Chapter 5

Epilogue

The present investigation had been conducted at four villages namely Bhogpur, Bordabar, Dariala and Chitra of the Purba Medinipur district in West Bengal. For selection of state and district purposive sampling techniques was adopted due to unique nature of the locations in terms of subject area of study and in case of selection of block, villages and farmers or respondents simple random sampling technique was taken up. A pilot study was conducted to understand the area, its people, institution, communication, education and attitude of people towards the impact of thermal power on the social ecology of study area.

The 13 independent variables and 7 dependent variables were selected and measured with the help of exact scales developed by previous social science researcher or by modifying the developed scale by structured schedule for requirement of the investigation.

The data was collected, tabulated and necessary statistical test have been administered to find out the logical as well as well as mathematical conclusion over the objective set forth. The summaries of finding are appended below:

SOCIO-ECONOMIC PROFILE OF SELECTETED RESPONDENT

It is evident from the study that majority percentage of the respondents are middle aged (35-50) followed by old aged and young aged. In selected area the 61% respondents are engaged in cultivation. Other important occupations are business, service, etc.

GENRAL DISTRIBUTION OF VARIABLES (INDEPENDENT VARIABLES IN TERMS OF MEAN, STANDARD DEVIATION AND COEFFICIENT OF VARIATION FOR ALL RESPONDENTS

It has been found from the study that the mean Age group(X1) is 50.97 years with standard deviation 8.26 for the total distribution taken for the study. Coefficient of variation of Age (X1) is 16.23% which shows a very high level of consistency in its distribution.

For the independent variable Education (X2) of farmer, it has been found from the study that the mean is 2.23 with standard deviation 1.46, for the total distribution taken for the study. Coefficient of variation of Education (X2) is 65.44% which shows a high level of consistency in its distribution.

The independent variable family size (X3) of the respondents, has been found from the study that the mean 6.45 with standard deviation 1.85, for the total distribution taken for the study. Co efficient of variation of Family size (X3) is 28.62 which shows a high level of consistency in its distribution.

The independent variable occupation(X4) of respondent has been found from the study that the mean is 0.60 with standard deviation 0.33, for the total distribution taken for the study. Coefficient of variation of size

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of holding (X4) is 55% which shows a high level of consistency in its distribution.

The independent variable homestead land (X5) of farmer, has been found from the study that the mean 48.65 katha with standard deviation 19.19, for the total distribution taken for the study. Coefficient of variation of homestead land(X5) is 39.44 which shows a moderate level of consistency in its distribution.

The independent variable land under cultivation (X6), it has been found from the study that the mean is 45.02 with standard deviation 18.56, for the total distribution taken for the study. Coefficient of variation of Land under cultivation (X6) is 41.22% which shows a high level of consistency in its distribution.

The independent variable Land under Irrigation (X7), it has been found from the study that the mean 6.46 with standard deviation, 2.78 for the total distribution taken for the study. Coefficient of variation of Family off farm income (X7) is 43% which shows a high level of consistency in its distribution.

The independent variable Land under Rain fed (X8) of farm land, has been found from the study that the mean is 0.52 with standard deviation 0.29, for the total distribution taken for the study. Coefficient of variation of cropping intensity (X8) is 55.76% which shows a high level of consistency in its distribution.

The independent variable cropping intensity (X9) of farm land, has been found from the study that the mean 2.28 with standard deviation,

0.20 for the total distribution taken for the study. Coefficient of variation of crop mix (X9) is 8.77 which shows high level of inconsistency in its distribution.

The independent variable cost of production (X10) of farmer, has been found from the study that the mean 13248.33 rupees with standard deviation, 732.65 for the total distribution taken for the study. Coefficient of variation of cost of production 5.5 (X10) is which shows a high level of consistency in its distribution.

The independent variable income from field crops(X11), It has been found from the study that the mean 3563.33with standard deviation, 352.70 for the total distribution taken for the study. Coefficient of variation of income from field crops(X11) is 9.8% which shows a lower level of consistency in its distribution.

