

# **WOMEN IN THE ENGINEERING PROFESSION IN INDIA – THE MILLENIUM SCENARIO**

## **EXECUTIVE SUMMARY**

*The present study is a sequel to a broad based study conducted earlier by the authors in 1987-90 on the participation of women in engineering courses and in the engineering profession. It was found then that the percentage of women in engineering courses had increased rapidly from about 1% in 1975 to about 10% in 1990. The study also revealed that women engineers were not being received well in the engineering job market. Over 26% of them were unemployed. Unemployment level was found to be higher in the states and in the disciplines having a higher population of women engineers. It was seen that the largest number of women were employed in Technical Educational Institutes (TEI). Private Industries ranked last as far as employment was concerned. Comparatively lower salary levels and a slower pace of career advancement were amongst the other findings of the study. The study indicated that women have to face problems at every stage of their career; in college, practical training, getting a job interview, getting a job, technical level of the work assigned to them and in earning recognition for their contributions in terms of career growth.*

*The present study is motivated by the concern caused by the findings of the previous study and the fact that the past decade has seen a further increase in women participation levels in the engineering profession. It was considered important to establish the current co-ordinates of the scenario, particularly the job and career status of women engineers. The study has been conducted in two parts. In the first part, the job and career status of a target group of women engineers has been studied through data received from the group members through replies to a specially designed questionnaire. The second part of the study consisted in obtaining the employers' viewpoint on hiring of women as engineering professionals. Contact was made with several organisations having engineers on their roll. Their views on the subject were obtained through replies to another structured questionnaire. Their responses provided a glimpse of the employers' side of the story. Availability of information from both sides has provided a rational and firm basis for formulation of a set of recommendations.*

## **PHASE-I : JOB AND CAREER STATUS OF WOMEN ENGINEERS**

### **SAMPLE DEFINITION OF WOMEN ENGINEERS**

*The target sample for the present study were women who had obtained their Bachelor's degree during the period 1994-98 in one of the six selected disciplines (Civil Engineering, Computer Science and Engineering, Electrical Engineering, Electronics Engineering, Mechanical Engineering and Architecture) and were located within the seven states of Andhra Pradesh, Delhi, Gujarat, Karnataka, Kerala, Maharashtra and Tamil Nadu. Out of the total stock, 11778 women (TS) were located through systematic efforts. Primary information about their year of*

graduation, branch of specialisation and state was gathered. Confirmed contact particulars were obtained for 2310 of these (DS). A structured questionnaire was mailed to all the 2310 members. 1020 completed replies were received and analysed. The group, which completed the questionnaire, is named as the Questionnaire Response Sample (QRS). Checks show that QRS is a random sample and is representative of the target stock.

Examination of the data shows that a large number and population fraction of DS and QRS belongs to Maharashtra and Tamil Nadu. This is a change from the previous scenario where Kerala ranked highest. Electronics Engineering is the most preferred branch (34.7%) followed by Civil Engineering and Computer Science, Electrical Engineering and Mechanical Engineering. Electronics Engineering has maintained its rank regarding branch preference of women engineers.

## **PERSONAL AND ACADEMIC BACKGROUND**

Most of the women engineers belong to educated families with over 70% having a father with a graduate degree or a higher qualification. Over 98% of the married women (280 out of 1020) have a husband with a graduate degree or a higher qualification.

The largest number did their schooling in Government and Semi-Government schools. 60% of the respondents had English as the medium of instruction in school. Taking up engineering as a career is by and large a planned affair for most girls. The performance of the women at the engineering college is generally good. Over 72% belong to the top 25% of the class in the degree examination.

## **PERCEPTIONS, CAREER GOALS AND VALUES**

### **Personal Qualities**

Out of the three personal qualities, 'Personal drive and determination, Self-confidence and Intellectual abilities', 'Personal drive and determination' is rated by respondents as the greatest contributor to their academic and career success.

### **Personal Priorities and Values**

35% of women engineers are inclined to think that 'For a married woman, a career should be secondary to her responsibilities as wife and mother'. In addition, 20% have the same as a conviction. A lower but comparable number accounting for 42% of the respondents disagree with the statement.

The statement, 'Small children suffer when mothers work full time' has been endorsed fully or partially by over 84% of the respondents. Most women disagree strongly with the suggestion that 'A woman who is really interested in her career should not have children'. These responses underline the value they assign to motherhood.

The response to the statement 'A working woman cannot manage both work and home without sacrificing either' radiates confidence and conviction. About 2/3rds of the respondents have expressed clear disagreement with the statement.

*'In a conflict between a husband's career and a wife's career, the husband's career should come first'. Over 42% of the respondents agree whereas 46% disagree with the notion. The response of married women is more towards agreement.*

*The statement 'Men can raise small children just as women can' is endorsed by 59% of the respondents. Percentage-wise the responses of married and single women are comparable.*

*55% of the respondents state that they would not be comfortable 'If husband kept house'. Although the fraction nurturing such a notion is higher amongst married women, the same feeling is prevalent even amongst unmarried women.*

*The need for support from family and husband is considered important and essential for a woman to have a successful career. This notion is unanimously endorsed by all the respondents, married or unmarried.*

*These responses underline the fact that priorities and values nurtured by Indian women engineers are essentially similar to those nurtured by Indian women in general.*

### **Professional Perceptions and Values**

*Over 60% of the respondents agree that 'Even today, professional women end-up in secondary roles doing routine jobs'. This indicates that there is under utilisation of the capabilities and skills of women engineers. A majority (55%) agree with the statement 'Compared to a man, it is harder for a woman to be accepted fully into a professional working group'. About 70% of the women engineers agree with the notion that 'Women will have to do better than men to get equal professional recognition'. It is felt that the women's movement has been a major force in opening up professional career for women. These responses are only marginally different from the ones received ten years ago.*

*The statement 'Since child rearing is demanding, the present work structure should be modified to enable a woman to continue her career without a break' has received overwhelming support. Over 80% of the respondents have affirmed the need for changing the work structure with inclusion of part-time and flexi-time work schedule as well as provision of working from, home wherever possible.*

### **Career Goals**

*The respondents perceive 'Opportunity for personal growth' and 'A feeling of security' as the most desirable career goals. These are also perceived as the career goals which have been realised by them to the maximum extent.*

### **Job Type Preferences**

*In terms of job type preference, an 'Execution' type job is preferred by 37.1% and a 'Desk' type by 26%. This is a change from the preference indicated in the previous project where the majority were in favour of a 'Desk' type job.*

*A majority of the respondents do not have a preference for either 'Men' or 'Women' as a 'Superior' or as a 'Subordinate'. Clearly this is not an issue of any concern.*

## **Job and Employment Status**

*Out of the 1020 respondents, 472 (46.3%) were continuously employed and 215 (21.1%) continuously unemployed since graduation. The remaining 333 (32.6%) had been intermittently employed and/or were pursuing further studies. Taking into account the employed and unemployed persons in the intermittently employed group, the employed persons at the time of data collection were 560 (54.9%), while the unemployed were 312 (30.6%). The remaining 148 (14.5%) respondents were pursuing higher studies.*

*Among the continuously employed respondents, the highest number belong to the 1998 batch. Branch-wise, the highest percentage were in Computer Science and the lowest in Civil Engineering, while on a state-wise basis, the highest percentage were in Gujarat (62.3%) followed by Maharashtra (54.1%) and the lowest in Kerala (25.2%) closely followed by Andhra Pradesh (28.4%).*

*As far as unemployment is concerned, the overall percentage was 26.1% in the previous study. Thus, there has been an increase of 4.5% in this respect. The percentage unemployment was found to be highest amongst the graduates of Electrical Engineering and Electronics Engineering, 29.2% and 28.8% respectively. With the inclusion of the unemployed part from the intermittently employed, these percentages increase to 37.3% and 36.4% respectively.*

*Amongst the states, Andhra Pradesh tops the list with over 43% of the engineering graduates remaining unemployed since graduation and 45.7% overall unemployment. These figures are higher than the corresponding ones for the state of Kerala. In the previous study, about ten years back, Kerala topped the list, with maximum unemployment.*

*Amongst Electronics engineers from Kerala, the unemployment comes out to be 70.6% and for those from Andhra Pradesh, 64.7%. These are unbelievably high figures and reflect an overall grave employment situation in the field of Electronics Engineering. In the previous study, the highest unemployment (50%) was found to be the combination of Kerala and Civil Engineering. The scenario has therefore changed.*

*The percentage of women engineers taking up higher studies is seen to be increasing in the later years. The highest percentage pertains to Civil Engineering. Lesser the job opportunities, greater are the number and fraction which takes up higher studies. This seems to be the general rule.*

## **Career Profiles and Problems**

### **a. Women Engineers Employed Continuously After Graduation**

*52% of the employed women engineers got their job by responding to advertisements. Although the majority did not have any problem in getting invited for a campus interview, a significant number (69 out of 472) did have some problem in this regard. 24% of the continuously employed respondents did not attend any campus interview due to many reasons including not being invited/permitted to do so by the employer/college. Amongst these, 81 did not attend any campus interview*

because there was none at their college. 51% of those who attended campus interviews got selected. One of the frequently mentioned reasons for non-selection is 'Preference to men'. The other reasons relate to academic performance and personal proficiencies of the respondents.

Amongst the continuously employed women engineers, 353 out of 472 did not face any difficulty in being called for a job interview. Amongst the 84 who have had difficulty, mention of 'Preference to men' predominates followed by 'Lack of experience'. The majority, 365 out of 472 did not face any difficulty in getting a job, 85 had some difficulty. Employers not being aware of the new course names floated by some colleges are mentioned as one of the difficulties in getting a job.

Over 40% of the respondents have rejected a job offer 'Low salary', 'Distance from home' and 'Better job offer' are frequently mentioned reasons for job rejection. The prime motivation for taking up a job is for 'Experience'. 'Better professional prospects' is the most predominant reason followed by 'Not satisfied with the type of job' for leaving a job. 'Marriage' also figures prominently in this context.

Over 2/3rds of the respondents had their first job in the field of their specialisation. Most of the continuously employed women engineers do a full time job. Teaching predominates in terms of the nature of job followed by Design, EDP/Computers and R&D. This scenario is similar to the one obtained in the previous study.

### Sector of Work

In terms of sector of work, Private Industry (Small-scale) (32.2%) and Technical Education Institutions (30.2%) are the largest avenues for employment of women engineers followed by Private Industry (Large-scale) (21.6%). This is a change from the previous situation, wherein the total industrial employment accounted only for 21.8% jobs. Industrial employment as a sector of work has definitely increased as compared to the previous study.

<b>Type of Employer</b>	<b>Current Study (%)</b>	<b>Previous Study (%)</b>
Govt. or Civil Service	3.4	22.0
Private Industry (Large-scale)	21.6	12.7
Private Industry (Small-scale)	<b>32.2</b>	9.1
R&D Organisation (Govt. & Private)	5.2	8.9
Public Sector Units (PSU)	6.5	18.9
Educational Institution	30.2	<b>26.9</b>
Others	0.9	1.5
<b>Total</b>	<b>100.0</b>	<b>100.0</b>

### Rating of the Current Job

The current job has been rated 'Average' by the respondents; neither too personal nor impersonal, as far as the general work atmosphere is concerned. The place of

work is found to be less pressurised and more relaxed. Majority of the respondents have appreciated the 'Degree of structure' in their organisations. The largest number rate their current job as 'Average' in regard to the 'Independence allowed in working'. Similarly 'Recognition and reward for efforts' are also perceived as 'Average' in their current jobs. On the other hand, the respondents have rated their current job as 'Good' in regard to opportunity for advancement as an engineer and climate for women. Majority of women indicate that they are well accepted in their current job and fit well in the same. 49% of them have their current job 'Related to their field of specialisation' and a large number feel that their current position is commensurate with their education and training. The overall picture is thus very positive on certain counts and not so positive on certain other counts.

Being engaged in satisfying work, utilisation of skills and abilities, freedom to manage their own work, opportunity to work on an idea, opportunity to keep abreast of the latest developments, being original and creative, involvement in technical work, opportunity to contribute to society, colleagues interested in new development and freedom to select their own project are the job-related intrinsic factors. The respondents assign highest importance to all these. Rating of the current job however is not comparable to the degree of importance except with respect to 'Being engaged in satisfying work' and 'Opportunity to contribute to society'. The rating with respect to all other factors is lower, the lowest being with regard to 'Freedom of selecting their own project'.

The extrinsic factors such as co-operative and pleasant workers, availability of personal leave, availability of crèche, no pressure to conform in personal life, desirable location, knowing the work responsibility, organisation respecting the family responsibilities, job security, flexible working hours, freedom from pressure to excel and opportunity to handle variety of work; are all extremely important to a majority of the respondents. Amongst these, highest ratings have been received by 'No pressure to conform in personal life', 'Desirable location', 'Knowing the work responsibility' and 'Job security' as far as their current job is concerned. The current job has been rated lowest in regards to 'Availability of crèche' and 'Flexible working hours'. These provisions do not exist in the present job structures.

All the listed career advancement factors; 'Delegation of responsibility', 'Opportunity to move into management', 'Opportunity to exercise leadership', 'Assignment in different areas', 'Opportunity to travel' and 'Enhanced social status', are considered most important by the largest fraction of the respondent group. The current job however does not match the level of importance assigned to these factors by the respondents. The current jobs have been rated lowest in regards to 'Opportunity to move into management' and 'Opportunity to travel'. All other factors have received mid-range rating, not commensurate with the degree of their perceived importance.

The respondents perceive 'Functional performance' as the most important criterion for promotion in their organisations. 'Educational qualification' and 'Tenure' follow in that order. 'Gender' is found to be an inconsequential factor on this count.

Promotion of a woman engineer with the same education, experience and job performance is considered 'Most likely' by 39.6% respondents and 'Less likely' by an additional 26.7%. About 71% of the respondents affirm the chances of their securing a management or administrative position in the organisation.

## **b. Women Engineers Unemployed Since Graduation**

*Out of the 215 women engineers unemployed since graduation, 88% were seeking employment for a period varying from six months to more than a year. A majority of these women had never attended a campus interview due to there being no campus interviews at their college.*

*183 out of 215 had applied for a job. The response to their job application was highest from the Technical Education Institutions, followed by Private Industry (Small-scale), Private Industry (Large-scale) and PSU, in that order. 'No response' to job applications figures as prominently as the 'Positive response' from most types of organisations.*

*87 out of 215 unemployed members report having rejected a job offer at some time or the other. 'Salary too low', 'Not allowed by parents' and 'Lack of hostel facilities' appear to be the most frequent reasons for rejecting a job offer.*

*The respondents perceive that they had remained unemployed due to lack of job opportunities; overall or at the place of stay or in the area of specialisation. Expenses involved in getting a job, may it be towards the traveling expenditure to the place of interview or an official payment requirement are also perceived as important factors for not being able to secure a job. Women engineers from a rural background and non-metro areas face such problems more severely.*

## **c. Women Engineers Pursuing Further Studies, Intermittently Employed, etc.**

*333 QRS members belong to this category, 148 pursuing further studies and 185 being employed intermittently. The main motivation for taking up further studies is the need to add to one's knowledge in the chosen career. However, a significant number take up further studies for want of a job. Women engineers possessing higher qualification plan on going in for R&D jobs or for teaching.*

*Unsatisfactory work or unsatisfactory work conditions are found to be the prime reasons for intermittence of the jobs. Family requirements also propelled some of the job changes.*

*122 out of 185 members of the intermittently employed group report to have had a career break at some time or the other 'Marriage' and 'Pregnancy' account for as many job changes as those resulting due to professional reasons such as 'Unfavourable job atmosphere', 'Low salary', etc.*

*A majority of women miss their professional work and want to come back to the profession after a break. Amongst the prime motivation for returning to work, 'A desire to be independent' and 'Have their own identity' figure predominantly. Non-availability of job in the field of specialisation or city/town of residence are the main difficulties associated with returning to work.*

*75 out 185 intermittently employed members report having refused a job. Similar to the unemployed group, here too 'Salary too low' and 'Family constraints' constitute the main reasons for refusing the job offer. Reasons for leaving a job include 'Unsatisfactory job type' and 'Better professional prospects'. 'Training period getting over', 'Temporary job' also figure significantly as much as 'Marriage'.*

*Private Industry (Small-scale) tops the list as the first employer of the intermittent job holders. Educational Institutions follow. In the current employment data however, the number employed in Educational Institutions are more than those in Private Industries (Small-scale).*

## **PHASE-II : EMPLOYERS' VIEWPOINT ON WOMEN IN THE ENGINEERING PROFESSION**

### **THE RESPONDING ORGANISATIONS**

*The responding organisations cover a wide spectrum, type-wise, viz. Private Industries, PSUs, TElS, R&D organisations and other Govt. and Semi-Govt. organisations. The largest response has been received from TElS and industries. TElS responded to the mailings, but industries had to be persuaded through personal approach. In all, the response to the 'Questionnaire for Employer/Executives' has been obtained from 104 organisations.*

*The employment data of the responding organisations shows that women engineers constitute about 21% of the engineering staff of TElS, whereas in industries, the percentage is only 3.5%. On the whole for the 82 organisations that have provided the employment data, the percentage of women engineers works out to be 6.1%.*

*Participation of women engineers in management is low. It decreases with increase in the level of management. Amongst all types of organisations, industries rank the lowest as far as participation of women engineers in management is concerned. It is only 7.6% at the lower management level and decreases to 2.4% at the upper level. In contrast, in TElS the participation of women in management is relatively good. It is 22.9% at the lower management level and decreases to 5.7% at the upper level.*

*As far as formation of working groups is concerned, 85.6% of the organisations report that they have mixed working groups. Only 9 out of 104 organisations state that they have 'All men' working groups.*

*71.1% of the responding organisations have a rating system for promotion. Out of these, 85.1% have a formal rating system. Almost all organisations have the same rating system for men and women engineers irrespective of the level of management.*

*Most organisations (90 out of 104) have provision for maternity leave. Only 3 have no provision and 11 have not responded to this question. The most frequent maternity leave provision ranges between 90 to 135 days. Re-entry/re-induction programmes for women after maternity leave are non-existent.*

*Special provisions for women such as flexible-time slots, option of working from home, part-time job option and availability of crèche etc., exist in a very limited number of organisations. The need for such provisions is apparently not felt by the employers.*



Only 20 out of 104 organisations have a policy regarding employment of both husband and wife. Out of these, 3 organisations discourage employment of husband and wife, while 13 encourage the same.

As regards having any special policy for encouraging women engineers is concerned, 88 out of 104 organisations state that they have no special policy. Others have chosen not to respond to this question.

## THE RESPONDING EXECUTIVES

129 executives have completed the 'Questionnaire for Executive/Employer'. Out of these, 17 are women. 'Administration' and 'Management' predominate as far as the nature of responsibility of these respondents is concerned. 82 of these belong to the upper management level, while 43 are from the middle management level.

112 out of the 129 executives are engineers (including 5 architects). Out of these, over 60% have a post-graduate qualification. Most of them have long working experience.

### **Views and Perceptions of the Executives**

'Women are competent enough to be successful in the engineering field'. Accepted fully by a large majority of the men respondents (80.4%) and all women executives.

'It is acceptable for women to assume leadership roles in industry as often as men'. Agreed to fully by about 70% of the men and women respondents.

'Women possess the self-confidence required of a competent engineer'. 67.9% of the men and 76.5% of the women 'Agree fully' with this statement although the numbers under 'Agree somewhat' category are also significant (28.7%).

'There is no difference between the experience, knowledge and interaction style of men and women engineers'. Opinion on this statement is also positive. About half (48.1%) 'Agree fully' and the other half (51.2%) 'Agree somewhat' with the remark. 'Do not agree' category is negligible.

Very few men and no women respondents agree with the statement 'Women engineers cannot work on the shop-floor'.

'Women cannot handle tough negotiations'. This statement is refuted by the respondents, 76.7% 'Do not agree'.

'Women cannot take up jobs involving travel'. A large majority of the men and women respondents do not see the travel needs of jobs as a barrier for employing women engineers.

'To be a successful engineer, a woman does not have to sacrifice her femininity'. 68.8% of men respondents and 94.1% women respondents 'Agree fully' with this statement.

*'The possibility of pregnancy does not make a woman less acceptable as an employee'. The response is mixed. 45.0% 'Agree fully', but 37.2% 'Agree somewhat' and 15.5% 'Do not agree'. Clearly the possibility of pregnancy is an issue that influences the employment of women.*

*'A full time employed mother of pre-school children is just as good as any other employee'. Only 38.0% 'Agree fully' with this statement. 41.9% have some reservations and 19.4% 'Do not agree'.*

*The response to the statement, 'It is equally important for a wife to have a career as to help her husband with his career' is generally positive. More than half (57.4%) 'Agree fully', while 28.7% 'Agree somewhat'.*

*The opinion on the statement 'Women engineers cannot work beyond office hours and/or on weekends' is divided. A significant number of men and women (27.9%) 'Agree', but a larger number (37.2%) 'Do not agree' with the statement. On the whole, working beyond office hours is not perceived to be a major barrier in employing women engineers.*

*'Women engineers cannot supervise male subordinates'. Supervision of male subordinates is not perceived as a problem. Almost all the respondents disagree with the statement.*

*'Women engineers do not join the male colleagues in informal groups and there is a certain amount of self-exclusion'. 56.6% of the respondents 'Do not agree' with this statement.*

*The majority agree fully or to some extent that 'Women cannot balance their work with their family, as they would have to give priority to children'.*

*A significant fraction of men have affirmed their concern about women engineers getting married and leaving the job. Surprisingly, a significant number of women respondents have also expressed such a concern. A comparatively lesser number of men and women are concerned about women needing maternity leave. 93 out of 129 have not expressed a concern on this count.*

*Special provisions like 'Flexible time slots' for young mothers and 'Provision of crèche' have been widely supported by a majority of the respondents. On the other hand, their views regarding provisions like 'Working from home' and 'Part-time job' option are divided.*

*A majority of the executives, both men and women, involved in interviewing and recruitment process do not seem to be aware of the legal implications of women being questioned differently at the interview. A definite awareness programme in this respect seems to be a necessity.*

*Most of the executives do not think there is any difference in the skills and characteristics of men and women engineers. Nevertheless, on further enquiry, they have given a long list of men-specific and women-specific qualities.*

Women have been rated 'Same as men engineers' with regards to 'Technical skills' by a majority of the respondents, men as well as women. Although 'Same as men engineers' predominates with respect to other performance facets also, a significant number of men find the performance of women engineers 'Lesser than men engineers' with regards to 'Supervision'. A significant number feel that they are 'Better than men engineers' with respect to 'Interpersonal skills', 'Public Relations' and 'Communication'. As regards 'Overall suitability' almost all respondents have rated women 'Same as men engineers'.

A majority of executives perceive that there is no adverse influence of women engineers on their 'Job assignment & responsibilities', 'Job performance' and 'Advancement opportunity'. The experience seems to be that women engineers do not allow their job responsibility to be affected by their personal responsibilities. The data also reveals that some women refuse professional opportunities to cater to family needs rather than accepting the same and not performing adequately.

The responding executives feel that women engineers are treated equal to others and are accepted as equals. This is true whether they are colleagues in the work places, subordinates or superiors. There are only a few responses, which mention discriminatory or preferential treatment.

The statement 'Women engineers have to work harder to prove themselves to earn the same credibility as male engineers in similar positions' has received a mixed response. Whereas a very large number of men do not find the statement correct, the same is not the case with women. This is reflected in the data as well as through the comments provided by the respondents.

There is a mixed response in regards to the existence of problems/difficulties that women engineers experience in the work place. Difficulties involved in late night working and working beyond office hours have been mentioned most frequently along with many other personal, inter-personal and professional problems.

Opportunity for advancement of women engineers is perceived to be equal by a majority of the respondents for the middle and lower management levels. However, it is not so strongly reflected for the upper management level where significant numbers perceive lesser opportunity for advancement for women engineers.

Computer Science/Engineering has been considered as the specialisation best suited for women followed by Electronics Engineering and Architecture.

Teaching emerges as the job best suited for women engineers followed by Design, EDP and R&D, in that order.

## **Special Measures and Policies**

Opinions regarding the need for having a company directive to avoid gender bias in the process of selection of engineering staff is equally divided. Opposition is based on the premise that selection has to be merit based and does not need any policies.

*On the other hand, advocates of a company directive stress the need for the same so that any discrimination against women engineers can be avoided. Amongst several suggestions given by the respondents, two important ones are (i) to have a woman member in the selection committee and (ii) to mention in the advertisement that the company is an equal opportunity employer.*

*A majority of the respondents do not find it necessary to identify women engineers with managerial potentials and to create a fast track for them. The premise is that equal opportunity and not special treatment will bring the best out of them.*

*Respondents feel that the reasons for low visibility of women in the engineering job market are of three types: typically women-specific personal reasons, personal-cum-professional reasons and reasons related to the work environment and attitudes of the employer.*

*A majority of the respondents feel that it is possible to correct this scenario of low visibility of women in the engineering job market. In order to do so, inputs have to come from the family, from women themselves and also from the employers. The family has to provide support, women engineers have to perform and the employers have to formulate policies to avoid any bias against women.*

*Regarding the possibility of giving preference in selection to men or women if both were equally qualified and experienced professionals, a larger number of respondents have expressed their preference for a woman engineer. Discipline, punctuality, hard work and obedience are stated to be the qualities of women engineers because of which respondents would like to exercise a preference in their favour.*

## **THE EMPLOYERS'/EXECUTIVES' VIEWPOINT – OVERALL REFLECTIONS**

*The overall reflections of this part of the study dealing with collection and compilation of the employers' viewpoint are both positive and negative. Replies to the formal questions suggest a very positive attitude towards hiring of women engineers. Women engineers are perceived as capable professionals with high potential. Such a positive response could either be because of general acceptance of 'Women in engineering' as a ground reality and a realisation that any resistance to their entry is likely to be futile. It could also be due to the alertness and anxiety of the executive respondents to be legally correct in responding to such questions. The opinions coming through the replies to certain other questions, however, indicate that these very positive responses may not necessarily be an expression of their inner beliefs and values. Although the capabilities of women as engineers are generally not questioned, unexpressed reservations about the concept of women participation in the engineering profession are clearly visible through the remarks made in the spaces provided for free expressions. Change of social values is a complex and time taking phenomenon. The study shows that changes are in offing. It is now a matter of time.*

## **RECOMMENDATIONS FOR ACTION**

*Based on the findings of the study recommendations for actions have been made in order to improve the situation. Some of these suggested corrective measures are educative in nature and some are regulatory. The educative measures are primarily concerned with the formulation and implementation of awareness programmes for parents, society and employers.*

*New and lesser-known courses are being started in engineering colleges all the time. Employers should be made aware of the names and contents of such courses. Special cells may be established on campus to provide professional help in career guidance. A regulatory requirement may need to be imposed on the colleges to have a certain minimum number of campus interviews and make sure that girls are not denied the opportunity to appear in the same. Colleges should make a deliberate effort to get as many employers as possible for campus interviews. 'Job Marts' organised by professional bodies and attended by employers could be an effective mode of employment for engineering graduates. It has also been suggested that number of centres of examinations and interviews be increased to ease the approach to the same, at least in the case of government jobs. A compulsory apprenticeship programme for experience and exposure to an industrial environment should be made a part of the curriculum. Colleges should have student chapters of reputed professional bodies on the campus to help in inculcating the culture of networking during the process of job seeking and later for career advancement.*

*In order to ensure increasing participation of women in the engineering profession, it has been recommended that industrial concerns be required to submit annually a record of employment of engineering staff with a specific mention of the number of women engineers employed. In any advertisement for jobs, a mandatory mention that the organisation is an 'equal opportunity employer' is recommended. Another regulatory measure that has been recommended is the presence of women members in interview boards. Every employer should have an organisational directive to avoid gender bias in the process of selection of engineering staff. Executives, both men and women, involved in the interviewing and recruitment process should be made aware of the legal implications of women being questioned differently at the interview.*

*The creation of physical facilities like working women's hostels and child care centres in major cities have also been suggested. As far as service rules are concerned, it has been recommended that married women engineers be eligible for long leave up to one year, twice in their working career, during the child bearing and caring period and that they be given the option of flexible working hours, part-time jobs and working from home, at least for some part of their working career. The organisational policies should support employment of both husband and wife and their transfers together.*

*Institution of scholarships and special awards for women has also emerged as an important recommendation to encourage their participation in the engineering profession and recognise their performance as engineering professionals. The National Commission of Women should take up the task of initiating the above mentioned approaches, monitoring their effectiveness and ensuring their implementation. Formation of a forum of women engineers, which takes up issues related with women engineers, has also been suggested. Such forums can take up organisation of meetings and workshops on various facets on the subject of women in engineering.*

# **WOMEN IN THE ENGINEERING PROFESSION IN INDIA – THE MILLENIUM SCENARIO**

**Final Report of the Project entitled “Women in the Engineering Profession”  
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**Sponsored by the Department of Science and Technology (DST), Govt. of India**

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**To**

**Women**

**In The Engineering Profession**



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# Chapter - 1

## INTRODUCTION

Women have been in the field of engineering as long as men. It is reported that a woman obtained an engineering degree as early as in 1892. However, the overall presence of women in the profession has been low.

The low participation of women in engineering courses and in the engineering profession has been a matter of concern the world over. The establishment of a large number of professional bodies of women engineers and the numerous studies that are being taken up on 'Women in Engineering' reflect this concern and confirm the importance of the subject. Most of the studies have aimed at quantifying the level of participation of women in engineering courses and in the profession. Branch preference and preferences regarding nature of jobs have also been studied. Job opportunities, career profiles and career problems of women engineers have been other areas of study and appraisal. By and large, the studies reveal that while the participation of women in the engineering courses has increased significantly in the last two decades, their acceptance in the job market as engineering professionals is far from satisfactory. Limited job opportunities and a slow pace of career growth stands out in almost all studies. This is a global phenomenon and is equally applicable to the Indian scene.

A broad based DST sponsored study entitled "Study on the Participation of Women in Engineering Courses and in the Engineering Profession" was taken up by the authors of the present study during 1987-1990 [1,2,3]. The main objective of the study was to establish the co-ordinates of the Indian scenario. The sample chosen for the study consisted of women engineers who had obtained their degree during the sixteen-year period from 1975 to 1990, in the country. It was found that on a nationwide basis, the participation of women in engineering courses had increased from about 1% in 1975 to over 10% by 1990 and that the rate of increase was increasing. The study also established that whereas in some states and some disciplines, the women population had increased up to 30% of the enrollment, in some other states and disciplines, the changes were insignificant. One of the important findings was that women enrollment in IITs and RECs had not changed much. Another important revelation of the study was that women were not being well received in the job market. As a result, a large fraction of women engineers was remaining unemployed. It was also seen that job opportunities for women engineers were limited to certain sectors of employment. Technical Educational Institutions (TEIs) were the largest employers of women engineers. Government or Civil Services, Government R&D and Public Sector Units followed in that order. Non-acceptance of women engineers was particularly striking in the Private Sector Industry, especially the large-scale. The respondents of the study reported the

existence of a strong reluctance on part of Private Industry in employing women engineers. Although the trends observed were alike irrespective of the branch of specialisation, the problem of unemployment was more severe in the states and in the branches of specialisations having higher enrollment rates and a larger population of women engineers. The findings obviously were a cause for serious concern.

The enrollment rate of women in engineering courses has increased since the time of the aforementioned study. Indications are, that the average enrollment is already touching the 30% level, with more and more girls taking up engineering courses. Considering the fact that the number of engineering colleges has substantially increased, the annual out-turn of women engineering graduates has increased many fold. Compared to the previous years therefore, the population of women engineers is growing at a much higher rate. If the job and career problems were to continue, it is likely that the trends of increased women participation in the profession maybe reversed. The phase where it was believed that engineering is not suitable for women is clearly over. It is now necessary to see that the increased participation trends continue and do not get adversely affected. The adverse influence of employment difficulties on the enrollment trends of women in the engineering courses has already been mentioned in the UNESCO's World Science Report-96. It is stated that "Recent growth in the numbers of women enrolling in engineering courses shows signs of slowing, even reversing, in India". Under these circumstances, an assessment of the contemporary co-ordinates of the employment and career scenario of women engineers was considered essential and important. Facts needed to be established and corrective approaches worked out, to prevent the alleged unwelcome consequences. This report outlines the findings of a second study undertaken to fulfill this need.

The present study was conducted with the aim of establishing the current job and career status of women engineers. The sample studied consisted of women who had obtained the Bachelor's degree in engineering during 1994-1998 in Architecture, Civil Engineering, Computer Science/Engineering, Electrical Engineering, Electronics Engineering, and Mechanical Engineering and are located in the states of Andhra Pradesh, Delhi, Gujarat, Karnataka, Kerala, Maharashtra and Tamil Nadu. The stock\* for this sample definition works out to be about 60000. The work has been carried out in two distinct parts. In the first part, contact information was gathered for 11778 sample members and contact was established with 2310 members. A specially designed questionnaire was sent to all the confirmed addresses. 1020 sample members replied with completed questionnaires. The completed questionnaires provided the data on their school education and family background, the engineering course and degree and their job status as well as other career related experiences. Analysis of this data and the findings are the basis for depiction of the current scenario. Comparison of the same with the picture which emerged from the previous project is used to profile the changes that have taken place since 1990. The facets examined include the family and personal background, academic performance and achievements, the branch and job type preferences, the job and career status, and career problems.

Non-acceptance of women in the engineering job market was established by the

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\* Please see Annexure-1

previous study. Although slighting of women engineers was found to be true in general, the situation was found to be particularly gloomy with reference to employment in the private sector industry. No attempts were made in that study to find the reasons for the observed non-acceptance of women in the engineering job market. In this context, obviously, the viewpoints of the employers about hiring women as engineering professionals would play a crucial role. Obtaining the employers' viewpoint and study of the reasons for their reluctance was thus an additional and important intent of the current study. The same constituted the second part of this current study. It was felt that the findings of this part would also provide a rational and firm basis for composing corrective approaches from a distinctly different angle. For example, if hangover of the traditional values was found to be the predominant factor restricting entry and acceptance of women in the engineering job market, awareness programmes with an educative-cum-legislative focus would acquire importance.

## NEED FOR THIS STUDY

Participation of women in the engineering profession is considered important on several counts including national development and improvement of the quality of life of women themselves. The findings of the previous study had shown that opportunities for women engineers are seriously constrained due to their non-acceptance in the job market. With increase in numbers, the two likely possibilities are: either they get accepted as engineering professionals or their job problems become overwhelming. The latter case would prove to be disastrous. The importance of taking appropriate timely precautions in this respect need not be over-emphasised.

The object of the present study is to update the information regarding some of the findings of the previous study. In addition, it will make available information on how employers have responded to increasing out-turn rates. It would also provide information regarding the response of women themselves and that of the society, to the increasing population of women engineers. In view of the rapidity of the change taking place, the future cannot be taken as an extension of the past. It has to be carefully re-assessed through exercises like the present one.

Collection and compilation of the employers' viewpoint would help in identifying the reasons for the apparent reluctance in employing women engineers. It could just be a hangover of past traditions and conventions or there may be some other reasons behind this hesitation. As of today, no indicative data is available on this aspect. To be effective and meaningful, the remedial measures must be based upon facts of the situation. The study as planned would provide factual co-ordinates of the current scenario and thus also a rational basis for formulation of corrective strategies.

## OBJECTIVES

The study aims at establishing the contemporary co-ordinates of the job and career status of women engineers belonging to a defined sample. The required data was planned to be obtained from two distinct sources; from the women engineers

belonging to the sample and from the employers in the form of their views and perceptions on different facets of the subject of women in engineering.

Given below are the main objectives of the study:

1. Study of the current job status and career opportunities for women engineers, to be able to dispel or confirm the apprehensions concerning accentuation of employment difficulties and career problems with their increasing population.
2. Collection, compilation and analysis of the data concerning employers' viewpoint.
3. Formulation of possible corrective approaches based upon the findings.

## **DEFINITION OF TWO SAMPLES**

Commensurate with the objectives of the study, two distinct groups have been contacted:

- a) Women Engineers
- b) Employers/Executives

The following are the profiles of the two groups.

### **Women Engineers**

Women who have obtained their graduate degree in engineering during the five-year period 1994-1998, from seven states (Andhra Pradesh, Delhi, Gujarat, Karnataka, Kerala, Maharashtra and Tamil Nadu) and in six specified disciplines (Civil Engineering, Computer Science and Engineering, Electrical Engineering, Electronics Engineering, Mechanical Engineering and Architecture) constitute the first group. This sample definition was derived from the findings of the previous study. The said seven states and five engineering disciplines other than Architecture constituted the major fraction of the total stock of women engineers in that study. Architecture was included in the current sample on a suggestion from DST. It is to be noted that the sample of previous study extended from 1975 to 1990 as the graduation years. A significant amount of data on young women enrolled/graduated after 1990 was also received and was used in the analysis. The sample for the present study was therefore so defined that it would have a minimum overlap with the sample studied previously, at the same time it would provide for evolution of the latest scenario. It was planned to obtain detailed data on 1000 women engineers. The group had to be representative of the sample from the viewpoint of the state-wise, branch-wise as well as graduation year-wise distribution.

### **Employers/Executives**

A list of employing organisations and the executives as given below was prepared to include different types of employers of engineering graduates. Data and findings of the earlier study were used in making this list.

- i) Technical Educational Institutions including IITs, RECs, Government Engineering Colleges and Private Engineering Colleges (about 30 - 35).
- ii) About 10 to 20 each of the following types of Industries:
  - Private (Large-scale)
  - Private (Medium/Small-scale)
  - Consultancy Organisations
  - Public Sector Industries
- iii) R & D organisations about 10 including Private and Government
- iv) Government, Semi-Government and Other Organisations, 10 to 15

The employment data as well as employers' viewpoint was planned to be obtained from about 100 to 120 organisations from the above list.

## Chapter – 2

### METHODOLOGY

Commensurate with the design and objectives, the work of the project has been carried out in two distinct phases. The first phase consisted of the study of the job and career status of the women engineers. Obtaining the employers' viewpoint on hiring women as engineering professionals has been the focus of the second phase. Each of the two phases comprised of several stages as discussed below.

#### PHASE-I : JOB AND CAREER STATUS OF WOMEN ENGINEERS

The activities of Phase-I are described in the following paragraphs.

#### **COLLECTION OF NAMES AND ADDRESSES OF WOMEN ENGINEERS**

Collection of names and addresses of women engineer graduates of the years 1994 to 1998 from the states of Andhra Pradesh, Delhi, Gujarat, Karnataka, Kerala, Maharashtra and Tamil Nadu who have obtained their engineering degree in the specified disciplines; Civil Engineering, Computer Science & Engineering, Electrical Engineering, Electronics Engineering, Mechanical Engineering or Architecture, constituted the first stage of Phase-I. Several parallel and systematic efforts were made to locate them and collect their particulars. The following pathways were followed.

##### **a) Advertisement in Daily Newspapers**

An advertisement was placed in several national daily newspaper editions published in the selected states, calling attention of the women engineers and announcing initiation of the project. Women engineer graduates of the years 1994 to 1998 were requested to write back with their particulars and addresses for further communication. In all 190 women engineers responded to the advertisement. Only 130 out of these belonged to the sample definition. The rest either did not belong to the selected period of graduation or belonged to a branch not included in the definition of the sample. A copy of the advertisement is appended as Annexure-4.

##### **b) Information from Employers**

A list of about 800 organisations was prepared. The organisations included Private Sector Industries, Public Sector Industries, R&D organisations and



Technical Educational Institutions. All these organisations were contacted through an appropriately worded letter and a data-seeking format specific to each type of organisation. Copies of the letters and the concerned formats are included as Annexure-5a. Through this mailing, employers were requested to provide information about the women engineering graduates employed in their respective organisation. They were also requested to provide the data on the total number of engineering graduates employed by them. Particulars like name, mailing address and the branch of specialisation were solicited. A self addressed, postage paid envelope was enclosed to ensure quicker response. The data on the number of organisations approached and the number who responded is given in Table-2.1.

**Table-2.1 Organisations Responding to Request for Information**

Industries and Institutions	Number of Organisations Contacted	Number of Organisations Responded		Total Response	% Response
		A*	B**		
		Private Sector Industries	477 [100.0]		
Public Sector Industries	43 [100.0]	5	1	6	14.0
R&D Institutions	26 [100.0]	6	3	9	34.6
Technical Education Institutions	282 [100.0]	58	34	92	32.6
<b>Total</b>	<b>828 [100.0]</b>	<b>108</b>	<b>58</b>	<b>166</b>	<b>20.0</b>

*A\* – Complete data about men & women engineers      B\*\* – Partial data*

It can be seen that the percentage response was relatively high from R&D institutions and Technical Educational Institutions. The responding organisations were of all sizes having the total number of engineers employed ranging from 1 to 3415 and women engineers ranging from none to 200. A fairly large number of organisations responded with a statement that they have no women engineers on their roll.

### **c) Graduate Records of Technical Educational Institutions**

Out of the 232 Technical Teaching Institutions contacted for employment information, 199 were approached for their graduate records. Type-wise distribution of these institutions is given in Table-2.2. Heads of the institutions were requested to provide year-wise and branch-wise data of the total as well as women graduates for the period of study. Particulars of the women graduates such as their name, address, branch and the year of graduation were requested on a separate format (Annexure-5b). 67 institutions furnished the requested information. Out of these, 36 institutions have provided complete data and 31 have sent partial data. Complete data means the details of women engineering graduates as well as the total out-turn for the corresponding year and branch. Some or the other information, mostly the data on the average total out-turn, has not been made available, in the responses categorised as incomplete.

Examination of Table-2.2 shows that, on the whole, about a third of the institutions have responded.

**Table-2.2 Response to Request for Information about Women and Total Engineering Graduates from the Graduate Records of Technical Teaching Institutions**

Institutions	Number of Institutions contacted	Number of Institutions Responded		Total Response	% Response
		A	B		
IIT	3 [100.0]	2	1	3	100.0
Regional Engineering College	6 [100.0]	4	0	4	66.7
Government Engineering College	41 [100.0]	6	8	14	34.1
Private Engineering College	138 [100.0]	23	20	43	31.2
Technical University/Department	11 [100.0]	1	2	3	27.3
<b>Total</b>	<b>199 [100.0]</b>	<b>36</b>	<b>31</b>	<b>67</b>	<b>33.7</b>

A – Complete data about men & women engineers

B – Partial data

An important information provided by the graduate records shows that the percentage participation by girls is on increase with passage of time. In 1998 the percentage girls, as per the data available from the graduate records, is 23.9% (Table-2.2a).

**Table-2.2a Out-turn Data from Graduate Records**

	1994		1995		1996		1997		1998		Total		%	
	B*	G**	B	G	B	G	B	G	B	G	B	G	Total	Girls
<b>Architecture</b>	240	203	245	226	246	264	272	266	255	315	1258	1274	2532	50.3
<b>Civil Engg.</b>	977	117	909	143	865	127	855	153	795	180	4401	720	5121	14.1
<b>Computer Sc./Engg.</b>	397	89	399	114	410	129	414	174	509	229	2129	735	2864	25.7
<b>Electrical Engg.</b>	497	88	488	102	491	110	534	104	606	129	2616	533	3149	16.9
<b>Electronics Engg.</b>	875	197	970	206	1028	221	889	264	1005	280	4767	1168	5935	19.7
<b>Mechanical Engg.</b>	1599	56	1678	63	1908	71	1773	124	1589	99	8547	413	8960	4.6
<b>Total</b>	4427	657	4610	726	4815	806	4606	969	4717	1129	23175	4287	27462	15.6
<b>% Girls</b>	14.8		15.7		16.7		21.0		23.9		18.5			

\*B - Boys

\*\*G - Girls

#### **d) Contacting individual Women Engineers**

All the women engineers about whom information was received either through the graduate records or their employers were contacted individually. A letter describing the project and its objectives was sent to each of them along with an information-seeking format (Annexure-5c) and a reply paid envelope. They were requested to fill in the format confirming their own particulars and also furnish data about their classmates, colleagues, acquaintances and friends. The next step consisted of writing to the addresses so received from the individual women engineers. Thus a chain of correspondence was created. Addresses continued to come in with each response and the formats were mailed to all the additional addresses, establishing contacts with more and more women engineers, enlarging the size of the sample.

#### **e) information from Nodal Centres**

Considerable amount of information was collected from the Nodal Centres of NSTMIS. The information available at these centres includes the out-turn records as well as employment data of educational institutions. The particulars available included names of the graduates along with their branch of specialisation and year of graduation. Help was availed from three nodal centres; Delhi, Gujarat and Maharashtra.

The 'chain' phase contributed significantly in collection of new addresses and addition to the number of confirmed addresses. After about a year of continuance of the chain, the count of the total number of addresses pertaining to the sample definition reached 11778. This population is named as the Total Sample and is referred to as TS, in the subsequent discussions.

Amongst the TS, the respondents with confirmed particulars numbered 2310. This set is named as the Direct Sample and is referred as DS. All members of DS have had at least one direct communication with the investigators. A structured, specially designed and tested questionnaire was mailed to all 2310 members of the DS. The questionnaire sought information about their personal background, academic achievements, employment status and career profiles. 1020 completed questionnaires were received. Women engineers who have completed the questionnaire constitute the Questionnaire Response Sample (QRS).

Table-2.3 gives the source-wise response in regard to the three samples; TS, DS and QRS. It can be seen that institutional graduate records have contributed the largest fraction of QRS. A comparable contribution has come through the 'chain' where particulars of several other members were provided by each of the DS members. The records of the Nodal Centres have also been a significant source, both through the employment data and the graduate records. It is also to be noted that the contribution of the direct approach for employment data to the Industries and R&D organisations has been rather low.

**Table-2.3 Source-wise Distribution of Total Sample, Direct Sample and Questionnaire Response Sample**

Source	TS	DS	QRS
	Number (%)	Number (%)	Number (%)
Advertisement	130 ( 1.1)	130 ( 5.6)	58 ( 5.7)
Chain	2229 ( 18.9)	696 ( 30.1)	296 ( 29.0)
Industry	346 ( 2.9)	66 ( 2.9)	35 ( 3.4)
Institute – Employment Data	414 ( 3.5)	92 ( 4.0)	37 ( 3.6)
Institute – Graduate Records	<b>4555 ( 38.7)</b>	<b>888 ( 38.4)</b>	<b>376 ( 36.9)</b>
Nodal Centre – Delhi*	222 ( 1.9)	31 ( 1.3)	18 ( 1.8)
Nodal Centre – Gujarat	819 ( 7.0)	147 ( 6.4)	65 ( 6.4)
Nodal Centre – Maharashtra	3040 ( 25.8)	253 ( 11.0)	133 ( 13.0)
R&D Organisations	23 ( 0.2)	7 ( 0.3)	2 ( 0.2)
<b>Total</b>	<b>11778 (100.0)</b>	<b>2310 (100.0)</b>	<b>1020 (100.0)</b>

\*The data from the nodal centres contained both employment records and the graduate records of the corresponding state.

## THE QUESTIONNAIRE

In the second stage of Phase-I, a questionnaire was designed keeping in view the objectives and the focus of the study. The findings and the experience of the previous study helped in framing of the questionnaire, which contained directed questions seeking personal and professional information from the respondents. Questions also sought the information about their job and career status. The questions were mostly of the objective or ranking type. A draft questionnaire was pre-tested through personal meetings with some DS members as well as some senior colleagues to ascertain clarity with respect to the questions. Testing was carried out in and around Bombay as well as in Baroda. The women on whom the testing was carried out had varied backgrounds i.e., rural and urban, English medium or vernacular medium in school, etc. Comments and suggestions received in the course of pre-testing were appropriately incorporated. The phase of formulation and pre-testing of the questionnaire lasted for about 3 months. It is essential to acknowledge the crucial contribution of Prof. Indira Mahadevan, consultant to the project, in formulation and finalisation of the questionnaire.

The questionnaire consists of three parts. Part-I seeks information about the respondent, her marital status, the education level of her husband, parents and brothers & sisters, schooling background including the medium of instruction and the academic performance. The second part deals with the perceptions of the respondents in regards to the career goals and values. Job status and career expectations and problems constitute the foci of the third part of the questionnaire. There are three sub-sections in this part, to be answered by a specified sub-group. For example, Part-IIIa is to be filled by members who have been employed continuously after graduation, whereas Part-IIIb relates to the group that has

remained unemployed throughout after graduation. The third sub-section is meant to be answered by the group, which is 'Intermittently employed or pursuing higher studies'. The last question (Q50) provides space for free expression. The respondents have been requested to use this space to express their views on the points that may not have been covered by the questionnaire. Scope for receiving comments and suggestions has been provided in other questions also. A copy of the questionnaire is appended as Annexure-6. It is necessary to mention that the respondents have been assured complete anonymity and told that the information provided by them will be used only for the purpose of the present study.

The average time required for completing the questionnaire varies from 20 to 35 minutes.

## RESPONSE TO QUESTIONNAIRE

The Questionnaire was mailed to all the DS members with a covering letter explaining the purpose of the project and information about the questionnaire. This mailing was done during June-July 1999. The first response to the mailing was received within a week of the mailing. Reminders were subsequently sent to the select groups from whom the response was particularly low. The response pattern of the questionnaires is depicted in Figure-2.1. By February 2001, 1050 completed questionnaires were already at hand. Out of these about 30 did not qualify due to either the state of their residence or the year of graduation or the branch of specialisation. Thus 1020 women engineers belonging to the sample definition have completed the questionnaire. The members who responded with completed questionnaire constitute the Questionnaire Response Sample (QRS). Information contained in the 1020 completed questionnaires received from the QRS members is the basis of the analysis and inferences of Phase-I of this study.

