CHAPTER V

SUMMARY AND CONCLUSIONS

1. Summary

The phenomenon of 'Energy Crisis' has become a burning issue of contemporary life. With increased consumption resulting in scarcity and price hikes, the family has come to experience much economic and emotional stress. Under such stressful conditions, the family's managerial behaviour for coping with the situation becomes significant.

Coping mechanism requires insight into the resulting problems and challenges. It further depends on the resourcefulness in discovering ways to cope with the changing circumstances. The two most common ways of responding to change are : (1) adjusting temporarily to external forces and (2) by reorganizing the family system to cope with an unexpected change in the environment (Deacon and Firebaugh, 1975).

Families need to become conscious of their energy consumption, as in the foreseeable future, it will consume a large share of the family income. In view of this, energy

conservation becomes imperative. This may require changes in attitudes, lifestyles, values and resource use patterns of families. Thus, the present energy crisis calls upon families to demonstrate their ability of adaptability. In fact most people conserve energy because they want to save money or are unable to pay high energy prices (Morrison and Gladhart, 1976; Gandotra, 1983; George and Ogale, 1983). Since empirical research is limited to few aspects , the present research was planned to study the family managerial behaviour in energy crisis situation.

This study was designed to gain insight into the managerial behaviour of families during the various energy crisis situations. To determine the managerial behaviour, respondents' perception about the energy crisis, stress felt and the coping measures adopted by them under energy crisis were ascertained. The family managerial behaviour is reflected in the managerial decisions taken and the ability exhibited by the family to act in a changed situation. The decision implementation is done by adopting the various coping measures. It provides different alternatives to reduce stress caused by energy scarcity and price rise.

1a. Objectives of the Study

The specific objectives of the study were :

1. To determine the demographic characteristics and the energy-related values of the families.

2. To assess the fuel/energy consumption pattern of families, specifically of cooking fuels, electricity and petrol.
3. To study the factors influencing the perception level of homemakers in relation to energy crisis situation.
4. To determine the variables influencing the kinds and extent of stress felt by families under energy crisis.
5. To identify the coping measures adopted by families to meet the energy crisis situations.

1b. Methodology

The study was conducted in the semi-urban area of Jagadhri town in Ambala district, Haryana.

Sample : The sample of the study comprised of 260 households representing three different socio-economic classes. Kuppuswamy's SES Scale (1981) was used to classify the sample into three SES groups. The sample constituted 50 families from low SES group, 120 families from middle SES group and 90 families belonged to the high SES group.

Tool Construction : An interview schedule was constructed for the study. The tool comprised of five sections. Section I gave information about the demographic characteristics of the respondents. Section II dealt with the sources of energy and quantity of different energy forms used by families,

purposes for which they were utilized and expenditure incurred on them per month. In addition, information about the household equipment and vehicles possessed alongwith their frequency of use, size of the house, food habits, knowledge about new technologies and the crisis situations faced were obtained. ~~The~~ Section III consisted of a four point scale to measure the perception level of homemakers regarding energy crisis situation. Section IV comprised of a five point scale to measure the degree of stress felt by homemakers due to energy crisis. The last section dealt with the coping measures adopted by families in different energy crisis situations. The instruments were validated prior to its use for the pilot study by seeking expert opinion of a panel of judges. After the pilot study, item analysis for perception scale was done. The perception scale thus consisted of twenty-two items. The stress scale comprised of twenty-five items. Reliability of the perception and stress scales were established which were 0.87 and 0.86, respectively.

Method of Data Collection : Data were gathered personally from homemakers on the interview schedule from January 1985 to March 1985.

Analysis of Data : Both descriptive (frequency , percentage and mean) and relational statistics (Chi-square, Coefficient of Contingency, Pearson's r, Multiple Correlation, analysis of variance and t - test) were used for analysing the data.

1c. Major Findings of the Study

Highlights of the findings of this investigation are reported below.

I Sample Characteristics :

(1) The mean age of homemakers was 33.75. Three-fourths of the homemakers had school level education and 10.77 percent were illiterate. Majority of homemakers (86.15 percent) were housewives and only a minority (5.77 percent) were gainfully employed outside the home. The mean family size was 6.30 and 64.62 percent were nuclear families. Occupation of the head of the household was business in 55.39 percent families and 43.46 percent were employed. About one-third of families had monthly family income below Rs. 750 and only 26.54 percent families had income above Rs. 2000/-.

