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ESTIMATION OF HAEMOGLOBIN STATUS OF FARM WOMEN: A SOCIO-ECONOMIC AND AGRO-ECOLOGICAL PERCEPTION

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ABSTRACT

Anemia is a common health problem among women throughout the world. However, there has been minimal research on farm women's concepts of anemia. The present study was thus undertaken with the objective to assess the agro-socio-economic factors related to haemoglobin content of farm women, of West Bengal, India. The study was confined to the women of age group of 19-60 years. A total of 211 women were selected randomly. Their haemoglobin (%) was measured by collecting blood samples. This present paper examines the socio-economic and agro-ecological predictors to a score of 26 exogenous variables which are correlated with the haemoglobin status of farm women. Multivariate analysis was carried out to understand the complex nature of variable interaction. It shows cultivated land (X_6) & land under irrigation (X_7) have a great contribution to the haemoglobin status of farm women.

INTRODUCTION

Iron-deficiency anemia is the most common form of malnutrition in the world and is the eighth leading cause of disease in girls and women in developing countries (World Bank 1993). About one-third of the global population is anemic (WHO 2010). Its estimated prevalence in South-East Asia is 50% to 70% (UNICEF 2002). In India, two- thirds of the women of child bearing age are estimated to suffer from iron deficiency anemia. Reports indicate that 15 per cent of all maternal deaths are attributed to anemia (IIPS 2007; Chakma 2000; National Nutrition Monitoring Bureau 2002; Micronutrient Initiative 2007). The high prevalence of anemia among women in India is a burden for them, for their families, and for the economic development and productivity of the country (Bentley and Griffiths 2003).Whereas severe anemia is closely related to risk of mortality, even mild anemia carries health risks and reduces the capacity to work (Cohen and Gibor 1980). Severe anemia is known to result in obstetric risks such as foetal complications and increased infant and maternal mortality, a variety of functional disabilities such as reduced working capacity, defective immune response, impairment of learning ability and physical fitness occur even in mild to moderate anemia. In spite of programmes, there is no significant decline in the prevalence of anemia in India.

Lack of knowledge of the dietary requirements and the nutritive value of different foods is an important contributory cause of widespread occurrence of malnutrition among vulnerable section of the population in the developing countries. Several studies have found a negative association between socioeconomic situation (SES) and anaemia prevalence. Women from poor households are usually found to have higher anaemia prevalence. Poor SES is known to be associated with a number of factors such as high parity, short birth interval, poor diet both in quantity and quality, lack of health and nutrition awareness, and a high rate of infectious diseases and parasitic infestations. The present study was thus planned to assess the socio-economic and agro-ecological factors related to haemoglobin content of farm women, of West Bengal, India.

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MATERIALS AND METHODS

The present study was conducted in four villages of West Bengal. Selection of the locale was finalized based on the following factors- i) area with preponderance of the problem and character, ii) accessibility, iii) even distribution of respondents, iv) representative to the region. The villages (Bhawanipore, Satyapole, Bramhopur, Panchkahonia) selected come under Haringhata I block of Nadia District. The selection of the district, blocks and Gram Panchayet areas have followed purposive selection. The study was confined to the women of age group 19-60 years only. Randomly 211 subjects willing to participate in the study were chosen. A questionnaire schedule was prepared to collect various information regarding subjects. Schedule was pretested on a non sample population having similar socio-economic background. General information related agro-socioeconomic factors of subjects were collected using the same schedule. To test the haemoglobin content of the blood of the samples two ml of blood was collected from the sample by a trained person on permission by ethical committee of the Calcutta University. To know the haemoglobin content the blood samples were tested by Sahli's method.