State-wise, branch-wise and graduation year-wise distributions of the TS, DS and QRS are presented in Table-2.4a to 2.4c and Figures-2.2a to 2.2c. Examination of this data reveals a number of interesting features which are discussed in the following paragraphs:

**Table-2.4a State-wise Distribution of Total Sample, Direct Sample and Questionnaire Response Sample [Q2(a)]**

State	TS	DS	QRS
	Number (%)	Number (%)	Number (%)
Andhra Pradesh	1096 ( 9.3)	189 ( 8.2)	81 ( 7.9)
Delhi	497 ( 4.2)	70 ( 3.0)	39 ( 3.8)
Gujarat	1560 ( 13.3)	262 ( 11.3)	122 ( 12.0)
Karnataka	1319 ( 11.2)	346 ( 15.0)	164 ( 16.1)
Kerala	1181 ( 10.0)	304 ( 13.2)	123 ( 12.1)
Maharashtra	<b>4311 ( 36.6)</b>	<b>635 ( 27.5)</b>	<b>281 ( 27.6)</b>
Tamil Nadu	1814 ( 15.4)	504 ( 21.8)	210 ( 20.6)
<b>Total</b>	<b>11778 (100.0)</b>	<b>2310 (100.0)</b>	<b>1020 (100.0)</b>

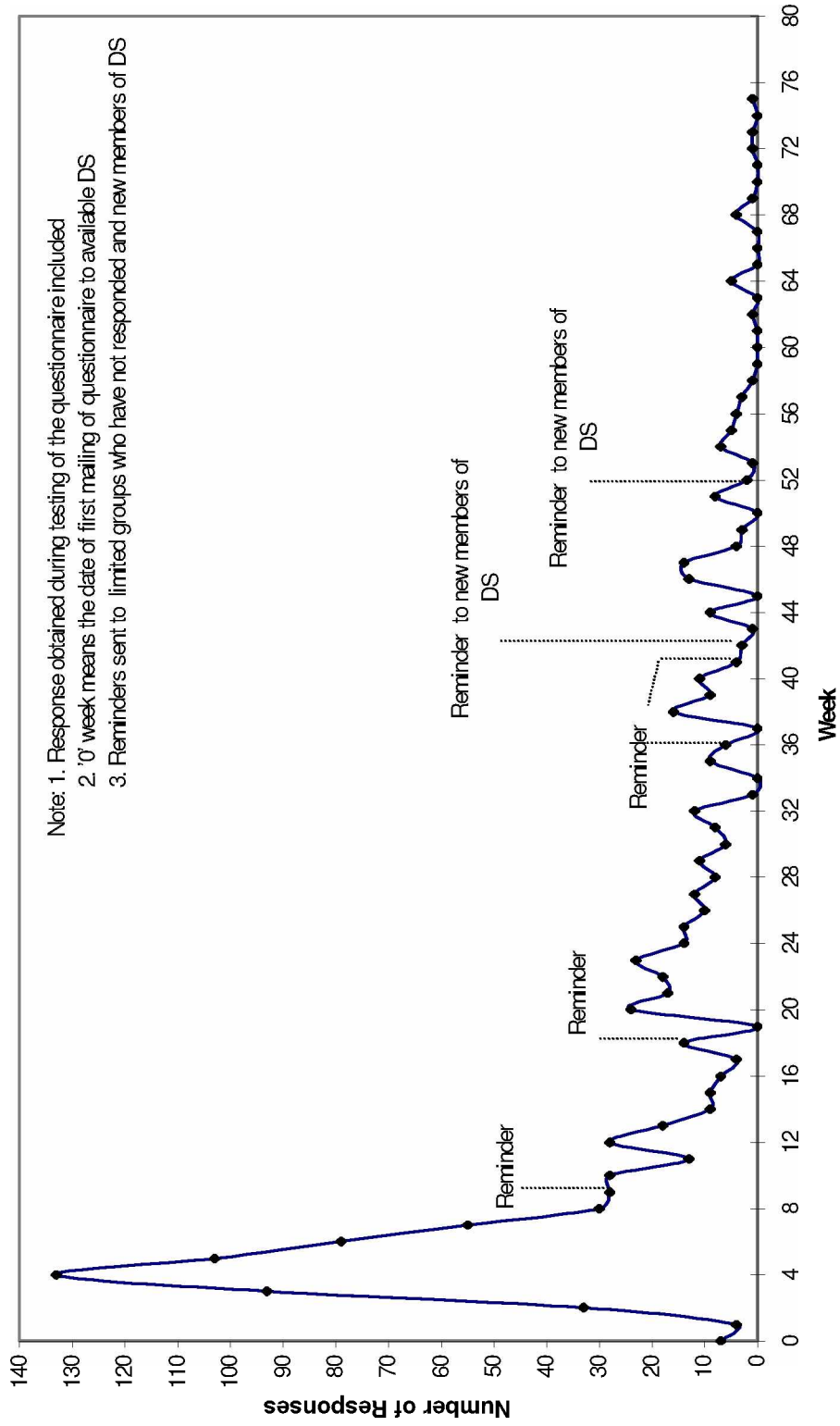
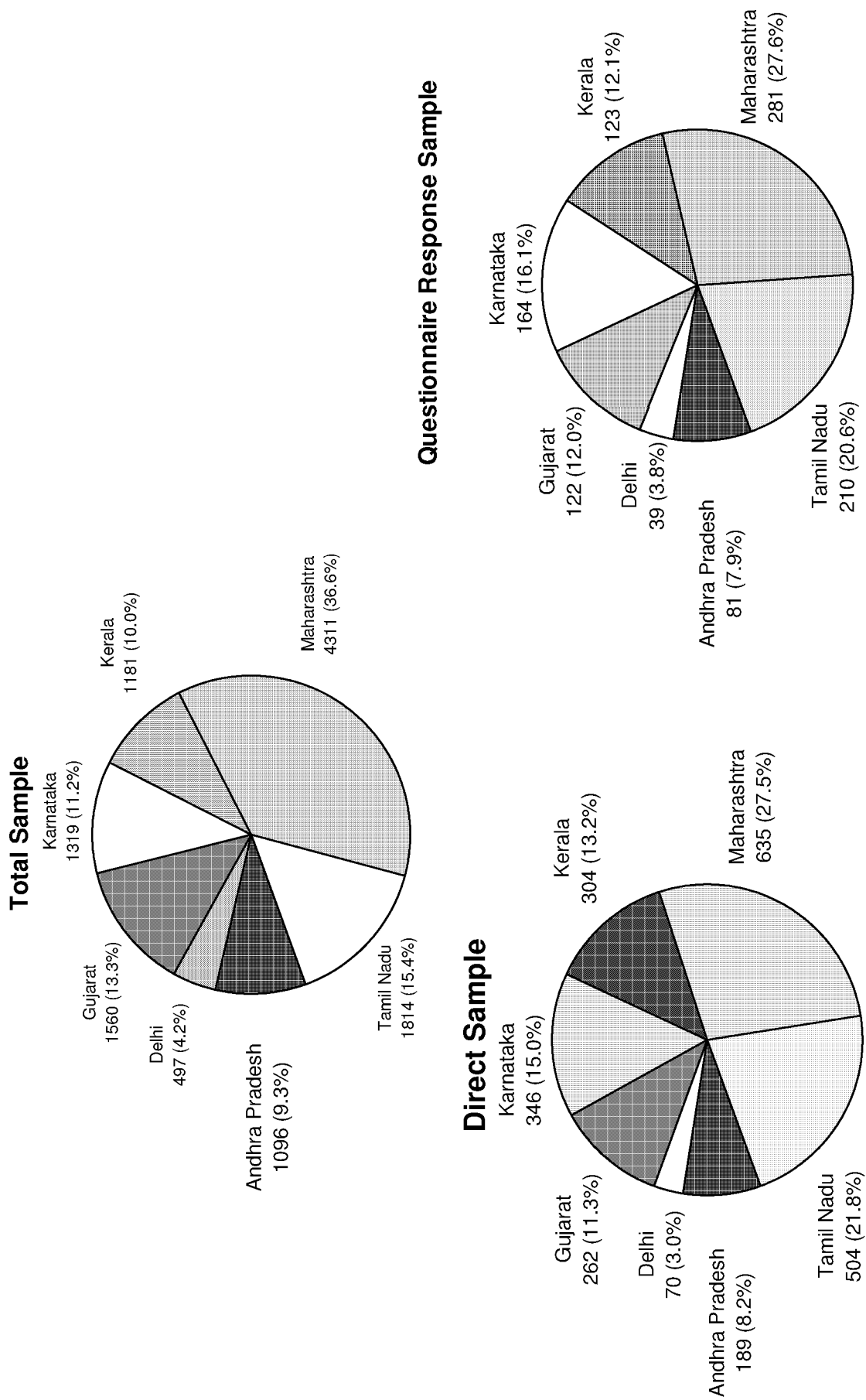
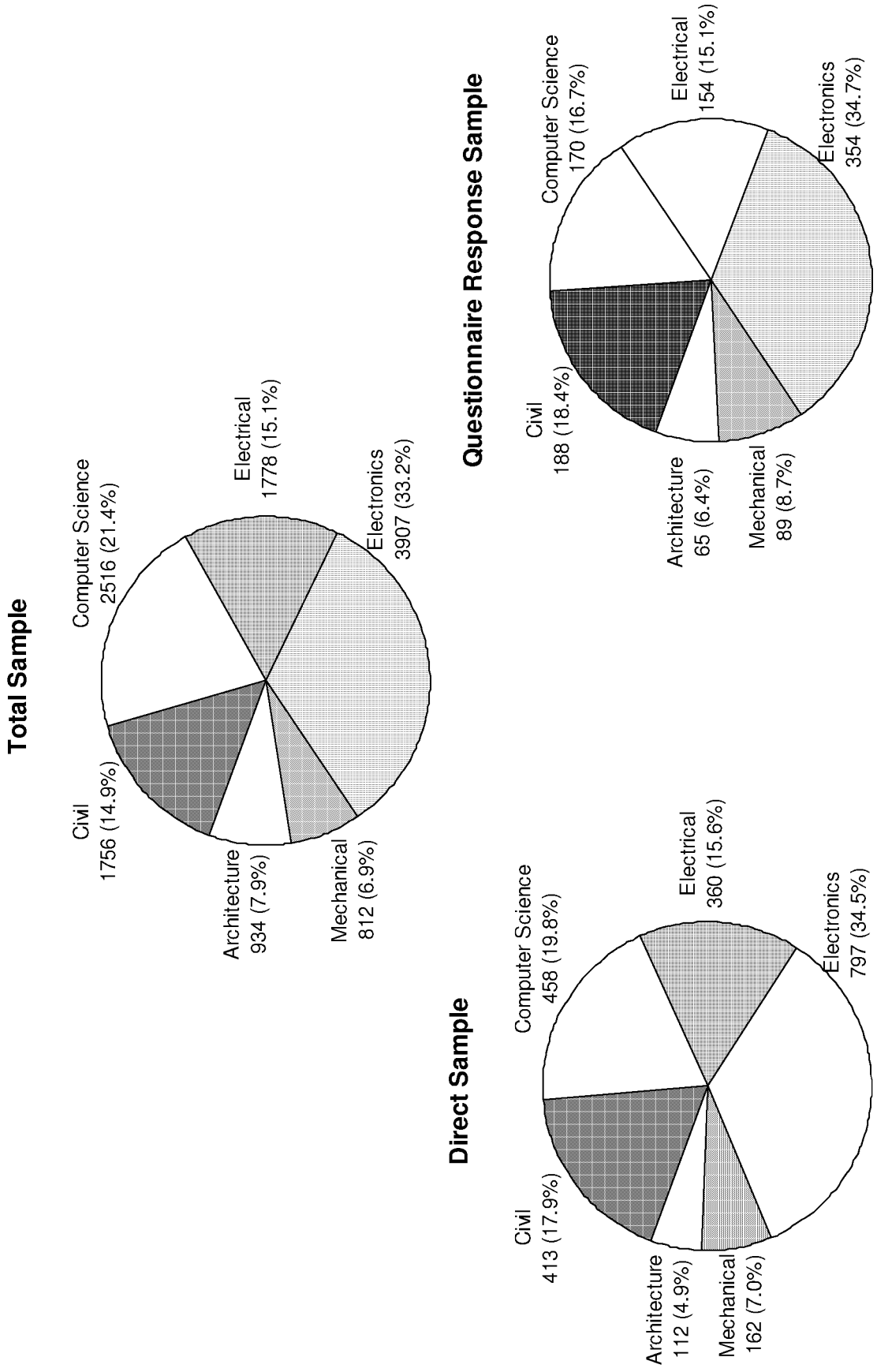


Figure-2.1 Questionnaire Response

**Figure-2.2a State-wise Distribution of Total Sample, Direct Sample and Questionnaire Response Sample**

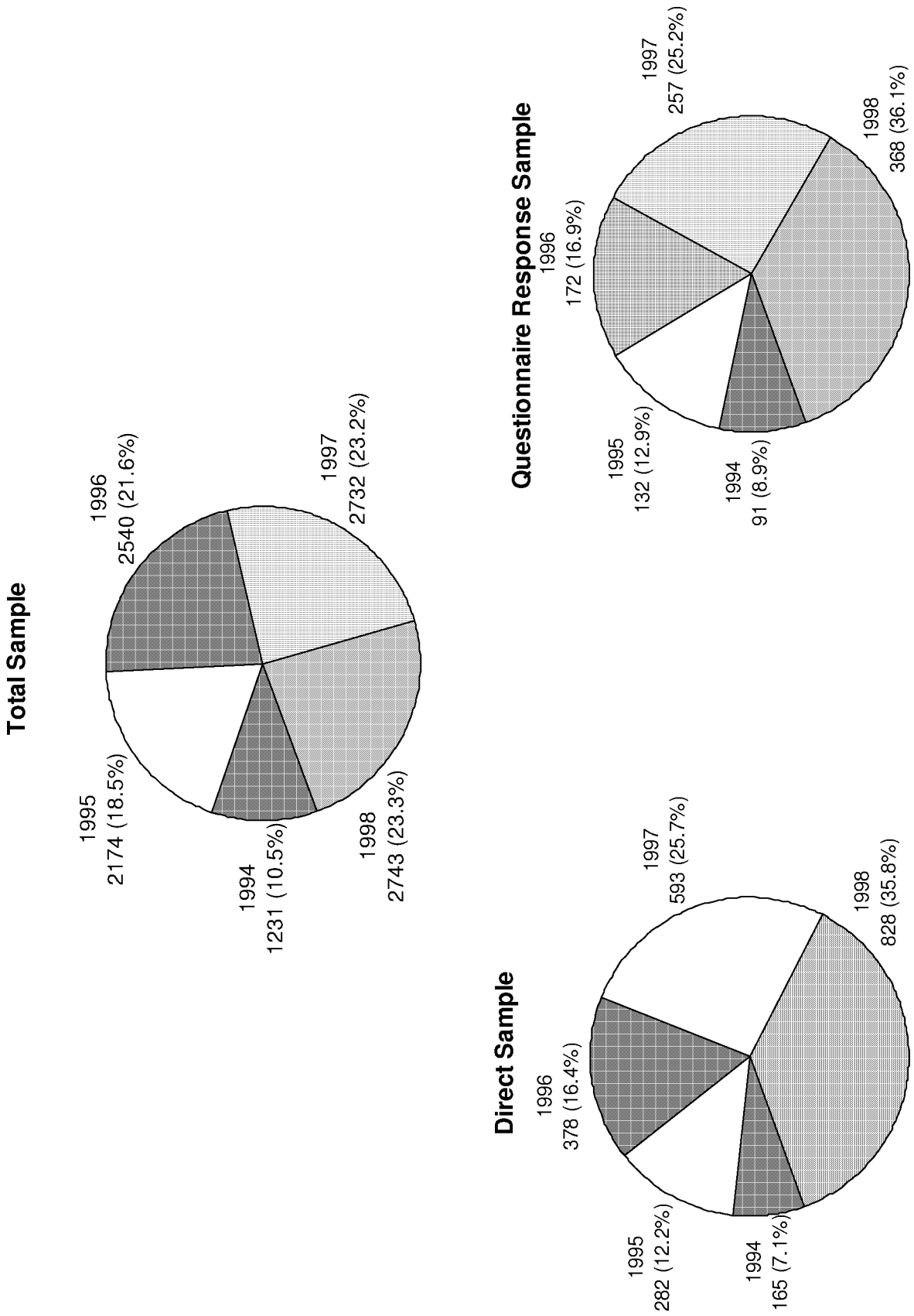


**Figure-2.2b Branch-wise Distribution of Total Sample, Direct Sample and Questionnaire Response Sample**





**Figure-2.2c Year-wise Distribution of Total Sample, Direct Sample and Questionnaire Response Sample**



The state-wise distribution of the three samples is given in Table-2.4a and Figure-2.2a. It is important to note the similarity in the pattern of the percentage distributions of the three samples. The maximum percentage of the sample population is in Maharashtra, followed by Tamil Nadu and Karnataka in that order. Similarly, in all the three samples, the minimum percentage is from Delhi, with the next higher figure being from Andhra Pradesh. This indicates that QRS is a representative sample for the chosen states.

Table-2.4b gives the branch-wise distribution of TS, DS and QRS. Electronics graduates constitute about one third of the total sample in all the three samples, and the population of the Electrical Engineering graduates is about half that of the Electronics graduates in each case. Comparable numbers and percentages of all other branches must also be underlined. This branch-wise distribution pattern further substantiates the fact that QRS is a representative sample of TS as well as DS.

**Table-2.4b Branch-wise Distribution of Total Sample, Direct Sample and Questionnaire Response Sample [Q8(a)]**

<b>Branch</b>	<b>TS Number (%)</b>	<b>DS Number (%)</b>	<b>QRS Number (%)</b>
Architecture	934 ( 7.9)	112 ( 4.9)	65 ( 6.4)
Civil Engineering	1756 ( 14.9)	413 ( 17.9)	188 ( 18.4)
Computer Science/Engg.	2516 ( 21.4)	458 ( 19.8)	170 ( 16.7)
Electrical Engineering	1778 ( 15.1)	360 ( 15.6)	154 ( 15.1)
Electronics Engineering	<b>3907 ( 33.2)</b>	<b>797 ( 34.5)</b>	<b>354 ( 34.7)</b>
Mechanical Engineering	812 ( 6.9)	162 ( 7.0)	89 ( 8.7)
Blank	75 ( 0.6)	8 ( 0.4)	—
<b>Total</b>	<b>11778 (100.0)</b>	<b>2310 (100.0)</b>	<b>1020 (100.0)</b>

Table-2.4c contains the same data presented on a graduation year-wise basis. It may be noted that the number and percentage content of the three samples increase for the later graduation years. The highest population is of the graduates of the year 1998. The percentage distribution of QRS and DS are almost identical, which is noteworthy and upholds the representative character of the QRS.

**Table-2.4c Graduation Year-wise Distribution of Total Sample, Direct Sample and Questionnaire Response Sample [Q8(a)]**

<b>Year of Graduation</b>	<b>TS Number (%)</b>	<b>DS Number (%)</b>	<b>QRS Number (%)</b>
1994	1231 ( 10.5)	165 ( 7.1)	91 ( 8.9)
1995	2174 ( 18.5)	282 ( 12.2)	132 ( 12.9)
1996	2540 ( 21.6)	378 ( 16.4)	172 ( 16.9)
1997	2732 ( 23.2)	593 ( 25.7)	257 ( 25.2)
1998	<b>2743 ( 23.3)</b>	<b>828 ( 35.8)</b>	<b>368 ( 36.1)</b>
Blank	358 ( 3.0)	64 ( 2.8)	—
<b>Total</b>	<b>11778 (100.0)</b>	<b>2310 (100.0)</b>	<b>1020 (100.0)</b>

As stated earlier, the analysis and inferences presented in this report are all based on the information received through QRS. Establishment of the representative nature of this sample is therefore extremely important. The same has been accomplished through the data presented in Table-2.4a to Table-2.4c and the corresponding figures. QRS is a representative sample, graduation year-wise, branch-wise as well as state-wise. It can therefore be assumed that the trends observed and the inferences drawn on the basis of the data provided by QRS, profiles the current scenario appropriately and truly. The following are the salient trends reflected by the QRS:

1. In the state-wise distribution, Maharashtra and Tamil Nadu have the largest share in QRS, followed by Karnataka. The population fractions of Gujarat and Kerala are comparable. The comparatively lower population of Andhra Pradesh needs to be pointed out. The lowest is from Delhi.
2. The largest fraction of QRS belongs to the branch of Electronics Engineering followed by Civil Engineering, Computer Science and Electrical Engineering, all three being comparable with rather marginal variations.
3. Year-wise distribution reflects increase in the participation levels with passage of time (Figure-2.3).

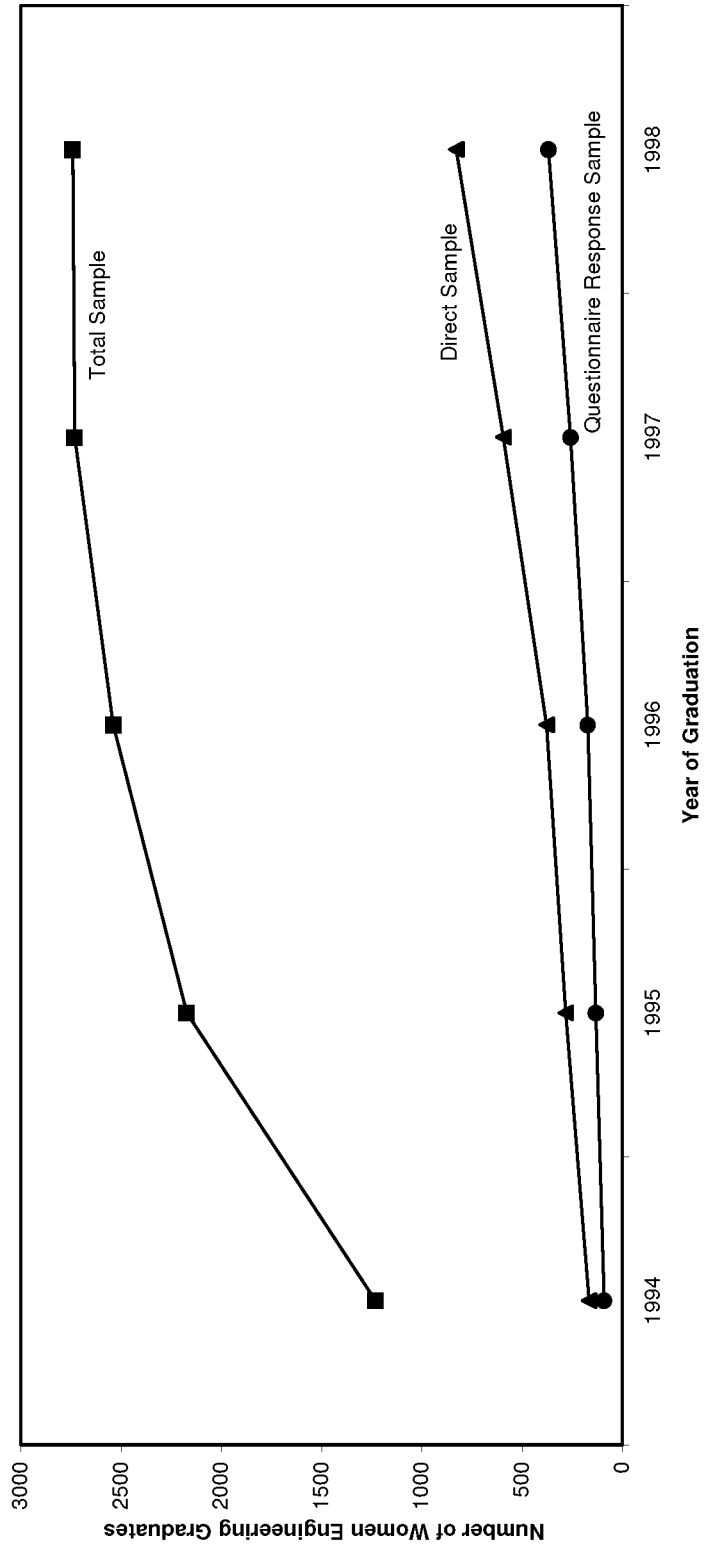
## DATA STORAGE AND ANALYSIS

The data received through completed questionnaires has been stored in a database designed for the purpose. The database provides for selective retrieval of information. Data entry and compilation preceded the analysis of the data. FoxPro 2.1 has been used for data storage and compilation. The following are the particulars of the data files:

<u>File Name</u>	<u>Particulars</u>	<u>Storage</u>
M.dbf	Name, Address, Branch/Specialisation, Year of Graduation of the members of the Total Sample (TS)	8.75 MB
Mcon.dbf	Confirmed Names, Addresses, Branch/Specialisation, Year of Graduation of the members of the Direct Sample + Details of the Institution Graduated from and Professional Affiliation, if any	2.70 MB
Q1n2n50.dbf	Response to Q1 to Q16 and Q50	2.27 MB
Ques3a.dbf	Response to Q17 to Q33	0.47 MB
Ques3b.dbf	Response to Q34 to Q39	0.09 MB
Ques3c.dbf	Response to Q40 to Q49	0.21 MB

The information has been divided into a number of fields as per the requirement of each question. Optimisation of storage space has been kept in view in designing the

Figure-2.3 Year-wise Distribution of Women Engineers



data record in each case. Each record consists of numeric as well as character fields. Information received as remarks/comments has been stored in character fields or memo fields depending upon the size of the remark/comment.

Space required for storage of the database files (.dbf) and the program files (.prg) works out to be 15.6 MB.

## **PHASE-II : EMPLOYERS' VIEWPOINT ON WOMEN IN THE ENGINEERING PROFESSION**

Phase-II of the project consisted of obtaining the employers' viewpoint on hiring women as engineering professionals and an analysis of the reasons for non-acceptance of women in the engineering job market.

The methodology of data collection consisted of preparation of a select list of 200 organisations having engineering graduates on their roll. This list was drawn from the larger list prepared in the context of data collection on women engineers. Information about their engineering staff was sought through a format. The information was sought about the total number of engineering degree holders on roll and the number of women engineers. The name and designation of the women engineers were also requested along with their addresses for further correspondence. As stated earlier this information was used for contacting women.

A separate questionnaire was prepared for acquiring the data about the organisations and obtaining the viewpoints of the employers/executives. This second questionnaire was mailed to all the organisations included in the list. The mailing was addressed to two classes of executives; those involved in the process of recruitment of engineers and those working with women engineers or supervising their work. For the convenience of the reader, details of this questionnaire and details of the responses are given in the chapter 'Employers' Viewpoint on Women in the Engineering Profession' (Chapter-6). Specifics of the storage of information received through the questionnaire and analysis of the same are also given in the same chapter. A copy of the 'Questionnaire for Employers/Executives' has been appended as Annexure-7.

## Chapter – 3

### **GENERAL INFORMATION ON THE WOMEN ENGINEER RESPONDENTS**

Women who obtained their graduate degree in engineering during the five year period 1994-1998, from seven specified states (Andhra Pradesh, Delhi, Gujarat, Karnataka, Kerala, Maharashtra and Tamil Nadu) and in six specified disciplines-Civil Engineering, Computer Science and Engineering, Electrical Engineering, Electronics Engineering, Mechanical Engineering and Architecture constituted the target sample of this study. 11778 women engineers belonging to the sample definition were located and direct contact could be established with 2310 members. The groups were named as TS and DS respectively as already explained. The questionnaires were mailed to all the 2310 members of the DS. 1020 completed questionnaires were received. The group, which filled the questionnaire, is named as the QRS (Questionnaire Response Sample). The data obtained through the completed questionnaires is the basis of the analysis presented. Some general information on the women engineer respondents is presented in this chapter. This includes their personal and family background, their academic career, particulars of school education, the engineering course and degree, etc.

#### **Personal and Family Background**

The aspects of personal and family background profiled include marital status, year of marriage, number of children, formal educational level of husband, mother, father and other family members. The data on these aspects has been collected through replies to question numbers 3, 4 and 5.

The marital status of the QRS members is given in Table-3.1, 740 out of 1020 QRS members reported single at the time of responding to the questionnaire, which was in the years 1999 and 2000. The data is further analysed for the year of marriage vis-à-vis the year of graduation (Table-3.2). The following observations will be of interest.

- Some QRS members got married before completing the engineering degree. This is true for all the graduation years selected for the study.
- More often, the marriage took place later, from one to several years after the graduation.
- The percentage of unmarried women in the QRS is larger amongst the graduates of the later years. (90.2% for 1998 graduates as against 33% in the graduates of 1994). This is a normal and expected trend. Nevertheless 33% of the 1994

graduates being unmarried is rather a high figure considering the fact that by this time their average age would be about 28 years. Whether or not the delay in marriage should be attributed to them being engineers, is a matter of debate.

**Table-3.1 Marital Status of the Respondents [Q3(i)]**

Marital Status	Number	%
Single	740	72.6
Married	280	27.5
<b>Total</b>	<b>1020</b>	<b>100.0</b>

**Table-3.2 Distribution of Women Engineers According to Their Year of Graduation and Year of Marriage**

Year of Marriage	Year of Graduation					Total
	1994	1995	1996	1997	1998	
1987	1	-	-	-	-	1
1991	-	2	-	-	-	2
1992	-	-	1	-	1	2
1993	3	-	-	-	-	3
1994	5	2	-	1	-	8
1995	10	5	3	-	1	19
1996	12	15	9	-	1	37
1997	12	16	12	5	1	46
1998	13	19	24	15	14	85
1999	5	13	15	17	18	68
2000	-	-	1	-	-	1
NR	3	-	3	2	-	8
<b>Total</b>	<b>64</b>	<b>72</b>	<b>68</b>	<b>40</b>	<b>36</b>	<b>280</b>
<b>Total number of graduates in that particular year</b>	91	132	172	257	368	1020
<b>%</b>	67.0	54.6	37.8	14.8	9.8	27.5

□ - The figures enclosed in boxes are the number of girls who got married before completing their graduation.

% - Percentage is based upon the total number of graduates of the particular year.

Table-3.2 shows another feature of the marriage aspect of women engineers. It shows that some members got married even before completing graduation. It is interesting to note that out of 280 married women engineers at least one got married even before joining the engineering course. Based upon this data, it is difficult to

draw a general inference concerning the age at marriage as influenced by their choice of profession. There are delayed marriages and early marriages.

The data on number of children is contained in Table-3.3. It is to be noted that 78 have one child and 2 have two children. This means 200 out of 280 married women engineers had no children at the time of data collection.

**Table-3.3 Number of Children [Q3(iii)]**

Number of Children	Number	%
Nil	<b>200</b>	<b>71.4</b>
Having 1 child	78	27.9
Having 2 children	2	0.7
<b>Total*</b>	<b>280</b>	<b>100.0</b>

\* Out of 1020 questionnaire responses, 280 Women Engineers were married according to Q3(i). Hence the percentages are based on 280.

Table-3.4 presents data regarding the formal educational level of the husband. 270 out of 280 married QRS members responded to the question. It can be seen that most of them have qualified life partners with 100 of them having a post graduate degree and an additional 166 having a graduate degree. The four cases where the husband does not have a graduate degree need to be noted. It is also important to note the fact that 14 women engineers having a postgraduate degree and three more pursuing postgraduate studies have a husband with only a graduate degree.

**Table-3.4 Formal Educational Level of Husband [Q4]**

Qualification of the Husband	Qualification of the Respondent			Total (%)
	Graduate	PG Students	Post-Graduate	
Post-Graduate	72	<b>7</b>	<b>21</b>	100 ( 37.0)
Graduate	<b>149</b>	3	14	166 ( 61.5)
High School	1	0	0	1 ( 0.4)
Secondary	3	0	0	3 ( 1.1)
No Schooling	0	0	0	0 ( 0.0)
Sub Total	225	10	35	270 (100.0)
No Response	10	0	0	10
<b>Total*</b>	<b>235</b>	<b>10</b>	<b>35</b>	<b>280</b>

\*Out of 1020 Questionnaire responses, 280 Women Engineers were married according to Q3(i). Hence the percentages are based on 280.

This data has been compared with that of the previous project in Figure-3.1. The two data are similar.



**Figure-3.1 Formal Educational Level of Husband [Q4]**

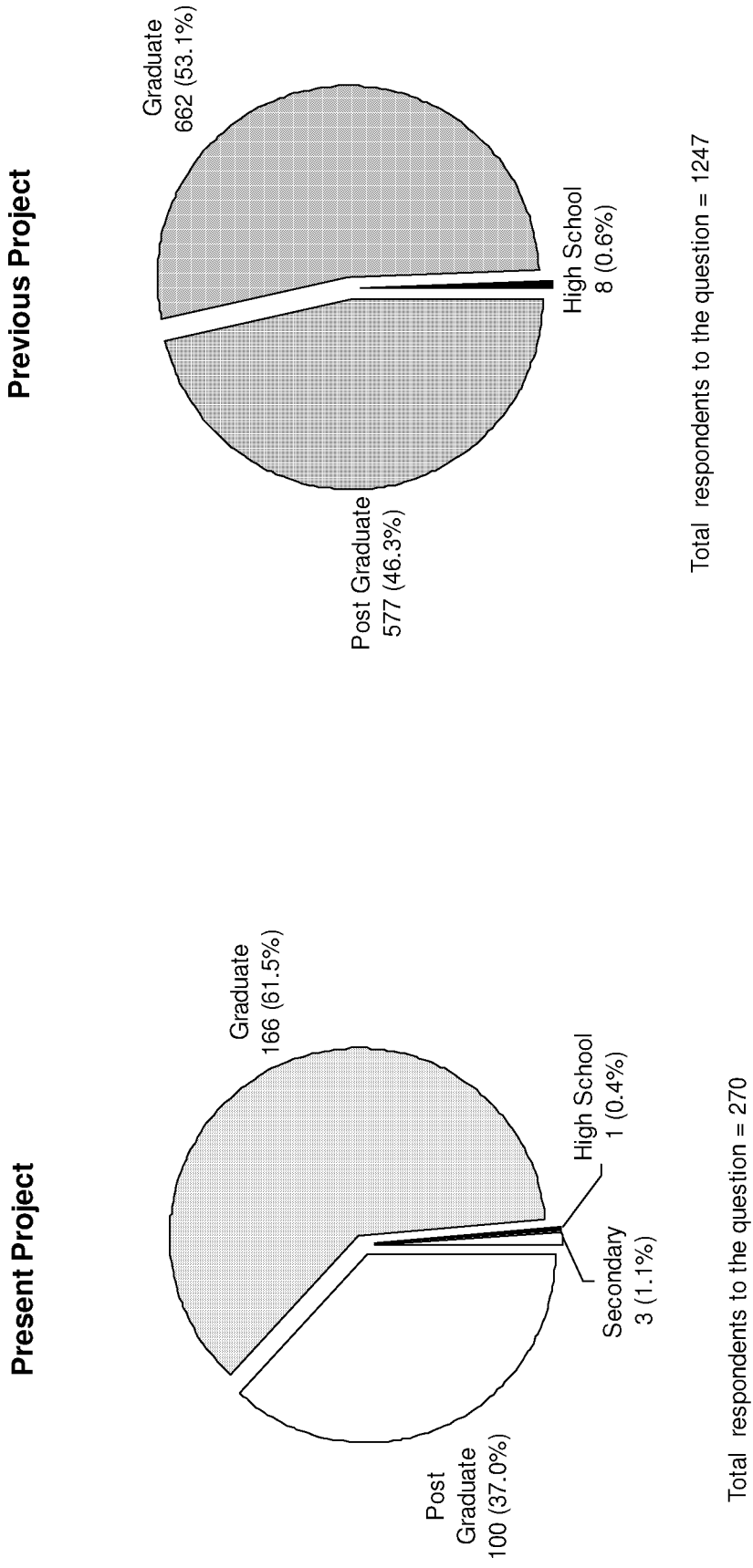


Table-3.5 gives the educational level of the parents, brothers and sisters. Over 43% of the QRS members have a mother who is a graduate or has a higher qualification, whereas over 71% of them have a father possessing a graduate degree or a higher qualification. Very few of the fathers belong to the 'No schooling' category.

**Table-3.5 Educational Level of Mother, Father, Sisters and Brothers [Q5]**

<b>Educational Level</b>	<b>Mother</b>	<b>Father</b>	<b>Sister-1</b>	<b>Sister-2</b>	<b>Brother-1</b>	<b>Brother-2</b>
<b>Post Graduate</b>	112 (12.1)	217 (23.4)	165 (29.2)	54 (23.5)	122 (18.5)	34 (17.8)
<b>Graduate</b>	287 (31.0)	<b>446</b> <b>(48.1)</b>	<b>319</b> <b>(56.5)</b>	<b>136</b> <b>(59.1)</b>	<b>394</b> <b>(59.6)</b>	<b>108</b> <b>(56.5)</b>
<b>High School</b>	<b>324</b> <b>(35.0)</b>	175 (18.9)	54 (9.6)	25 (10.9)	104 (15.7)	36 (18.9)
<b>Secondary</b>	171 (18.5)	83 (8.9)	25 (4.4)	14 (6.1)	41 (6.2)	12 (6.3)
<b>No Schooling</b>	32 (3.5)	7 (0.8)	2 (0.4)	1 (0.4)	0 (0.0)	1 (0.5)
<b>Sub Total</b>	926 (100.0)	928 (100.0)	565 (100.0)	230 (100.0)	661 (100.0)	191 (100.0)
<b>Not Mentioned</b>	94	92	455	790	359	829
<b>Total</b>	<b>1020</b>	<b>1020</b>	<b>1020</b>	<b>1020</b>	<b>1020</b>	<b>1020</b>

As regards brothers and sisters, the fractions possessing graduate degrees or higher qualifications are still higher. Large numbers under 'No Response' can be due to the fact that the respondents do not have brothers or sisters.

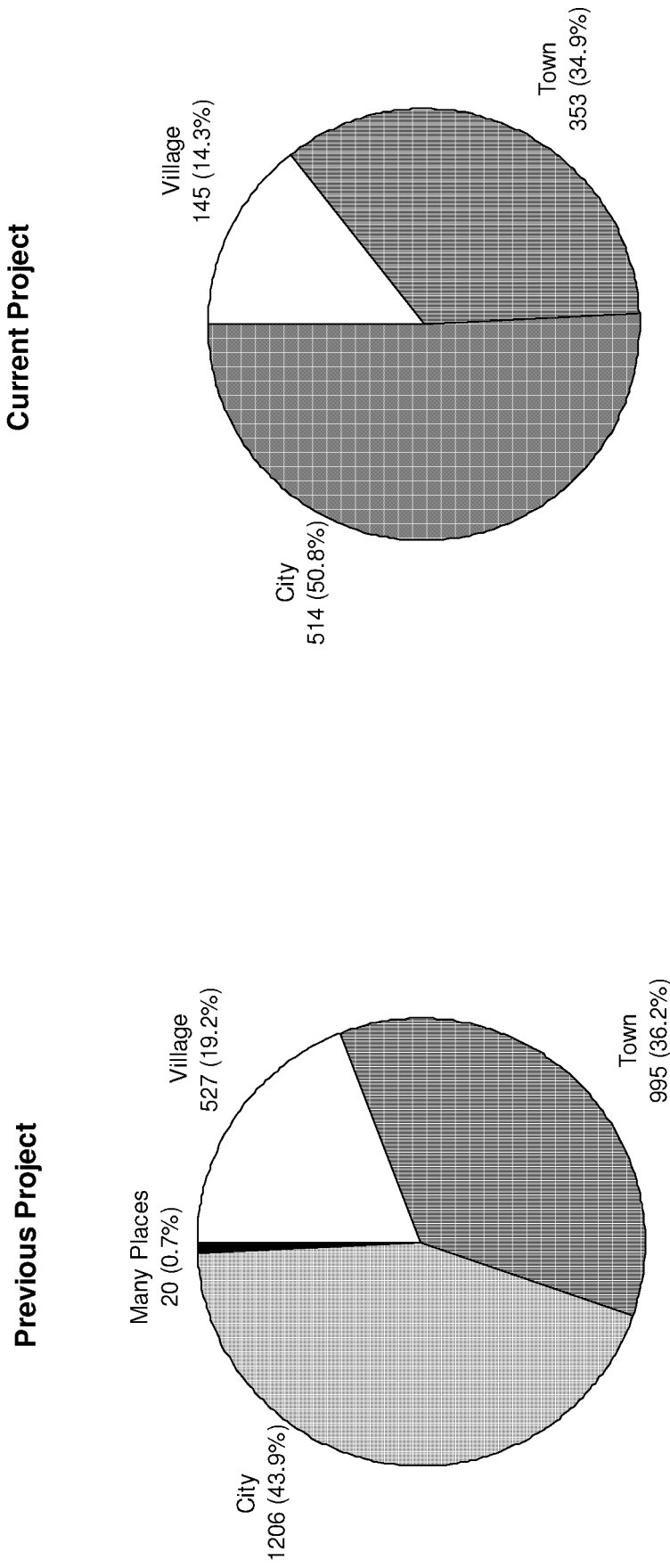
An overall ambience of a good educational background of the family is reflected from the table. These observations match very well with the data of the previous project. The educational background of the parental side of the family plays a crucial role in women taking up an engineering course and that of the husband provides encouragement in pursuit of the career. From these angles, the QRS members are favourably placed.

## **Academic Career**

Schooling particulars of the respondents (location, type and medium of instruction), their performance during schooling and during the engineering education are presented and discussed in this section. Data on the training record and association with professional societies are also included. This data has been obtained through replies to Q6, Q7, Q8, Q9 and Q10 of the Questionnaire.

Information regarding the category of the place where most of the schooling of the respondents was done is given in Figure-3.2. Corresponding data of the previous study

**Figure-3.2 Category of Place where Schooling was done [Q6a]**



Total respondents to the question = 2748

Total respondents to the question = 1012

is also given in the figure. It can be seen that in the present study, over 50% of the respondents report having done their schooling in the city as against 43.9% in case of the previous study. As compared to the previous study, the percentage of respondents with village level schooling is lower by about 5%. It is 14.3% in the current study as compared to 19.2% in the previous study.

Predominance of the city is a common factor in both the studies. This goes well with the data on the type of school attended by them. The largest numbers have attended Government, Semi-Government schools, closely followed by Private and Christian Missionary schools. The numbers who have studied in municipal schools and Kendriya Vidyalayas are comparatively smaller which also was the case in the previous study (Table-3.6).

**Table-3.6 Type of School [Q6(b)]**

Type of School	Present Project Number (%)	Previous Project Number (%)
Public	72 ( 7.2)	108 ( 3.9)
Kendriya Vidyalaya	54 ( 5.4)	127 ( 4.6)
Christian Missionary	253 ( 25.4)	<b>893 ( 32.5)</b>
Government/Semi-Government	<b>309 ( 31.1)</b>	821 ( 29.9)
Municipal	26 ( 2.6)	55 ( 2.0)
Private	257 ( 25.8)	599 ( 21.8)
Others	24 ( 2.4)	144 ( 5.2)
Sub Total	995 (100.0)	2747 (100.0)
Not Mentioned	25	6
<b>Total</b>	<b>1020</b>	<b>2753</b>

There has been a general belief that English as the medium of instruction during schooling helps in taking up higher education and planning of a professional career. Table-3.7 contains the data regarding medium of instruction during schooling for the current as well as the previous project. It can be seen that the said belief did not hold as far as the data of the previous study is concerned where over 52% of the women engineers reported having done their schooling in vernacular. The scenario reflected by the current data where more than 60% of the QRS members have attended English medium schools, is more attuned to the common belief. This phenomenon of attending English medium schools, however, seems more related to the attributes of the location. English medium schools are more prevalent in the bigger cities. People do prefer sending their children to English medium schools, if possible. In the current study the fraction of the respondents belonging to bigger cities and towns is higher so is the share from English medium schools. These data do not endorse the belief about the influence of the medium of instruction on the professional career.

**Table-3.7 Medium of Instruction During Schooling [Q6(c)]**

Medium of Instruction	Present Project Number (%)	Previous Project Number (%)
English	<b>604 ( 60.5)</b>	1304 ( 47.4)
Vernacular	395 ( 39.5)	<b>1449 ( 52.6)</b>
Sub Total	999 (100.0)	2753 (100.0)
Not Mentioned	21	0
<b>Total</b>	<b>1020</b>	<b>2753</b>

Table-3.8 presents the responses received in regards to the query about the stage at which the respondents planned their engineering career. It is interesting to note that a majority of them have opted for engineering career in a planned manner. Only 17% of the respondents took up engineering without planning. About 60% planned at the higher secondary school stage and 23.7% planned right at the secondary school stage. These responses are very much the same as obtained in the previous study (Figure-3.3).

**Table-3.8 Stage at which an Engineering Career was Planned [Q7]**

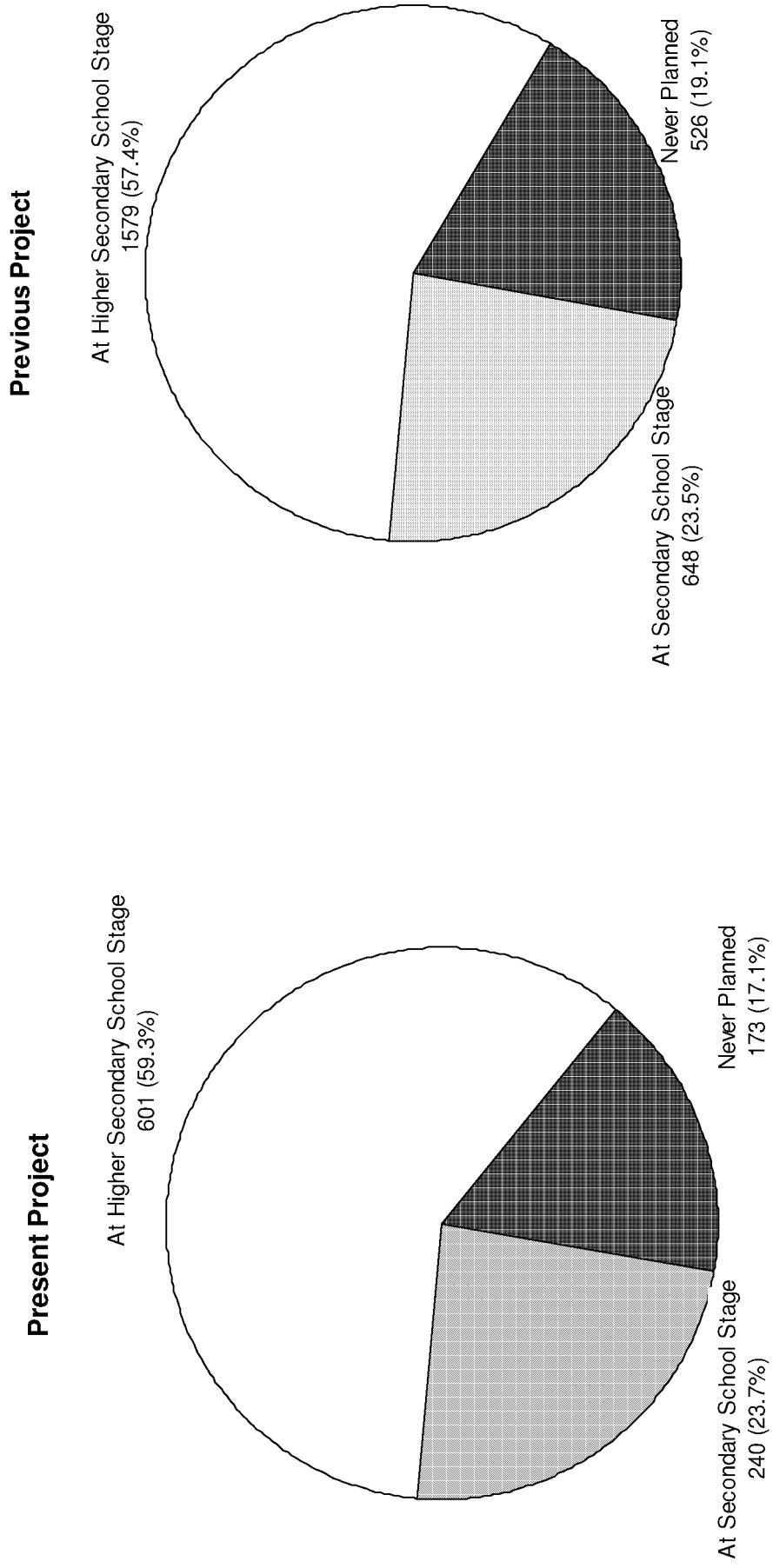
Stage	Present Project Number (%)	Previous Project Number (%)
At Secondary School Stage	240 ( 23.7)	648 ( 23.5)
At The Higher Secondary School Stage	<b>601 ( 59.3)</b>	<b>1579 ( 57.4)</b>
Never Planned	173 ( 17.1)	529 ( 19.1)
Sub Total	1014 (100.0)	2753 (100.0)
No Response	6	0
<b>Total</b>	<b>1020</b>	<b>2753</b>

The data about the degree possessed by the respondents and their performance at the degree examination is presented in Tables-3.9 and 3.10. The respondents having a graduate degree in engineering [B. E., B. Tech., B. Sc. (Engg.)] constitute 93.6% of the sample of this study. 65 out of 1020 (6.4%) have a B. Arch. degree.

**Table-3.9 Graduation Degree Obtained [Q8(a)]**

Qualification	Number	%
B.Arch./B. Planning	65	6.4
B. E./B.Tech./B.Sc. (Engg.)	955	93.6
<b>Total</b>	<b>1020</b>	<b>100.0</b>

**Figure-3.3 Stage at which an Engineering Career was Planned [Q7]**



Total respondents to the question = 2753

Total respondents to the question = 1014

Distribution of the QRS in regards to their qualification and academic status is given in Table-3.10. It can be seen that majority of them are graduates, as was the case in the previous study. 148 PG students and 74 Post Graduates, together total up to 21.8%, which is a noteworthy and significant number. Percentage-wise, this is comparable to the one in the previous study except for the fact that the student fraction is higher in the current study and vice-versa. This is understandable, since the members of the current sample are younger.

**Table-3.10 Qualification of Respondents [Q8(a)]**

<b>Qualification</b>	<b>Present Project Number (%)</b>	<b>Previous Project Number (%)</b>
Graduate	<b>798 ( 78.2)</b>	<b>2195 ( 79.7)</b>
P. G. Student	148 ( 14.5)	142 ( 5.2)
Post Graduate	74 ( 7.3)	392 ( 14.2)
Ph. D.	0 ( 0.0)	24 ( 0.9)
<b>Total</b>	<b>1020 (100.0)</b>	<b>2753 (100.0)</b>

The data on the approximate rank in the engineering college while passing out is given in Table-3.11. It can be seen that about 37.8% of the respondents are in the upper 10% of the class and an additional 34.7% in the upper 10-25%. This means over 72% of the respondents belong to the top 25% of the class in the graduate examination. Only 2.3% belonging to the lower 50% need to be noted. This data has been compared with that of the previous study in Figure-3.4. The comparison reveals that the pattern of the two data is similar and the percentage of respondents belonging to each of the performance brackets are comparable. This underlines the fact that the performance of girls in the engineering degree examination is good.

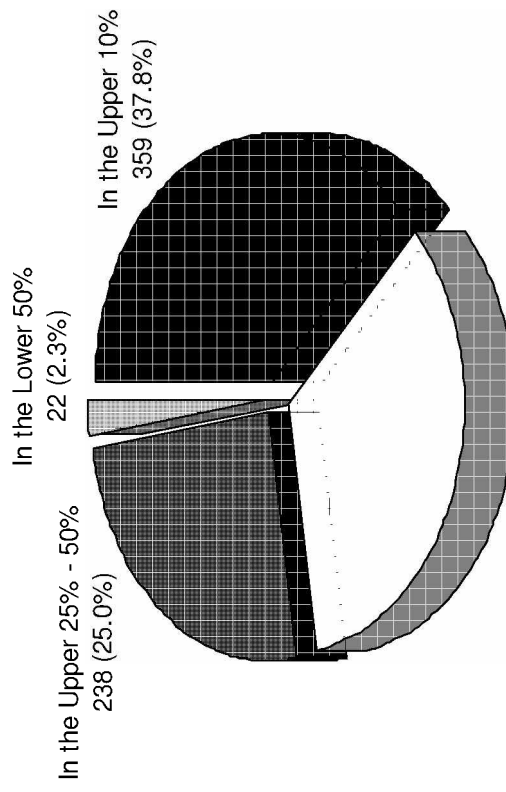
**Table-3.11 Approximate Rank in the Engineering College while Passing Out [Q8(b)]**

<b>Rank</b>	<b>Present Project Number (%)</b>	<b>Previous Project Number (%)</b>
In the Upper 10%	<b>359 ( 37.8)</b>	1030 ( 37.9)
In the Upper 10% - 25%	330 ( 34.7)	<b>1038 ( 38.2)</b>
In the Upper 25% - 50%	238 ( 25.0)	557 ( 20.5)
In the Lower 50%	22 ( 2.3)	92 ( 3.4)
Sub Total	949 (100.0)	2717 (100.0)
No Response	71	36
<b>Total</b>	<b>1020</b>	<b>2753</b>

The membership of professional bodies is a measure of one's awareness and involvement in professional activities. A question was therefore asked whether or not the respondents have acquired such a membership (Table-3.12). Over 80% have replied negatively and 67 have not responded to the question. Only 182 out of 1020

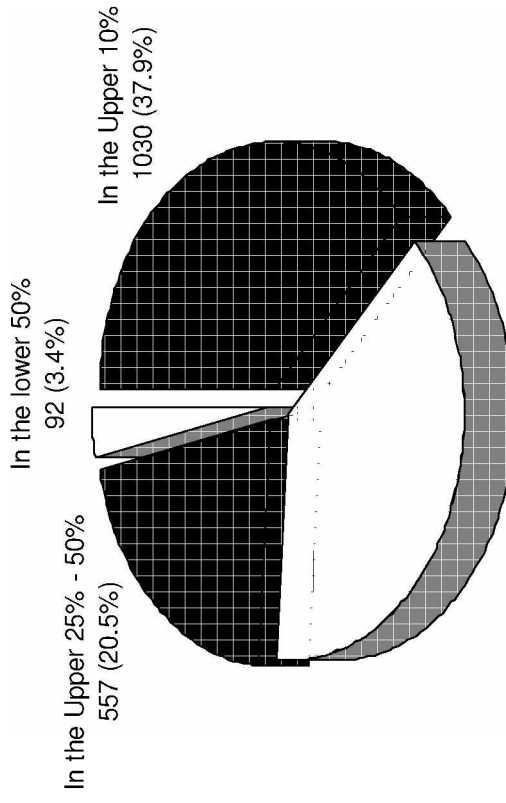
**Figure-3.4 Approximate Rank in the Engineering College while passing out [Q8b]**

**Present Project**



Total respondents to the question = 949

**Previous Project**



In the Upper 10% - 25%  
1038 (38.2%)

Total respondents to the question = 2717



have indicated their association with professional societies. Since, the sample members are generally young, a benefit of doubt can be given to them on the grounds that they may still not have come across the concept of membership of the professional associations and may not be even aware of the necessity and benefits of such memberships. It will be useful and interesting to compare this data with the overall data of men and women engineers. It will also be useful to make a deliberate provision in the degree curricula to at least expose the engineering student to such concepts through Student Chapters etc.

**Table-3.12 Membership of Professional Society/Association [Q10]**

	<b>Number</b>	<b>%</b>
Yes	182	19.1
No	<b>771</b>	<b>80.9</b>
Sub Total	953	100.0
No Response	67	
<b>Total</b>	<b>1020</b>	

## **SUMMARY**

1. 280 out of 1020 QRS members reported that they were married at the time of data collection. The remaining 740 were unmarried.
2. As expected, the percentage of married women is less amongst the graduates of later years. However, there are a few cases of marriage before graduation or even before starting the engineering course.
3. A significant fraction of the senior-most QRS members (average age of 28-29 years) reported that they were unmarried. No defined inference could therefore be drawn regarding the relationship between age at marriage and women taking up engineering.
4. 78 out of 280 married respondents have one child and 2 had two children.
5. 100 out of 280 respondents have a husband with a post graduate qualification. An additional 166 have a graduate husband. The two categories total up to over 98% of the married respondents.
6. Amongst mothers, graduates and those having higher qualifications constitute 43% of the total with about 35% having high school qualifications. Amongst fathers, the postgraduates and graduates total over 71% and those with high school qualifications are 18.9%. Thus, an overall ambience of a good educational background of the families is reflected in the study.
7. The largest number (31.1%) of respondents did their schooling in Government and Semi-Government schools. About 25% each were in Private and Christian Missionary schools, while the smallest numbers came from Municipal schools.

8. Over 60% of the respondents had English as their medium of instruction in school.
9. Taking up engineering as a career is, by and large, a planned affair for most girls. This has been duly reflected by the fact that about 59% planned for it at the higher secondary stage and about 24% at the secondary stage.
10. In the QRS, 93.6% of the respondents have an engineering graduate degree and 6.4% have a degree in Architecture.
11. Out of 1020 respondents, 74 have a post-graduate degree, while 148 are pursuing higher studies have a postgraduate qualification. Thus about 22% will eventually have a postgraduate qualification.
12. Performance of women at the engineering college is generally good. Over 37% of the QRS belong to the upper 10% of the class in the degree examination. An additional 34.7% belong to the performance bracket of upper 10-25%. Only 2.3% were in the lower 50% of the class.
13. Less than 20% of the sample reported having membership of a professional society/ association. This is probably because they are in the process of entering the profession.
14. In general, the data (in terms of percentages) in this chapter is very similar to the data obtained in the previous study. This is significant since the previous study focussed on women who had passed out in the eighties, while the present study has focussed on women who passed out in the later part of the nineties.

## Chapter – 4

### PERCEPTIONS, CAREER GOALS AND VALUES

Perceptions, career goals and values nurtured by the members of QRS constitute the focus of this chapter. These are the facets that determine the co-ordinates of their career plan and also govern the professional performance, contributions as well as the job satisfaction. The concerned data has been obtained through replies to Q11, Q14 and Q15 of the Questionnaire. The data and analysis of the replies is presented herein. The same has been compared with the data and findings of the previous study.

#### CONTRIBUTION OF PERSONAL QUALITIES

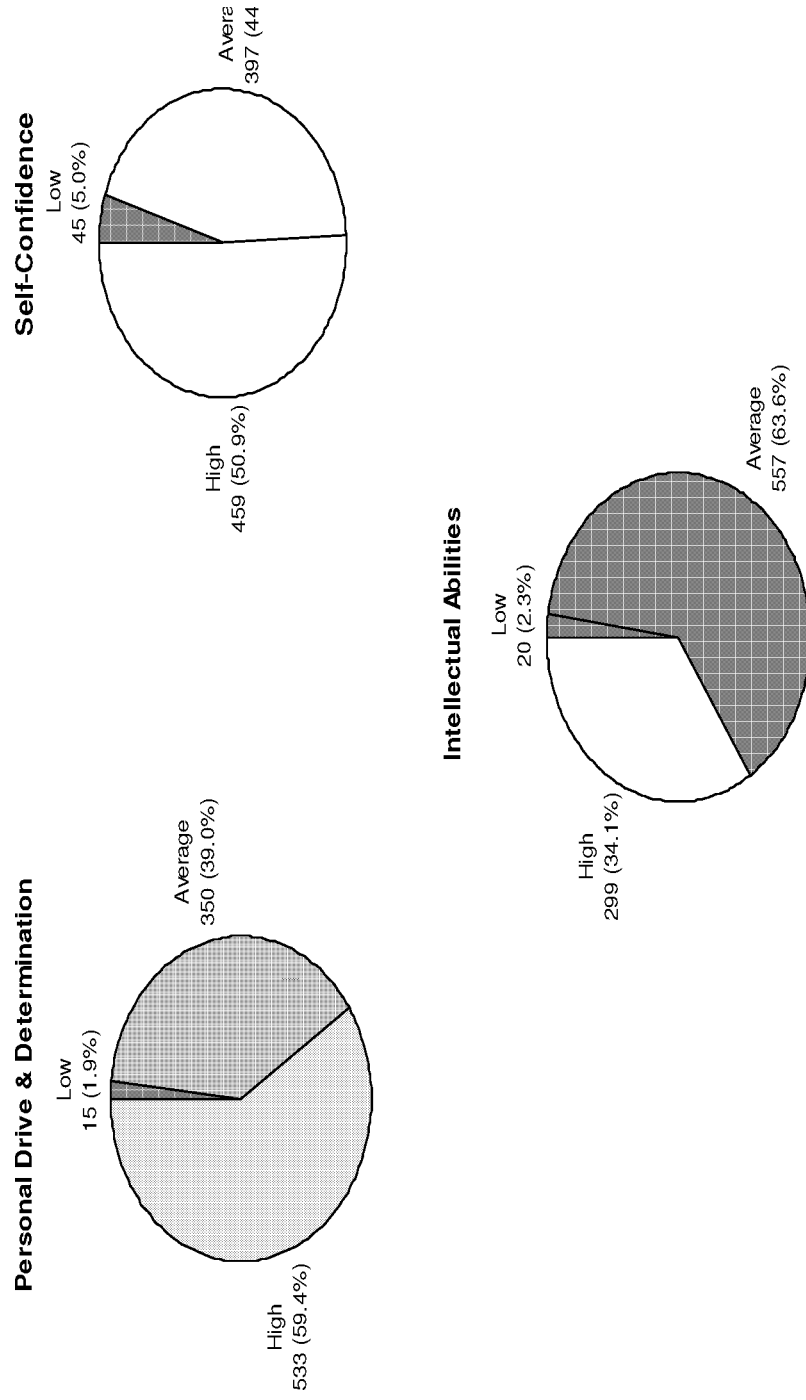
Perceptions of the respondents regarding contribution of personal attributes viz. Personal Drive & Determination, Self-confidence and Intellectual Abilities, in achieving academic and career goals were obtained through a question containing three sub-questions referring to the three personal attributes and each having three options; Low, Average and High. The response is given in Table-4.1 and Figure-4.1.