The general value pattern of the total sample as determined in this study was the same as for the low and middle SES groups. Value for health was ranked first, education second, economy third, comfort fourth position and status was ranked fifth. The high SES group varied in this ranking slightly, ranking 'status' fourth and 'comfort' fifth.

II Consumption Pattern of Energy :

(2) Almost all families (97.31 percent) used electricity. LPG was mainly used for cooking by 58.46 percent households. Firewood was used by 68.46 percent families for both cooking and heating water. Kerosene was used by 93.46 percent families either as the main fuel, or supplementary fuel, or as a stand-by fuel. Coal was used by 47.69

percent households and cowdung cakes by 32.69 percent families for both cooking and heating water. Petrol was used by only 26.54 percent families for transportation purpose. The use of non-commercial fuels was more in low and middle SES families than in the high SES households.

(3) LPG, kerosene and coal were used in more quantity by the middle SES families, whereas firewood and cowdung cakes were used in more quantity by the low SES households.

(4) The average expenditure incurred per month on energy forms used was Rs.164.12. The maximum amount was spent by the high SES households (Rs.254.19), followed by the middle group (Rs.111.76) and then the low SES families (Rs. 79.64).

(5) The low SES households did not possess any fuel energy-driven vehicle whereas 58.89 percent high SES and 13.33 percent middle SES families possessed them.

(6) Only 26 percent families in the low SES group possessed electricity operated equipment, mainly iron. Hence, their expenditure on electricity was low (mean = Rs.12.78 per month) whereas the high SES families spent Rs.58.21 and the middle SES households Rs. 33.26 as they used more of electrical equipment.

(7) Most of the households used LPG stoves with one big and one small burner. 'Angithi' was used by almost three-fourths of families. Solar cooker and smokeless 'Chulah' were not prevalent in the area surveyed.

(8) Pressure cooker was used by 79.23 percent homemakers, which included only 30 percent of low SES families.

(9) About 88 percent homemakers reported that they get sufficient quantity of fuel to meet their energy needs. While the rest complained of not getting adequate quantity of kerosene.

(10) During scarcity, some kinds of problems were faced in procuring the fuels used, one of them being that kerosene was not available to many even after standing in a queue for long hours.

(11) In all the three SES groups,62 to 82 percent respondents had faced crisis at sometime or the other during the past five yea_rs but 22 to 66 percent were facing energy crisis during the period when the survey was conducted. During the survey period, low and middle SES group families were experiencing energy crisis more than the high SES group families. At different periods, electricity shortage was most felt by majority, followed by kerosene, LPG and then wood and coal. Large number felt that kerosene prices had increased a great deal during the past five years, second in line was wood price, then coal followed by LPG and lastly electricity.

(12) Only 58.85 percent homemakers of which majority were from the high SES group were aware about solar cooker being utilized for cooking purpose,whereas 84.23 percent of homemakers were aware about biogas energy though not possessing sufficient knowledge about it. However, 78.08 and 71.92 percent were willing to use solar and biogas energy, respectively.

(13) Seventy percent homemakers knew about 'Nutan' stove; 27.69 percent were aware about smokeless 'chulah' and only 8.85 percent possessed an idea about the double purpose 'chulah and angithi'. None of them knew about the 'Priagni' wood stove. Majority of respondents

(84.62 percent) expressed their willingness to use these high efficiency stoves depending on the circumstances.

(14) Methods such as, adoption of solar and biogas technology, use of improved and efficient stoves and electrical equipment, giving incentives to encourage conservation and educating the public about the energy situation were considered appropriate alternatives for controlling the energy crisis situation by 82.69 to 98.08 percent homemakers. Three-fourths of the respondents suggested rationing of energy resources. Raising the price of energy forms was considered unsuitable by 96.15 percent respondents.

III Perception of the Energy Crisis Situation :

(15) The mean perception score of the sample was 38.44. Average level of perception was possessed by 72.31 percent homemakers and almost equal percent (13.08 and 14.61 percent) possessed good and poor perception about the energy crisis. Majority of homemakers were not aware about the energy situation and problems of the country, the causes due to which the crisis situation has developed and the actions government is taking to solve the energy problems.

