CHAPTER IV

RESULTS AND DISCUSSION

Results of the investigation are described and discussed in this chapter. The findings and relevant discussion are presented under the following sections.

1. Description of the sample
2. Consumption pattern of energy sources
3. Perception of the energy crisis
4. Stress felt due to energy crisis
5. Coping behaviour of families during energy crisis situation.
6. Decisions taken for the future in relation to energy use.
7. Testing the hypotheses
8. Discussion of findings

1. Description of the Sample

The total sample was drawn from Jagadhri, a semi-urban town in Haryana. The respondents were housewives from all income groups, and the data are reported by their socio-economic status (SES) computed by using Kuppuswamy's (1981) scale. The data were analysed for demographic characteristics -

personal and family characteristics, of respondents.

1a. Personal Characteristics of Respondents

Table 2 : Personal Characteristics of Respondents

Personal Characteristics	Socio-Economic Status						Total (N=260)	
	Low (N=50)		Middle (N=120)		High (N=90)			
	f	%	f	%	f	%	f	%
1 Age : (Years)								
1. 30 and below	24	48.00	47	39.17	42	46.67	113	43.46
2. 31 - 40	16	32.00	50	41.67	33	36.66	99	38.08
3. 41 - 50	7	14.00	16	13.33	8	8.89	31	11.92
4. 51 and above	3	6.00	7	5.83	7	7.78	17	6.54
Mean		33.68		34.18		33.22		33.75
S.D.		10.30		10.30		10.12		10.25
2 Education :								
1. Illiterate	14	28.00	14	11.67	0	0.00	28	10.77
2. Primary School	29	58.00	40	33.33	11	12.22	80	30.77
3. Middle School	4	8.00	30	25.00	12	13.33	46	17.69
4. High School	1	2.00	21	17.50	27	30.00	49	18.85
5. Intermediate or Post High School Diploma	1	2.00	10	8.33	9	10.00	20	7.69
6. B.A. or B.Sc. degree	1	2.00	3	2.50	19	21.11	23	8.85
7. Professional degree or Hons., M.A. and above	0	0.00	2	1.67	12	13.34	14	5.38
3 Employment Status								
1. Employed	5	10.00	7	5.83	3	3.33	15	5.77
2. Unemployed	38	76.00	102	85.00	84	93.34	224	86.15
3. Self-employed	7	14.00	11	9.17	3	3.33	21	8.08

The mean age of the total sample was 33.75 years. The mean age of respondents in different SES groups was almost the same. In the low and high SES groups, 48 percent and 46.67 percent homemakers were in the age group of 30 years and below, respectively, whereas in the middle SES, 41.67 percent were in 31 to 40 years age group (Table 2).

Nearly one-third of respondents (30.77 percent) were educated upto primary school in the total sample, whereas 10.77 percent respondents were illiterate, belonging to the low and middle SES groups. The education level of most of the respondents in the low and middle SES groups was primary school only but in the high SES group, 30 percent had obtained high school education. None were illiterate in the high SES group and none possessed a postgraduate degree in the low SES group.

The employment status of respondents showed that 86.15 percent were housewives and only a minority (5.77 percent) were gainfully employed outside the home. Most of them were employed as school teachers and in the low SES class, as maid servants. Those self-employed (8.08 percent) were mainly engaged in stitching garments and knitting woollens.

1b. Family Characteristics of Respondents

On the whole about two-thirds were nuclear families (64.62 percent). Low and middle SES groups consisted of more

nuclear families whereas in the high SES, joint families were more in number (Table 3). Majority of the joint families were business families.

The mean size of the family was 6.30 for the total sample. The range was 2 to 20 members. The high SES had the largest family size, mean size being 7.28 followed by 6.30 in the middle SES group and 4.54 in the low SES class. Family size was comparatively large in the high SES group due to more of joint families (56.67 percent) whereas in the low SES group, 96 percent families were nuclear families, hence the small family size. In the middle and high SES groups, 62.50 percent and 57.78 percent respectively, had a family size of 5 to 8 members, whereas the family size was 2 to 4 members for majority (54 percent) in the low SES group.

Most of the respondents (55.39 percent) belonged to families having their own business, whereas only a minority 1.15 percent) were from farm families. Rest of the respondents (43.46 percent) belonged to families employed in various occupations. Among the high SES group, 68.89 percent families were engaged in metal business. In both the low and middle SES groups, almost equal percentage fell in business class or employed families. Farming was the occupation of the head of the family for only 2.5 percent respondents in the middle SES group. Business was quite common in the area

Table 3 : Family Characteristics of Respondents

Family Characteristics	Socio-Economic Status							
	Low (N=50)		Middle (N=120)		High (N=90)		Total (N=260)	
	f	%	f	%	f	%	f	%
1. Family Type :								
1. Joint	2	4.00	39	35.50	51	56.67	92	35.38
2. Nuclear	48	96.00	81	67.50	39	43.33	168	64.62
2. Family Size:(Members)								
1. 2 - 4	27	54.00	27	22.50	14	15.55	68	26.15
2. 5 - 8	22	44.00	75	62.50	52	57.78	149	57.31
3. 9 - 12	1	2.00	15	12.50	16	17.78	32	12.31
4. 13 or more	0	0.00	3	2.50	8	8.89	11	4.23
Mean	4.54		6.30		7.28		6.30	
S.D.	1.79		2.43		3.12		2.76	
3. Occupation of the Head :								
1. Farming	0	0.00	3	2.50	0	0.00	3	1.15
2. Service	27	54.00	58	48.33	28	31.11	113	43.46
3. Business	23	46.00	59	49.17	62	68.89	114	55.39
4. Family Income : (Rupees)								
1. Rs.299 and below	2	4.00	0	0.00	0	0.00	2	0.77
2. Between 300 - 499	35	70.00	5	4.17	0	0.00	40	15.38
3. Between 500 - 749	12	24.00	29	24.17	0	0.00	41	15.77
4. Between 750 - 999	1	2.00	30	25.00	2	2.22	33	12.69
5. Between 1000-1999	0	0.00	48	40.00	27	30.00	75	28.85
6. Between 2000-2999	0	0.00	7	5.83	38	42.22	45	17.31
7. Rs. 3000 and above	0	0.00	1	0.83	23	25.56	24	9.23

surveyed, it being an industrial town of metals.

Family income ranges were made according to Kuppuswamy's SES scale to facilitate in determining the SES groups. Hence, unequal ranges. About 29 percent families had income between Rs. 1000 and Rs. 1,999; 17.31 percent respondents had income between Rs.2000 and Rs. 2,999; and almost equal percentage (about 16 percent) belonged to the income range, Rs. 300 to Rs.499 and Rs. 500 to Rs.749 respectively. Seventy percent families in the low SES group had an income between Rs. 300 and Rs. 499; 40 percent in middle SES had between Rs. 1000 and Rs. 1,999 and 42.22 percent in the high SES had income between Rs. 2000 and Rs. 2,999. Thus it was observed that the income increased with the rise in the SES.

Values are important to give direction to one's behaviour. Values held related to energy use will influence energy consumption

Table 4 : General Value Pattern of Households

Ranks	Socio Economic Status			Total
	Low (N=50)	Middle (N=120)	High (N=90)	(N=260)
First	Health	Health	Health	Health
Second	Education	Education	Education	Education
Third	Economy	Economy	Economy	Economy
Fourth	Comfort	Comfort	Status	Comfort
Fifth	Status	Status	Comfort	Status

and conservation behaviour of families as revealed by data reviewed (Hogan, 1976; Morrison and Gladhart, 1976; Paolucci et al. 1977; Hungerford, 1978). Hence value pattern was determined.

The value hierarchy of the total sample was observed to be the same as for the low and middle SES groups (Table 4). The value pattern of low and middle SES families was identical, health being given the first rank, education second, economy third, comfort fourth position and status was ranked fifth. The value pattern of the high SES was slightly different from the other two groups, the only difference being that status was given fourth rank by majority and comfort the fifth rank. The value profiles of respondent families is presented graphically in Figure 2.

2. Consumption Pattern of Energy Source

The findings pertinent to sources of energy and quantity of different energy forms used by households, purposes for which they were utilized and expenditure incurred on them per month are presented in this section. In addition, the household equipment and vehicles possessed, their frequency of use, size of the house, food habits, knowledge about new technologies and the crisis situations faced are also described.

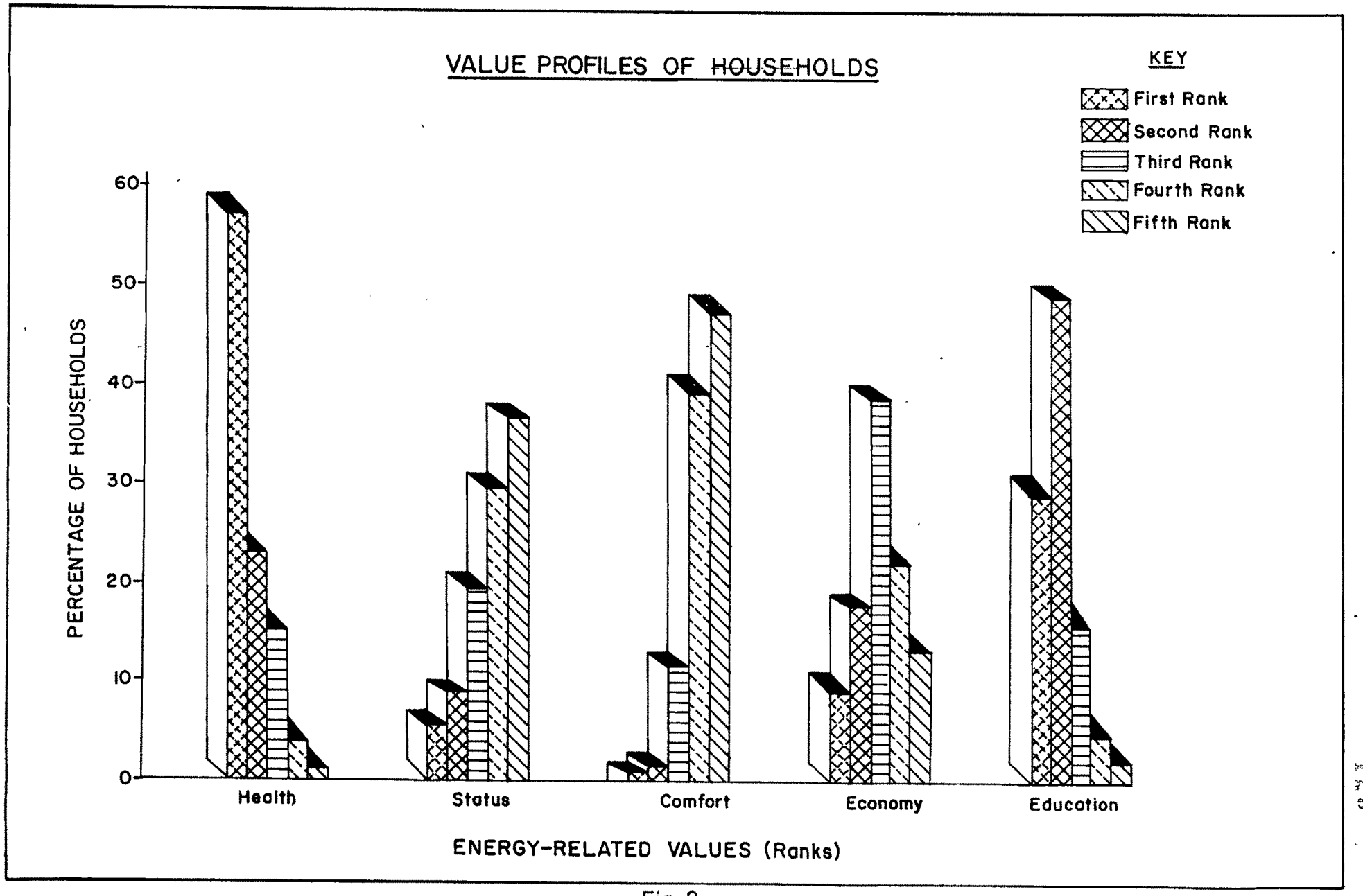
VALUE PROFILES OF HOUSEHOLDS
KEY
First Rank
Second Rank
Third Rank
Fourth Rank
Fifth Rank
PERCENTAGE OF HOUSEHOLDS
60
50
40
30
20
10
0
Health
Status
Comfort
Economy
Education
ENERGY-RELATED VALUES (Ranks)

Fig. 2

2a. Energy Forms Utilised

It is observed that 58.46 percent families were using liquid petroleum gas (LPG), highest percentage (91.11 percent) being in the high SES group (Table 5 and Figure 3).

Table 5 : Different Energy Forms used by Households

Energy Forms	Socio-Economic Status						Total (N=260)	
	Low (N=50)		Middle (N=120)		High (N=90)			
	f	%	f	%	f	%	f	%
1. LPG	4	8.00	66	55.00	82	91.11	152	58.46
2. Kerosene	47	94.00	113	94.47	83	92.22	243	93.46
3. Coal	17	34.00	66	55.00	41	45.56	124	47.69
4. Coke	4	8.00	5	4.17	10	11.11	19	7.31
5. Firewood	45	90.00	87	72.50	46	51.11	178	68.46
6. Cowdung Cakes	24	48.00	45	37.50	16	17.78	85	32.69
7. Agro-wastes	0	0.00	1	0.83	0	0.00	1	0.38
8. Solar Energy	0	0.00	0	0.00	0	0.00	0	0.00
9. Electricity	45	90.00	118	98.33	90	100.0	253	97.31
10. Petrol	0	0.00	16	13.33	53	58.89	69	26.54

Only 8 percent households in the low SES group used LPG. Kerosene was used by 92 to 94 percent households from each of the three SES groups. This is because practically everyone had to keep some type of fuel for emergency even though it was not used as the main fuel. Kerosene was mainly used as a standby fuel by LPG users and as a supplementary fuel by firewood and coal users.

Coal was used by 47.69 percent households in the total sample. More families in the middle SES group used coal than

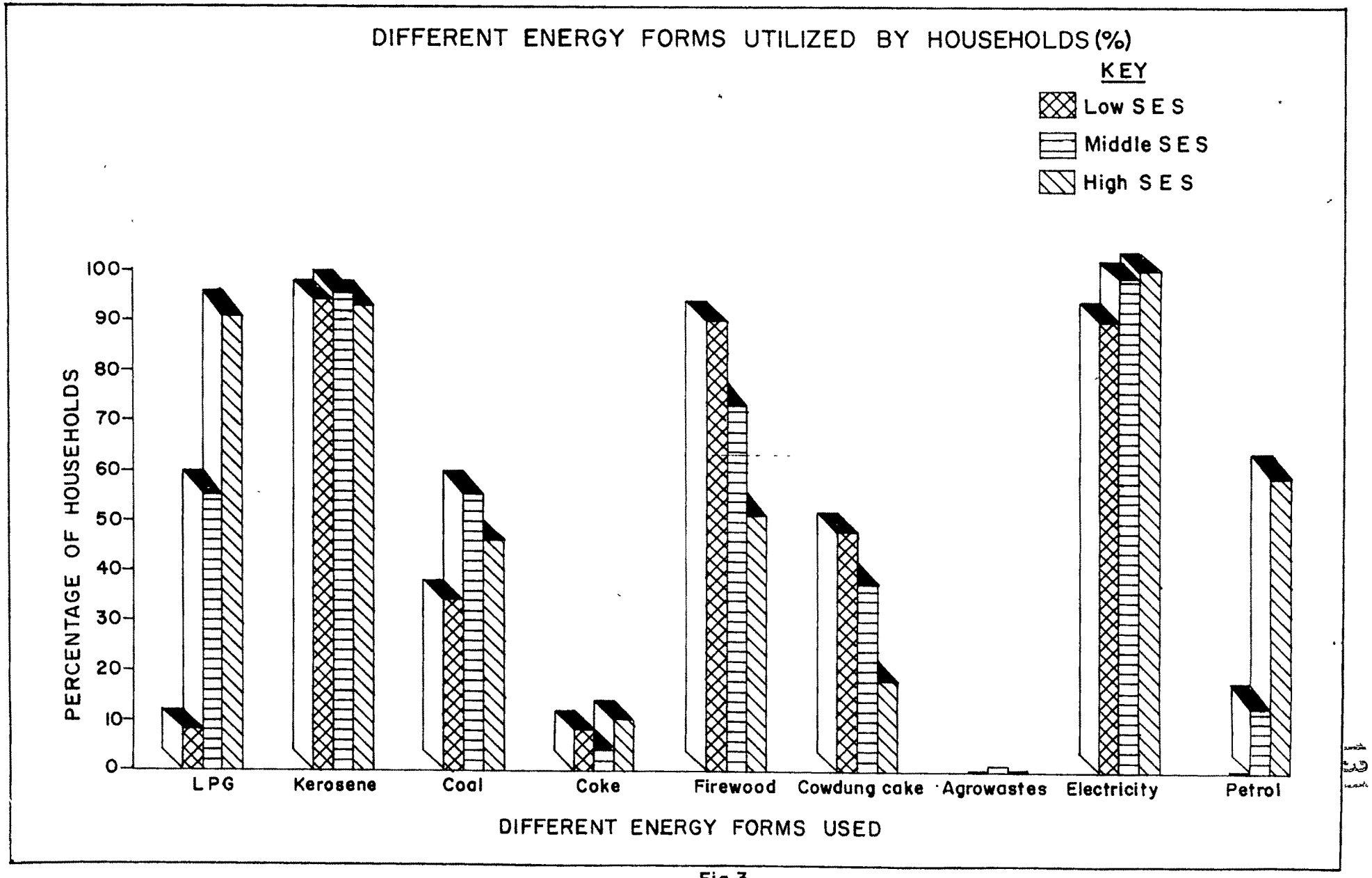
DIFFERENT ENERGY FORMS UTILIZED BY HOUSEHOLDS (%)
KEY
Low S E S
Middle S E S
High S E S
PERCENTAGE OF HOUSEHOLDS
100
90
80
70
60
50
40
30
20
10
0
LPG
Kerosene
Coal
Coke
Firewood
Cowdung cake
Agrowastes
Electricity
Petrol
DIFFERENT ENERGY FORMS USED

Fig.3

the other two groups. Coke was utilised by only 7.31 percent families.

Firewood, an important non-commercial fuel, was used by 68.46 percent households. Though it was used by all the three SES groups, still the highest percentage using this fuel belonged to the low SES group (90 percent) followed by middle (72.5 percent) and then the high (SES) group.

On the whole, 32.69 percent households were using cowdung cakes as fuel. The same pattern was observed in this case as was for firewood in the three different SES groups.

As regards agro-wastes and solar energy, it was found that negligible number of families (0.38 percent) were using agro-waste and none were acquiring the benefits of solar energy. One respondent who reported using agro-wastes as fuel belonged to the middle SES and possessed a family farm.

On the whole 97.31 percent households had electrical connections in their homes. All in the high SES group, 90 percent in low and 98.33 percent families in the middle SES group possessed and used electricity for various purposes.

Petrol was used by about one-fourth of the respondent families for transportation purpose (26.54 percent). None in the low SES group, 58.89 percent in the high and 13.33 percent in the middle SES group used petrol.

From an overview of the above, it will be seen that electricity was used by almost all families as it is an essential energy for lighting the home and providing comfort in living. This was followed by kerosene, another indispensable fuel for homes. Firewood, LPG and coal were next in rank order.

Another observation is that fifty percent households were using non-commercial fuels, i.e. firewood, agro-wastes and cowdung cakes and more than fifty percent were using commercial fuels which are LPG, kerosene, coal and soft coal. The use of non-commercial fuels was more in low and middle SES families than in the high SES households.

It may be pointed out that the percentage of families using cowdung cakes, wood, coal and kerosene was much higher in Haryana families than in Baroda households as was reported by Chaturvedi (1984) but it was reverse in case of LPG.

2b. Quantity of Energy Forms Utilised

The average quantity of LPG used by the sample was one cylinder per month. Only four out of 50 families in the low SES used it, resulting into a low mean consumption of LPG : The average quantity of kerosene used was 7.69 litres per month; coal 17.25 kilograms per month; soft coal 0.89 kilogram per month; firewood 27.25 kilograms per month and 30.41 pieces of cowdung cakes per month. (Table 6).

Table 6 : Average Quantity of Different Energy Forms Used per Month

Energy Forms	Socio-Economic Status			Total
	Low (N=50)	Middle (N=120)	High (N=90)	(N=260)
1. LPG (No. of Cylinder/ month)	0.10	1.31	1.07	0.99
2. Kerosene (Litres/month)	7.90	8.03	7.13	7.69
3. Coal (Kg/month)	13.10	20.95	14.63	17.25
4. Soft Coal (Kg/month)	2.80	0.27	0.67	0.89
5. Firewood (Kg/month)	39.90	31.84	14.10	27.25
6. Cowdung Cakes) (Pieces/month)	55.00	37.98	6.67	30.41

The data shows that LPG, kerosene and coal were used in more quantity by the middle SES families as compared to the other two strata. Soft coal, firewood and cowdung cakes were used more by the low SES households than the middle and high strata. The low income category still mainly depended on the non-commercial fuels.

The homemakers were unable to provide data on quantity of electricity and petrol used. Therefore it was not possible to determine the quantity of electricity and petrol used as mostly husbands' dealt with these two energy forms. Only the expenditure per month incurred on these two energy forms was obtained.

2c. Expenditure incurred on Energy Forms Utilized

The average expenditure per month on different energy forms used was calculated on the basis of the total sample and not only the users. Rs. 164.12 was the average expenditure per month on different energy forms used by the respondent households. The maximum amount was spent by the high SES group, followed by the middle and then by the low SES group (Table 7).

Table 7 : Average Expenditure per Month on Different Energy Forms Utilized

Energy Forms	Socio-Economic Status			Total (N=260)
	Low (N=50)	Middle (N=120)	High (N=90)	
	Rs.	Rs.	Rs.	Rs.
1. Gas (LPG)	5.48	25.37	57.01	32.50
2. Kerosene	16.76	17.04	14.53	16.12
3. Coal	10.96	17.03	13.90	14.78
4. Soft Coal	2.80	0.33	0.76	0.95
5. Firewood	27.26	23.42	9.76	19.43
6. Cowdung Cakes	3.60	2.23	0.41	1.86
7. Electricity	12.78	33.26	58.21	37.96
8. Petrol	0.00	13.08	99.61	40.52
Total	79.64	111.76	254.19	164.12

On the whole, maximum average expenditure per month was incurred on petrol (Rs.40.52) although the consumption was nil for the low SES group. Families belonging to the high SES spent Rs.99.61 on an average per month on petrol (Figure 4).

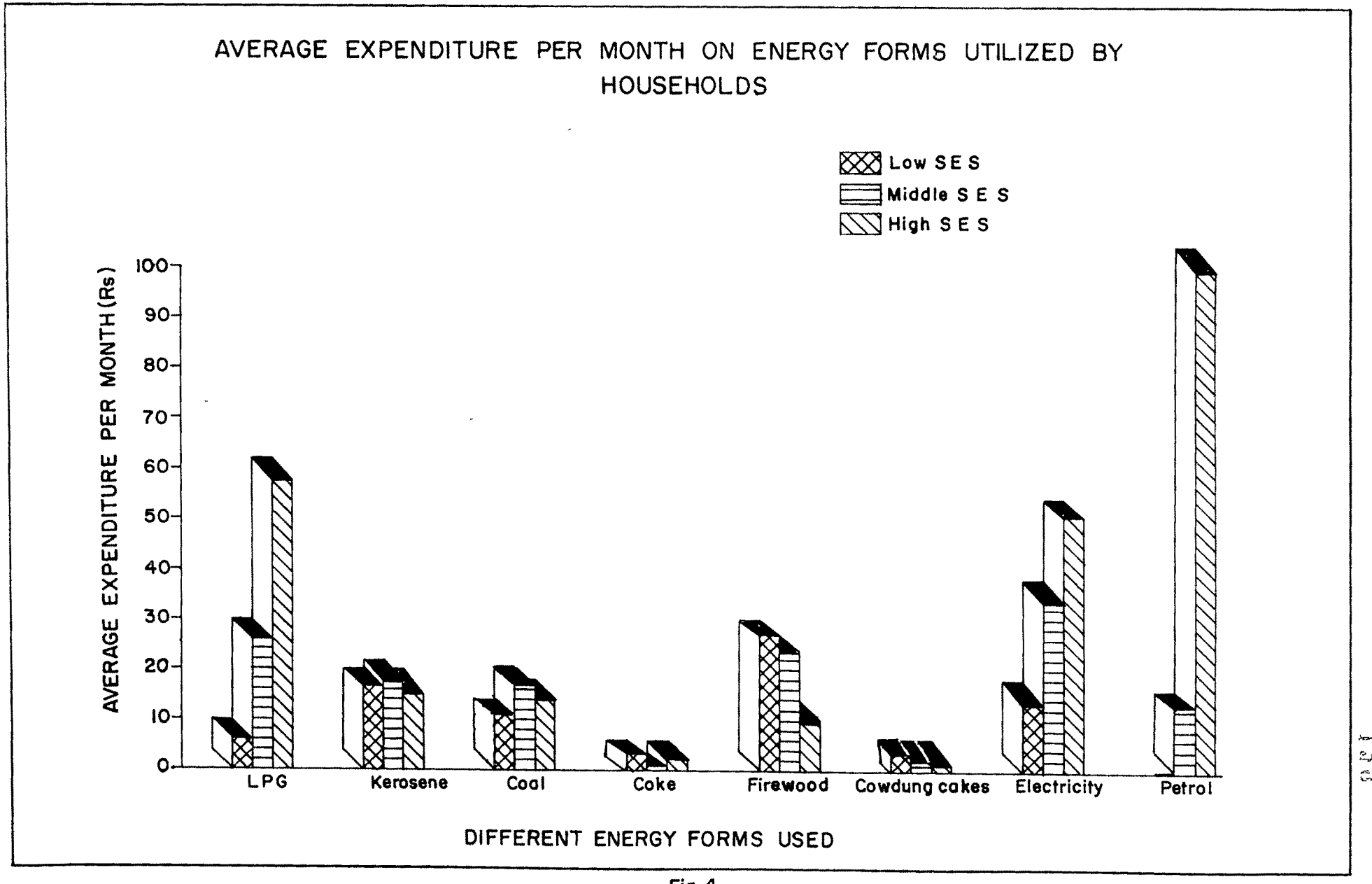
AVERAGE EXPENDITURE PER MONTH ON ENERGY FORMS UTILIZED BY HOUSEHOLDS
Low S E S
Middle S E S
High S E S
AVERAGE EXPENDITURE PER MONTH (Rs)
100
90
80
70
60
50
40
30
20
10
0
LPG
Kerosene
Coal
Coke
Firewood
Cowdung cakes
Electricity
Petrol
DIFFERENT ENERGY FORMS USED

Fig. 4

Expenditure on electricity ranked second in position for the total sample, spending on an average Rs. 37.96 per month. Again the high SES stratum had the highest consumption expenditure on electricity as compared to other SES groups.