Data analysis

The statistical analysis was done on computer in MS-Excel and SPSS with complier. The data was analyzed for mean, Standard deviation, regression co-efficient, path analysis to estimate relations and interactions. The independent variables are X_1-Age, X_2- Education, X_3- Family size, X_4-Family education, X_5- Homestead land(bigha), X_6- Cultivated land (bigha), X_7- Land under irrigation d (bigha), X_8- Cropping intensity, X_9- Irrigation index, X_{10}- Expenditure index (Education & Others), X_{11}- Expenditure index (Food & Health), X_{12}- Owner agricultural implements, X_{13}- Technology socialization status, X_{14}- Animal entrepreneurial index, X_{15}- Animal production consumption index, X_{16}- Animal production sale index, X_{17}- Crop diversification index, X_{18}- Media-social interaction index, X_{19}- Market interaction, X_{20}- Entrepreneurial interaction, X_{21}- Capacity building index, X_{22}- Credit rotation index, X_{23}- Distance of road, X_{24}- Status of sanitation index, X_{25}- Distance matrix, X_{26}- Health index and the dependent variables are-Y_1- Haemoglobin (%)

RESULTS AND DISCUSSION

Table-1 presents the coefficient of correlation between Haemoglobin(%)(Y_1) & 26 independent variables of total 4 villages.

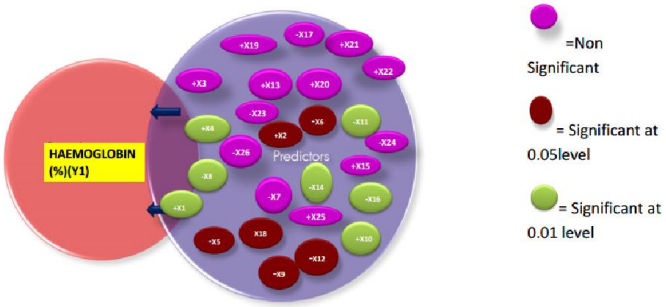
Results

It has been found that the variables Age (X_1), Education (X_2), Family education (X_4), Homestead land (X_5), Cultivated land (X_6), Cropping intensity (X_8), Irrigation index (X_9), Expenditure index (Education & Others) (X_{10}), Expenditure index (Food & Health) (X_{11}), Owner agricultural implements (X_{12},) Animal entrepreneurial index (X_{14}), Animal production sale index (X_{16}) and Media-social interaction index (X_{18}) have been significantly correlated with the dependent variable Haemoglobin (%) (Y_1).

Table 1. Correlation coefficient of Haemoglobin(%) (Y_1) with 26 independent variables

	N=211
Age(X_1)	0.2087**
Education(X_2)	0.1579*
Family statement(X_3)	0.0759
Family education(X_4)	0.2557**
Homestead land(X_5)	-0.1474*
Cultivated land(X_6)	-0.1463*
Land under irrigation(X_7)	-0.1370
Cropping intensity(X_8)	-0.1852**
Irrigation index(X_9)	-0.1518*
Expenditure index (Education &Others)(X_{10})	0.2981**
Expenditure index (Food & Health)(X_{11})	-0.3830**
Owner agricultural implements(X_{12})	-0.1752*
Technology socialization status(X_{13})	0.0593
Animal entrepreneurial index(X_{14})	-0.3772**
Animal production consumption index(X_{15})	0.0709
Animal production sale index(X_{16})	-0.1859**
Crop diversification index(X_{17})	-0.1253
Media-social interaction index(X_{18})	0.1426*
Market interaction(X_{19})	0.0004
Entrepreneurial interaction(X_{20})	0.0835
Capacity building index(X_{21})	0.0829
Credit rotation index(X_{22})	0.0123
Distance of road(X_{23})	-0.1169
Status of sanitation index(X_{24})	-0.0797
Distance matrix(X_{25})	0.0567
Health index(X_{26})	-0.0504

