on marketable surplus. This might be reason that size of holding and risk orientation as such cannot characterise the generation of marketable surplus unless

it is being operationally supported by other variables like income and economic land. The residual effect implies that even with the combination of 18 exogenous variables there has been 17.54% variance in marketable surplus cannot be explained. Size of holding and risk orientation are the strongest variables to characterize marketable surplus, while income and economic land are having indirect entry into the domain of system interaction on configuring marketable surplus.

Policy implication

- The empirical results of the study offer a splendid scope for micro level policy formulation.
- The enterprise selection based on holding size specificity and market connectivity can go a long way for designing market driven crop enterprise production and management.
- The enterprise co-integration, rather than land integration, can help a reinforced risk management strategy and management.
- The micro-micro market interaction can add a new drive to make a monolithic local market into a polymer of community market venture.

Conclusion

The study has uniquely revealed the critical and decisive impact of causal variables on the level of generating marketable surplus in a typical agro-ecology, dominated by small and fragmented holding, of west Bengal. Size of holding and risk orientation have been found to have distinct direct effect on marketable surplus to conclude that land resources are still behaving as an important determinant, but, risk and market orientations have also been critical motivational input for transforming an apparently stale agriculture into a vibrant agripreneurship, just for a decent and secured agro-based livelihood.

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