Among the cooking fuels, average expenditure on LPG was the highest i.e., Rs. 32.50 for the total sample. The break-up showed that the high SES group spent Rs. 57.01, the middle SES group households spent Rs. 25.37 and Rs. 5½48 was the expenditure in low SES group. The expenditure on gas for the low and middle strata is quite low because few households in both these groups were possessing and using LPG.

The expenditure on kerosene was almost the same for all the three SES households, the average being Rs. 16.12 per month.

Expenditure on cowdung cakes was only Rs. 1.86 per month since most of the respondents obtained these free of cost. Moreover, it was cheap compared to other fuels, Rs.6 to 8 for 100 pieces.

The expenditure on soft coal was negligible as only a minority used this fuel sometimes for keeping the house warm in winter.

2d. Purposes for which Energy Forms were Utilized

Energy forms are used for a combination of purposes. It was observed that more number of households in the low SES group utilized non-commercial energy forms than commercial energy sources for cooking and heating water whereas in the other two SES groups, commercial energy was used by large number of families for the same activities (Table 8).

Gas, coal and wood were generally used for both cooking and heating water by all the SES groups (Appendix IE). Kerosene was used for cooking, heating water, lighting kerosene lamps and lighting fire. One family who was 'Dhobi' by profession used kerosene for stain removal. After the two activities of cooking and heating water were over, the left over coal in the angithi was used for warming themselves in extreme cold winter climates. Coke was used by comparatively more families in the high SES group than in the others, mainly for warming of rooms in winters. Cowdung cakes were used

Table 8 : Purposes for which Different Energy Forms were Used

Purposes	Socio-Economic Status					
	Low		Middle		High	
	*Commercial (f)	Non-commercial (f)	*Commercial (f)	Non-Commercial (f)	*Commercial (f)	*Non-commercial (f)
1. Cooking	14	-	55	4	57	8
2. Cooking and heating water	24	60	107	88	84	18
3. Cooking and Lighting	10	-	24	-	13	-
4. Lighting	3	-	1	-	5	-
5. Cooking, heating water and lighting	8	-	22	-	26	-
6. Cooking, heating water, lighting and lighting fire	4	-	17	-	6	6
7. Lighting fire and stain removal	1	-	-	-	-	-
8. Cooking, heating water and warming homes	8	-	15	7	7	4
9. Heating water	-	9	4	34	7	26
10. Lighting and lighting fire	-	-	5	-	4	-
11. Warming homes	-	-	-	-	6	-
12. Lighting and cooling homes	20	-	27	-	4	-
13. Lighting, cooling homes and entertainment	17	-	83	-	59	-
14. Lighting, cooling homes, entertainment and heating water	-	-	6	-	27	-
15. Transportation	-	-	16	-	53	-
16. Operating generator	-	-	-	-	2	-

* Types of Energy

generally for cooking, heating water and for warming of rooms in winters. Only one family in the middle SES group utilized agro-wastes of their farm for cooking and heating water. Electricity was used for lighting, cooling homes and entertainment but in the high SES group 30 percent families used it for heating water also. Besides using petrol for transportation, 2.22 percent households belonging to high SES group used it for operating generators.

Firewood was purchased from the market by all users. Cowdung cakes were made by 11.92 percent respondents whereas the rest purchased them. Those making cowdung cakes themselves spent on an average one hour per day for this activity. In two families belonging to the high SES group, servants made the cowdung cakes.

2e. Mode of Transportation

The type, size and frequency of use of the energy-driven vehicles possessed directly influences the consumption of petrol per month. Therefore, information was sought from the respondents regarding the mode of transportation possessed and used by them.

The low SES group did not possess any fuel energy-driven vehicles but 46 percent families used bicycle daily for conveyance (Table 9).

Table 9 : Modes of Transportation possessed by Respondents

Modes of Transportation	Socio-Economic Status						Total (N=260)	
	Low (N=50)		Middle (N=120)		High (N=90)			
	f	%	f	%	f	%	f	%
1. Car	0	0.00	1	0.83	6	6.67	7	2.69
2. Scooter	0	0.00	7	5.83	34	37.78	41	15.77
3. Motor Cycle	0	0.00	5	4.17	9	10.00	14	5.38
4. Moped	0	0.00	4	3.33	15	16.67	19	7.31
5. Tractor	0	0.00	2	1.67	0	0.00	2	0.77
6. Matador	0	0.00	0	0.00	1	1.11	1	0.38
7. Bicycle	23	46.0	99	82.50	74	82.22	196	75.38
8. Cycle Rickshaw	0	0.00	0	00.00	1	1.11	1	0.38

Relatively, the high SES families possessed more of fuel energy-driven vehicles as compared to the middle households, and majority used them daily for business purposes mainly. Therefore, they spent more on petrol per month as was observed earlier. Tractor possessed by only two families in the middle SES group was frequently used for farming and the automobile-matador-owned by one high SES family was operated for business purpose daily, and occasionally for personal use. A cycle rickshaw was also owned by one respondent family in the high SES group for sending their children to school.

One or the other type of energy-driven vehicles were possessed by 26.54 percent families (Table 5). Out of these,

88 to 96 percent used their vehicle for shopping, recreational outing and for office going (Table 10).

Table 10 : Purposes for which the Fuel Energy-Driven Vehicles were Used

Purposes	Socio-Economic Status				Total (N=69)	
	Middle (N=16)		High (N=53)			
	f	%	f	%	f	%
1. Office going	12	75.00	49	92.45	61	88.41
2. Taking children to school	1	6.25	12	22.64	13	18.84
3. Shopping	13	81.25	53	100.00	66	95.65
4. Recreational outing	14	87.50	49	92.45	63	91.30
5. For long tours	4	25.00	17	32.08	21	30.43

Children generally went to school either by hired rickshaw, their own bicycle or walked to closeby located schools, but 22.64 percent high SES families used their vehicles for sending children to school. Vehicles were rarely taken on long tours. Only big business families used their vehicles for long distance travel for business purpose. Some households in the middle SES group used the vehicle mainly for business purpose.

2f. Size of the House and Electrical Fittings

Size and quality of the house is associated with high energy consumption, hence data on it was obtained.

Only the living areas were considered for the number of rooms excluding the kitchen and bathroom. More than fifty percent of respondents lived in small sized houses having one to two rooms and 11.54 percent were staying in big houses with five or more number of living rooms. (Table 11). All families in the low SES group and 62.50

Table 11 : Size of the House Occupied by Respondents

Number of Rooms	Socio-Economic Status						Total (N=260)	
	Low (N=50)		Middle (N=120)		High (N=90)			
	f	%	f	%	f	%	f	%
1 - 2	50	100.0	75	62.50	24	26.67	149	57.31
3 - 4	-	-	38	31.67	43	47.78	81	31.15
5 - 6	-	-	6	5.00	19	21.11	25	9.62
7 or more	-	-	1	0.83	4	4.44	5	1.92

percent in the middle SES group were living in one to two room houses whereas 47.78 percent in the high SES group were living in medium-sized houses (three to four rooms). Maximum number of rooms in a house was thirteen which was occupied by the high SES family. In most cases, those who had one or two rooms, part of kitchens were used as bathrooms, and verandah or the single room was used as kitchen.

About 82 percent respondents reported having well-ventilated houses. In each of the three SES groups more than three-fourths of the families were staying in well-ventilated

houses. But still, quite a few houses had dark and dingy rooms which required artificial lighting even during the day time.

As majority of the families were staying in small, well-ventilated houses, their electricity consumption was low. These findings are substantiated by the results reported by Morrison and Gladhart (1976); and Hogan (1978) who reported that energy consumption increased as the number of rooms, windows and exterior doors increased.

It was observed that in all the three SES groups 60 watt bulbs were most commonly used. Hundred watt bulbs were used more by high SES than by middle SES families. Zero watt bulbs were used by a small number in middle and high SES families. Two hundred watt bulbs were also used by 7.78 percent families belonging to the high SES group. Eighty percent in the high SES, 66.10 percent in the middle SES and 31.11 percent in the low SES group used a combination of fluorescent tube and filament bulbs. As the installation cost of fluorescent tube is more, less percentage in the low SES group used them due to financial reasons. The number of fluorescent tubes in a house varied from one to ten. The maximum number of bulb points being used in the house were six for the low SES, fifteen for the middle SES and thirty

for the high SES group. The number of outlets in the houses ranged from one to twenty. It was less in low SES houses and more in the high SES houses. The number of light points and outlets used were dependent on the size of the house.

Regarding number of fans used, it was found that 4.74 percent families were not using any type of fans, most of them belonged to the low SES group. The number of ceiling fans in the houses ranged from one to nine which was dependent on the number of ~~ceiling-fans~~ rooms in the house. Besides this, table fan was also used in the open during summer.

2g. Recreational Equipment

It was found that a higher percentage of respondents in the high SES group possessed various recreational equipment as compared to the other two groups (Table 12). Naturally

Table 12 : Different Recreational Equipment possessed by Respondents

Recreational Equipment	Socio-Economic Status						Total	
	Low		Middle		High			
	f	%	f	%	f	%	f	%
1. Radio	15	30.00	71	59.17	64	71.11	150	57.69
2. Television	3	6.00	57	47.50	70	77.78	130	50.00
3. Tape Recorder	2	4.00	26	21.67	43	47.78	71	27.31
4. Record Player	0	0.00	2	1.67	9	10.00	11	4.23
5. Transistor	22	44.00	63	52.50	66	73.33	151	58.08
6. Video	0	0.00	0	0.00	2	2.22	2	0.77

the high SES group would consume more of electrical energy which is substantiated by the expenditure incurred on electricity being highest for this group (Table 7). More than fifty percent families possessed radio, television and transistor.

Table 13 : Mean Hours of Use of the Recreational Equipment

Recreational Equipment	Socio-Economic Status			Total
	Low	Middle	High	
	(Mean hours per day)			
1. Radio	1.733	1.444	1.301	1.493
2. Television	1.667	2.272	2.671	2.203
3. Tape Recorder	0.500	0.558	0.837	0.632
4. Record Player	-	1.750	0.278	1.014
5. Transistor	2.136	2.278	2.280	2.231
6. Video	-	-	1.000	1.000

The mean hours per day was calculated on the basis of those who used the recreational equipment. The mean hours per day varied from half an hour to 2½ hours for different items (Table 13). The mean hours of use per day was more for the high SES group for television, tape recorder and transistor as compared to the other two groups. Video was used twice a week for seeing movies. Among items involving the use of electricity, television was used for maximum hours per day (2.203 mean hours per day) by the total sample. During the day time generally radio/transistors were used

but during the evening and night majority watched the television. The families mostly saw only movies and some interesting programmes on television, therefore, the use of television was less.

2h. Household Appliances

Electricity consumption in the houses is dependent on the various types of electrical equipment possessed and their frequency of use. Only 26 percent families in the low SES group possessed electric iron and it was used occasionally by most of them. Two percent owned a refrigerator and a room cooler which were used daily in summer season (Table 14).

Table 14 : Various Types of Household Appliance possessed by Respondents

Types of Appliance	Socio-Economic Status						Total (N=260)	
	Low (N=50)		Middle (N=120)		High (N=90)			
	f	%	f	%	f	%	f	%
1. Mixer/Grinder	0	0.00	23	19.17	57	63.33	80	30.77
2. Toaster	0	0.00	7	5.83	31	34.44	38	14.62
3. Oven	0	0.00	3	2.50	11	12.22	14	5.38
4. Iron	13	26.0	82	68.33	73	81.11	168	64.62
5. Washing Machine	0	0.00	10	8.33	31	34.44	41	15.77
6. Refrigerator	1	2.00	10	8.33	47	52.22	58	22.31
7. Immersion Heating Rod	0	0.00	9	7.50	27	30.00	36	13.85
8. Geyser/Water heater	0	0.00	5	4.17	14	15.56	19	7.31
9. Room Heater	0	0.00	11	9.17	41	45.56	52	20.00
10. Room Cooler	1	2.00	15	12.50	36	40.00	52	20.00
11. Hot Plate	0	0.00	7	5.83	15	16.67	22	8.46
12. Churner	0	0.00	0	0.00	1	1.11	1	0.38

As very few appliances were possessed by the low SES families, their expenditure on electricity was also low, Rs. 12.78 per month on an average which was mainly used for lighting and operating fans. Percentage of families possessing the different appliances was higher in case of high SES group than the middle group. Since more of electrically operated equipment were possessed by high SES group, the expenditure on electricity was more for this group than the middle and low SES families. Most of the appliances were used daily by majority of respondents, such as iron, refrigerator, immersion rod, geyser, room heater and room cooler (Appendix X). Refrigerator was kept closed in winters by most families in the low and middle SES groups. These findings are supported by studies conducted by McNew (1980) and Uusitalo (1983) who reported the ~~the~~ electricity consumption increased with increase in number of electrical equipment operated.

2i. Types of Stove Used

LPG stove used by LPG users had different size burners. Among the kerosene stoves, pressure stove was commonly used by 80.38 percent respondents whereas wick stove was used by only 12.31 percent families (Table 15). The reason being that pressure stove was considered more efficient and less

Table 15 : Different Types of Stove Used by Respondents

Types of Stove	Socio-Economic Status						Total (N=260)	
	Low (N=50)		Middle (N=120)		High (N=90)			
	f	%	f	%	f	%	f	%
1. LPG Stove	4	8.00	66	55.00	82	91.11	152	58.46
2. Pressure Stove	41	82.00	104	86.67	64	71.11	209	80.38
3. Wick Stove	2	4.00	10	8.33	20	22.22	32	12.31
4. Ordinary Chulah	11	22.00	24	20.00	5	5.56	40	15.38
5. Angithi	44	88.00	89	74.17	55	61.11	188	72.31
6. Tandoor	3	6.00	19	15.83	5	5.56	27	10.38
7. Smokeless Chulah	0	0.00	3	2.50	0	0.00	3	1.15
8. Solar Cooker	0	0.00	0	0.00	0	0.00	0	0.00

fuel consuming than wick stoves. Angithi was used by almost three-fourths of families but ordinary 'chulah' was used by only 15.38 percent households. Solar cooker was not prevalent in the area surveyed and large number of respondents were unaware about it. Smokeless 'chulah' used by three respondents in the middle SES group was the modification of the ordinary 'chulah' made by themselves.

2j. Use of Pressure Cooker

Pressure cooker is an energy saving device. It takes less time and saves 30 percent fuel compared to ordinary cooking (Petroleum Conservation Research Association). But still, only 30 percent families in the low SES group were

found to use pressure cooker. On the whole, 79.23 percent homemakers utilized pressure cooker. The reasons for not using pressure cooker were, (1) the husband did not like the food cooked in it; (2) it was considered a dangerous equipment to use as it could burst due to negligence of the user; and (3) it was expensive for the low SES families to purchase it.

2k. Fuel Procurement

Information was obtained from respondents on whether they got sufficient fuel to meet their energy needs and if not, how did they fulfil their requirements.

More than three-fourths of respondents (87.69 percent) reported that they got sufficient fuel to meet their energy needs. Rest complained of not getting adequate quantity of kerosene and that it was frequently in short supply. Generally they borfowed someone's ration card to meet their kerosene requirement and their last resort was to purchase it at black rate. Even families from low SES group were sometimes forced to buy it at black rate to meet their energy needs. Some families in the low and middle SES groups made adjustments like, using more of firewood, paper and cowdung cakes during kerosene shortage. Many families managed to procure sufficient quantity of kerosene and LPG through their business contacts. Therefore, they did not feel its

scarcity in the market.

Respondents were asked about the problems in getting the different fuels used by them. Data revealed that 50 percent respondents in the middle SES group, 45.66 percent in the high SES group and 36 percent in the low SES group faced some kind of problems in obtaining the fuels used. Kerosene was in short supply frequently and not available to many (29.61 percent) even after standing in a queue for long hours. Some (3.46 percent) reported that occasionally firewood was not easily available, especially during the rainy season when dry wood became scarce. LPG shortage was experienced by 23.46 percent respondents during the past five years. Severe shortage was found during the period following Mrs. Indira Gandhi's death. Only a negligible number (1.54 percent) stated that coal was not available sometimes and the same percent of respondents were completely ignorant about any problem faced as their husbands did all the household purchases.

2L. Energy Crisis Situation in the Past and Present

Information was sought from respondents whether they faced energy shortage and price rise during the past five years and whether they were confronting energy crisis presently.

The cost of kerosene in Haryana at the time of survey was Rs. 2.10 per litre, LPG Rs.52.50 per cylinder and petrol was Rs. 6.17 per litre. The prices of firewood and coal varied depending on the quality. Cowdung cakes were priced at Rs. 8 to 10 for 100 pieces.

It was found that a high percentage of respondents 62 to 82 percent in all the three SES groups had faced energy crisis during the past five years, but the percentage of respondents facing energy crisis during the period when the survey was being conducted (January 1985 to March 1985) decreased for the middle and high SES groups. The low SES group indicated a slight increase (Table 16).

Table 16 : Energy Crisis Situation faced by Respondents in the Past and Present

Statements	Socio-Economic Status						Total (N=260)	
	Low (N=50)		Middle (N=120)		High (N=90)			
	f	%	f	%	f	%	f	%
1.Faced energy crisis during past 5 years	31	62.00	57	72.50	74	82.22	162	62.31
2.Facing energy crisis now	33	66.00	59	49.17	20	22.22	112	43.08

Respondents reported facing crisis of various energy forms at different periods. Electricity shortage was most felt by majority, second was kerosene shortage, next LPG,

then wood followed by coal. In case of price rise of energy, large number felt that kerosene prices had increased a great deal during the past five years, second in line was wood prices, then coal followed by LPG and lastly electricity.

Respondents reported facing energy crisis of some energy forms at the time the survey was conducted. The order of energy shortages were similar to those indicated for the past five years, i.e. shortage of electricity, kerosene, LPG, wood and coal. Regarding price rise situation, respondents were unable to respond properly as the husband purchased the energy sources. On the basis of those who responded, it was found that almost similar order was observed in this case also. Increase in kerosene prices was top-most in the list, then in order were the prices of wood, electricity, coal and lastly LPG. Only one respondent mentioned about rising cost of petrol.

About one-fourth of respondents in the high SES group were presently facing energy crisis. The reasons for not encountering difficulties in procuring the fuel used were : (1) majority utilized LPG as cooking fuel which was then easily available; (2) most of them possessed more than one LPG cylinder; and (3) having own business, they obtained the fuel easily through known sources even during the shortage.

Due to heavy load shedding, families have been facing electricity crisis since few years. There were ways in which cooking fuels' scarcity could be supplemented, i.e. by using a substitute fuel, or making some adjustment but power shortage had to be endured. Kerosene was a standby fuel for LPG users but those families using kerosene as main fuel suffered due to its crisis.

It can be concluded that during the survey period, low and middle SES group families were experiencing energy crisis more than the high SES group families.

2M. Awareness regarding New Technology

In order to ascertain whether respondents were aware of new technologies, certain related questions were asked.

1. Solar Energy :

The analysis revealed that 58.85 percent homemakers were aware about solar cooker being utilized for cooking purpose. (Table 17). Awareness was low among the low SES

Table 17 : Awareness and Willingness of Respondents to Use Solar Cooker

Solar Cooker	Socio-Economic Status						Total (N=260)	
	Low (N=50)		Middle (N=120)		High (N=90)			
	f	%	f	%	f	%	f	%
Awareness	14	28.00	67	55.83	72	80.00	153	58.85
Willing to use	42	84.00	91	75.83	70	77.78	203	78.08

homemakers (28 percent) and high among the high SES homemakers (80 percent). Majority of respondents in Gujarat villages were aware about the solar cooker as it was popularised in many villages through demonstrations and subsidized schemes (Chauhan, 1985). The knowledge of Haryana rural homemakers about solar cooker was average (Sharma and Singh, 1984). But on the contrary, none of the rural homemakers of Coimbatore district were aware of the solar device for cooking (Devadas and Rajagopal, 1983).

The response regarding whether to use solar cooker if provided at subsidized rate was fairly good. More than three-fourths of respondents showed willingness to use the solar cooker. Numerous reasons were given for not willing to use solar cooker, out of which the main reasons quoted by many were : (1) they neither possessed the knowledge about it, nor had they seen it; (2) problem of absence of sunlight in the house; (3) possessed LPG which was convenient to use and therefore did not feel the need; (4) not interested to adopt this technology; (5) possibility of damage to equipment due to presence of monkeys; (6) it is time-consuming; (7) depends on elder's and husband's willingness to allow to use it; (8) expensive; (9) does not like food cooked in cooker; and (10) large family size. (Appendix XIA).

Those who were willing to use this technology to reduce their fuel expenditure pointed out that they would adopt this technology provided it was cheap, convenient to use, when they felt the need, if others also use it, if sufficient sun enters the house and first experimenting with it for themselves. There were respondents who were surprised to hear about the solar technology and found it hard to believe. They desired to know in details about the solar cooker.

The results indicate the need to educate the homemakers regarding solar cookers as it saves fuel upto 40 to 50 percent (GEDA). Homemakers acceptance of this technology would help to control the energy crisis situation of the country as well as decrease family expenditure on cooking fuels. These results also indicate the need to design and manufacture cheap solar cookers to create an impact on families.

2. Biogas Energy :

The data revealed that 84.23 percent homemakers were aware about biogas energy (Table 18). These results are different from that reported by Chauhan (1985) as very few

Table 18 : Awareness and Willingness of Respondents to Use Biogas Energy

Biogas Energy	Socio-Economic Status						Total (N=260)	
	Low (N=50)		Middle (N=120)		High (N=90)			
	f	%	f	%	f	%	f	%
Awareness	29	58.00	110	91.67	80	88.89	219	84.23
Willing to use	38	76.00	91	75.83	58	64.44	187	71.92

respondents in the Gujarat village knew about biogas energy.

Percentage of respondents willing to use biogas energy was 71.92 percent, being less in the high SES than in the low and middle SES groups as most of the high SES families were LPG users. Conditions mentioned for willingness to use it were : (1) only in emergency or when LPG is not available; (2) if cheap and convenient to use; (3) if it is made compulsory by the government; and (4) if others in the locality also use it (Appendix XIB),

Reasons enlisted for not willing to adopt bio-gas energy for household use were : (1) possess LPG so does not feel the need of it; (2) had no knowledge about it; (3) as LPG is convenient to use and also available; (4) does not like it as produced out of cowdung/dirt; (5) gas may smell of cowdung; (6) not interested to adopt new ways as satisfied with the present system; (7) gets sufficient fuel to meet needs; (8) prefers LPG and firewood than biogas; and (9) husband does not allow use of any other fuel than firewood.

The reasons enumerated for willing/not willing to adopt biogas technology reveals the fact that homemakers do not possess sufficient knowledge about it. Therefore it is imperative to educate homemakers regarding biogas energy and to convince homemakers to adopt such alternative fuels, if feasible, which will help to reduce energy crisis in the country.

3. New High Efficiency Stoves :

High efficiency stoves are being designed and manufactured by various agencies. If households switch over to these improved stoves and 'Chulahs', remarkable conservation of energy could be attained.

It was observed that 70 percent knew about Nutan stove; 27.69 percent respondents were aware about the smokeless 'chulah' and only 8.85 percent possessed an idea about the double purpose 'chulah' and 'angithi' (Table 19).

Table 19 : Awareness and Willingness of Respondents to use the New High Efficiency Stoves

New Stoves	Socio-Economic Status						Total (N=260)	
	Low (N=50)		Middle (N=120)		High (N=90)			
	f	%	f	%	f	%	f	%
Awareness :								
1. Nutan Stove	27	54.00	78	65.00	77	85.56	182	70.00
2. Smokeless Chulah	21	42.00	24	20.00	27	30.00	72	27.69
3. Priagni Wood Stove	0	0.00	0	0.00	0	0.00	0	0.00
4. Double purpose Chulah and Angithi	0	0.00	13	10.83	10	11.11	23	8.85
Willing to use	47	94.00	101	84.17	72	80.00	220	84.62

None of them knew about the Priagni wood stove designed and developed by the rural energy laboratory of the Central Power Research Institute, Bangalore. According to this source, Priagni burns wood fuel at more than 30 percent

efficiency compared to the traditional 'chulah' having 8 to 10 percent efficiency. Nutan stove consumes 30 percent less kerosene than normal stoves (PCRA); and smokeless 'chulahs' save 20 percent of time and 14 percent of fuel (Devadas and Kamalanathan, 1983).

Majority of homemakers were not aware about these high efficiency, energy saving stoves. Hence the need to educate the homemakers about them becomes imperative to create an impact and accrue energy savings. These findings are also supported by Chauhan (1985) as very few homemakers in the village of Gujarat knew about smokeless 'chulah'.

Majority of respondents (84.62 percent) expressed their willingness to use these efficient stoves when they would feel the necessity; if they are easily available, cheap, useful and convenient to use; when gas is not available; and husband buys the stoves for them (Appendix XIC).

Major reason for not willing to use these improved stoves was, because LPG is very convenient to use, time-saving as well as easily available. Hence, does not feel the need to use them. Besides this, other reasons were : (1) do not want to change the present system; (2) permission of husband is required; (3) already possess the old models and buying these would involve additional expenditure; (4) may be expensive; (5) does not have the knowledge about

them and moreover not interested to use them; and lastly (6) do not have sufficient space to burn wood and coal.

Everyone had some problem or the other in using these high efficiency stoves but expressed a degire to use them depending on the circumstances.

2N. Food Habits

Food habits influence the fuel requirement of families. Preparing non-vegetarian meal requires more time and fuel than vegetarian meal. Moreover the number of dishes prepared per meal also affects the fuel requirement.

Data revealed that 89.23 percent families were vegetarians and minority were non-vegetarians (Table 20).

Table 20 : Food Habits of Respondents

Food Habits	Socio-Economic Status						Total (N=260)	
	Low (N=50)		Middle (N=120)		High (N=90)			
	f	%	f	%	f	%	f	%
1. Vegetarian	48	96.00	102	85.00	82	91.11	232	89.23
2. Non-vegetarian	2	4.00	18	15.00	8	8.89	28	10.77
2. Type of Meal :								
Simple Meals	50	100.00	119	99.17	87	96.67	256	98.46
Elaborate Meals	0	0.00	1	0.83	3	3.33	4	1.54
3. Eating Meals together:								
Breakfast	49	98.00	97	80.83	65	72.22	211	81.15
Lunch	45	90.00	83	69.17	49	54.44	177	68.08
Tea	47	94.00	110	91.67	66	73.33	223	85.77
Dinner	48	96.00	99	82.50	68	75.56	215	82.69

Non-vegetarian dishes were not prepared daily but only once or twice a week; not with the idea to conserve fuel but because meat itself costs more. Almost all respondents had simple meals daily, i.e. one to two main dishes. A minority belonging to the high SES group had elaborate meals daily. Regarding having meals together to avoid reheating of food for saving fuel, it was observed that 68 to 86 percent had all four meals of the day together or had food without reheating.