The independent variable income from cash crops (X12), it has been found from the study that the mean is 24658.33 with standard deviation 1660.84, for the total distribution taken for the study. Coefficient of income from field crops (X12) is 6.7% which shows a high level of consistency in its distribution.

The independent income from live stocks (X13) of farmer, has been found from the study that the mean is 8270.00 with standard deviation 2187.66, for the total distribution taken for the study. Coefficient of variation of income from field crops (X13) is 26.405 which shows a moderate level of consistency in its distribution.

Correlation coefficient

Correlation coefficient between Dependent and independent variables of the respondents

It has been found that following variables viz. Land under cultivation(X_6) and Income from live stocks (X_{13}) have recorded significant correlation (1% level of significance) with the dependent variable that is impact on Human Health (Y_1).

It has been found that following variables viz. Land under Rain Fed (X_8) and has recorded significant correlation (1% level of significance) with the dependent variable Income from Cultivated Crops (Y_2)

It has been found that following variables viz. Land under Rain Fed (X_8) and has recorded significant correlation (1% level of significance) with the dependent variable Impact on Livestock (Y_3).

It has been found that following variable viz. Income from Field Crops (X_{11}) has recorded significant correlation (1% level of significance) with the dependent variable Impact on Fishes (Y_4).

It has been found that following variables viz. Education (X_2) and Occupation (X_4) have recorded significant correlation (1% level of significance) with the dependent variable Impact on Commercial Crops (Y_5).

It has been found that following variable viz. Cropping intensity (X_9) has recorded significant correlation with the dependent variable Intensity of Human Health Hazards (Y_6).

It has been found that following variables viz. Land under rain fed (X_8) and Income from Livestock (X_{13}) have recorded significant correlation with the dependent variable Intensity of Crop Hazards (X_7).

Multiple Regression Analysis

It has been found that the variables Land under irrigation(X_7), Cost of production(X_{10}), Income from cash crops(X_{12}) have contributed substantially to the variance embedded with the consequent variable Impact on Human Health (Y1).

The R^2 value being 0.375, it is to infer that 37.50 per cent of variance in the consequent variable has been explained by the combination of these 13 causal variables.

Multiple Regression Analysis retain the most important and critical causal variables that are Land under irrigation(X_7),Cost of production(X_{10}) ,Income from cash crops(X_{12}) have been retained at the last step.

The R^2 value being 0.268, it is to infer that 26.80% of variants in the consequent variable have been explained by the combination of these 3 causal variables.

It has been found that the variable Land under rain fed(X_8) has contributed substantially to the variance embedded with the consequent variable Impact on Human Health (Y2).

The R^2 value being 0.251, it is to infer that 25.10 per cent of variance in the consequent variable has been explained by the combination of these 13 causal variables.

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Multiple Regression Analysis retain the most important and critical causal variables that is Land under rain fed(X_8) has been retained at the last step.

The R^2 value being 0.34, it is to infer that 34.70% of variants in the consequent variable has been explained by the combination of 1 causal variable.

It has been found that the variable Land under rain fed (X_8) has contributed substantially to the variance embedded with the consequent variable Impact on Livestock (Y3).

The R^2 value being 0.288, it is to infer that 28.80 per cent of variance in the consequent variable has been explained by the combination of these 13 causal variables.

Multiple Regression Analysis, retain the most important and critical causal variables that is Land under rain fed(X_8) has been retained at the last step.

The R^2 value being 0.115, it is to infer that 11.50 % of variants in the consequent variable have been explained by the combination of 1 causal variable.

It has been found that the variables Homestead Land(X5) Land under cultivation(X_6), Income from cash crops(X_{12}) have contributed substantially to the variance embedded with the consequent variable Impact on Fishes (Y4).