**Table-4.1 Contribution of Personal Qualities in Achieving Academic and Career Goals [Q11]**

<b>Personal Quality</b>	<b>Low</b>	<b>Average</b>	<b>High</b>	<b>Sub Total</b>	<b>Not Specified</b>	<b>Total</b>
<b>Personal Drive and Determination</b>	15 (1.9)	350 (40.0)	<b>533</b> <b>(59.4)</b>	898 (100.0)	122	<b>1020</b>
<b>Self-Confidence</b>	45 (5.0)	397 (44.1)	<b>459</b> <b>(50.9)</b>	901 (100.0)	119	<b>1020</b>
<b>Intellectual Abilities</b>	20 (2.3)	<b>557</b> <b>(63.6)</b>	299 (34.1)	876 (100.0)	144	<b>1020</b>

As can be seen from the table, contribution of 'Personal drive and determination' is rated 'High' by a large number of respondents, 533 as against 350 rating the contribution as 'Average'. Similarly, contribution of 'Self-confidence' is considered

**Figure-4.1 Contribution of Personal Qualities in Achieving Academic and Career Goals [Q11]**



'High' by a larger number of respondents than those considering it to be 'Average'. Surprisingly, a large number, 557, have rated the contribution of 'Intellectual abilities' as 'Average'. Based upon this response it can be said that amongst the various factors, the contribution of 'Personal drive and determination' towards their academic achievements, is perceived much higher by women engineers. This is followed by 'Self-confidence'. 'Intellectual abilities' stand the last. The response to this question was similar in the previous project in regards to 'Personal drive and determination'. As for 'Self-confidence' and 'Intellectual abilities', 'Average' predominated in that study. This is a change as far as contribution of 'Self-confidence' is concerned. Intelligence is a gift of nature. Success will depend upon best utilisation of this attribute, which is governed by the degree of determination exercised. Determination, in turn will depend upon the drive. This comes out clearly from the response.

## PERCEIVED PRIORITIES AND VALUES

Data on the priorities and values nurtured by the respondents in regards to certain personal and professional facets were obtained through replies to Q14. The question contained 15 statements commonly encountered in connection with working women. The response was sought in terms of the degree to which the respondents 'Agree' or 'Disagree' with each of the statements. Out of the 15 statements, 3 had a professional orientation, 10 had a family and personal orientation and 2 related to general women issues or issues related to women in engineering. Analysis of the responses was carried out separately for married and unmarried women. This approach made it possible to identify the attitudinal differences that may have resulted due to the experience of being married.

Table-4.2a presents the responses to the statement, 'For a married woman, a career should be secondary to her responsibilities as a wife and mother'. The responses from married and single women have been tabulated separately. The overall response is presented in the third column of the table.

**Table-4.2a 'For a married woman, a career should be secondary to her responsibilities as a wife and mother' [Q14(a)]**

	Married	Single	Total
Agree Fully	73 ( 26.4)	127 ( 17.4)	200 ( 19.8)
Agree Somewhat	<b>96 ( 34.7)</b>	<b>263 ( 35.9)</b>	<b>359 ( 35.6)</b>
Disagree Somewhat	50 ( 18.1)	148 ( 20.2)	198 ( 19.6)
Disagree Strongly	54 ( 19.5)	173 ( 23.6)	227 ( 22.5)
No Opinion	4 ( 1.4)	21 ( 2.9)	25 ( 2.5)
Sub Total	277 (100.0)	732 (100.0)	1009 (100.0)
Not Specified	3	8	11
<b>Total</b>	<b>280</b>	<b>740</b>	<b>1020</b>

It can be seen that the overall response is in agreement with the statement. Over 55% of the responding women engineers give higher importance to their responsibility as a wife and mother, agreeing fully or somewhat with the statement. Slightly lower but significant numbers (about 42%) disagree and feel that a career should not be secondary. Comparison of the response from the married and single women reflects a significant difference in the perceptions only in the 'Agree fully' category. This is quite expected and can be attributed to the fact that single women are yet to touch base with the ground realities of married life. Figure-4.2a compares the responses to the statement by the respondents of the present and the previous project. A larger fraction disagreeing strongly in the current project can be attributed to the fact that the sample population is younger in this case and contains a much larger unmarried population. Qualitatively both the responses are similar.

Table-4.2b contains the responses to the statement regarding whether or not 'Small children suffer when mothers work full time'. The data reflects a general agreement with the statement with a total number of 855 respondents 'Agreeing fully' or 'Agreeing somewhat'. It is important to note that perceptions on the subject are quite clear irrespective of the respondents being married or single women. Thus, the statement stands forcefully endorsed. Figure-4.2b compares the responses to the statement by the respondents of the present and the previous project.

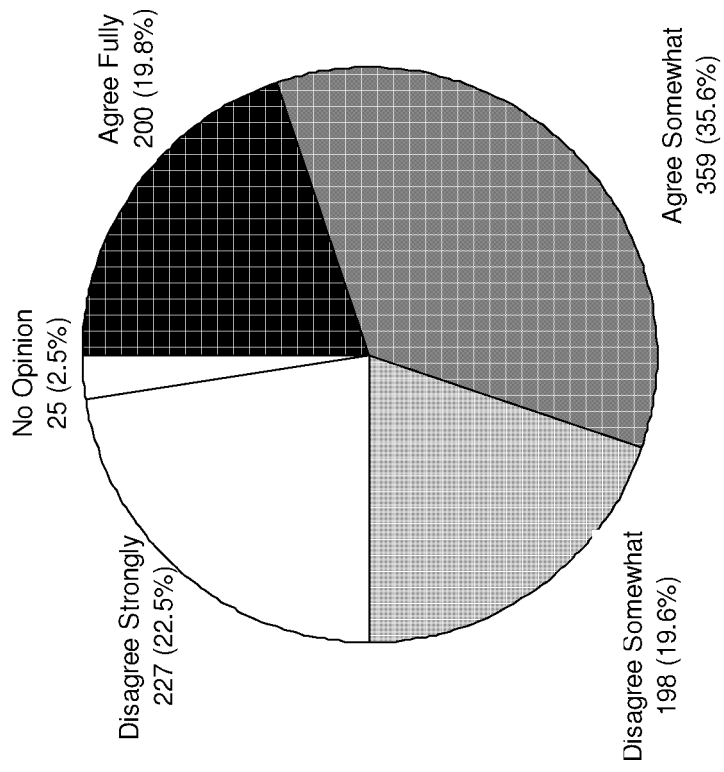
**Table-4.2b 'Small children suffer when mothers work full time' [Q14(c)]**

	<b>Married</b>	<b>Single</b>	<b>Total</b>
Agree Fully	<b>132 ( 47.5)</b>	<b>314 ( 42.8)</b>	<b>446 ( 44.1)</b>
Agree Somewhat	107 ( 38.5)	302 ( 41.2)	409 ( 40.5)
Disagree Somewhat	20 ( 7.2)	54 ( 7.4)	74 ( 7.3)
Disagree Strongly	18 ( 6.5)	39 ( 5.3)	57 ( 5.6)
No Opinion	1 ( 0.4)	24 ( 3.3)	25 ( 2.5)
Sub Total	278 (100.0)	733 (100.0)	1011 (100.0)
Not Specified	2	7	9
<b>Total</b>	<b>280</b>	<b>740</b>	<b>1020</b>

This response along with the one received with respect to the statement regarding responsibilities as a wife and mother indicates that women engineers are clear about their priorities and responsibilities. At the same time, they do not want to succumb to undue social pressure. The latter echoes from the data presented in Table-4.2c wherein views of the women engineers on the statement 'A woman who is really interested in her career should not have children' are presented. It can be seen that 700 out of 1007 respondents have refuted the statement. Both married and single women have refuted the statement, the percentage being larger (72%) with single women. Motherhood is the right and pride of women and a statement like this questions their basic right. Nevertheless, about 17% of the married respondents and 9% of the single respondents have agreed with the statement. This has come as a surprise and needs to be underlined. The response has not changed between the

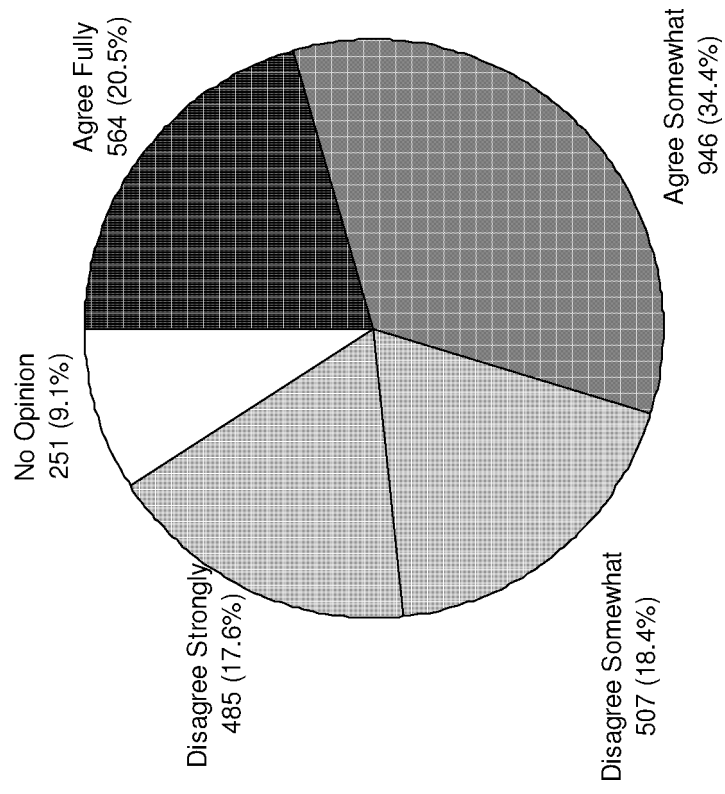
**Figure-4.2a 'For a married woman, a career should be secondary to her responsibilities as a wife and mother' [Q14(a)]**

**Present Project**



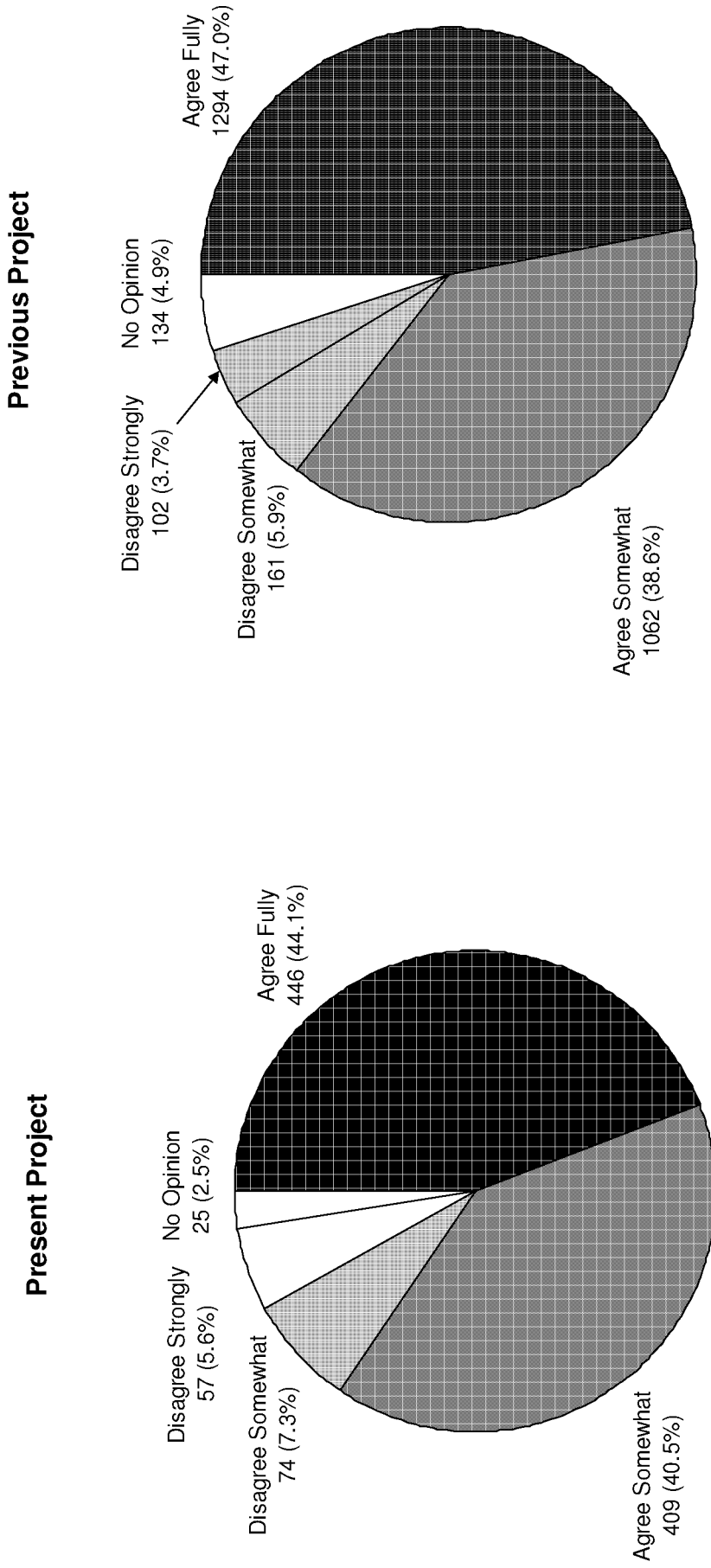
Total respondents to the question = 1009

**Previous Project**



Total respondents to the question = 2753

**Figure-4.2b 'Small children suffer when mothers work full time' [Q14(c)]**



Total respondents to the question = 1011

Total respondents to the question = 2753



two studies, as can be seen from Figure-4.2c which compares the data with that of the previous study.

**Table-4.2c 'A woman who is really interested in her career should not have children' [Q14(d)]**

	<b>Married</b>	<b>Single</b>	<b>Total</b>
Agree Fully	23 ( 8.2)	28 ( 3.9)	51 ( 5.1)
Agree Somewhat	26 ( 9.3)	41 ( 5.6)	67 ( 6.7)
Disagree Somewhat	47 ( 16.9)	99 ( 13.6)	146 ( 14.5)
Disagree Strongly	<b>176 ( 63.1)</b>	<b>524 ( 72.0)</b>	<b>700 ( 69.5)</b>
No Opinion	7 ( 2.5)	36 ( 5.0)	43 ( 4.3)
Sub Total	279 (100.0)	728 (100.0)	1007 (100.0)
Not Specified	1	12	13
<b>Total</b>	<b>280</b>	<b>740</b>	<b>1020</b>

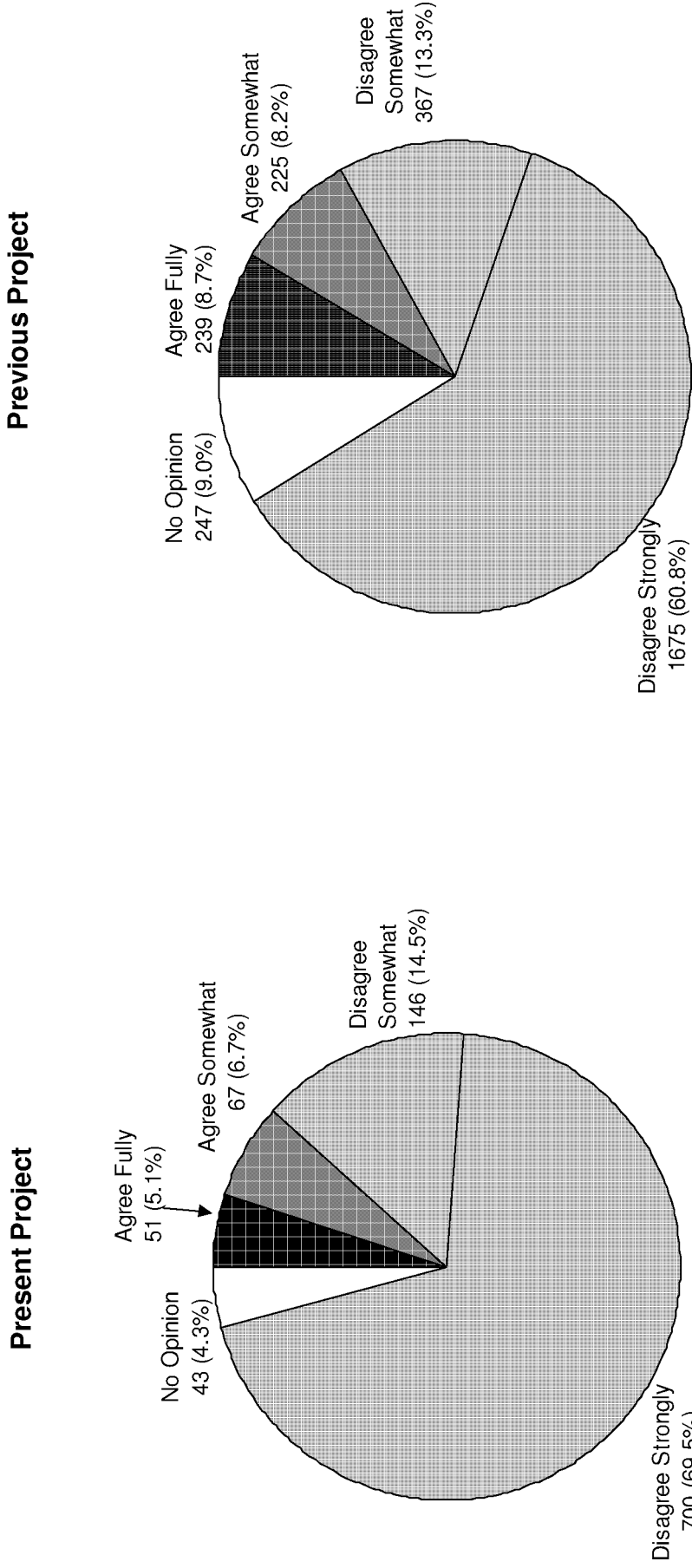
Table-4.2d presents the responses to the statement 'A working woman cannot manage both home and work demands without sacrificing either'. Over 38% of married women and 45% of single women have expressed strong disagreement to the statement. Additionally over 22% of the married and 23% of the single women have disagreed with the statement to some extent. On the whole the percentage of women disagreeing to the statement strongly or to some extent, accounts for over 66% of the total respondents. Although about 31% of the responses being in agreement with the statement cannot be ignored, it is not incorrect to state that the perceptions generally weigh towards disagreement.

Confidence of women in looking after both home and work demands is clearly seen from this data. This is different from the data of the previous study where the opinion did not come out so strongly (Figure-4.2d).

**Table-4.2d 'A working woman cannot manage both home and work demands without sacrificing either' [Q14(e)]**

	<b>Married</b>	<b>Single</b>	<b>Total</b>
Agree Fully	30 ( 10.8)	58 ( 7.9)	88 ( 8.7)
Agree Somewhat	76 ( 27.2)	154 ( 21.0)	230 ( 22.8)
Disagree Somewhat	63 ( 22.6)	173 ( 23.6)	236 ( 23.3)
Disagree Strongly	<b>107 ( 38.4)</b>	<b>330 ( 45.1)</b>	<b>437 ( 43.2)</b>
No Opinion	3 ( 1.1)	17 ( 2.3)	20 ( 2.0)
Sub Total	279 (100.0)	732 (100.0)	1011 (100.0)
Not Specified	1	8	9
<b>Total</b>	<b>280</b>	<b>740</b>	<b>1020</b>

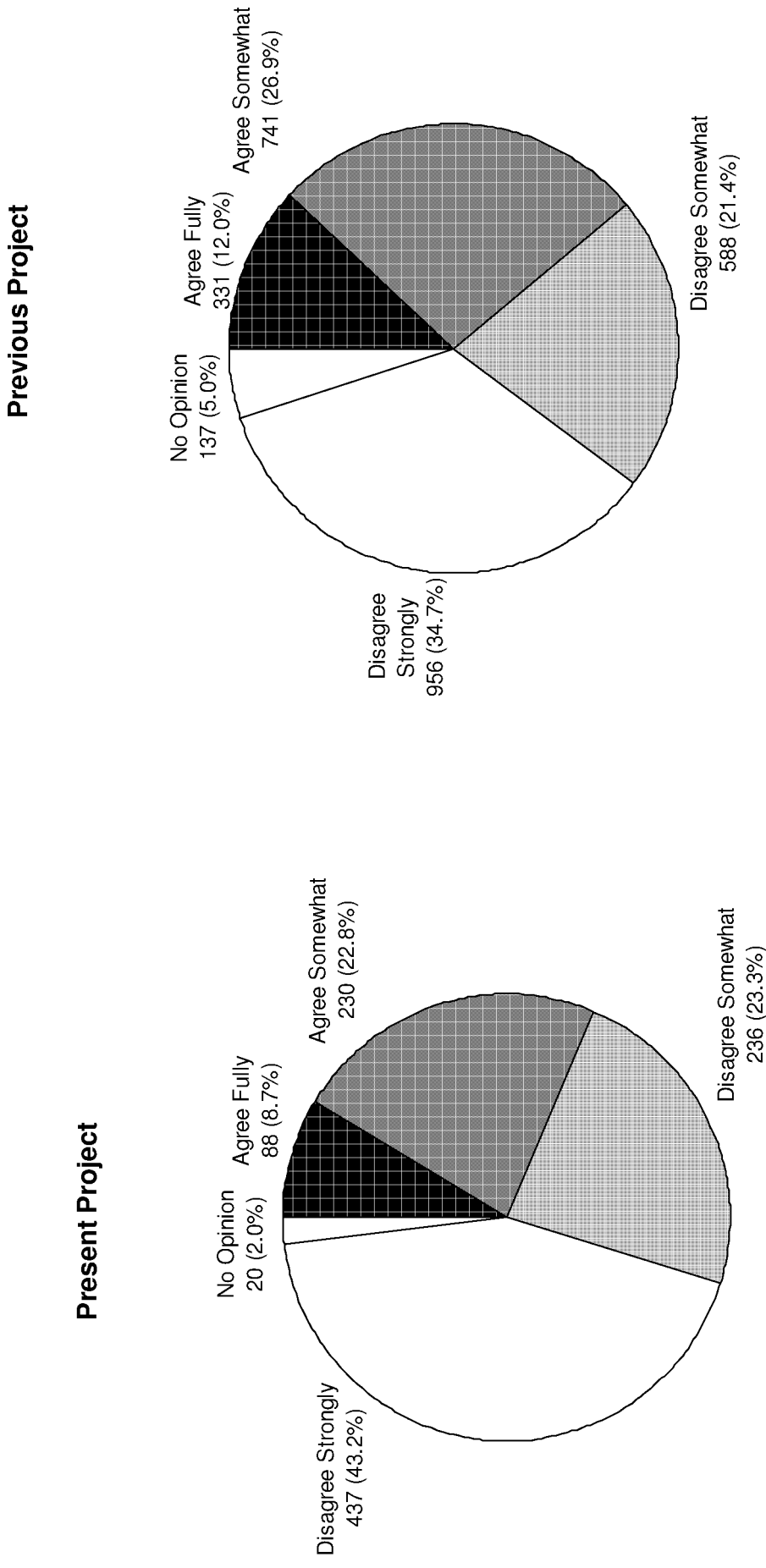
**Figure-4.2c 'A woman who is really interested in her career should not have children' [Q14(d)]**



Total respondents to the question = 2753

Total respondents to the question = 1007

**Figure-4.2d 'A working woman cannot manage both home and work demands without sacrificing either' [Q14(e)]**



Total respondents to the question = 1011

Total respondents to the question = 2753

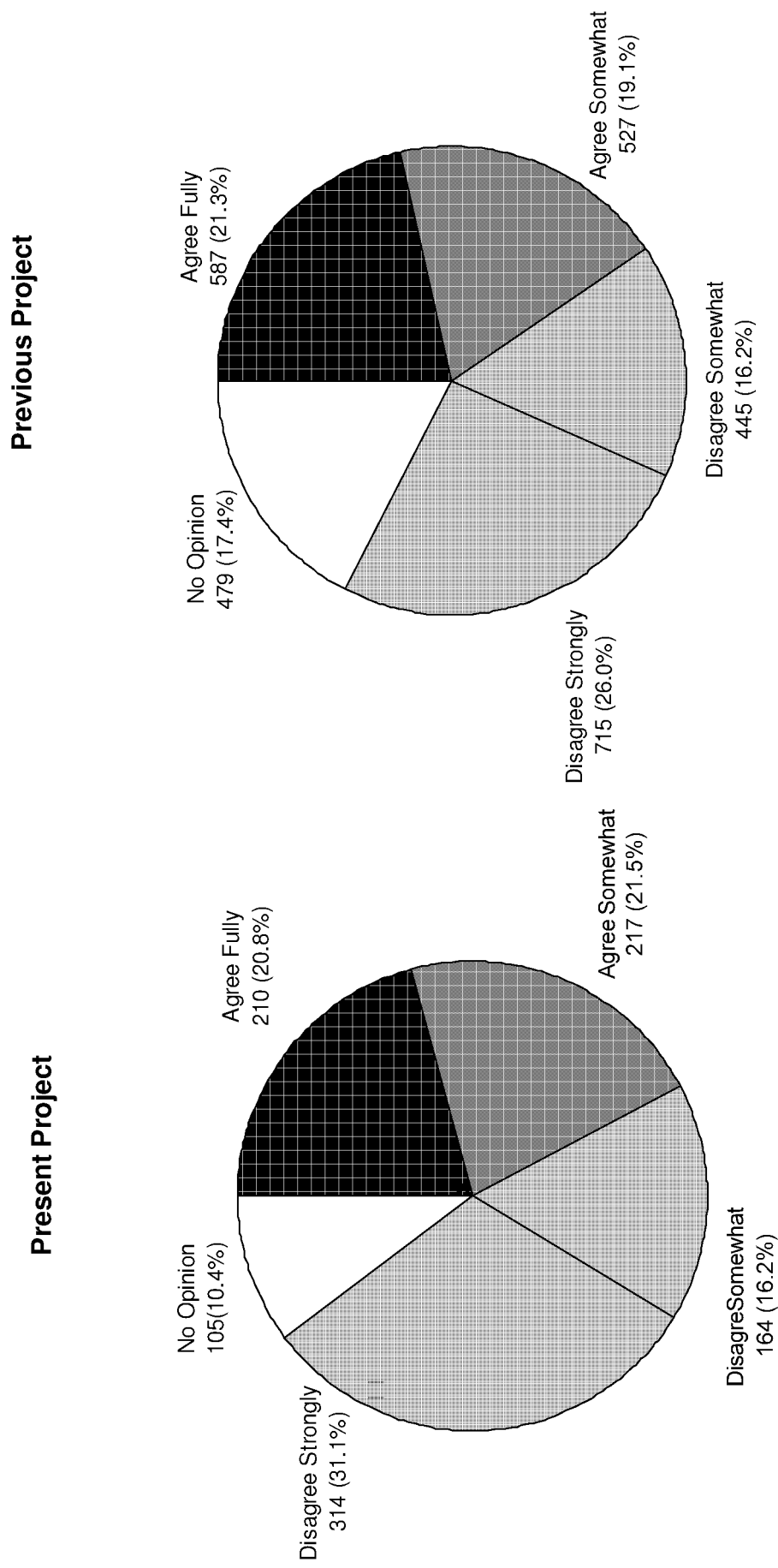
Table-4.2e presents the data received in response to the statement 'In a conflict between a husband's career and a wife's career, the husband's career should come first'. The overall response on this issue is divided although the largest number, 314 out of 1020 disagree strongly with the statement. Out of these 314 respondents, 232 are single women and 82 are married. Percentage-wise the response from married and single women are quite comparable as far as strong disagreement goes. Over 52% of the married respondents and about 38% of the single respondents agree with the statement. It is also important to underline this and the fact that over 42% of the total respondents are in agreement with the statement to a full or to some extent. This data reflects the importance Indian women give to their husband's career. Such notions reflect prevalence of traditional social values and the fact that a significant number of women engineers would like to conform to such values and expectations. It is necessary to highlight that by taking up engineering as a career, women do not change their value system. Figure-4.2e compares this response, to that obtained in the previous study. It can be seen that the basic features have remained unaltered between the two studies.

**Table-4.2e 'In a conflict between a husband's career and a wife's career, the husband's career should come first' [Q14(i)]**

	<b>Married</b>	<b>Single</b>	<b>Total</b>
Agree Fully	75 ( 27.0)	135 ( 18.4)	210 ( 20.8)
Agree Somewhat	70 ( 25.2)	147 ( 20.1)	217 ( 21.5)
Disagree Somewhat	34 ( 12.2)	130 ( 17.8)	164 ( 16.2)
Disagree Strongly	<b>82 ( 29.5)</b>	<b>232 ( 31.7)</b>	<b>314 ( 31.1)</b>
No Opinion	17 ( 6.1)	88 ( 12.0)	105 ( 10.4)
Sub Total	278 (100.0)	732 (100.0)	1010 (100.0)
Not Specified	2	8	10
<b>Total</b>	<b>280</b>	<b>740</b>	<b>1020</b>

While on the subject of traditions and conventions, it is appropriate to present and discuss the responses received with respect to the statement 'Men can raise small children just as women can' and 'I would feel uncomfortable if my husband kept the house'. The response to the first statement presented in Table-4.2f is rather revealing wherein majority of women, married as well as single, have agreed with the statement. Contrary to this, the majority have expressed the opinion that they would not be comfortable if their husband kept the house (Table-4.2g). Whereas, the response regarding being uncomfortable if the husband kept the house is in tune with the traditions and societal values, the same is not true with respect to men raising children. Probably the statement about men raising children is interpreted more as confirming the skills and capacities of men being able to raise children. The intention probably is not to say that men should raise small children but to state that they can raise small children. This may also originate from concerns about well-being of children. This response is comparable to the one in the previous study where also capability of men in raising small children has been affirmed by a large fraction of the sample population (Figure-4.2f). The responses in the two studies,

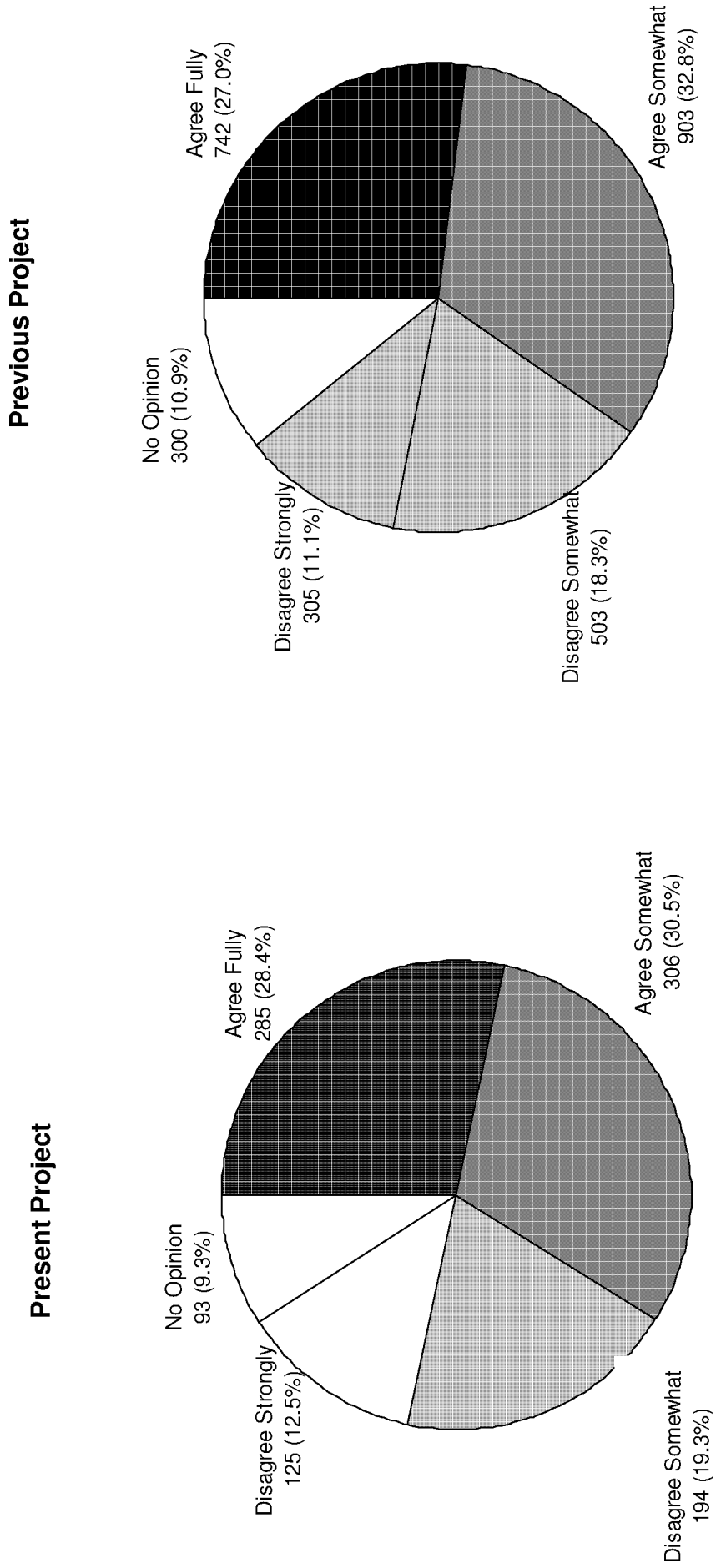
**Figure-4.2e 'In a conflict between a husband's and a wife's career, the husband's career should come first' [Q14(i)]**



Total respondents to the question =1010

Total respondents to the question = 2753

Figure-4.2f 'Men can raise small children just as women can' [Q14(k)]



about being comfortable with husband keeping the house, are compared in Figure-4.2g. The responses are similar in nature, except for some differences in the respective fractions. A smaller fraction of respondents is perceived as being uncomfortable in the previous study as compared to the fraction in the present study.

**Table-4.2f 'Men can raise small children just as women can' [Q14(k)]**

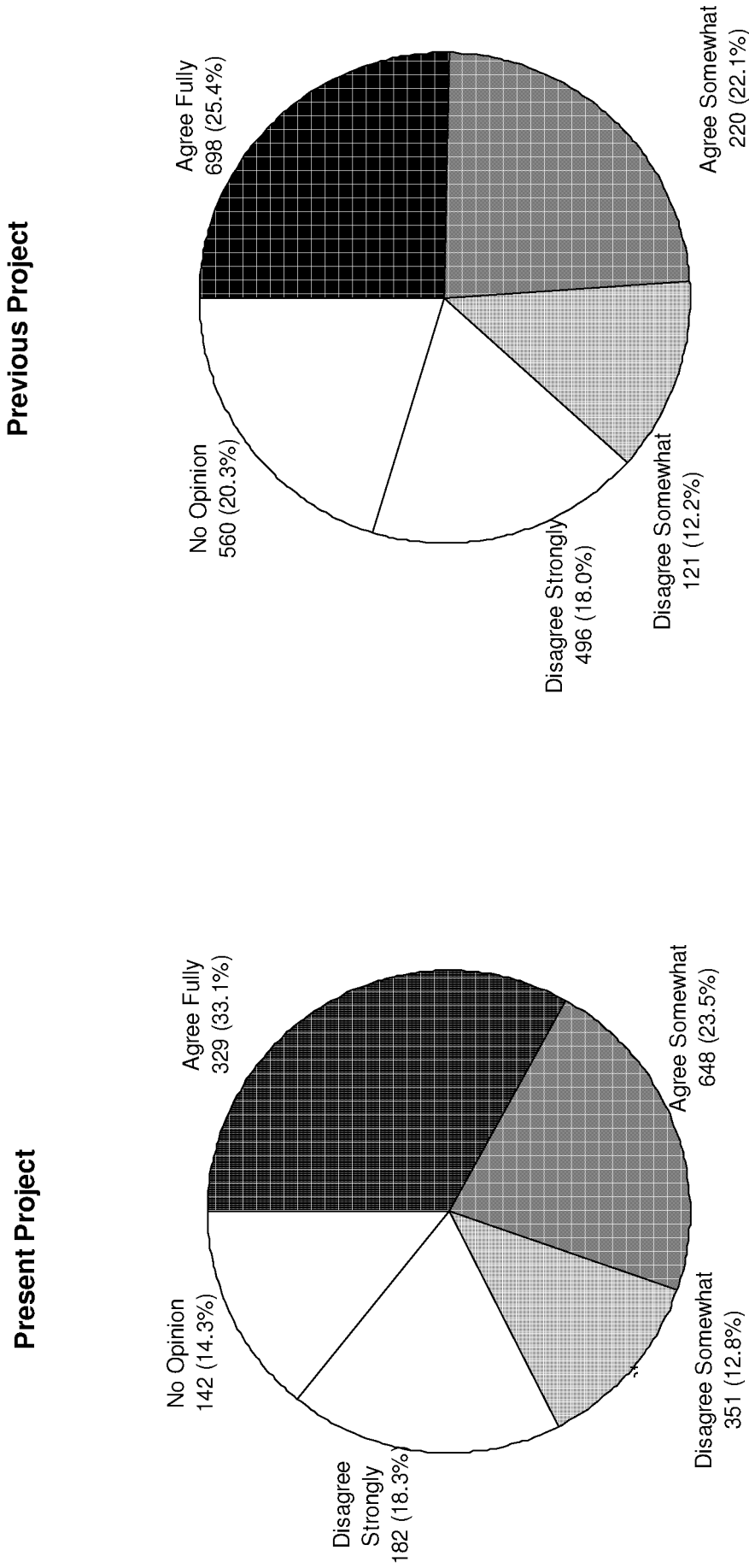
	<b>Married</b>	<b>Single</b>	<b>Total</b>
Agree Fully	70 ( 25.2)	215 ( 29.7)	285 ( 28.4)
Agree Somewhat	<b>85 ( 30.6)</b>	<b>221 ( 30.5)</b>	<b>306 ( 30.5)</b>
Disagree Somewhat	60 ( 21.6)	134 ( 18.5)	194 ( 19.3)
Disagree Strongly	49 ( 17.6)	76 ( 10.5)	125 ( 12.5)
No Opinion	14 ( 5.0)	79 ( 10.9)	93 ( 9.3)
Sub Total	278 (100.0)	725 (100.0)	1003 (100.0)
Not Specified	2	15	17
<b>Total</b>	<b>280</b>	<b>740</b>	<b>1020</b>

**Table-4.2g 'I would feel uncomfortable if my husband kept house' [Q14(l)]**

	<b>Married</b>	<b>Single</b>	<b>Total</b>
Agree Fully	<b>111 ( 40.2)</b>	<b>218 ( 30.4)</b>	<b>329 ( 33.1)</b>
Agree Somewhat	61 ( 22.1)	159 ( 22.1)	220 ( 22.1)
Disagree Somewhat	36 ( 13.0)	85 ( 11.8)	121 ( 12.2)
Disagree Strongly	54 ( 19.6)	128 ( 17.8)	182 ( 18.3)
No Opinion	14 ( 5.1)	128 ( 17.8)	142 ( 14.3)
Sub Total	276 (100.0)	718 (100.0)	994 (100.0)
Not Specified	4	22	26
<b>Total</b>	<b>280</b>	<b>740</b>	<b>1020</b>

Support from family and husband is seen as an important necessity for a woman to have a successful career. Perceptions of women engineers on the statement 'Unless the family/ husband provides a supportive role, a woman cannot have a successful career' are presented in Table-4.2h. An overwhelming number of the respondents, irrespective of the fact whether they are married or single, agree with this statement. Clarity regarding the concept of the single women who are yet to be exposed to married life stands out. This is recognising the truth. The response was the same in the earlier study (Figure-4.2h).

Figure-4.2g 'I would feel uncomfortable if my husband kept house' [Q14(I)]

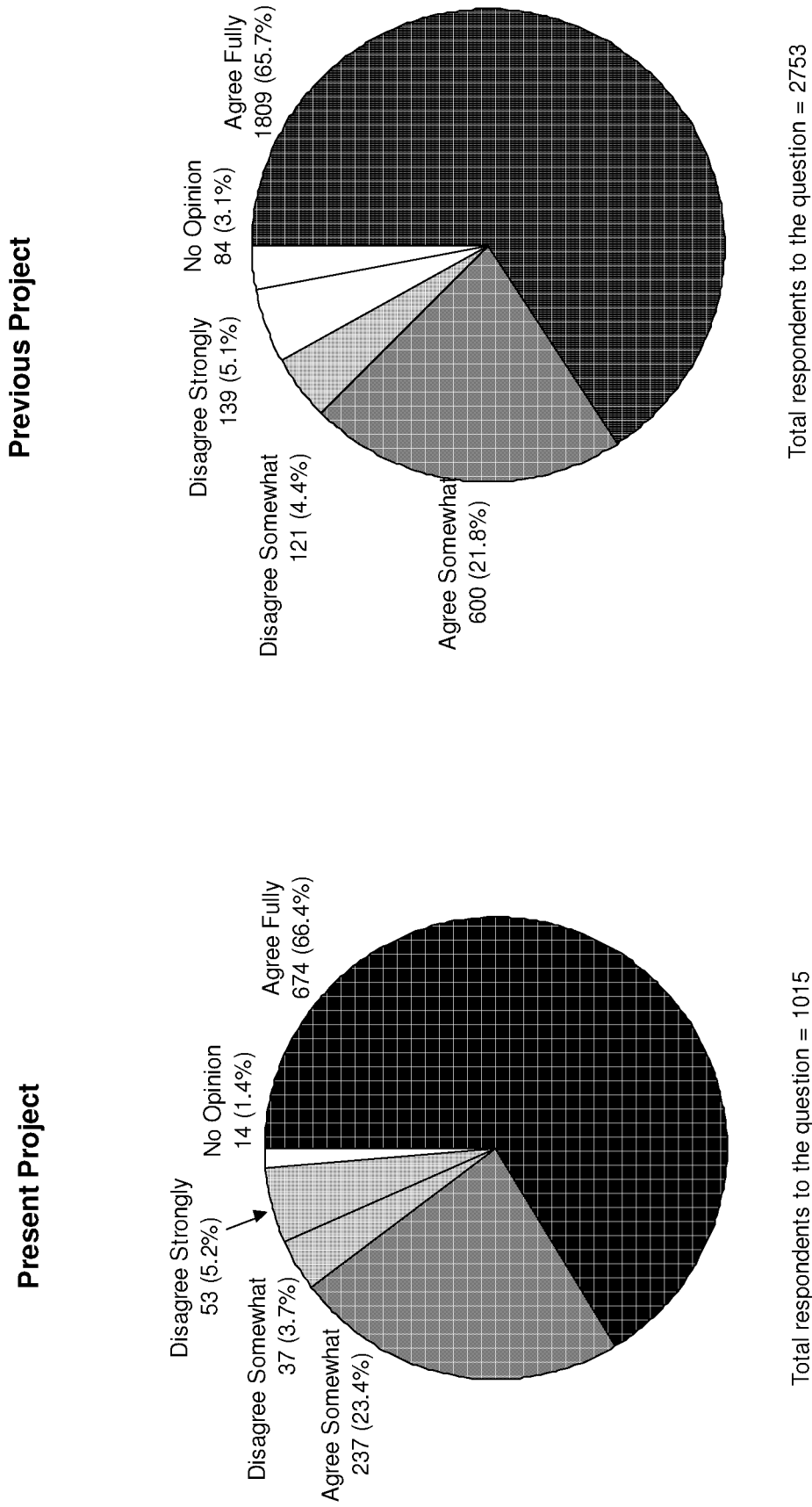


Total respondents to the question = 2753

Total respondents to the question = 994



**Figure-4.2h 'Unless family/husband provide a supporting role, a woman cannot have a successful career' [Q14(i)]**



**Table-4.2h 'Unless the family/husband provides a supporting role, a woman cannot have a successful career' [Q14(j)]**

	<b>Married</b>	<b>Single</b>	<b>Total</b>
Agree Fully	<b>204 ( 73.1)</b>	<b>470 ( 63.9)</b>	<b>674 ( 66.4)</b>
Agree Somewhat	61 ( 21.9)	176 ( 23.9)	237 ( 23.4)
Disagree Somewhat	7 ( 2.5)	30 ( 4.1)	37 ( 3.7)
Disagree Strongly	5 ( 1.8)	48 ( 6.5)	53 ( 5.2)
No Opinion	2 ( 0.7)	12 ( 1.6)	14 ( 1.4)
Sub Total	279 (100.0)	736 (100.0)	1015 (100.0)
Not Specified	1	4	5
<b>Total</b>	<b>280</b>	<b>740</b>	<b>1020</b>

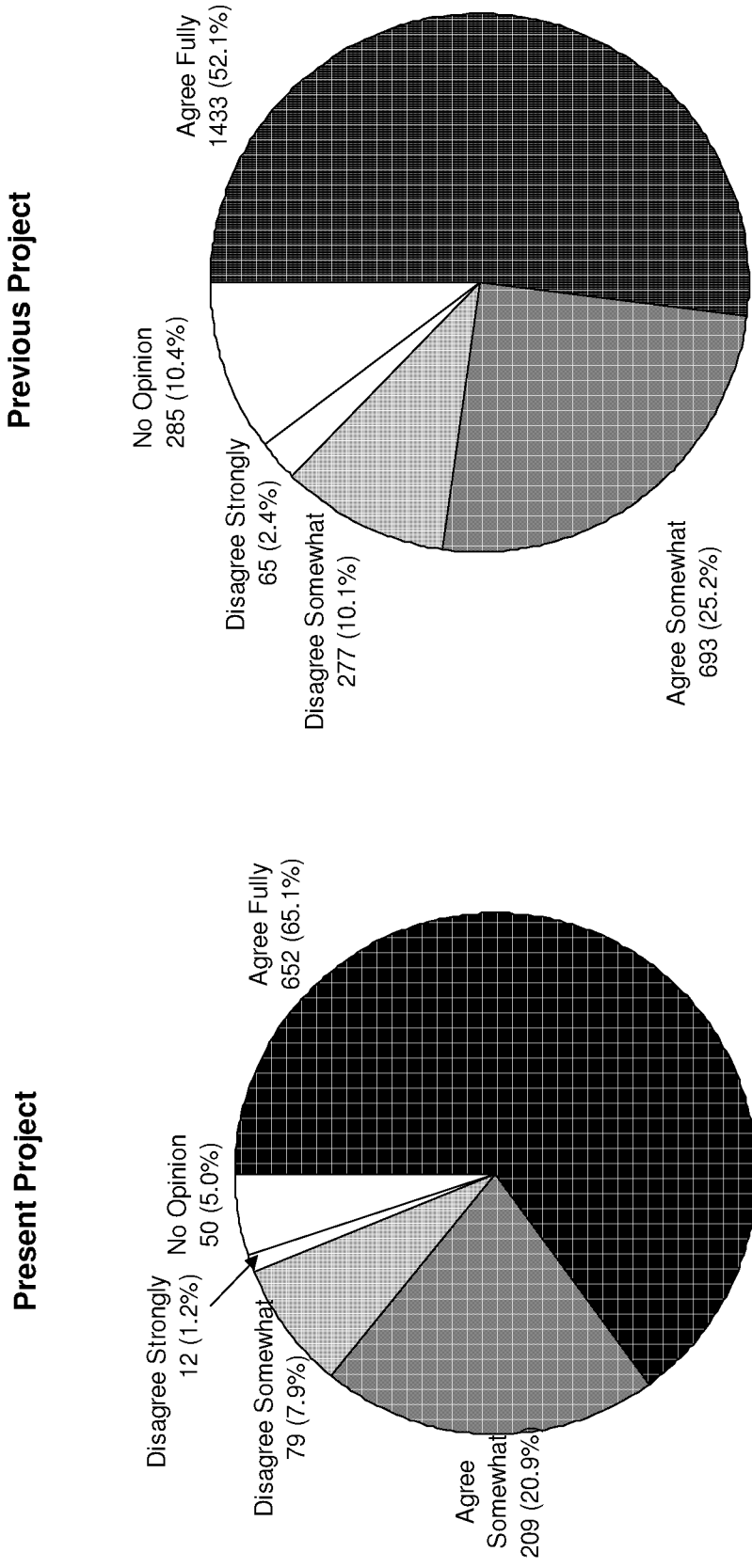
The confidence of women engineers is duly reflected by their strongly affirmative response to the statement 'It is acceptable for women to assume leadership roles in industry as often as men'. As can be seen from Table-4.2i over 65% of them 'Fully agree' with the statement and about 21% 'Agree somewhat'. The two categories total upto 86% as against the figure of 77% in the previous project (Figure-4.2i). The response and its comparison with the previous project depict a very positive picture about the confidence of women. The fact that the group in the current project is younger, could be one of the reasons for increased degree of affirmation.

**Table-4.2i 'It is acceptable for women to assume leadership roles in industry as often as men' [Q14(n)]**

	<b>Married</b>	<b>Single</b>	<b>Total</b>
Agree Fully	<b>153 ( 56.7)</b>	<b>499 ( 68.2)</b>	<b>652 ( 65.1)</b>
Agree Somewhat	68 ( 25.2)	141 ( 19.3)	209 ( 20.9)
Disagree Somewhat	33 ( 12.2)	46 ( 6.3)	79 ( 7.9)
Disagree Strongly	3 ( 1.1)	9 ( 1.2)	12 ( 1.2)
No Opinion	13 ( 4.8)	37 ( 5.1)	50 ( 5.0)
Sub Total	270 (100.0)	732 (100.0)	1002 (100.0)
Not Specified	10	8	18
<b>Total</b>	<b>280</b>	<b>740</b>	<b>1020</b>

Perceptions of women engineers on the statement, 'Even today professional women end up in secondary roles doing routine jobs' are presented in Table-4.2j. The predominance of 'Agree somewhat' stands out. This category along with the 'Agree

**Figure-4.2i 'It is acceptable for women to assume leadership roles in industry as often as men' [Q14(n)]**



Total respondents to the question = 1002

Total respondents to the question = 2753

fully' category accounts for over 60% of the responses which indicates an overall agreement, as was also the case in the previous project (Figure-4.2j).

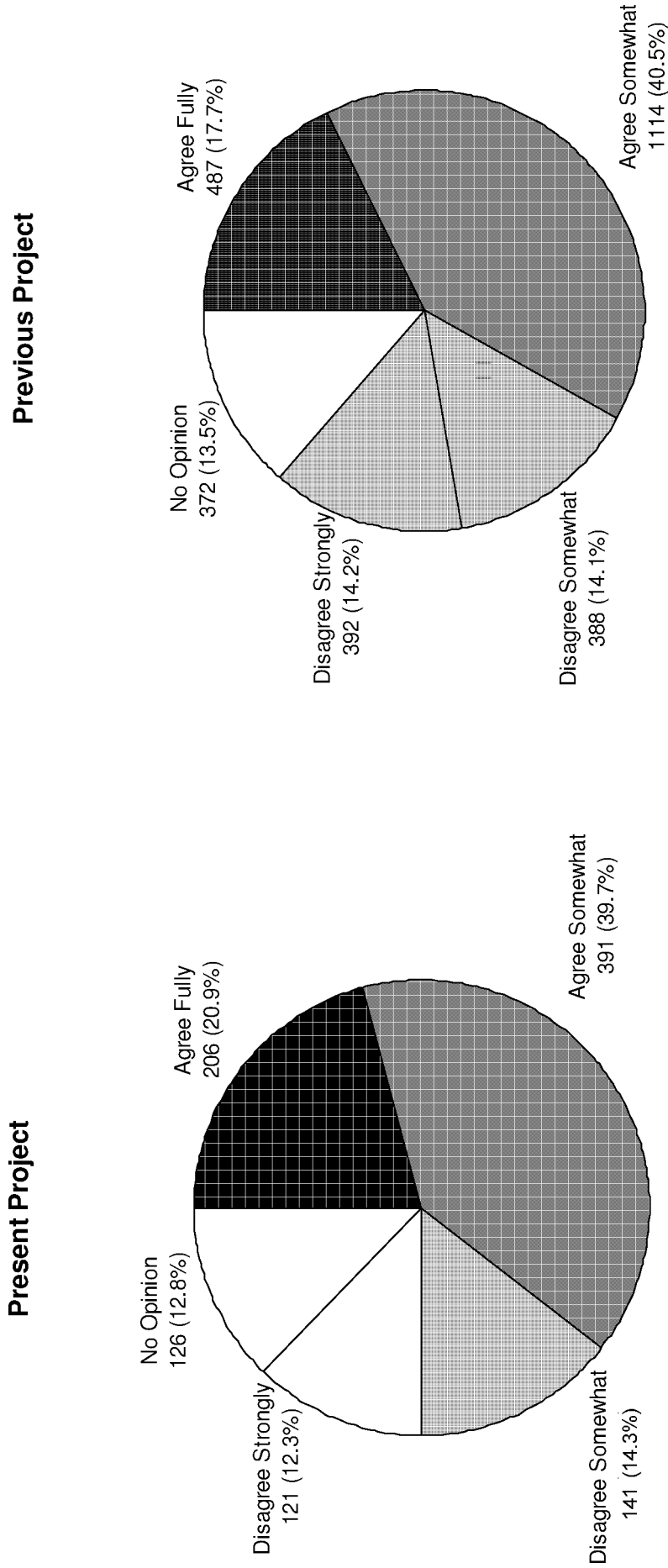
**Table-4.2j 'Even today professional women end up in secondary roles doing routine jobs' [Q14(g)]**

	Married	Single	Total
Agree Fully	47 ( 17.5)	159 ( 22.2)	206 ( 20.9)
Agree Somewhat	<b>120 ( 44.8)</b>	<b>271 ( 37.8)</b>	<b>391 ( 39.7)</b>
Disagree Somewhat	37 ( 13.8)	104 ( 14.5)	141 ( 14.3)
Disagree Strongly	40 ( 14.9)	81 ( 11.3)	121 ( 12.3)
No Opinion	24 ( 9.0)	102 ( 14.2)	126 ( 12.8)
Sub Total	268 (100.0)	717 (100.0)	985 (100.0)
Not Specified	12	23	35
<b>Total</b>	<b>280</b>	<b>740</b>	<b>1020</b>

The responses received in the two studies that have been conducted about a decade apart are strikingly similar. The similar nature of the responses in the two projects do underline the possibility of under-utilisation of the capabilities and skills of women professionals. This is also evident from the quotes below. Each quote is preceded by a code which is the reference number relating to the particular response. The code also includes the name of the state (AP, DEL, GUJ, KAR, KER, MAH and TN), the branch of specialisation (AR, CV, CS, EL, EN and ME) and the year of graduation (94, 95, 96, 97 and 98) of the respondent.