Data on food habits indicated that majority tried to minimise fuel consumption as much as possible.

2 0. Ways to Control the Energy Crisis

It is very important that families should be conscious about the energy situation and adopt ways to control the crisis situation. Therefore, opinion of respondents was sought regarding ways which should be adopted to decrease the intensity of energy crisis in the future. Six out of eight ways listed were considered by majority (74 to 98 percent) to be appropriate alternatives for controlling the energy crisis situation (Table 21). The methods, using more of firewood and cowdung cakes and raising the price of energy forms were thought to be unsuitable ways to deal with the crisis situation. The former was not suitable as majority found LPG and kerosene convenient to use and did

Table 21 : Opinion of Respondents Regarding Adoption of Ways to Control Energy Crisis

Ways to control Energy Crisis	Socio-Economic Status						Total (N=260)	
	Low (N=50)		Middle (N=120)		High (N=90)			
	f	%	f	%	f	%	f	%
1. Using more of fire wood and cowdung cakes	25	50.00	41	34.17	23	25.56	89	34.23
2. Adoption of Solar technology	41	82.00	109	90.83	81	90.00	231	88.85
3. Adoption of biogas energy	39	78.00	101	84.17	75	83.33	215	82.69
4. Use of improved and efficient stoves and electrical equipment	47	94.00	116	96.67	83	92.22	246	94.62
5. Raising the price of energy forms	1	2.00	6	5.00	3	3.33	10	3.85
6. Rationing of energy resources	42	84.00	86	71.67	66	73.33	194	74.62
7. Giving incentives to encourage conservation	42	84.00	105	87.50	78	86.67	225	86.54
8. Educating the public about the energy situation	48	96.00	117	97.50	90	100.00	255	98.08

not prefer to use firewood and cowdung cakes. Raising the price of energy forms was not considered to be a suitable option to reduce crisis as it would directly affect them. Rationing of energy resources was opined to be a good way to tackle the situation by three-fourths of respondents provided fair dealing

was done by the ration shopkeepers. The general complaint was that the rationshop incharge generally created shortage to sell the commodity in black rate which then became problematic for the common consumer.

These findings can be substantiated by Kaul's study (1984). She also reported that majority of Baroda homemakers did not opt for measures like 'rationing of fuel forms' and 'making fuel forms more dear'.

3. Perception of the Energy Crisis Situation

Perception here is dealt with the understanding of the ecological environment related to energy crisis. The perception scale developed consisted of statements concerning the causes, effects, alternatives and possible solutions of the energy situation.

3a. Mean Scores on Perception of the Energy Crisis

The mean perception score for the total sample was 38.44 which indicates average perception (Table 22).

Table 22 : Mean Scores and Standard Deviations of Perception of Homemakers Regarding the Energy Crisis

	Socio-Economic Status			
	Low (N=50)	Middle (N=120)	High (N=90)	Total (N=260)
Mean Score	30.10	37.17	44.78	38.44
Standard Deviation	11.60	12.51	11.00	12.96

The comparison of the mean perception scores of the three SES groups shows that the high SES group homemakers exhibited a better perception of the energy crisis situation than the other two SES groups although the perception level was average for all three groups.

There was not much variation in the standard deviation values of the three SES groups which indicated very little difference among the groups regarding perception of energy crisis.

The mean scores on perception according to educational level indicated that as educational level increased, the perception of energy crisis situation also increased with a fall after the intermediate level (Figure 5). The fall in mean scores was high for the low SES homemakers between intermediate and graduate level but it was almost the same for the middle and high SES homemakers. The level of perception increased for the postgraduate middle SES homemakers whereas it decreased slightly for the high SES homemakers with postgraduate qualification. It will be observed that majority of homemakers in all the three SES groups had perception scores more than the sample mean score. The perception of homemakers in relation to age did not have a distinct pattern as it was increasing and decreasing for different age groups (Figure 6). Majority of homemakers in the middle and all in the low SES group had perception

EDUCATIONAL LEVEL OF HOMEMAKERS AND
THEIR LEVEL OF PERCEPTION REGARDING ENERGY CRISIS

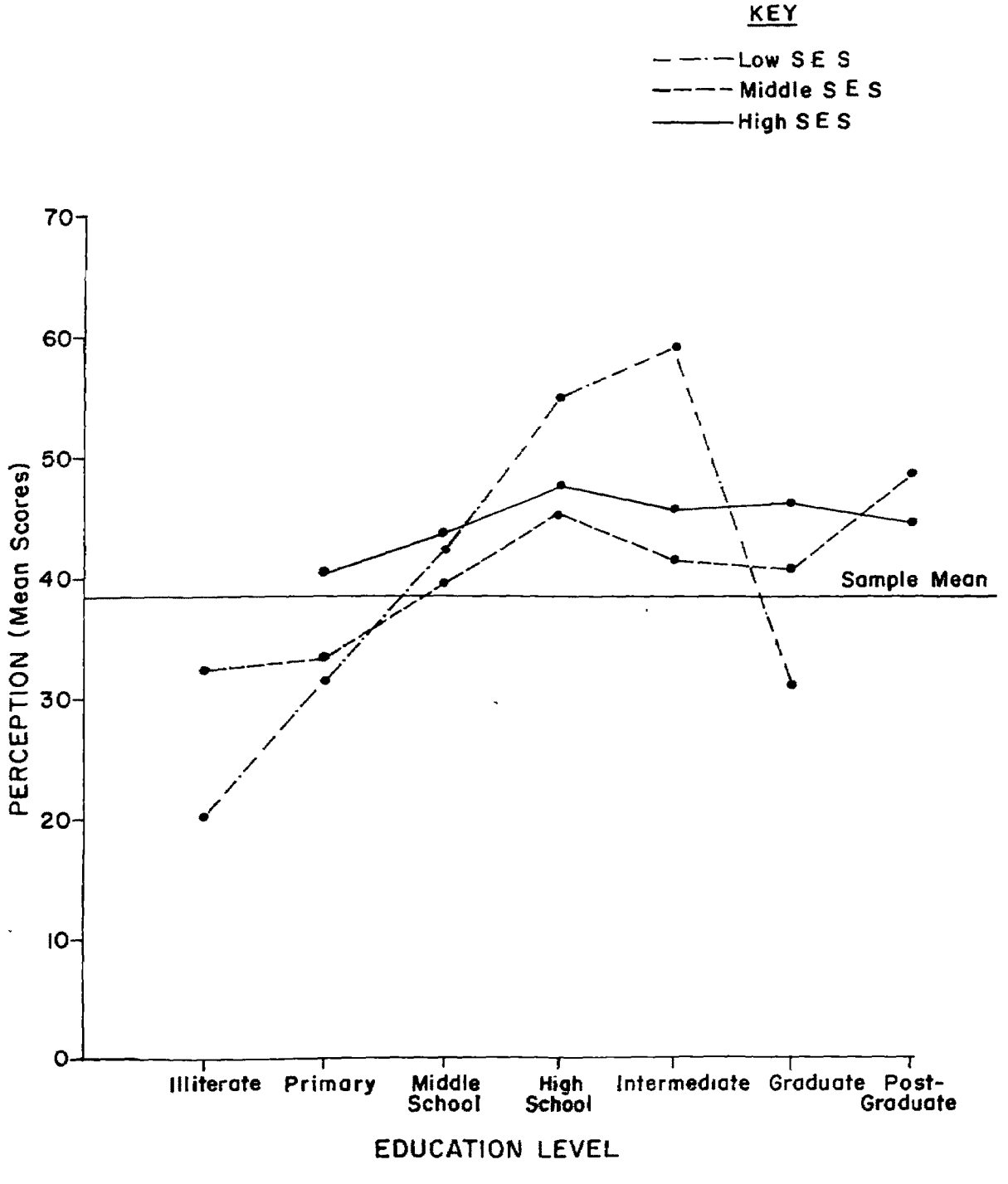

Fig. 5

AGE OF HOMEMAKERS AND THEIR LEVEL OF PERCEPTION REGARDING ENERGY CRISIS

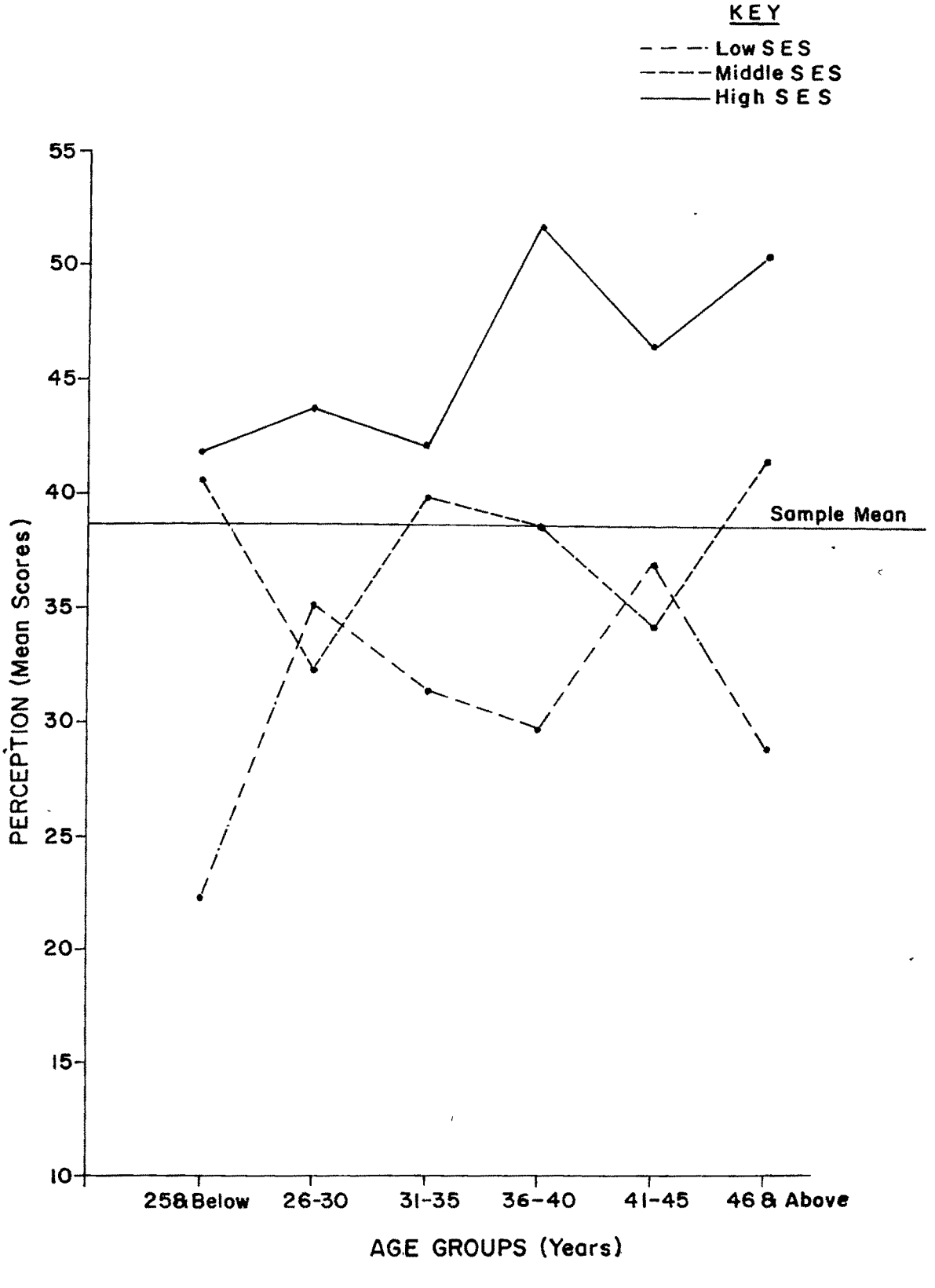

Fig 6

score below the sample mean score.

3b. Level of Perception regarding Energy Crisis

To determine the level of perception the responses on the perception scale were summed and on the basis of total scores the level of perception of homemakers regarding the energy crisis situation was determined in terms of good, average and poor perception. The minimum possible score was zero and maximum 66. Mean ± standard deviation scores were considered for making the three categories of perception.

Data revealed that about three-fourths (72.31 percent) of respondents had average perception and almost equal percentage, 13.08 and 14.6 percent, possessed good and poor perception about the energy crisis, respectively (Table 23).

When analysed in relation to age and education level of homemakers, it was observed that 43.46 percent of respondents were below 31 years in age and among them, 34.23 percent possessed average perception about the energy crisis situation.

Regarding education, three-fourths of homemakers had school level education out of which 55 percent showed average perception. Illiterate respondents were 10.77 percent. Equal percentage of them possessed average and poor perception about the energy crisis.

Table 23 : Level of Perception of Homemakers Regarding Energy Crisis in Relation to Associated Variables

N = 260

Level of Perception	Age Groups (Years)										Educational level									
	30 and below		31 - 40		41 - 50		51 and above		Total		Illiterate		School Educa.		College Educa.		Total			
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%		
Good	6	2.31	18	6.93	5	1.92	5	1.92	34	13.08	0	0.00	27	10.39	7	2.69	34	13.08		
Average	89	34.23	68	26.15	21	8.08	10	3.85	188	72.31	15	5.77	143	55.00	30	11.54	188	72.31		
Poor	18	6.92	13	5.00	5	1.92	2	0.77	38	14.61	13	5.00	25	9.61	0	0.00	38	14.61		
Total	113	43.46	99	38.08	31	11.92	17	6.54	260	100.0	28	10.77	195	75.00	37	14.23	260	100.00		

Average level of perception was possessed by most homemakers belonging to different age groups and education levels.

Data on perception of homemakers regafding the energy crisis situation which was measured on perception scale was also analysed itemwise, to probe further, to ascertain the aspects of energy crisis on which they possessed better perception. Fifty percent and more scores were considered to indicate good perception and below fifty percent as poor perception. It was observed that large number in the low and middle SES groups were totally ignorant about many aspects of perception of energy crisis such as : (1) the oil reserve of the world is limited; (2) our country does not have enough oil of its own; (3) large amount of oil is imported from other oil rich countries to meet the nation's requirements; (4) it is very expensive for our country to buy oil from other nations; (5) coal, gas, petrol and kerosene are natural resources limited in supply; (6) energy crisis is due to excessive use of energy by people; (7) rate of consumption of fuel wood is more than the rate of its production; and (8) government is making efforts to popularise biogas, solar energy and other alternative energy sources to reduce the energy crisis (Appendix XII). In addition, majority in the low SES group expressed ignorance about the statements, 'energy crisis is due to increased industrialization', and

'urbanization is one of the reasons of energy crisis.' In the high SES group, only one item scored less than 50 percent score which was 'the oil reserve of the world is limited'.

These observations reveal the fact that 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. These results are in congruence with those reported by George and Ogale (1983). According to itemwise and total score analysis, it was found that the high SES group homemakers exhibited a better perception of energy crisis than the other two SES groups. This may be due to the effect of education as 34.45 percent homemakers in the high SES group had acquired college education, whereas only a minority in the other two groups had college education.

The above findings indicate that there is an urgent need to educate homemakers regarding the energy situation and problems of the country to enable them to understand and realise their role in controlling the energy crisis by making informed decisions to conserve energy.

4. Stress Felt due to Energy Crisis

A Stress Scale was developed to study the economic and emotional strain felt by families during energy crisis situation. The scale constituted of statements which expressed

the strain or tension felt by families when there is shortage of different energy forms and/or increase in their price. The homemakers expressed their feelings under the different situations.

4a. Mean Scores on Stress Felt

The mean score of the total sample was 54.03. The mean score on stress felt was less for the low SES group and increased with increase in the SES (Table 24).

Table 24 : Mean Scores and Standard Deviations of Stress Felt by Homemakers during Energy Crisis Situation

	Socio-Economic Status			Total (N=260)
	Low (N=50)	Middle (N=120)	High (N=90)	
Mean Score	50.22	53.29	57.12	54.03
Standard Deviation	13.32	13.44	13.76	14.16

The mean stress score was comparatively low for the low SES group because quite a few items on the scale were not applicable to them, for example, stress caused by shortage or price rise of petrol was nil as none of them utilized petrol for transportation. Moderate degree of stress was felt by respondents of different age group, family size, family income and educational level.

The mean scores indicated that as the family size increased till twelve members, the stress also increased with

a fall thereafter. The decrease in stress was more for the middle SES group than the other two groups. (Figure 7). Stress decreased for the low SES families after eight members. The decrease in the stress felt by families with thirteen or more members may be because they were joint families of business category with high family income. So stress due to shortage and price rise of different energy forms did not affect them much as they could afford to pay more price and get the required fuel without much difficulty. Stress scores of all the high SES homemakers was above the sample mean line and for all the low SES homemakers, it was below the sample mean line.

The stress felt decreased for the low SES families as the income increased to Rs. 999. The low SES households did not have income more than this. In case of high SES families, the stress felt increased as the family income increased to Rs.2,499 and tended to decrease thereafter. (Figure 8). This increase in stress may be due to shortage of energy which affected their comfort in living rather than economic reasons. The middle SES homemakers did not show a distinct trend in stress felt.

A similar pattern as above was observed in case of age of homemakers upto 40 years.(Figure 9). After 40 years of age there was a steep fall in stress felt which again rose high as the age increased above 45 years for the middle and high SES households. The low SES homemakers showed a decline in stress felt after 40 years of age.

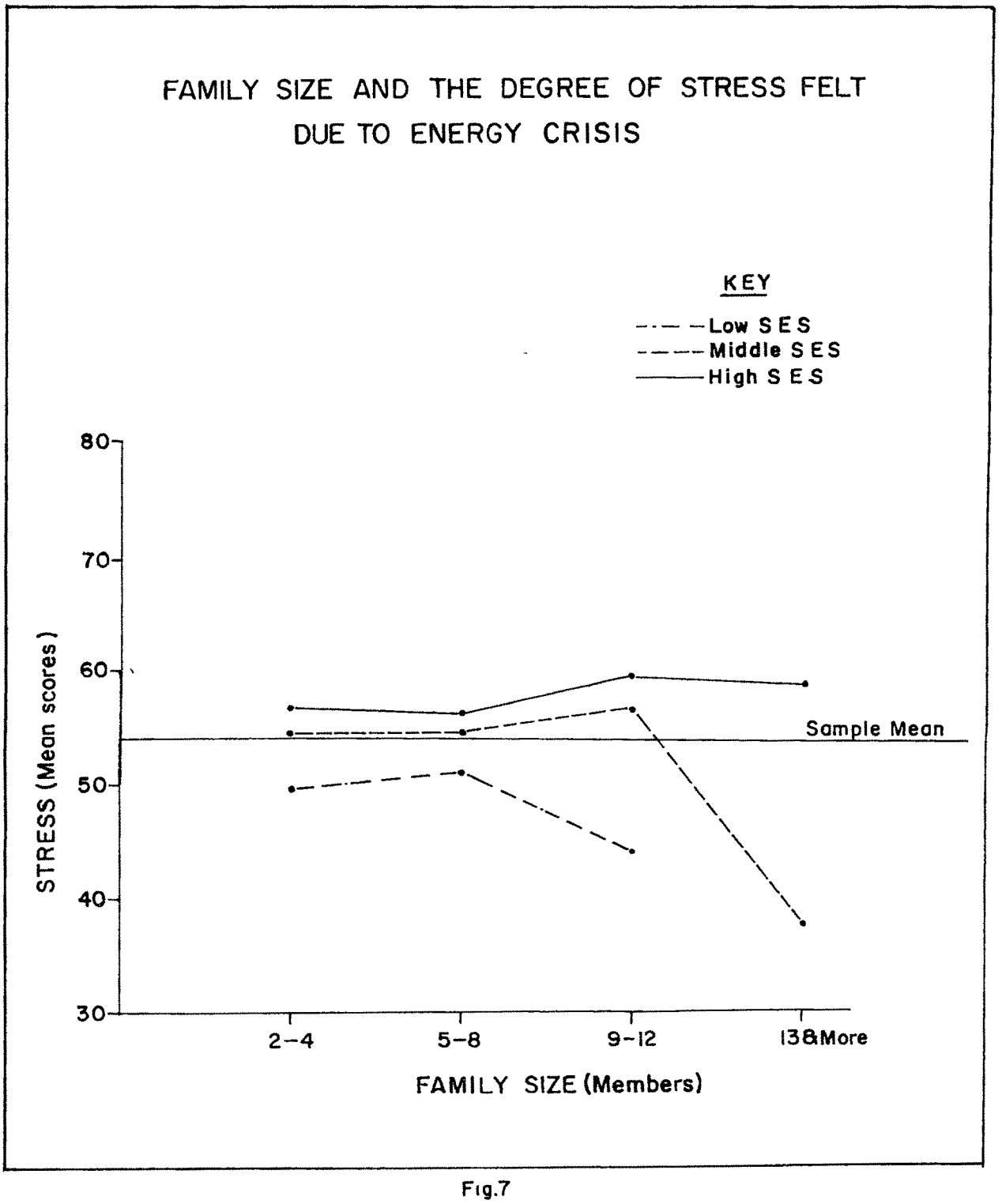
FAMILY SIZE AND THE DEGREE OF STRESS FELT
DUE TO ENERGY CRISIS
KEY
Low S E S
Middle S E S
High S E S
80
70
60
50
40
30
STRESS (Mean scores)
Sample Mean
2-4
5-8
9-12
13&More
FAMILY SIZE (Members)

Fig.7

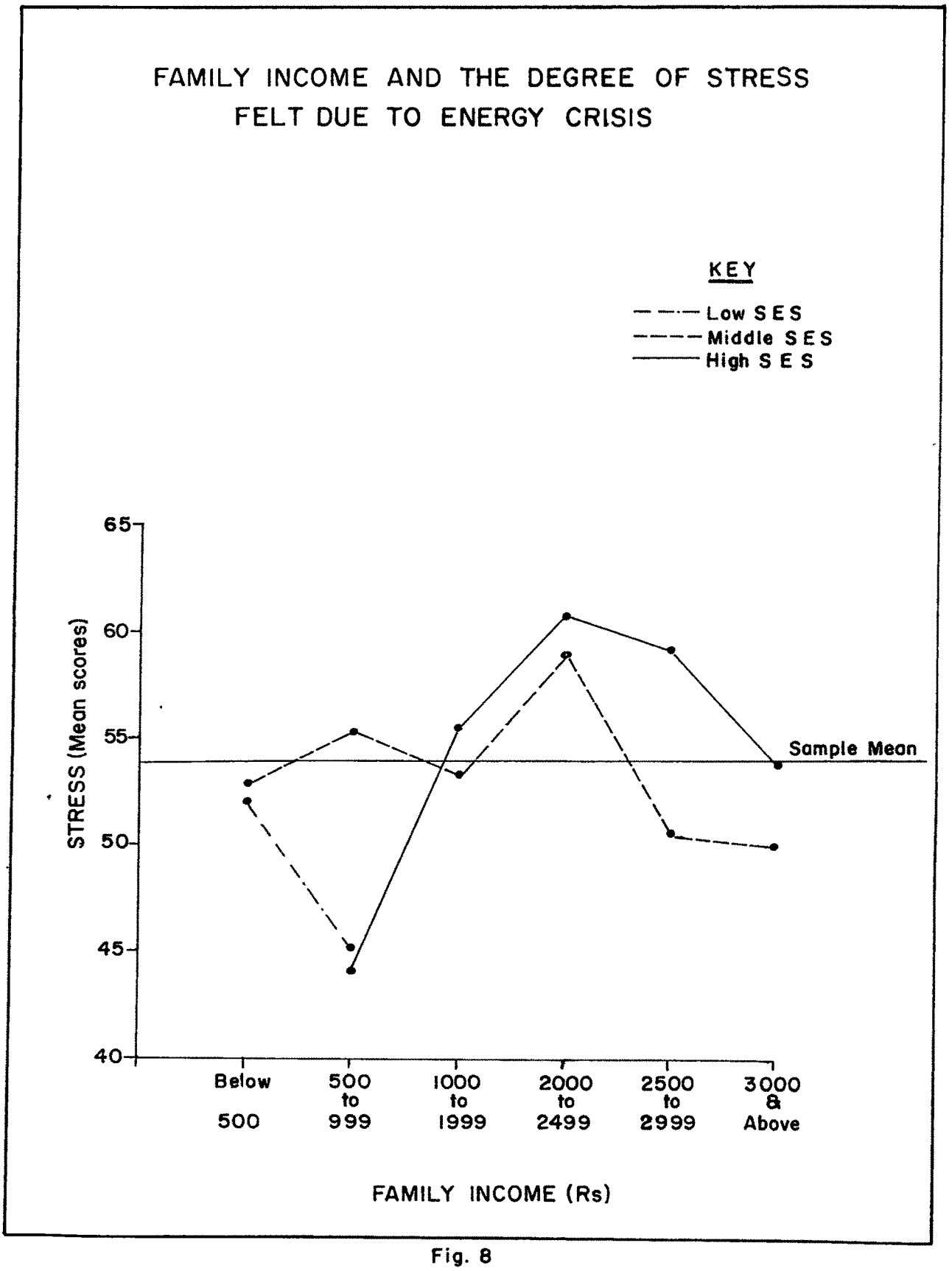
FAMILY INCOME AND THE DEGREE OF STRESS
FELT DUE TO ENERGY CRISIS
KEY
Low S E S
Middle S E S
High S E S
65
60
55
50
45
40
STRESS (Mean scores)
Sample Mean
Below 500
500 to 999
1000 to 1999
2000 to 2499
2500 to 2999
3000 & Above
FAMILY INCOME (Rs)

Fig. 8

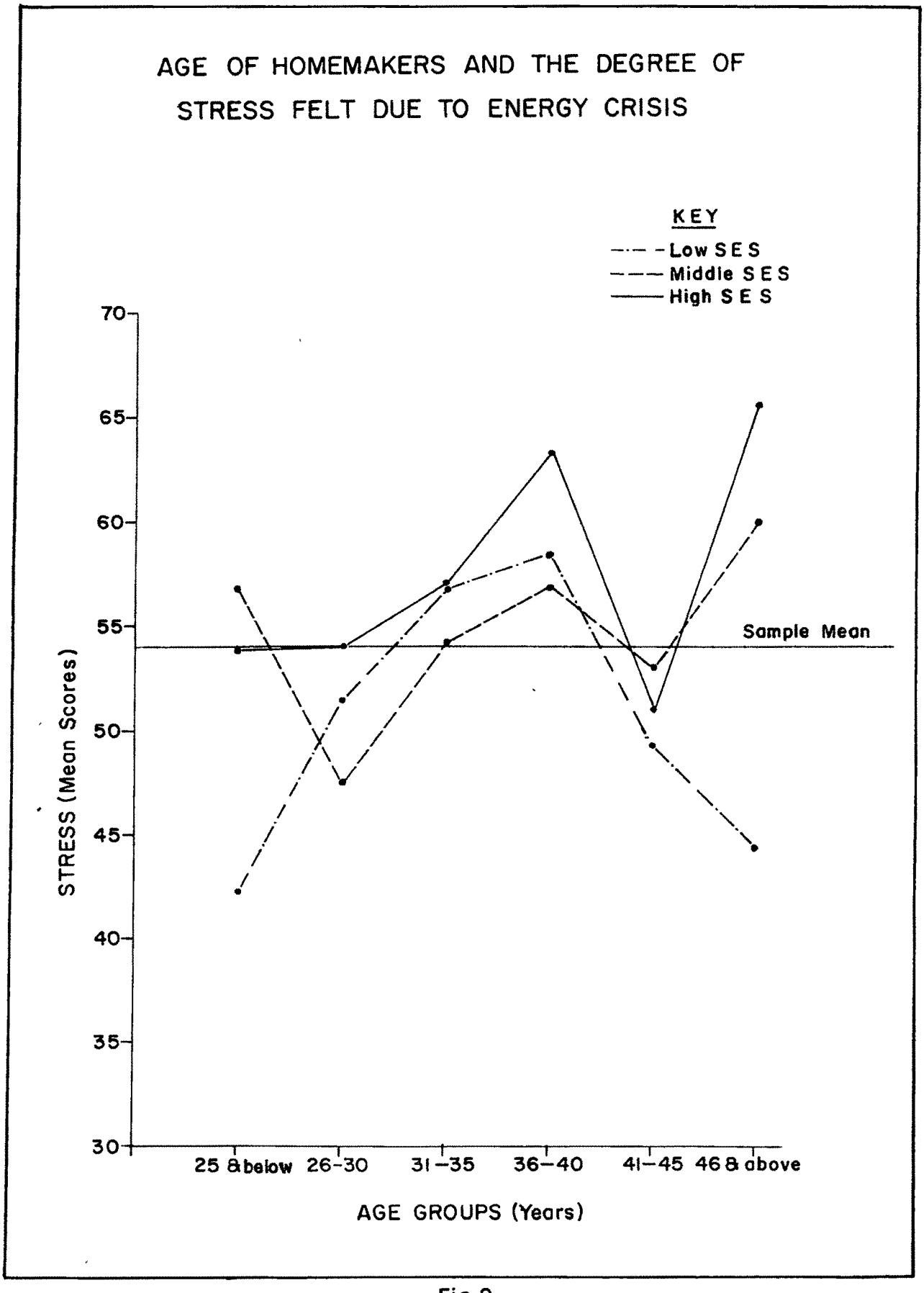
AGE OF HOMEMAKERS AND THE DEGREE OF STRESS FELT DUE TO ENERGY CRISIS
KEY
Low SES
Middle SES
High SES
Sample Mean
STRESS (Mean Scores)
70
65
60
55
50
45
40
35
30
25 & below
26-30
31-35
36-40
41-45
46 & above
AGE GROUPS (Years)

Fig. 9

The mean scores of the four types of stress were calculated which lie between one and three for the total sample. Thus the degree of stress felt by homemakers during energy crisis was moderate (Table 25).