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The R^2 value being 0.128, it is to infer that 12.80 per cent of variance in the consequent variable has been explained by the combination of these 13 causal variables.

Multiple Regression Analysis, retain the most important and critical causal variables that are Homestead Land(X5) Land under cultivation(X_6),Income from cash crops(X_{12}) have been retained at the last step.

The R^2 value being 0.068, it is to infer that 6.80 % of variants in the consequent variable has been explained by the combination of 3 causal variable.

It has been found that the variables Occupation(X_4), Income from Livestock(X_{13}) have contributed substantially to the variance embedded with the consequent variable Impact on Commercial Crops (Y5).

The R^2 value being 0.289, it is to infer that 28.90 per cent of variance in the consequent variable has been explained by the combination of these 13causal variables.

Multiple Regression Analysis, retain the most important and critical causal variables that are Occupation(X_4), Income from Live stocks(X_{13}) have been retained at the last step.

The R^2 value being 0.175, it is to infer that 17.50% of variants in the consequent variable have been explained by the combination of 2 causal variables.

It has been found that the variable Cropping intensity(X_9) has contributed substantially to the variance embedded with the consequent variable Intensity of Human Health Hazards (Y6).

The R^2 value being 0.221, it is to infer that 22.10 per cent of variance in the consequent variable has been explained by the combination of these 13 causal variables.

Multiple Regression Analysis, retain the most important and critical causal variable that is Cropping Intensity has been retained at the last step.

The R^2 value being 0.068, it is to infer that 6.80 % of variants in the consequent variable have been explained by the combination of 1 causal variable.

It has been found that the variable Income from live stocks (X_9) has contributed substantially to the variance embedded with the consequent variable Impact on Crop Hazards (Y7).

The R^2 value being 0.326, it is to infer that 32.60 per cent of variance in the consequent variable has been explained by the combination of these 13 causal variables.

Multiple Regression Analysis, retain the most important and critical causal variable that is Income from livestock has been retained at the last step.

The R^2 value being 0.065, it is to infer that 6.50 % of variants in the consequent variable have been explained by the combination of 1 causal variable.

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Factor Analysis

Factor1 is consists of 3 variables viz. Homestead Land(X_5), Land under cultivation (X_6), Land under irrigation (X_7). These variables contribute about 14.773 per cent of variance, and the factor renamed as Resource back-up.

Factor2 consists of 2 variables education(X2), occupation(X4). These variables contribute about 11.99% per cent of variance and is renamed as Capacity.

Factor3 consists of 4 variables Impact on commercial crops (Y6),impact on Human Health(Y1) Income from cash crops(X_{12}), Income from live stocks(X_{13}), contributes about 10.63% per cent of variance and is renamed as performance.

Factor 4 consists of 3 variables viz. Impact on cultivation crops(Y_2), Land under rain fed(X_8), Impact on livestock(Y_3).These 3 variables contribute 9.514 per cent variance and is renamed as Agro-ecology.

Factor 5 consists of 2 variables viz. Education(X2) and Age(X1). These 2 variables contribute 8.68 per cent of variance and is renamed as acquisition factor.

Factor 6 consists of 3 variables viz. Intensity of Human Health Hazards (Y_6), Impact on Fishes (Y_4), Cropping intensity (X_9). These 3 variables contribute 8.01 per cent of variance and are renamed as Health ecology.

Factor 7 consists of 2 variables viz. Cost of production(X_{10}), Income from field crops(X_{11}). These 2 variables contribute 6.93 per cent of variance and is renamed as Agro ecology.

Path Analysis

It has been found that the variable Income from Commercial Crops (X_{12}) has contributed highest Total Effect, Size of Homestead Land(X_5) shows highest Direct Effect and also the size of homestead land shows the highest total indirect effect on the Human Health.

The residual effect 62.50 per cent (Even with the combination of 13 exogenous variables 62.50 per cent of variables in Y1 (Impact on Human Health) can't be explained.