(16) Perception of the energy crisis was influenced by the education level of homemakers (X^2 = 26.797, Sig. 0.01) but no effect of their age was observed. The degree of association between perception and education level of homemakers was found to be very high (87 percent). A positive relationship was observed

between perception of homemakers and their age ($r = 0.12$, Sig. 0.05), Since the 'r' value was on the boarder line of significance level its effect was considered negligible.

(17) Perception of energy crisis influenced the number of coping measures adopted during fuel scarcity and price rise ($X^2 = 23.597$ and 24.286, Sig. 0.001, respectively) and during power cut and its price rise. ($X^2 = 19.796$ and 39.71, Sig. 0.001, respectively).

(18) The low SES homemakers differed significantly from high SES ($t = -7.595$, Sig. 0.001) and from middle SES group homemakers ($t = -3.8$, Sig. 0.001). The middle SES homemakers differed significantly from homemakers belonging to the high SES group ($t = 4.547$, Sig.0.001).

IV. Stress Felt due to the Energy Crisis :

(19) The mean stress score was 54.03 for the sample. Moderate degree of stress was felt by 69.62 percent respondents, whereas almost equal percentages (16.15 and 14.23 percent) experienced high and low stress, respectively.

(20) More than fifty percent homemakers (50.38 to 58.85 percent) felt different types of stress. More respondents felt stress due to household work (58.85 percent) and obstructions in comfortable living (57.31 percent), followed by stress due to inability to meet family demands (52.31 percent) and then economic stress (50.38 percent). Most of the homemakers who experienced the different types of stress belonged to the income range Rs. 750 to Rs. 1999.

(21) The degree of stress felt was found to be associated with the family income (X^2 = 10.379, Sig. 0.05) but not influenced by the family size and age of homemakers. The degree of association was found to be very high (87 percent). Though a positive correlation was observed between stress felt and age of homemakers (r = 0.117, Sig. 0.05) the effect was considered negligible as the value is just at the minimum level of significance. A significant positive correlation existed between perception of homemakers regarding energy crisis and stress felt (r = 0.384, Sig. 0.01).

(22) The high SES group differed significantly from the low SES group (t = -2.671, Sig. 0.01) in the degree of stress felt, while no differences were found between other groups. The low SES homemakers differed from the high SES homemakers on economic stress (t = 3.569, Sig. 0.001), household work stress (t = -3.183, Sig.0.01) and stress due to inability to meet family demands (t = -7.758, Sig. 0.001). The low SES differed from the middle SES homemakers only on stress due to inability to meet family demands (t = -3.693, Sig. 0.001). The middle SES homemakers differed significantly from the high SES respondents on economic stress (t = 2.836, Sig. 0.01), household work stress (t =-2.008, Sig. 0.05) and stress due to inability to meet family demands (t = -3.68), Sig. 0.001).

V. Coping Behaviour of Families During Energy Crisis Situations :

(i) Cooking Fuel Scarcity and Price Rise :

(23) During both scarcity and price rise of fuels, larger number of respondents (about 61 percent) adopted conservation measures as compared to those adopting substitution/supplementary and adjustment measures.

(24) More than fifty percent (56.54 percent) homemakers used more number of coping measures during scarcity of fuels and less number of measures during price rise.

(25) During scarcity of cooking fuels, the number of coping measures adopted was found to be associated with the variables of SES (X^2 = 21.178, Sig. 0.001); family income (X^2 = 13.549, Sig. 0.01); perception of homemakers regarding energy crisis (X^2 = 23.597, Sig. 0.001); stress felt due to energy crisis (X^2 = 19.392, Sig.0.001); and education level of homemakers (X^2 = 11.266,Sig.0.01). The degree of association with the variables of SES, perception of homemakers and stress felt was between 77 to 83 percent.

(26) During price rise of cooking fuels, a significant association existed between the number of coping measures adopted and variables of SES (X^2 = 6.036, Sig. 0.05) perception of homemakers regarding energy crisis (X^2 = 24.284, Sig. 0.001); and stress felt due to energy crisis (X^2 = 22.389, Sig. 0.001). The degree of association was low with SES variable (35 percent) and high with perception of homemakers (83 percent) and stress felt (81 percent).

(27) A significant association existed between the number of conservation measures adopted during fuel scarcity and price rise and value for economy (X^2 = 7.238 and 10.196, Sig. 0.01, respectively). But no association was found between the number of substitution/supplementary and adjustment measures adopted and values of comfort and convenience and social status under both crisis situations.