Table 25 : Mean Scores on Different Types of Stress Felt

Types of Stress	Socio-Economic Status			Total (N=260)
	Low (N=50)	Middle (N=120)	High (N=90)	
1. Economic stress	2.940	2.879	2.511	2.777
2. Household work stress	2.151	2.331	2.498	2.327
3. Stress due to obstructions in comfortable living	2.160	2.239	2.260	2.220
4. Stress due to inability to meet family demands	1.504	1.622	1.957	1.694
Total	2.189	2.268	2.307	2.255

Economic stress was felt more in degree by the low SES group than the other two groups. Stress due to household work, obstructions in comfortable living style and inability to meet family demands were felt more in degree by the high SES group than the low and middle SES groups though the difference was not much.

4b. Types of Stress Felt

Analysis was done to determine the percentage of respondents who felt the different types of stress during the energy crisis situation with mean as the dividing line. It was found that more than fifty percent homemakers felt the 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 (Table 26). More homemakers felt emotional stress than economic stress as revealed from the data.

Table 26 : Types of Stress Felt by Homemakers due to Energy Crisis

Types of Stress	Feel Stress		Do not feel Stress		Total	
	f	%	f	%	f	%
1. Economic stress	131	50.38	129	49.62	260	100.00
2. Household work stress	153	58.85	107	41.15	260	100.00
3. Stress due to obstructions in comfortable living	149	57.31	111	42.69	260	100.00
4. Stress due to inability to meet family demands	139	52.31	124	47.69	260	100.00

Further analysis was done to ascertain to which income group the respondents who felt stress belonged to. Out of

those who felt economic stress, 40.46 percent had an income between Rs. 750 to Rs.1,999 and 37.40 percent respondents had income below Rs. 750 (Table 27). Less percentage of homemakers

Table 27 : Types of Stress Felt by Homemakers according to Income Groups

Types of Stress	Income Groups (Rs.)						Total	
	749 and below		750 - 1999		2000 & above			
	f	%	f	%	f	%	f	%
1. Economic stress	49	37.40	53	40.46	29	22.14	131	100.00
2. Household work stress	48	31.37	60	39.22	45	29.41	153	100.00
3. Stress due to obstructions in comfortable living	51	34.23	57	38.25	41	27.52	149	100.00
4. Stress due to inability to meet family demands	34	25.00	60	44.12	42	30.88	136	100.00

with more income faced economic stress. Most of the respondents who experienced stress due to household work, obstructions in comfortable living style and inability to meet family demands belonged to the middle income range.

4c. Degree of Stress Felt due to Energy Crisis

To determine the degree of stress felt, responses on the stress scale were summed up and the degree of stress felt by homemakers in terms of high, moderate and low stress was ascertained on the basis of total scores. Minimum possible score was zero and maximum 100. Mean ± standard deviation values were taken as the basis for categorizing the degree of stress felt.

Analysis of data revealed that majority (69.62 percent) of respondents experienced moderate stress whereas almost equal percentages (16.15 percent and 14.23 percent) felt high and low stress, respectively (Table 28).

In relation to three variables, family size, family income and age of homemakers, degree of stress felt was further assessed.

Majority (57.31 percent) of the homemakers had a family size of five to eight members. Moderate stress was felt by most of the homemakers having different family size. When seen in relation to family income, it was found that moderate stress was experienced by most homemakers irrespective of the family income. 43.46 percent homemakers were below 31 years in age and 30 percent of them felt moderate stress. Out of 16.15 percent homemakers feeling high stress, 8.08 percent homemakers were in the age group 31 to 40 years whereas the same percent feeling low stress belonged to the young age group i.e. 30 years and below.

Item-wise analysis of statements on stress scale was further done to determine the situations under which stress was felt due to energy crisis. Fifty percent and more scores were considered to indicate high stress and below fifty percent as low stress. On the whole, all homemakers felt economic stress during price rise of energy forms irrespective

Table 28 : Degree of Stress Felt by Homemakers during Energy Crisis Situations in Relation to Associated Variables

N = 260

Degree of Stress	Family Size (Members)								Family Income (Rs.)								Age of Homemakers (Years)									
	2 to 4		5 to 8		9 or more		Total		749 and below		750 - 1999		2000 & above		Total		30 and below		31 - 40		41 - 50		51 and above		Total	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
High	11	4.23	23	8.84	8	3.08	42	16.15	9	3.46	17	6.54	16	6.15	42	16.15	13	5.00	21	8.08	4	1.53	4	1.54	42	16.15
Moderate	42	16.15	107	41.16	32	12.31	181	69.62	54	20.77	80	30.77	47	18.08	181	69.62	78	30.00	70	26.92	21	8.08	12	4.62	181	69.62
Low	15	5.77	19	7.31	3	1.15	37	14.23	20	7.69	11	4.23	6	2.31	37	14.23	22	8.46	8	3.08	6	2.31	1	0.38	37	14.23
Total	68	26.15	149	57.31	43	16.54	260	100.00	83	31.92	108	41.54	69	26.54	260	100.00	113	43.46	99	38.08	31	11.92	17	6.54	260	100.00

of the SES. But majority in the low and middle SES groups felt great economic stress whereas homemakers in the high SES group felt it 'somewhat' (Appendix XIII).

Regarding household work stress, it was observed that the homemakers did not feel much stress under the situation, 'I am unable to make use of my electrical equipment due to power cut' as majority of them did not possess or use a variety of electrical equipment. But the high SES group felt the stress quite a bit as they were unable to make optimum use of their electrical equipment. Long hours of power cut and energy shortage did not affect the daily schedule of the low SES group homemakers. They generally kept a stock of substitute fuel ready to avoid tensions during energy crisis. The high SES group did not feel the stress related to kerosene shortage as majority were LPG users and did not have to stand in a queue to obtain kerosene. They could procure it easily through a known source because of their business contacts.

It was observed that the homemakers felt stress in all items related to obstructions in comfortable living style except items concerning use of energy-driven vehicle and refrigerator as majority were not possessing them. Majority experienced very high stress when they were unable to use fan / cooler / room heater and had to cook dinner in candle light due to heavy power cut.

According to SES it was found that the high SES group homemakers did not feel the necessity to rise earlier than usual to complete the morning's routine work due to energy shortage. This is because majority of them were LPG users, possessing more than one cylinder and during shortage they managed to get the LPG cylinder through known sources. Thus these homemakers did not experience much shortage of fuel energy. The low SES homemakers did not express much stress for the item 'I feel tense when there is gas/kerosene shortage as I do not get much free time for relaxing', whereas the other two groups did feel stress to some extent. This could be because majority in the low SES group were wood users and kerosene was used only as a supplementary or standby fuel. The high SES homemakers did not feel much stress when 'I have to use coal/wood/cowdung during fuel shortage as it requires additional space for storage'. Reasons attributed to this could be that space was not a problem for them, and they generally did not use these fuels even during shortage as they kept LPG cylinders and kerosene in reserve which occupy less space. This was a problem for the low and middle SES families who were residing in one or two room houses.

On the whole, the homemakers felt stress due to inability to meet family demands only for one item which was 'I feel tense when children have to complete their studies immediately after coming from school due to uncertainty of electricity

at night' whereas other items did not create much stress feelings. All the three SES groups faced this stress but in families where the children were very small or had no school or college going children, the stress was nil. The middle and high SES group homemakers felt stress as they were not able to enjoy watching the television or listening to tape recorder/radio due to power cut but it did not affect the low SES homemakers as majority of them did not possess such recreational items. Situations, I feel tense... 'when I am not able to satisfy my children's demands for special food because of energy shortage'; 'when I am not able to entertain friends frequently at home due to energy shortage which affects our social life'; 'when I am unable to pursue all my interests in order to save on fuel consumption'; and 'when I have to decrease outdoor entertainments due to high cost of petrol' were not stressful irrespective of the different SES groups. This is because the social gatherings and outdoor recreations were already less for the respondent families. Neither did they have such interests which involved use of energy. Hence, stress was not felt under those situations.

5. Coping Behaviour of Families during Energy Crisis Situations

During energy crisis situations, many families face stressful times as they attempt to make adjustments to cope up with the crisis in order to reduce stress. The coping measures

adopted by families during the various crisis situations in relation to cooking fuels, petrol and electricity was studied.

5a. Different Coping Measures Adopted

The percentage of homemakers adopting the different types of coping measures and the mean number of measures adopted during the various energy crisis situations were determined. These were obtained by summing up the scores to the responses of all respondents on one type of measure and then dividing it by the number of respondents.

5a(i) Cooking Fuel Scarcity and Price Rise :

During scarcity of cooking fuels, larger number of respondents (61.92 percent) adopted conservation measures as compared to those adopting substitution/supplementary and adjustment measures (Table 29). When compared according to SES, it was observed that more percent of homemakers in the high SES group adopted substitution/supplementary and conservation measures as compared to the other two groups. Fifty percent respondents in the low SES group adopted adjustment measures whereas it was less than fifty percent for the middle and high SES group (Figure 10).

During price rise situation, similar pattern was observed as seen for scarcity of cooking fuels but the percentages decreased. The difference in the fall of the percentages was

Table 29 : Different Types of Coping Measures adopted by Households during Fuel Crisis

Types of coping measures	Possible number of measures	Fuel Scarcity				Fuel Price Rise			
		Socio-economic Status			Total (N=260)	Socio-Economic Status			Total (N=260)
		Low (N=50)	Middle (N=120)	High (N=90)		Low (N=50)	Middle (N=120)	High (N=90)	
		f %	f %	f %	f %	f %	f %	f %	f %
1. Substitution/ Supplementary measures	4	20 40.00 (1.60)	46 38.33 (1.54)	43 47.78 (1.89)	109 41.92 (1.67)	13 26.00 (1.04)	41 34.17 (1.35)	41 34.17 (1.34)	95 36.54 (1.29)
2. Adjustment measures	6	25 50.00 (2.96)	51 42.50 (2.57)	39 43.33 (2.61)	115 44.23 (2.66)	25 50.00 (2.94)	47 39.17 (2.36)	33 36.67 (2.20)	105 40.38 (2.42)
3. Conservation measures	17	25 56.00 (9.38)	73 60.83 (10.38)	60 66.67 (11.40)	161 61.92 (10.54)	28 56.00 (9.38)	72 60.00 (10.21)	58 64.44 (11.03)	158 60.77 (10.33)

(Figures in parentheses indicate mean number of coping measures adopted)

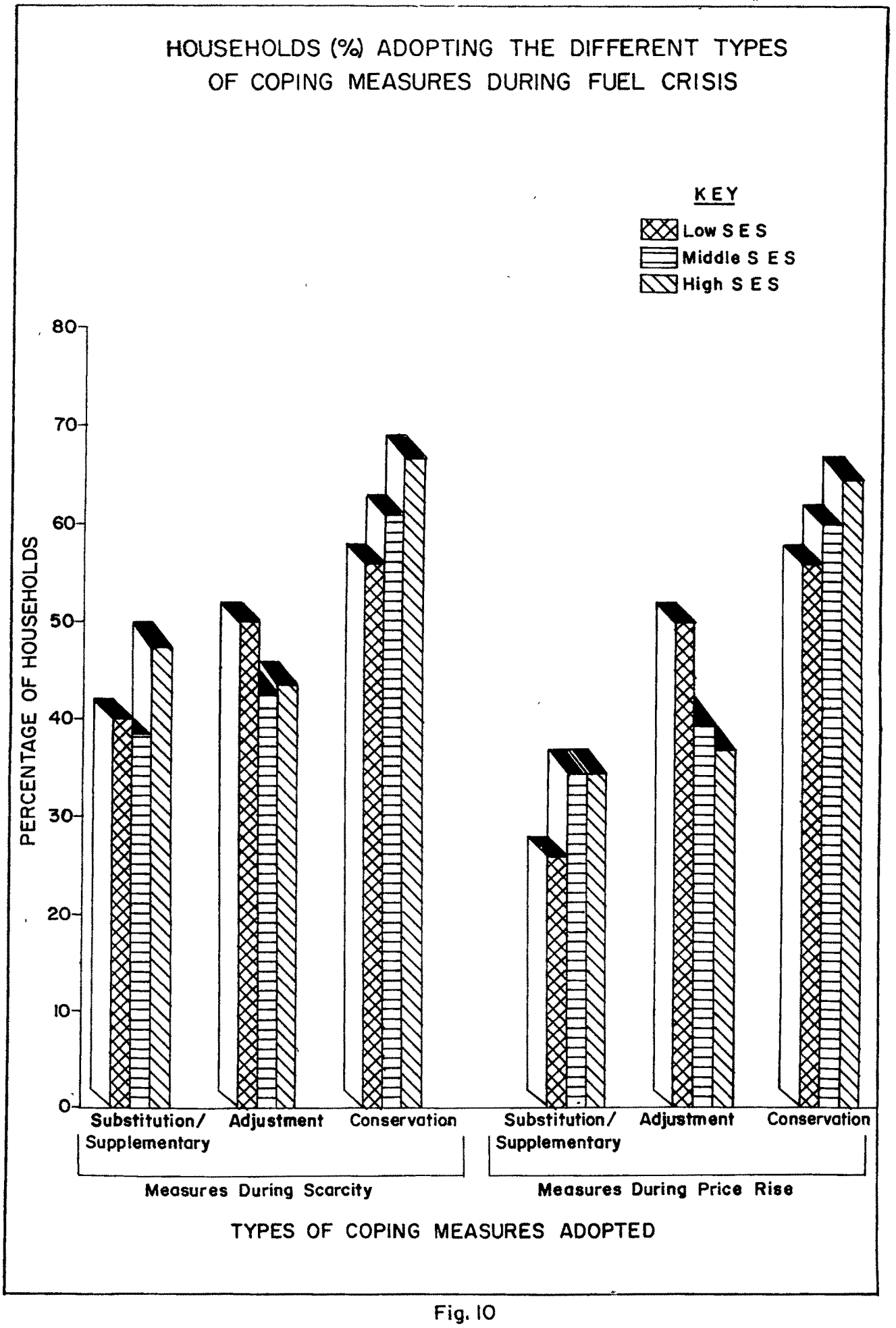
HOUSEHOLDS (%) ADOPTING THE DIFFERENT TYPES OF COPING MEASURES DURING FUEL CRISIS
KEY
Low S E S
Middle S E S
High S E S
PERCENTAGE OF HOUSEHOLDS
80
70
60
50
40
30
20
10
0
Substitution/ Supplementary
Adjustment
Conservation
Substitution/ Supplementary
Adjustment
Conservation
Measures During Scarcity
Measures During Price Rise
TYPES OF COPING MEASURES ADOPTED

Fig. 10

more prominent in case of high SES group than in the low and middle SES groups.

It is concluded that on the whole, more percentage of respondents adopted substitution/supplementary and adjustment measures during scarcity than during price rise. Conservation measures were practised by majority irrespective of the two crisis situations. Though it was expected that the low and middle SES families will adopt more conservation measures but it was not found to be so under both situations. This could be due to lack of knowledge about the conservation methods and less scope for conservation as their energy consumption was already low.

In case of mean number of coping measures adopted, it was found that under both crisis situations, less than half of the substitution/supplementary and adjustment measures were adopted by families, whereas more than half of the conservation measures listed were practised by the homemakers (Table 29).

Mean number of substitution/supplementary measures were more in case of high SES group during scarcity and for middle and high SES groups during price rise. Mean number of adjustment measures was more for low SES households than the other two. As regards conservation measures, comparatively more number of them were practised by high SES households.

Not much difference was found between the mean number of coping measures adopted during scarcity and price rise.

5a(ii) Petrol Scarcity and Price Rise :

Petrol was utilized by only 26.54 percent families in the total sample as reported earlier. During both crisis situations, 82.61 percent families using petrol adopted conservation measures than substitution/supplementary and adjustment measures (Table 30). Comparatively, majority (75 percent and 62.50 percent) in the middle SES group adopted substitution/supplementary and adjustment measures, respectively, than the high SES households during both scarcity and price rise of petrol (Figure 11).

No marked difference was observed in the percentage of homemakers adopting the various coping measures during the two petrol crisis situations.

About three-fourths of the conservation measures, more than half of the substitution/supplementary measures and less than half of the adjustment measures were adopted by families as coping measures during scarcity and price rise of petrol (Table 30). In comparison, middle SES households were found to adopt more number of all the three types of coping measures than the high SES households during both the crisis situations.

There was no noticeable difference in the mean number of different coping measures adopted during scarcity and price

Table 30 : Different Types of Coping Measures adopted by Households during Petrol Crisis

Types of coping measures	Possible number of measures	Petrol Scarcity			Petrol Price Rise		
		Socio-Economic Status		Total	Socio-Economic Status		Total
		Middle (N=16)	High (N=53)	(N=69)	Middle (N=16)	High (N=53)	(N=69)
		f %	f %	f %	f %	f %	f %
1. Substitution/ Supplementary measures	2	12 75.00 (1.50)	29 54.72 (1.08)	41 59.42 (1.17)	10 62.50 (1.25)	27 50.94 (1.00)	37 58.63 (1.06)
2. Adjustment measures	4	10 62.50 (2.38)	21 39.62 (1.57)	31 44.93 (1.75)	9 56.25 (2.31)	22 41.51 (1.62)	31 44.93 (1.78)
3. Conservation measures	15	13 81.25 (12.13)	44 83.02 (12.45)	57 82.61 (12.38)	13 81.25 (11.88)	44 83.02 (11.79)	57 62.61 (11.81)

(Figures in parentheses indicate mean number of coping measures adopted)

HOUSEHOLDS (%) ADOPTING THE DIFFERENT TYPES OF COPING MEASURES DURING PETROL CRISIS

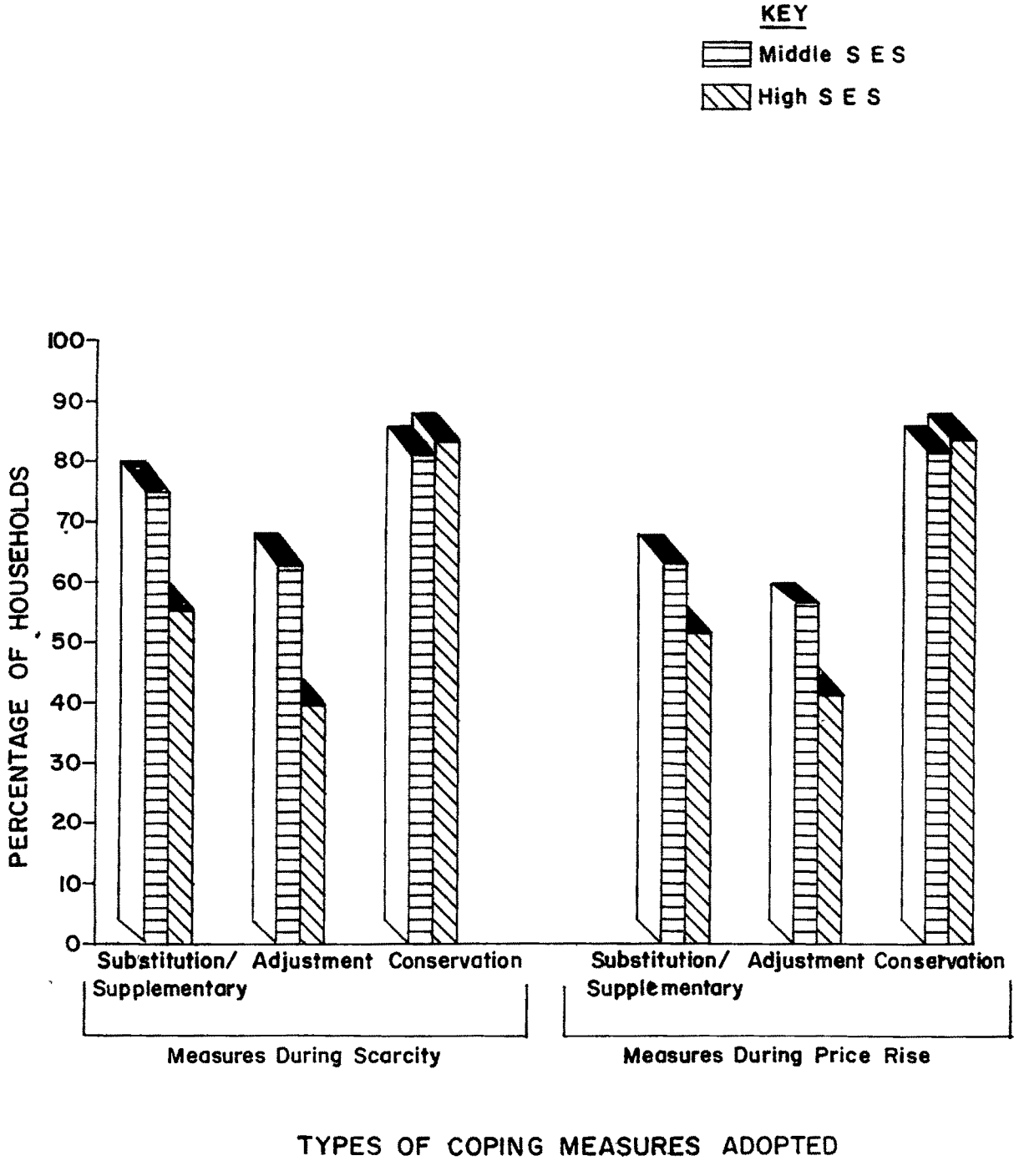

Fig. II

rise of petrol. High cost of petrol may be one of the reasons for using more conservation measures.

5a(iii) Electricity Scarcity and Price Rise :

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 and substitution/supplementary measures than during price rise (Table 31).

When compared SES wise, substitution/supplementary and conservation measures were adopted by 43.33 percent and 62.22 percent of homemakers, respectively, in the high SES group. But adjustment measures were practised by 65.25 percent and 50 percent households belonging to the middle SES group during scarcity and price rise situations, respectively. More than fifty percent homemakers in all the three SES groups adopted conservation measures during electricity crisis (Figure 12).

It may be concluded that more percentage of households substituted/supplemented and made adjustments during power cut than during price increase of electricity. Electricity conservation was generally followed regardless of the crisis.