*significant at 0.05 level
**significant at 0.01 level



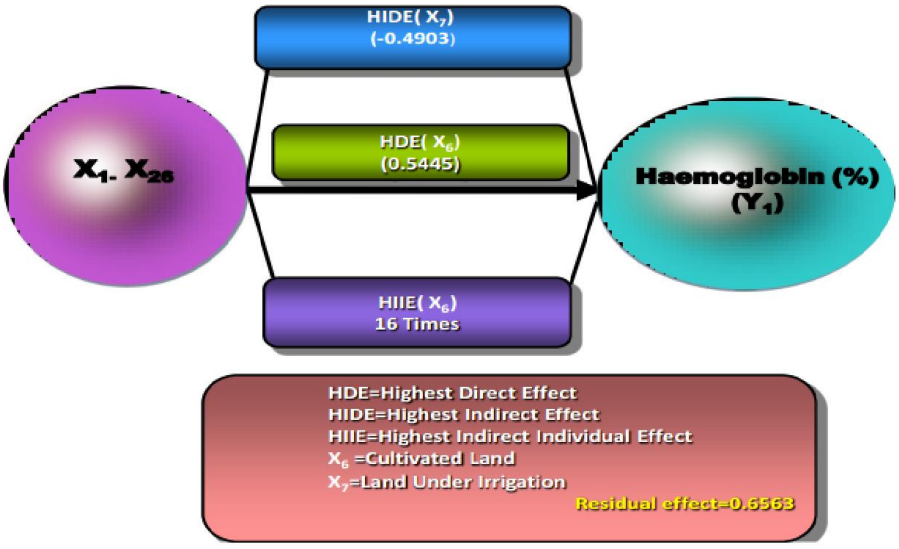
Model I- Correlation coefficient of Haemoglobin(%) (Y_1) with 26 independent variables

Revelation

Chronologically age (X_1) has got an implication on haemoglobin status, only when the other possible factors are

Table 2. Path analysis of Haemoglobin(%) (Y_1) versus 26 independent variables of Total 4 villages, Nadia, West Bengal

N=211						
Variables	TE	TDE	TIE	Substantial Indirect Effect		
				I	II	III
Age(X_1)	0.2087	0.0334	0.1753	0.1203(X_6)	-0.0907(X_7)	0.0888(X_9)
Education(X_2)	0.1579	-0.0709	0.2288	0.1984(X_{18})	-0.1098(X_4)	0.0109(X_{13})
Family statement(X_3)	0.0759	-0.0214	0.0973	-0.0531(X_{14})	0.0521(X_9)	0.0261(X_{18})
Family education(X_4)	0.2557	0.2088	0.0469	0.2355(X_{18})	0.1664(X_6)	-0.1305(X_7)
Homestead land(X_5)	-0.1474	0.0863	-0.2337	-0.2516(X_6)	0.1613(X_7)	-0.0718(X_8)
Cultivated land(X_6)	-0.1463	-0.5445	0.3982	0.3505(X_7)	-0.1726(X_8)	0.1618(X_9)
Land under irrigation(X_7)	-0.1370	0.3533	-0.4903	-0.5407(X_6)	-0.1739(X_8)	0.1631(X_9)
Cropping intensity(X_8)	-0.1852	-0.3739	0.1887	0.2849(X_9)	-0.2514(X_6)	0.1643(X_7)
Irrigation index(X_9)	-0.1518	0.3036	-0.4554	-0.3509(X_8)	-0.2901(X_6)	0.1898(X_7)
Expenditure index (Education& Others) (X_{10})	0.2981	-0.1711	0.4692	-0.1354(X_6)	0.0908(X_{11})	0.0884(X_7)
Expenditure index (Food & Health)(X_{11})	-0.3830	-0.2347	-0.1483	-0.0922(X_6)	-0.0767(X_{14})	-0.0625(X_8)
Owner agricultural implements(X_{12})	-0.1752	-0.0632	-0.112	-0.1664(X_8)	0.1177(X_9)	0.0803(X_{12})
Technology socialization status(X_{13})	0.0593	0.1275	-0.0682	-0.2544(X_6)	-0.2236(X_8)	0.1872(X_9)
Animal entrepreneurial index(X_{14})	-0.3772	-0.2422	-0.135	-0.0743(X_{11})	-0.0637(X_8)	-0.0636(X_7)
Animal production consumption index(X_{15})	0.0709	0.1275	-0.0566	0.0759(X_8)	-0.0676(X_9)	0.0562(X_6)
Animal production sale index(X_{16})	-0.1859	-0.0023	-0.1836	-0.1661(X_{14})	0.0553(X_{15})	-0.0349(X_{11})
Crop diversification index(X_{17})	-0.1253	0.0074	-0.1327	-0.2879(X_8)	-0.2804(X_6)	0.1673(X_7)
Media-social interaction index(X_{18})	0.1426	-0.0221	0.1647	0.1232(X_4)	-0.0968(X_6)	0.0605(X_7)
Market interaction(X_{19})	0.0004	0.0323	-0.0319	-0.0749(X_6)	-0.0611(X_8)	0.0592(X_9)
Enterpreneral interaction(X_{20})	0.0835	0.0495	0.034	-0.0892(X_8)	0.0463(X_7)	0.0395(X_4)
Capacity building index(X_{21})	0.0829	0.0182	0.0647	0.0674(X_4)	-0.0361(X_{11})	0.0352(X_{10})
Credit rotation index(X_{22})	0.0123	0.0763	-0.064	-0.1717(X_8)	0.1456(X_9)	-0.1398(X_6)
Distance of road(X_{23})	-0.1169	0.0561	-0.173	-0.0733(X_6)	-0.0727(X_4)	-0.0705(X_{18})
Status of sanitation index(X_{24})	-0.0797	-0.0032	-0.0765	-0.0646(X_6)	-0.0529(X_8)	0.0416(X_9)
Distance matrix(X_{25})	0.0567	0.0811	-0.0244	-0.0381(X_{11})	0.0321(X_4)	0.0310(X_{14})
Health index(X_{26})	-0.0504	0.1088	-0.1592	-0.0430(X_{11})	-0.0234(X_{10})	-0.0217(X_4)
Residual Effect				0.6563		
Highest Count				Cultivated land(X_6):16		