(28) A positive correlation also existed between the number of coping measures adopted during scarcity and price rise of cooking fuels and the variables of perception of homemakers (r = 0.167 and 0.148, Sig. 0.01, respectively) and stress felt (r = 0.25 and 0.21, Sig. 0.01, respectively).

(29) The low SES homemakers differed significantly from high SES homemakers in the number of coping measures adopted during both scarcity (t = -3.698, Sig. 0.001) and price rise of fuels (t = -2.733, Sig. 0.01). The low SES homemakers differed significantly from the middle SES ~~and~~ homemakers during the situation of price rise only (t = -2.254, Sig. 0.05). The middle SES homemakers differed from the high SES homemakers during the scarcity of fuel only (t = -3.215, Sig. 0.01).

(ii) Petrol Scarcity and Price Rise :

(30) During both situations, 82.61 percent of families using petrol adopted conservation measures, 44.93 percent practised adjustment measures and 59.42 percent adopted substitution/supplementary measures.

(31) Majority of families utilizing petrol (91.30 percent) were adopting more number of coping measures during both scarcity and price rise situations. Forming car pools was adopted 'sometimes' by only one-third households.

(32) There was no association between the number of coping measures adopted during the two crisis situations of petrol and any of the variables studied.

(33) No association was observed between the number of conservation measures adopted during petrol crisis and value for economy. Similarly, no association was

found between the number of substitution/supplementary and adjustment measures adopted and value for comfort and convenience. However, there was a significant association with social status value for the situations of scarcity and price rise of petrol (X^2 = 4.135 and 4.135, Sig. 0.05 respectively). The degree of association between these two variables was 45 percent.

(34) When perception of homemakers and stress felt were correlated individually with number of coping measures adopted during petrol scarcity, no relationship was found. But a combined effect of perception and stress felt was observed (R = 0.367, Sig. 0.01).

(35) No significant difference was observed between the middle SES and high SES group families in the number of coping measures adopted during both crisis situation of petrol.

(iii) Electricity Scarcity and Price Rise :

(36) Majority of homemakers (58.89 percent and 60.47 percent) adopted conservation measures during power cut and price rise of electricity, respectively. During power cut, more percentage of homemakers adopted adjustment (59.29 percent) and substitution/supplementary measures (35.18 percent) than during price rise.

(37) During power cut, majority of families (68.38 percent) adopted more number of coping measures whereas during price rise, 58.50 percent families used less number of measures.

(38) To meet the increased cost of energy forms, families usually cut down expenses on other items and used another cheap fuel alongwith the main fuel.

(39) A significant association existed between the number of coping measures adopted during power cut and SES (X^2 = 9.068, Sig. 0.05); family income (X^2 = 16.111, Sig. 0.001); perception of homemakers regarding energy crisis (X^2 = 19.796, Sig. 0.001); stress felt due to energy crisis (X^2 = 23.1, Sig. 0.001); and age of homemakers (X^2 = 12.162, Sig. 0.01). The degree of association between them were found to be fifty percent. It was high for perception (78 percent) and stress felt (82 percent).

(40) A significant association was observed between the number of coping measures adopted during price rise of electricity and family income (X^2 = 6.299, Sig. 0.05); perception of homemakers (X^2 = 39.71 Sig. 0.001); stress felt (X^2 = 32.057, Sig. 0.001); and age of homemakers (X^2 = 17.686, Sig. 0.001). The degree of association was 93 percent with perception, 90 percent with stress felt and 74 percent with age of homemakers.

(41) No association was found between the number of conservation measures adopted and value for economy during electricity crisis. No association existed between the number of substitution/supplementary and adjustment measures adopted and values for comfort and convenience and social status.

(42) A significant positive relationship existed between the number of coping measures adopted during power cut and perception of homemakers (r = 0.324, Sig. 0.01); and stress felt due to energy crisis (r = 0.262, Sig. 0.01). But during price rise, a positive correlation was found with perception of homemakers only (r = 0.337, Sig. 0.01).

(43) The combined effect of perception of homemakers and stress felt was found to have a positive significant association with the number of coping measures adopted during power cut (R = 0.357, Sig. 0.01); and price rise of electricity (R = 0.341, Sig. 0.01).

(44) A highly significant difference was observed between the low and high SES groups (t = -3.963, Sig. 0.001); middle SES group differed significantly from the low (t = -2.222, Sig. 3.05) and from the high SES group (t = -2.204, Sig. 0.05) in the number of coping measures adopted during power cut. There was no difference between the groups during price rise of electricity.