The data on mean number of coping measures adopted revealed that during power cut, two out of six substitution / supplementary measures; 2.30 out of four adjustment measures, and 5.14

Table 31 : Different Types of Coping Measures adopted by Households during Electricity Crisis

Types of coping measures	Possible number of measures	Power cut				Electricity Price Rise			
		Socio-Economic Status			Total	Socio-economic Status			Total
		Low (N=45)	Middle (N=118)	High (N=90)	(N=253)	Low (N=45)	Middle (N=118)	High (N=90)	(N=253)
		f %	f %	f %	f %	f %	f %	f %	f %
1. Substitution/ supplementary measures	6	12 26.67 (1.48)	38 32.20 (1.88)	39 43.33 (2.62)	89 35.18 (2.06)	5 11.11 (0.56)	14 11.86 (0.68)	16 17.78 (1.09)	35 13.83 (0.80)
2. Adjustment measures	4	27 60.00 (2.16)	77 65.25 (2.57)	46 51.11 (2.03)	150 54.29 (2.30)	24 53.33 (1.92)	59 50.00 (1.97)	29 32.22 (1.28)	112 44.27 (1.72)
3. Conservation measures	8	24 53.33 (4.30)	69 58.47 (5.15)	56 62.22 (5.59)	149 58.89 (5.14)	24 53.33 (4.32)	71 60.17 (5.36)	58 64.44 (5.84)	153 60.47 (5.33)

(Figures in parentheses indicate mean number of coping measures adopted)

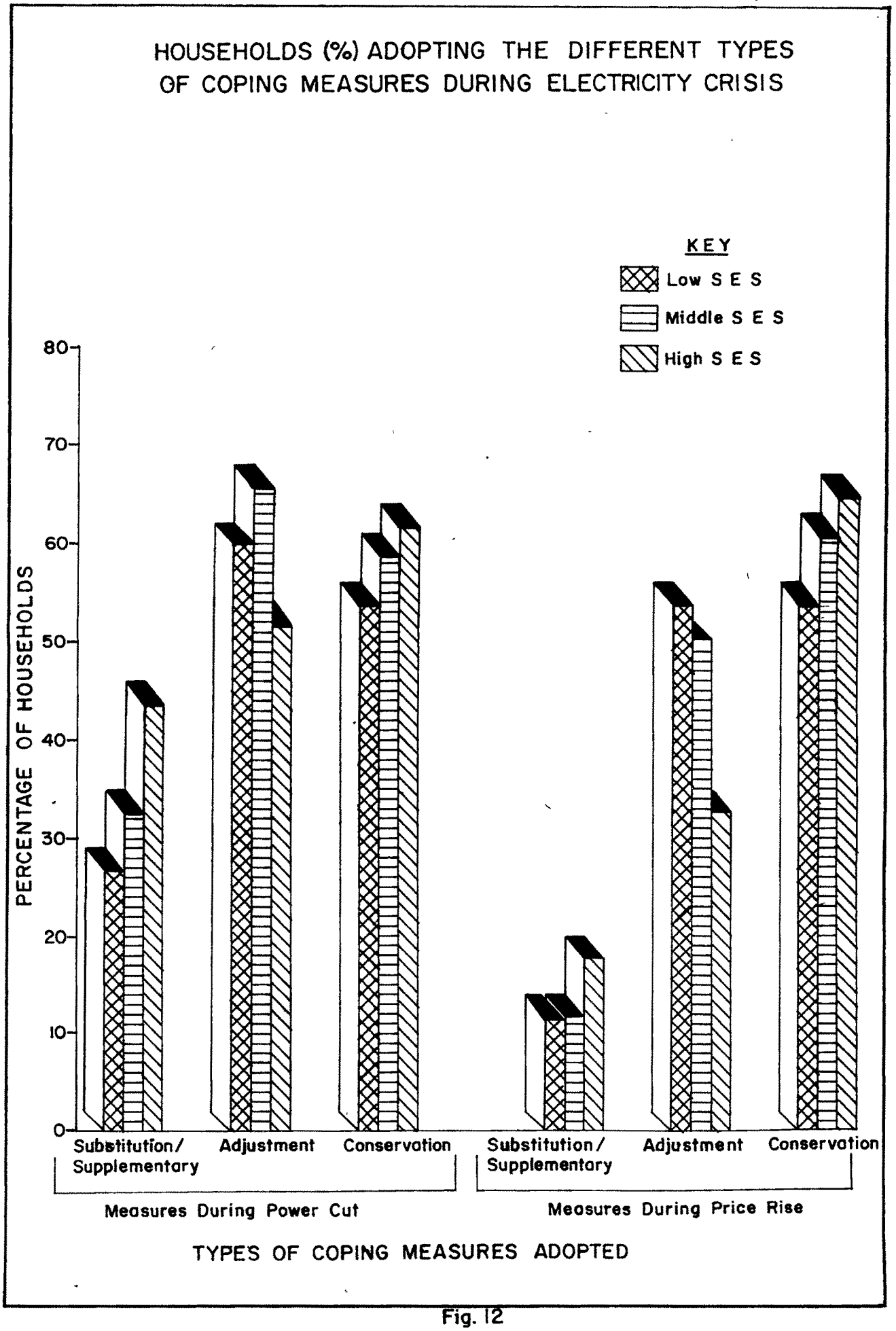
HOUSEHOLDS (%) ADOPTING THE DIFFERENT TYPES OF COPING MEASURES DURING ELECTRICITY CRISIS
KEY
Low S E S
Middle S E S
High S E S
PERCENTAGE OF HOUSEHOLDS
80
70
60
50
40
30
20
10
0
Substitution/ Supplementary
Adjustment
Conservation
Substitution/ Supplementary
Adjustment
Conservation
Measures During Power Cut
Measures During Price Rise
TYPES OF COPING MEASURES ADOPTED

Fig. 12

out of eight conservation measures were followed by the homemakers (Table 31). The difference in the mean number of different coping measures adopted by the three SES groups was not much. The mean number of substitution/ supplementary measures adopted were less for the low and middle SES groups as they did not possess and use many electrical goods.

During price rise of electricity, families generally did not substitute/supplement, but adopted two out of four adjustment measures; and 5.33 measures out of nine conservation measures.

5b. Number of Coping Measures adopted during Crisis of Different Energy Forms in Relation to Associated Variables

Further analysis was done to determine the number of coping measures adopted by families during scarcity and price rise of different forms of energy and their association with different variables. Twenty-eight possible coping measures were listed under cooking fuels crisis; twenty-one under petrol crisis; and eighteen possible measures under electricity crisis. Homemakers indicated the measures they adopted during each of the crisis situations.

5b(i) Cooking Fuel Shortage and Price Rise :

Data revealed that 56.54 percent homemakers employed more than fourteen coping measures during scarcity of fuels and less than fifteen measures during price rise. It was found that on the whole 46.15 percent homemakers belonged to the middle SES group; 41.54 percent had a family income between Rs. 750 to Rs. 1,999; and 57.31 percent homemakers had a family size of 5 to 8 members (Table 32). Further, 43.46 percent homemakers were below 31 years in age; three-fourths of them were educated upto school level; 72.31 percent showed average perception about the energy crisis; and 69.62 percent homemakers experienced moderate stress during fuel crisis. The coping behaviour of families according to each of the variables is discussed herewith.

Socio-economic status : It was observed that the coping behaviour of middle and high SES groups was different during the two situations. During scarcity of fuel, 24.61 percent middle and 25.39 percent high SES families adopted large number of coping measures whereas during price rise of fuels, percentage of users and the numbers of coping measures adopted decreased. Fuel being an essential commodity, they used it in the quantity they could afford. Thus, price rise did not seem to affect most of the families belonging

Table 32 : The Number of Coping Measures adopted by Respondents during Fuel Crisis according to Associated Variables

N = 260

Associated Variables	NUMBER OF COPING MEASURES ADOPTED					
	During Fuel Scarcity			During Fuel Price Rise		
	1 to 14 (%)	15 to 29 (%)	Total (%)	1 to 14 (%)	15 to 28 (%)	Total (%)
1. Socio-Economic Status :						
(a) Low	12.69	6.54	19.23	13.85	5.38	19.23
(b) Middle	21.54	24.61	46.15	24.23	21.92	46.15
(c) High	9.23	25.39	34.62	18.46	16.16	34.62
2. Family Income (Rs.) :						
(a) 749 and below	18.94	13.08	31.92	19.23	12.69	31.92
(b) 750 to 1999	16.54	25.00	41.54	23.08	18.46	41.54
(c) 2000 and above	8.08	18.46	26.54	14.23	12.31	26.54
3. Family Size (Members) :						
(a) 2 - 4	13.07	13.08	26.15	15.38	10.77	26.15
(b) 5 - 8	21.93	35.38	57.31	31.16	26.15	57.31
(c) 9 and more	8.46	8.08	16.54	10.00	6.54	16.54
4. Education of Homemakers :						
(a) Illiterate	7.69	3.08	10.77	8.08	2.69	10.77
(b) School Education	31.92	43.08	75.00	40.00	35.00	75.00
(c) College Education	3.85	10.38	14.23	8.46	5.77	14.23
5. Age of Homemakers (Years) :						
(a) 30 and below	20.38	23.08	43.46	27.69	15.77	43.46
(b) 31 - 40	15.39	22.69	38.08	19.23	13.35	39.08
(c) 41 and above	7.69	10.77	18.46	9.62	8.84	18.46
6. Perception of Homemakers :						
(a) Good	3.08	10.00	13.08	4.62	8.46	13.08
(b) Average	28.95	43.46	72.31	38.46	33.85	72.31
(c) Poor	11.53	3.08	14.61	13.61	1.15	14.61
7. Stress Felt :						
(a) High	3.46	12.69	16.15	4.62	11.53	16.15
(b) Moderate	29.62	40.00	69.62	40.00	29.62	69.62
(c) Low	10.38	3.85	14.23	11.92	2.31	14.23

HOUSEHOLDS (%) ADOPTING NUMBER OF COPING MEASURES DURING FUEL CRISIS

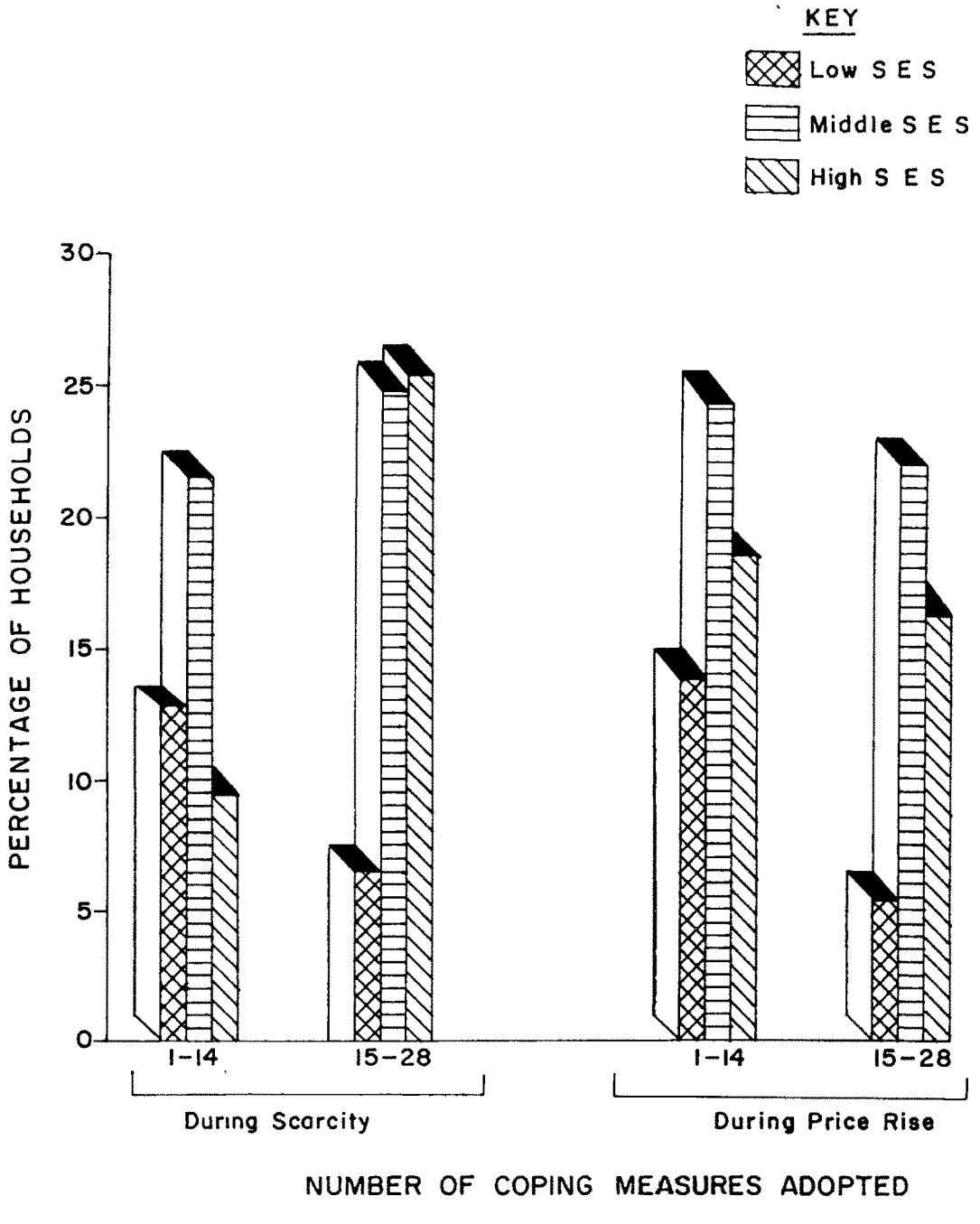

Fig. 13

to these two SES groups. Most of the low SES homemakers employed less than fifteen coping measures under both the crisis situations (Figure 13). As most of them used only one main fuel, i.e. firewood, therefore, few substitution/ supplementary and adjustment measures were sometimes employed. Measures such as : 'cooking in large quantities at a time and storing the prepared food in the refrigerator' and 'using electric hot plate for specific purpose' were not adopted by them as they did not possess these equipment. 'Having one meal outside the home'; 'using more of pre-prepared/canned foods'; and 'getting fuel in black rate' were some of the ways which were impracticable for the low SES group families because of economic reasons. Hence, used less number of measures.

Family Income : Households with family income of more than Rs. 750 exhibited different behaviours during both types of crisis situations. Most of them adopted more than fourteen coping measures during scarcity of fuels and less number of measures during price rise. But about 19 percent of respondents having income less than Rs. 750 practised less than fifteen measures under both crisis situations. Many coping measures were not applicable for the low income families, hence they adopted just a few measures as compared to the other two income groups.

Family Size : During fuel scarcity, 35.38 percent homemakers with a family size of 5 to 8 members adopted more than fourteen coping measures. No difference was found in the number of measures adopted by the small size and large size families. During price rise of cooking fuel, most of the homemakers having different family size practised less number of measures.

This again indicates that the increase in price did not affect the usual behaviour of most of the families. Reasons may be that coping with the price rise was within their limits and they could afford to purchase the required quantity of fuels to meet the requirements of all members of the family.

Education of Homemakers : During cooking fuel shortage, 43.08 percent homemakers with school education and 10.38 percent with college education adopted more than fourteen coping measures whereas most of the illiterate homemakers employed less than fifteen measures (Table 32). During price rise, irrespective of educational level, most of the homemakers (56.54 percent) adopted less than fifteen measures. This differential behaviour during scarcity and price rise indicates the preference for comfort and convenience in doing household tasks. Among the illiterate homemakers, this

behaviour may have resulted due to lack of knowledge regarding the various conservation methods and the financial constraints to purchase energy efficient stoves or time and fuel saving equipment.

During each crisis situation, the coping behaviour of educated homemakers was different, whereas the illiterate homemakers displayed no difference in their behaviour.

Age of Homemakers : During scarcity of cooking fuels, most of the homemakers (56.54 percent) adopted more than fourteen coping measures independent of their age. During price rise, majority adopted less measures, out of which 27.69 percent were young homemakers. Almost equal percentage of homemakers above 30 years of age were found adopting different numbers of coping measures.

Perception of Homemakers : During scarcity it was observed that one-tenth of the homemakers with good perception and 43.46 percent with average perception adopted more than fourteen measures whereas 11.53 percent with poor perception adopted less number of measures. During price rise, the behaviour of homemakers varied slightly. More homemakers having average perception (38.46 percent) adopted less than fifteen coping measures in this situation, but most homemakers with good and poor perception exhibited similar behaviour as they showed during fuel shortage.

Stress Felt : During scarcity of fuel, 12.69 percent and 40 percent families experiencing high and moderate stress respectively, adopted more number of coping measures whereas 10.38 percent families facing low stress employed less number of measures. During price rise, 11.53 percent homemakers experiencing high stress adopted more number of measures and those feeling moderate and low stress were employing less number of coping measures.

The coping behaviour exhibited by families experiencing high and low stress during the two crisis situations was similar but varied for those feeling moderate stress.

Family Values : Family values was considered as one of the independent variables in studying the family managerial behaviour. The coping behaviour of families was assumed to be influenced by the energy-related values specifically, economy, comfort and convenience and social status, held by families. Thus the family's energy related-values and their influence on the number of coping measures adopted was investigated. The value for economy was associated with the number of conservation measures adopted. The value for comfort and convenience, and social status was seen in relation to number of substitution/supplementary and adjustment measures selected as alternatives.

Value for Economy : About three-fourths of respondents (73.85 percent) ranked economy at positions other than first or second. During both scarcity and price rise of cooking fuels, majority of respondents (82 to 86 percent) adopted more than eight number of conservation measures irrespective of ranks assigned to economy (Table 33). Most of the conservation measures listed were the efficient cooking practices which the majority seemed to be following.

Value for Comfort and Convenience : Majority of respondents (96.92 percent) ranked comfort and convenience value at a lower level in the value hierarchy (Table 34). During both shortage and price rise of fuels, 55.77 percent and 72.69 percent of homemakers, respectively, used less number of substitution/supplementary and adjustment measures. It was observed that majority of them who ranked comfort and convenience at a lower position adopted less number of these coping measures. This is because some of the measures were not practical and suitable for majority of respondents.

Value for Social Status : Social status was ranked third, fourth or fifth by 86.92 percent respondents. Less than five substitution/supplementary and adjustment measures were adopted by most of the respondents during scarcity and price rise of fuels although social status was given a lower rank relative to other values.

Table 33 : The Number of Conservation Measures adopted by Respondents during Fuel Crisis according to Value for Economy

N = 260

Value for Economy	Number of Conservation Measures adopted											
	During Fuel Scarcity						During Fuel Price Rise					
	1 to 8		9 to 17		Total		1 to 8		9 to 17		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
1. Ranks first or Second	16	6.15	52	20.00	68	26.15	21	8.08	47	18.07	68	26.15
2. Other Ranks	20	7.70	172	66.15	192	73.85	26	10.00	166	63.85	192	73.85
Total	36	13.85	224	86.15	260	100.00	47	18.08	213	81.92	260	100.00

Table 34 : The Number of Substitution/Supplementary and Adjustment Measures adopted by Respondents during Fuel Crisis according to Comfort and Convenience and Social Status Values

N = 260

Value	Number of Substitution/Supplementary and Adjustment measures Adopted									
	During Fuel Scarcity						During Fuel Price Rise					
	1 to 4		5 to 11		Total		1 to 4		5 to 11		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
1. Comfort and Convenience												
Rank first or second	6	2.31	2	0.77	8	3.08	7	2.69	1	0.39	8	3.08
Other ranks	139	53.46	113	43.46	252	96.92	182	70.00	70	26.92	252	96.92
Total	145	55.77	115	44.23	260	100.00	189	72.69	71	27.31	260	100.00
2. Social Status												
Rank first or second	24	9.23	10	3.85	34	13.08	28	10.77	6	2.31	34	13.08
Other ranks	121	46.54	105	40.38	226	86.92	161	61.92	65	25.00	226	86.92
Total	145	55.77	115	44.23	260	100.00	189	72.69	71	27.31	260	100.00

From the above discussion of family values, conclusion is drawn that majority of respondents adopted more number of conservation measures and less number of substitution/ supplementary and adjustment measures during both shortage and price rise of fuels although they ranked economy, comfort and convenience, and social status values at positions below second rank.

5b(ii) Petrol Shortage and Price Rise :

Results pertinent to petrol crisis indicated that majority of families utilizing petrol (above 90 percent) were adopting more than ten coping measures during both scarcity and price rise situations. When seen in relation to the different variables, it was found that more than three-fourths of the households using petrol belonged to the high SES group; 60.87 percent had family income above Rs.2000; and 55.07 percent homemakers' family size constituted of 5 to 8 members (Table 35). School education was acquired by 66.22 percent homemakers; 46.38 percent were between 31 to 40 years in age; about three-fourths possessed average perception about the energy crisis and 62.32 percent families felt moderate stress. Families having income below Rs. 750 per month did not use petrol. All respondents having good and poor perception and experiencing high and low stress adopted more measures.

Table 35 : The Number of Coping Measures adopted by Respondents during Petrol Crisis according to Associated Variables

N = 69

Associated Variables	NUMBER OF COPING MEASURES ADOPTED					
	During Petrol Scarcity			During Petrol Price Rise		
	1 to 10 (%)	11 to 21 (%)	Total (%)	1 to 10 (%)	11 to 21 (%)	Total (%)
1. Socio-Economic Status :						
(a) Low	-	-	-	-	-	-
(b) Middle	2.90	20.29	23.19	4.35	18.84	23.19
(c) High	5.80	71.01	76.81	5.80	71.01	76.81
2. Family Income (Rs.):						
(a) 749 and below	0.00	0.00	0.00	0.00	0.00	0.00
(b) 750 - 1999	2.90	36.23	39.13	4.35	34.78	39.13
(c) 2000 and above	5.80	55.07	60.87	5.80	55.07	60.87
3. Family Size (Members):						
(a) 2 - 4	1.45	13.04	14.49	1.45	13.04	14.49
(b) 5 - 8	5.80	49.27	55.07	7.24	47.83	55.07
(c) 9 and more	1.45	28.99	30.44	1.45	29.99	30.44
4. Education of Homemakers :						
(a) Illiterate	0.00	1.45	1.45	0.00	1.45	1.45
(b) School Education	5.80	59.42	65.22	7.24	57.35	65.22
(c) College Education	2.90	30.43	33.33	2.90	30.43	33.33
5. Age of Homemakers (Years) :						
(a) 30 and below	5.80	36.23	42.03	7.24	34.79	42.03
(b) 31 - 40 years	2.90	43.49	46.39	2.90	43.48	46.38
(c) 41 and above	0.00	11.59	11.59	0.00	11.59	11.59
6. Perception of Homemakers:						
(a) Good	0.00	21.74	21.74	0.00	21.74	21.74
(b) Average	8.70	65.21	73.91	10.15	63.76	73.91
(c) Poor	0.00	4.35	4.35	0.00	4.35	4.35
7. Stress Felt :						
(a) High	1.45	30.43	31.88	1.45	30.43	31.88
(b) Moderate	5.80	56.52	62.32	7.25	55.07	62.32
(c) Low	1.45	4.35	5.80	1.45	4.35	5.80

HOUSEHOLDS (%) ADOPTING NUMBER OF COPING MEASURES DURING PETROL CRISIS

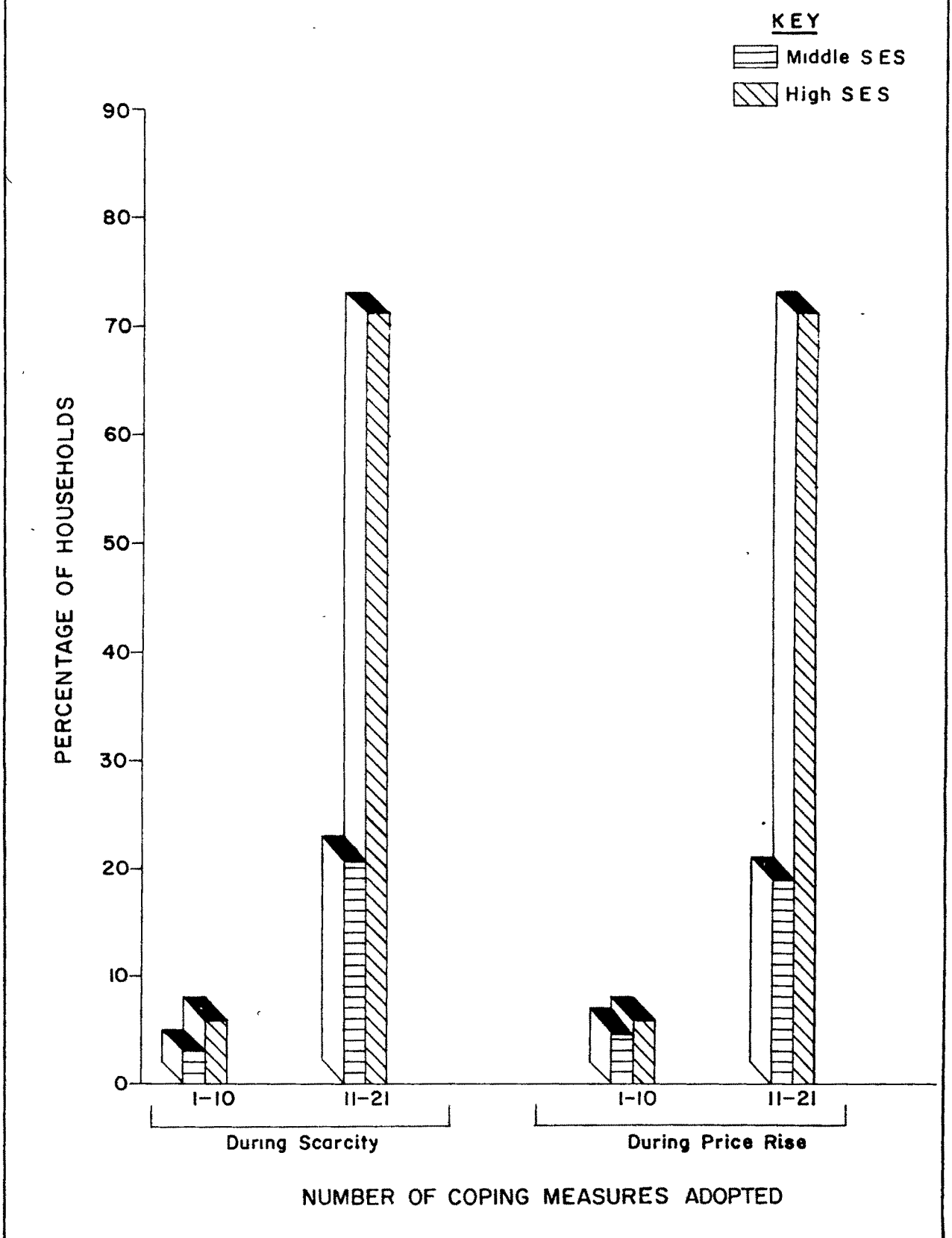

Fig. 14

Data revealed that all the seven variables studied, i.e. socio-economic status, family income, family size, education level and age of homemakers, perception of homemakers and stress felt did not influence the coping behaviour of families in relation to petrol consumption during its shortage and price rise. Irrespective of any of the variables, families adopted more number of coping measures during both crisis situations of petrol. The families were conscious about the soaring price of petrol. This behaviour may be attributed to the reason that petrol being a comparatively expensive energy form, more efforts were made by practically everyone to economise on its consumption by adopting large numbers of coping measures. Moreover, the area of survey being a small town, it was possible for them to restrict the use of their vehicles as the market and schools were easily approachable on foot. Almost all vehicle drivers reported possessing good driving habits which helps to save petrol. Since the percentage of families in the sample utilizing petrol was only 26.54 percent, therefore, no definite generalizations could be drawn regarding the factors affecting the coping behaviour during petrol crisis.