- 18/MAH/CV/97      *“After 1 and 1/2 years of service to my company, I find that there is no ‘up’ for me. I can only move ‘down’ or ‘side-ways’. As a female, I will always have to settle for a dull mediocre desk job. A permanent desk job is unacceptable to me. It stifles my productivity; I do not get to learn as much as I would on site. As a woman civil engineer, I would never get the same respect and appreciation as a male civil engineer. Most girl civil engineers are put to work as P.A.’s/ Secretaries to directors - which is a really SAD thing.”*
- 88/KER/CV/97      *“Employers give more preference to men rather than women if work is related to site supervision or site management. So we have to be satisfied with low paid drafting works. For need for experience we are also forced to take low paid jobs.”*
- 334/MAH/CV/97      *“1. Being a woman we are allotted only office work. There is no choice in office work. Any sort of tedious work is allotted to us. But the very basic thing in Civil Engineering is to have site experience. We are never allowed to go on sites, though they are easily accessible, for the only reason that we are girls. This does influence on our office work because until you know practical things you cannot produce better in theory and they blame us that we don’t know every small thing.*

**Figure-4.2j 'Even today professional women end up in secondary roles doing routine jobs' [Q14(g)]**



Total respondents to the question = 985

Total respondents to the question = 2753

2. *There are lot of varieties in work but we never come across their practical significance.*
3. *There are no promotion chances because management says you are already at the best position in our firm and we can not afford any more.*
4. *In turn a person (male) from drawing dept (i.e. AutoCAD operator) which any diploma holder in drafting can do is offered easy promotion thus neglecting the importance of engineers (Because it is assumed that engineers should do all the hard work but I think not at such a poor return)."*

575/MAH/CS/97

*"My 1<sup>st</sup> Employer was ..... I had got the job through campus interview. After 11 weeks of training (classroom) the 2 computer engineers in our batch were put into Information Systems Department. Though we were promised interesting work, for the 7 months I was there, we were doing clerical work, sometimes even that of a peon. Also I personally felt an undercurrent of discrimination against women, which could not be stated clearly or in concrete terms as it was very subtle. My 2<sup>nd</sup> job with ..... was very satisfying. Hard work was amply rewarded. Male colleagues were very co-operative and there was never a feeling of being discriminated against. I feel that the essential difference lies in the fact that the 2<sup>nd</sup> company was a purely software industry as compared to the 1<sup>st</sup> which was essentially into process control and automation. I feel the software industry gives women opportunities to show their talents and gives ungrudging respect, which is not shown by other industries."*

698/TN/CS/97

*"Gender discrimination is something we have learned to live with. We've been facing it since college, but in work it is more pronounced. Being in a software profession, innumerable opportunities for on-site assignments do not come our way, for the only reason that the company has to take up responsibilities finding suitable accommodation, other facilities, despite the fact that we are better suited for the job. Even in offshore projects, we are often given the routine, mundane jobs while men in the same level, take up better responsibilities. This is because the superiors believe male subordinates can be called at any time. Somehow the confidence level of superiors on female subordinates while assigning responsibilities is much lower than that on male subordinates. At every stage, we have got to ask, demand and even fight! In fact, every opportunity that comes to us has come to us, because we have fought for it!"*

863/KER/CV/98

*"I am a graduate in Civil Engineering, but it is not possible to get a job for women in this field and if they give jobs, the job offered is only mere office work that anyone can do with some experience. Most of my college mates (girls) are still unemployed."*

Perceptions on the statement ‘Compared to a man, it is harder for a woman to be accepted fully into a professional working group’ are presented in Table-4.2k. The same are compared with those obtained in the previous study in Figure-4.2k. In all 1014 out of 1020 women engineers responded to this part of the question (Q14h) in the current study. Out of these 659 (65%) agree ‘fully’ or ‘somewhat’ to the statement. About 33% disagree ‘somewhat’ or ‘strongly’ to the statement. In the previous project the corresponding response was over 70% agreeing and 24% in disagreement to the statement.

The response is not very different from the one obtained in the previous project, except for the fact that a larger fraction now disagree with the statement as could be anticipated with passage of time. The level of agreement at 65%, however, is high and disappointing. This indicates that even today women face difficulties in getting accepted in professional working groups. This is worrisome since it could lead to operational problems and may tell upon the proficiency and output of women engineers.

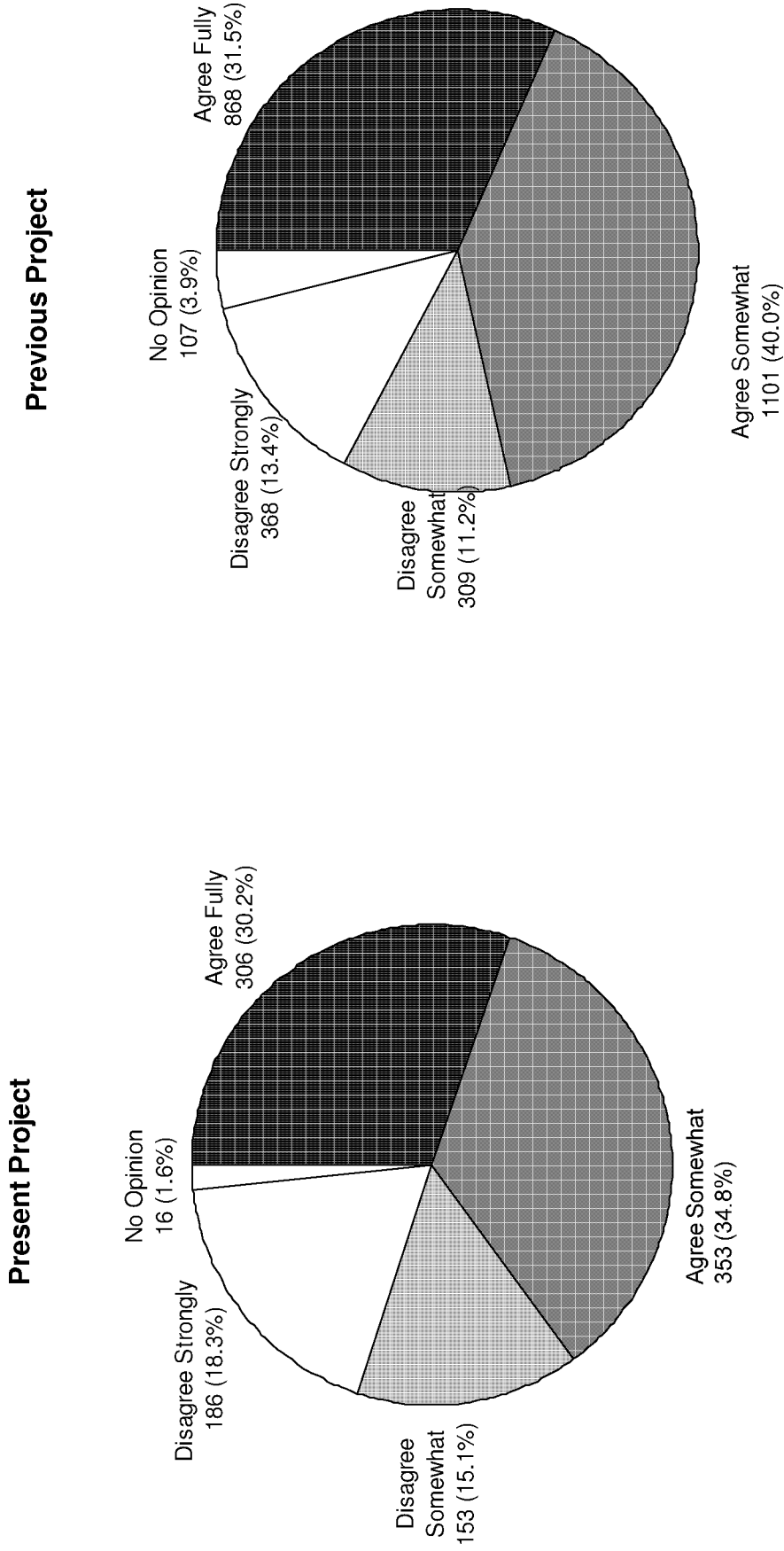
The response of the executive/employers (Table-6.19f) on this aspect is different. The executives, by and large, have denied the existence of such a problem. This difference of opinion needs to be further examined and the reasons analysed.

**Table-4.2k ‘Compared to a man, it is harder for a woman to be accepted fully into a professional working group’ [Q14(h)]**

	<b>Married</b>	<b>Single</b>	<b>Total</b>
Agree Fully	85 ( 30.5)	221 ( 30.1)	306 ( 30.2)
Agree Somewhat	<b>96 ( 34.4)</b>	<b>257 ( 35.0)</b>	<b>353 ( 34.8)</b>
Disagree Somewhat	45 ( 16.1)	108 ( 14.7)	153 ( 15.1)
Disagree Strongly	49 ( 17.6)	137 ( 18.6)	186 ( 18.3)
No Opinion	4 ( 1.4)	12 ( 1.6)	16 ( 1.6)
Sub Total	279 (100.0)	735 (100.0)	1014 (100.0)
Not Specified	1	5	6
<b>Total</b>	<b>280</b>	<b>740</b>	<b>1020</b>

A commonly encountered statement concerning difficulty in getting professional recognition was included in the Questionnaire for Women Engineers (Q14b) as well as the one for executives (Q22). The response from the women engineers to the statement ‘Women will have to do better than men to get equal professional recognition’ is presented in Table-4.2l. A large number 470 out of 1004 ‘Agree fully’ with the statement and another 238 ‘Agree somewhat’. Percentage-wise, this response conveys a higher degree of concurrence with the statement than that in the previous project (Figure-4.2l). On the other hand, the percentage of the respondents belonging to the ‘Disagree strongly’ has reduced from 16.8 to 14%. This means a greater fraction of the participants of the current study perceive that they would have to perform better than men to be able to get equal professional recognition.

**Figure-4.2k 'Compared to a man, it is harder for a woman to be accepted into a professional working group' [Q14(h)]**



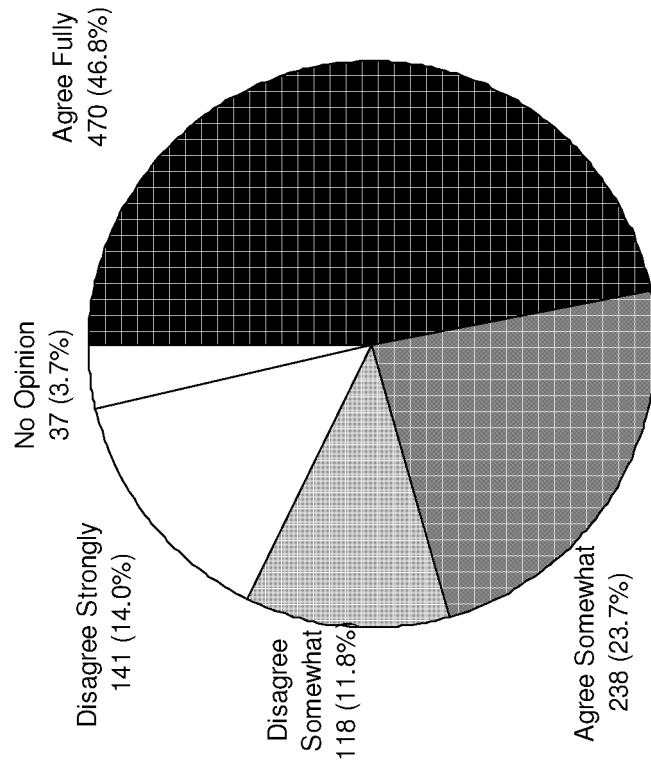
Total respondents to the question = 1014

Total respondents to the question = 2753



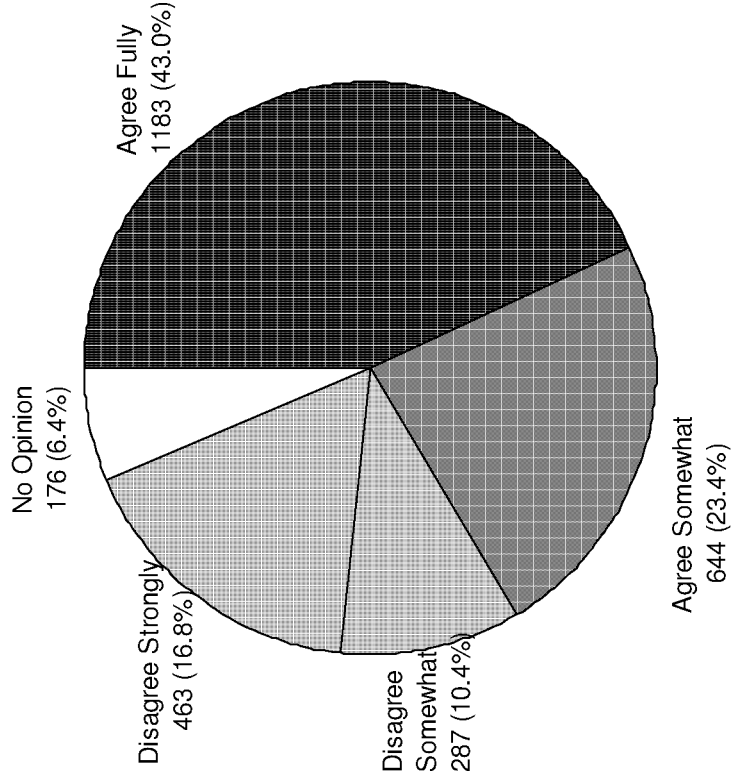
**Figure-4.2] 'Women will have to do better than men to get equal professional recognition' [Q14(b)]**

**Present Project**



Total respondents to the question = 1004

**Previous Project**



Total respondents to the question = 2753

**Table-4.2l 'Women will have to do better than men to get equal professional recognition' [Q14(b)]**

	<b>Married</b>	<b>Single</b>	<b>Total</b>
Agree Fully	<b>118 ( 43.2)</b>	<b>352 ( 48.2)</b>	<b>470 ( 46.8)</b>
Agree Somewhat	62 ( 22.7)	176 ( 24.1)	238 ( 23.7)
Disagree Somewhat	42 ( 15.4)	76 ( 10.4)	118 ( 11.8)
Disagree Strongly	43 ( 15.8)	98 ( 13.4)	141 ( 14.0)
No Opinion	8 ( 2.9)	29 ( 4.0)	37 ( 3.7)
Sub Total	273 (100.0)	731 (100.0)	1004 (100.0)
Not Specified	7	9	16
<b>Total</b>	<b>280</b>	<b>740</b>	<b>1020</b>

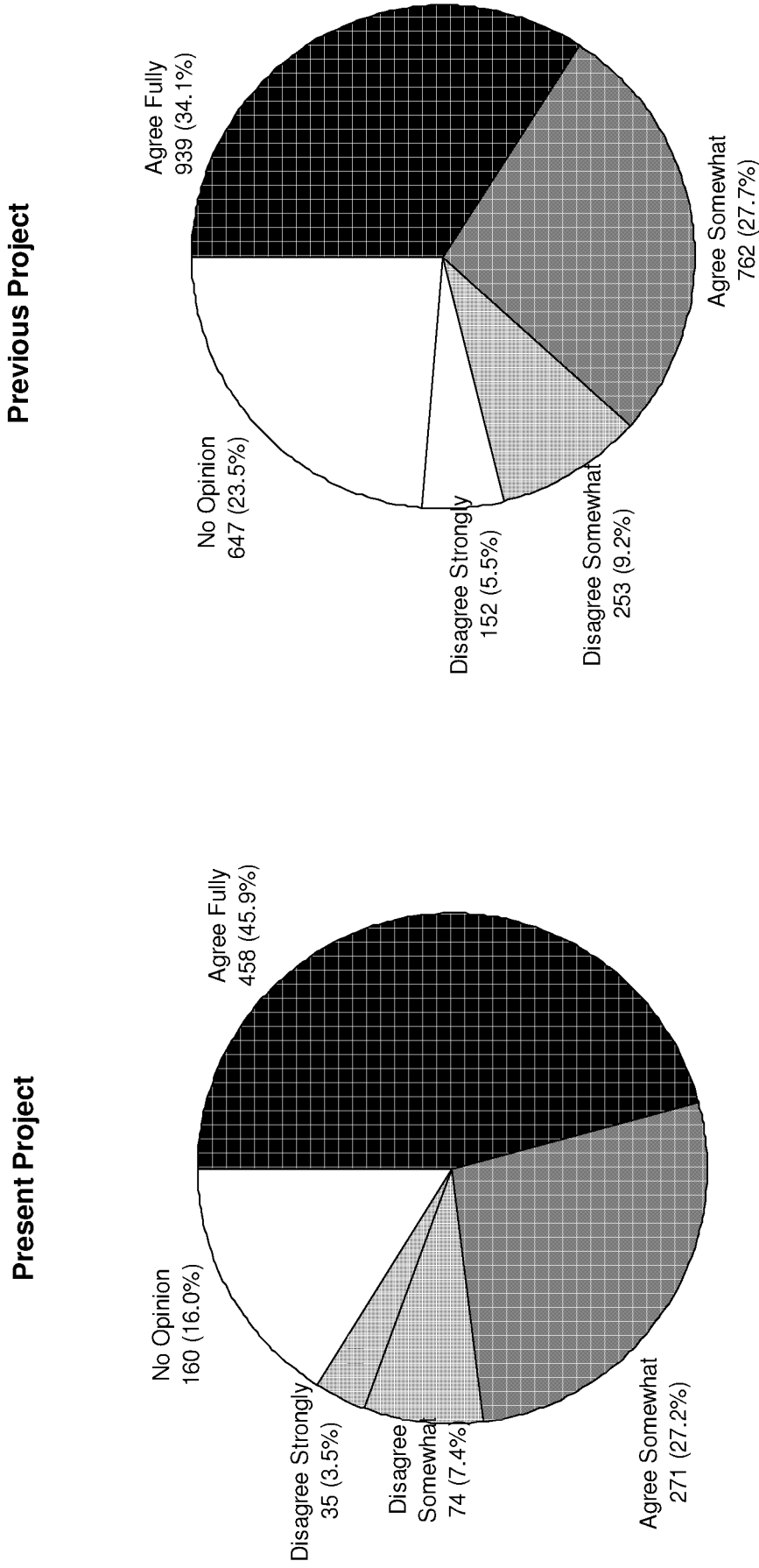
It is interesting to compare the response of women engineers with that received from the executives in response to the statement 'Women engineers have to work harder to prove themselves to earn the same credibility as male engineers in similar positions' (Table-6.27). Majority (about 69%) of the men executives have disagreed with the statement, whereas about 53% of the women executives agree with the statement. Thus response of the women executives is closer to the response of women engineers. The response of men executives, however, is very different from that of the women engineers.

Data presented in Table-4.2m relates to the perceptions of women engineers in regards to the statement 'The women's movement has been a major force in opening up professional careers for women'. About 73% of the respondents of the current project agree with the statement. Figure-4.2m compares the response on the subject with the one received in the previous project, a decade ago. There is a significant increase in the 'Agree fully' fraction. What is important is that this increase is associated with a decrease in the 'No opinion' category. Growing awareness about the women's movement and its likely contributions may be the reason behind the observed change in the response. With passage of time, more and more women have come to know about the movement and are getting involved with the same.

**Table-4.2m 'The women's movement has been a major force in opening up professional careers for women' [Q14(m)]**

	<b>Married</b>	<b>Single</b>	<b>Total</b>
Agree Fully	<b>119 ( 43.4)</b>	<b>339 ( 46.8)</b>	<b>458 ( 45.9)</b>
Agree Somewhat	73 ( 26.6)	198 ( 27.4)	271 ( 27.2)
Disagree Somewhat	22 ( 8.0)	52 ( 7.2)	74 ( 7.4)
Disagree Strongly	12 ( 4.4)	23 ( 3.2)	35 ( 3.5)
No Opinion	48 ( 17.5)	112 ( 15.5)	160 ( 16.0)
Sub Total	274 (100.0)	724 (100.0)	998 (100.0)
Not Specified	6	16	22
<b>Total</b>	<b>280</b>	<b>740</b>	<b>1020</b>

**Figure-4.2m 'The woman's movement has been a major force in opening up professional careers for women' [Q14(m)]**



Total respondents to the question = 998

Total respondents to the question = 2753

Work environment and organisational policies play a crucial role in the career planning and growth of women engineers. A statement relating to work environment and another on special provisions for women were included in the questionnaire.

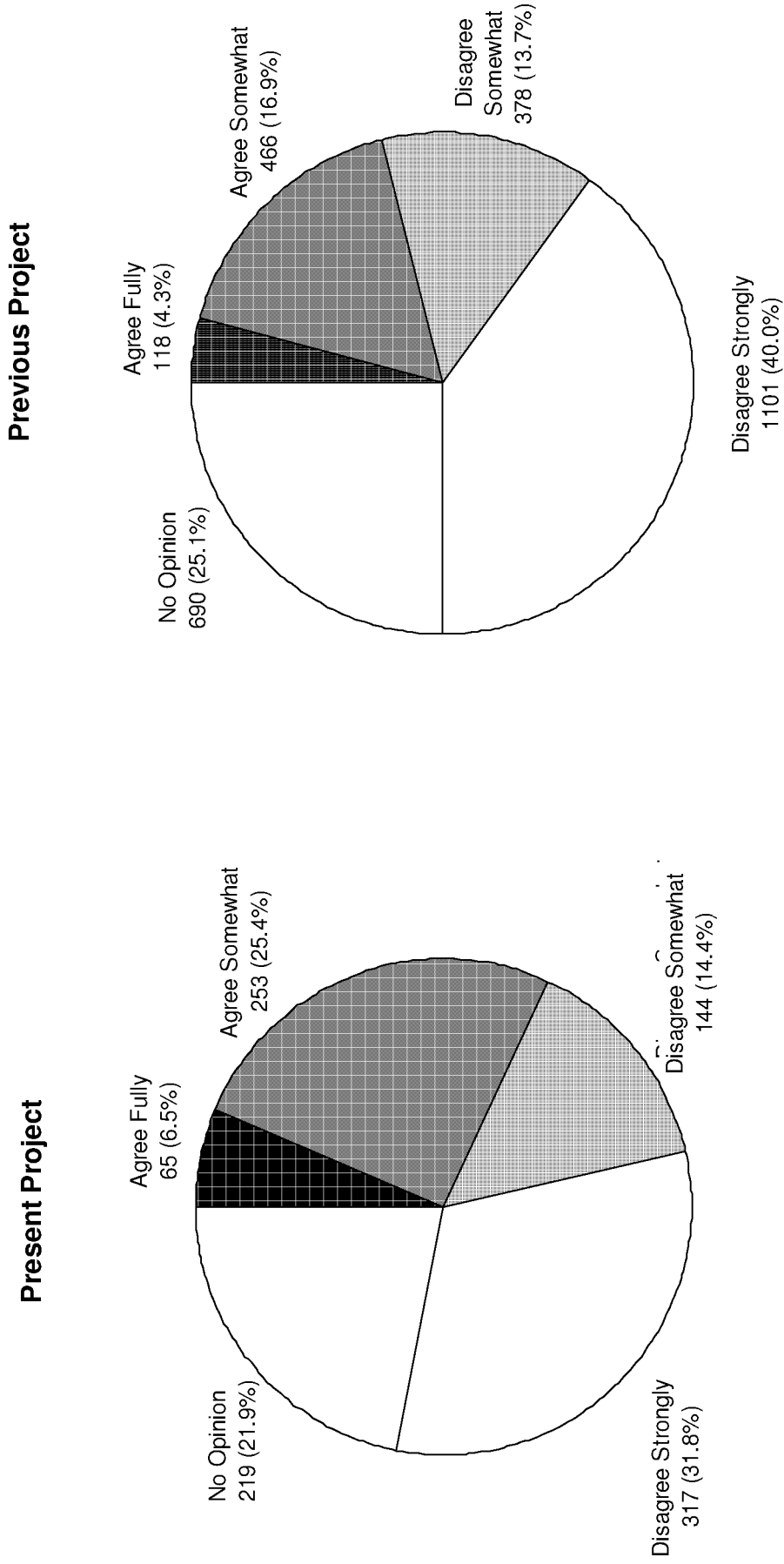
Perceptions on the statement 'Working women often have to deal with sexual advances from men they work with' are presented in Table-4.2n. The response is somewhat disjointed, 'Disagree strongly' having the largest poll followed by 'Agree somewhat'. This does not appear very logical. Either, women are hesitant to accept existence of the problem or they are able to deal with such situations. 'Agree somewhat' may belong to the former category. It is important to note that the numbers under 'Agree fully' are the smallest. It is also important to note that a significant number of respondents have refrained from expressing any opinion on the statement probably due to the stigma attached to the same. Clearly, this question has not received an honest response. Figure-4.2n compares the response with the one received in the previous study where 'Disagree strongly' predominated, which is different from the current data.

**Table-4.2n 'Working women often have to deal with sexual advances from men they work with' [Q14(f)]**

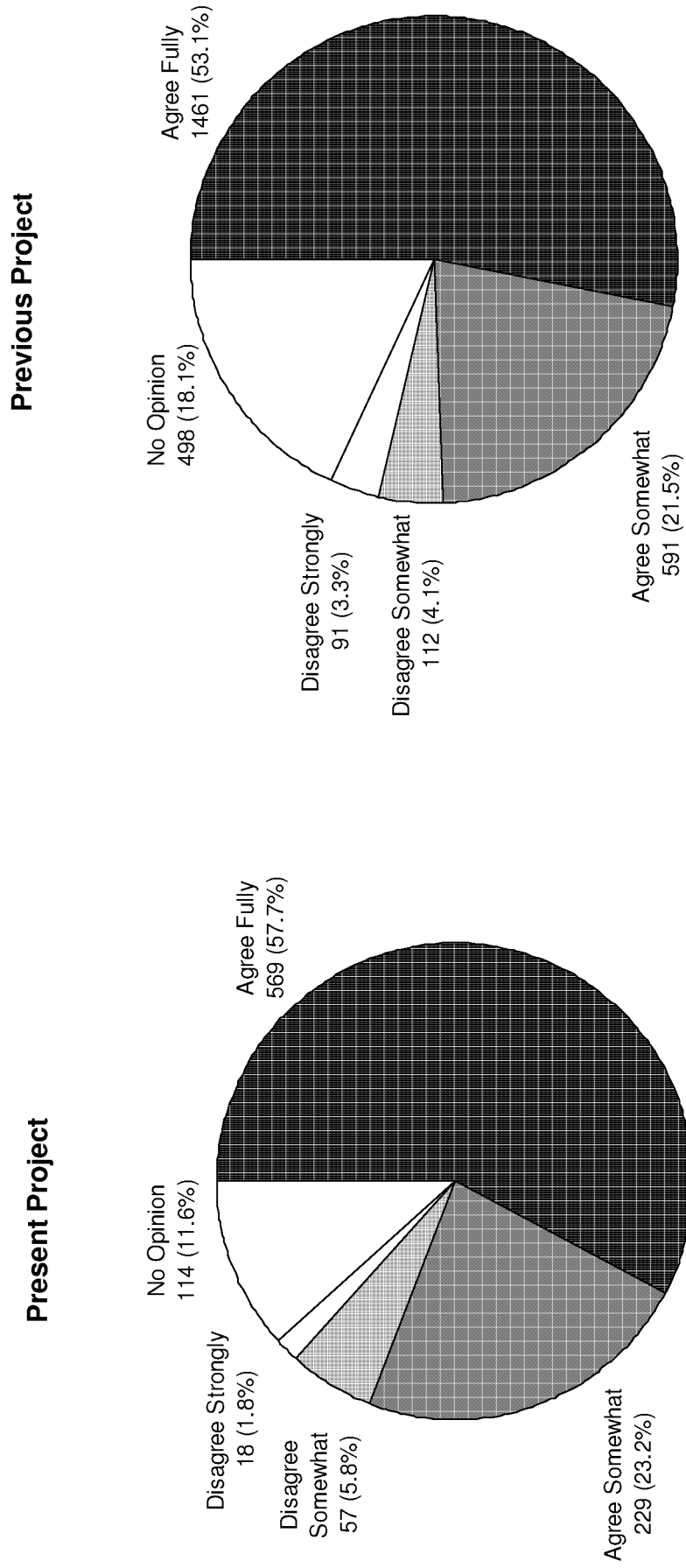
	<b>Married</b>	<b>Single</b>	<b>Total</b>
Agree Fully	14 ( 5.2)	51 ( 7.0)	65 ( 6.5)
Agree Somewhat	69 ( 25.5)	184 ( 25.3)	253 ( 25.4)
Disagree Somewhat	37 ( 13.7)	107 ( 14.7)	144 ( 14.4)
Disagree Strongly	<b>101 ( 37.3)</b>	<b>216 ( 29.7)</b>	<b>317 ( 31.8)</b>
No Opinion	50 ( 18.5)	169 ( 23.3)	219 ( 21.9)
Sub Total	271 (100.0)	727 (100.0)	998 (100.0)
Not Specified	9	13	22
<b>Total</b>	<b>280</b>	<b>740</b>	<b>1020</b>

Perceptions on the statement 'Since child rearing is demanding and the present work structure should be modified to enable a woman to continue her career without a break' are presented in Table-4.2o. By and large the respondents agree with the statement. The 'Agree fully' and 'Agree somewhat' category total upto over 80% of the responses. A large fraction of married women seek modification in the work structure, as can be expected. The response is quite similar to the one in the previous study. This is depicted in Figure-4.2o. It can be seen that the fraction endorsing the need for modification in the work structure has significantly increased over the last decade.

**Figure-4.2n 'Working women often have to deal with sexual advances from men they work with' [Q14(f)]**



**Figure-4.2o** 'Since child rearing is demanding, the present work structure should be modified to enable a woman to



Total respondents to the question = 987

Total respondents to the question = 2753

**Table-4.2o** 'Since child rearing is demanding, the present work structure should be modified to enable a woman to continue her career without a break' [Q14(o)]

	<b>Married</b>	<b>Single</b>	<b>Total</b>
Agree Fully	<b>178 ( 65.7)</b>	<b>391 ( 54.6)</b>	<b>569 ( 57.7)</b>
Agree Somewhat	59 ( 21.8)	170 ( 23.7)	229 ( 23.2)
Disagree Somewhat	8 ( 3.0)	49 ( 6.8)	57 ( 5.8)
Disagree Strongly	8 ( 3.0)	10 ( 1.4)	18 ( 1.8)
No Opinion	18 ( 6.6)	96 ( 13.4)	114 ( 11.6)
Sub Total	271 (100.0)	716 (100.0)	987 (100.0)
Not Specified	9	24	33
<b>Total</b>	<b>280</b>	<b>740</b>	<b>1020</b>

In the executive questionnaire, perceptions were sought on the same issue in terms of the necessity of having special policies for young mothers in terms of flexible time slots, working from home, part time job option and provision for crèche (Q17b). Except for 'Working from home', the response was affirmative pronouncing the necessity of such provisions. The responses from women engineers and from executives match in this case. Under this scenario, strong recommendations need to be made in this regard. This implementation would play a positive role, in so far as young mothers are concerned.

## **CAREER GOALS**

The importance of having career goals is undeniable. Career goals govern people's aspirations, their professional satisfaction and also their performance. Data on the perceived desirability of certain stated goals has been obtained through replies to Q15.

Q15 is a directed question where the respondents were led through a list of professional goals and were asked to assign a perceived rank to each goal. They were also asked to indicate the degree to which each of the stated goals had been realised in their career. The data on ranks is presented in Table-4.3a. It is necessary to mention that all of the QRS members did not respond to the question and that the respondents assigned ranks to different number of goals; some ranked only 1 goal, some 2 and some ranked even 3 goals. The data table presents the rank-wise votes received by each of the career goals and also a weighted score. The weighted score has been obtained by giving graded weightage to the ranks, i.e. 3, 2 and 1 to Rank I, Rank II and Rank III respectively. The last column of the table contains the rating as projected by the weighted score.

The highest score has been obtained by 'Opportunity for personal growth and development for independent thought and action' closely followed by 'A feeling of security by being self-supporting and opportunity for financial advancement'. These

goals have therefore been rated '1' and '2' respectively. This was the same in the previous project also. 'Involvement in challenging and creative activity and opportunity for intellectual stimulation' is rated as the third goal. This response shows that personal growth, feeling for security and financial advancement are of prime importance to women engineers, more than having an opportunity for intellectual stimulation and having their own identity.

**Table-4.3a Desirability of Having the Following Goals in One's Career and the Extent to Which These Have Been Realised in the Career [Q15]**

	Rank I	Rank II	Rank III	Weighted Score*	Ranking
a) A feeling of security by being self supporting and opportunity for financial advancement	210	112	81	935	2
b) Opportunity for personal growth and development for independent thought and action	195	132	111	<b>960</b>	<b>1</b>
c) A sense of one's own identity rather than that of husband/family	125	97	79	648	4
d) A sense of accomplishment	91	86	88	533	5
e) Opportunity to influence important decisions by being part of a collective endeavour	44	50	93	325	6
f) Involvement in challenging and creative activity and opportunity or intellectual stimulation	128	119	85	707	3

\* Weighted score is obtained by giving a weightage of 3, 2, and 1 to rank I, rank II and rank III respectively.

The data on the degree of realisation of the listed goals is presented in Table-4.3b. The responses were to be one of the three i.e. 'Not at all realised', 'Partially realised' or 'Fully realised'.

The following emerges from an examination of the data given in Table-4.3b.

- a) Over 55% of the women engineers who have responded to the question perceive full realisation of their most desirable goal 'Opportunity for personal growth and development for independent thought and action'. Partial realisation of the same is projected by additional 37.6%. Thus the goal that has been polled most desirable has been realised fully or partially by over 92% of the respondents.



**Table-4.3b Desirability of Having the Following Goals in One's Professional Career and the Extent to Which These Have Been Realised in the Career [Q15]**

	Not at all Realised	Partially Realised	Fully Realised	Sub Total	No Response	Total
a) A feeling of security by being self-supporting and opportunity for financial advancement	104 (12.1)	283 (32.9)	<b>473</b> <b>(55.0)</b>	860 (100.0)	160	<b>1020</b>
b) Opportunity for personal growth and development for independent thought and action	61 (7.2)	319 (37.6)	<b>469</b> <b>(55.2)</b>	849 (100.0)	171	<b>1020</b>
c) A sense of one's own identity rather than that of husband/family	131 (15.7)	279 (33.4)	<b>425</b> <b>(50.9)</b>	835 (100.0)	185	<b>1020</b>
d) A sense of accomplishment	111 (14.0)	<b>382</b> <b>(48.1)</b>	302 (38.0)	795 (100.0)	225	<b>1020</b>
e) Opportunity to influence important decisions by being part of a collective endeavour	169 (20.4)	<b>408</b> <b>(49.3)</b>	251 (30.3)	828 (100.0)	192	<b>1020</b>
f) Involvement in challenging and creative activity and opportunity for intellectual stimulation	124 (14.8)	<b>365</b> <b>(43.6)</b>	348 (41.6)	837 (100.0)	183	<b>1020</b>

- b) 'Feeling of security by being self-supporting and opportunity for financial advancement' has been fully realised by 55% of the respondents and realised partially by another 32.9%. This is the goal, which has been polled second highest and has also been well realised. Over 87% of the respondents perceive it to be realised fully or partially. This is as important a finding as the one in regard to personal growth.
- c) 'Involvement in challenging and creative activity and opportunity for intellectual stimulation' stands next, weighted score wise. On the realisation scale it is almost the last where 41.6% have realised it fully and additional 43.6% perceive partial realisation. It may be appropriate to link this response to the responses of Q14g and Q14h, where the respondents have expressed reservations about the type of work assigned to them and the difficulties they run into in being accepted fully in professional working groups. Majority agree with the statement 'Even today professional women end up in secondary roles doing routine jobs' and 'Compared to a man, it is harder for a women to be accepted fully into a professional working group'. Given below are some of the several statements obtained on these issues through response to Q50 in the space for free expression.

544/KAR/CV/97      *"In our country, even today, woman is not accepted fully as a colleague and as a boss. Women are not getting full co-operation from her male colleagues."*

554/MAH/EN/98      *"I had a very considerate boss who expressed full confidence in me. But for some of my colleagues who keep degrading me and not taking my advice and waiting for my boss to tell them the same thing just because I am a girl."*

587/KAR/EN/98      *"I feel that women have to work doubly hard and be 100% perfect in their work to earn the same recognition as men. I even have back talks sometimes with my peers who are men. Their attitude towards me is nothing more than 'After all she is a girl, she will get married and leave'."*

1009/DEL/CV/98      *"Normally female executives are not acceptable by their male colleagues easily, this is the most important factor which should be taken into account. Male colleagues/subordinate cannot tolerate a female at the same designation/level. They always have a feeling of competition/jealousy. Even the superior hesitates to give a new assignment to a female employee. They always try to put them to the lowest and show as if they are never satisfied with their performance. That is why most of the female employees feel neglected in the organisation, as this is like a mental torture to them."*

- d) The respondents have ranked 'A sense of one's own identity rather than that of husband/family' the next desirable goal. On the realisation scale this goal has scored higher than the previous one about challenging activities etc., over 50% perceiving full realisation and another 33.4% partial realisation.

- e) 'Sense of accomplishment' although perceived as the next desirable goal and has been rated 5<sup>th</sup> as far as the desirability goes. On the realisation scale only 38% have fully realised it and about 48% report partial realisation of the same. This finding is important. Sense of accomplishment is derived from the nature of work and participation in important activities. Probably, the respondents are not quite satisfied on these counts to let them enjoy this sense. This quite agrees with the inferences drawn from the data on 'Involvement in challenging.....stimulation', discussed above.
- f) The goal of 'Influencing important decision-making and being part of a collective endeavour' gets the lowest rank on the desirability scale. Realisation wise it scores better than the sense of accomplishment, which needs to be noted. This response is not quite in tune with many above. The question is that if women engineers are assigned only secondary roles and do not enjoy the sense of accomplishment, how can they be influencing the important decisions? It is possible that the spirit of the question was not adequately understood.

Thus, personal growth, self-identity and financial security, are perceived as the important career goals and these have been well realised. The other goals having lower ranks have been realised to a lesser extent. It goes without saying that realisation of the goals would depend upon the nature of work, opportunities and responsibilities. Such response underlines the lack of full utilisation of the professional capabilities and skills of women engineers not permitting them to have job satisfaction. The response is not very different from what was received in the previous project through a similar question.

It was difficult to derive any inference from the analysis of the data of Q15 about goal realisation on the basis of marital status, employment status and on graduation year basis. It is possible to explain this on the basis of the fact that the group was rather young and the responses are based more on perceptions than on experience.

## **SUMMARY**

### **Personal Qualities**

1. Out of three personal qualities, personal drive and determination, self-confidence and intellectual ability, personal drive and determination is rated by the respondents as the greatest contributor towards academic and career success.

### **Priorities and Values**

2. About 35% of women engineers are inclined to think that 'For a married woman, a career should be secondary to her responsibilities as a wife and mother'. In addition about 20% have the same as a conviction. A lower but

comparable number accounting for over 42% of the respondents disagree with the statement.

3. The statement, 'Small children suffer when mothers work full time' has been endorsed fully or partially by over 84% of the respondents.
4. Most women disagree strongly with the suggestion that 'A woman who is really interested in her career should not have children'. This opinion reflects the value they assign to motherhood.
5. The response to the statement 'A working woman cannot manage both work and home without sacrificing either' radiates confidence and conviction. About 2/3<sup>rd</sup> of the respondents have exhibited the same by disagreeing with the statement.
6. 'In a conflict between a husband's career and a wife's career, the husband's career should come first'. Over 42% of the respondents have affirmed the importance of the husband's career, whereas about 46% have disagreed with the notion. The response of married women is more inclined towards agreement.
7. The statement 'Men can raise small children just as women can' has been endorsed by about 59% of the respondents. Percentage-wise the response of the married and single women are comparable. About 32% have disagreed.
8. About 55% women state that they would not be comfortable 'If my husband kept house'. The percentage of married women nurturing such a notion is higher (62.3%) than single women (52.5%).
9. The need for support from family and husband as a precursor to having a successful career has been endorsed almost unanimously. This is one concept about which single women are as clear as married women.
10. The statement 'It is acceptable for women to assume leadership roles in industry as often as men' has been affirmed by more than 85% of the respondents. The response of single women with respect to the statement is even more affirmative.
11. Over 60% of the respondents seem to agree that 'Even today professional women end up in secondary roles doing routine jobs'. This view indicates that there is under utilisation of the capabilities and skills of women professionals.
12. There is more agreement (55%) than disagreement (33%) with the statement that 'Compared to a man, it is harder for a woman to be accepted fully in a professional working group'. However, it is to be noted that the level of agreement has decreased in the last decade.

13. About 70% of the women engineers have agreed with the notion that 'Women will have to do better than men to get equal professional recognition'. This fraction is higher than the one in the previous project.
14. 'The women's movement has been a major force in opening up professional careers for women'. Over 72% of the respondents agree with the statement. The number is larger than the one obtained 10 years ago.
15. The statement, 'Working women often have to deal with sexual advances from men they work with' has received a mixed and rather incoherent response, with comparable numbers 'Disagreeing strongly' and 'Agreeing somewhat', which is not logical.
16. The last statement : 'Since child rearing is demanding, the present work structure should be modified to enable a woman to continue her career without a break' has received overwhelming support. Over 80% of the respondents have affirmed the need for changing the work structure.

## **Career Goals**

17. 'Opportunity for personal growth and development for independent thought and action' was rated as the most desirable career goal by the respondents. This was followed by 'Feeling of security by being self-supporting and opportunity for financial advancement' and 'Involvement in challenging and creative activity and opportunity for intellectual stimulation' in that order.
18. 'Opportunity for personal growth and development for independent thought and action', which was polled most desirable career goal, has been realised partially or fully by over 92% of the respondents.
19. 87% of the respondents stated full or partial realisation of 'Feeling of security by being self-supporting and opportunity for financial advancement'. This career goal was second on the desirability scale.
20. 'Involvement in challenging and creative activity and opportunity for intellectual stimulation' which was third on the desirability scale stands last on the realisation scale.

## Chapter – 5

### **JOB STATUS, CAREER PROFILES AND PROBLEMS**

Job status and career profiles of women engineers constitute the main focus of this chapter. Employment status, type of employer, nature of work, career advancement parameters and prospects, and the atmosphere at the work place are facets discussed along with job type preferences of the QRS members. Job and career problems experienced by the members have also been looked into. Job expectations and career plans of the fraction pursuing higher studies have been examined. The data on these aspects has been collected through replies to questions Q12 & Q13 of Part-II, Q16 to Q49 from Part-III, and Q50 of the questionnaire. Q12 and Q13 relate to the job type preference of QRS.

QRS has been divided into three sub-groups, viz. 'Continuously employed since graduation', 'Unemployed since graduation' and 'Pursuing higher studies, Intermittently employed etc.' Accordingly, Part-III comprises of three sub-sections (Part-IIIa, Part-IIIb and Part-IIIc), containing questions relevant to the background of the corresponding sub-group. The data and analysis of all the different facets is presented in the following paragraphs, starting with 'Job type preference'.

### **JOB TYPE PREFERENCE AND CHANGE OF PREFERENCE**

Data regarding any preference for the type of job sought at the time of graduation has been obtained through replies to Q12a and Q12b. Whereas Q12a seeks a reply in terms of 'Yes' or 'No' and further elaboration in terms of type of job, Q12b enquires whether or not the preference has changed since graduation. Q12a is a directed question where the respondent was required to tick one of three types of jobs. In case the job type was different from these, she had to specify her preference against 'Any other'. Tables-5.1a to 5.1f contains the responses to these questions.

723 women engineers constituting 71.9% of those who have replied to this question did have a job type preference. The remaining 283 did not have a preference and 14 did not respond to the question.

Job type preference data has been compared with that obtained in the previous project in the same table. It can be seen that the two data are quite comparable with 73.8% of the respondents in the previous project stating that they did have a job type preference.

**Table-5.1a Existence of Preference Regarding the Type of Job Sought at the Time of Graduation [Q12(a)]**

	<b>Present Project Number (%)</b>	<b>Previous Project Number (%)</b>
Yes	<b>723 ( 71.9)</b>	<b>2033 ( 73.8)</b>
No	283 ( 28.1)	720 ( 26.2)
Sub-total	1006 (100.0)	2753 (100.0)
No response	14	
<b>Total</b>	<b>1020</b>	

Further enquiry regarding the job type preference proved quite revealing. Out of 706 women who responded, 262 (37.1%) have stated their job type preference to be 'Execution'. This is quite contrary to the general expectation where 'Desk type jobs' are considered most suitable for women (Table-5.1b). 61 respondents giving their preference for 'Marketing and management' also need to be noted. This response differs from the one received in the previous project where the preference went predominantly in favour of 'Desk type' jobs. The number under 'Any other' was rather small in the previous study.

**Table-5.1b Preferred Job [Q12(a)]**

	<b>Present Project Number (%)</b>	<b>Previous Project Number (%)</b>
Desk Type Job	184 ( 26.1)	<b>1422 ( 71.9)</b>
Execution	<b>262 ( 37.1)</b>	369 ( 18.7)
Marketing & Management	61 ( 8.6)	134 ( 6.8)
Any Other	199 ( 28.2)	52 ( 2.6)
Sub-total	706 (100.0)	1977 (100.0)
No response	17	56
<b>Total</b>	<b>723</b>	<b>2033*</b>

\* Number of women engineers having preference for type of job at the time of graduation.

Table-5.1c contains the distribution of the job types mentioned under 'Any other', in the current project. As can be seen a large number of job types have been specified. These include computers, research, administration, business, designing, consultancy etc. Although mention of computers is quite as expected, field work/production being mentioned as a separate job type was not anticipated because the same could come under the category of 'Execution'. In fact, many of the types given under 'Any other' could have come under the general umbrella of the listed job types, reducing the variety under 'Any other'.

**Table-5.1c Job Type Preferences under 'Any Other' [Q12(a)]**

	<b>Number</b>	<b>%</b>
a) Computers	<b>73</b>	<b>10.3</b>
b) Teaching	30	4.2
c) Consultancy	4	0.6
d) Research	43	6.1
e) Administration	4	0.6
f) Designing	22	3.1
g) Field Work/Production	12	1.7
h) Business	2	0.3
i) Others	9	1.3
Sub-total	199	28.2
Total of all those who have stated that they had a preference	<b>706</b>	<b>100.0</b>

Table-5.1d contains data about change of preference for the type of job sought. 173 out of 723, who had a preference to start with stated that their preference had changed since graduation. The majority (533 out of 723), however, did not change their preference. Data of the previous study is also included in the table for comparison. The two data are quite similar.

**Table-5.1d Change of Preference Since Graduation Regarding Type of Job [Q12(b)]**

	<b>Present Project Number (%)</b>	<b>Previous Project Number (%)</b>
Yes	173 ( 24.5)	516 ( 25.4)
No	<b>533 ( 75.5)</b>	<b>1517 ( 74.6)</b>
Sub-total	706 (100.0)	2033 (100.0)
No response	17	
<b>Total</b>	<b>723</b>	

The distribution of the preference for the respondents, whose preference has changed after graduation, is given in Table-5.1e along with the original preference. The largest number (67 out of 173) had 'Execution' as their initial preference. Changes have also taken place from 'Desk type' to other types. 27 out of 184 respondents with initial preference for 'Desk type' jobs later changed to some other types. Thus, changes have taken place in all directions.



**Table-5.1e Change of Job Preferences [Q12]**

<b>From Preference at the Time of Graduation</b>	<b>Original Preference Number (%) [%]</b>	<b>Preference Changed by Number (%) [%]</b>
Desk Type Job	184 ( 26.1) [100.0]	27 ( 16.2) [14.6]
Execution	<b>262 ( 37.1) [100.0]</b>	<b>67 ( 40.1) [25.6]</b>
Marketing & Management	61 ( 8.6) [100.0]	19 ( 11.4) [ <b>31.2</b> ]
Any Other	199 ( 28.2) [100.0]	54 ( 32.3) [27.1]
Sub-total	706 (100.0) [100.0]	167 (100.0) [23.7]
No response		17 6
<b>Total</b>	<b>723</b>	<b>173</b>

*Percentages in square brackets are based on Original Preference*

Reasons for the change of preference are listed in Table-5.1f. These reasons have evolved out of the comments provided by the respondents in the space for free expression after Q12b. As can be seen, the largest poll has been received by 'Better opportunities in software field' closely followed by 'Non availability of jobs in the preferred field'. Both are valid professional reasons. 14 out of 173 respondents have mentioned getting a particular type of job and continuing with it as the reason for change of preference, whereas, site work/production and travelling not being suitable has been mentioned as the reason for change by 11 respondents. What is important in the analysis is the fact that all these reasons have a professional rather than a personal basis. The only personal reason that appears in the list is the household responsibility, marriage, and children. 13 out of 173 have changed the job type preference due to these reasons. This is a revelation.

**Table-5.1f Reasons for Change of Preference [Q12(b)]**

<b>Reasons</b>	<b>Number</b>	<b>%</b>
a) Better opportunities in software field	29	19.1
b) Easily obtained teaching job and continued with it	14	9.2
c) Household responsibilities, marriage and children	13	8.6
d) Site work/Production, Travelling not suitable for girls	11	7.2
e) Non availability of job in preferred field/Opted for a better job	29	19.1
f) Exposure and awareness about job types	9	5.9
g) Prefer management jobs for moving up	5	3.3
h) Prefer a less stressful job	7	4.6
i) Prefer Desk type jobs	5	3.3
j) Want to start something of own	6	3.9
k) Others	24	15.8
Sub-total	152	100.0
No response	21	
<b>Total</b>	<b>173</b>	

## PREFERENCE FOR COLLEAGUES

Table-5.2 presents the responses received concerning preference of women engineers, 'Man' or 'Woman', as a 'Superior' or a 'Subordinate'. 'No preference' predominates for both, 'Superior' as well as 'Subordinate'. Clearly this is not an issue of any concern. It is however interesting to note that a larger number of respondents have shown a preference in regards to 'Superior' as compared to the number showing a preference for 'Subordinates'. 177 out of 1020 would prefer a woman as a superior as against 165 preferring a man. On the other hand, 155 would prefer a man as a subordinate and 120 would prefer a woman as a subordinate. Comparison of this data with that of the previous project is depicted in Figure-5.1.

**Table-5.2 Preference Regarding Superior or Subordinate [Q13]**

	Superior	Subordinate
Would prefer a man	165 ( 17.5)	155 ( 17.9)
Would prefer a woman	177 ( 18.8)	120 ( 13.9)
No preference	<b>600 ( 63.7)</b>	<b>589 ( 68.2)</b>
Sub-total	942 (100.0)	864 (100.0)
No response	78	156
<b>Total</b>	<b>1020</b>	<b>1020</b>

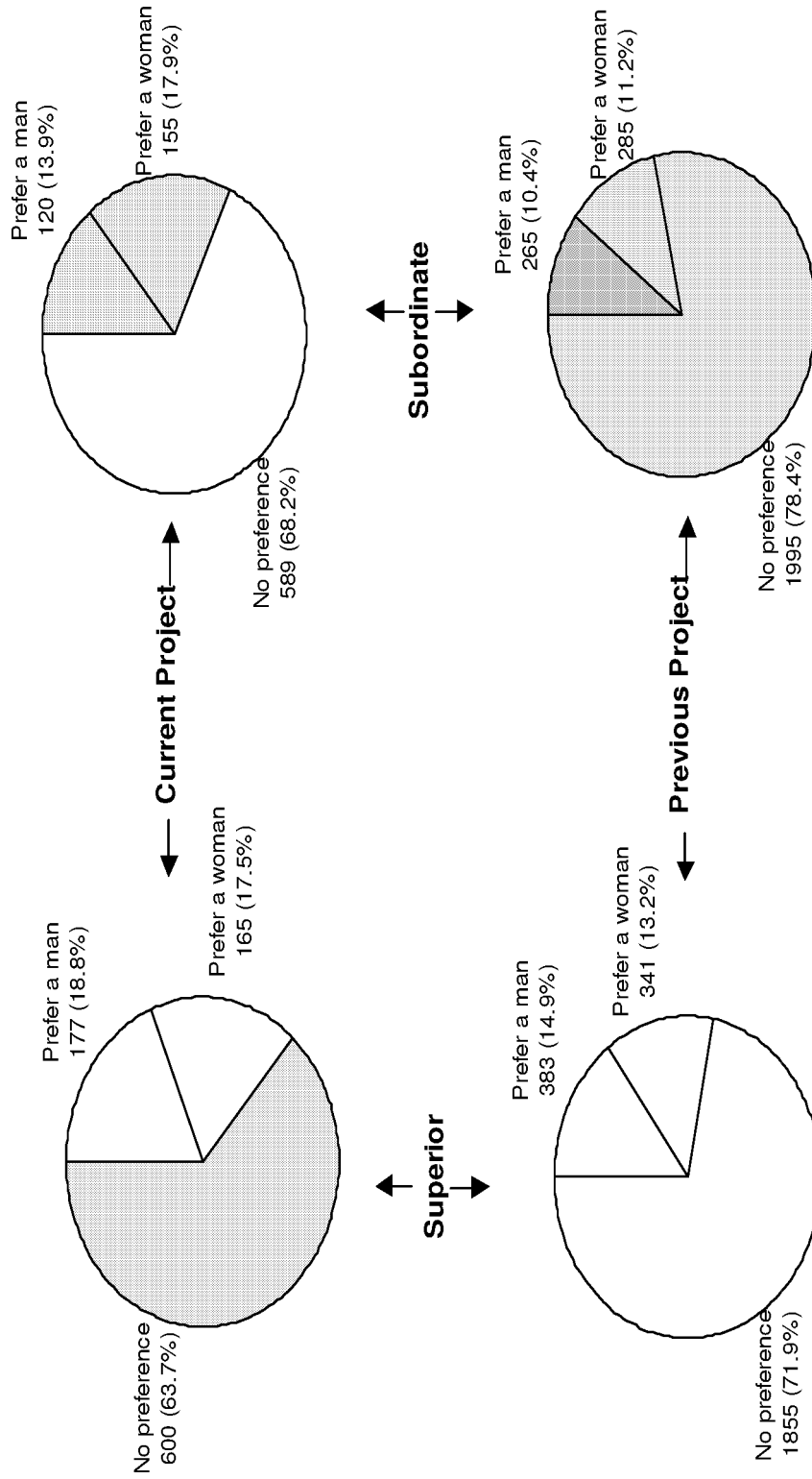
## JOB AND EMPLOYMENT STATUS

The job status of the QRS is presented in Table-5.3a. 472 out of 1020 members reported being employed continuously after graduation, while 215 were unemployed since graduation. The continuously employed category includes 16 self-employed respondents. The remaining 333 have been employed intermittently since graduation, are pursuing further studies, etc.

**Table-5.3a Job Status of Questionnaire Respondents [Q16]**

Group	Number (%)
<b>A</b> Employed continuously after graduation	<b>472 ( 46.3)</b>
<b>B</b> Unemployed since graduation	215 ( 21.1)
<b>C</b> Intermittently employed since graduation, pursuing further studies, etc.	333 ( 32.6)
<b>Total</b>	<b>1020 (100.0)</b>

**Figure-5.1 Preference Regarding Superior or Subordinate [Q13]**



Since job and career status is an important facet of the study the third category viz. 'C' has been further divided in three sub-groups, 'Intermittently employed and currently employed', 'Intermittently employed and currently unemployed' and those 'Pursuing further studies'. Information about the three sub-groups A, B and C has been obtained through 3 separate sections (Part-IIIa, Part-IIIb and Part-IIIc) of the Questionnaire. Analysis of the data of these categories is presented in this chapter in separate sections.

The job status taking into account all those who were employed or unemployed at the time of data collection (including the corresponding members of the sub-groups of category C above) works out to be as given in Table-5.3b.

**Table-5.3b Job Status of Questionnaire Respondents [Q16]**

<b>Group</b>	<b>Number (%)</b>
Employed at the time of data collection	<b>560 ( 54.9)</b>
Unemployed at the time of data collection	312 ( 30.6)
Pursuing further studies	148 ( 14.5)
<b>Total</b>	<b>1020 (100.0)</b>

The table shows that 30.6% of the QRS were unemployed during the period of data collection. This number (312 out of 1020) reflects the true extent of unemployment. The extent of unemployment amongst women engineers is clearly very high and should be a cause for concern. Although comparable data for men is not readily available, it is likely that the unemployment percentage is much less. A good guess would be a number between 15 and 20%.

14.5% of the women engineers are pursuing further studies. These include the members doing computer courses or working towards a post-graduate degree in management or a M.E./M.Tech. degree in the corresponding field of specialisation. Further data and analysis of those pursuing further studies has been presented and discussed in Part-C of the chapter.

The state-wise, branch-wise and year-wise distributions of the three categories A, B and C (Table-5.3a) are given in the paragraphs below.