2. Conclusions

On the basis of the findings of this investigation, the following conclusions are drawn.

(1) The perception level of homemakers regarding energy crisis increases with the increase in the education level of homemakers and the SES.

(2) The average expenditure incurred per month on different energy forms increases with the increase in the SES.

(3) The degree of stress felt increases with the rise in the SES, of which economic stress decreases and emotional stress increases with the increase in the SES.

(4) The families are more affected during energy shortages than during their price increase.

(5) More number of coping measures are adopted during scarcity than during price rise of cooking fuels and electricity. During petrol crisis, more number of coping measures are adopted.

(6) Conservation measures are generally adopted irrespective of any of the energy crisis situation. Substitution/ supplementation and adjustments are generally made during shortage of energy forms than during their price rise.

(7) Homemakers showed concern for conservation of energy only to the extent of reducing expenditure on fuel by different ways without sacrificing their comforts and conveniences associated with energy use.

(8) Families have flexible household standards which help them to adjust to the crisis situation readily.

(9) Perception of homemakers regarding energy crisis and stress felt emerged as important determinants of number of coping measures adopted during energy crisis situation.

(10) The non-commercial fuels are still being used mainly by the low and middle SES families in small towns.

3. Implications of the Study

The results of this study have implications for Government's energy policies and programmes. Results suggest that the focus of policies and programmes should be on education and attitudinal change of people in relation to energy use. Results also suggest that these policies and programmes should focus on incentives designed to bring about behavioural change in energy consumption. Moreover, the findings of this study will help in designing energy-related research studies and action programmes for families by various institutions

working for family welfare. This can be done by promoting energy literacy programmes which will help to educate the homemakers about the energy problems of the country and their contributions in decreasing the intensity of the energy problems. Energy literate homemakers can bring about substantial savings of energy resources. Home Economists can reach out to individuals and families with concrete, action-oriented programmes. Such programmes need to encourage greater use of energy saving practices and also advocate a basic shift in values towards more energy thrifty lifestyles.

4. Recommendations for Future Research

A few suggestions for future research are as below.

(1) An experimental study to ascertain the influence of energy conservation education on attitudes and behaviours of homemakers need to be conducted.

(2) Generally there is a difference in the attitude towards the need for energy conservation and the actual behaviour patterns. Therefore a study needs to be undertaken to determine the level of attitude - behaviour consistency in energy resource use.

(3) As the socio-economic status and lifestyles differ from state to state, interstate comparisons of energy consumption patterns needs to be conducted as a longitudinal study to assess the socio-cultural and structural factors which account for such differences.

(4) An analysis of the social costs and benefits in relation to the consumption of non-commercial fuels needs to be done.

(5) What are the implications of the coping strategies of families adopted during energy crisis on family's well-being needs to be studied.

(6) The impact of alternative technology on family's quality of life needs to be studied.

5. Action Programmes

The following action programmes need to be undertaken by the Government and other welfare organizations.

(1) The Government needs to invest adequate amount of funds for the research and development of renewable energy resources to encourage maximum use of those energy.

(2) Intensive energy literacy programmes for families need to be conducted.

(3) The Government needs to adopt measures to bring about energy savings, such as :

(a) Giving tax deductions for consuming less amount of energy.

(b) Charging lower rates per unit of electricity if consumed within the minimum admissible quantity.

(c) Providing solar cookers and solar water heaters at subsidized rates.

(d) Providing subsidy for setting up biogas plants.

(e) Installing community biogas plants.

(f) Rationing of scarce energy resources.

(g) Popularizing the use of high efficiency stoves.

(4) The people need to reconsider the non-commercial fuels as an alternative source of energy.

(5) The manufacturers need to bring about changes in designs of existing equipment for energy efficiency and device many more fuel energy saving devices.

(6) Improvements in housing technology is needed for saving energy, such as better insulation and ventilation, proper window shades and orientation of the building, so that less energy is required to heat, light and cool houses.

(7) There is a need for stringent licensing policy to encourage the manufacture of automobiles which give high mileage per litre of petrol.

Besides these, to solve the immediate energy crisis problems, better planning and management in energy distribution is needed more than anything else. The national policy and programmes should ensure adequate energy for a better standard of living in the future by protecting the natural energy resources and the environment to the fullest possible extent.