Family Values :

Value for Economy : Invariably, almost all families using petrol adopted more number of conservation measures

Table 36 : The Number of Conservation Measures adopted by Respondents during Petrol Crisis according to Value for Economy

N = 69

Value for Economy	Number of Conservation Measures Adopted											
	During Petrol Scarcity						During Petrol Price Rise					
	1 to 7		8 to 15		Total		1 to 7		8 to 15		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
1. Rank first or second	0	0.00	16	23.19	16	23.19	0	0.00	16	23.19	16	23.19
2. Other ranks	1	1.45	52	75.36	53	76.81	1	1.45	52	75.36	53	76.81
Total	1	1.45	68	98.55	69	100.00	1	1.45	68	98.55	69	100.00

Table 37 : The Number of Substitution/Supplementary and Adjustment Measures adopted by Respondents during Petrol Crisis according to Social Status and Comfort and Convenience Values.

N = 69

Values	Number of Substitution/Supplementary and Adjustment Measures adopted											
	During Petrol Scarcity						During Petrol Price Price					
	1 to 2		3 to 6		Total		1 to 2		3 to 6		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
1. Comfort and Convenience												
Ranks first or Second	0	0.00	2	2.90	2	2.90	0	0.00	2	2.90	2	2.90
Other ranks	28	40.58	39	56.52	67	97.10	28	40.58	39	56.52	67	97.10
Total	28	40.58	41	59.42	69	100.00	28	40.58	41	59.42	69	100.00
2. Social Status												
Ranks first or second	8	11.59	3	4.35	11	15.94	8	11.59	3	4.35	11	15.94
Other ranks	20	28.99	38	55.07	58	84.06	20	28.99	38	55.07	58	84.06
Total	28	40.58	41	59.42	69	100.00	28	40.58	41	59.42	69	100.00

It may be concluded that majority of families utilizing petrol adopted more number of conservation, substitution/ supplementary and adjustment measures during petrol shortage and price rise, irrespective of the ranks assigned to value of economy, comfort and convenience, and social status in the family value hierarchy.

5b(iii) Electricity Shortage and Price Rise :

Results on coping behaviour indicated that during power cut, 63.38 percent families adopted more than eight coping measures but 58.50 percent families used less number of measures in case of price rise. Power cut is imposed by the government to curtail consumption. In such a situation, households have no option than to adjust to the situation by adopting different ways to meet the crisis. Hence, majority of the families adopted more number of measures. The total picture showed that 46.64 percent respondents belonged to the middle SES group; 42.30 percent had family income between Rs. 750 to Rs. 1,999; and 57.71 percent had 5 to 8 members staying in the house (Table 38). Around three-fourths were educated upto school level, possessed average perception of the energy crisis and experienced moderate stress. 43.08 percent homemakers were young, their age being below 31 years. The coping behaviour of families according to each of the above variables is discussed herewith.

Table 38 : The Number of Coping Measures adopted by Respondents during Electricity Crisis according to Associated Variables

N = 253

Associated Variables	NUMBER OF COPING MEASURES ADOPTED DURING					
	Power Cut			Electricity Price Rise		
	1 to 8 (%)	9 to 18 (%)	Total (%)	1 to 8 (%)	9 to 18 (%)	Total (%)
1. Socio-Economic Status :						
(a) Low	8.70	9.09	17.79	13.05	4.74	17.79
(b) Middle	14.62	32.02	46.64	26.88	19.76	46.64
(c) High	9.30	27.27	35.57	18.57	17.00	35.57
2. Family Income (Rs.) :						
(a) 749 and below	15.02	15.41	30.43	21.34	9.09	30.43
(b) 750 - 1999	10.28	32.02	42.30	22.14	20.16	42.30
(c) 2000 and above	6.32	20.95	27.27	15.02	12.25	27.27
3. Family Size (Members) :						
(a) 2- 4	9.49	15.81	25.30	14.63	10.67	25.30
(b) 5 - 8	18.97	38.74	57.71	34.78	22.93	57.71
(c) 9 and more	3.16	13.83	16.99	9.09	7.90	16.99
4. Education of Homemakers :						
(a) Illiterate	4.35	5.14	9.49	6.72	2.77	9.49
(b) School education	22.93	52.96	75.89	42.29	33.60	75.89
(c) College education	4.34	10.28	14.62	9.49	5.13	14.62
5. Age of Homemakers (Years) :						
(a) 30 and below	18.57	24.51	43.08	31.62	11.46	43.08
(b) 31 - 40	9.49	28.85	38.34	18.58	19.76	38.34
(c) 41 and above	3.58	15.02	18.59	8.30	10.28	18.58
6. Perception of Homemakers :						
(a) Good	1.18	11.86	13.04	2.37	10.67	13.04
(b) Average	22.14	51.38	73.52	43.09	30.43	73.52
(c) Poor	8.30	5.14	13.44	13.04	0.40	13.44
7. Stress Felt :						
(a) High	0.79	15.81	16.60	3.95	12.65	16.60
(b) Moderate	23.32	47.43	70.75	43.08	27.67	70.75
(c) Low	7.51	5.14	12.65	11.47	1.18	12.65

(a) Socio-Economic Status : When compared according to SES groups, it was found that most of the respondents belonging to the different SES groups employed more number of coping measures during scarcity of electricity and less than nine measures during price increase (Figure 15). Data revealed that the expenditure on electricity for the low SES group was nominal (Rs. 12.78 per month). These families lived in one or two rooms houses and possessed very few electrically operated items. Therefore, they adopted less number of measures during price rise, most of them being conservation measures. Many respondents in the middle and high SES groups were not very receptive to price rise situation as they were to power cut, as they were financially better-off. Power cut was a situation which compelled them to adopt different ways as it is a situation beyond the control of households.

Family Income : Similar behaviour was observed in relation to family income as was seen for the SES variable. Independent of the income groups, the majority adopted more coping measures during power cut than during price rise. The same reasons are attributable for this behaviour as given for the SES variable.

HOUSEHOLDS (%) ADOPTING NUMBER OF COPING MEASURES DURING ELECTRICITY CRISIS

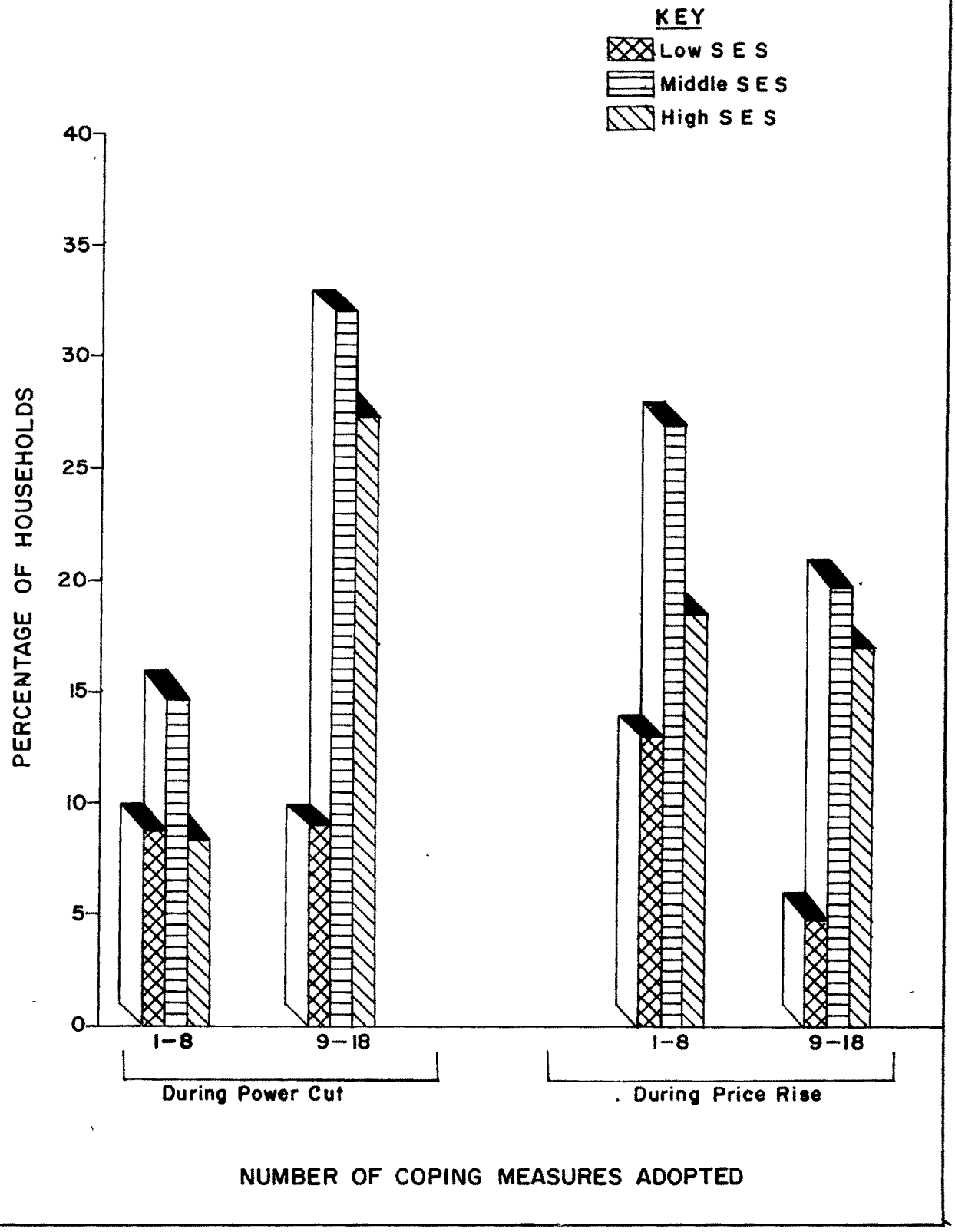

Fig.15

Family Size : It was observed that during power cut most of the families adopted more number of coping measures irrespective of the family size. It was reverse in case of price rise. The difference in the percentage of respondents using more and less measures was not much during price rise than was for the scarcity situation.

Education Level of Homemakers : During power cut, most of the homemakers with school and college education adopted more number of coping measures. When electricity charges increased they adopted less than nine measures which indicates that they were less susceptible to price increase. Almost equal percentage of illiterate homemakers adopted more and less numbers of coping measures during power cut. During price increase, most of them (6.72 percent) employed less than nine coping measures. The price increase of electricity did not seem to influence the usual behaviour of majority of respondents.

Age of Homemakers : In case of electricity shortage, the data indicated that most of the homemakers employed more than eight coping measures irrespective of their age. During

price increase of electricity, 31.62 percent of young homemakers adopted less than nine number of measures whereas most of the homemakers belonging to the other two age-groups adopted more measures, though the difference was not much.

Perception of Homemakers : It was revealed that most homemakers with good and average perception adopted more number of coping measures under both crisis situations and those with poor perception employed less than nine coping measures. This indicates that perception of the energy crisis helped homemakers to adapt to the situation in a better way by finding solutions and adopting more coping measures.

Stress Felt : It was found that 16.60 percent and 12.65 percent respondents felt high and low stress, respectively. During power cut, most of respondents experiencing high and moderate stress (15.81 percent and 47.43 percent, respectively) adopted more coping measures whereas families feeling low stress adopted less number of measures. When there was price increase in electricity charges, 12.65 percent homemakers who felt high stress employed more measures whereas most of them facing moderate and low stress used less than nine coping measures.

This observation reflects the managerial behaviour of families experiencing low and high stress. Low stress families resulted in adopting less measures and families experiencing

high stress employed a variety of different coping measures to reduce the stress created.

In conclusion it may be said that the price rise of electricity did not influence the managerial behaviour of majority of families to a great extent as they reported using less than fifty percent of the possible measures listed. It affected their behaviour in a minor way only, like being more careful to switch off lights and fans in unused rooms. Their desire for a comfortable living with good standard seemed to restrict their managerial behaviour in terms of reduction in electricity consumption. Moreover, electricity being an essential energy for lighting and cooling homes and for entertainment, it was being used in the quantity required without any concern for its shortage. These results are supported by the studies conducted by Seligman et al., (1979); George (1983); and Gandotra (1983); and Kaul (1984). During power cut, majority of families had to make some adjustments whether they wanted to or not.

Value for Economy : A similar behaviour pattern was observed in case of electricity crisis also as had been exhibited during fuel and petrol crisis. Majority of them adopted more number of conservation measures during both crisis situations but there was a noticeable difference in the percentages (Table 39). During power cut, 93.68 percent of families adopted more conservation measures whereas during price rise the percentage using more measures decreased to 72.33 percent.

Table 39 : The Number of Conservation Measures adopted by Respondents during Electricity Crisis according to Value for Economy

N = 253

Value for Economy	Number of Conservation Measures adopted											
	During Power Cut						During Electricity Price Rise					
	1 to 3		4 to 8		Total		1 to 3		4 to 8		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
1. Ranks first or second	5	1.98	58	22.92	63	24.90	21	8.30	42	16.60	63	24.90
2. Other ranks	11	4.34	179	70.76	190	75.10	49	19.37	141	55.73	190	75.10
Total	16	6.32	237	93.68	253	100.00	70	27.67	183	72.33	253	100.00

Value for Comfort and Convenience : During power cut, almost equal percentage of families (about fifty percent) adopted more and less number of substitution/supplementary and adjustment measures despite their ranking for comfort and convenience value was at a lower level. (Table 40). During price rise of electricity, 85.77 percent employed less than five measures.

Value for Social Status : Although 86.56 percent respondents ranked social status at third, fourth or fifth positions, still almost equal percentage (43 percent) employed more and less number of substitution/supplementary and adjustment measures during power cut. But when there was a price increase, more than three-fourths of respondents adopted less number of measures.

From the results on family values it can be concluded that majority of families adopted more number of various conservation measures during both shortage and price rise of electricity irrespective of the rank assigned to economy as a value. Whereas less number of substitution/supplementary and adjustment measures were adopted independent of the importance given to value for comfort and convenience, and social status.

Marked difference in percentage of respondents adopting more or less number of measures was observed in price rise

Table 40 : The Number of Substitution/Supplementary and Adjustment Measures adopted during Electricity Crisis according to Family Values

N = 253

Values	Number of Substitution/Supplementary and Adjustment Measures											
	Adopted during Power Cut						Adopted during Electricity Price Rise					
	1 to 4		5 to 10		Total		1 to 4		5 to 10		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
1. Comfort and Convenience :												
Ranks first or second	3	1.19	5	1.97	8	3.16	7	2.77	1	0.39	8	3.16
Other ranks	124	49.01	121	47.83	245	96.84	217	85.77	28	11.07	245	96.84
Total	127	50.20	126	49.80	253	100.0	224	88.54	29	11.46	253	100.0
2. Social Status :												
Ranks first or second	17	6.72	17	6.72	34	13.44	32	12.65	2	0.79	34	13.44
Other ranks	110	43.48	109	43.08	219	86.56	192	75.89	27	10.67	219	86.56
Total	127	50.20	126	49.80	253	100.0	224	88.54	29	11.46	253	100.00

situation than during power cut. This behaviour may be due to various reasons : (1) The rise in price may not be much to encourage families to adopt different measures; (2) Their value and preference for comfortable living and high social status may hinder the adoption of substitution/ supplementary and adjustment measures; (3) Electricity being an essential energy for activities such as lighting, cooling homes and for entertainment, families used it in the quantity they could afford for these activities. McNew (1980) also supports this behaviour of families. As families had no control over the power cut situation, they were compelled to adopt more number of different coping measures to cope with the situation.

5c. Coping Measures adopted during Each of the Crisis Situations

5c(i) Cooking Fuel Scarcity and Price Rise :

Majority of the households adopted mainly two out of five substitution/supplementary measures during both the crisis situations. 'Using fuel which is available along with the scarce fuel' was adopted by 88.46 percent respondents during scarcity and by 66.54 percent homemakers during price rise (Table 41). 'Managing to obtain the scarce fuel from black market' was employed by 58.46 percent and 44.62 percent families during scarcity and price rise of fuels, respectively.

Table 41 : Percentage of Respondents adopting the Various Coping Measures During Fuel Crisis

N = 260

Sr. No.	Coping Measures	Fuel Scarcity				Fuel Price Rise			
		Socio-Economic Status				Socio-Economic Status			
		Low (N=50) %	Middle (N=120) %	High (N=90) %	Total (N=260) %	Low (N=50) %	Middle (N=120) %	High (N=90) %	Total (N=260) %
	Substitution/Supplementary Measures:								
1.	Using another fuel which is available along with the scarce fuel.	96.00	88.33	84.44	88.46	96.00	71.67	43.33	66.54
2.	Using hot plate for specific purposes	0.00	4.17	15.56	7.31	0.00	4.17	7.78	4.62
3.	Keeping two gas connections	0.00	5.83	30.00	13.08	0.00	5.83	30.00	13.08
4.	Managing to get the scarce fuel from black market	64.00	55.83	58.89	58.46	8.00	53.33	53.33	44.62
5.	Making use of solar cookers and solar water heaters	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Adjustment Measures								
6.	Having at least one meal outside the home	2.00	0.83	10.00	4.23	2.00	0.00	1.11	0.77
7.	Having simple meals	98.00	99.17	98.89	98.85	98.00	97.50	98.89	98.08
8.	Decreasing the number of meals i.e. avoiding breakfast	52.00	31.67	25.56	32.31	48.00	18.33	10.00	21.15
9.	Decreasing frequency of social gatherings at home	46.00	35.83	44.44	41.15	48.00	34.17	36.67	37.69
10.	Having meals together	98.00	89.17	75.56	86.15	98.00	85.00	71.11	82.69
11.	Using more of pre-prepared tinned foods	0.00	0.00	6.67	1.54	0.00	0.83	2.22	1.15

(continued...)

(Table 41 continued)

Sr. No.	Coping Measures	Fuel Scarcity				Fuel Price Rise			
		Socio-Economic Status				Socio-Economic Status			
		Low (N=50) %	Middle (N=120) %	High (N=90) %	Total (N=260) %	Low (N=50) %	Middle (N=120) %	High (N=90) %	Total (N=260) %
	Conservation Measures								
12.	Cooking foods that require less time and fuel	78.00	78.33	68.89	75.00	78.00	75.83	50.00	67.31
13.	Cooking two meals at a time	62.00	37.50	28.89	38.46	64.00	35.83	17.78	35.00
14.	Cooking in large quantities at a time and storing in the refrigerator	0.00	3.33	4.44	3.08	0.00	0.83	3.33	1.54
15.	Using funnel and pump to pour kerosene in the stove	86.00	89.17	87.78	86.92	86.00	85.83	84.44	85.39
16.	Regularly cleaning the gas burners to maintain efficiency	8.00	51.67	90.00	56.54	8.00	51.67	91.11	56.92
17.	Trimming wicks and maintaining proper length of wicks for efficiency	4.00	8.33	22.22	12.69	4.00	9.17	22.22	12.69
18.	Adopting efficient cooking practices such as :								
	(a) Making maximum use of pressure cooker	30.00	74.17	91.11	70.77	30.00	72.50	87.78	69.62
	(b) Cooking 2 to 3 items at a time in the pressure cooker	4.00	12.50	18.89	12.69	4.00	12.50	20.00	13.46
	(c) Organising tools and utensils before starting to cook	100.00	100.00	95.56	98.46	100.00	98.33	95.56	97.69
	(d) Doing preparation of food i.e. of cutting vegetables, washing dal, rice, etc. before lighting the fire	100.00	99.17	98.89	99.23	98.00	99.17	98.89	98.85

(Continued..)

(Table 41 continued)

Sr. No.	Coping Measures	Fuel Scarcity				Fuel Price Rise			
		Socio-Economic Status				Socio-Economic Status			
		Low (N=50) %	Middle (N=120) %	High (N=90) %	Total (N=260) %	Low (N=90) %	Middle (N=120) %	High (N=90) %	Total (N=260) %
	(e) Cooking food in vessels by covering with a lid	100.00	100.00	100.00	100.00	100.00	199.07	199.00	99.62
	(f) Using vessels of correct size and shape for the quantity to be cooked	96.00	97.50	97.78	96.92	96.00	97.50	97.78	97.31
	(g) Drying utensils before keeping on fire	90.00	71.67	73.33	75.77	90.00	70.83	73.33	75.39
	(h) Reducing the flame once the food reaches the boiling point	92.00	95.83	95.56	95.00	90.00	95.00	95.56	94.23
	(i) Allowing refrigerated food to reach room temperature	2.00	6.67	44.44	18.85	2.00	6.67	42.22	18.08
	(j) Soaking pulses and legumes before cooking	78.00	76.67	71.11	73.85	78.00	75.83	72.22	75.00
	(k) Making more use of small burner of gas stove	6.00	35.00	51.11	33.85	6.00	34.17	51.11	34.62

None were found using solar cookers and solar water heaters and only 13.08 percent families possessed two gas cylinders as a supplementary measure. Only 7.31 percent homemakers made use of hot plate for specific purposes as most families did not possess it.

It was observed that 96 percent low SES families used another fuel along with the scarce fuel even during price rise of the main fuel used, to minimise expenditure on fuel. Whereas the behaviour of the middle and high SES groups varied during the two situations. Less percentage of families were found to be using this measure during price rise. Though the low SES families avoided purchasing of fuel at black rate during price rise, the middle and high SES group households continued to buy the fuel at black rate even when there was an increase in price because of the convenience in using that particular fuel.

During both the crisis situations of cooking fuels, it was observed that out of six adjustment measures listed, families were using only two, namely, 'having simple meals' (98.85 percent) and 'having meals together' (86.15 percent). 'Having at least one meal outside the home' and 'using more of pre-prepared/canned foods' were measures adopted by a negligible percentage of homemakers. The Indian food habits and lifestyle make the latter two measures unsuitable for the

majority. Moreover, financial constraints is another reason for the unsuitability of using pre-prepared/canned foods for the low and middle income families. The families surveyed had occasional social gatherings at home. Those who had frequent social gatherings, reported avoiding them as far as possible during crisis situations. 'Decreasing the number of meals like avoiding breakfast' seemed impractical for home-makers, especially in families with school and college going children. Few families did not prepare wholesome breakfast as a matter of food habit but not to cut down on fuel consumption and expenditure.

One-tenth of the high SES families were inclined to have at least one meal outside the home during scarcity of fuel but not during price rise. This is because they were not willing to use any other fuel besides the main fuel and spending money was not a problem for them to have a meal in a restaurant. The low SES families tend to decrease the number of meals during scarcity and price rise than the other two SES group families. The low and middle SES families did not use pre-prepared/canned foods at all whereas a negligible number (6.67 percent) belonging to the high SES group reported using such foods sometimes during shortage of fuel.

Majority of homemakers showed a concern about energy conservation. Three fourths of homemakers cooked food that required less time and fuel during the shortage whereas 67.31

percent homemakers employed this measure when the prices of fuels increased. To save on fuel consumption and expenditure 'cooking two meals at a time' was adopted by 38.46 percent and 35 percent of homemakers during shortage and price rise, respectively. Another measure, i.e. 'cooking in large quantities at a time and storing it in the refrigerator' was adopted by only a negligible number as they did not like to eat stale food. Moreover, this equipment was possessed by only 22.31 percent families. Majority (85 to 87 percent) used a funnel to fill kerosene in the stove under both situations. Almost all LPG users were regularly cleaning the gas burners to maintain efficiency. All homemakers using wick-type kerosene stoves were trimming the wicks and maintaining proper length of wicks as and when required for greater efficiency. Majority of homemakers adopted efficient cooking practices during both crisis situations to economise on fuel energy. Maximum use of pressure cooker was made by 70.77 percent homemakers but only 13.46 percent homemakers reported cooking of two to three items at a time in it. Pressure cooker was not possessed by 20.77 percent families as it was expensive to purchase and in some cases the husband did not enjoy the taste of the food cooked in it. Hence, optimum use of this time and fuel saving device was not made. 'Large size families' and 'lack of knowledge about the use of separaters in pressure cookers were the reasons

given by homemakers for not cooking more than one item at a time in the pressure cooker. Moreover, the pressure cookers available nowadays are not provided with the separators. They are to be bought on extra payment. The cooking practices such as, doing pre-preparation of food before lighting the fire, organizing tools and utensils before starting to cook; cooking foods in covered vessels; using vessels of correct size and shape for the quantity to be cooked; and reducing the flame once the food reaches the boiling point were followed by 95 to 100 percent home-makers. Three-fourths of homemakers dried the utensils before keeping on fire and soaked pulses and legumes for at least an hour prior to cooking. Almost all homemakers who possessed a refrigerator, followed the practice of 'allowing refrigerated food to reach room temperature' before reheating. Among the LPG users, 60.53 percent made maximum use of the small burner of the gas stove. Soaking of pulses and legumes, and use of small burner consumes less fuel', this was not known to many homemakers, therefore, this practice was less followed. Some reported of making more use of the small gas burner and reducing the flame after the food reached boiling point as food is cooked well on slow fire but not with the idea of saving fuel. In this process, two goals were attained: good quality of cooked food and fuel saving.

All the cooking practices were followed by majority in all the three SES groups. But the low SES homemakers were more particular to dry the utensils before keeping them on fire than homemakers belonging to middle and high SES groups. The middle SES homemakers made more use of small gas burner than homemakers belonging to the high SES group. Awareness of saving fuel by keeping dry utensils on fire did not exist among majority of homemakers.

In conclusion, it can be said that very few substitution/supplementary and adjustment measures were adopted by majority during scarcity and price rise of cooking fuels. Two out of five substitution/supplementary measures and two out of six adjustment measures were generally adopted. Most of the conservation measures were adopted by the majority during both situations. Two measures, namely, 'cooking two meals at a time' and 'cooking food in large quantities at a time and storing it in a refrigerator' were not commonly observed. Homemakers followed most of the efficient cooking practices to conserve energy. The least common practice was to cook more than one item at a time in the pressure cooker.

5c(ii) Petrol Scarcity and Price Rise :

The analysis was done for only those who were using petrol for transportation. Among the two substitution/supplementary measures, about three-fourths of families preferred to go on foot for short distance, during both crisis situations of petrol. During scarcity and price rise, 40.58 percent and 33.33 percent respondents respectively, reported using more of cycle than scooter/car (Table 42).