### **STATE-WISE, BRANCH-WISE AND YEAR-WISE DISTRIBUTION OF WOMEN ENGINEERS CONTINUOUSLY EMPLOYED SINCE GRADUATION**

A profile of the respondents employed continuously after graduation is given in Tables-5.4a, 5.4b and 5.4c.

Table-5.4a contains the state-wise distribution of the continuously employed members. On a state-wise basis, the largest number in this group belongs to Maharashtra followed by Tamil Nadu and Karnataka. Percentage-wise also Maharashtra stands high with 54% of its graduates being continuously employed but

Gujarat is better with the percentage of continuously employed at 62.3%. The lowest percentage belongs to Kerala closely followed by Andhra Pradesh. It is important to note that the total number of respondents from Kerala are 123 out of which only 31 are continuously employed which is a very low number. Similar is the case of Andhra Pradesh where only 23 out of 81 report having been employed continuously after graduation.

**Table-5.4a State-wise Distribution of the Continuously Employed Women Engineers**

State	Continuously Employed Women Engineers			Total Respondents for the Particular State
	Number	(%)	[%]*	
Andhra Pradesh	23	( 4.9)	[28.4]	81 [100.0]
Delhi	20	( 4.2)	[51.3]	39 [100.0]
Gujarat	76	( 16.1)	<b>[62.3]</b>	122 [100.0]
Karnataka	85	( 18.0)	[51.8]	164 [100.0]
Kerala	31	( 6.6)	[25.2]	123 [100.0]
Maharashtra	<b>152</b>	<b>( 32.2)</b>	[54.1]	281 [100.0]
Tamil Nadu	85	( 18.0)	[40.5]	210 [100.0]
<b>Total</b>	<b>472</b>	<b>(100.0)</b>	<b>[46.3]</b>	<b>1020 [100.0]</b>

\* Percentages in square brackets are based on total respondents for the particular state

The branch-wise distribution of continuously employed members is given in Table-5.4b. Data shows highest percentage employment in the branch of Computer Science and Engineering and the lowest in Civil Engineering. This is as expected.

**Table-5.4b Branch-wise Distribution of the Continuously Employed Women Engineers**

Branch of Specialisation	Continuously Employed Women Engineers			Total Respondents for the Particular Branch
	Number	(%)	[%]	
Architecture	45	( 9.5)	<b>[69.2]</b>	65 [100.0]
Civil Engineering	63	( 13.3)	[33.5]	188 [100.0]
Computer Science	105	( 22.2)	[61.8]	170 [100.0]
Electrical Engineering	59	( 12.5)	[38.3]	154 [100.0]
Electronics Engineering	<b>150</b>	<b>( 31.8)</b>	[42.4]	354 [100.0]
Mechanical Engineering	50	( 10.6)	[56.2]	89 [100.0]
<b>Total</b>	<b>472</b>	<b>(100.0)</b>	<b>[46.3]</b>	<b>1020 [100.0]</b>

Employment difficulties in the area of Civil Engineering are well known and constituted one of the main findings of the previous study. The same is duly reflected by the quotes given below. It may be noted that the quotes are from women engineers belonging to different states meaning that the employment situation in the field of Civil Engineering is generally bad, particularly so for women.

63/DEL/CV/98 *“Being a civil engineer I feel it is very difficult to find a job. Most of my friends (girls) are working for wages as low as Rs. 1000/-per month. Boys seem to be better paid. Campus interviews are also very few for civil engineers at least in Kerala. In I. I. T Delhi also the only campus interview that takes place for M. Tech. Civil is for TCS. Out of the 17 girls who graduated along with me 3 are doing M. Tech., one is working for a computer firm at Chennai, 4 are married and unemployed, 4 are unemployed and rest are working for meagre income.”*

82/KAR/CV/98 *“After my B. Tech. I stayed one year at home trying for various jobs. Now I have started going for experience in a Private Industry (Small-scale) (office job). I did CAD and I am planning to do another package STAAD/PRO. I intend to join for M.Tech. If I can't, I will continue as a trainee and then join there itself as a regular employee.”*

621/GUJ/CV/94 *“Jobs for women in Civil Engineering profession are very limited. For getting a license as a structural engineer, she has to produce 5 years work experience certificate. Due to this she cannot even start her own business. I tried to find job as a civil engineer, but I did not succeed and so I joined as visiting lecturer.”*

863/KER/CV/98 *“I am a graduate in Civil Engineering, but it is not possible to get a job for women in this field and if they give jobs, the job offered is only mere office work that anyone can do with some experience. Most of my college mates (girls) are still unemployed.”*

Computer and software jobs being most suitable for women engineers, the highest employment in Computer Science and Engineering is as anticipated. It is however necessary to take note of the high employment fraction of 56.2% in Mechanical Engineering. Maybe the sample size of Mechanical Engineering graduates is small and it is not reflecting the true picture. The feedback from the Mechanical Engineering graduates does not match with this figure. It happens quite often that the employers turn away the women mechanical engineers. Typical quotes reflect the same.

126/KAR/ME/96 *“In our country job opportunity for women are very less that's what I feel. Being the only lady mechanical engineer from our college, and that too being the second topper in my class and having secured 74% in university exam, I had to sit at home for*

*10 months after my graduation applying for jobs in different companies. Then I got a job in ....., a job that was not at all connected with my education. So I had to leave that job and join as a lecturer in the same college where I did my B.E.”*

139/AP/ME/97 *“All the engineering students are shifting to software side. Lack of opportunities especially for women (in Mechanical) is pushing them to software. Though there is increase in the admissions in Mechanical Engineering, the jobs have not increased in the corresponding ratio. To top it all, women candidates are not preferred in Mechanical Engineering departments.”*

142/GUJ/ME/98 *“Since result of final semester I am looking for a good job in newspaper Side by side I was doing computer courses and even now my computer class is going on. I am looking for a good job but I can find none. Neither have I experience nor have any jack for getting job. Some of jobs were for men (for night duties etc.). I had passed my B.E. (Mechanical) with such a good result (First class with distinction 72.1%) but I am still unemployed. Hope I get a job in the near future.”*

243/MAH/ME/98 *“I would like to enlighten you with a fact that women engineers who have taken up Mechanical or Production as their branch, for them getting a job is very difficult even though they have all the capabilities as that of men.”*

946/GUJ/ME/94 *“Being a woman engineer we have to face so many problems in field, especially in Mechanical Engineering. Employers do not prefer a lady in the factory. I think that there should not be any seats for ladies in Mechanical field in colleges. So, girls will not go in that field and will not suffer ”*

The percentage employed in Architecture has been found to be high, much higher than expected. Architecture is a branch, which is technical as well as artistic but it has very little employment opportunities. Architectural firms have generally single owner or partnership structure. The pay scale in doing a job as an architect is very very low. People therefore prefer to spend a year or so in a job and then try to develop their own practice. Maybe it is the practising architects who have contributed to the employed fraction being as high as 69%.

Table-5.4c shows a consistent increase in number with the year of graduation. The same expressed as percentage of the total of the corresponding year decreases with the year of graduation except for the year 1994. This could mean that there are many more graduates than are needed by the job market. These trends may hold on an overall basis and may not necessarily be applicable only for women engineers.

**Table-5.4c Year-wise Distribution of the Continuously Employed Women Engineers**

Year of Graduation	Continuously Employed Women Engineers			Total Respondents for the Particular Year [%]
	Number	(%)	[%]	
1994	50	( 10.6)	[54.9]	91 [100.0]
1995	78	( 16.5)	<b>[59.1]</b>	132 [100.0]
1996	88	( 18.6)	[51.2]	172 [100.0]
1997	117	( 24.8)	[45.5]	257 [100.0]
1998	<b>139</b>	<b>( 29.4)</b>	[37.8]	368 [100.0]
<b>Total</b>	<b>472</b>	<b>(100.0)</b>	<b>[46.3]</b>	<b>1020 [100.0]</b>

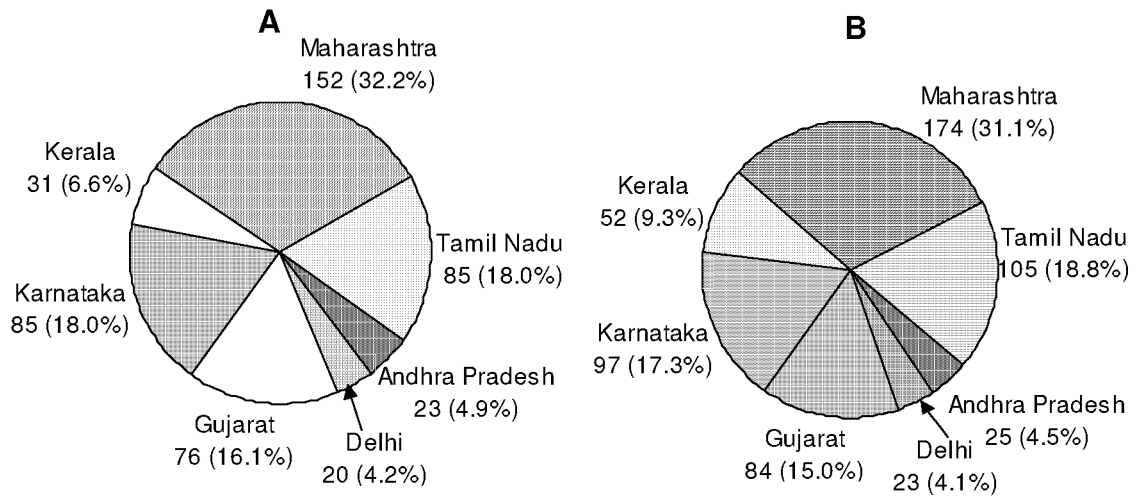
Tables-5.5a to 5.5c presents the state-wise, branch-wise and year-wise distribution of the total employed fraction including both the 'Continuously employed' and the 'Intermittently employed but currently employed' categories. The overall distribution pattern remains unchanged between the two categories i.e. 'Continuously employed' and 'Intermittently employed + currently employed' (Figure-5.2a). This is contrary to the changes that have taken place in the distribution patterns of the unemployed.

**Table-5.5a State-wise Distribution of 'Continuously Employed' + 'Intermittently Employed and Currently Employed' Women Engineers**

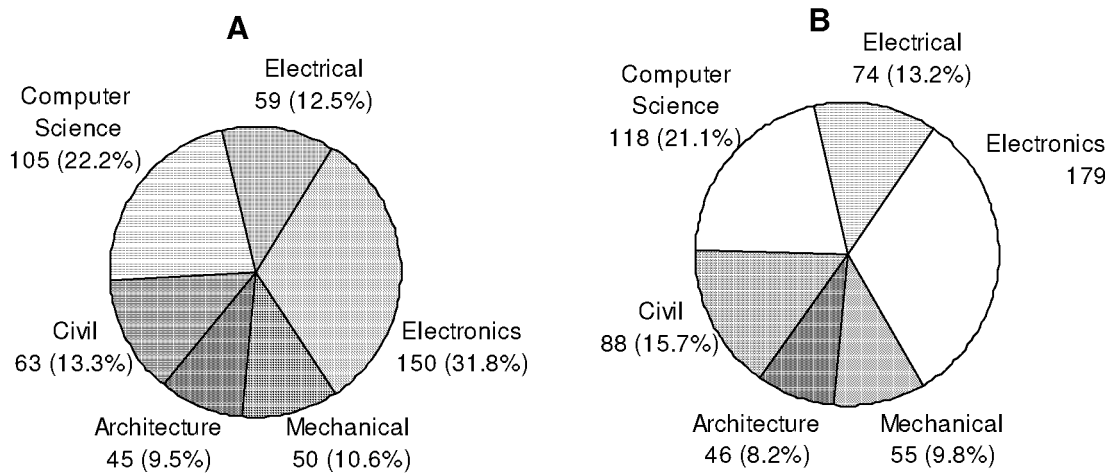
State	Women Engineers Employed at the time of Data Collection			Total Respondents for the Particular State
	Number	(%)	[%]	
Andhra Pradesh	25	( 4.5)	[30.9]	81 [100.0]
Delhi	23	( 4.1)	[59.0]	39 [100.0]
Gujarat	84	( 15.0)	<b>[68.9]</b>	122 [100.0]
Karnataka	97	( 17.3)	[59.1]	164 [100.0]
Kerala	52	( 9.3)	[42.3]	123 [100.0]
Maharashtra	<b>174</b>	<b>( 31.1)</b>	[61.9]	281 [100.0]
Tamil Nadu	105	( 18.8)	[50.0]	210 [100.0]
<b>Total</b>	<b>560</b>	<b>(100.0)</b>	<b>[54.9]</b>	<b>1020 [100.0]</b>



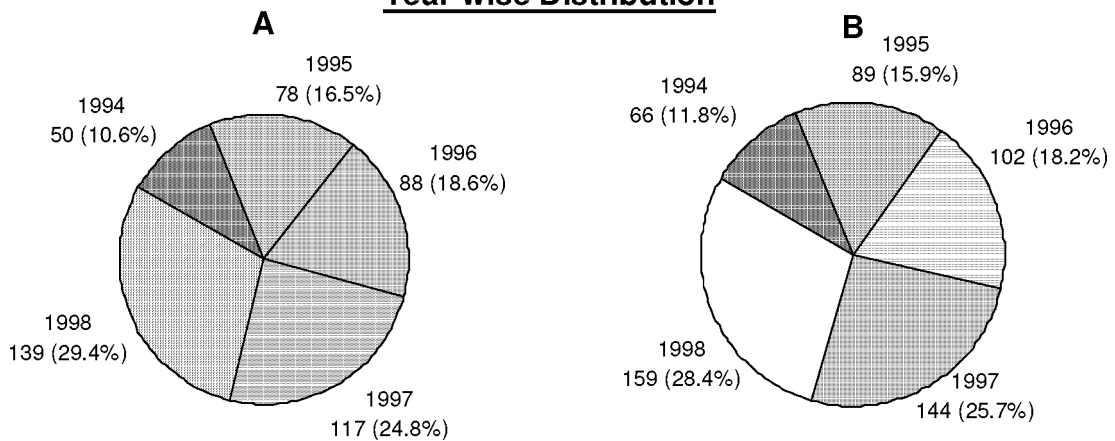
### State-wise Distribution



### Branch-wise Distribution



### Year-wise Distribution



**Figure-5.2a State, Branch and Year-wise Distribution of Women Engineers who are**  
**A- 'Continuously Employed (Total number = 472)'**  
**B - 'Continuously Employed' + 'Intermittently Employed and Currently Employed (Total number = 560)'**

**Table-5.5b Branch-wise Distribution of ‘Continuously Employed’ + ‘Intermittently Employed and Currently Employed’ Women Engineers**

Branch of Specialisation	Women Engineers Employed at the time of Data Collection			Total Respondents for the Particular Branch
	Number	(%)	[%]	
Architecture	46	( 8.2)	<b>[70.8]</b>	65 [100.0]
Civil Engineering	88	( 15.7)	[46.8]	188 [100.0]
Computer Science	118	( 21.1)	[69.4]	170 [100.0]
Electrical Engineering	74	( 13.2)	[48.1]	154 [100.0]
Electronics Engineering	<b>179</b>	<b>( 32.0)</b>	[50.6]	354 [100.0]
Mechanical Engineering	55	( 9.8)	[61.8]	89 [100.0]
<b>Total</b>	<b>560</b>	<b>(100.0)</b>	<b>[54.9]</b>	<b>1020 [100.0]</b>

**Table-5.5c Year-wise Distribution of ‘Continuously Employed’ + ‘Intermittently Employed and Currently Employed’ Women Engineers**

Year of Graduation	Women Engineers Employed at the time of Data Collection			Total Respondents for the Particular Year
	Number	(%)	[%]	
1994	66	( 11.8)	<b>[72.5]</b>	91 [100.0]
1995	89	( 15.9)	[67.4]	132 [100.0]
1996	102	( 18.2)	[59.3]	172 [100.0]
1997	144	( 25.7)	[56.0]	257 [100.0]
1998	<b>159</b>	<b>( 28.4)</b>	[43.2]	368 [100.0]
<b>Total</b>	<b>560</b>	<b>(100.0)</b>	<b>[54.9]</b>	<b>1020 [100.0]</b>

## STATE-WISE, BRANCH-WISE AND YEAR-WISE DISTRIBUTION OF WOMEN ENGINEERS UNEMPLOYED SINCE GRADUATION

The data of the 215 women engineers, who have never been employed since graduation, is presented in Tables-5.6a, 5.6b, 5.6d state-wise, branch-wise and graduation year-wise.

Andhra Pradesh ranks highest as far as the percentage of unemployed women engineers is concerned (Table-5.6a). Karnataka is the next with 27.4% unemployed

women engineers followed by Kerala and Tamil Nadu. This is a change from the findings of the previous study where Kerala had the highest unemployment.

**Table-5.6a State-wise Distribution of Women Engineers Unemployed since Graduation**

State	Women Engineers Unemployed Since Graduation			Total Respondents for the Particular State
	Number	(%)	[%]	
Andhra Pradesh	35	( 16.3)	<b>[43.2]</b>	81 [100.0]
Delhi	3	( 1.4)	[ 7.7]	39 [100.0]
Gujarat	14	( 6.5)	[11.5]	122 [100.0]
Karnataka	45	( 20.9)	[27.4]	164 [100.0]
Kerala	28	( 13.0)	[22.8]	123 [100.0]
Maharashtra	43	( 20.0)	[15.3]	281 [100.0]
Tamil Nadu	<b>47</b>	<b>( 21.9)</b>	[22.4]	210 [100.0]
<b>Total</b>	<b>215</b>	<b>(100.0)</b>	<b>[21.1]</b>	<b>1020 [100.0]</b>

The branch-wise distribution of the unemployed women engineers as presented in Table-5.6b is quite revealing with 29.2% being Electrical Engineering and 26.8% being Electronics Engineering graduates. Even in Computer Science/Engineering, which is supposed to be a very suitable branch for women, the percentage of unemployed is 18.2%. This is unexpected.

**Table-5.6b Branch-wise Distribution of Women Engineers Unemployed since Graduation**

Branch of Specialisation	Women Engineers Unemployed Since Graduation			Total Respondents for the Particular Branch
	Number	(%)	[%]	
Architecture	1	( 0.5)	[ 1.5]	65 [100.0]
Civil Engineering	28	( 13.0)	[14.9]	188 [100.0]
Computer Science	31	( 14.4)	[18.2]	170 [100.0]
Electrical Engineering	45	( 20.9)	<b>[29.2]</b>	154 [100.0]
Electronics Engineering	<b>95</b>	<b>( 44.2)</b>	[26.8]	354 [100.0]
Mechanical Engineering	15	( 7.0)	[16.9]	89 [100.0]
<b>Total</b>	<b>215</b>	<b>(100.0)</b>	<b>[21.1]</b>	<b>1020 [100.0]</b>

The percentage unemployment amongst the Civil Engineering graduates is not commensurate with the fact that the employment in the branch is found to be lowest. It can be seen that the percentage unemployment is rather low in the branch of Civil Engineering. This can be explained on the basis of Table-5.6c, which shows that over 51% of the stock of women civil engineers belong to the category of 'Intermittently employed, pursuing further studies etc.'

As can be seen from the data presented in the subsequent paragraphs, 22% of the civil engineers are pursuing further studies and about 30% have been intermittently employed. Intermittent employment reflects an unstable employment situation, which could be due to temporary jobs or due to unsatisfactory jobs, which the respondents maybe taking up as an ad-hoc/interim measure while looking for a better job.

**Table-5.6c Branch-wise Distribution of the Questionnaire Respondents**

Branch of Specialisation	Total for the Corresponding Branch	Employed	Unemployed	Students + Intermittently Employed
		Number [%]	Number [%]	Number [%]
Architecture	65 [100.0]	<b>45 [69.2]</b>	1 [1.5]	19 [29.2]
Civil Engg.	188 [100.0]	63 [33.5]	28 [14.9]	<b>97 [51.6]</b>
Computer Science	170 [100.0]	105 [61.8]	31 [18.2]	34 [20.0]
Electrical Engg.	154 [100.0]	59 [38.3]	<b>45 [29.2]</b>	50 [32.5]
Electronics Engg.	354 [100.0]	150 [42.4]	95 [26.8]	109 [30.8]
Mechanical Engg.	89 [100.0]	50 [56.2]	15 [16.9]	24 [27.0]
<b>Total</b>	<b>1020 [100.0]</b>	<b>472 [46.3]</b>	<b>215 [21.1]</b>	<b>333 [32.6]</b>

The largest number and fraction of unemployed women engineers are the graduates of 1998 (Table-5.6d). The questionnaire response was collected during 1999-2000. This means the unemployed were already in the job market but without a job for more than a year at the time of data collection. 21.1% on an overall basis and 34.2% for the graduates of 1998 are both worrisome figures. Some, though comparatively smaller numbers, remaining unemployed from the earlier graduation years also need to be noted.

**Table-5.6d Year-wise Distribution of Women Engineers Unemployed since Graduation**

Year of Graduation	Women Engineers Unemployed Since Graduation			Total Respondents for the Particular Year
	Number	(%)	[%]	
1994	6	( 2.8)	[ 6.6]	91 [100.0]
1995	12	( 5.6)	[ 9.1]	132 [100.0]
1996	24	( 11.2)	[14.0]	172 [100.0]
1997	47	( 21.9)	[18.3]	257 [100.0]
1998	<b>126</b>	<b>( 58.6)</b>	<b>[34.2]</b>	368 [100.0]
<b>Total</b>	<b>215</b>	<b>(100.0)</b>	<b>[21.1]</b>	<b>1020 [100.0]</b>

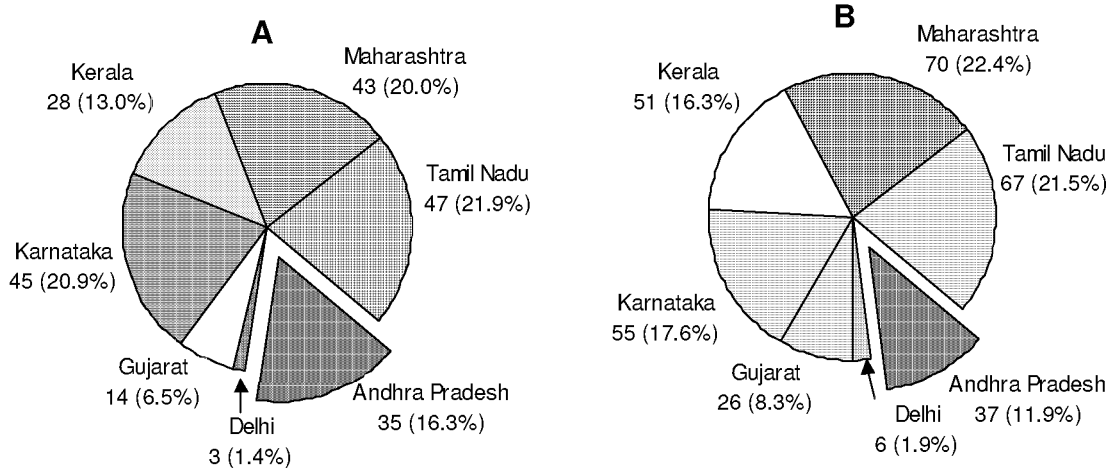
In order to understand the overall unemployment scenario, it is necessary to take into account all the women engineers who were unemployed at the time of data collection. This number therefore needs also to include the category of 'Intermittently employed and currently unemployed'. The total number of unemployed women engineers thus becomes significantly larger at 312 instead of 215. The state-wise and branch-wise distribution of the same is given in Table-5.7a and the year-wise distribution in Table-5.7b. A comparison of the two fractions i.e. of 215 and 312 is given in Figure-5.2b. The following may be observed.

Andhra Pradesh still tops the list with over 45% of the QRS being unemployed. In this sample with currently unemployed women included, Kerala ranks the next with 41.5% unemployment. This is a change as compared to the analysis of the group 'Unemployed since graduation' where Karnataka was next to Andhra Pradesh.

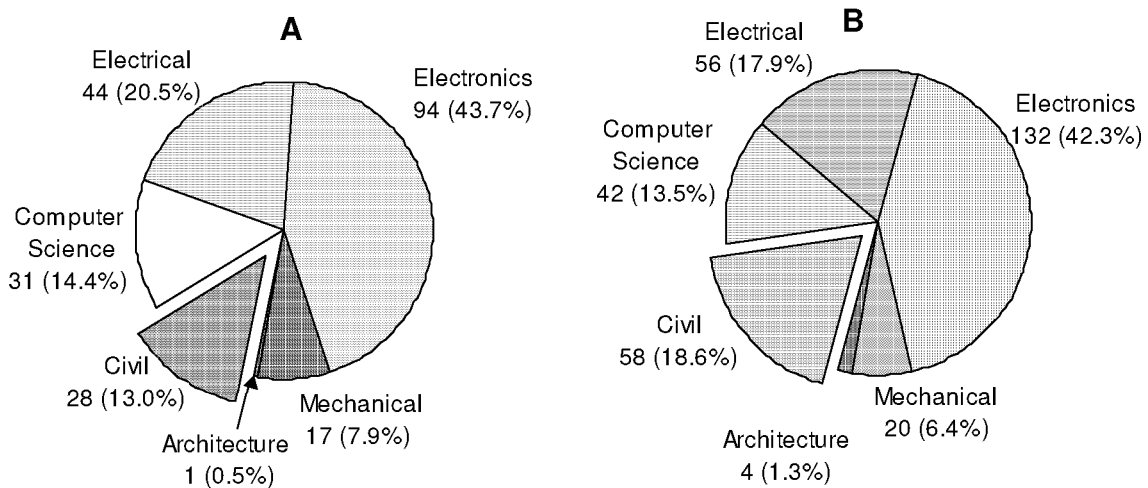
On a branch-wise basis, the percentage unemployment amongst Electronics engineers (37.3%) tops the list closely followed by Electrical Engineering (36.4%). The positions of Electronics and Electrical Engineering have been interchanged as compared to the group of continuously unemployed members. Increase in unemployed percentage in Computer Science from 18.3% to 24.1% also needs to be underlined along with change in the unemployed percentage of Civil Engineering from 14.9 to 30.9%. The same amongst the Andhra Pradesh graduates is as high as 56.5%.

Amongst the Electronics engineers from Kerala, the unemployment comes out to be 70.6% and those from Andhra Pradesh 64.7%. Even in Maharashtra and Tamil Nadu the unemployed fraction is highest amongst Electronics engineers. The scenario is not in tune with the general belief that Electronics is a suitable branch for all engineers from the point of view of employment. It seems that with the increasing number of institutions awarding a degree in Electronics Engineering, an imbalance has been created in demand and supply of the electronics graduates. It is important to verify whether or not such an unemployment scenario exists for all electronics graduates or is only true for women engineers.

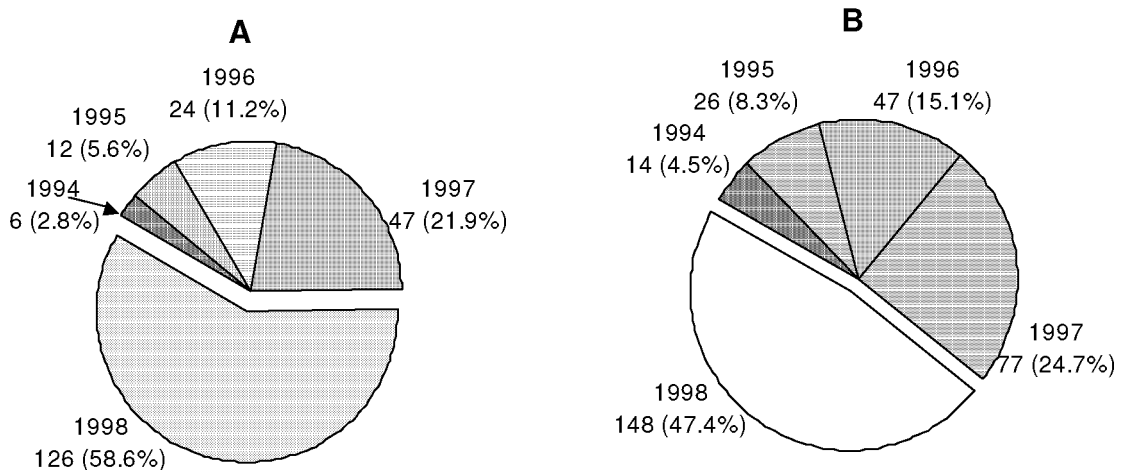
### State-wise Distribution



### Branch-wise Distribution



### Year-wise Distribution



**Figure-5.2b State, Branch and Year-wise Distribution of Women Engineers who are**  
**A - 'Continuously Unemployed' (Total number = 215)**  
**B - 'Continuously Unemployed' + 'Intermittently Employed and Currently Unemployed' (Total number = 312)**

*The sectors showing significant change have been pulled out for reference*

**Table-5.7a State-wise and Branch-wise Distribution of 'Unemployed since Graduation' + 'Intermittently Employed and Currently Unemployed' Women Engineers**

	Andhra Pradesh		Delhi		Gujarat		Karnataka		Kerala		Maharashtra		Tamil Nadu		Total	
	T*	U** %	T	U %	T	U %	T	U %	T	U %	T	U %	T	U %	T	U %
<b>Architecture</b>	1	100.0	13	0.0	4	0.0	7	0.0	7	14.3	27	7.4	6	0.0	65	6.2
<b>Civil Engg.</b>	23	56.5	7	14.3	36	19.4	14	28.6	55	34.6	34	26.5	19	5.26.3	188	58.30.9
<b>Computer Science/Engg.</b>	11	18.2	5	20.0	19	10.5	47	34.0	2	0.0	50	28.0	36	7.19.4	170	42.24.7
<b>Electrical Engg.</b>	13	30.8	5	40.0	16	31.3	21	42.9	39	48.7	18	5.6	42	16.38.1	154	56.36.4
<b>Electronics Engg.</b>	17	64.7	9	22.2	17	23.5	62	37.1	17	70.6	142	29.6	90	38.42.2	354	132.37.
<b>Mechanical Engg.</b>	16	37.5	0	0.0	30	26.7	13	23.1	3	0.0	10	20.0	17	1.5.9	89	20.22.
<b>Total</b>	<b>81</b>	<b>37.45.7</b>	<b>39</b>	<b>6.15.4</b>	<b>122</b>	<b>26.21.3</b>	<b>164</b>	<b>55.33.5</b>	<b>123</b>	<b>51.41.5</b>	<b>281</b>	<b>70.24.9</b>	<b>210</b>	<b>67.31.9</b>	<b>1020</b>	<b>312.30.6</b>

\* T- Total respondents from the specified branch and state

\*\* U- Unemployed respondents from the specified branch and state

Unemployment amongst the graduates of Electrical Engineering in almost all the selected states is rather high and needs a similar analysis.

Thus, taking into account the intermittently employed, the scenario becomes significantly worse. Based upon the feedback received through various expressions including the one through reply to Q50, intermittent employment, essentially means, taking up odd jobs and eventually leaving the same for either a better job or for further studies. Losing the job is also a part of the 'Intermittent employment' scenario. Further studies include job-oriented training like a computer course. This perhaps is the reason for 97 out of 333 (29.1%) of the intermittently employed etc. group being unemployed.

From the Tables-5.7b, it is seen that the graduation year-wise unemployed fraction has increased significantly in the recent years, as was also the case in the previous group. The worst case happens to be the graduates of 1998 in either of the groups. The percentage unemployed amongst the 1998 graduates is found to be 40.2% and as stated earlier, the overall unemployment is 30.6%.

**Table-5.7b Year-wise Distribution of the 'Unemployed since Graduation' + 'Intermittently Employed and Currently Unemployed' Women Engineers**

Year of Graduation	Women Engineers Unemployed at the time of Data Collection			Total Respondents for the Particular Year
	Number	(%)	[%]	
1994	14	( 4.5)	[15.4]	91 [100.0]
1995	26	( 8.3)	[19.7]	132 [100.0]
1996	47	( 15.1)	[27.3]	172 [100.0]
1997	77	( 24.7)	[30.0]	257 [100.0]
1998	<b>148</b>	<b>( 47.4)</b>	<b>[40.2]</b>	368 [100.0]
<b>Total</b>	<b>312</b>	<b>(100.0)</b>	<b>[30.6]</b>	<b>1020 [100.0]</b>

It would be interesting to compare the overall unemployment scenario with that found in the previous study (Tables-5.8a and 5.8b). The percentage unemployed in the previous study was 25% as against 30.6% in the current study. The unemployment of women engineers was highest in Kerala that too amongst the graduates of Civil Engineering. The overall unemployment amongst women engineers from Kerala was about 36% but the unemployment amongst women civil engineering graduates from Kerala was over 50%.

In the present study Kerala continues to have high unemployment at 41.5%, but the highest rate is in Andhra Pradesh where 45.7% of the women engineers are unemployed. Percentage unemployment amongst Electronics and Electrical Engineering graduates has increased significantly surpassing the figure for Civil Engineering which is 30.9%. The unemployed amongst Electronics graduates from Kerala and Andhra Pradesh are 70.6% and 64.7% respectively, percentages which



are much higher than the Kerala-Civil Engineering combination in the last study. The scenario has thus significantly changed not only in respect to the overall unemployment levels, but also in regard to the states and branches where unemployment is highest. Kerala-Electronics and Andhra Pradesh-Electronics combination have much higher unemployment than the highest reported in the previous study.

**Table-5.8a State-wise Distribution of Unemployed Women Engineers  
\*(Previous Project)**

State	Unemployed Women Engineers			Total Respondents for the Particular State
	Number	(%)	[%]	
Andhra Pradesh	28	( 4.4)	[16.7]	168 [100.0]
Delhi	2	( 0.3)	[ 5.4]	37 [100.0]
Gujarat	39	( 6.2)	[24.4]	160 [100.0]
Karnataka	106	( 16.7)	[25.7]	412 [100.0]
Kerala	<b>234</b>	<b>( 36.9)</b>	<b>[34.0]</b>	688 [100.0]
Maharashtra	34	( 5.4)	[12.0]	283 [100.0]
Tamil Nadu	191	( 30.1)	[32.8]	583 [100.0]
<b>Total</b>	<b>634</b>	<b>(100.0)</b>	<b>[27.2]</b>	<b>2331 [100.0]</b>

\* Data for the states under study in the current project

**Table-5.8b Branch-wise Distribution of Unemployed Women Engineers  
\*(Previous Project)**

Branch of Specialisation	Unemployed Women Engineers			Total Respondents for the Particular Branch
	Number	(%)	[%]	
Computer Science	32	( 5.1)	[21.1]	152 [100.0]
Civil Engineering	<b>225</b>	<b>( 35.9)</b>	<b>[34.7]</b>	648 [100.0]
Electrical Engineering	204	( 32.6)	[25.5]	799 [100.0]
Electronics Engineering	144	( 23.0)	[19.3]	748 [100.0]
Mechanical Engineering	21	( 3.4)	[19.1]	110 [100.0]
<b>Total</b>	<b>626</b>	<b>(100.0)</b>	<b>[25.5]</b>	<b>2457 [100.0]</b>

\* Data for the branches under study in the current project

## STATE-WISE, BRANCH-WISE AND YEAR-WISE DISTRIBUTION OF WOMEN ENGINEERS PURSUING HIGHER STUDIES

The analysis in this section pertains to a sub-group of Part-C, viz. those pursuing higher studies. (They may or may not have been employed after graduation). Tables-5.9a to 5.9c presents the state, branch and year-wise distributions of this sub-group.

Data on state-wise distribution of respondents pursuing further studies is given in Table-5.9a. Percentage-wise Delhi tops the list closely followed by Andhra Pradesh. The number of responding graduates from Delhi is 39 out of which 10 are pursuing higher studies. For Andhra Pradesh, the corresponding numbers are 19 out of 81.

**Table-5.9a State-wise Distribution of Respondents Pursuing Further Studies**

State	Women Engineers Pursuing Further Studies			Total Respondents for the Particular State
	Number	(%)	[%]	
Andhra Pradesh	19	( 12.8)	[23.5]	81 [100.0]
Delhi	10	( 6.8)	<b>[25.6]</b>	39 [100.0]
Gujarat	12	( 8.1)	[ 9.8]	122 [100.0]
Karnataka	12	( 8.1)	[ 7.3]	164 [100.0]
Kerala	20	( 13.5)	[16.3]	123 [100.0]
Maharashtra	37	( 25.0)	[13.2]	281 [100.0]
Tamil Nadu	<b>38</b>	<b>( 25.7)</b>	[18.1]	210 [100.0]
<b>Total</b>	<b>148</b>	<b>(100.0)</b>	<b>[14.5]</b>	<b>1020 [100.0]</b>

Predominance of Electronics Engineering in this sample of 148 members is clearly seen, closely followed by Civil Engineering (Table-5.9b). It is necessary to note that the percentage taking up higher studies amongst the Computer Science/Engineering graduates are the lowest, the same being highest in Architecture followed by Civil Engineering. Since non-availability of job is also a reason for taking up higher studies, the data reflects the very poor job availability in Civil Engineering amongst the engineering branches. Better job opportunities in the field of Computer Science may be the reason for lesser number of graduates taking up further studies.

**Table-5.9b Branch-wise Distribution of Respondents Pursuing Further Studies**

Branch of Specialisation	Women Engineers Pursuing Further Studies			Total Respondents for the Particular Branch
	Number	(%)	(%)	
Architecture	15	( 10.1)	<b>[23.1]</b>	65 [100.0]
Civil Engineering	42	( 28.4)	[22.3]	188 [100.0]
Computer Science	10	( 6.8)	[ 5.9]	170 [100.0]
Electrical Engineering	24	( 16.2)	[15.6]	154 [100.0]
Electronics Engineering	<b>43</b>	<b>( 29.1)</b>	[12.1]	354 [100.0]
Mechanical Engineering	14	( 9.5)	[15.7]	89 [100.0]
<b>Total</b>	<b>148</b>	<b>(100.0)</b>	<b>[14.5]</b>	<b>1020 [100.0]</b>

Increasing numbers belonging to later years is the common feature of all the groups, which prevails here also (Table-5.9c).

**Table-5.9c Year-wise Distribution of Respondents Pursuing Further Studies**

Year of Graduation	Women Engineers Pursuing Further Studies			Total Respondents for the Particular Year
	Number	(%)	[%]	
1994	11	( 7.4)	[12.1]	91 [100.0]
1995	17	( 11.5)	[12.9]	132 [100.0]
1996	23	( 15.5)	[13.4]	172 [100.0]
1997	36	( 24.3)	[14.0]	257 [100.0]
1998	<b>61</b>	<b>( 41.2)</b>	<b>[16.6]</b>	368 [100.0]
<b>Total</b>	<b>148</b>	<b>(100.0)</b>	<b>[14.5]</b>	<b>1020 [100.0]</b>

The state-wise, branch-wise and year-wise distribution of the three groups viz. those employed at the time of data collection, those unemployed at the time of data collection and those pursuing further studies have been compared in Tables-5.10a to 5.10c. The following needs to be noted.

- Amongst states, the highest employment is in Gujarat followed by Maharashtra and then Karnataka and Delhi. Kerala stands last with 42.3% employed. The unemployed fraction is highest in Andhra Pradesh, followed by Kerala, Karnataka and Tamil Nadu. Percentage taking up further studies is highest amongst the graduates of Delhi, closely followed by Andhra Pradesh. High unemployment in Andhra Pradesh could be the cause of the larger percentage taking up further studies.
- Amongst branches, the highest employed fraction is Computer Science and Engineering. The unemployed fraction is highest amongst the graduates of Electronics, closely followed by Electrical Engineering. It is to be noted that the percentage doing further studies is high in Civil Engineering, the lowest being in Computer Science. Architecture also has a large fraction pursuing higher studies and a very small fraction of unemployed. Higher fractions taking up further studies could be related to lack of jobs in the particular branch.
- In the year-wise distribution, the percentage employed decreases for the later years and correspondingly the percentage of unemployed is increasing. The fraction pursuing further studies has also increased in the later years, but the magnitude of increase is small.

**Table-5.10a State-wise Distribution of the Questionnaire Respondents**

State	Total for the Corresponding State	Employed	Unemployed	Further Studies
		Number [%]	Number [%]	Number [%]
Andhra Pradesh	81 [100.0]	25 [30.9]	37 <b>[45.7]</b>	19 [23.5]
Delhi	39 [100.0]	23 [59.0]	6 [15.4]	10 <b>[25.6]</b>
Gujarat	122 [100.0]	84 <b>[68.9]</b>	26 [21.3]	12 [9.8]
Karnataka	164 [100.0]	97 [59.1]	55 [33.5]	12 [7.3]
Kerala	123 [100.0]	52 [42.3]	51 [41.5]	20 [16.3]
Maharashtra	281 [100.0]	174 [61.9]	70 [24.9]	37 [13.2]
Tamil Nadu	210 [100.0]	105 [50.0]	67 [31.9]	38 [18.1]
<b>Total</b>	<b>1020 [100.0]</b>	<b>560 [54.9]</b>	<b>312 [30.6]</b>	<b>148 [14.5]</b>

**Table-5.10b Branch-wise Distribution of the Questionnaire Respondents**

Branch of specialisation	Total for the Corresponding Branch	Employed	Unemployed	Further Studies
		Number [%]	Number [%]	Number [%]
Architecture	65 [100.0]	46 <b>[70.8]</b>	4 [6.2]	15 <b>[23.1]</b>
Civil Engg.	188 [100.0]	88 [46.8]	58 [30.9]	42 [22.3]
Computer Sc.	170 [100.0]	118 [69.4]	42 [24.7]	10 [5.9]
Electrical Engg.	154 [100.0]	74 [48.1]	56 [36.4]	24 [15.6]
Electronics Engg.	354 [100.0]	179 [50.6]	132 <b>[37.3]</b>	43 [12.1]
Mechanical Engg.	89 [100.0]	55 [61.8]	20 [22.5]	14 [15.7]
<b>Total</b>	<b>1020 [100.0]</b>	<b>560 [54.9]</b>	<b>312 [30.6]</b>	<b>148 [14.5]</b>

**Table-5.10c Year-wise Distribution of the Questionnaire Respondents**

Year of Graduation	Total for the Corresponding Year	Employed	Unemployed	Further Studies
		Number [%]	Number [%]	Number [%]
1994	91 [100.0]	66 <b>[72.5]</b>	14 [15.4]	11 [12.1]
1995	132 [100.0]	89 [67.4]	26 [19.7]	17 [12.9]
1996	172 [100.0]	102 [59.3]	47 [27.3]	23 [13.4]
1997	257 [100.0]	144 [56.0]	77 [30.0]	36 [14.0]
1998	368 [100.0]	159 [43.2]	148 <b>[40.2]</b>	61 <b>[16.6]</b>
<b>Total</b>	<b>1020 [100.0]</b>	<b>560 [54.9]</b>	<b>312 [30.6]</b>	<b>148 [14.5]</b>

## CAREER PROFILES AND PROBLEMS

### PART-A WOMEN ENGINEERS EMPLOYED CONTINUOUSLY AFTER GRADUATION

An analysis of the data received through replies to questions of Part-IIIa of the questionnaire is presented below. This part of the questionnaire addresses the group of women engineers who have been employed continuously after graduation.

Out of a total of 1020 members of QRS, 472 women engineers have reported being continuously employed after graduation. These constitute the subject of the analysis presented below. The data and information on this group has been obtained through replies to Q17-Q33 (Part-IIIa).

The facets probed into through these questions include the process of selection, nature of job, type of employers, job change analysis, work atmosphere, career advancement criteria and characteristics of the present job. Information has been obtained about the campus interviews, and performance and problems at the campus interviews. The other aspects include job interviews, difficulties in getting the job and any other career problems that these women engineers may have encountered during their job and career.

#### Process of Selection

There are several routes through which one seeks and secures a job, viz. campus interviews, response to an advertisement, as a sequel to practical training and through personal contacts and networking. The information about the process through which the respondents secured their present and previous jobs was obtained through Q17, which is a directed question giving the above 4 options and a fifth one as 'Any other'. The data is presented in Table-5.11.

**Table-5.11 Process of Selection for Obtaining Present/Previous Job [Q17]**

<b>Process of Selection</b>	<b>Present Job Number (%)</b>	<b>Previous Job Number (%)</b>
Campus interview	68 ( 15.2)	34 ( 17.2)
Response to advertisement	<b>244 ( 54.5)</b>	<b>78 ( 39.4)</b>
As a sequel to practical training	18 ( 4.0)	16 ( 8.1)
Through personal contacts or networking	105 ( 23.4)	66 ( 33.3)
Others	13 ( 2.9)	4 ( 2.0)
Sub-total	448 (100.0)	198 (100.0)
Not specified	24	274
<b>Total</b>	<b>472</b>	<b>472</b>

It can be seen that the total numbers who have furnished information about the 'Previous job' is much smaller. This can be due to the fact that a large number of the group may have had only one job. Obviously the members who have had only one job would not respond to the part of the question related to 'Previous job'. This explains the large number against 'Not specified'. An examination of the data shows that 'Response to advertisement', is the route through which the largest number of women have obtained their job. This is true for the present as well as the previous job. Personal contacts and networking stands second amongst the modes of securing a job. Comparatively insignificant numbers getting a job 'as a sequel to practical training' needs to be noted. Low contribution of campus interviews also needs to be underlined. Reasons for the same have been discussed in subsequent paragraphs.

## Problems Faced in Being Called for Interview

In order to analyse the reasons for campus interviews being an ineffective mode of employment, several questions were asked in the Questionnaire. The response is presented in Tables-5.12 to 5.15.

A majority of the candidates report not having had any difficulty in being invited for a campus interview. A smaller but significant number do report having faced some problems related to being invited for a campus interview. The NA (Not Applicable) category in the table refers to the respondents who had no campus interview.

**Table-5.12 Problems in Being Invited for a Campus Interview [Q18]**

	Number	%
Yes	69	16.8
No	<b>260</b>	<b>63.4</b>
NA	81	19.8
Sub-total	410	100.0
No response	62	
<b>Total</b>	<b>472</b>	

The data about the number of campus interviews attended is given in Table-5.13. 78 out of 189 have stated that no interviews were conducted at their campus. However, the reason for the remaining 111 not having given any campus interviews is not clearly known. There are many remarks and comments suggestive of the fact that in many colleges, women are not invited or even permitted to have campus interviews by employers. This could be one of the reasons why such a large number report no campus interviews.

The largest number have attended 2-5 campus interviews and almost a comparable number 'Less than 2'. The 'Less than 2' and 'Less than 5' category account for over 54%. 17 out of 472 have attended about 10 campus interviews. On the whole 259 out of 472 have attended one or more campus interviews.

**Table-5.13 Number of Campus Interviews Attended [Q19]**

	<b>Number</b>	<b>%</b>
About 10	17	3.8
Less than 5	122	27.2
Less than 2	120	26.8
Nil	<b>189</b>	<b>42.2</b>
Sub-total	448	100.0
No response	24	
<b>Total</b>	<b>472</b>	

Out of the 259 who have attended one or more campus interviews, only 133 report having been selected. Obviously the remaining 127 were not selected (Table-5.14).

**Table-5.14 Selection in the Campus Interview [Q20]**

	<b>Number</b>	<b>%</b>
Yes	132	51.0
No	127	49.0
<b>Total</b>	<b>259</b>	<b>100.0</b>

The next question sought information about the reasons for not getting selected in a campus interview as perceived by the concerned women engineers. The answer to this question was sought in form of a free expression where 3 spaces were provided and the respondent could specify from 1 to 3 reasons. The response to this question is summarised in Table-5.15.

**Table-5.15 Reasons for Not Getting Selected in the Campus Interview [Q21]**

	<b>Count</b>	<b>Rating</b>
a) Lack of communication skill	14	4
b) Lack of preparation	22	3
c) Preference given to men	<b>33</b>	<b>1</b>
d) Not suitable for job	4	9
e) Poor marks/Poor fundamentals	23	2
f) Lack of computer knowledge an impediment	4	9
g) No fluency in English	4	9
h) Not many companies came for campus interview	9	6
i) Lack of confidence	8	7
j) Poor performance	11	5
k) Too many competitors	6	8
l) Away from home	6	8
m) Others	7	

The principle reason as perceived by the respondents was that preference was given to men. Almost all the other reasons reflect diffidence, lack of confidence and some kind of deficiency on their own part. Diffidence of some kind and lack of confidence are factors which may lead to poor performance and therefore failure in getting selected in the campus interview.

Having analysed the state of affairs at the campus interview, a similar analysis has been carried out regarding the job interviews. The concerned data has been obtained through replies to Q22 and Q23. Q22 sought information about any difficulties which women engineers might have faced in being called for job interviews. The response was to be in form of a 'Yes' or a 'No' with a further elaboration in the form of comments. Table-5.16 presents this response. Although, 32 members have not responded to the question, the majority of those (353 out of 472) who have responded state that they did not have difficulties in being called for job interviews. 84 who have replied as 'Yes' i.e. indicating that they did have some difficulties have elaborated and the analysis is presented in Table-5.17. 'Preference to men' and 'Lack of experience' are the most frequently mentioned difficulties in this response. 'No experience' stands out as the main reason for not getting a job. But 'Preference to men' predominates in this response as well as in replies to many other questions in the other sections and for the other groups

**Table-5.16 Difficulties in Being Called for Job Interview [Q22]**

	Number	%
Yes	84	19.1
No	<b>353</b>	<b>80.2</b>
NA	3	0.7
Sub-total	440	100.0
No response	32	
<b>Total</b>	<b>472</b>	

**Table-5.17 Difficulties in Being Called for Job Interview [Q22]**

	Count	Rating
a) Low percentage/marks	7	4
b) Preference to men	<b>26</b>	<b>1</b>
c) Residing away from a major city	11	3
d) No experience	21	2
e) No fluency in English/Lack of communication skills	5	6
f) Influence	6	5
g) Others	13	



## Problems Faced in Getting a Job

Table-5.18 and 5.19 present the data and analysis concerning difficulties in getting a job as obtained through replies to Q23. It can be seen that only 85 out of 472 continuously employed women engineers had difficulties in getting a job. This response is similar to the one received in regard to problems in being called for campus interviews and difficulties in being called for job interviews. The analysis of the response of the 85 members who report having had some difficulties in getting a job is given in Table-5.19. 'Preference to men' closely followed by 'No experience' and 'Lack of opportunities' predominate. This is very similar to the response presented in Table-5.15 and 5.17. In all these tables, presence of 'Lack of influence' as a reason or difficulty needs to be noted. It is necessary also to underline the presence of 'Wrong specialisation' as one of the reasons. Although the number of respondents mentioning this reason is small, this reason has been mentioned by many in some other response (Q50).

With the opening of a large number of technical institutions, degrees are being awarded with many new names/specialisation. The employers not being aware of these specialisation and therefore not being ready to employ engineering graduates with these specialisation is a new problem added to the scenario. Industrial Engineering & Management, Instrumentation Technology, Industrial Electronics and Architectural Engineering are examples of the same.

**Table-5.18 Had any Difficulties in Getting Job? [Q23(a)]**

	Number	%
Yes	85	18.9
No	365	81.1
Sub-total	450	100.0
No response	22	
<b>Total</b>	<b>472</b>	

**Table-5.19 Difficulties in Getting Job [Q23(a)]**

	Count	Rating
a) No experience	15	2
b) Low percentage/marks	3	6
c) Preference to men	<b>18</b>	<b>1</b>
d) No help from college (Not reputed)	3	6
e) Away from city	3	6
f) Influence	6	4
g) Too many competitors/Less job opportunities	12	2
h) Wrong specialisation	5	5
i) No job satisfaction/Not the right job	10	3
j) Poor performance during interview	3	6
k) Others	13	

## Rejecting a Job Offer and Reasons

A question was posed as to whether or not the respondents have rejected a job offer and if so, the reason for the rejection. A similar question has been subsequently asked to the unemployed as well as intermittently employed respondents. The responses of all the three groups have been presented here and compared with each other (Table-5.20).

192 out of 472 (41.8%) members of the continuously employed group have rejected a job offer some time or the other. Percentage-wise, the response is very similar to the response of the other two groups, i.e. unemployed since graduation and intermittently employed.

That 'unemployed' as well as 'intermittently employed' respondents have rejected a job offer is a revelation. It is however necessary to point out that the third column contains the response from the intermittently employed members who are either employed or not employed at the time of data collection. It does not include the respondents pursuing further studies. They were not asked this question.

**Table-5.20 Rejection of Job Offer [Q24, Q38 & Q48]**

	A	B	C1
Yes	192 ( 41.8)	87 ( 43.1)	74 ( 45.1)
No	267 ( 58.2)	115 ( 56.9)	90 ( 54.9)
Sub-total	459 (100.0)	202 (100.0)	164 (100.0)
No response	13	13	21
<b>Total</b>	<b>472</b>	<b>215</b>	<b>185</b>

Table-5.21 lists the reasons for rejection of job offers by continuously employed respondents as obtained through replies to Q24 in the form of remarks/comments. It is interesting to note that 'Low salary' has received the highest count closely followed by 'Distance from home' etc. A lot of information on these issues, which in a way are inter connected, have come in through replies to Q50. These problems have been reflected with much greater intensity by the other two groups. The same have been analysed and discussed at appropriate places subsequently.

**Table-5.21 Reasons for Rejection of Job Offer [Q24]**

	<b>Count</b>	<b>Rating</b>
a) Low salary	<b>35</b>	<b>1</b>
b) Distance from home/Stay away from home	34	2
c) Job atmosphere	16	4
d) Not acceptable to family	9	8
e) Present job/job offered is better	28	3
f) Job not of liking	16	4
g) Travelling/Marketing/Site job	13	6
h) Long working hours/Night shift	7	10
i) Requirement of Bond	8	9
j) Teaching not preferred	5	12
k) Inappropriate for career advancement	7	10
l) Not challenging/satisfying	14	5
m) Preference given to men	2	14
n) Personal problem	6	11
o) Job not in area of interest	12	7
p) Wanted to take up higher studies	4	13
q) Others	11	

The other side of the coin is the motivation for taking up a job. Information about the same was obtained in reply to another part of the same question, 'What was the prime factor which made you take up the job?' The response was received in the form of comments as presented in Table-5.22. It is important to note that acceptance of the job is primarily and predominantly for having a job. This inference can be drawn from the statement like 'Something better than nothing', 'Needed the job', 'For experience', 'First job', 'Good company', etc. This response indicates that in more than half the cases, the job acceptance is governed merely by the need for a job. The other factors include 'Good salary', 'Liked the job', 'Financial independence', 'Job not in area of interest', etc.

**Table-5.22 Prime Factor for Taking up a Job [Q24]**

	Count	Rating
a) For experience	33	2
b) First job/Campus interview	30	3
c) Good company	33	2
d) Near home	16	6
e) Good salary	14	7
f) Liked the job	20	5
g) Family problem	8	11
h) Financial independence	24	4
i) Something better than nothing/Needed the job	<b>35</b>	<b>1</b>
j) In the field of specialisation/Job in area of interest	24	4
k) For career advancement	13	8
l) Preferred teaching	11	9
m) Good job environment	10	10
n) Others	13	

The response of the employed group in regards to 'Whether or not their first job after graduation was in the same field as their specialisation' is presented in Table-5.23. Over 71% of the respondents state that their first job has been in their field of specialisation. However, the number of responses negating the same is large enough, 127 out of 472, to call for attention.

**Table-5.23 Was the First Job after Graduation in the Same Field as their Specialisation [Q25]**

	Number	%
Yes	<b>324</b>	<b>71.8</b>
No	127	28.2
Sub-total	444	100.0
No response	21	
<b>Total</b>	<b>472</b>	

### Nature of Work

What is it that the employed women engineers are doing in their current job? The information presented in Table-5.24 has been obtained in reply to Q26 in which

several options have been given along with a provision for any unspecified area. The responses have been sought in form of one or two areas being ticked along with a ranking. The last column of the table contains the weighted score of the poll. It can be seen that generally the rating emerging out of the first choice and that of the weighted score are in agreement with each other.