It has been found that the variable Income from Livestock (X_{13}) has contributed highest Total Effect, Size of Land under Rain fed (X_8) shows highest Direct Effect and Education (X_2) shows the highest total indirect effect on Cultivated Crops.

The residual effect 74.9 per cent [Even with the combination of 13 exogenous variables 74.9 percent of variables in Y2 (Impact on Cultivated Crops) can't be explained].

It has been found that the variable Land under rain fed (X_8) has contributed highest Total Effect, No. of Family Members (X_3) shows highest Direct Effect and Land under Irrigation (X_7) shows the highest total indirect effect on livestock.

The residual effect 71.2 per cent [Even with the combination of 13 exogenous variables 71.2 percent of variables in Y3 (Impact on Livestock) can't be explained.

It has been found that the variable Income from Field crops(X_{11}) has contributed highest Total Effect, Size of homestead Land (X_5) shows

highest Direct Effect and also size of Homestead Land (X_5) shows the highest total indirect effect on Fishes.

The residual effect 87.2 per cent [Even with the combination of 13 exogenous variables 87.2 percent of variables in Y4 (Impact on Fishes) can't be explained.

It has been found that the variable Land under rain fed (X_8) has contributed highest Total Effect, No. of Family Members (X_3) shows highest Direct Effect and Land under Irrigation (X_7) shows the highest total indirect effect on commercial crops.

The residual effect 70.2 per cent [Even with the combination of 13 exogenous variables 70.2 percent of variables in Y5 (Impact on Commercial Crops) can't be explained].

It has been found that the variable Cropping intensity (X_9) has contributed highest Total Effect, Size of Homestead Land (X_5) shows highest Direct Effect and Land under rain fed (X_8) shows the highest total indirect effect on commercial crops.

The residual effect 77.9 per cent [Even with the combination of 13 exogenous variables 77.9 percent of variables in Y6 (Intensity of human Health hazards) can't be explained].

It has been found that the variable income from Livestock (X_{13}) has contributed highest Total Effect, Size of Land under cultivation (X_6) shows highest Direct Effect and also Land under Cultivation (X_5) shows the highest total indirect effect on Intensity of Crop Hazards

The residual effect 67.4 per cent [Even with the combination of 13 exogenous variables 67.4 percent of variables in Y7 (Intensity of crop hazards) can't be explained].

Conclusion

The study which is conducted on Rapid Environmental Impact Assessment of Thermal Power on the socio-ecology of Kolaghat has under gone a rigorous exercises in the form of data collection, from different farmers group, gone through the literature available on the related areas and topic, critically examined and analyzed with sophisticated statistical tools, come out with the following conclusions

- The fly ash and toxic chemicals comes out from thermal power have both chronic and acute hazards on the ecology of the study area.
- Human Health, Livestock Health, Commercial Crops cultivation are devastatingly effected day by day. So the new generations are migrated to risky jobs.
- Traditional lotus and water chest-nut cultivation is totally disrupted and ecological balance is disturbed.
- Proper management of emitted toxic matters are should be needed from all level.
- Alternative uses of wastage materials are very less amount, we should look for more alternative uses of waste materials emitted from the Power plant.

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Future scope of study

The scope of the study includes detailed characterization of the status of environment in an area of 10 km radius around Kolaghat thermal Power Plant for identifying environmental components, viz. air, noise, water, land, biological and socio-economic impact local people.

Under the scope of REIA, it is envisaged

- To assess the present status of air, noise, water, land, biological and socio-economic components of environment.
- To identify and quantify significant impacts of various operations on environmental components.
- To evaluate existing and proposed pollution control measures.
- To prepare Environmental Management Plan (EMP) outlining additional control technologies to be adopted for mitigation of adverse impacts.
- To evaluate existing Environmental Quality Monitoring Programmes and suggest strengthening of existing monitoring Programmes keeping in view pollution potential of the proposed project.

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