The middle SES families were more inclined to save petrol by employing the substitution/supplementary measures than the high SES families. More than fifty percent middle SES families (56.25 percent) made more use of bicycle than their own vehicle whereas only 35.85 percent families in high SES group did so only during fuel shortage. Similar behaviour was observed during price increase also but with a fall in percentages of both groups. Going on foot for short distance was adopted by 93.75 percent middle SES respondents during shortage and by 75 percent during price increase. Respondents belonging to high SES group (71.70 percent) adopted this method during both crisis situations.

In respect of adjustment measures taken, 39.13 percent and 49.28 percent families decreased their social

Table 42 : Percentage of Respondents adopting the Various Coping Measures during Petrol Crisis

N = 69

Sr. No.	Coping Measures	Petrol Scarcity				Petrol Price Rise			
		Socio-Economic Status				Socio-Economic Status			
		Low	Middle (N=16) %	High (N=53) %	Total (N=69) %	Low	Middle (N=16) %	High (N=53) %	Total (N=69) %
	Substitution/Supplementary Measures								
1.	Using more of cycle than scooter/car	-	56.25	35.85	40.58	-	50.00	28.30	33.33
2.	Going on foot for short distance	-	93.75	71.70	76.81	-	75.00	71.70	72.46
	Adjustment Measures								
3.	Decreasing social visits	-	68.75	30.19	39.13	-	62.50	32.08	39.13
4.	Decreasing outdoor recreations	-	68.75	43.40	49.28	-	62.50	45.28	49.28
5.	Using more of public transport	-	68.75	58.49	79.25	-	68.75	56.60	59.42
6.	Using own vehicle in emergency only	-	31.25	24.53	33.96	-	37.50	28.30	30.43
	Conservation Measures								
7.	Making large quantity purchase at a time to save trips	-	93.75	92.45	92.75	-	93.75	90.57	91.30
8.	Making a list of things to be done and purchased and plan the route accordingly	-	68.75	75.47	73.91	-	68.75	75.47	73.91
9.	Avoiding going out in own vehicle during crowded hours	-	37.50	56.60	52.17	-	43.75	58.49	55.07
10.	Planning shopping and recreational outings together	-	81.25	84.91	84.06	-	81.25	86.79	85.51

(Continued...)

(Table 42 continued)

Sr. No.	Coping Measures	Petrol Scarcity				Petrol Price Rise			
		Socio-Economic Status				Socio-Economic Status			
		Low	Middle (N=16)	High (N=53)	Total (N=69)	Low	Middle (N=16)	High (N=53)	Total (N=69)
		%	%	%	%	%	%	%	%
11.	Sharing vehicle with friends to save fuel	-	31.25	33.96	33.33	-	31.25	35.85	34.78
12.	Avoiding traffic lights	-	68.75	58.49	60.87	-	56.25	58.49	57.97
13.	Getting the vehicle engine checked regularly for efficiency	-	100.00	96.23	97.10	-	100.00	94.34	95.65
14.	Cleaning the air filter regularly	-	100.00	96.23	97.10	-	100.00	96.23	97.10
15.	Developing good driving habits such as :								
	(a) preventing clutch stops and break binding	-	93.75	98.11	97.10	-	93.75	98.11	97.10
	(b) Driving in correct gear always	-	100.00	100.00	100.00	-	93.75	100.00	98.55
	(c) Avoiding use of the choke longer than necessary	-	100.00	98.11	98.55	-	100.00	98.11	98.55
	(d) Driving at a steady speed	-	100.00	100.00	100.00	-	100.00	100.00	100.00
	(e) Driving between 40 to 50 kmph	-	93.75	86.79	88.41	-	87.50	86.79	86.96
	(f) Using clutch only when changing gears	-	87.50	100.00	97.10	-	87.50	100.00	97.10
	(g) Closing the engine when stopping the vehicle	-	56.25	67.92	65.22	-	50.00	66.04	62.32

visits and outdoor recreations, respectively, during both crisis situations. These measures were adopted by less number of families as majority of them indulged less in these activities. 'Using own vehicle in emergency only' was not opted by many families. Majority of families possessing scooters/motorcycle used them daily. During shortage of petrol,79.25 percent families adjusted to the situation by using more of public transport than own vehicle but with price increase, 59.42 percent families adopted this measure to decrease expenditure on petrol.

When analysed according to SES, the middle SES families were more prone to adopt the different adjustment measures than the high SES families during both the situations. Majority of the high SES families did not face financial problems, therefore, made maximum use of their vehicle but during the shortage they had to bear with the situation by finding alternative solutions.

On the whole, majority of families conserved petrol by following various methods. Ninety to ninety seven percent families followed measures like 'making large quantity purchase at a time to save trips'; 'getting the vehicle engine checked regularly for efficiency'; and 'cleaning the air filter regularly'. Planning shopping and recreational outings together was practised by 84 to 86 percent households. About

three-fourths of households formed the habit of making a list of things to be done and purchased, and accordingly planned the route to save on petrol. More than fifty percent families avoided going out in own vehicle during crowded hours and avoided traffic lights as far as possible though the problem of stopping at traffic light crossings was very little as the place of investigation was a small town. The petrol saving measure - forming car pools, was adopted sometimes by only one-third families. Large majority, 88 to 100 percent households, reported possessing good driving habits such as : preventing clutch stops and break bindings; driving in correct gear always; avoiding use of the choke longer than necessary; driving at a steady speed; driving between 40 to 50 kilometers per hour; and using clutch only when changing gears. 'Closing the engine when stopping the vehicle at red light crossings was the habit of 62 to 65 percent families. This behaviour in relation to petrol consumption was the same during shortage and price rise of petrol.

Not much difference was found between the behaviour of middle and high SES families regarding adoption of conservation measures. Almost same percentage of families belonging to the middle and high SES groups adopted the various conservation measures during both the crisis situations.

Thus, it can be concluded that using cycle more than own fuel energy-driven vehicles was a less adopted measure generally by the high SES families. High SES families were less inclined to use adjustment measures than the middle SES families. Maximum number of conservation measures were adopted by majority of families. Similar findings were reported by Ayotollahi (1980). They reported possessing good driving habits which would help to reduce on petrol consumption. Forming car pools was not a common practice among the respondents.

5c(iii) Electricity Shortage and Price Rise :

During power cut, families were compelled to adopt alternatives. A substitute fuel was used for heating water by 13.04 percent families during power cut (Table 43). This low percent is because only eight families in the middle SES group and thirty families in high SES group were heating water with electricity in winter season. For some families it was a routine to have cold water bath and some families adopted this measure during power cut only. When electricity charges increased or electricity bill was high, only 6.92 percent families switched over to other fuels for heating water. More than fifty percent (54.69 percent) families using radio reported using

Table 43 : Percentage of Respondents adopting the Various Coping Measures During Electricity Crisis

Sr. No.	Coping Measures	Power Cut				Electricity Price Rise			
		Socio-Economic Status				Socio-Economic Status			
		Low (N=45) %	Middle (N=118) %	High (N=90) %	Total (N=253) %	Low (N=45) %	Middle (N=118) %	High (N=90) %	Total (N=253) %
	Substitution/Supplementary Measures								
1.	Using wood/coal/kerosene/gas for heating water instead of electricity	-	4.24	31.11	13.04	-	2.54	15.56	6.92
2.	Having cold water bath	44.44	29.66	22.22	29.64	44.44	22.88	18.89	25.30
3.	Using more of transistor than radio	8.89	22.03	44.44	27.67	8.89	18.64	33.33	22.13
4.	Using coal angithi to keep warm in winter	-	3.39	10.00	5.14	-	5.93	8.89	5.93
5.	Getting clothes ironed from 'Dhobi'	11.11	35.59	55.56	38.34	8.89	19.49	32.22	22.13
6.	Cooking in candle light or kerosene lamp	100.00	96.61	98.89	98.02	-	-	-	-
	Adjustment Measures								
7.	Wearing unironed clothes	28.89	56.78	36.67	44.66	26.67	44.92	14.44	30.83
8.	Sleeping in open during summer to save on electricity	66.67	75.42	58.89	67.98	62.22	60.17	43.33	54.55
9.	Making children study before dark	75.55	71.19	70.00	71.54	60.00	50.85	47.78	51.38
19.	Preparing dinner before dark	68.89	57.63	37.78	52.57	64.44	44.07	22.22	39.92

(Continued...)

(Table 43 continued)

Sr. No.	Coping Measures / Conservation Measures	Power Cut: Socio-Economic Status: Low (N=45) %	Middle (N=118) %	High (N=90) %	Total (N=253) %	Electricity Price Rise: Socio-Economic Status: Low (N=45) %	Middle (N=118) %	High (N=90) %	Total (N=253) %
11.	Working together in one or two rooms to decrease consumption	100.00	91.53	77.78	88.14	100.00	90.68	81.11	88.93
12.	Reducing light intensities where possible	100.00	95.76	85.56	92.89	100.00	94.92	85.56	92.49
13.	Switching off lights and fans before leaving the room	97.78	94.92	92.22	94.47	97.78	94.07	93.33	94.47
14.	Decreasing the use of electrical equipments	28.89	54.24	52.22	49.01	31.11	53.39	54.44	49.80
15.	Storing the ice set in the fridge in ice box for the day	0.00	1.69	77.78	7.11	0.00	2.54	7.78	3.95
16.	Using more of tube lights than bulbs	28.89	40.68	66.67	47.83	24.44	42.37	66.67	47.83
17.	Checking appliances for maintaining efficiency	26.67	43.22	88.89	56.52	26.67	44.92	88.89	57.31
18.	Checking the meter occasionally whether it gives proper reading or not and which appliances consume more energy	-	-	-	-	6.67	44.92	51.11	40.32
19.	Doing maximum work during the day time	95.56	89.83	77.78	86.56	93.33	77.12	55.56	72.33

transistor instead of radio during power cut; rest did without it. But to keep the electricity bill low, only 43.75 percent families made more use of transistor than radio. Very few families (16.15 percent) used room-heater to keep themselves warm in winter season. During power cut and price rise, a low percentage of families substituted it with coal 'angithi'. Majority of households as a routine were getting the clothes ironed from a 'dhobi'. Out of those using electric iron, 62.58 percent and 36.13 percent households got the clothes ironed from a 'dhobi' during power cut and price rise of electricity, respectively. Families wore unironed clothes at home generally. Ninety-eight percent homemakers did cooking in candle light or under kerosene lamp during power cut as there was no other choice and the rest prepared the food before dark to avoid inconveniences.

Comparatively, most of the high SES families used a substitute fuel to heat water during both situations as very few of them opted for the alternative of having a cold water bath. Moreover, these families were using electricity for heating water. Again, the high SES families made more use of transistor than radio. As the transistor batteries are expensive, majority in the low and middle SES groups did not adopt this measure. They listened to the radio

when there was electricity or did not do so when there was power cut. More middle SES families used coal 'angithi' instead of room heater to warm themselves up in winter than the high SES families. During scarcity, majority (55.56 percent) belonging to the high SES group got their clothes ironed from the 'dhobi' as compared to the other two groups.

About 45 percent of the families made adjustment by wearing unironed clothes during power cut, whereas only 30.83 percent adopted this measure to cut down on electricity bill. Sixty eight percent families during power cut and 54.55 percent families during price rise situation slept in the open courtyard during summer to cope with the power cut and save on electricity. More percent of homemakers during power cut (71.54 percent) than during price rise (51.58 percent) reported that children completed their studies before dark. Similarly, 52.57 percent homemakers prepared dinner before dark anticipating power cut and less percent did so during price rise of electricity.

The middle SES families (56.78 percent) adjusted to the crisis situations by wearing unironed clothes when necessary but very few in the high SES group did so. As very few families in the low SES group possessed and were using iron for ironing clothes, hence the percentage of households adopting this measure was low compared to the other two groups.

The high income families were less inclined to save electricity by sleeping in the open yard during summer than the other two groups. During price rise, the children completed their studies before dark not only with the intention of decreasing electricity consumption but because the voltage of light was quite low which affected the eyesight. To cope with the situation of uncertainty of electricity at night, 71.54 percent homemakers reported that the children completed their studies before dark. The percentage of families adopting this measure was comparatively more for low SES families and less for high SES families. Majority in the low SES group prepared dinner before dark than in the middle and high SES group families. Some practised this measure as a habit and some to avoid strain caused by working in the candle light or dim light due to low voltage.

A large majority (88.14 to 94.47 percent) of homemakers reported working in one or two rooms to decrease the electricity consumption, reducing light intensities where possible, and switching off lights and fans before leaving the room under both crisis situations. These are the general conservation practices irrespective of crisis situation. About fifty percent households used more of fluorescent tubes than filament bulbs. Anticipating power cut, 86.56 percent families adopted the practice of doing maximum work during the daytime whereas during price increase, 72.33 percent

families used this option. Of those who possessed electrical equipment, more than two-thirds of them decreased the use of electrical equipment during scarcity and price rise of electricity. A higher percentage of respondents, more than three-fourths, regularly checked their appliances for maintaining efficiency. The practice of 'checking the electric meter occasionally whether it gives proper reading or not and which appliances consume more energy' was the habit of 40.32 percent families. During long hours of power cut, 7.11 percent homemakers removed the ice cubes set in the refrigerator and stored them in a ice box for use during the day in extreme summer season. As few households possessed refrigerator, hence the figure is low.

The low SES families and majority in the middle SES group were living in one or two room houses, hence worked together in one or two rooms. Moreover, they used appropriate watts bulbs according to the activity area. Again, these families were more particular to switch off lights and fans in an unused room than the high SES families. They also decreased the use of electrical equipment. The high SES families used more fluorescent tubes than filament bulbs as compared to the middle and low SES households. This is because the high SES families could afford to get them installed. The low and middle SES families preferred to use 40 and 60 watts bulbs than invest money on fluorescent tubes.

It may be concluded from the above discussion that majority of homemakers were inclined to use more coping measures during power cut than during price rise. More of low and middle SES families made efforts to decrease electricity consumption than the high SES families.

Besides the above, other measures were also adopted to meet the increased cost of energy forms used. Data revealed that 52.31 percent respondents reduced expenses on other items to pay for the increased cost of energy; 47.31 percent respondents used another cheap fuel along with the main fuel; 36.92 percent met the increased expenditure of energy from the savings; 13.08 percent families used more of the fuel which was available at no cost to them; and only a minority (3.85 percent) were doing a job or an income generating activity at home (Table 44).

Table 44 : Percentage of Respondents adopting the Different Coping Measures to meet the Increased Cost of Energy Forms

N = 260

Sr. No.	Coping Measures	Socio-Economic Status			
		Low (N=50) %	Middle (N=120) %	High (N=90) %	Total (N=260) %
1.	Cut down expenses on other items to pay for the increased cost of energy	74.00	60.83	28.89	52.31
2.	Take up a job/start income generating activity at home to meet the increased expenditure	6.00	5.00	1.11	3.85
3.	Use savings for meeting the expenditure	42.00	32.50	40.00	36.92
4.	Use another cheap fuel along with the main fuel	84.00	50.83	22.22	47.31
5.	Use more fuel which is available at no cost	10.00	19.17	6.67	13.08

When compared according to SES, less families in the high SES group made adjustments in their budget for meeting the increased expenditure on energy as compared to the other two SES groups. Neither did they feel the necessity of taking up a job or starting an income generating activity at home, or using a cheap subsidiary fuel or fuel available at no cost along with the main fuel as finance was not a constraint for them. Very few homemakers in the low and middle SES were doing a job to meet the increased expenditure. It was the low SES families followed by middle SES households who encountered more of economic problems due to price rise of energy than the high SES families. Using more of the fuel which is available at no cost was not a common practice.

6. Decisions for the Future in Relation to Energy Use

The decisions families take in relation to energy use has its implications on future energy availability and price. Families and individuals must have the ability to foresee long-term consequences of the energy decisions taken by them. As the energy resources are fast depleting, it is essential for families to take such decisions which will help to avoid long-term consequences. Responses were obtained from respondents regarding certain line of actions they were planning to follow.

Out of the seven different strategies to reduce energy consumption, 'planning for a small family' was opted by 90 to 95 percent respondents in all the three SES groups. They were aware that small families will have less demand on energy consumption and expenditure, hence were in favour of it (Table 45). 'Making more use of public transport to decrease

Table 45 : Decisions taken by Families to avoid Future Consequences

Decisions	Socio-Economic Status						Total (N=260)	
	Low (N=50)		Middle (N=120)		High (N=90)			
	f	%	f	%	f	%	f	%
1. Making more use of cycle	0	0.00	10	8.33	18	20.00	28	10.77
2. Planning to use solar energy	29	58.00	76	63.33	48	53.33	153	58.85
3. Planning to use bio-gas energy	27	54.00	56	46.67	30	33.33	113	43.46
4. Making more use of public transport	48	96.00	113	94.17	75	83.33	236	90.77
5. Planning for a small family	46	92.00	109	90.83	86	95.56	241	92.69
6. Making less use of electrical equipment	49	98.00	114	95.00	57	63.33	220	84.62
7. Deciding to construct a small compact house with good ventilation	32	64.00	49	40.83	38	42.22	119	45.77

private consumption on petrol' was another alternative which 90.77 percent of families thought of adopting, though the percentage was slightly less in the high SES group. Only 10.77 percent families made decisions to use more of cycle than own vehicle.

Among the two supplementary/substitution methods, i.e.

'planning to use solar energy and biogas energy', the former had a better response than the latter. This is because, those respondents already possessing LPG connections were not very willing to use biogas energy unless forced to do so. Comparatively, higher percentage in the low SES group planned to use biogas energy than the other two groups as they were non-users of LPG. More than fifty percent respondents planned to use solar energy. Reasons for not showing very keen interest to adopt solar energy and biogas energy for cooking purposes is mentioned earlier in the second section.

Again, 84.62 percent homemakers were in favour of making less use of electrical equipment to decrease electricity consumption-expenditure. Though the percentage was 95 and 98 in the middle and low SES groups, respectively, only 63.33 percent in the high SES group thought of adopting this method.

Most of the households already possessed their own homes, but those who were deciding to construct a house, had decided to construct a small compact house with good ventilation. This would help to decrease the electricity consumption by changing the temperature levels inside the house.

Thus on the whole, two out of seven ways/decisions to reduce energy consumption were not considered suitable

to be used by them which were 'making more use of cycle' and 'planning to use biogas energy.' The majority were planning to implement the remaining decisions and some were already practising them.

7. Testing the Hypotheses

In order to test the hypotheses, chi-square, coefficient of contingency, product moment correlation, multiple correlation as well as analysis of variance were computed. When significant F values were found, t-tests were conducted to further probe into differences between the groups.

Hypothesis 1 : There is no association between the number of coping measures adopted during each of the energy crisis situations and the selected variables (Table 46).

The chi-square test was applied and a significant association was found between the number of coping measures adopted during scarcity of cooking fuels and socio-economic status (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 between the number of coping measures adopted during scarcity of cooking fuels and the

Table 46 : Chi-square Values showing the Association Between the Number of Coping Measures adopted and Selected Variables

Number of Coping Measures adopted	Variables (X^2)						
	SES	Family Income	Family Size	Age	Education	Perception	Stress
During...							
(a) cooking fuel scarcity	21.178*** (df=2)	13.549** (df=2)	3.867 (df=2)	0.985 (df=2)	11.266** (df=2)	23.597*** (df=2)	19.392*** (df=2)
(b) cooking fuel price rise	6.036* (df=2)	0.743 (df=2)	0.701 (df=2)	4.222 (df=2)	3.897 (df=2)	24.284*** (df=2)	22.389*** (df=2)
(c) petrol scarcity	0.012 (df=1)	0.018 (df=1)	0.094 (df=2)	0.511 (df=2)	1.963 (df=2)	0.580 (df=2)	0.153 (df=2)
(d) petrol price rise	0.686 (df=1)	0.038 (df=1)	0.061 (df=2)	1.246 (df=2)	1.407 (df=2)	0.994 (df=2)	0.293 (df=2)
(e) power cut	9.068* (df=2)	16.111*** (df=2)	3.621 (df=2)	12.162** (df=2)	2.479 (df=2)	19.796*** (df=2)	23.100*** (df=2)
(f) electricity price rise	5.583 (df=2)	6.299* (df=2)	0.642 (df=2)	17.686*** (df=2)	1.922 (df=2)	39.710*** (df=2)	32.057*** (df=2)

*** Significant at 0.001 level ; ** at 0.01 level ; * at 0.05 level

significant variables were : SES 80 percent; family income 64 percent; perception of homemakers 83 percent; stress felt 77 percent; and education of homemakers 57 percent.

A significant association existed between the number of coping measures adopted during price rise of cooking fuel and socio-economic status (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 between the number of coping measures adopted during price rise of fuels and SES was found to be 35 percent; with perception of homemakers 83 percent; and 81 percent with stress felt.

There was no association between the number of coping measures adopted during the two situations of scarcity and price rise of petrol and any of the variables as the chi-square values were non-significant.

Data revealed a significant association between the number of coping measures adopted during power cut and socio-economic status (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 : with SES 50 percent; family income 71 percent; perception of homemakers 78 percent; stress felt 82 percent; and age of homemakers 61 percent.

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 regarding energy crisis (X^2=39.710, Sig. 0.001); stress felt due to energy crisis (X^2 = 32.057, Sig. 0.001); and age of homemakers (X^2 = 17.686, Sig. 0.001).

The degree of association between the number of coping measures adopted during electricity price rise and family income was found to be 37 percent; with perception of homemakers 93 percent; stress felt 90 percent; and 74 percent with age of homemakers.

Thus, the null hypothesis was rejected for the variables SES, family income, perception of homemakers, stress felt, age and education level of homemakers. It was accepted for the variable family size.

Therefore, it is inferred that the number of coping measures adopted during cooking fuel scarcity was influenced by the socio-economic status, family income, education and perception of homemakers and stress felt. During cooking fuel price rise it was affected by the socio-economic status, perception of homemakers and stress felt. During power cut it was influenced by the socio-economic status, family income, age and perception of homemakers, and stress felt. When there was electricity price rise, the number of coping

measures adopted was affected by family income, age and perception of homemakers and stress felt. The number of coping measures adopted during petrol shortage and price rise was not affected by any of the variables studied. Family size did not influence the number of coping measures employed during any of the crisis situations.

The degree of association between the number of coping measures adopted and variables, perception of homemakers and stress felt was high (77 to 93 percent) in all situations as compared to other variables.

Hypothesis 2 : There is no association betweenn the number of conservation measures adopted during each of the energy crisis situation and the value for economy (Table 47)

Table 47 : Chi-square Values showing the Association Between the Number of Conservation Measures adopted and Value for Economy

Number of Conservation measures adopted	Value for Economy(X^2)
During ...	
(a) cooking fuel scarcity	7.238**
(b) cooking fuel price rise	10.196**
(c) petrol scarcity	0.410
(d) petrol price rise	0.410
(e) power cut	0.095
(f) electricity price rise	1.345

** Significant at 0.01 level df = 1

A significant association was found between the number of conservation measures adopted during fuel scarcity and price rise and value for economy (X^2 = 7.238, Sig. 0.01; X^2 = 10.196, Sig. 0.01, respectively) but no association existed between the two variables during petrol and electricity crisis.

The degree of association between the number of conservation measures adopted and value for economy during cooking fuel scarcity was 41 percent and during price rise of fuel was found to be 53 percent.

The null hypothesis was rejected for fuel scarcity and price rise and accepted for petrol and electricity crisis situation.

Thus, it is concluded that the number of conservation measures adopted during cooking fuel shortage and price rise was found to be influenced by the value for economy but it did not seem to affect the number of measures employed during petrol and electricity shortages and price rise.

The degree of association between the two variables was higher for the price rise situation than for the fuel scarcity situation.

Hypothesis 3 : There is no association between the number of substitution/supplementary and adjustment measures adopted during various energy crisis situations and the values for comfort and convenience, and social status (Table 48).

Table 48 : Chi-square Values showing the Association Between the Number of Substitution/Supplementary and Adjustment Measures adopted and Values for Comfort and Convenience and Social Status.

Number of Substitution/ Supplementary and Adjustment measures adopted	Value for Comfort and Convenience (X^2)	Value for Social Status (X^2)
During ...		
(a) cooking fuel scarcity	0.564	2.825
(b) cooking fuel price rise	0.305	1.322
(c) petrol scarcity	0.781	4.135 *
(d) petrol price rise	0.781	4.135 *
(e) power cut	0.137	0.025
(f) electricity price rise	0.221	0.654

* Significant at 0.05 level df = 1

No association was found to exist between the number of substitution/supplementary and adjustment measures adopted during the various energy crisis situations and comfort and convenience value. 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 the two significant variables was found to be 45 percent during both scarcity and price rise of petrol.

Thus, the null hypothesis was accepted for comfort and convenience value but not for social status value.

It is inferred that the number of substitution/supplementary and adjustment measures adopted during the various energy crisis situations was not influenced by comfort and convenience value. Social status value influenced the number of measures adopted only during petrol shortage and price rise situations, and the degree of association between them was 45 percent during both crisis situation.

Hypothesis 4 : There is no association between the perception of Homemakers regarding energy crisis and variables, age and education level of homemakers. (Table 49)

Table 49 : Chi-Square Values showing the Association Between Perception and Stress Felt with Selected Variables

Variables	Chi-square Values	
	Stress	Perception
1. Family size	4.391 (df=4)	-
2. Family income	10.379* (df=4)	-
3. Age of homemakers	7.425 (df=6)	5.139 (df=6)
4. Education level of homemakers	-	26.797** (df=4)

** Significant at 0.01 level ; * at 0.05 level

The chi-square values showed that a significant association existed between the perception of homemakers regarding the energy crisis and their educational level (X^2 = 26.797, Sig. 0.01); but no association was found with age of homemakers. The degree of association between perception and education of homemakers was 87 percent.

Therefore the null hypothesis was rejected for education level of homemakers and accepted for age of homemakers.

It is concluded that education level of homemakers had an influence on the level of their perception regarding energy crisis whereas age did not. Moreover, the degree of association was found to be very high.

Hypothesis 5 : There is no association between the stress felt due to energy crisis and variables, family size, family income and age of homemakers (Table 49).

A significant association was observed between the stress felt and family income (X^2 = 10.379, Sig. 0.05). The degree of association determined was 54 percent. No association was found with family size and age of homemakers.

The null hypothesis was rejected for family income variable and accepted for family size and age of homemakers.

This infers that the degree of stress felt due to energy crisis was affected by the family income but it was not influenced by family size and age of homemakers. The degree of association was also above fifty percent.

Hypothesis 6 : There is no significant relationship between the number of coping measures adopted during all the energy crisis situations and the variables, perception of homemakers and stress felt (Table 50).