Teaching tops the list amongst the nature of present job, followed by Design, EDP/Computer and R&D, in that order. Rather small numbers against Finance, Marketing and Production need to be noted. These numbers are smaller than even Maintenance and Troubleshooting and Construction/Erection and Commissioning. Thus Teaching, Design, EDP/Computer and R&D are the main avenues in which the group of the employed women engineers, participating in the study, are working. This distribution is not very different from the one received in the previous study (Table-5.24P).

**Table-5.24 Nature of Present Job [Q26]**

	Rank-I	Rank-II	Weighted	Order
	Number (%)	Number (%)	Score*	
a) Teaching	138 ( 30.7)	6 ( 2.6)	<b>282</b>	<b>1</b>
b) R&D	37 ( 8.2)	25 ( 10.9)	99	4
c) Design	77 ( 17.1)	48 ( 21.0)	202	2
d) Production	8 ( 1.8)	9 ( 3.9)	25	9
e) Maintenance & troubleshooting	24 ( 5.3)	24 ( 10.5)	72	6
f) Construct./Erect./Commissioning	16 ( 3.6)	12 ( 5.2)	44	8
g) EDP/Computer	80 ( 17.8)	33 ( 14.4)	193	3
h) Consultancy	20 ( 4.4)	35 ( 15.3)	75	5
i) Project planning	21 ( 4.7)	24 ( 10.5)	66	7
j) Marketing	4 ( 0.9)	2 ( 0.9)	10	11
k) Finance	2 ( 0.4)	0 ( 0.0)	4	12
l) Management	7 ( 1.6)	8 ( 3.5)	22	10
m) Any Other	16 ( 3.6)	3 ( 1.3)		
Sub-total	450 (100.0)	229 (100.0)		
No response	22	243		
<b>Total</b>	<b>472</b>	<b>472</b>		

\* Weighted score is obtained by giving a weightage of 2 and 1 to Rank I and Rank II respectively.

**Table-5.24P Nature of Present Job – Previous Project**

	Number	%
a) Teaching	515	25.3
b) R&D	296	14.6
c) Design	293	14.4
d) Production	74	3.6
e) Maintenance & troubleshooting	145	7.1
f) Construction/Erection/Commissioning	68	3.3
g) EDP/Computer	167	8.2
h) Consultancy	67	3.3
i) Project planning	88	4.3
j) Marketing	36	1.8
k) Finance	7	0.3
l) Management	69	3.4
m) Any other	209	10.3
<b>Total</b>	<b>2034</b>	<b>100.0</b>

### Category of Job

Table-5.25a and 5.25b gives the distribution on the basis of kind of job held by the women engineers, i.e. full-time or part-time. The data clearly shows that most of them are employed full-time. It will be interesting to compare this data with those employed intermittently (Table-5.25b). Although the majority of that group also is employed full-time, the percentage is lower (84.8%) as against 95.4% amongst the continuously employed women engineers. In the previous study, the percentage of full-time jobholders was found to be over 98%. This analysis establishes the fact that part-time jobs are not a reality in the country as far as the engineering profession is concerned.

**Table-5.25a Category of Jobs of Continuously Employed Women Engineers [Q27]**

	Number	%
Full-time	438	95.4
Part-time	21	4.6
Sub-total	459	100.0
No response	13	
<b>Total</b>	<b>472</b>	

**Table-5.25b Category of Jobs of Intermittently Employed Women Engineers [Q45]**

	Number	%
Full-time	<b>134</b>	<b>84.8</b>
Part-time	24	15.2
Sub-total	158	100.0
No response	27	
<b>Total</b>	<b>185</b>	

### Sector of Work

The data and analysis concerning the type of employer is presented in Table-5.26 for the 472 continuously employed members of QRS. The distribution with respect to the first employer and the current employer are tabulated. Private Industry (Small-scale) followed by the TEIs tops the list accounting for over 62% of the jobs held by the group, currently. The same is true for the previous employer except for the fact that the numbers employed in the TEIs is higher than those employed in Private Industry (Small-scale) in this case. These two avenues account for about 60% of the total jobs. What is important and needs to be underlined is the third position of Private Industry (Large-scale) in either case. Over 21% of the group are employed by the Private Industry (Large-scale).

**Table-5.26 Type of Employer [Q27]**

Type of Employer	First Employer		Current Employer	
	Number	%	Number	%
a) Government or Civil Service	22 ( 4.7)		15 ( 3.4)	
b) Private Industry (Large-scale)	100 ( 21.2)		96 ( 21.6)	
c) Government R&D Organisation	9 ( 1.9)		7 ( 1.6)	
d) Private R&D Organisation	11 ( 2.3)		16 ( 3.6)	
e) Private Industry (Small-scale)	137 ( 29.0)		<b>143 ( 32.2)</b>	
f) Public Sector Unit	40 ( 8.5)		29 ( 6.5)	
g) Educational Institution	<b>145 ( 30.7)</b>		134 ( 30.2)	
h) Others	8 ( 1.7)		4 ( 0.9)	
Sub-total	472 (100.0)		444 (100.0)	
No response	0		28	
<b>Total</b>	<b>472</b>		<b>472</b>	

Comparison of this data with the one obtained in the previous project presented in Table-5.26P shows a radical change in the scenario except for the level of employment in the TEIs. In the previous project, the employment in the private industry both small-scale and large-scale accounted for only 21.8% as against in the present study where it is 53.8%. This difference needs to be highlighted, so also the

radical reduction in the percentages employed in Public Sector Units (from 18.9% to 6.5%). The latter can be explained on the basis of the decreasing importance of PSUs. Significant decrease in the percentages employed in Government or Civil Service also needs to be noted. The shift can be seen from PSUs & Government or Civil Service to Private Industries.

**Table-5.26P Type of Employer – Previous Project**

	<b>Number</b>	<b>%</b>
a) Government or Civil Service	402	22.0
b) Private Industry (Large-scale)	232	12.7
c) Government R&D Organisation	163	8.9
d) Private Industry (Small-scale)	166	9.1
e) Public Sector Unit	344	18.9
f) Educational Institution	<b>490</b>	<b>26.9</b>
g) Others	28	1.5
<b>Total</b>	<b>1825</b>	<b>100.0</b>

### Reason for Changing Job

Table-5.27 is the frequency table of the reasons for leaving a job. This data has been obtained through reply to Q27 in which a list of reasons was provided and in addition, there is a space provided for giving a reason not included in the list. It is important to note that most of the job changes have taken place due to either 'Better professional prospects' or 'Not satisfied with the job'. All other reasons have received a negligible response compared to these two. This brings out the fact that majority of the job changes are propelled by professional reasons.

**Table-5.27 Reason for Leaving the Job [Q27]**

	<b>Count</b>	<b>Rating</b>
a) Better professional prospects	<b>120</b>	<b>1</b>
b) Children's care/education	4	5
c) Transfer not acceptable	7	4
d) Personal/family transfer	7	4
e) Husband/father's transfer	8	3
f) <b>Not satisfied with type of job</b>	60	2
g) Others	106	

Several reasons other than the listed ones have been mentioned by the respondents against 'Others'. A list of the same along with the count is given in Table-5.27a. Predominance of 'Marriage' is noteworthy in this table. 'Temporary jobs/Short-term jobs/Contract' and 'Apprenticeship/Training period getting over' are the next two causes for leaving jobs. These two obviously are professional reasons in which the job is automatically terminated.



Contrary to the general belief, personal reasons other than 'Marriage' occupy a rather insignificant place amongst the reasons for leaving a job. This is true even for 'Pregnancy' as per the details given for 'Others', below.

**Table-5.27a Reason for Leaving the Job under 'Others' [Q27]**

	<b>Count</b>	<b>Rating</b>
a) Marriage	44	1
b) Temporary job/Short-term job/Contract	18	2
c) Apprenticeship/Training period over	16	3
d) Personal/Family problem	7	5
e) For taking up higher studies	9	4
f) Low salary	5	6
g) Unfavourable job atmosphere	1	8
h) Pregnancy	1	8
i) Going abroad	3	7
j) Others	2	

### **Rating of Current Job**

Career opportunity and work satisfaction are the two important facets for rating a job. The data received through replies to earlier questions primarily dealt with career facets of the job such as interviews, selection, reasons for rejection of the job and motivation for accepting a job, type of employer, nature of job, etc. Important findings included that having a job was the main factor governing acceptance of the job and that Teaching, Design, Computer and R&D are the areas in which a majority of the respondents are employed. Over half of them had refused a job some time or the other which means they did wait for an acceptable offer despite the difficulties they faced in getting a job. The next important question that arises is whether or not they are happy in doing what they are doing.

Job satisfaction would depend upon the general and professional environment at the workplace and also on the advancement opportunities the job holds. Q28-Q33 seeks perception of the respondents about the rating they assign to their current job in regards to the general and professional environment and prospects of career advancement.

Q28 is a directed question provided with a list of job attributes, viz. general atmosphere, degree of structure, degree of freedom, place of work, professional challenge, recognition of efforts and overall climate for women, etc. Response to this question was sought in terms of a rating on a graded scale provided against each of the attributes. The meaning of the scale has been duly included within the question for each attribute separately. Table-5.28 contains the response to this question. The numeral against each attribute and under a rating indicates the number of respondents giving the corresponding rating for the attribute. In the parenthesis below the numeral, a percentage based on the total number of respondents to that part of the question is given. The following needs to be noted:

**Table-5.28 Rating of the Current Job [Q28]**

	Range →							
	1	2	3	4	5	Sub- total	NR*	Total
<b>a) General atmosphere (Impersonal to Personal)</b>	70 (16.5)	80 (18.9)	146 (34.5)	77 (18.2)	50 (11.8)	423 (100.0)	49	472
<b>b) Degree of structure (Precisely Defined to Loosely Defined)</b>	147 (35.0)	99 (23.6)	92 (21.9)	47 (11.2)	35 (8.3)	420 (100.0)	52	472
<b>c) Independence allowed (No Independence to Full Independence)</b>	48 (11.2)	68 (15.8)	123 (28.6)	115 (26.7)	76 (17.7)	430 (100.0)	42	472
<b>d) Place of work (Pressurised to Relaxed)</b>	54 (12.5)	61 (14.1)	111 (25.7)	110 (25.5)	96 (22.2)	432 (100.0)	40	472
<b>e) Reward of effort (Efforts Un-rewarded to High Reward)</b>	62 (14.6)	88 (20.7)	130 (30.5)	94 (22.1)	52 (12.2)	426 (100.0)	46	472
<b>f) Professional challenge (No Challenge to Great Challenge)</b>	64 (15.0)	74 (17.4)	103 (24.2)	119 (27.9)	66 (15.5)	426 (100.0)	46	472
<b>g) Your opportunity to advance (None to No Limits)</b>	62 (14.5)	76 (17.8)	99 (23.1)	100 (23.4)	91 (21.3)	428 (100.0)	44	472

	Range →								
	1	2	3	4	5	Sub- total	NR*	Total	
<b>Attributes of the current job</b>									
<b>h) Engineers opportunity to advance (None to No Limits)</b>	64 (15.4)	63 (15.2)	88 (21.2)	103 (24.8)	97 (23.4)	415 (100.0)	57	472	
<b>i) Opportunity for women to advance (None to No Limits)</b>	55 (13.0)	69 (16.3)	97 (22.9)	100 (23.6)	102 (24.1)	423 (100.0)	49	472	
<b>j) Climate for women (Uncomfortable to Very Comfortable)</b>	35 (8.2)	33 (7.7)	65 (15.2)	117 (27.4)	177 (41.5)	427 (100.0)	45	472	
<b>k) How do you fit (Not at all to Very Well)</b>	28 (6.6)	37 (8.7)	77 (18.1)	147 (34.6)	136 (32.0)	425 (100.0)	47	472	
<b>l) My current position is related to my field (Agree to Disagree)</b>	210 (49.1)	66 (15.4)	50 (11.7)	39 (9.1)	63 (14.7)	428 (100.0)	44	472	
<b>m) Position commensurate with my education and training (Commensurate to Not Commensurate)</b>	161 (40.0)	76 (18.9)	83 (20.6)	43 (10.7)	40 (9.9)	403 (100.0)	69	472	

\* NR- No response

1. As regards 'General atmosphere', the largest number have stated that it is neither too impersonal nor too personal. This can be considered as an average rating.
2. The response on structure has 147 out of 423 saying that the structure is precisely defined. Loosely defined structure has received the minimum support. The response can therefore be classified as highly positive meaning thereby that the respondents have appreciated the 'Degree of structure' in their organisations.
3. As regards 'Independence allowed', the response is a rather distributed one, although positive. The largest number rates their current job as 'Average' in regard to independence. The number saying they have 'No independence' in the job is the lowest.
4. The same can be said about 'Place of work' in terms of pressure or otherwise. The overall complexion of the response indicates a relaxed work atmosphere, meaning thereby that the majority of the respondents are comfortable as far as pressure at the place of work is concerned.
5. 'Recognition and reward of efforts' has received an average rating from the respondents, whereas 'Professional challenge' in the job has received a positive rating. The same is the case for 'Opportunity for advancement', in general as well as for women engineers. The climate for women is rated as quite positive and generally the majority of women indicate that they are well accepted and fit well into their current jobs.
6. 49% of them have their 'Current job related to their field of specialisation' and large numbers feel that their current position is commensurate with their education and training.

The overall picture that emerges from this response is very positive indicating that majority like their current job and the associated work atmosphere. This means that women engineers once in the job create their own place and generate acceptance for themselves as engineering professionals. All the diffidence and lack of confidence, which shows up so prominently at the entry level, disappears giving way to confidence and good performance.

### **Characteristic Attributes of the Job and Their importance**

Functional performance in a job definitely depends upon the satisfaction one derives from the work and also the degree of comfort one experiences being in the work place. Certain factors, which constitute the inherent characteristics of the job, govern the degree of satisfaction that can be derived from the assignment. This would, of course depend upon the degree of importance the concerned factor has in one's thinking canvas. 12 such intrinsic factors were listed in Q30 and the respondents were requested to specify the degree to which these are important to them and the extent to which these are characteristic of their current job. The aim behind asking this question was to evaluate the degree of peace, which the respondent would be enjoying doing their current job. The responses are presented in Table-5.29.

**Table-5.29 Rating of the Present Job (Intrinsic Factors) [Q30]  
(1 - Most important to 5 - Least important)**

	Of importance to you						Rating of the present job									
	1	2	3	4	5	Sub-total	NR*	T**	1	2	3	4	5	Sub-total	NR*	T**
a) Engaged in satisfying work	298 (70.1)	67 (15.8)	33 (7.8)	10 (2.4)	17 (4.0)	425 (100.0)	47	472	136 (33.4)	108 (26.5)	99 (24.3)	39 (9.6)	25 (6.1)	407 (100.0)	65	472
b) Utilised skills and abilities	251 (59.9)	95 (22.7)	39 (9.3)	17 (4.1)	17 (4.1)	419 (100.0)	53	472	92 (22.8)	115 (28.5)	112 (27.8)	63 (15.6)	21 (5.2)	403 (100.0)	69	472
c) Freedom to manage own work	231 (54.9)	118 (28.0)	46 (10.9)	9 (2.1)	17 (4.0)	421 (100.0)	51	472	93 (23.1)	107 (26.6)	110 (27.3)	59 (14.6)	34 (8.4)	395 (100.0)	69	472
d) Opportunity to work an idea	215 (51.9)	119 (28.7)	46 (11.1)	21 (5.1)	13 (3.1)	414 (100.0)	58	472	81 (20.3)	100 (25.0)	96 (24.0)	78 (19.5)	45 (11.3)	400 (100.0)	72	472
e) Opportunity to keep abreast	142 (38.4)	115 (31.1)	73 (19.7)	20 (5.4)	20 (5.4)	370 (100.0)	102	472	65 (18.1)	80 (22.2)	122 (33.9)	50 (13.9)	43 (11.9)	360 (100.0)	112	472
f) Be original and creative	247 (59.9)	88 (21.4)	45 (10.9)	12 (2.9)	20 (4.9)	412 (100.0)	60	472	84 (21.1)	115 (28.3)	95 (23.8)	61 (15.3)	44 (11.0)	399 (100.0)	73	472

	Of importance to you								Rating of the present job							
	1	2	3	4	5	Sub-total	NR*	T**	1	2	3	4	5	Sub-total	NR*	T**
<b>g) Variety of technical work</b>	<b>179</b> <b>(43.1)</b>	120 (28.9)	62 (14.9)	32 (7.7)	22 (5.3)	405 (100.0)	57	472	77 (19.2)	81 (20.2)	<b>97</b> <b>(24.2)</b>	84 (20.9)	62 (15.5)	415 (100.0)	71	472
<b>h) Problems with no readymade Solution</b>	<b>125</b> <b>(32.1)</b>	117 (30.0)	80 (20.5)	37 (9.5)	33 (8.5)	390 (100.0)	80	472	78 (20.6)	85 (22.4)	<b>103</b> <b>(29.2)</b>	66 (17.7)	46 (12.1)	379 (100.0)	93	472
<b>i) Opportunity to help others</b>	<b>187</b> <b>(44.9)</b>	121 (29.1)	63 (15.1)	26 (6.3)	19 (4.6)	416 (100.0)	56	472	103 (25.9)	<b>126</b> <b>(31.7)</b>	95 (23.9)	34 (8.6)	39 (9.8)	397 (100.0)	75	472
<b>j) Opportunity to contribute to society</b>	<b>195</b> <b>(47.6)</b>	110 (26.8)	60 (14.6)	21 (5.1)	24 (5.9)	410 (100.0)	62	472	<b>94</b> <b>(23.7)</b>	79 (19.9)	<b>94</b> <b>(23.7)</b>	60 (15.1)	70 (17.6)	397 (100.0)	75	472
<b>k) Freedom to select own project</b>	<b>177</b> <b>(42.7)</b>	103 (24.8)	73 (17.6)	24 (5.8)	38 (9.2)	415 (100.0)	57	472	41 (10.4)	57 (14.4)	82 (20.7)	92 (23.2)	<b>124</b> <b>(31.3)</b>	396 (100.0)	76	472
<b>l) Colleagues who are interested in new development</b>	<b>198</b> <b>(47.9)</b>	102 (24.7)	62 (15.0)	23 (5.6)	28 (6.8)	472 (100.0)	59	472	76 (19.3)	80 (20.3)	<b>107</b> <b>(27.2)</b>	68 (17.3)	63 (16.0)	394 (100.0)	78	472

\* NR - No response

\*\* T - Total

Being 'Engaged in satisfying work' has received the largest support in terms of importance to the respondents. However the rating of the present job with respect to being 'Engaged in satisfying work' has not received a rating of a comparable order although the largest number do think that the present job provides for satisfying work. The positive nature of the response is not as strong as its importance to the respondents.

'Utilisation of skills and abilities' is obviously most important to the largest number of respondents. The potential of the present job offering 'Utilisation of skills and abilities' is rated high by as many respondents. The current job does not seem to offer maximum utilisation of the skills and abilities to significant numbers.

'Freedom to manage their own work' is most important to a large number of women engineers. But the current job provides that extent of freedom to a limited number only.

It is most important to get an 'Opportunity to work on an idea' to 215 out of 414 respondents. The rating of the present job reflects this to a much lesser extent where only 81 perceive availability of such an opportunity and 100 perceive it to be lesser than the full opportunity.

142 women engineers out of 472 find it most important to 'Keep abreast with the latest knowledge'. However the current job seems to provide such an opportunity to a much lesser number.

'Being original and creative' is very important to 247 out of 472 respondents only 84 of them find that the current job provides them with such an opportunity to the fullest extent. Another 115 have rated the job slightly lower than the best, the overall complexion of the response remaining positive.

'Variety of technical work' is most important to 179 out of 472 respondents, only slightly less important to additional 120 women. Only 77 of them rate their current job highest in regards to providing such an opportunity of working with variety of technical matters.

'Jobs involving problems with no readymade solutions' are most important to 125 out of 472 respondents. Only 78 out of them perceive the present job providing such an opportunity. The largest number, 103 out of 472 have polled in favour of 3 which is a mid-range rating.

'An opportunity to help others' is of importance to 187 out of 472 respondents with 121 having slightly less importance for the same. These 2 categories total upto 308. 103 of them have indicated availability of such opportunity in the current job and another 126 have rated the present job as the one with marginally lower opportunity.

Response with respect to 'Opportunity to contribute to society', 'Freedom to select your own project' and 'Colleagues who are interested in new development' are similar with 170 to 200 respondents finding these to be the most important factors. Opportunities available in the present job in each case are obviously not in tune with the importance to the respondents. Worst is the case of 'Freedom to select own project' where the largest number appears under '5' in the rating of the present job.

Whereas 'Intrinsic factors' provide the inspiration and improve the quantity and quality of work, contribution of the external factors, which constitute the job environment, is of no less importance. The extrinsic factors not only make the work atmosphere more congenial but also help in developing a sense of belonging and prevalence of relaxed atmosphere in the work place. Behaviour and attitudes of co-workers, caring organisational policies and job security can play a crucial role in enhancing the output of a worker. A list of 12 such extrinsic factors were made and an assessment in terms of importance to the respondents was sought along with the degree of such factors being inherently present in the current job (Q31).

Response to this question is given in Table-5.30. It is important to note that all the listed extrinsic factors have received the highest poll in terms of degree of importance by the largest number of respondents.

'Co-operative workers' are of importance to over 62% of the respondents. However, the current job does not seem to be as favourably placed with respect to this factor with only 116 rating it at the highest level and additional 123 at the next level.

Over 47% of the respondents state having 'Pleasant workers' around being most important to them and for additional 31.8% the same has been assigned second importance. The response with respect to the rating of their present job is certainly not high with only 24.6% of respondents assigning '1' and 30.2% giving '2' as the rating.

'Availability of personal leave' is most important to 174 out of 407 respondents and important to additional 97 members. However 100 of them rate the present job at the highest level and 111 at the next level in regards to this factor. This response is somewhat not understandable since generally the leave policies and provisions are quite standard in almost all organisations.

'Availability of crèche' is most important to 107 out of 317 respondents. Rating of the present job emerges to be the lowest in this regard. 148 members rating their present job at the lowest in regards to 'Availability of crèche' must be underlined. Probably the organisations where they are working do not have a crèche facility.

'Work pressure not affecting the personal life' is most important to over 48% of the respondents. The rating of the job, though positive, does not match the level of importance of this factor.

'Location of the job' is obviously most important to 198 and important to another 90 respondents. The current job is assigned the highest rating by 133 and the next rating by 76 women engineers. This rating reflects that many of them would like to have more suitable location of the job.

'Knowing the work responsibility' is of highest importance to largest number of members. The rating by the present job, though higher than many other factors, is not as high as the importance assigned to it.



**Table-5.30 Rating of the Present Job (Extrinsic Factors) [Q31]  
(1 - Most important to 5 - Least important)**

	Of importance to you										Rating of the present job					
	1	2	3	4	5	Sub-total	NR*	T**	1	2	3	4	5	Sub-total	NR*	T**
a) Co-operative workers	254 (62.2)	88 (21.6)	35 (8.6)	14 (3.4)	17 (4.2)	408 (100.0)	64	472	116 (29.5)	123 (31.3)	92 (23.4)	28 (7.1)	34 (8.7)	393 (100.0)	79	472
b) Pleasant workers	192 (47.1)	130 (31.9)	58 (14.2)	10 (2.4)	18 (4.4)	408 (100.0)	64	472	97 (24.6)	119 (30.2)	106 (26.9)	48 (12.2)	24 (6.1)	394 (100.0)	78	472
c) Availability of personal leave	174 (42.8)	97 (23.8)	91 (22.4)	27 (6.6)	18 (4.4)	407 (100.0)	65	472	100 (25.4)	111 (28.2)	86 (21.8)	56 (14.2)	41 (10.4)	394 (100.0)	78	472
d) Availability of crèche	107 (33.8)	49 (15.5)	82 (25.9)	29 (9.1)	50 (15.7)	317 (100.0)	155	472	36 (11.8)	31 (10.1)	67 (21.9)	24 (7.8)	148 (48.4)	306 (100.0)	166	472
e) No pressure to conform in personal life	183 (48.3)	82 (21.6)	71 (18.7)	17 (4.5)	26 (6.9)	379 (100.0)	93	472	100 (27.7)	76 (21.0)	97 (26.9)	40 (11.1)	48 (13.3)	361 (100.0)	111	472
f) Desirable location	198 (48.9)	90 (22.2)	67 (16.5)	25 (6.2)	25 (6.2)	405 (100.0)	67	472	133 (34.0)	76 (19.4)	83 (21.2)	54 (13.8)	45 (11.5)	391 (100.0)	81	472

	Of importance to you										Rating of the present job									
	1	2	3	4	5	Sub-total	NR*	T**	1	2	3	4	5	Sub-total	NR*	T**				
<b>g) Knowing the work responsibility</b>	<b>290</b> <b>(71.4)</b>	69 (17.0)	19 (4.7)	11 (2.7)	17 (4.2)	406 (100.0)	66	<b>472</b>	<b>172</b> <b>(44.3)</b>	105 (27.1)	72 (18.6)	24 (6.2)	15 (3.9)	388 (100.0)	84	<b>472</b>				
<b>h) Organisation respects family responsibilities</b>	<b>205</b> <b>(50.6)</b>	113 (27.9)	44 (10.9)	17 (4.2)	26 (6.4)	405 (100.0)	67	<b>472</b>	94 (24.3)	88 (22.7)	<b>109</b> <b>(28.2)</b>	49 (12.7)	47 (12.1)	387 (100.0)	85	<b>472</b>				
<b>i) Job security</b>	<b>272</b> <b>(65.9)</b>	78 (18.9)	28 (6.8)	10 (2.4)	25 (6.1)	413 (100.0)	59	<b>472</b>	<b>132</b> <b>(33.8)</b>	76 (10.4)	79 (20.2)	37 (9.5)	67 (17.1)	391 (100.0)	81	<b>472</b>				
<b>j) Flexible working hours</b>	<b>208</b> <b>(50.7)</b>	83 (20.2)	60 (14.6)	30 (7.3)	29 (7.1)	410 (100.0)	62	<b>472</b>	102 (26.0)	68 (17.4)	70 (17.9)	48 (12.2)	<b>104</b> <b>(26.5)</b>	366 (100.0)	80	<b>472</b>				
<b>k) Freedom from pressure to excel</b>	<b>160</b> <b>(41.3)</b>	104 (26.9)	74 (19.1)	26 (6.7)	23 (5.9)	387 (100.0)	85	<b>472</b>	60 (16.4)	75 (20.5)	<b>127</b> <b>(34.7)</b>	62 (16.9)	42 (11.5)	395 (100.0)	106	<b>472</b>				
<b>l) Opportunity to handle variety of work</b>	<b>228</b> <b>(55.5)</b>	92 (22.4)	51 (12.4)	17 (4.1)	23 (5.6)	411 (100.0)	61	<b>472</b>	77 (19.5)	83 (21.0)	<b>102</b> <b>(25.8)</b>	65 (16.5)	68 (17.2)	389 (100.0)	77	<b>472</b>				

\* NR - No response

\*\* T - Total

The 'Organisations respecting the family responsibility' is of highest importance to over 50% of the respondents with additional about 28% considering this factor to be of next importance. The overall rating of the present job emerges to be rather average with the largest number assigning their job a rating of 3.

'Job security' is most important to over 65% of the respondents and only about 33% rate their job highest as regards 'Job security'. Least rating has been assigned by 67 out of 391 respondents reflecting that they do not enjoy 'Job security'. Lack of job security amongst employed members could not be understood.

'Flexible working hours' is of highest importance to 208 out of 410 members and 102 rate their job best in regards to this factor. The largest number, 104 members, have rated their current jobs lowest meaning thereby non-availability of flexible hours.

'Freedom from pressure to excel' is most important to 160 and important to 104 out of 387 women engineers respondents. The rating of the current job in regards to this factor are rather average with the largest number appearing under '3' which is a mid-range rating.

'Opportunity to handle variety of work' is considered most important by 228 members and is assigned the next level of importance by additional 92 respondents. The response in regards to rating of their present job reflects that majority do not have opportunity of handling variety of jobs.

The response discussed above regarding extrinsic factors leaves much to be desired as far as the work atmosphere, organisational policies and attitudes of the colleagues are concerned. The situation with respect to intrinsic factors is definitely better.

## **Career Advancement Potential and Influencing Factors**

Importance of the career advancement factor to the worker has to match with the characteristics of the job to get the best benefit, both to the organisation so also to the employee. The current scenario with respect to career advancement factor is evaluated through replies to Q32 where 7 such factors have been listed. Information regarding the importance of each of these factors to the working individual and the extent to which their present job provides for these, has been obtained. Obviously, if whatever is most important for the worker is also the characteristic of the job, one can expect best atmosphere in the workplace and best output in the job. The responses are compiled in Table-5.31. Almost all of the 7 factors listed in the question have received highest poll under most important category meaning thereby that all these factors are most important to the largest number of the respondents. The number of respondents having lesser importance for a factor are less for the lesser degree of importance.

'Supervisor delegating the responsibility' is most important to 148 out of 389 respondents and important to additional 116 respondents. Only 91 respondents have assigned highest rating to their current job with 100 more assigning the next rating. Largest numbers have assigned average rating to their current jobs. The job rating therefore does not match the importance of the factor 'Supervisor delegating the responsibility'.

**Table-5.31 Career Advancement Factors [Q32]  
(1 - Most important to 5 - Least important)**

	Of importance to you						Rating of the present job									
	1	2	3	4	5	Sub -total	NR*	T**	1	2	3	4	5	Sub -total	NR*	T**
a) Supervisor delegates responsibility	148 (38.1)	116 (29.8)	75 (19.3)	27 (6.9)	23 (5.9)	389 (100.0)	83	472	91 (24.1)	100 (26.5)	101 (26.8)	42 (11.1)	43 (11.4)	377 (100.0)	95	472
b) Opportunity to move into management	123 (30.5)	116 (28.8)	85 (21.1)	40 (9.9)	39 (9.7)	402 (100.0)	69	472	46 (12.0)	60 (15.6)	98 (25.5)	76 (19.8)	104 (27.1)	384 (100.0)	88	472
c) Opportunity to exercise leadership	158 (39.1)	130 (32.2)	56 (13.9)	33 (8.2)	27 (6.7)	404 (100.0)	68	472	61 (15.7)	95 (24.4)	104 (26.7)	69 (17.7)	60 (15.4)	389 (100.0)	83	472
d) Preparation for top level careers	231 (56.9)	96 (23.7)	43 (10.6)	16 (3.9)	20 (4.9)	406 (100.0)	66	472	66 (16.9)	81 (20.8)	103 (26.4)	70 (17.9)	70 (17.9)	390 (100.0)	82	472
e) Assignment in different areas	154 (38.8)	120 (30.2)	70 (17.6)	24 (6.1)	29 (7.3)	397 (100.0)	75	472	53 (13.9)	81 (21.2)	103 (27.0)	59 (15.4)	86 (22.5)	382 (100.0)	90	472
f) Opportunity to travel	111 (27.2)	76 (18.6)	78 (19.1)	61 (14.9)	82 (20.1)	408 (100.0)	64	472	58 (15.0)	55 (14.3)	66 (17.1)	61 (15.8)	146 (37.8)	386 (100.0)	86	472
g) Enhance social status	190 (46.8)	97 (23.9)	58 (14.3)	28 (6.9)	33 (8.1)	406 (100.0)	66	472	96 (24.7)	87 (22.4)	96 (24.7)	56 (14.4)	53 (13.7)	388 (100.0)	84	472

\* NR - No response

\*\* T - Total

As regards 'Opportunity to move into management', the overall job rating is rather disappointing with the largest number of the respondents ticking number '5' on the rating chart.

'Opportunity to exercise leadership' as well as 'Preparation for top level careers' and 'Assignment in different areas' have received nearly identical ratings with almost 26% respondents assessing their job as average. The numbers under highest rating and those under lowest rating are comparable.

'Opportunity to travel' has received still lower rating with 146 out of 386 rating their jobs the lowest.

Despite the ratings as above in regards to other factors, the job held by the respondents seem to be satisfying them to some extent as far as 'Enhancement of their social status' is concerned. Over 47% of the respondents rate their jobs above average.

Career advancement-wise therefore, the jobs held by the employed respondents are considered promising. Although responsibilities are delegated by the supervisors and probably there is no difficulty in ensuring the output, the job does not seem to contain the promise of career advancement to women engineers. At least that is what they perceive.

Every organisation has certain policies and criteria for promotion of their employers. Some criteria are well defined and measurable whereas some other are notional and to a great extent subjective. A list of 10 important perceivable criteria was provided in Q29 and the respondents were requested to choose any three of these given criteria in a ranked manner. If they considered some other criteria beyond the given list as an important one, they were expected to mention the same under 'Others'. Information received through replies to this question is presented in Table-5.32. Count of the respondents assigning the three ranks and a weighted score is given against each of the criteria. The weighted score has been computed as mentioned in the footnote under the table. A rating has been provided to the listed criteria based upon the rated score and given in the last column.

It can be seen that functional performance, qualifications and tenure emerge as the most frequently mentioned criteria for promotion. Management experience, amenability with the corporate culture follows. Age, personality, appearance and gender do not occupy a place of importance amongst the criteria for promotion as per this response.

**Table-5.32 Top Three Criteria for Promotion in the Company [Q29]**

	Rank-I No. (%)	Rank-II No. (%)	Rank-III No. (%)	Weighted Score*	Rating
a) Tenure	59 (13.7)	50 (12.0)	43 (11.0)	319	3
b) Functional Performance	184 (42.7)	120 (28.9)	50 (12.8)	<b>828</b>	<b>1</b>
c) Management Experience	30 ( 7.0)	78 (18.8)	48 (12.2)	292	4
d) Gender	4 ( 0.9)	3 ( 0.7)	9 ( 2.3)	26	9
e) Education	98 (22.7)	83 (20.0)	61 (15.6)	512	2
f) Fitting into Corporate Culture	11 ( 2.6)	27 ( 6.5)	56 (14.3)	142	5
g) Appearance	3 ( 0.7)	3 ( 0.7)	7 ( 1.8)	22	10
h) Personality	6 ( 1.4)	18 ( 4.3)	30 ( 7.7)	82	7
i) Age	10 ( 2.3)	6 ( 1.4)	21 ( 5.4)	61	8
j) Personal Connection/Networking	15 ( 3.5)	20 ( 4.8)	48 (12.2)	129	6
k) Others	11 ( 2.6)	8 ( 1.9)	19 ( 4.9)		
Sub-total	431 (100.0)	416 (100.0)	392 (100.0)		
No response	41	56	80		
<b>Total</b>	<b>472</b>	<b>472</b>	<b>472</b>		

\*Weighted score is obtained by giving a weightage of 3, 2 and 1 to Rank I, Rank II and Rank III respectively.

Q33 aims at analysing the perceptions of the respondents regarding chances for promotion and moving into administrative/management positions. The question consists of 3 parts. In Q33a, the perceptions of respondents were sought, concerning the comparative possibility of an equally qualified woman being promoted. The respondents were requested to circle a number on a graded scale of 1-5, '1' meaning 'Most likely' and '5' meaning 'Least likely'. The same question seeking a direct answer in terms of 'Yes' or 'No' is contained in Q33b and Q33c in different words. Table-5.33 contains the response to Q33a. 'Most likely' is the most frequent response. The number however constitutes only 39.6% of the total respondents. Significant numbers under other levels of likelihood need to be noted. 14 out of 472 consider the promotion least likely. The overall tone of the data is positive reflecting optimism.

**Table-5.33 Likelihood of Promotion of a Woman Engineer with Same Education, Experience and Job Performance [Q33(a)]**

Likelihood of Promotion	Number	%
1 (Most likely)	<b>166</b>	<b>39.6</b>
2	112	26.7
3	95	22.7
4	32	7.6
5 (Least likely)	14	3.3
Sub-total	419	100.0
No response	53	
<b>Total</b>	<b>472</b>	

Table-5.34 gives the response to Q33b. This data also presents a hopeful picture wherein over 71% feel that there are equal chances of securing a senior management position in the organisation. The same is the case with the data presented in Table-5.35 where also over 71% project the hope of securing an administrative position in the organisation.

**Table-5.34 Chances of Securing a Senior Management Position in the Organisation [Q33(b)]**

	Number	%
Yes	296	71.3
No	119	28.7
Sub-total	415	100.0
No response	57	
<b>Total</b>	<b>472</b>	

**Table-5.35 Chances of Securing an Administrative Position in the Organisation/Institution [Q46(c)]**

	Number	%
Yes	298	71.8
No	117	28.2
Sub-total	415	100.0
No response	57	
<b>Total</b>	<b>472</b>	

The responses to all the three parts of Q33 substantiate each other, together reflecting an optimistic picture as regards chances of promotions and career advancement of women engineers. However, the actual scenario is different, with a rather small number of women being seen in senior management and administrative positions.

## **PART-B WOMEN ENGINEERS UNEMPLOYED SINCE GRADUATION**

This section of the report pertains to the QRS members who have been unemployed since graduation. This is named as group B (Table-5.3a). 215 out of 1020 QRS members belong to this group. The data of the group is obtained through replies to Q34-39 constituting Part-IIIb of the Questionnaire. Through these questions an attempt is made to examine the efforts made by the women engineers towards seeking a job and the response received to their job applications. The basic focus of

this section is to try to identify and analyse the factors responsible for unemployment of the group.

## Whether Seeking Employment?

An inquiry was made through the question ‘Have you being seeking employment?’ to find whether the unemployment is by choice or due to not getting a job despite efforts. The reply to this question is received in the form of ‘Yes’ or ‘No’ as presented in Table-5.36. 186 constituting 88.2% of the group report being unemployed despite seeking employment and 25 have responded with a ‘No’. This means these 25 women engineers were not looking for a job. This finding was rather surprising.

**Table-5.36 Whether Seeking Employment? [Q34]**

	Number	%
Yes	186	88.1
No	25	11.9
Sub-total	211	100.0
No response	4	
<b>Total</b>	<b>215</b>	

The reasons for not seeking a job have not been furnished by the respondents since the same was not asked. However, the remarks and comments provided by them in their replies to several other questions do provide this information. Apparently, parents do not want them to seek a job since it may conflict with their efforts of getting the girls married. They would rather have the girls married and then take up a job. In such cases securing an engineering graduate degree is accepted to serve only as a passport for getting a good match. The quotes given below illustrate the point.

391/MAH/EN/98      *“Here I want to say something that happened to me. When I passed B.E. there was an opportunity of a good job at Pune. But my father did not allow me to join that because he was in hurry about my marriage. From his point of view, if I get married and go elsewhere, what is the use of a job? Till now I am not married. But he still does not allow me to go far from village for job. This could happen to most of girls who are engineers. My father says that you have to settle where your husband is so why to try for a job? This point is still teasing me.”*

589/KER/AR/97      *“I wanted a job, because earlier my understanding was that if I can support myself I have freedom of expression. Moreover I wanted to do something which will give me satisfaction. But, to my surprise I realised that parents educate their daughters so that they may get good matches, better status in the society and for middle class people, financial benefits also (if the girl gets a*



*job). Yes, the society doesn't accept that profession makes the life of a woman secure. Profession is only a secondary factor in the life of a woman. This attitude of the society should change. The woman herself is the one who discourages another woman. A little encouragement makes the difference between giving up and going on. As an architect, neither my parents nor my boss (Who was my professor in my college) says that my profession as an architect is good for females. Its such a sad situation that people look at our career as just the means for making money, increasing your status, position etc. Its lot more than all these."*

A further question to those reported seeking employment sought information about the number of months they were actively looking for employment. It was found that 45 out of 186 members were looking for a job for more than a year and 147 were seeking a job for more than 6 months. This does not paint an encouraging picture.

### **Called for a Campus Interview?**

Campus interviews constitute one of the important routes for securing an employment, while still in college. A direct question asking, 'Have you ever been called for a campus interview?' brought the information presented in Table-5.37. Only 51 out of 207 respondents of the question had been called for a campus interview, while the remaining 156 have never been called for a campus interview.

**Table-5.37 Whether Called for a Campus Interview? [Q35]**

	Number	%
Yes	51	24.6
No	156	75.4
Sub-total	207	100.0
No response	8	
<b>Total</b>	<b>215</b>	

The reasons for not receiving a call for campus interview were obtained in reply to the subsequent part of the question. The same is listed in Table-5.38. The largest number, 51 out of 156 respondents did not get an interview call simply because there were no campus interviews held at their colleges. There were no campus interviews in the field of Architecture. This fact has been brought out quite strongly in response to some other questions including Q50. The employing organisations do not seem to be holding interviews at distant new colleges. The students of such colleges therefore are at a disadvantage.

Amongst the other reasons, most are circumstantial. 29 out of 156 women have candidly stated their own poor academic performance being the reason for not being

called for campus interview. Only 7 respondents have given the reason 'Preference to men'.

**Table-5.38 Reasons for Not Being Invited for Campus Interview [Q35]**

	Count	Rating
a) No campus interview	51	1
b) No campus interview for our branch	9	3
c) Poor marks	29	2
d) Preference to men	7	4
e) Not interested in a job at that time	5	5
f) Not many companies came for campus interview	7	4
g) Lack of awareness/guidance	2	7
h) No fluency in English	3	6
i) Lack of experience	2	7
j) Others	17	

Further examination of this facet was carried out by analysing the approximate rank of these 156 respondents. It can be seen that 93% of them are from the upper 50% of the class (Table-5.39). The question therefore arises as to what the 29 respondents in Table-5.38 mean by poor marks.

**Table-5.39 Approximate Rank in the Engineering College while Passing Out for the Girls who have not been called for a Campus Interview [Q35]**

Rank in College	Number	%
In the upper 10%	28	20.9
In the upper 10% - 25%	45	33.6
In the upper 25% - 50%	<b>53</b>	<b>39.5</b>
In the lower 50%	8	6.0
Sub-total	134	100.0
No response	22	
<b>Total</b>	<b>156</b>	

### Applied for a Job?

Applying for a job is another important route for seeking a job. A question was therefore asked whether or not they have applied for a job, if 'No' why not and if 'Yes', how many places and what has been the response. The data given in Table-5.40 shows that a majority of them have applied for a job. Only 24 out of 215 have

not applied for a job. This may mean that they were not serious in seeking a job. It has been verified that all the members of the group 'Not seeking job' are not the same as those 'Not applied for job', as expected.

**Table-5.40 Whether Applied for a Job [Q36]**

	Number	%
Yes	183	88.4
No	24	11.6
Sub-total	<b>207</b>	100.0
No response	8	
<b>Total</b>	<b>215</b>	

Table-5.41 contains the list of reasons for not applying for a job, as given by these 24 respondents. Family problems, marriage, preparation for exams, etc. are given as the reasons for not applying.

**Table-5.41 Reasons for Not Applying for a Job [Q36]**

	Number	%
a) Family problem	<b>8</b>	<b>42.1</b>
b) Marriage	2	10.5
c) Preparing for exams/Doing some course	3	15.8
d) Others	6	31.6
Sub-total	19	100.0
No response	5	
<b>Total</b>	<b>24</b>	

## Response to Job Applications

Q36(i) seeks information about the number of applications made by the respondents before receiving a reply. From the response, it appears that the respondents have furnished the sought data without taking cognisance of the last part of the question, 'Before you received the response'. 166 members have responded to the question. The response shows that the number of job applications made varies from one to hundreds. 83 out of 166 made upto 10 applications and the remaining more than 10. Despite so many applications, not getting any job tells some story.

Data regarding response to the job applications is presented sector-wise in Table-5.42. The following may be noted;

- Out of 106 women engineers who applied to Private Sector Industry (Large-scale), 44 received a positive response whereas 19 applications were rejected. The remaining applicants did not receive any response.

- Positive response from Private Sector Industry (Small-scale) is higher and so is the rejection. The 'No response' category has decreased in this case.
- Public Sector Units responded positively to 43 out of 83 applicants and 28 applications remains unresponded.
- Percentage-wise, the response of the R&D organisations is lesser compared to industries, particularly in case of private organisations. Larger numbers have opted for not responding to the application.
- Largest positive response of TEIs stands out. Nevertheless about 20% responding with rejection and about 24% not responding also needs to be noted.
- Response of Defence Services is comparable to that of Private Sector Industry (Large-scale) in all respects although number of women engineers applying for Defence Services is less than half of those applying for private sector large-scale industries.

**Table-5.42 Responses of Organisations to Application for a Job [Q37]**

	Responded (Positively)	Responded (with Rejection)	Not Responded	Sub- total	Not Specified	Total
i) Private Sector (Large-scale)	44 (41.5)	19 (17.9)	43 (40.6)	106 (100.0)	109	<b>215</b>
ii) Private Sector (Small-Scale)	54 (50.9)	<b>23</b> <b>(21.7)</b>	29 (27.4)	106 (100.0)	109	<b>215</b>
iii) Public Sector Units	43 (51.8)	12 (14.5)	28 (33.7)	83 (100.0)	132	<b>215</b>
iv) R&D Organisation (Govt.)	25 (37.3)	10 (14.9)	32 (47.8)	67 (100.0)	148	<b>215</b>
v) R&D Organisation (Pvt.)	9 (20.9)	6 (14.0)	<b>28</b> <b>(65.1)</b>	43 (100.0)	172	<b>215</b>
vi) Tech. Edu. Instn. (TEI)	<b>57</b> <b>(56.4)</b>	20 (19.8)	24 (23.8)	101 (100.0)	114	<b>215</b>
vii) Defence Services	20 (42.5)	8 (17.1)	19 (40.4)	47 (100.0)	168	<b>215</b>

Response with rejection as well as no response could have many reasons including qualifications and experience not matching the job requirement. The applicant being a woman could also be one of the reasons. It is not appropriate to draw any further inference from the data presented in Table-5.42

## Rejecting a Job Offer and Reasons

Reasons for rejecting a job offer have been analysed through the responses to the question, 'Have you ever rejected a job offer?' (Q38). This data has been presented earlier in Table-5.20 and compared with the responses to the same question by the other groups. It can be seen that 87 out of 215 unemployed incumbents have rejected a job offer at some time or the other due to some reason. It is equally important to note that 115 out of 215 have not rejected a job offer, which means they never got a job offer.

Since the group never had a job, it is important to examine the reasons for this rejection. The concerned data is given in Table-5.43.

Amongst the reasons for rejecting a job offer, 'Salary too low' predominates followed by 'Not allowed by parents/husband' and 'Lack of hostel facilities/accommodation'. 'Could not leave the present residence' and 'Not economical to have separate establishment' also figure significantly as the reasons for rejecting a job offer. It is necessary to note that three of these responses are of a locational nature ('Lack of hostel facilities', 'Could not leave the present residence' and 'Not economical to have separate establishment').

**Table-5.43 Reasons for Rejecting a Job Offer [Q38]**

	Count	Rating
c) Poor marks	29	2
a) Lack of hostel facilities/accommodation	25	3
b) Could not leave present residence	14	4
c) Lack of suitable educational facilities for children	0	8
d) Health reasons	9	6
e) Children too young	1	7
f) Not economical to have separate establishment	12	5
g) Not allowed by parents/husband	27	2
h) Salary too low	<b>32</b>	<b>1</b>
i) Any other	18	

**Table-5.43a Reasons Specified under 'Any Other' [Q38]**

	Count	Rating
a) Distance from home/Stay away from home	1	4
b) Marriage	2	3
c) Not interested in teaching	4	2
d) Bond	2	3
e) Not satisfied/interested with type of job	<b>5</b>	<b>1</b>
f) Timing not suitable	2	3
g) Others	2	

A convenient location of the job, amenable to the family and in tune with the societal requirements emerges as an important facet in this context. Many a times, parents do not permit their girls to live all by themselves in a distant place and therefore the girls are compelled to reject a job offer.

Employment in Private industry (Small-scale), temporary jobs, ad-hoc jobs could be the factors behind the reason 'Salary too low'. Also in certain states and certain branches, the salaries are very low probably due to there being more engineers than needed or because there is a reluctance to employ women engineers. Lower payments to women engineers are mentioned by the respondents quite frequently. The salaries are so low that it neither justifies staying away from home nor does it support the cost of a separate establishment. Hence, women have to reject the job offer. The quotes below illustrate these aspects.

440/KER/CV/95      *"A B. Tech. (Civil) graduate in Kerala draws Rs. 800-1800 per month in private companies whereas a mason gets Rs. 200-250 per day and helper man gets 150-200 and for a woman it is Rs. 150-175 so you can imagine the situation of engineers here. Especially in the Civil Engineering field."*

63/DEL/CV/98      *"Being a civil engineer I feel it is very difficult to find a job. Most of my friends (girls) are working for wages as low as Rs. 1000/-per month. Boys seem to be better paid. Campus interviews are also very few for civil engineers, at least in Kerala."*

334/MAH/CV/97      *"I am a civil engineer, an engineering profession that a woman should not choose. But now I have become a graduate and hence there is no alternative. I am working from 9 a.m. to 1 p.m. and then 3 p.m. to 6.30 p.m. There is always overtime and what we get in return is just Rs. 1600/- per month, 2 years after graduation. I accepted the job because I thought I could get lot of experience but even after gaining experience there is no positive response or appreciation from seniors."*

It is necessary to underline that personal health and young children rate rather low amongst the reasons for rejecting a job offer. The nature of this response including the reasons for rejecting the job offer is not very different from the employed group (Table-5.20 and 5.21).

This response is very similar with the one received in the previous project despite the fact that the current group is much younger compared to the previous one in which the age span was rather wide.

## **Perceptions About Reasons for Not Being Employed**

Perceptions about the reasons for not being employed were sought from the women engineers constituting the group which never had any job. The same has been received in the form of comments in the space for free expression provided in Q39. An analysis of the responses is presented in Table-5.44. The respondents have given 19 perceived reasons for their non-employment.

**Table-5.44 Reasons for Not Being Employed [Q39]**

	Count	Rating
a) Lack of employment opportunity/Too much competition	39	1
b) Lack of job opportunity in place of stay/state	15	8
c) Rural/Non-metro area, Interview and test venues distant from place of stay	19	6
d) Family/Societal restrictions to do a job/Lack of encouragement and support from family	20	5
e) Low marks/Low performance	10	10
f) Expenses involved in getting a job	6	12
g) Lack of accommodation	5	13
h) Choice of location/Locational preference	4	14
i) Lack of communication skill/Lack of confidence	30	4
j) Lack of effort	37	2
k) Lack of information about recruitment and inexperience about the recruitment process/Lack of guidance	15	8
l) Lack of job experience	33	3
m) Lack of job opportunity for women/Women not preferred	16	7
n) No influence/Contacts	11	9
o) Marriage, children and family and personal problems	19	6
p) Wanting particular type of job	5	13
q) Lack of opportunity in the specialisation/Lesser known new specialisation	8	11
r) Low salary	4	14

'Lack of employment opportunity/Too much competition' has been stated to be the most significant reason. 'Lack of job opportunity at place of stay/state' and 'Lack of opportunity in the specialisation/Lesser known new specialisation' are similar reasons which have also been cited. Probably too many engineers and too few jobs is the reason. The quotes given below express the same.

Lack of employment opportunity/Too much competition

42/KAR/CS/98      *"First I think heavy competition, for 5 post more than thousand of people attend and some exams are eyewash. Some companies first keep aptitude, then technical tests etc. by the time you finish all rounds, you will be out."*

56/TN/EN/98      *"Nowadays, engineering colleges are mushrooming everywhere. Though the quantity is increasing, the quality gets worse. This affects the students very badly. As the output (number of*

students) keeps on increasing, getting a job becomes very tough. And we people especially rural women do not get proper guidance and encouragement to attain our goals.”

#### Lack of job opportunity at place of stay/state

125/KER/EN/98      *“In Kerala unemployment is a big problem even for post-graduate engineers and it is very hard to find a suitable career of our own choice. But Bangalore being an electronics city, things are not like this. Everyone says that it will be very easy to get a job if you go to Bangalore. But I can’t go to Bangalore, stay there and try because my parents are against sending me to Bangalore alone. I think this is a major problem faced by the women engineers.”*

166/KAR/EL/98      *“My native place is Sudi i.e. a village. To get a job I should go to city like Bangalore, Bombay. There are no opportunities of getting job near to my native place. If I go to city there is accommodation problem.”*

#### Lack of opportunity in the specialisation

88/KER/CV/97      *“I have completed my graduation in 1997 and I have done one year apprenticeship training. So I am just a beginner in the Civil Engineering profession. One major difficulty that I face while sending applications for job is the demand for experience. No construction firm is ready to take fresh hands. For need for experience we are also forced to take low paid jobs. ”*

99/TN/EN/97      *“I wanted to be a doctor, because I want to dedicate myself to poor But I lost it by 3 marks. Unwillingly I joined in the engineering college but I worked hard (very hard). I liked this field very much. I loved engineering very much. I worked hard. I never thought of myself as being unemployed. I completed my degree in 1<sup>st</sup> class in 1997. Two years has gone but still I am unemployed. Now I am very worried about me. No job bothers me. If I were a doctor, I can get the happiness from the smile of patients, relief from their diseases. But now where shall I go?”*

341/MAH/EN/95      *“I have completed B.E. (Electronics) in July 1996. From that onwards I tried for a job opportunity. But I did not get a job, which settle my life or which help me to make progress towards my career. I joined a plastics company but I had to leave the job because of not job satisfaction. Then completed one year Apprenticeship in M.S.E.B. from 1997-98. Now I have completed a one year computer course. With the additional computer certificate I hope I will get a job in well organised institute. Let us see what will happen.”*

848/GUJ/CV/96      *“The output of Civil branch is the more; the job opportunities are less. The big projects are idle, i.e. Narmada project and so there*



*is less scope for Civil Engineering students. In the small cities we don't have too many multi-storey at present, so the contractors though they are only diploma's, they carry out the bulky structure designs for small buildings. The structural designers of M.E. level are sitting idle. From this you can judge the job situation."*

#### Lesser known new specialisations

279/KER/AR/97 *"I was qualified in B.Tech. degree in Architectural Engineering from REC, Calicut in 1997. Ever since I have been trying for a job, but unfortunately until today I was not fortunate enough to secure a good job in engineering profession. I had applied for the post of Junior Engineer in the Telecom Department, Kerala circle. The required qualification was a degree in Civil Engineering. In as much as for the B.Tech. degree in Architectural Engineering, 50% of the subjects were relating to Civil branch unlike B.Arch. I applied for the post, but the authorities had turned down my application on the grounds 'No Required Qualification'. In another case I had applied for the post of Architectural Head Draughtsman in the P.W.D., Govt. of Kerala. I applied for this post also but that too was rejected for the reason 'B.Tech. in Architectural Engineering' is not equivalent to B.Arch. Besides I had sent several applications to reputed private sector firms, but there was no response from anybody. I now feel that while branches like Computer Science, Electrical, Electronics, Mechanical etc. have wide range of scope; Architectural Engineering has absolutely no scope in the professional field. I have secured my degree from the reputed college like the REC, Calicut. But that degree has become of no use to me. It was under these circumstances that when there was a notification by the Department of Posts calling for application for the post of postal assistants I applied and secured a job there. The basis of recruitment was on the marks secured in the pre-degree examination followed by written test. I am now drawing a monthly salary of Rs. 5555/-"*

486/KAR/ME/97 *"Not all employers are aware of engineering branches newly named like 'Industrial Production Engineering' has been named as 'Industrial Engineering and Management'. We students find it difficult to explain about these branches."*

'Lack of job experience' has figured equally strongly in the responses. 'There is no job without experience and no experience without job' has been mentioned frequently. The same is blatantly reflected through the following quotes.