Model- II Path analysis of Haemoglobin(%) (Y1) versus 26 independent variables of Total 4 villages, Nadia, West Bengal

being considered. Education (X_2) provides the basic input of scientific concept on nutritional practices, hygiene, and behavior and calorie intake properties by an individual. Family education (X_4) has got a decisive impact on the haemoglobin status of family member. Both homestead land (X_5) and cultivated land (X_6) have got a negative impact on haemoglobin content of the respondents. Cropping intensity (X_8) and Irrigation index (X_9) also has got a negative impact bearing on haemoglobin content of the respondents. This indicates that the respondents having higher haemoglobin level have got a lower cropping intensity and lower irrigation index. Expenditure index has source of interesting relationship. Expenditure index (Education & Others) (X_{10}) has got impact as well as relationship needs to be decomposed through path analysis. It is, of course, the variety media-social interaction index(X_{18}) have got a positive impact on haemoglobin content

Results

Table no. 2 presents the path analysis of consequent variable, Haemoglobin (%) (Y_1) versus 26 exogenous variables of pooled village by decomposing the total effect 'r' into direct, indirect effect and residual effect. The table revealed that the exogenous variable, Cultivated land (X_6) has exerted highest total direct effect and the other exogenous variable Land under irrigation (X_7) has exerted highest total indirect effect on the consequent variable, Haemoglobin (%) (Y_1). The table also reveales that the exogenous variable, Cultivated land (X_6) also has routed the highest individual dominating effect as many as 16 times to define the tremendous impact on other exogenous variable to ultimately characterizing the performance of consequent variable, Haemoglobin (%) (Y_1). The residual effect being 0.6563, it is to infer that even with the combination of 26 exogenous variables 35 percent of variance embedded in the consequent variable, Haemoglobin (%) (Y1) has been explained so far.

Revelation

Land only implies here not only resources endowment but also its resource support to retain health status by contributing high haemoglobin content. The respondents of higher holding size are also retaining high haemoglobin level. This is the social-ecology of haemoglobin level as suggested by the empirical study.

Conclusion

The paper studies the sociology of nutrition in the context of sociology nutrition of farm women in the context of transforming rural economy and agriculture. The empirical evidences show that the farm ecological components, cultivated land, irrigation status, are making pathways into the complex interaction of rural health eco-system. The farm women supported by better land resources, irrigated agro-eco system and income have bestowed higher haemoglobin content viz. better health status. There is constant osmosis between social ecology and bio-physical transformations wherein nutrition and health play the pivotal in brining resilience in the entire ecosystem. The same study can be cloned in the similar social ecology, might be different gender and age category to justify its reliability and applicability and also to conclude in the most realistic manner.

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