Table 50 : Correlation Coefficient Values showing Relationship Between Variables

Variables	Perception (r values)	Stress felt (r values)	df
1. Number of coping measures adopted during ...			
(a) cooking fuel scarcity	0.167**	0.250**	258
(b) cooking fuel price rise	0.148**	0.210**	258
(c) petrol scarcity	-0.203	0.204	67
(d) petrol price rise	-0.133	0.102	67
(e) power cut	0.324**	0.262**	251
(f) electricity price rise	0.337**	0.082	251
2. Age of homemakers	0.12*	0.117*	258
3. Stress felt	0.384**	-	258
4. Family Size	-	0.080	258

** Significant at 0.01 level ; * at 0.05 level

To test this hypothesis, Product-Moment Correlation Coefficient was computed. A significant positive relationship resulted between perception of homemakers regarding energy crisis and the number of coping measures adopted during cooking fuel scarcity ($r = 0.167$, Sig. 0.01); during cooking fuel price rise ($r = 0.148$, Sig. 0.01); during power cut ($r = 0.324$, Sig. 0.01); and during electricity price rise ($r = 0.337$, Sig. 0.01).

A significant positive relationship was found between the stress felt due to energy crisis and number of coping measures adopted during cooking fuel scarcity ($r = 0.25$, Sig. 0.01); during cooking fuel price rise ($r = 0.21$, Sig.0.01); and during power cut ($r = 0.262$, Sig. 0.01).

The null hypothesis was rejected for both variables, perception of homemakers and stress felt in view of the 'r' values.

Thus it is concluded that the number of coping measures adopted during scarcity and price rise of cooking fuels and electricity was positively related to the level of perception of homemakers regarding energy crisis. Stress felt was found to be positively related to number of coping measures adopted during cooking fuel shortage, price rise and during power cut. There was no relationship between the number of coping measures adopted during petrol scarcity and price rise

and perception of homemakers and stress felt due to energy crisis.

Hypothesis 7 : There is no significant relationship between perception of homemakers regarding energy crisis and stress felt, and age of homemakers (Table 50).

This hypothesis was tested by computing the Product-Moment Correlation Coefficient. The 'r' values indicated that a significant positive relationship resulted between perception of homemakers and their age ($r = 0.12$, Sig.0.05), and stress felt ($r = 0.384$, Sig. 0.01).

In view of the above results, the null hypothesis was rejected.

Thus, a conclusion can be drawn that there was a positive relationship between the level of perception of homemakers about energy crisis and their age, and degree of stress felt. This infers that as the age of homemakers increased, there was a rise in the level of perception. The degree of stress felt was dependent on the perception level of homemakers.

Hypothesis 8 : There is no relationship between the stress felt due to energy crisis and age of homemakers and family size (Table 50).

The correlation coefficient value indicated that there was a positive and significant relationship between the

stress felt due to energy crisis and age of homemakers ($r = 0.117$, Sig. 0.05) but no relationship existed with family size.

The null hupothesis was rejected for age and accepted for family size.

Thus, it can be concluded that ~~with~~ the degree of stress felt was dependent on the age of homemakers but family size had no effect on stress felt.

Hypothesis 9 : There is no relationship between the number of coping measures adopted during each of the energy crisis situations and the combined effects of perception and stress felt due to energy crisis (Table 51).

Table 51 : R Values showing the Relationship Between the Number of Coping Measures adopted during Each of the Energy Crisis Situations and combined Effects of Perception of Homemakers and Stress Felt.

Number of Coping Measures adopted	R Values	df
During ...		
(a) cooking fuel scarcity	0.262**	257
(b) cooking fuel price rise	0.222**	257
(c) petrol scarcity	0.367**	66
(d) petrol price rise	0.213	66
(e) power cut	0.357**	250
(f) electricity price rise	0.341**	250

** Significant at 0.01 level

Multiple correlation coefficient was computed which indicated that there was a positive significant relationship between number of coping measures adopted during cooking fuel shortage and the combined effects of perception and stress felt (R = 0.262, Sig. 0.01); between the three variables during cooking fuel price rise (R = 0.222, Sig. 0.01); during petrol scarcity (R = 0.367, Sig. 0.01); during power cut (R = 0.357, Sig. 0.01); and during electricity price rise (R = 0.341, Sig. 0.01).

Thus, the null hypothesis was rejected.

It can be inferred from the results that there was a combined effect of perception and stress felt due to energy crisis on the number of coping measures adopted during cooking fuel scarcity and price rise, petrol scarcity, power cut and electricity price rise but no effect of the two variables was observed during price rise of petrol. The 'R' values were higher in all cases as compared to the individual 'r' values. As mentioned previously that there was no relationship between number of coping measures adopted during petrol scarcity and the variables,perception of homemakers and stress felt due to energy crisis when related individually, but combined effects of perception and stress felt was found to exist during this crisis situation. Similarly, no relationship was found between the number of coping measures adopted

during price rise of electricity and stress felt but a combined effect of perception and stress felt on it gave a higher value.

Hypothesis 10 A : There is no difference among the various SES groups in relation to level of perception of homemakers regarding energy crisis.

To test this hypothesis, first the analysis of variance was computed to determine if there was any difference 'between' and 'within' group mean squares. If the F ratio was significant, then t-test was applied.

F-ratio value calculated was 25.719 which was significant at 0.01 level. It revealed a significant difference (Table 52).

Table 52 : Analysis of Variance for Perception of Energy Crisis

Source of Variance	df	Sum of Squares	Mean Square	F-Value
'Between' Groups	2	7287.43	3643.715	25.719**
'Within' Groups	257	36410.00	141.673	
Total	259	43697.43		

** Significant at 0.01 level

Further t-test was applied to determine between which groups there was a significant difference between the means.

Results indicated that the mean of the low SES group homemakers differed significantly from that of high SES group ($t = -7.598$, Sig. 0.001) and from middle SES group homemakers ($t = -3.8$, Sig. 0.001); and middle SES homemakers differed significantly from high SES homemakers ($t = 4.547$, Sig. 0.001) (Table 53).

The null hypothesis was rejected.

Table 53 : t-Values showing the Difference Between the Various SES Groups on Perception of Energy Crisis and Stress Felt

Variables	t - values		
	Socio-Economic Status		
	Low and High	Low and Middle	Middle and High
I Perception of Energy Crisis	- 7.598***	- 3.800***	- 4.547***
II Stress felt	- 2.671**	- 1.832	- 1.463
III Types of Stress Felt:			
(a) Economic stress	3.569***	1.123	2.863**
(b) Household work stress	- 3.183**	- 1.624	- 2.008*
(c) Stress due to obstructions in comfortable living	- 0.888	0.629	- 1.635
(d) Stress due to inability to meet family demands	- 7.758***	- 3.693***	- 3.680***

*** Significant at 0.001 level ; ** at 0.01 level;
* at 0.05 level

It may be concluded that the level of perception of homemakers regarding energy crisis varied for the three SES groups. The high and middle SES group homemakers possessed better perception than the low SES group homemakers. The high SES homemakers had better perception than middle SES homemakers.

Hypothesis 10 B : There is no difference among the various SES groups in relation to the degree of stress felt due to energy crisis

Analysis of variance was computed. F ratio = 4.206 (Sig. 0.05) indicates that there was a difference 'between' and 'within' group mean squares. (Table 54).

Table 54 : Analysis of Variance for Stress Felt

Source of Variation	df	Sum of Squares	Mean Square	F-value
'Between' Groups	2	1651.79	825.895	4.206*
'Within' Groups	257	50463.80	196.357	
Total	259	52115.59		

t-test results revealed that the high SES group differed significantly from low SES group (t = -2.671, Sig. 0.01) in the degree of stress felt (Table 53).

No difference was found in the degree of stress felt between the low and middle SES groups and middle and high SES groups as t-values were non-significant.

The null hypothesis was rejected.

Therefore it is concluded that the degree of stress felt by the high SES group homemakers was statistically different from the low SES group homemakers. High group felt more stress than the low SES homemakers.

No statistical difference was observed between low and middle SES groups and middle and high SES groups in the degree of stress felt due to energy crisis.

Hypothesis 10-C : There is no difference between the various SES groups in relation to the different types of stress felt (Table 53).

Further analysis was done to determine the difference among the three SES groups on the different types of stress felt. It was found that the low SES group differed significantly from high SES group ($t = 3.569$, Sig. 0.001); and middle SES differed significantly from high SES group ($t = 2.863$, Sig. 0.01) on economic stress (Table 53).

The low SES group differed significantly from high SES group ($t = -3.183$, Sig. 0.01) and middle differed significantly from high SES group ($t = -2.008$, Sig. 0.05) on household work stress.

There was no difference amongst the groups when tested in relation to stress due to obstructions in comfortable living as revealed by the t-values.

A highly significant difference was observed when the three groups were compared with each other on stress due to inability to meet family demands. (Low and high SES, t = -7.758, Sig. 0.001; low and middle SES, t = - 3.693, Sig. 0.001; and middle and High SES, t = - 3.680, Sig. 0.001).

The null hypothesis was rejected for economic stress, household work stress and stress due to inability to meet family demands. It was accepted for stress due to obstructions in comfortable living.

It is, therefore, concluded that there was difference between low SES and high SES groups in relation to economic stress, household work stress and stress due to inability to meet family demands. The low SES families felt more economic stress and the high SES families experienced more stress due to inability to meet family demands and household work stress when compared amongst each other. The low SES group differed significantly from the middle SES group in relation to stress due to inability to meet family demands only, the middle SES families feeling more stress. Significant difference was found between middle SES and high SES groups in relation to economic stress, household work stress and stress due to inability to meet family demands. The middle SES families experienced more of economic stress than other types of stress in comparison to high SES families, whereas high SES families felt more stress due to inability to meet family demands and household

work stress. There was no significant difference between the groups when compared against each other on stress due to obstructions in comfortable living style.

Hypothesis 10-D : There is no difference among the various SES groups in the number of coping measures adopted during each of the energy crisis situations. (Table 55).

Table 55 : Analysis of Variance for Number of Coping Measures adopted during Fuel Crisis

Source of Variation	df	Sum of Squares	Mean Square	F-value
I During Scarcity :				
'Between' Groups	2	105.5462	52.7731	8.091**
'Within' Groups	257	1676.3422	6.5227	
II During Price Rise :				
'Between' Groups	2	47.7411	23.8706	4.295*
'Within' Groups	257	1428.4089	5.5580	

** Significant at 0.01 level ; * at 0.05 level

Analysis of variance was done. The F ratio during scarcity of fuel was found to be 8.091 (Sig. 0.01) and during price rise, it was 4.295 (Sig. 0.01) which indicated a difference 'between' and 'within' group mean squares (Table 55). t-test was computed to determine the difference between the SES groups. A highly significant difference (t = -3.696, Sig. 0.001) was found between the low and high SES groups in

the number of coping measures adopted during scarcity of fuel (Table 56). Even the middle and high SES groups differed significantly (t = -3.215, Sig. 0.01), but no difference was observed between low and middle SES groups.

Table 56 : t-Values showing the Difference Between the Various SES Groups on the Number of Coping Measures adopted during Each of the Energy Crisis Situations

Number of Coping measures adopted	t-Values		
	Socio-Economic Status		
	Low and High	Low and Middle	Middle and High
During ...			
(a) cooking fuel scarcity	-3.696***	-0.847	-3.215**
(b) cooking fuel price rise	-2.733**	-2.254*	-1.159
(c) power cut	-3.963***	-2.222*	-2.204*

*** Significant at 0.001 level ; ** at 0.01 level
* at 0.05 level

During the price rise of fuels, the low SES group differed significantly from the high SES group (t = -2.733, Sig. 0.01) and from middle SES group (t = -2.254, Sig.0.05) but no statistical difference was found between the middle and high SES groups in the number of coping measures adopted during fuel price rise.

Table 57 : Analysis of Variance for Number of Coping Measures adopted during Petrol Crisis

Source of Variation	df	Sum of Squares	Mean Square	F Value
I During Scarcity :				
'Between' Groups	1	7.7408	7.7408	0.854 NS
'Within' Groups	67	607.4186	9.0659	
II During Price Rise :				
'Between' Groups	1	1.9065	1.9065	0.470 NS
'Within' Groups	67	578.7311	8.6378	

The F-ratio indicated that there was no difference between the mean squares of the middle SES and high SES group families in the number of coping measures adopted during scarcity and price rise of petrol (Table 57).

Table 58 : Analysis of Variance for Number of Coping Measures adopted during Electricity Crisis

Source of Variation	df	Sum of Squares	Mean Square	F Value
I During Power cut :				
'Between' Groups	2	77.2046	38.6023	7.649**
'Within' Groups	250	1261.6887	5.0468	
II During Price Rise :				
'Between' Groups	2	15.8925	7.9463	1.400 NS
'Within' Groups	250	1418.6964	5.6748	

** Significant at 0.01 level

Analysis of variance was computed for electricity shortage and price rise situations. The variation was found to be significant (F = 7.649, Sig. 0.01) for power cut but was non-significant for price rise situation (Table 58). Hence, t - test was done for only scarcity situation.

A highly significant difference was observed between low and high SES groups (t = -3.963, Sig. 0.001) in the number of coping measures adopted during power cut (Table 56). The middle SES group differed significantly from the low SES (t = -2.222, Sig. 0.05) and from the high SES group (t = -2.204, Sig. 0.05) in the number of coping measures adopted during power cut.

The null hypothesis was rejected for cooking fuel shortage, its price rise and power cut situations. It was accepted for crisis situations, petrol shortage and price rise and electricity price rise.

Thus, it may be concluded that there was difference between the low and high SES groups in the number of coping measures adopted during cooking fuel scarcity, its price rise and during power cut. In all cases, the high SES families adopted more coping measures. The low SES groups differed significantly from the middle SES group in the number of coping measures employed during cooking fuel price rise and power cut, the middle SES families adopting more number of measures. A significant difference was found between middle and high SES groups during cooking fuel scarcity and power cut, the

high SES families adopting more measures than the middle SES families. No significant difference was found between the groups in the number of coping measures adopted during petrol scarcity and price rise of petrol and electricity.

Hypothesis 10-E : There is no difference among the various SES groups in relation to the mean number of different coping measures adopted during each of the energy crisis situation.

Further analysis was done to determine if there was any difference between the SES groups in the mean number of different types of coping measures adopted during cooking fuel shortage and price rise and power cut. The t-values were found to be non-significant in all the cases (Table 59)

Table 59 : t-Values showing the Difference Between the Various SES Groups on the Mean Number of the Different Types of Coping Measures during Each of the Energy Crisis Situations

Mean Scores on Different Types of Coping Measures adopted	t-values		
	Socio-Economic Status		
	Low and High	Low and Middle	Middle and High
During ...			
1. cooking fuel scarcity	-0.165	-0.050	-0.087
2. cooking fuel price rise	-0.103	-0.050	-0.053
3. power cut	-1.653	-1.269	-0.431

The null hypothesis was accepted.

Hence, no difference was found between the SES groups compared in relation to the mean number of different types

of coping measures adopted, although they differed when compared on total number of coping measures adopted. This may be due to the fact that the number of substitution/supplementary and adjustment measures listed were not many to make comparisons.

8. Discussion of Findings

Findings in relation to interrelationships of the variables studied are discussed below.

8a. The Consumption Pattern of Energy

The main fuels used for cooking were LPG, firewood, kerosene, coal and cowdung cakes. The use of non-commercial fuels was more in the low and middle SES families, constituting about two-thirds of the sample, than in the high SES households. Among the non-commercial fuels, firewood was used by 68 · 46 percent families. Though firewood is used as a main cooking fuel in the rural areas of Karnataka, Gujarat, Rajasthan, district of Saurashtra and Kutch (ASTRA, 1980; Ravindranath et al., 1980; Reddy and Subramaniam, 1980; Malhotra and Chaurasia, 1981; Gomkale and Shah, 1981; Mathuveerappan, 1982; Nagbrahman and Sambrani, 1983; Mehta, 1983; Jyoti Consultants Limited, 1984), the present finding shows that it is also being used on a large scale in the semi-urban areas. In the urban areas of Gujarat, firewood was less used (Gandotra, 1983; George, 1983; George and Ogale, 1983; Kaul, 1984).

Kerosene was used by 93.46 percent families either as the main fuel, or supplementary fuel, or as a stand-by fuel. Though kerosene was an important fuel for the families of this study, it was noted that it was used by very few households in the villages of Rajasthan, Bhavnagar area and North Gujarat (Gomkale and Shah, 1981; Malhotra and Chaurasia, 1981; Sharan, 1984; Chauhan, 1985). Cooking gas was not used in villages but used in urban areas and small towns and cities as reported by Mathuveerappan (1982) which is true for this study also.

It was found that percentage of families using cowdung cakes, wood, coal and kerosene was much higher in families of this study than in Baroda households as was reported by Chaturvedi (1984) but it was reverse in case of LPG. There was great difference in the mean monthly outlay on the different energy forms between the families residing in semi-urban area of Haryana and urban area of Gujarat. The mean monthly outlay on energy forms utilized by the families of this study is much lower than those reported by George (1982, 1983) and Kaul (1984) on energy consumption of Baroda families. Even the expenditure incurred on individual energy forms, i.e. LPG, kerosene, electricity and petrol was much lower for families of this study than that of Baroda households. This is because of variation in the living styles and the socio-economic status of families in the two states.

Thus, the regional variations are evident in the use of commercial and non-commercial fuels.

The average expenditure incurred per month on different energy forms increased with the increase in the SES. This result is supported by three studies (Morrison and Gladhart, 1976; McNew,1979, Yao, 1980).

The expenditure on electricity increased with the increase in the SES as the high SES households possessed and used more of electrically operated equipment. This result is supported by McNew (1980) and Uusitalo (1983) who reported that increased number of electrical equipment possessed and intensity of their use was associated with high energy consumption.

The high SES families spent more on petrol than the middle SES families because income was not a constraint for them. Also the high SES families did not want to change their lifestyle in relation to transportation because of convenience. Ayotollahi (1980) reported that those who consumed more petrol were among higher income levels which supports the result of this investigation also.

There was a variation among the SES groups in the energy crisis faced at different time periods. It was found that large percentage of respondents who faced energy crisis, five years prior to data collection, belonged to the high SES

group, whereas large percentage in the low SES group faced energy crisis currently (during the time of data collection). This is because the high SES families possessed more than one LPG cylinder and also majority of this group were businessmen having contacts through which they could obtain the fuel easily even during the shortage.

The main problem faced by the low and middle SES families was regarding procuring kerosene. During kerosene and LPG shortage, some families in the low and middle SES groups made adjustments by using more of firewood, cowdung cakes and coal. But the high SES households rarely switched over to these fuels. Instead they purchased LPG and kerosene at black rates because of the convenience in use of these fuels.

8b. Perception of Energy Crisis in Relation to Variables Studied

The mean perception score was 38.44 which indicates average level of perception of the sample. It was assumed that there will be variation among individuals on level of perception about the energy crisis. This assumption was found to be correct as the high SES families exhibited a better perception than the low and middle SES families. They also varied significantly from each other in their perception level. This was due to effect of education as more homemakers in the high SES group had college education. Exposure to mass

media may be another reason.

Education of homemakers was found to be an important determinant of the perception level of homemakers as was evident from the chisquare and contingency coefficient values. (X^2 = 26.797, Sig. 0.01; C = 87 percent). The perception level of homemakers increased with the increase in the education level and the SES. This result is substantiated by a study conducted by Kaul (1984). Age of homemakers showed no influence on the perception level of homemakers. Though a positive relationship was found between age and perception level of homemakers, the effect of age on perception level was negligible as the correlation value was on the boarder line. This finding differs from that of the study by Kaul (1984) which reported that age of homemakers affected their knowledge on energy sources and its related aspects. It was expected that perception of homemakers may affect the degree of stress felt which was statistically found to be so (r = 0.384, Sig. 0.001). Moreover, it will also help the families to cope with the energy crisis situations in a better way. This is supported by the finding which shows a significant relationship between perception and coping behaviour of families. It was observed that more respondents with good perception adopted more number of coping measures whereas more homemakers with poor perception adopted less number of measures during fuel and electricity crisis.

8c. Stress Felt in Relation to Variables Studied

The mean stress score was 54.03. The degree of stress felt increased with the rise in the SES. It was comparatively low in case of the low SES families (50.22) and high for the high SES families (57.12). The low SES homemakers differed significantly from the high SES families in the degree of stress felt but the middle SES homemakers did not show any statistically significant difference from the low and high SES homemakers.

It was hypothesised that stress felt due to energy crisis will be influenced by the family size, family income and age of homemakers. But only family income was found to be associated with the degree of stress felt due to energy crisis as was evident from the chisquare and contingency coefficient values (X^2 = 10.379, Sig. 0.05; C = 87 percent). It was found that most of the homemakers experiencing the four different types of stress belonged to the middle income group, i.e. Rs. 750 to 1999. The effect of age of homemakers on stress felt was considered to be negligible as the correlation value was on the boarder line.

It was expected that the stress felt will be associated with the crisis of the various energy forms used. As commercial fuels were used more by the high SES households, the stress felt was comparatively more for these families than the other

two SES groups as they were unable to carry on their usual energy-related activities requiring the use of LPG, kerosene, petrol and electricity due to their shortage. Their preference for convenience in use of particular fuels in performing household tasks do not allow them to change over to other fuels. The high SES families experienced high stress mainly in relation to electricity and petrol shortage as it affected their lifestyles and status. They were not affected by price rise of these fuels as finance was not a problem for them. The low and middle SES families felt less stress compared to high SES households as these families used more of non-commercial fuels which are relatively cheap. Majority of families were prepared to buy the energy forms at black rate when necessary as it is an essential commodity for daily living. Families consumed energy in the quantity they could afford and were not affected much by the price rise as they were by the shortages. This is in congruence with the findings reported by Rudd (1978), George (1983) and Kaul (1984).

When analysed in terms of types of stress felt, it was found that the low SES families were experiencing economic stress more in degree than the other two groups as expected. But emotional stress related to household work, obstructions in comfortable living style and inability to meet family demands was felt more in degree by the high SES families, though the difference was not much. This is because the high

SES families had no financial constraints to cause much economic stress but experienced emotional stress during energy shortage as it interfered with their comfort in living, status ego and lifestyle. On the whole, more homemakers experienced emotional stress than economic stress due to shortage of energy forms.

It was hypothesised that families experiencing high stress will adopt more number of coping measures to meet the requirements of the family and vice versa, which was found to be true. A significant relationship existed between the number of coping measures adopted during fuel and electricity crisis and stress felt. It was observed that most homemakers experiencing high stress, adopted more number of coping measures and those experiencing low stress used less number of measures during both fuel and electricity crisis. This indicates that families experiencing high stress adopted various alternatives to reduce the stress felt, whereas families feeling low stress did not make much change in their usual behaviour pattern.

8d. Coping Behaviour of Families during Energy Crisis Situation :

The coping behaviour of families in relation to the variables studied is discussed for cooking fuels, petrol and electricity.

8d(i) Cooking Fuel Scarcity and Price Rise :

The families exhibited different coping behaviour during scarcity and price rise of cooking fuels which also varied among the SES groups. Majority of homemakers adopted more number of coping measures during scarcity and less number of measures during price rise. When assessed in terms of types of coping measures adopted it was found that during scarcity of cooking fuels, more percentage of respondents adopted substitution/supplementary and adjustment measures than during price rise. This behaviour during price rise is due to the families being less inclined to change their life-styles. Also, they do not want to change the fuels which are more convenient to use in performing household tasks. Most of the conservation measures were practised by majority of homemakers irrespective of the crisis situation in order to avoid unnecessary wastage of fuel and to keep their fuel bills as low as possible. Though the low and middle SES families were expected to adopt more number of conservation measures, but it was not so under both crisis situations. This was due to lack of knowledge about the conservation methods and less scope for conservation as their fuel consumption was already low.

The three SES groups differed significantly from each other in their coping behaviour during both crisis situations. Results revealed that most families belonging to the middle

8d(ii) Petrol Scarcity and Price Rise :

Regarding the coping behaviour of families during petrol crisis, it was observed that invariably almost all families utilizing petrol adopted more number of coping measures during both situations. They adopted more of the conservation measures than the substitution/supplementary and adjustment measures. This observation is substantiated by two studies (Gandotra, 1983; Kaul, 1984). Most of the conservation measures were in the form of possessing good driving habits which help to conserve petrol upto 15 percent of the 200 crore litres of petrol consumed (PCRA). Forming car pools was not a common practice as the area of survey was a small place. The high cost of petrol was one of the reasons for using more number of coping measures. More percent families in the middle SES group adopted more number of substitution/supplementary and adjustment measures than the high SES households during both situations. The family lifestyle, comfort needs and status ego were the constraints for the high SES families to adopt more number of these measures.

During petrol crisis , none of the variables studied showed any influence on the number of coping measures adopted.

A significant association was observed with the value for social status only (X^2 = 4.135, Sig. 0.05 for both situations).

As the percentage of families utilizing petrol in the sample was less (26.54 percent), therefore, no effect of any of the variables was found. But a combined effect of perception and stress felt was observed on the number of coping measures adopted during petrol scarcity only. (R = 0.367, Sig. 0.01).

8d(iii) Electricity Scarcity and Price Rise :

Almost all families used electricity for lighting and operating fans and very few used it for cooking, heating water and other purposes. Majority of homemakers adopted more number of coping measures during power cut and less number of measures during price rise irrespective of the SES groups. This behaviour indicates that households were more susceptible to power cut than to price rise, because they could afford to pay for the quantity consumed.

During power cut and price rise, majority of homemakers adopted more of conservation measures than substitution/ supplementary and adjustment measures to keep the electricity bill low. This is supported by two studies (Gandotra, 1983; Kaul, 1984). Majority followed conservation practices in relation to home lighting, use of fans and appliances. These results are in congruence with those reported by George and Ogale (1983) and Kaul (1984). More percentage of households substituted/supplemented and made adjustments

during power cut than during price rise of electricity. Status needs hindered the adoption of more measures during price rise. This was also pointed out by George (1983).

Results revealed that variables such as SES, family income, perception of homemakers regarding energy crisis, stress felt and age of homemakers influenced the number of coping measures adopted during power cut, whereas during price rise, except SES, all other variables mentioned above affected the number of coping measures adopted. Energy-related values did not seem to influence the coping behaviour of families during electricity crisis.

All the three SES groups differed significantly amongst each other in the number of coping measures adopted during power cut but no difference was observed among them during price rise situation.

These findings indicate the need to educate the home-makers about the energy situation of the country and their related problems. This will help them to appreciate the energy problems and become conscious about their energy consumption. The dire need of the present day is to induce a change in the values and lifestyles of households in relation to energy use. Such a change can assist the families to cope with the energy crisis situation, which would simultaneously help to attain the national goal of energy conservation.