215/AP/ME/98 *"I am facing the following situation in most of the companies while approaching for a job. They expect that the candidate should have some experience in a particular field. How does one get experience when everyone wants an experienced individual?"*

238/KAR/EN/98 *“Nowadays everywhere the companies require work experience. Freshers have to face very tough competition. In public sectors and in some private companies influence and money will play a very important role.”*

270/KAR/EN/97 *“All private sectors require experienced candidates. Without getting a job where is the chance to have experience. This is the biggest problem of the fresh engineering candidates.”*

A large number of women have candidly accepted lack of efforts on their own part and their deficiencies in terms of ‘Lack of communication skills/Confidence’, ‘Poor academic performance’ and ‘Inexperience about the recruitment process’ being responsible for not having secured a job.

#### Lack of communication skills/Confidence

736/TN/EN/97 *“1. Having less percentage of marks (Only 63% aggregate).  
2. Insufficient guidance (Uneducated family background).  
3. No high level support for recommendation for job.  
4. Inferiority complex about my English fluency.”*

#### Poor academic performance

929/KAR/EN/98 *“I am not employed so far because of my low percentage. All Technical institution wanted minimum 80%. I was disappointed in campus interview with HAL, ECIL with percentage problem. My percentage in Diploma is 71% and B.Tech. is 58%. However, above 70% students also are waiting for job. Parents are suffering with my problem.”*

#### Inexperience about the recruitment process

122/TN/EN/97 *“After the completion of my graduation I joined in a computer course. After finishing the computer course, with the help of my brother, I sent some applications to some computer-oriented companies. But the companies did not give any useful information. As an engineering graduate I have no idea that where the companies are located according to my subject and how to approach them. Since my brother is a graduate in Horticulture, he also has no idea about my job opportunities. Now I am preparing for some Banking exams.”*

‘Lack of opportunities for women/women not preferred’ and ‘Lack of career guidance’ have also figured significantly.

#### Lack of opportunities for women/women not preferred

539/TN/EL/98 *“Electrical companies are very limited when compared to other fields. Some companies are away from the cities. So they are not giving preference to women. For working in big industries we have*

*to handle big machinery change and do night shifts etc. In such case also they think that women can't work as efficiently as men do."*

796/MAH/EL/97 *"A major hurdle women face is getting a job at the age of 21 or 22, when they finish their engineering degree. It is not so much because of competence but a general bias against hiring women at that particular age, because of the likelihood of marriage and leaving the company. I have noticed a perceptible reluctance to even call them for interviews especially in the software development set-ups. For women, getting married, moving to different cities, changing jobs, studying further, has to be viewed as a progress and development of an individual. Job opportunities without bias must be available on graduation or else women will be discouraged from taking rigorous professional courses. Worked 6 months each with two companies and after marriage desired to work in IT, so started studying further."*

#### Lack of career guidance

347/MAH/EN/98 *"For the last nine months, I was searching for a good job. I tried and tried but alas! I didn't find any good job. Because of economic crises at home, I accepted the one I found. From April 99, I am working as a Clerk in Aurangabad. It's a temporary job for 5 or 6 months. I think, the women engineers don't get proper guidance. I want to study further as I want a good job. But I don't know what should be done for further studies and for a good job. Madam, please guide me. What should I do if I want a good job and to continue my studies side by side."*

980/AP/EN/98 *"The technical education environment in India is such that, the student at higher secondary school, the stage at which he/she begins to work towards a career goal is almost ignorant of the nature and specification of various streams of engineering and just takes up a branch which is considered as most fetching in the job market, without knowing whether they have interest in that particular job or not."*

The 'Expenses involved in getting a job', also constitute a serious reason constraining the possibility of employment of women engineers. Expenditure requirement could be for travelling to the place of interview, or undergoing a special pre-job training.

438/AP/CS/98 *"Over here in Hyderabad, many companies (private) offers training-cum-induction programme for training we have or they charge us fees of about 30,000 to 2 lakhs, which I could not afford."*

695/KAR/EN/98 *"It is very painful experience for a person to sit idle at home after securing distinction in B.E. I think in our country there are no corrective measures to encourage women in their career. They*

*only graduate them and leave them to their fate. For whoever stays in city, it is very easy for them, but for people like us (Who stay in town) it is very difficult. If we want to attend any interview or tests, we have to invest at least Rs. 1,000/- in total and every time it's not possible."*

An unofficial payment requirement for securing a job has also been mentioned frequently, in this context. Significant numbers of women engineers perceive that they could not get a job because they did not have money for making such payments.

236/TN/EN/97 *"I completed my B.E. in the year 1997. After that I tried for a job. I got a job as a lecturer but wasn't able to continue because of no hostel facility. In present day, Government jobs are not possible due to bribery. To get employment in Electricity Board, the concern is demanding in lakhs. So I decided to continue my further studies. I hope I will get better employment."*

540/TN/EL/98 *"Most of the companies are asking for experience. Opportunity for a fresher is below 1%. If each and every company wants an experienced hand where will a fresher get the experience. If we are in want of a Government job we have to spend at least 3 lakhs for a position. It is not possible for a middle class person like me to pay this amount and get a job."*

Girls from rural background and even those who belong to non-metro areas face additional problems due to the interview and test venues being distant from their place of stay. Their approach to jobs gets severely constrained due to the financial restrictions and also due to family and societal restraints. Parents are not comfortable with letting their girls go alone to distant places for interviews. They have neither money nor time to accompany them.

46/TN/EN/98 *"Firstly I am a lady from village side. So for attending an interview I have to take my parents (parents wish). As my mother and father are employed it is difficult."*

355/TN/CS/98 *"From my experience, the main problem I had encountered is as a female we are not allowed to get to the interview say from Vellore to Chennai. Girls from towns suffer a lot. If I were in a city like Chennai or Pune I would have settled my life. My house is 5 hours bus journey from Chennai and for the interview I have to get my father with me, who is working in a school. This is not possible frequently."*

'Contacts and influences' are perceived to be playing a significant role in securing a job. The girls from rural and non-metro area suffer more due to lack of contacts and influence. 'Lack of accommodation' at the job site has also been mentioned as a reason for not having been able to secure a job. Such lack of accommodation could warrant having a separate and independent establishment which may not be

acceptable to the parents or husband and would definitely prove to be an expensive option. In fact, women in general and married women in particular look for a job and take it up only if it is available in the vicinity of their place of living to ensure that the family does not get disturbed.

### Contact and influence

932/TN/EN/94 *“I prefer to work if I get a job but people are getting lecturer’s job only through recommendations. Recommendation plays a major role. Political influence also helps getting a job. As I do not know anybody I am not able to get a job. Hence now I am in a dilemma what to do?”*

### Lack of accommodation

44/MAH/CS/98 *“Though there are immense good opportunities for women, some problem resists them. My problem is - I cannot leave my city immediately for an interview. If good, girls hostels are present in job areas, employed women will increase in numbers.”*

230/KAR/CS/98 *“I would like to add some points such as accommodation problems, security for working women. When she gets a job located outside her city, then she will face accommodation problem. I feel the organisation should arrange for women’s accommodation at primary level.”*

372/KER/CI/97 *“Being a woman, I cannot go for a job anywhere in the country. There is the question of lodging, travelling etc. Hence a woman graduate engineer encounters the problem of place of posting. Being a girl my father did not allow me to go to far-off places.”*

495/KER/CI/95 *“Place of work is also an important factor in the selection of career for women. Working in the nearby city or town will be helpful in the case of married women so that she could manage home demands also.”*

‘Low salary’ has also been mentioned as one of the reasons for not securing a job.

96/KER/CI/95 *“After my graduation in 1995, I did a short-term course in AutoCAD from a private institution. On course completion, I was offered a job there as Instructor But I could not accept it because; the vacancy was at Ernakulam where I did not have any separate accommodation. The salary was not enough for the job to make it economically viable.”*

‘Marriage, children, family and personal problems’ have also been mentioned as the reasons for not getting a job in notable number of cases. The quotes below reflect that job and career prospects of women engineers get seriously and adversely affected due to these factors.

- 327/MAH/CV/98 *"I completed my degree course in Civil Engineering in the year 1995 with first class and I was willing to make a successful career but it all ended in vain. As immediately I got married and was pregnant. My husband didn't allow me to join services during my pregnancy period. I had hoped that after giving birth to my child I would be able to have some suitable career. I on that belief had applied to some companies. And I got a positive response and was offered a job at very long distance from my residence. During that period my child was very young and it made me uncomfortable to adjust the timings. But right now I am in position to compensate the above said difficulties and I still have confidence to do job after passing four years of graduation. So right now it has become difficult for me to apply for a job, as I am not in touch with technical matters."*
- 892/MAH/ME/94 *"My experience shows that the fault doesn't lie with the organisations that choose/do not choose us. The fault is in our social structure, which does not allow a married woman to have a successful career. Children, in-laws, husband, kitchen, house, relatives are given more priority Till the thinking of Indians does not change, educated women will continue being overburdened at home and work because handling the two is not simple. I am lucky to be working in my husband's organisation but not all are that lucky. Something should be done to make an educated woman's life less hectic if she wants to have a career too."*
- 820/TN/EL/95 *"I completed my engineering degree with good score, then also my father didn't allow me to go out for job. So one year after graduation I joined in my college itself as temporary/part-time lecturer. I worked for 6 months. Then my marriage was fixed. I was settled in Madras. Since I have to do much housework, I planned to go to job after settling in the new life. By that time I was carrying. And now I am a mother of one year-old child. Now I feel he needs my nearness. So when I think he can manage himself (after one or two years). I will try for a job. I am very much interested in going for job but not now. In future, I'll definitely go for a job. I'll not waste my degree."*

In addition to the factors discussed above, it has been found that many women opt for higher studies with the aim of taking up 'Teaching' as their career. Teaching is viewed as an option, which by virtue of its work format provides for certain time flexibility and enables women to cope with their dual responsibilities. The same is clearly seen in the quotes presented below.

- 409/MAH/EN/97 *"My first priority has always been my family, I would like to become a good wife to my husband and a good mother to my children. Therefore I would like a job that is not much demanding on my time, a cool job that does not add much of stress in my life. Teaching does satisfy all the conditions. R&D because I have always wanted to do something new."*

464/GUJ/ME/96

*"I would like a job in teaching at an engineering college or in diploma engineering college because I want to balance work between my family and career I don't want to lose either family or career because private job section would not match with me because of time and distance."*

It can be seen that lack of job opportunity for women engineers is a special facet of the overall lack of opportunity. Locational preferences and family and societal constraints also play a much greater role in the case of women than men. The same is the case regarding expenditure involved in seeking a job. All these reasons can be traced back to issues confronting women in general rather than women in the engineering profession.

## **PART-C WOMEN ENGINEERS PURSUING FURTHER STUDIES, INTERMITTENTLY EMPLOYED SINCE GRADUATION, ETC.**

Data and analysis of the group pursuing higher studies and intermittently employed since graduation is the focus of this section of the report. The information presented and discussed has been obtained through replies to Q40 to Q49.

### **Current Status**

333 out of 1020 QRS members belong to this group. It consists of two sub-categories, namely the respondents pursuing higher studies and the ones who have had intermittent jobs, currently employed or unemployed. Those pursuing higher studies have been further sub-divided in three sub-categories i.e. (a) Pursuing higher studies in continuation after completion of graduation, (b) Pursuing higher studies after doing a job for some time and (c) Pursuing higher studies for want of a job. The distribution of all these sub-categories is presented in Table-5.45.

The largest number (97) are the intermittent jobholders, not employed at the time of data collection. A comparable number of intermittent jobholders were employed (88) and 148 out of 333 reported that they were pursuing further studies. Out of those pursuing higher studies, 52 were doing so in continuation after graduation, 70 had worked on some job and then joined further studies and 26 took up further studies for want of a job.

**Table-5.45 Sub-groups of Respondents of Part-C [Q40]**

	<b>Number</b>	<b>%</b>
a) Pursuing higher studies in continuation after completion of graduation	52	15.6
b) Pursuing higher studies after doing a job for some time	70	21.0
c) Pursuing higher studies for want of a job	26	7.8
d) Had jobs intermittently, presently unemployed	<b>97</b>	<b>29.1</b>
e) Had jobs intermittently, presently employed	88	26.4
<b>Total</b>	<b>333</b>	<b>100.0</b>

## Motivation for Higher Studies

Interesting data concerning the main motivation for taking up further studies is presented in Table-5.46. This data has been obtained in reply to Q41. Q41 is a directed question listing three of the possible motivations and a space for a reason other than the listed ones.

**Table-5.46 Main Motivation for Taking up Further Studies [Q41]**

	Number	%
a) Wanted to study further	80	54.8
b) Did not get a job of choice so decided to go in for further studies	41	28.1
c) Realised that teaching would suit better as a career	16	11.0
d) Any other	9	6.2
Sub-total	146	100.0
Not specified	2	
<b>Total*</b>	<b>148</b>	

\* Only 148 respondents pursuing further studies according to Q40 were required to answer this question

It can be seen that 80 out of 148 have taken up further studies by choice, whereas 41 went for higher studies because they did not get a job of their choice. As many as 16 turned to higher studies having realised that teaching would suit them as a better career and a post-graduate degree is a basic requirement for a teaching career. These 16 can be clubbed with those who have taken up higher studies by choice making that category as large as 96, accounting for over 65% of the respondents of the sub-group pursuing further studies. The nine respondents under 'Any other' have given a variety of reasons including wanting to go for a management career, option for software career and intention of doing research in future. 41 having compulsorily taken up higher studies for want of a job stand out. The quotes given below illustrate these points.

103/GUJ/EL/97 *“After my graduation I did not want to do M.E. or M.B.A. I was searching for a job and I wanted to do something in computers because today computer knowledge is a must. Even in the interview, I was asked so many times if I had any computer knowledge. Right now I am doing M.C.A. to get a better job because there is much more scope in computer field than any other.”*

128/GUJ/ME/96 *“I started MBA from IGNOU from Jan. 99 because I did not get job after graduation but, I still have hope for getting job so I joined MBA from IGNOU and not from any other full-time Institute. I also joined Aptech Computer Education to get a job.”*



- 778/MAH/EN/97 *"I have worked intermittently. But now I am thinking of pursuing higher studies (M.Tech.) for better job prospects. After post graduation I may take up teaching as a career or would like to work in an organisation."*
- 817/MAH/EL/94 *"After graduation I worked as a Quality controller in a private organisation in Pune for one year. After that I tried for a job but didn't get of my choice so I decided to go for further studies and joined D.B.M. of Nagpur University."*
- 837/KER/CV/97 *"After graduation I went for IBM mainframe training still couldn't find proper job. Now I am studying for M.Tech. in Computer Aided Structural Analysis & Design in Cochin University of Science and Technology."*

It is necessary to mention that most of the members taking up higher studies were found to be working towards a post-graduate degree or diploma i.e. M.Tech., M.E., M.Arch., MBA, etc. The respondents in replies to other questions have mentioned taking up computer courses for increasing job prospects. It is necessary to point out that the group pursuing higher studies is not the same as the one going in for such courses.

## **Perceptions About Career Plan**

A corroborative question sought perceptions regarding the best career plan for the respondents as engineering professionals possessing higher qualifications. The response is presented in Table-5.47. 143 out of 148 answered this question. 40 respondents perceive a 'R&D job in industry' as the best career plan with another 21 perceiving 'R&D job in defence and other Government establishments' as their best career plan. The two together account for 42.7% of the group responding to the question. 'Teaching and R&D in institutes of higher learning' and a 'Teaching job in TEIs' have received a comparable response and these two together account for 28% of the group. Thus 'Teaching' and 'R&D' predominates as the best perceived career plan for women possessing higher qualifications. This is as expected. Only 7 out of 143 women have perceived a shop-floor job as their future career. They opt for teaching since it satisfies their urge to deal with new problems and at the same time permits adequate time for looking after the family. The following quote substantiates the same.

- 889/MAH/EN/95 *"Being an electronics engineer, I wish I could do some research and development projects in some company. I feel I am not utilising my technical knowledge fully. I have no other option since I won't be able to give more than 7 to 8 hours daily. I have sorted a balance between my career and household activities by choosing teaching profession. Even though I would have liked an industry job more than the present one, I am doing this job too with great dedication and hard work."*

'Any other' category includes a complete spectrum of possible assignments including Software, Management, Consultancy, Administration and even Financial services, IES and NGO. The relevance of higher studies with many of these areas could not be readily understood.

**Table-5.47 Perception of Best Career Plan for an Engineering Professional Possessing Higher Qualifications [Q42]**

	Number	%
a) Shop-floor job in industry	7	4.9
b) R&D job in industry	<b>40</b>	<b>28.0</b>
c) R&D job in defence or other Govt. R&D establishments	21	14.7
d) Teaching and R&D assignment in institutes of higher learning	22	15.4
e) Teaching job in technical educational institutes	18	12.6
f) Any other	35	24.5
Sub-total	143	100.0
Not specified	5	
<b>Total*</b>	<b>148</b>	

*\*Only 148 respondents pursuing further studies according to Q40 were required to answer this question*

The respondents were further questioned about the reasons behind their perception about the best career plan. Replies to the query have been obtained as remarks/suggestions. The following is an analysis of their responses:

1. An R&D job in industry is perceived as an innovative and challenging job, which could provide an opportunity to use their knowledge and skills. Some of them perceive an industrial R&D job as the one that would provide space for looking after the family as well. Involvement in the frontier areas, possibility of contribution to the development of nation, moving with the time and opportunity to do new things are the other facets which govern this preference.
2. A job in a Defence or other Government R&D establishments is also perceived as being good on grounds of knowledge-based work, opportunity for career growth and making contributions to the development of the country. In addition, defence and government jobs are perceived as being more stable, providing higher job security and better professional prospects.
3. Liking for teaching, an opportunity to be in touch with the latest innovations and being a part of a creative activity are the factors behind the respondents considering teaching as their best career plan. The possibility of managing the family as well as profession and job security are also seen as positive features of teaching jobs in the institutes of higher learning.
4. A teaching job in TEIs is perceived as a lighter job and hence a good career plan by some respondents. Most of the reasons provided point towards possibility of

managing home, work with less strain and at the same time accruing financial gains out of the career. It is also seen as a safe and secure job with built-in flexi-timings, still keeping one in close touch with technical subjects.

## Intermittent Jobs – Reasons for Intermittence

It was presumed that intermittent employment would involve either loosing a job or changing a job. The reasons for intermittence were sought through an objective and directed question provided with nine options covering various facets of the job and personal life. The respondents were requested to tick the appropriate reason(s) for their not being able to retain the job. The response is given in Table-5.48.

**Table-5.48 Reasons for Not Being Able to Retain the Jobs [Q43]**

	Count	Rating
a) Needed a part-time job	11	5
b) Maternity leave	19	3
c) Needs of family	16	4
d) Needs of children	10	6
e) Unable to stand upto pressure of work	6	7
f) Dislike the job atmosphere	22	2
g) Dislike the attitude of male colleagues	4	8
h) No job satisfaction	<b>51</b>	<b>1</b>
i) Wrong specialisation	10	6
j) Others	5	

This question was put to the intermittently employed 185 respondents who have given one or more reasons for their not being able to retain their jobs. Table-5.48 is the frequency table mentioning the particular reason. The number against each one of the reasons is the number of times the reason has been mentioned. 'No job satisfaction' can be seen as the most predominant reason for change of jobs followed by disliking of the job atmosphere. 'Maternity leave', 'Needs of family' and 'Needs of children' have together received 45 votes, which is comparable to 'No job satisfaction'. Thus improper job/job atmosphere and personal and family needs emerge as the main reasons due to which job changes seem to be taking place amongst women engineers. The count against 'Needed a part-time job' can also be added to this number because such needs are also essentially for family reasons. The count of all these family reasons together then becomes 56, which is higher than the largest single count against 'No job satisfaction'.

Thus there are essentially only 2 reasons which give rise to intermittent employment, no job satisfaction and family reasons. Whether the intermittence of job is by choice or by compulsion meaning thereby whether the respondents opt for leaving the job or they lose the job would be a subject matter of interest to examine. The present data however does not provide that information.

Some women have stated that they have had part-time jobs. It would be of interest to know whether they took the part-time job option or it was given to them as a compulsion rather than an option. The response was sought in form of 'Yes', 'No' or 'Not applicable' in reply to a question, 'If you were working part-time, was it because the full time job was not available?' (Q44). The response is presented in the Table-5.49. It can be seen that there are only 34 women who had part-time jobs. Out of the 34 part-time jobholders, 22 did it due to non-availability of the full time job option. Only 12 held a part-time job because they wanted to.

22 out of 34 holding a part-time job due to non-availability of a full time job underlines lack of job opportunities for women engineers. The very small possibility of getting part-time jobs is the other facet reflected by this data. This was also seen in the case of 'Continuously employed since graduation' group (Table-5.25a).

**Table-5.49 Working Part-time Due to Unavailability of Full Time Job [Q44]**

	Number	%
Yes	22	17.6
No	12	9.6
NA	<b>91</b>	<b>72.8</b>
Sub-total	<b>125</b>	100.0
No response	60	
<b>Total*</b>	<b>185</b>	

*\*Only 185 intermittently employed respondents according to Q40 were required to answer this question*

## Career Breaks

Intermittent jobs can mean a career break, if the span between the two jobs is long. Whether or not the respondents had any career break was the information sought through Q45. Information about the reasons for the career break was also obtained through the same question by a directed statement providing eleven options and a space for free expression. Table-5.50 presents the data on break in career. 122 out of 185 respondents belonging to the group who had intermittent jobs had a break. 33 specify a definite 'No' regarding break in career, and another 30 have not responded to the question.

**Table-5.50 Break in Career [Q45]**

	Number	%
Yes	122	78.7
No	33	21.3
Sub-total	155	100.0
No response	30	
<b>Total*</b>	<b>185</b>	

*\*Only 185 intermittently employed respondents according to Q40 were required to answer this question*

## Reasons for Career Breaks

Table-5.51 which presents the reasons for the career break along with the count, shows that 'Marriage' and 'Pregnancy' are the most frequent reasons for the break. This is followed by professional reasons such as 'Unfavourable professional environment', 'Low salary', 'Loss of job'. The total number of counts accrued under these three profession related reasons is 52, which is quite comparable to the count of 55 for marriage and pregnancy. This number and an analysis of the 31 under 'Others', projects an almost equal distribution of the reasons for career break between personal and professional reasons. The 31 grouped under 'Others' essentially give professional reasons - a temporary or unsatisfactory job or further studies.

**Table-5.51 Reasons for Break in Career [Q45]**

	Count	Rating
a) Marriage	32	1
b) Lost the job	16	5
c) Pregnancy	23	2
d) Family/husband's pressure	2	8
e) Poor personal health	1	9
f) Unfavourable professional environment	19	3
g) Desire to spend more time with family	5	7
h) Low salary	17	4
i) Change of residence due to transfer of husband/partner	10	6
j) Inability to cope with family and job	1	9
k) Others	31	

## Problems Associated with Career Breaks

Information about the reasons for wanting to work after a break was received through response to Q46. This question, too, is of an objective type having 10 specific options with an 11<sup>th</sup> providing a space for a reason not included in the 10 given reasons. The respondents were required to check one or more of the options and rank the same if they had chosen to check more than one. The response is presented in Table-5.52.

All those who have had a career break have responded to this question. The response has been assigned rank specific weightage as explained in the footnote of the table. An examination of the column of the weighted score reveals that the most frequent reason for wanting to work after a break arises out of the desire to be independent and have one's own identity. 'Missing professional work', 'Bored with just being a housewife' and 'Needing income for oneself' have earned identical scores and stand second to the reason 'Wanted to be independent and have my own identity'. Thus the primary motivation for returning to work after the break is the urge to be independent, to work and to be in profession or financial incentives and necessities. This is an anticipated picture.

**Table-5.52 Reasons for Wanting to Work After Break [Q46]**

	Rank-I Number (%)	Rank-II Number (%)	Rank-III Number (%)	Weighted Score**	Order
a) Missed professional work	25 ( 21.4)	8 ( 9.0)	7 ( 11.9)	98	2
b) Desire to be away from home	2 ( 1.7)	0 ( 0.0)	1 ( 1.7)	7	7
c) Bored with just being a housewife/being at home	17 ( 14.5)	17 ( 19.1)	12 ( 20.3)	97	3
d) Need income for myself	11 ( 9.4)	28 ( 31.5)	8 ( 13.6)	97	3
e) Wanted to be independent and have my own identity	47 ( 40.2)	18 ( 20.2)	17 ( 28.8)	<b>194</b>	<b>1</b>
f) Received an attractive job offer	2 ( 1.7)	2 ( 2.3)	5 ( 8.5)	15	5
g) Children did not need my attention any more	1 ( 0.9)	1 ( 1.1)	0 ( 0.0)	5	8
h) Change in family circumstances	2 ( 1.7)	3 ( 3.4)	1 ( 1.7)	13	6
i) Got separated/divorced/widowed	1 ( 0.9)	0 ( 0.0)	0 ( 0.0)	3	9
j) Financial need of family	5 ( 4.3)	10 ( 11.2)	7 ( 11.9)	42	4
k) Others	4 ( 3.4)	2 ( 2.3)	1 ( 1.7)		
Sub-total	117 (100.0)	89 (100.0)	59 (100.0)		
Not specified	5	33	63		
<b>Total*</b>	<b>122</b>	<b>122</b>	<b>122</b>		

\* Of the 185 women engineers who were intermittently employed, 122 girls had break in their career according to Q45.

\*\* Weighted score was obtained by giving a weightage of 3,2 and 1 to Rank I, Rank II and Rank III respectively.

Documentation and analysis of difficulties that might have been experienced by the respondents while trying to return to work was considered important. Such an information was obtained in response to an objective question (Q47) giving nine specified options with a 10<sup>th</sup> space for additional reasons not specified in the list. Checking one or more and ranking if more than one, was requested in the response. Obviously the 122 women engineers belonging to the intermittently employed group who had a break in their career have answered this question. Table-5.53 presents the response to the same. The response can be best analysed on the basis of weighted score in which 'Difficulty in finding a job in city or town of residence' tops the list closely followed by 'Suitable job in the field not available'. The ranking on the weighted score with respect to these two reasons is identical between Rank 1 and the weighted score, which needs to be noted. All the other reasons have received a much smaller weighted score.

**Table-5.53 Difficulties Associated with Returning to Work After a Break [Q47]**

	Rank-I Number (%)	Rank-II Number (%)	Rank-III Number (%)	Weighted Score**	Order
a) Suitable job in the field not available	33 ( 35.5)	18 ( 30.0)	2 ( 8.3)	137	2
b) Difficulty in finding a job in city/town of residence	36 ( 38.7)	24 ( 40.0)	3 ( 12.5)	<b>159</b>	<b>1</b>
c) No satisfactory help at home for the care of the children	9 ( 9.7)	1 ( 1.7)	1 ( 4.2)	30	3
d) Satisfactory crèche facility not available	0 ( 0.0)	2 ( 3.3)	0 ( 0.0)	4	7
e) Lack of confidence to get back to work	3 ( 3.2)	1 ( 1.7)	5 ( 20.8)	16	5
f) No retraining available to catch-up with professional advancement	4 ( 4.3)	6 ( 10.0)	6 ( 25.0)	30	3
g) Out of date professional skills	2 ( 2.2)	5 ( 8.3)	2 ( 8.3)	18	4
(h) Age	0 ( 0.0)	1 ( 1.7)	1 ( 4.2)	3	8
(i) Unfavourable family attitude towards resumption of career	2 ( 2.2)	1 ( 1.7)	4 ( 16.7)	12	6
(j) Any other	4 ( 4.3)	1 ( 1.7)	0 ( 0.0)		
Sub-total	93 (100.0)	60 (100.0)	24 (100.0)		
No response	29	62	98		
<b>Total*</b>	<b>122</b>	<b>122</b>	<b>122</b>		

\* Of the 185 women engineers who were intermittently employed, 122 girls had break in their career according to Q45.

\*\* Weighted score was obtained by giving a weightage of 3,2 and 1 to Rank I, Rank II and Rank III respectively.

## Rejecting a Job Offer and Reasons

Analysis of the response in the previous study as well as the responses of the Group B (Unemployed women engineers) show that they have refused a job some time or the other. The predominant reason for refusal being either the 'Location of the job', and 'Nature of work and atmosphere' or 'Salary too low/temporary job'. Response of the QRS on job refusal is given in Table-5.20 group-wise i.e. separately for A, B and C1, C1 being the intermittently employed part of C (Table-5.3). Out of 185 members of this group, 74 have refused a job, 90 have not refused a job and 21 have not responded.

The reasons for refusal are listed in Table-5.54 along with the count. Similar to the previous data 'Salary too low' is the most frequently mentioned reason followed by 'Could not leave the present residence'. The number 27 under 'Others' include reasons mostly related to job type, nature of work or location of job. 'Bond', 'Job in remote area' and 'Night shift' have been particularly mentioned by some girls in this response (Table-5.54a). 'Salary too low' may relate to a part-time/temporary or ad-hoc jobs in small-scale organisations as discussed earlier.

**Table-5.54 Reasons for Refusing a Job [Q48]**

	Count	Rating
a) Lack of hostel facilities/accommodation	3	6
b) Could not leave present residence	10	2
c) Lack of suitable educational facilities for children	1	7
d) Health reasons	4	5
e) Children too young	6	4
f) Not economical to have separate establishment	4	5
g) Not allowed by parents/husband	8	3
h) Salary too low	<b>26</b>	<b>1</b>
i) Others	27	

**Table-5.54a Reasons for Refusing a Job under 'Others' [Q48]**

	Count	Rating
a) Unsuitable job atmosphere	3	1
b) Present job/job offered was better	1	3
c) Job not of liking	2	2
d) Travelling/Marketing/Site job not preferred	3	1
e) Night shift/Unsuitable timing	2	2
f) Bond	1	3
g) Job in remote area	2	2
h) Job not in area of interest	3	1
i) Job not challenging/satisfying	1	3
j) Teaching not preferred	1	3
k) Others	2	



## Reasons for Changing Job

Reasons for leaving the job constituted one of the columns of the table given in Q49. A directed response was sought through six objective options listed below the table. Space for free expression provides for any additional reason not listed therein.

Table-5.55 contains the data on reasons for leaving a job. Predominance of the reasons 'Not satisfied with the type of job' and 'Better professional prospects' stands out.

**Table-5.55 Reasons for Leaving Job [Q49]**

	Count	Rating
a) Better professional prospects	66	2
b) Children's care/education	20	3
c) Transfer not acceptable	2	6
d) Personal/Family transfer	7	5
e) Husband/Father's transfer	11	4
f) Not satisfied with type of job	<b>68</b>	<b>1</b>
g) Others	155	

Table-5.55a provides the details of 'Others' along with their frequency distribution. Amongst 'Others', 'Marriage' is the most dominant reason followed by 'Temporary/short-term/contract jobs', 'Apprenticeship/Training getting over' is also mentioned as a reason for leaving a job. Some women engineers have reported 'Pregnancy' as the reason for leaving the job.

**Table-5.55a Reasons For Leaving Job under 'Others' [Q49]**

	Count	Rating
a) Marriage	<b>36</b>	<b>1</b>
b) Temporary job/Short-term job/Contract	35	2
c) Apprenticeship/Training period over	27	3
d) Personal/Family problem	4	7
e) Higher studies	8	5
f) Low salary	8	5
g) Unfavourable job atmosphere	6	6
h) Pregnancy	13	4
i) Others	18	

The response is almost identical to the one received from the 'Continuously employed after graduation' group (Table-5.27 and 5.27a) and is not very different from the one obtained in the previous study.

## Sector of Work

Data on the 'Type of employer' for the intermittently employed group is presented in Table-5.56 for the first as well as the current employer. Similar to the continuously employed group, here too, TEIs and Private Industry (Small-scale) predominate. The two together accounts for over 68% of the jobs held by the groups. Negligible employment in Private and Government R&D needs to be underlined. Employment in PSUs is also rather low. The employment in Private Industry (Large-scale) is comparable in the first as well as current employer's list. The percentage employed in Government or Civil Service is larger than the one amongst continuously employed group.

**Table-5.56 Type of Employer [Q49]**

Type of Employer	First Employer Number %	Current Employer Number %
a) Government or Civil Service	24 ( 13.0)	27 ( 14.6)
b) Private Industry (Large-scale)	16 ( 8.6)	14 ( 7.6)
c) Government R&D Organisation	2 ( 1.1)	4 ( 2.2)
d) Private R&D Organisation	0 ( 0.0)	0 ( 0.0)
e) Private Industry (Small-scale)	<b>64 ( 34.6)</b>	53 ( 28.6)
f) Public Sector Unit	10 ( 5.4)	6 ( 3.2)
g) Educational Institution	61 ( 33.0)	<b>75 ( 40.5)</b>
h) Others	8 ( 4.3)	6 ( 3.2)
<b>Total</b>	<b>185 (100.0)</b>	<b>185 (100.0)</b>

\* Only 185 intermittently employed respondents according to Q40 were required to answer this question

## Concluding Remarks

Many additional aspects not covered in the Questionnaire surfaced through the replies to Q50. It was found that the parents, family and women engineers themselves are also responsible for the current employment scenario as much as the employers. In addition, new course names, absence of campus interviews in newer colleges, requirement of bonds for jobs and unofficial payment requirement also emerge as factors responsible for the present situation. The responses to Q50 contain many such undocumented issues and problems. Annexure-2 contains some of the important quotes concerning such aspects.

## **SUMMARY**

### **JOB PREFERENCE**

1. Over 70% of the respondents had a job type preference at the time of graduation. A significant number had 'Execution' as their preference, 262 out of 706 preferred an 'Execution' type of job and 184 preferred a 'Desk type' job. 173 out of them changed their preference. The changes took place in all directions. 40% of the changes were from 'Execution' to other job types.

Largest number of changes has taken place due to recognition of better opportunities in software field and due to non-availability of jobs in the field of initial preference. Some changes take place based on the realisation of certain kind of jobs not being suitable for women engineers.

2. Majority of the respondents show no preference for either man or woman being a 'Superior' or 'Subordinate'. Although the numbers having such preferences are not insignificant.

### **JOB AND EMPLOYMENT STATUS**

3. 46.3% of the QRS reported continuously employed and 21.1% continuously unemployed since graduation. The remaining 32.6% had intermittent employment, a part of them were pursuing further studies.

Considering the employed and unemployed parts of the intermittently employed group, the employment scenario at the time of data collection consisted of 54.9% employed women engineers, 30.6% unemployed women engineers and 14.5% members pursuing higher studies.

4. Amongst the 'Continuously employed' members, the largest number as well as fraction belongs to 1998, the last year of the selected duration. Percentage employment based upon the stock of the corresponding year was found to be lowest for the last year.
5. Largest fraction of the graduates possessed a degree in Electronics Engineering, followed by Civil Engineering, Computer Science/Engineering and Electrical Engineering in that order. Highest percentage employment pertained to the branch of Computer Science and the lowest to Civil Engineering.
6. The percentage of continuously employed women engineers is lowest amongst the graduates of Kerala (25.2%), closely followed by Andhra Pradesh (28.4%). The same becomes 42.3% for Kerala and 30.9% for Andhra Pradesh by including the employed members of the intermittently employed group. This means the lowest percentage employment pertained to Andhra Pradesh. The highest percentage employment is found to be in Gujarat (62.3%) followed by Maharashtra (54.1%), Karnataka (51.8%), Delhi (51.3%) and Tamil Nadu (40.5%). The order of the states other than Kerala and Andhra Pradesh, in

regards to the percentage employment, does not change with inclusion of the employed members of the intermittently employed group.

7. 21.1% of the QRS reported unemployed since graduation and 30.6% were found unemployed at the time of data collection. The additional 9.6% belong to the 'Intermittently employed' category.
8. Highest unemployed fraction was found amongst the graduates of 1998. Since the data was collected during 1999-2000, it was surmised that they were already without a job for more than a year. Percentage unemployment was found to be highest in the branches of Electrical Engineering and Electronics Engineering (29.2% and 26.8% respectively). The percentages further increase to 37.3% amongst Electronics engineers and 36.4% amongst Electrical engineers with inclusion of the unemployed part of the 'Intermittently employed' group. Civil Engineering has the largest percentage pursuing higher studies and also the intermittently employed and unemployed groups.
9. Andhra Pradesh tops the list with over 43% of the graduates remaining unemployed since graduation and 45.7% overall unemployment. These figures are much higher than the corresponding figures of the state of Kerala. In the previous study about ten years back Kerala topped the list.
10. Amongst the Electronics engineers from Kerala, the unemployment comes out to be 70.6% and those from Andhra Pradesh, 64.7%. These are unbelievably high figures and reflect an overall serious situation in the field of Electronics.
11. The unemployment scenario has changed since the time of the previous study where Kerala and Civil Engineering combination had the highest unemployment at 50%.
12. Percentage of women taking up further studies increases in the later years. Amongst engineering branches, the highest percentage pertains to Civil Engineering. Pursuance of higher studies is most frequent amongst the Delhi graduates closely followed by Andhra Pradesh. This factor seems to be related to the job opportunities. Lesser the job opportunity, greater is the number and fraction which takes up higher studies.

## **CAREER PROFILE AND PROBLEMS**

### **a. Women Engineers Employed Continuously after Graduation**

13. Response to advertisements is found to be the most effective process of securing a job. 244 out of 472 members of the employed group got their job through this route. Majority of the respondents, state having no problem in being invited for a campus interview although 69 out of 472 mention having had some problems in this regard.
14. About 24% of the continuously employed respondents did not attend any campus interview due to many reasons including not being invited/permitted to do so by the employer/college. Amongst these 81 did not attend any campus

interview because there was none at their college. The number of campus interviews attended ranges from 2-10 with majority attending 2-5 interviews. 189 out of 472 attended no interview, 51% of those who attended the campus interviews got selected.

15. Amongst the reasons for not getting selected, the most frequently mentioned reason is perceived to be 'Preference to men'. The other reasons relate to academic performance and personal proficiencies of the respondents.
16. 353 out of 472 mention that they did not face any difficulty in being called for job interviews. Amongst the 84 who have had difficulty mention of 'Preference to men' predominates followed by 'Lack of experience'.
17. Similar to the response regarding job interviews, the majority 365 out of 472 report not having any difficulty in getting a job and 85 report having had some difficulty, 'Preference to men' once again predominates in this response too followed by 'No experience'.
18. One of the difficulties faced pertains to the employers not being aware of the new names of the courses floated by engineering colleges.
19. Over 40% of the respondents report having rejected a job offer in each of the 3 group viz. continuously employed, continuously unemployed and intermittently employed. The main reasons for rejection of job by continuously employed are found to be 'Low salary', 'Distance from home' and 'Better job offer' The prime factor for taking up job was for having a job and gaining some experience.
20. 324 out of 472 had their first job in the field of their specialisation.
21. Teaching predominates as the nature of job followed by Design, EDP/Computers and R&D. This scenario is similar to the one depicted by the previous study.
22. 438 out of 472 of the continuously employed women engineers are doing full time job. Similar is the case with intermittently employed women engineers.
23. Private Industry (Small-scale) and TEIs account for more than 60% of the first and the current job followed by about 21% in Private Industry (Large-scale) jobs. This is quite a change from the previous scenario wherein the industrial employment accounted for 21.8% jobs. The other difference is low employment in PSUs in the current study as against 8.2% employment in PSU's in the previous study.
24. Amongst the reason for leaving a job, 'Better professional prospects' occupies most predominant reason followed by 'Not satisfied with type of job'. 'Marriage' also figures prominently as a reason for leaving the job.
25. The current job has been rated 'Average' by the respondents; neither too personal nor impersonal, as far as the general work atmosphere is concerned. The place of work is found to be less pressurised and more relaxed. Majority of the respondents have appreciated the 'Degree of structure' in their

organisations. The largest numbers rate their current job as 'Average' in regard to the 'Independence allowed in working'. Similarly 'Recognition and reward for efforts' are also perceived as 'Average' in their current jobs. On the other hand the respondents have rated their current job as 'Good' in regard to 'Opportunity for advancement as an engineer' and 'Climate for women'. Majority of women indicate that they are well accepted in their current job and fit well in the same. 49% of them have their current job 'Related to their field of specialisation' and a large number feel that their 'Current position is commensurate with their education and training'. The overall picture is thus very positive on certain counts and not so positive on certain other counts.

26. Being engaged in satisfying work, utilisation of skills and abilities, freedom to manage their own work, opportunity to work on an idea, opportunity to keep abreast with the latest developments, being original and creative, involvement in technical work, opportunity to contribute to society, freedom to select their own project and colleagues interested in new developments, are the job related intrinsic factors. All respondents assign highest importance to all these. Rating of their current job however is somewhat comparable only with respect to 'Being engaged in satisfying work' and 'Opportunity to contribute to society'. The rating with respect to all other factors is lower, the lowest being in regards to 'Freedom of selecting their own project'.
27. The extrinsic factors such as co-operative and pleasant workers, availability of personal leave, availability of crèche, desirable location, job security, no pressure to conform in personal life, knowing the work responsibility, opportunity to handle variety of work and sensitivity of the organisation towards the family responsibility of women, are all extremely important to majority of the respondents. Amongst these 'No pressure to conform in personal life', 'Desirable location', 'Knowing the work responsibility' and 'Job security' have received higher rating as far as the current job goes. 'Availability of crèche' and 'Flexible working hours' are the aspects on which the current jobs have been rated the lowest underlining non-availability of such provisions in the job structures.
28. All the listed career advancement factors; 'Delegation of responsibility', 'Opportunity to move into management', 'Opportunity to exercise leadership', 'Assignment in different areas', 'Opportunity to travel' and 'Enhanced social status', are considered most important by the largest fraction of the respondent group. The current job however does not match the level of importance assigned to these factors by the respondents. The current jobs have been rated lowest in regards to 'Opportunity to move into management' and 'Opportunity to travel'. All other factors have received mid-range rating, not at all commensurate with the degree of importance.
29. Perceptions regarding the top three criteria for promotion in the organisations of their employment, the highest poll has been received by functional performance, followed by education and tenure, in that order. Low frequency of mention of gender as criteria for promotion needs to be noted.
30. Promotion of a woman engineer with same education, experience and job performance is considered most likely by 39.6% respondents and slightly less

than 'Most likely' by additional 26.7%. Only 3.3% respondents consider it to be 'Least likely'.

31. About 71% respondents affirm the chances of them securing a management or administrative position in the organisation.

**b. Women Engineers Unemployed Since Graduation**

32. Of the 215 unemployed women engineers, 88% reported seeking employment for a period varying from 6 months to more than a year. Many of those who were seeking employment had never attended a campus interview. No campus interview at their college is one of the main reasons for this.
33. 92% of the unemployed group seeking employment belong to the upper 50% of the class at the time of graduation.
34. 183 out of 215 had applied for a job. Response to job applications was highest from the TEIs followed by Private Industry (Small-scale), Private Industry (Large-scale) and PSUs, in that order. No response to the applications figures as prominently as the positive response from most types of organisations.
35. 87 out of 215 unemployed members report having rejected a job offer some time or the other. The most frequently mentioned reason for rejection of job offer is 'Salary too low'. 'Not allowed by Parents' and 'Lack of hostel facilities' also figure amongst the reasons for rejecting a job offer.
36. Lack of job opportunity, overall or at the place of stay or in the specialisation constitute most frequent perceptions for not being employed. Expenses involved in getting a jobs may it be towards travelling to a place of interview or an unofficial payment requirement, are also important and predominant reasons perceived for women engineers not being able to secure a job. Women engineers from rural background and non-metro area face such problems severely.

**c. Women Engineers Pursuing Further Studies, Intermittently Employed, etc.**

37. Out of 1020 QRS members, 333 women engineers belong to this category; 148 were pursuing further studies and 185 were intermittently employed. The main motivation for taking up further studies comes out to be the need of the chosen career. Significant numbers took up further studies for want of a job. The career plans of women engineers possessing higher qualification are either going in for R&D jobs or teaching.
38. A query for the reasons for intermittence of job revealed that most of the jobs were left due to unsatisfactory work or work atmosphere. Family responsibilities propelled almost equal number of job changes.
39. Part-time jobs were reported to be opted mainly due to non-availability of a full time job.

40. 122 out of 185 members of the intermittently employed group report having had a career break some time or the other. 'Marriage' is the most frequently mentioned reason for break in career. 'Marriage' along with 'Pregnancy' account for the job changes equal in number to the ones taking place due to professional reasons such as 'Unfavourable work atmosphere', 'Low salary', 'Loss of job' etc.
41. Majority of women miss their professional work and want to come back to the profession after a break. Amongst the prime motivation for returning to work, 'A desire to be independent' and 'Have their own identity' figure predominantly.
42. Amongst the difficulties associated with returning to work non-availability of job in the field of specialisation or in the city or town of residence constitute the most predominant reasons.
43. Out of 185 members of the intermittently employed group, 75 members report having refused a job. 'Salary too low' and 'Family constraints' including the locational constraints due to family are the main reasons for refusing a job offer.
44. Amongst the reasons for leaving a job 'Unsatisfactory job type' and 'Better professional prospects' predominate. The other significant reason includes 'Marriage', 'Temporary job' and 'Apprenticeship/Training period getting over'.
45. Amongst the type of employers for the intermittent jobholder, Private Industry (Small-scale) tops the list as far as first employment is concerned. Educational institutions follow the same. In the current employer data however, educational institutions supersede the Private Industry (Small-scale) with 75 out of 185 being employed in educational institutions.



## Chapter – 6

# **EMPLOYERS' VIEWPOINT ON WOMEN IN THE ENGINEERING PROFESSION**

Non-acceptance of women in the engineering job market was clearly noticed in the earlier study. The study also brought out the fact that the employment problems were more severe in the states and in the branches having higher enrollment and a larger population of women engineers. The number of women taking up engineering has increased enormously since the time of this study. Higher enrollment rates and increase in the number of engineering colleges together have led to a large rise in the annual out-turn and a much faster pace of growth of the population of women engineers. In such a changed scenario, re-assessment of the job status of women engineers becomes vital. It is equally important to identify and analyse the reasons behind the employment problems. Clearly the perceptions, attitudes and views of the employers would be of critical importance in this context. In the earlier study, no attempt was made to find and analyse the reasons for the reluctance of employers in hiring women engineers. Obtaining the employers' viewpoint constituted an important part of the present study. The main intent of this part of the current project was to get to know and understand the employers' side of the story and evolve a rational and firm basis for suggesting corrective approaches.

Commensurate with the design and plan of work of the study, a structured questionnaire was prepared. The questionnaire was sent to a select list of organisations; Private Industries, Public Sector Units (PSUs), Technical Educational Institutions (TEIs) and R&D organisations-both government and private. The questionnaire was mailed to two classes of the executives; those who were involved in recruitment of engineers and those who work with women engineers or supervise their work.

The information and data received through the completed questionnaires was stored in a database designed for the purpose. The database provides for selective retrieval of the information. Data entry and compilation were followed by analysis of the collected information. The analysis, observations and inferences presented below lead to the conclusions listed at the end of the chapter.

### **METHODOLOGY**

Important details about preparation of the list of organisations, the questionnaire, and the steps involved in data collection, compilation and analysis of data are presented in the following paragraphs.

## **PREPARATION OF THE LIST OF ORGANISATIONS**

Preparation of a list of organisations having engineer employees was the first step. A list of about 800 organisations that was prepared in the context of data collection on women engineers has been used for this part of the project also. The type of organisations covered in the list included the TEIs, Private Industries, PSUs and R&D organisations of various categories. Out of these, a smaller list having a similar mix of organisations with which a contact had already been established, totalling to about 200, was prepared. Some more organisations where an approach channel had been identified/established were added to the list in the course of time.

The questionnaires for Employers/Executives were mailed to all these organisations along with an appropriately worded letter. The covering letter is a part of the questionnaire. Questionnaires were mailed to two classes of the executives; those who are involved in recruitment of engineers i.e. HRD executives, and those who work with women engineers or supervise their work. In all, about 400 questionnaires were mailed.

## **THE QUESTIONNAIRE**

The questionnaire was designed keeping in view the objectives of the study. It consists of two parts. The first part sought information about the profile of the organisation including the number of total employees, number of employees with engineering and technical background and the number of women engineers employed etc. Information was also sought regarding the year of establishment, nature of predominant activity, participation of engineering/technical personnel in management, rating system for promotion and personnel policies of the organisation specific to women. The personal views and perceptions of the responding executives, on women in the engineering profession were obtained through the second part of the questionnaire. Perceptions about the barriers faced by women engineers were acquired along with their experiences regarding the performance of women as engineers.

The questionnaire was pre-tested by interviewing some executives, both men and women, in person. Comments and suggestions received during the pre-testing stage were incorporated before finalising this instrument. In its final form the questionnaire contains 30 questions, 13 in the first part and the remaining in the second part. Majority of the questions are objective type. Through provision of some open-ended questions and free spaces, sufficient scope has been provided to permit sharing of personal experiences. Since some of the questions are of a personal and sensitive nature, the respondents have been assured complete anonymity and confidentiality.

## **RESPONSE TO THE QUESTIONNAIRE**

As stated above, in all about 400 questionnaires were mailed with the aim of obtaining the viewpoints of employers. About 200 questionnaires were mailed in May 2000. An equal number were sent subsequently as reminders from time to time. In addition to these mailings about 100 questionnaires were given out

personally to different organisations, 25 in the course of testing of the questionnaire instrument and the remaining while chasing the response.

The response to the mailed questionnaires was poor. Response from industries was particularly dismal. Until March 2001, only 37 responses had been received despite reminders. It was therefore decided to pursue this matter through personal contacts and visits. Several known IIT alumni and friends were located, approached in person and interviewed with the questionnaire. A group of research assistants traveled to Vadodara, Ahmedabad and Chennai personally and visited several organisations to secure responses from the concerned executives. Timely help received from the DST officials in making contacts with senior techno-administrators/executives of various Public Sector and Government organisations must also be mentioned in this context. These concerted efforts yielded good results. The number of completed questionnaires rose to 129.

The data tables given in this section show the number of executives contacted as 294 and the number of organisations contacted as 240. It is necessary to mention here that the actual number of questionnaires sent or given is much larger than 294 due to reminder mailings.

## **DATA STORAGE AND ANALYSIS**

FoxPro 2.6 for Windows has been used for data storage and compilation. The data received has been stored in two data files; QORG.dbf and QEMP.dbf. QORG.dbf contains the information about the 104 responding organisations. QEMP.dbf is the other data file in which the data about the responding executives and their views and perceptions is stored.

Some of the questions in the questionnaire are so designed that the responses have to be in form of comments. These comment-form responses are stored in memo fields. Analysis of memo fields is carried out manually. Excel has been used for generating the graphics and tables are generated through FoxPro. Memory requirement of the data and program files concerning 'Employers' Viewpoint' is less than 1MB.

## **THE QUESTIONNAIRE RESPONSE - DATA AND ANALYSIS**

Analysis of the data received from the executives/employers is presented in the following paragraphs. The analysis is presented in the sequence of the questions appearing in the questionnaire.

### **THE RESPONDING ORGANISATIONS**

Presented below is the data on type, size and policies of the organisation.

The questionnaire was sent to 240 organisations. Out of these, 104 (43.3%) responses have been received. The number of responses is high enough to draw reasonable inferences. Classification of the responding organisations is given in

Table-6.1. The largest response is from the Private Industry and the TEIs. Response of the industry to the mailed questionnaires was negligible. It increased to the number shown in the table due to special efforts made through personal contacts and visits. On the other hand, almost all the responses from the TEIs have been received through the mail. Consultancy organisations as well as the Govt., Semi-Govt. and other organisations also had to be persuaded to give a response. The same is generally true for PSUs and R&D organisations also. It is only TEIs, which responded without much effort.

Private industries constitute 32.7% of the responding organisations. A deliberate effort was made to obtain a higher response from them in view of the finding of the previous study. TEIs also constitute 32.7% of the responding organisations. In view of the fact that TEIs are the main employment avenue for women engineers, the importance of obtaining the employers' viewpoint from these organisations needs no justification.

**Table-6.1 Type of Responding Organisation/Institution [QU3]\***

Type of Organisation	Number of Organisations		% of the Total Response
	Contacted	Responded Number (%)	
Private Industry	81	34 ( 42.0)	32.7
Public Sector Units	17	10 ( 58.8)	9.6
R&D Organisations	12	8 ( 66.7)	7.7
Technical Educational Institutions	105	34 ( 32.4)	32.7
Consultancy Organisations	5	5 (100.0)	4.8
Govt., Semi-Govt. & other Orgns.	20	13 ( 65.0)	12.5
Total	240	104 ( 43.3)	100.0

## Year of Establishment

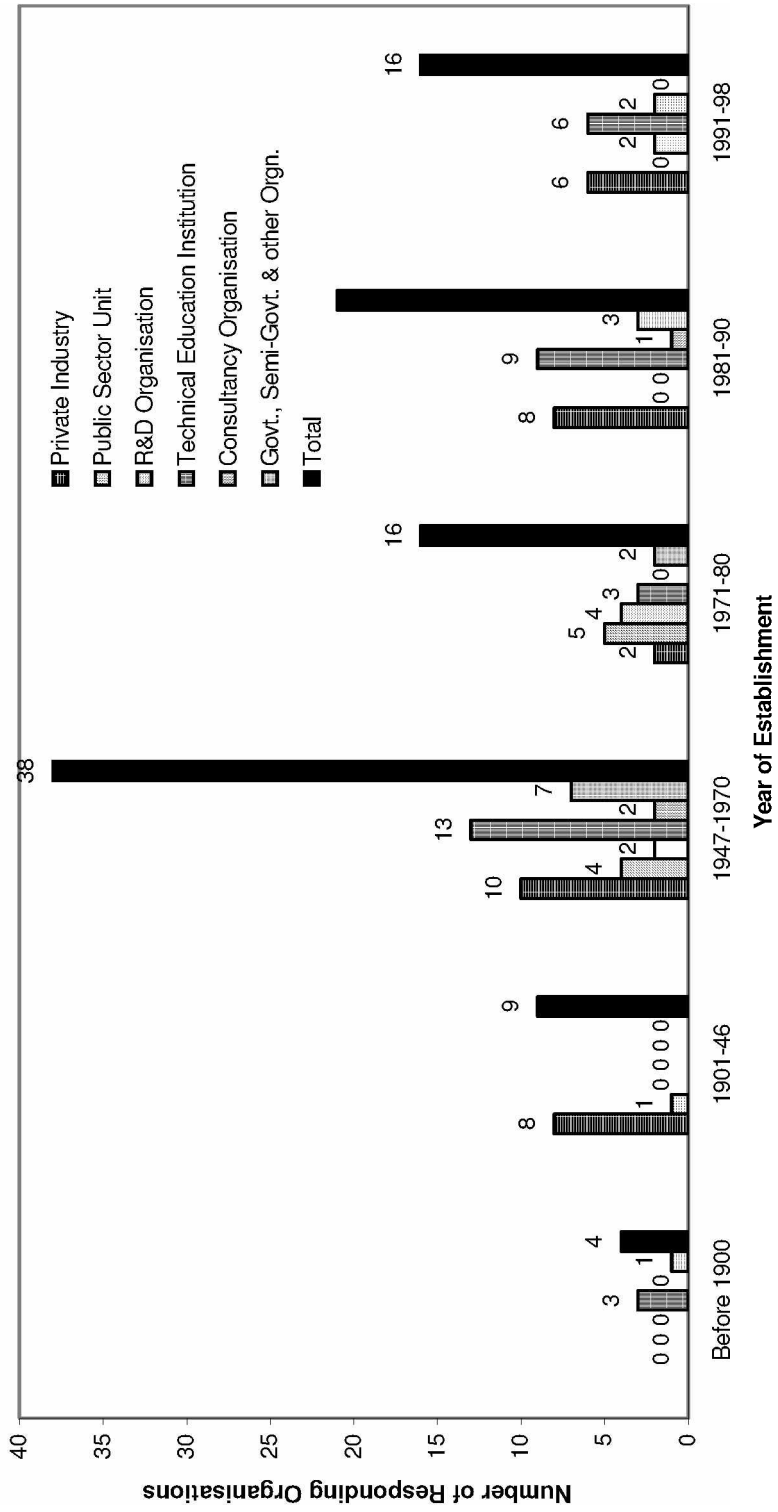
Figure-6.1 shows distribution of the responding organisations on the basis of the year of establishment and type. It can be seen that a fairly complete spectrum with regard to type of organisations and years of establishment has been covered.

## State-wise Distribution

On a state-wise basis, the largest number of responses is from Gujarat followed by Maharashtra (Table-6.2). The level of response from these states is higher due to personal efforts and repeated visits to the organisations in these states. This is particularly true for Private Industry. As stated earlier, the TEIs have generally responded on their own.

\* QU is used to denote the question numbers in the Questionnaire for Employing Organisations and Executives

Figure-6.1 Distribution of Responding Organisations According to their Type and Year of Establishment [QU4]



**Table-6.2 State-wise Distribution of the Responding Organisations [QU2]**

State	Sent (Number)	Received (Number)	% of the Total Response
Andhra Pradesh	14	3	2.9
Delhi	19	7	6.7
Gujarat	50	41	<b>39.4</b>
Karnataka	28	8	7.7
Kerala	6	0	0.0
Maharashtra	86	31	29.8
Tamil Nadu	37	14	13.5
	<b>240</b>	<b>104</b>	<b>100.0</b>

### Nature of Predominant Activity

Table-6.3 presents data on the predominant activity of the responding organisations [QU5]. In some cases, help has also been taken from the information provided at the web-sites of the organisations.

**Table-6.3 Nature of Predominant Activity of the Organisation/Institution [QU5]**

Category	Number	%
Production + Design & Development (D&D) + Research & Development (R&D)	30	28.9
Consultancy + D&D	13	12.5
R&D + D&D	5	4.8
Teaching + Consultancy + D&D + R&D	<b>34</b>	<b>32.7</b>
Information Technology/Software	8	7.7
Others	14	13.5
<b>Total</b>	<b>104</b>	<b>100.0</b>

As can be seen from the table, the largest number of organisations have 'Teaching + Consultancy + Design & Development (D&D) + R&D' as their major activity. This is followed by the category where 'Production + D&D + R&D' constitute the major activity. These obviously are TEIs and Private Industries in that order. 8 out of 104 organisations are IT/Software industries. 'Others' include the Govt./Semi-Govt. organisations such as PWD, Confederation of Industries, Municipal Corporations, State Energy Development Agency, etc.

## Number of Employees

Data on number of employees in the responding organisations having a degree in engineering is given in Table-6.4. Out of 104 responding organisations, data was furnished by 82 only. The last column of the table gives the data of women engineers as a percentage of the total number of employees having an engineering degree. The highest percentage of women is in consultancy organisations (22.2%) closely followed by TEIs (20.7%). The lowest percentage of women engineers is employed in industries (3.5%). On the whole, for the 82 responding organisations, the percentage works out to be 6.1, which is low and does not paint a positive picture about employment of women engineers.

**Table-6.4 Number of Employees with a Degree in Engineering [QU8]**

Type of Organisations	No. of Orgns.*	No. of Employees with Engineering Degree			Women as % of Total with Engg. Degree
		Total	Men	Women	
Industry	38	11405	11010	395	3.5
R&D Organisation	7	654	587	67	10.2
Technical Educational Institution (TEI)	25	1244	986	258	20.7
Consultancy Organisation	4	36	28	8	<b>22.2</b>
Govt., Semi-Govt. & other Organisation	8	4719	4354	365	7.7
<b>Total</b>	<b>82</b>	<b>18058</b>	<b>16965</b>	<b>1093</b>	<b>6.1</b>

\*The number of organisations which provided the above data on employees

## Participation of Engineering/Technical Personnel in Management

Corroborative employment data was sought about participation of engineering/technical personnel in management [QU10]. Separate data was sought for participation in the lower, the middle and the upper management for men and women. The data so received has been consolidated in Table-6.5a. The count of the responding organisation for this question is 66 for lower management, 70 for middle management and 62 for upper management. The remaining in each case, have not responded to the question. It is necessary to note that in this case, the technical personnel include degree as well as diploma holders.

Percentage-wise participation in management at the lower levels is highest in TEIs followed by consultancy. This data matches with the employment data presented in Table-6.4. Even at the lower levels, participation of women in management in industry is the lowest amongst different types of organisations. Their low presence in industry itself could be the basic reason for this reflection. The overall figure of participation by women engineers in the lower management levels is 12.1%.

**Table-6.5a Participation of Engineering/Technical Personnel in Management [QU10]**

Type of Organisation	Number of Engineering/Technical Personnel in								
	Lower Management			Middle Management			Upper Management		
	Total	W*	% W	Total	W	% W	Total	W	% W
Industry	6532	499	7.6	4036	122	3.0	587	14	2.4
R&D Organisation	1652	207	12.5	1752	255	14.6	277	38	13.7
Technical Educational Institution	2150	492	<b>22.9</b>	845	102	12.1	123	7	5.7
Consultancy	28	6	21.4	9	2	<b>22.2</b>	3	0	0.0
Govt., Semi-Govt. & other Organisation	1344	207	15.4	512	53	10.4	150	20	13.3
<b>Total</b>	<b>11706</b>	<b>1411</b>	<b>12.1</b>	<b>7154</b>	<b>534</b>	<b>7.5</b>	<b>1050</b>	<b>77</b>	<b>7.3</b>

W\*-Women Employees

The participation of women in middle management and upper management is less. This is true for all types of organisations excepting R&D organisations. The data seems to indicate that the career growth of women engineers is rather slow. A glass ceiling seems to exist in all types of organisations.

Tables-6.5b and 6.5c present further details on the participation of women in management in the industrial sector and in the TEIs, both having been sub-divided into different categories.

Decrease in percentage participation of women employees with increase in management level in all categories of industries needs to be noted. No participation in upper management level in small-scale industries stands out as much as the high figure of 22.7% in the lower management levels. The lower management level percentage probably refers to entry-level positions. Minimal participation in all levels of management by women engineers in PSUs also needs to be noted.

**Table-6.5b Participation of Engineering/Technical Personnel in Management in Industries [QU10]**

Type of Organisation	Number of Engineering/Technical Personnel in								
	Lower Management			Middle Management			Upper Management		
	Total	W*	% W	Total	W	% W	Total	W	% W
Private Industry (Large-scale)	3902	317	8.1	3033	90	3.0	307	7	2.3
Private Industry (Medium-scale)	1053	125	11.9	304	23	<b>7.6</b>	83	4	<b>4.8</b>
Private Industry (Small-scale)	44	10	<b>22.7</b>	42	3	7.1	13	0	0.0
Public Sector Units	1533	47	3.1	657	6	0.9	184	3	1.6
<b>Total</b>	<b>6532</b>	<b>499</b>	<b>7.6</b>	<b>4036</b>	<b>122</b>	<b>3.0</b>	<b>587</b>	<b>14</b>	<b>2.4</b>

W\*-Women engineering and technical personnel



A similar analysis for TEIs is presented in Table-6.5c. The observation regarding decrease in percentage participation of women employees in the higher level of management holds good in this case also. Occurrence of 'zero' in many categories of TEIs both at the middle and upper management levels needs to be noted. Other than some stray instances in Private Engineering Colleges (Aided), the participation of women in management seems to be negligible in the middle and upper levels. This observation is in agreement with the overall scenario discussed in the context of the data given in Table-6.5a. Here too the lower management level probably refers to the entry-level positions maybe even ad-hoc appointments.

**Table-6.5c Participation of Engineering/Technical Personnel in Management in Technical Educational Institutions [QU10]**

Type of Organisation	Number of Engineering/Technical Personnel in								
	Lower Management			Middle Management			Upper Management		
	Total	W*	% W	Total	W	% W	Total	W	% W
iIT	275	54	19.6	533	77	14.5	90	2	2.2
REC	6	1	16.7	14	0	0.0	4	0	0.0
GEC	59	10	17.0	25	4	<b>16.0</b>	1	0	0.0
PEC (Aided)	481	88	18.3	68	9	13.2	9	2	22.2
PEC (Unaided)	748	202	27.0	131	7	5.3	13	0	0.0
Architecture College	23	9	<b>39.1</b>	3	0	0.0	1	0	0.0
Other (Univ. Dept. etc.)	558	128	22.9	71	5	7.0	5	3	<b>60.0</b>
<b>Total</b>	<b>2150</b>	<b>492</b>	<b>22.9</b>	<b>845</b>	<b>102</b>	<b>12.1</b>	<b>123</b>	<b>7</b>	<b>5.7</b>

REC – Regional Engg. College

GEC - Govt. Engg. College

PEC – Pvt. Engg. College

## Formation of Work Groups

Information about formation of working groups, whether 'All men', 'All women' or 'Mixed' was obtained through response to QU11 of the questionnaire. The data received is tabulated in Table-6.6. It can be seen that although majority of the organisations have mixed working groups, the number having 'All men' working groups is also significant. Nine out of 104 organisations have stated that they have 'All men' groups. These organisations include Private Industries, PSUs and Govt./Semi-Govt. organisations like PWD and Engineering Research Institute etc. This is so despite the fact that many of them have women engineers on their roll. This obviously is distressing. None of the responding organisations have 'All women' working groups.

**Table-6.6 Formation of Work Groups [QU11]**

Type	Number	%
All Men	9	8.7
All Women	0	0.0
Mixed Groups	<b>89</b>	<b>85.6</b>
No Response	6	5.8
<b>Total</b>	<b>104</b>	<b>100.0</b>

## Rating System for Promotion

Table-6.7a and Table-6.7b contain data on the rating systems of the organisations [QU12]. Out of 104, 27 organisations report not having a rating system for promotions. Out of those who have a rating system, 8 have informal and 63 have a formal rating system.

**Table-6.7a Type of Rating System [QU12a]**

	Number (%)		Number (%)	
Yes	74 ( 71.2)	→	Formal	63 ( 85.1)
			Informal	8 ( 10.8)
			No Response	3 ( 4.1)
			<b>Total</b>	<b>74 (100.0)</b>
No	27 ( 26.0)			
No Response	3 ( 2.9)			
<b>Total</b>	<b>104 (100.0)</b>			

Response to a query about the rating system for different management levels is presented in Table-6.7b Almost all organisations say that they have the same rating systems for men and women. However it is interesting to see that two organisations have different rating system for men and women in the lower and middle management levels. The number of organisations having a different rating system in the upper management level is 3. This number is inclusive of the 2 organisations mentioned above in the context of lower and middle management levels.

**Table-6.7b Rating System for Women Engineers v/s that of Men Engineers [QU12b]**

Rating in ↓	Same	Different Response	No	Total
Lower Management	69 (93.2)	2 (2.7)	3 (4.1)	74 (100.0)
Middle Management	69 (93.2)	2 (2.7)	3 (4.1)	74 (100.0)
Upper Management	67 (90.5)	2 (2.7)	5 (6.8)	74 (100.0)

## Personnel Policies of the Organisation Specific to Women

Questions were asked regarding the personnel policies of the organisation specific to women such as maternity leave, re-induction or re-entry programme after confinement, etc. Existence of any special provisions or policies such as flexi-timing,

working from home, part-time job option, policies regarding employment and transfer of husband and wife were also probed. Particular inquiry was made regarding presence of special policies for encouraging women engineers. The responses with respect to specific aspects are presented and discussed below.

### a) Maternity Leave

Data received regarding provision of maternity leave is presented in Table-6.8. Maternity leave provision is found to be ranging from 60-180 days, 90 days being the most frequent provision.

Some organisations have responded with a statement that they follow legal requirements. Three of the respondents do not give any maternity leave. These are small-scale private industries. Most Government organisations have provision of 135 days maternity leave. Longest maternity leave provision of 180 days pertains to two colleges of Architecture, one private and the other, a university department. It will be interesting to find whether this long maternity leave is with or without benefits.

**Table-6.8 Maternity Leave Granted [QU13a]**

<b>Total Leave</b>	<b>Number</b>	<b>%</b>
60 Days	3	2.9
Between 60 and 90 Days	8	7.7
90 Days	<b>39</b>	<b>37.5</b>
120 Days	3	2.9
135 Days	25	24.0
150 Days	1	1.0
180 Days	2	1.9
As Per Legal Requirement	9	8.7
Nil	3	2.9
No Response	11	10.6
<b>Total</b>	<b>104</b>	<b>100.0</b>

### b) Re-entry, Re-induction Programmes

Existence of re-entry/re-induction programme for women engineers after maternity leave was queried through a separate question. The response is tabulated in Table-6.9. Only 6 out of 104 organisations have stated that they have re-entry/re-induction programmes after maternity leave. None of them however, have given any details about the said programme. There is reason to believe that the question has not been understood properly. Continuation of the job and promotion has been construed to be the re-entry, re-induction programme.

**Table-6.9 Existence of Re-entry/Re-induction Programmes After Maternity Leave [QU13b]**

	Number	%
Yes	6	5.8
No	84	80.8
No Response	14	13.5
<b>Total</b>	<b>104</b>	<b>100.0</b>

### c) Special Provisions for Women

The response to a question seeking information on the existence of any special provisions for women engineers is given in Table-6.10. Most of the organisations have no special provisions. A significant number of respondents have chosen not to answer this question.

**Table-6.10 Existence of Special Provisions [QU13c]**

Provisions	Yes	No	No Response	Total
Flexible Time Slots	21 (20.2)	74 (71.2)	9 (8.7)	104 (100.0)
Work From Home	4 (3.9)	88 (84.6)	12 (11.5)	104 (100.0)
Part-time Job Option	13 (12.5)	78 (75.0)	13 (12.5)	104 (100.0)
Availability of a Crèche	17 (16.4)	72 (69.2)	15 (14.4)	104 (100.0)

*The numbers in the parenthesis are the percentages of responding organisations having/not having the specific special provision*

Only 21 out of 104 state that they to have special provisions with respect to 'Flexible time slots'. Seven of these are TEIs and five have IT related activities. The rest are a mix of small-scale and large-scale private industrial organisations. Provision of flexible time slots in the last category cannot be understood without details. It is possible that shift duties are interpreted as flexible timing.

In the 'Yes' category, the smallest number belongs to 'Work from home' option. Out of the four organisations, which have provision of working from home, one is a TEI, two are Semi-Government autonomous bodies and the fourth one is a small-scale industry. None of them are IT companies. Other than the small-scale industry having designing as one of the major activities, it is not clear as to how the 'Work from home' option is being provided.

13 organisations state that they have a part-time job option. Seven of them are TEIs, one is an IT company, two are small-scale industries, one a consultant, one a PSU and one a Semi-Govt. organisation. Part-time job option in educational institutions is well known in the present scenario in which a large number of private colleges exist.

As regards 'Availability of crèche', 17 organisations have responded affirmatively, 72 responses are negative and 15 organisations have not responded. 3 out of 17 are IITs who provide the crèche services on chargeable basis. The remaining of those having crèche facility are Govt./Semi-Govt./PSU organisations except three, which are large-scale private sector industries.

Figure-6.2 presents the summary of the responses concerning special provision for women engineers.

The overall response to the question regarding existence of special provisions is not encouraging. The number of women engineers is growing and they have to deal with the dual responsibility of home and career. Employers not being sensitive to needs of women engineers, is a matter of as much concern as reluctance of the engineering job market in accepting women engineers. This issue needs to be seriously addressed in formulation of corrective measures.

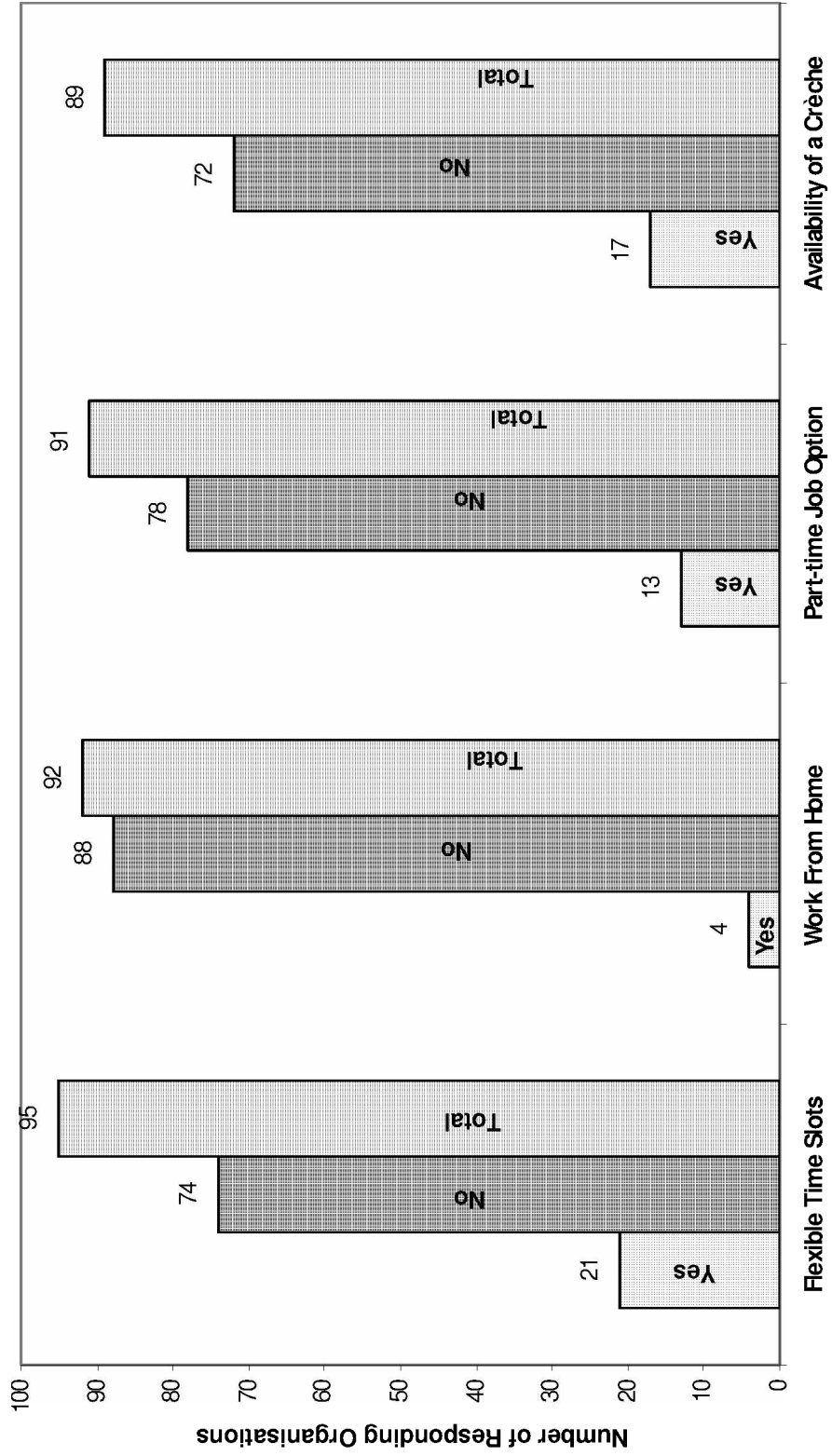
#### d) Policy of Employment of Both Husband and Wife

It is important for married women to be with their families, husbands and children. Transfers disturb family life. It is a fact that many a times women are forced to give up their jobs due to transfers. On the other hand, getting an employment at the same place as her husband helps career pursuance without disturbing family life. Information regarding the organisation having or not having a policy regarding employment and transfer of husband and wife was collected through a direct question. Data is tabulated in Table-6.11. It reveals that 75 organisations out of 104 do not have a policy regarding employment of both husband and wife. This can be taken positively or negatively depending upon the interpretation of the same by the management. Out of the 20 organisations, which claim to have a policy, 13 encourage employment of both husband and wife, 4 have not specified whether they encourage or discourage and one organisation has categorically mentioned that employment of both husband and wife is discouraged as a policy. Surprisingly, the organisation having a discouraging policy is a TEI where a large number of women engineers are employed.

**Table-6.11 Policy Regarding Employment of Husband and Wife [QU13d]**

	Number (%)		Number
Yes	20 ( 19.2)	Policy encourages employment of both husband and wife	13
		Policy is to discourage employment of both husband and wife	3
		No Response	4
<b>Total</b>			<b>20</b>
No	75 ( 72.1)		
No Response	9 ( 8.7)		
<b>Total</b>	<b>104 (100.0)</b>		

Figure-6.2 Existence of Special Provisions [QU13c]



### e) Policy for Transfer to Another City

For reasons which are not clear, only 20 organisations have answered the question as to whether they have a policy for transfer to another city. Out of these, 5 have mentioned that this question is not applicable to them (Table-6.12). This is probably because these organisations have only one establishment. All the five are TEIs. Three organisations have said that they do not have a policy. The remaining 12 do have a policy concerning transfer to another city. However, the details of the policy have not been provided.

**Table-6.12 Existence of a Policy for Transfer to Another City [QU13e]**

Existence of a Policy for Transfer	Number of Organisations
Yes	12
NA	5
No	3
<b>Total</b>	<b>20</b>

### f) Special Policy for Encouraging Women Engineers

The responses to a general query whether the organisation has any special policy to encourage women engineers is presented in Table-6.13. A majority, 88 out of 104, responded negatively, 9 did not respond at all and only 7 confirmed having special policies to encourage women engineers. The said special policies include reservation for women and part-time jobs. One industrial establishment has stated preferential employment of women engineers from the women engineering college managed by themselves. Another private college has mentioned preferential employment of women engineers as teaching staff.

**Table-6.13 Existence of Special Policies to Encourage Women Engineers [QU13f]**

	Number	%
Yes	7	6.7
No	88	84.6
No Response	9	8.7
<b>Total</b>	<b>104</b>	<b>100.0</b>

## THE RESPONDING EXECUTIVES

The second part of the questionnaire concentrated on the responding executives, their assignment profile and their views on various facets related with the issues of women in engineering. An analysis of the responses received is the focus of paragraphs that follow.

129 completed questionnaires have been received from executives of 104 organisations (Table-6.14). More than one executive has responded from some

organisations, which explains the difference between the number of completed questionnaires and responding organisations.

**Table-6.14 Type of Organisation/Institution of the Responding Executives [QU3]**

Type of Organisation	Number of Questionnaires		% of the Total Response
	Sent/Given	Received	
Private Industry	104	44	<b>34.1</b>
Public Sector Unit	25	15	11.6
R&D Organisation	22	14	10.9
Technical Educational Institution	109	34	26.4
Consultancy Organisation	5	5	3.9
Govt., Semi-Govt. & other Orgn.	29	17	13.2
<b>Total</b>	<b>294</b>	<b>129</b>	<b>100.0</b>

### Nature of Responsibility of the Responding Executive/Employer

Data was sought on the assignment profiles of the executives with respect to the nature of their responsibility and also the level of management to which they belong (Table-6.15 & 6.16). From the response it can be seen that 'Administration' and 'Management' predominate as the nature of responsibilities followed by 'Teaching', 'Shop-floor' and 'R&D', in that order. Only 4 out of 129 have 'Marketing' as their main responsibility. 82 out of 129 belong to the 'Upper management level'. This goes well with predominance of 'Administration' and 'Management' as the main responsibility. Almost one third of the responding executives belong to 'Middle level management'. Out of the 129 respondents, 17 are women.

**Table-6.15 Nature of Responsibility of the Executive/Employer [QU14d]**

Nature of Responsibility	Number	%
Administration	<b>45</b>	<b>34.9</b>
Management	42	32.6
Marketing	4	3.1
R&D	9	7.0
Shop-floor	12	9.3
Teaching	17	13.2
<b>Total</b>	<b>129</b>	<b>100.0</b>

**Table-6.16 Assignment Profile of the Executive/Employer [QU15a]**

Profile	Number	%
Middle Level Management	43	33.3
Upper Level Management	82	63.6
No Response	4	3.1
<b>Total</b>	<b>129</b>	<b>100.0</b>



All those who have stated 'Teaching' as their main responsibility are obviously from TEIs. This number however is only 17 as against the total number of TEIs, which is 34. Many of the respondents from TEIs being Principal/Director/Head of an institution have stated 'Administration' or 'Management' as their main responsibility. This explains the difference between the two numbers. Out of the 12 respondents having 'Shop-floor' as their main responsibility, 3 belong to PSUs and 7 to Private Industries and the remaining 2 to organisations like the Municipal Corporation and PWD. Out of 4 respondents stating their main responsibility as 'Marketing', 3 belong to Private Industries and one to a Confederation.

'R&D' is the main responsibility of 9 respondents. Out of these, 3 are from Private Industries and the remaining are from Government R&D organisation.

It is to be noted that the respondents having 'Administration' or 'Management' as their primary responsibility are from all types of organisations including TEIs. Thus it can be claimed that the sample of the study covers a fairly complete spectrum of the type of employing organisations.

## Academic Background

The academic background of the responding executive is given in Table-6.17. It is seen that 37 out of 129 respondents possess a Doctoral degree and 31 a Masters degree [M.E., M.Tech., M.S. or M.Sc.(Engg.)]. 10 of the respondents have an engineering degree with post-graduate diploma/training. Thus about 60% of the responding executives have post-graduate qualifications. 29 of the respondents have a graduate degree in Engineering and 5 have a degree in Architecture. The percentage of engineers amongst the respondents works out to be 86% including Architects. The remaining 17 do not belong to engineering discipline but have a graduate or a post-graduate degree in science or arts or a post-graduate diploma in management. Thus the majority of the respondents are qualified engineers. Most of them have long working experience of about 30 years.

**Table-6.17 Academic Qualifications of the Employers/Executives [QU14e]**

Degree	Number	%
Ph.D., D.Sc.	37	28.7
M.E., M.Tech., M.S. or M.Sc.(Engg.)	31	24.0
B.E. + P.G. Dip.	10	7.8
B.E., B.Tech. or B.Sc.(Engg.)	29	22.5
B.Arch.	5	3.9
Others	17	13.2
<b>Total</b>	<b>129</b>	<b>100.0</b>

The number of engineers reporting to them, depending upon the type of organisation and the post held, vary from Nil to over 350, except for one executive who has stated that the number of employees reporting to him are 753. Out of these, the number of women engineers reporting varies from Nil to 50.

## VIEWS OF THE EXECUTIVES

The following paragraphs contain the views of executives on women in the engineering profession [QU16]. Responses of men and women executives have been presented separately to enable analysis of differences, if any, in the responses.

### Views About Women in the Engineering Profession

Views of the executives have been obtained in form of their agreement or otherwise to a list of commonly made statements about women engineers. This is a directed question of objective type.

Table-6.18a contains the responses on the statement; 'Women are competent enough to be successful in the engineering field'. 90 out of 112 men respondents 'Agree fully', another 20 hesitantly agree. Two of the men respondents who 'Do not agree' with the statement stand out. On probing, it was found that the reason for this bias was generalisation based on some specific singular experience. Women respondents seem to be very clear. 100% of them have affirmed that women are competent enough. The overall response is very positive.

**Table-6.18a 'Women are competent enough to be successful in the engineering field' [QU16a(i)]**

	Men	Women	Total
Agree fully	90 ( 80.4)	17 (100.0)	107 ( 83.0)
Agree somewhat	20 ( 17.8)	0 ( 00.0)	20 ( 15.5)
Do not agree	2 ( 1.8)	0 ( 00.0)	2 ( 1.5)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

Table-6.18b contains the responses regarding 'Acceptability for women to assume leadership roles in the industry as often as men'. The responses are not as positive as in the case of 'Competence', although the majority 'Fully agree' that it is 'Acceptable for women to assume leadership roles'. Here too, 4 out of 112 men do not agree on the issue and another 4 have refrained from responding to the question.

**Table-6.18b 'It is acceptable for women to assume leadership roles in industry as often as men' [QU16a(ii)]**

	Men	Women	Total
Agree fully	80 ( 71.4)	12 ( 70.6)	92 ( 71.3)
Agree somewhat	24 ( 21.4)	5 ( 29.4)	29 ( 22.5)
Do not agree	4 ( 3.6)	0 ( 0.0)	4 ( 3.1)
No Response	4 ( 3.6)	0 ( 0.0)	4 ( 3.1)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

Table-6.18c presents the perceptions about self-confidence in women engineers. A significant number of both men and women seem to be having hesitation in affirming this aspect. However, the majority (69.0%) 'Agree fully' that women possess the self-confidence required of a competent engineer.

**Table-6.18c 'Women possess the self-confidence required of a competent engineer' [QU16a(iii)]**

	<b>Men</b>	<b>Women</b>	<b>Total</b>
Agree fully	<b>76 ( 67.8)</b>	<b>13 ( 76.5)</b>	<b>89 ( 69.0)</b>
Agree somewhat	33 ( 29.5)	4 ( 23.5)	37 ( 28.7)
Do not agree	2 ( 1.8)	0 ( 0.0)	2 ( 1.5)
No Response	1 ( 0.9)	0 ( 0.0)	1 ( 0.8)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

Table-6.18d presents the response to a question seeking an opinion on whether or not a woman has to sacrifice her femininity to be a successful engineer. A majority of both men and women concur that a woman does not have to sacrifice her femininity. However, a significant number of men seem to be having hesitation on this issue and 12 out of 112 'Do not agree', meaning thereby that they feel that women have to sacrifice their femininity to be a successful engineer. In the present era when most engineering jobs do not call for large-scale field activities, this response is indeed strange. The perception of women requiring to sacrifice their femininity seems really misplaced, particularly in view of the fact that a significant fraction of women engineers today are employed in TELs and software firms. Women respondents have expressed no reservation. They fully agree with the statement that a 'Woman engineer does not have to sacrifice her femininity in order to be a successful engineer.'

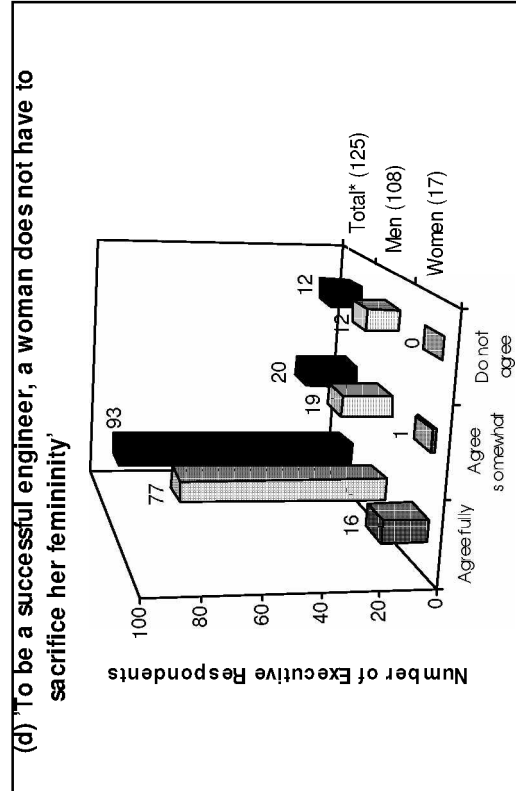
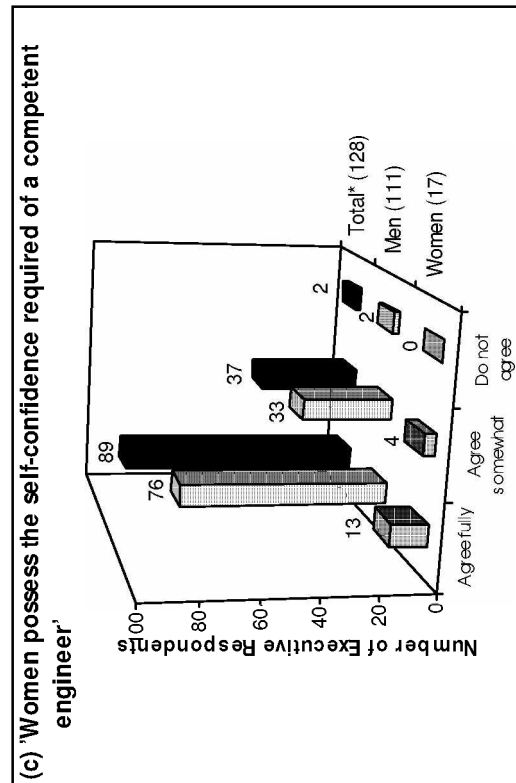
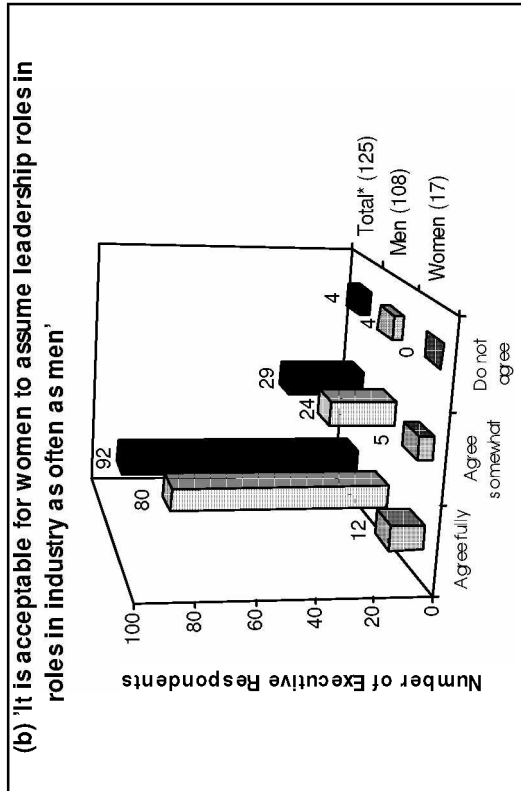
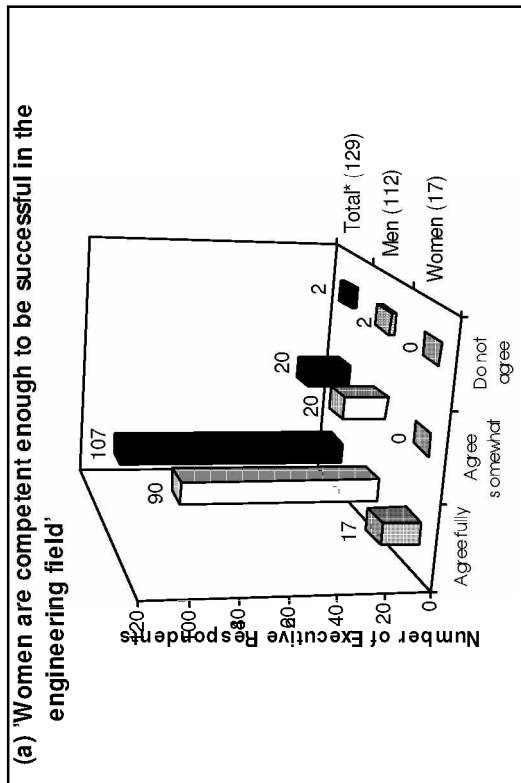
**Table-6.18d 'To be a successful engineer, a woman does not have to sacrifice her femininity' [QU16a(iv)]**

	<b>Men</b>	<b>Women</b>	<b>Total</b>
Agree fully	<b>77 ( 68.7)</b>	<b>16 ( 94.1)</b>	<b>93 ( 72.1)</b>
Agree somewhat	19 ( 17.0)	1 ( 5.9)	20 ( 15.5)
Do not agree	12 ( 10.7)	0 ( 0.0)	12 ( 9.3)
No Response	4 ( 3.6)	0 ( 0.0)	4 ( 3.1)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

Figure-6.3a to 6.3d depicts the data of the above four statements.

Table-6.18e presents the response regarding the difference in experience, knowledge and interaction style of men and women engineers. Opinions of men respondents are fairly divided on this facet. 53 out of 112 agree that there is no difference and 42 hesitantly agree but 16 do not agree. The response scenario from women executives is also divided. This kind of mixed response on interaction styles

**Figure-6.3 Views on Women in the Engineering Profession [QU16a]**



\* Total number of executives responding to the question

of men and women engineers is understandable. It is however difficult to understand their perceptions about knowledge and experience. Maybe it was not correct to mix the three attributes, in one question.

**Table-6.18e 'There is no difference between experience, knowledge, and interaction styles between men and women engineers' [QU16a(v)]**

	Men	Women	Total
Agree fully	<b>53 ( 47.3)</b>	<b>9 ( 52.9)</b>	<b>62 ( 48.1)</b>
Agree somewhat	42 ( 37.5)	5 ( 29.4)	47 ( 36.4)
Do not agree	16 ( 14.3)	3 ( 17.7)	19 ( 14.7)
No Response	1 ( 0.9)	0 ( 0.0)	1 ( 0.8)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

The 'Possibility of pregnancy does not make women less acceptable as employees' was one more statement on which the opinion of the executives was sought. The response to this statement is again mixed from both men and women. This response does indicate that possibility of pregnancy is definitely an issue that influences employment of women in general. This is so, irrespective of the fact whether the employer is a man or a woman (Table-6.18f). Similarly, presence of pre-school children affecting the work of mothers is perceived as a reality as is reflected by Table-6.18g where the largest number of respondents 'Agree somewhat' to the statement 'A full time employed mother of pre-school children can be just as good as any other employee'.

**Table-6.18f 'The possibility of pregnancy does not make women less acceptable as employees' [QU16a(vi)]**

	Men	Women	Total
Agree fully	<b>50 ( 44.6)</b>	<b>8 ( 47.1)</b>	<b>58 ( 45.0)</b>
Agree somewhat	41 ( 36.6)	7 ( 41.2)	48 ( 37.2)
Do not agree	18 ( 16.1)	2 ( 11.7)	20 ( 15.5)
No Response	3 ( 2.7)	0 ( 0.0)	3 ( 2.3)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

**Table-6.18g 'A full time employed mother of pre-school children can be just as good as any other employee' [QU16a(vii)]**

	Men	Women	Total
Agree fully	42 ( 37.5)	7 ( 41.2)	49 ( 38.0)
Agree somewhat	<b>46 ( 41.1)</b>	<b>8 ( 47.1)</b>	<b>54 ( 41.8)</b>
Do not agree	23 ( 20.5)	2 ( 11.7)	25 ( 19.4)
No Response	1 ( 0.9)	0 ( 0.0)	1 ( 0.8)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

Table-6.18h contains the data received in response to the question on the relative importance of the careers of the wife and husband. A larger number of men and women agree that it is equally important for a wife to have a career as for her husband. However, a significant number of men (33 out of 112) 'Agree somewhat' and 16 out of 112 'Do not agree'. There are some women who also feel similarly.

**Table-6.18h 'It is equally important for a wife to have a career as to help her husband with his career' [QU16a(viii)]**

	Men	Women	Total
Agree fully	<b>63 ( 56.2)</b>	<b>11 ( 64.7)</b>	<b>74 ( 57.4)</b>
Agree somewhat	33 ( 29.5)	4 ( 23.5)	37 ( 28.7)
Do not agree	16 ( 14.3)	2 ( 11.8)	18 ( 13.9)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

Depiction of the data in Figure-6.3e to 6.3h brings out these points clearly.

### **Views on Barriers Faced by Women in the Engineering Profession**

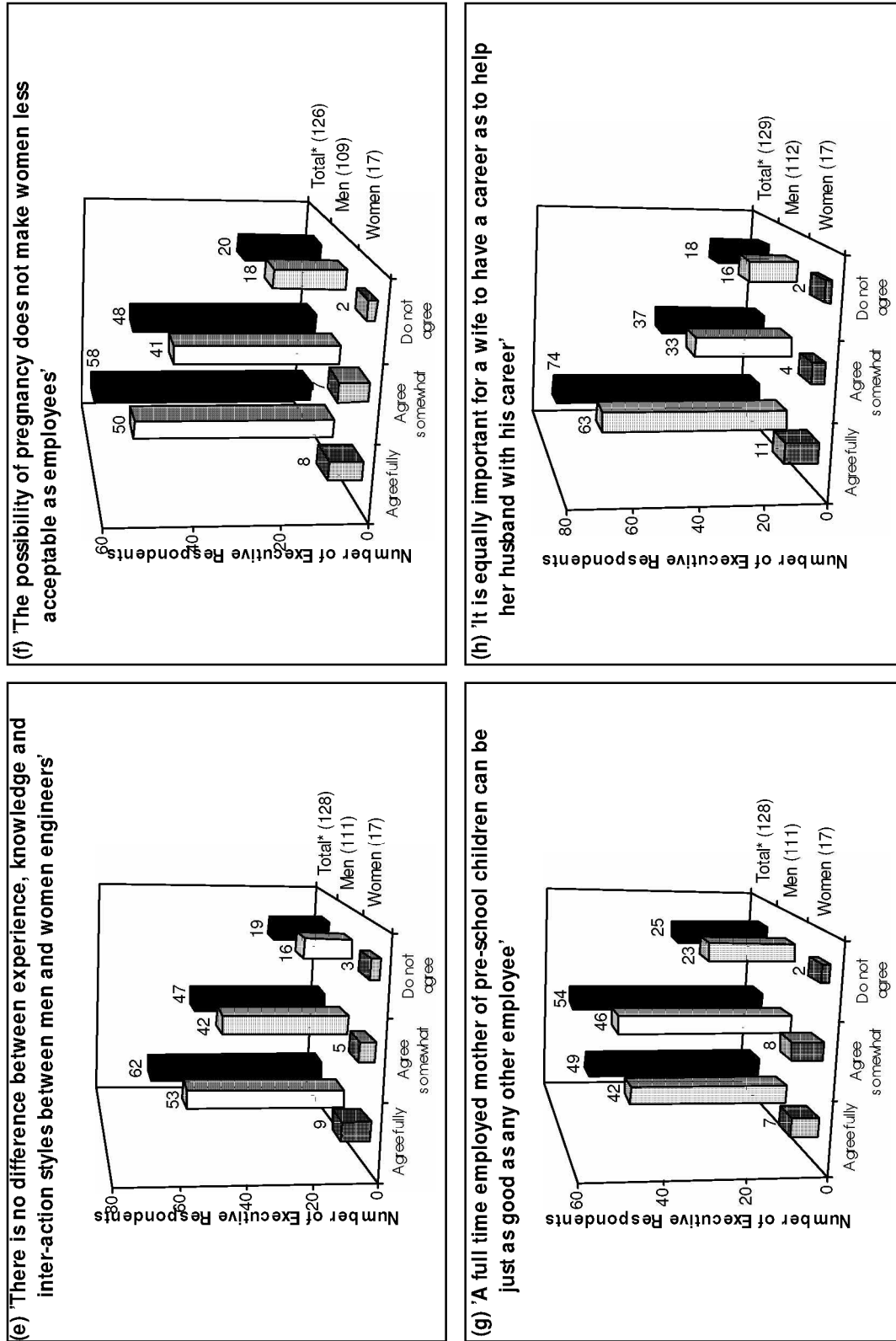
Prevalence of some pre-conceived notions can seriously influence the employment of women engineers. In fact, the presence of such notions constitutes the main barrier in career of women engineers. Employers and executives were approached to express their views on such frequently made statements. The responses are contained in the Tables-6.19a to 6.19f.

'Women engineers cannot work on the shop-floor' is one such notion, which impedes their employment. The response is presented in Table-6.19a. It can be seen that 17 out of 112 men agree with the statement. However, none of the women respondents agree with this statement. The number under 'Agree somewhat' is rather large, 50 men and 6 women. This category of 'Agree somewhat' can be interpreted as those who agree but hesitatingly. Perhaps they do not wish to express their views on the subject openly. 42 men and 11 women executives clearly disagree with the statement. The total number of those who 'Disagree' is 53 and the total of the 'Agree' and 'Agree somewhat' is 73. Clearly the overall tone of the response is not favourable. The notion that 'Women engineers cannot work on the shop-floor' does exist. Considering the fact that today many engineering jobs do not really need shop-floor working, the existence of such a notion should not affect job prospects. It is however necessary to mention that the existence of such a belief should be guarded against as a potential damaging factor.

**Table-6.19a 'Women engineers cannot work on the shop-floor' [QU16b(i)]**

	Men	Women	Total
Agree fully	17 ( 15.2)	0 ( 0.0)	17 ( 13.2)
Agree somewhat	<b>50 ( 44.6)</b>	6 ( 35.3)	<b>56 ( 43.4)</b>
Do not agree	42 ( 37.5)	<b>11 ( 64.7)</b>	53 ( 41.1)
No Response	3 ( 2.7)	0 ( 0.0)	3 ( 2.3)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

**Figure-6.3 Views on Women in the Engineering Profession [QU16a]**



\* Total number of executives responding to the question

The views of the respondents on the statement 'Women cannot work beyond office hours and/or on week-ends' are presented in Table-6.19b. It can be seen that 36 respondents positively perceive that 'Women cannot work beyond office hours and/or on weekends'. Additional 45 out of 129 accept it hesitantly and belong to the 'Agree somewhat' category. 48 out of 129 respondents, 35 men and 13 women, do not accept the statement. The overall response suggests that the major fraction of the employers do believe in the statement. If so, this may prove to be a barrier not only in getting a job but also in career growth of women engineers. The fact that a very large fraction of the women responding 'Do not agree' needs to be pointed out. 35 out of 112 men executives have also refuted the statement.

**Table-6.19b 'Women engineers cannot work beyond office hours and/or on weekends' [QU16b(ii)]**

	Men	Women	Total
Agree fully	33 ( 29.5)	3 ( 17.6)	36 ( 27.9)
Agree somewhat	<b>44 ( 39.3)</b>	1 ( 5.9)	45 ( 34.9)
Do not agree	35 ( 31.2)	<b>13 ( 76.5)</b>	<b>48 ( 37.2)</b>
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

The response to the statement 'Women cannot take up jobs involving travel' (Table-6.19c and Figure-6.4d) shows that large numbers, both men and women, do not perceive travel as a barrier for women engineers. Only 16 out of 112 men and 1 out of 17 women think that 'Women cannot take up jobs involving travel'. The numbers of men and women who 'Agree somewhat' are significant. It is difficult to infer the tone of the response under 'Agree somewhat'. It seems more like a presumptuous thought than a definite view.

**Table-6.19c 'Women cannot take up jobs involving travel' [QU16b(iii)]**

	Men	Women	Total
Agree fully	16 ( 14.3)	1 ( 5.9)	17 ( 13.2)
Agree somewhat	42 ( 37.5)	4 ( 23.5)	46 ( 35.7)
Do not agree	<b>54 ( 48.2)</b>	<b>12 ( 70.6)</b>	<b>66 ( 51.1)</b>
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

It is not uncommon to hear the statement; 'Women cannot handle tough negotiations'. A majority of the respondents, 99 out of 129, do not agree with the statement (Table-6.19d). The number responding with 'Agree somewhat' is also small. Only 5 out of 129 executives perceive that 'Women cannot handle tough negotiations'. Response to this statement suggests that barriers on account of the belief articulated by the statement do not exist. The opinion is clear and encouraging.



**Table-6.19d 'Women cannot handle tough negotiations (such as winning a contract for the company or research funding)' [QU16b(iv)]**

	<b>Men</b>	<b>Women</b>	<b>Total</b>
Agree fully	4 ( 3.5)	1 ( 5.9)	5 ( 3.9)
Agree somewhat	18 ( 16.1)	2 ( 11.8)	20 ( 15.5)
Do not agree	<b>87 ( 77.7)</b>	<b>12 ( 70.5)</b>	<b>99 ( 76.7)</b>
No Response	3 ( 2.7)	2 ( 11.8)	5 ( 3.9)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

It is often believed that women engineers would have difficulty in supervising male subordinates. Views on this perception deny this belief strongly (Table-6.19e and Figure-6.4e). Only 3 men out of 112 and none of the women executives 'Agree fully' that 'Women engineers cannot supervise male subordinates'. 'Do not agree' category is largest both for men and women. On the whole therefore, the respondents perceive that women engineers can supervise male subordinates. The job requirement of supervision of male subordinates should therefore not prove to be a barrier in employment of women engineers.

**Table-6.19e 'Women engineers cannot supervise male subordinates' [QU16b(v)]**

	<b>Men</b>	<b>Women</b>	<b>Total</b>
Agree fully	3 ( 2.7)	0 ( 0.0)	3 ( 2.3)
Agree somewhat	15 ( 13.4)	3 ( 17.6)	18 ( 14.0)
Do not agree	<b>94 ( 83.9)</b>	<b>14 ( 82.4)</b>	<b>108 ( 83.7)</b>
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

Joining the male colleagues in informal groups helps in improving the work atmosphere. Women engineers not joining such informal groups and indulging in certain amount of self-exclusion is often stated as a barrier in their career. The views of the respondents on this facet are given in Table-6.19f. Very few men and women agree with the statement 'Women engineers do not and cannot join male colleagues in informal groups and there is a certain amount of self-exclusion'. A very large number; 62 out of 112 men and 11 out of 17 women; 'Do not agree' with the statement. The overall tone is that women engineers do not live in self-exclusion. This is probably more true for younger women.

**Table-6.19f 'Women engineers do not and cannot join male colleagues in informal groups and there is a certain amount of self-exclusion' [QU16b(vi)]**

	<b>Men</b>	<b>Women</b>	<b>Total</b>
Agree fully	7 ( 6.2)	1 ( 5.9)	8 ( 6.2)
Agree somewhat	43 ( 38.4)	5 ( 29.4)	48 ( 37.2)
Do not agree	<b>62 ( 55.4)</b>	<b>11 ( 64.7)</b>	<b>73 ( 56.6)</b>
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

The task of balancing work and family responsibility is difficult, particularly with small children at home. It is rightly viewed as a barrier in career of women. Views of the responding executives were sought on the statement 'Women cannot balance their work with their family as they would have to give priority to their children'. Only 1 out of 17 women and 21 out of 112 men 'Agree' with the statement fully (Table-6.19g). Thus rather a small number feel that they cannot balance their work and family. The largest group belongs to the 'Agree somewhat' category closely followed by 'Do not agree'. Considering the nature and wording of the question, the reflections of the 'Agree somewhat' group are more towards agreeing than not agreeing with the statement. The 'Do not agree' group refutes the statement. As per their perception women can balance their work and family and therefore such a presumption should not create any barrier in the career path of women engineers. Thus more persons feel that women have problems in balancing the dual responsibilities.

**Table-6.19g 'Women cannot balance their work with their family as they would have to give priority to the children' [QU16b(vii)]**

	<b>Men</b>	<b>Women</b>	<b>Total</b>
Agree fully	21 ( 18.7)	1 ( 5.9)	22 ( 17.0)
Agree somewhat	<b>49 ( 43.8)</b>	7 ( 41.2)	<b>56 ( 43.4)</b>
Do not agree	41 ( 36.6)	<b>9 ( 52.9)</b>	50 ( 38.8)
No Response	1 ( 0.9)	0 ( 0.0)	1 ( 0.8)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

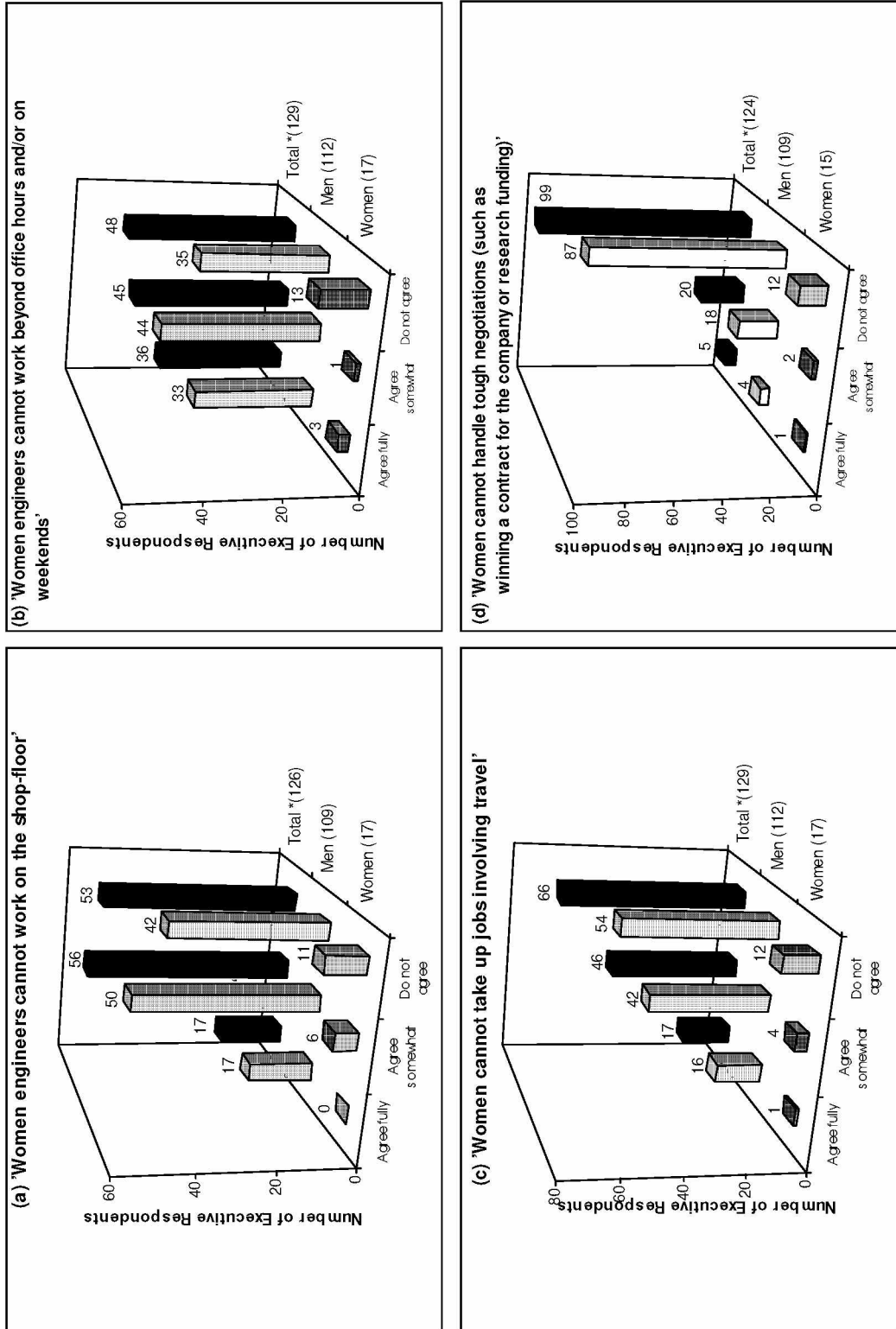
Figure-6.4a to 6.4g depicts the data of the above seven statements.

## **Concerns While Interviewing Woman Engineers for a Job**

### **a) Concern that a Woman Engineer will Leave the Job on Getting Married**

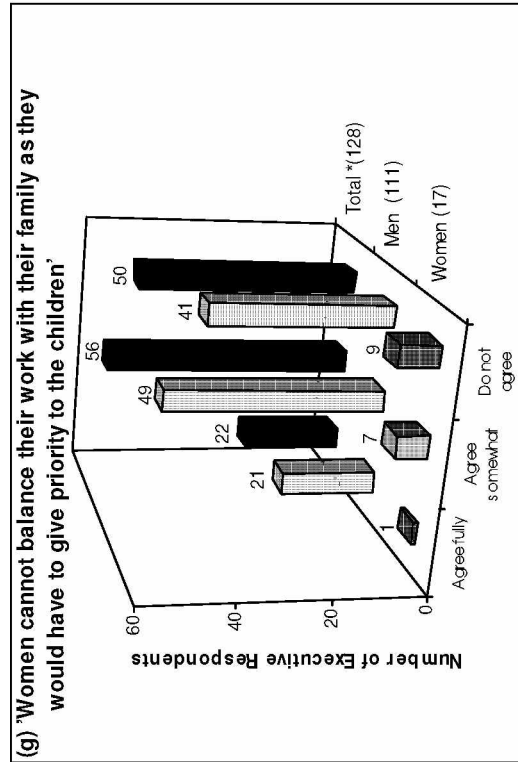
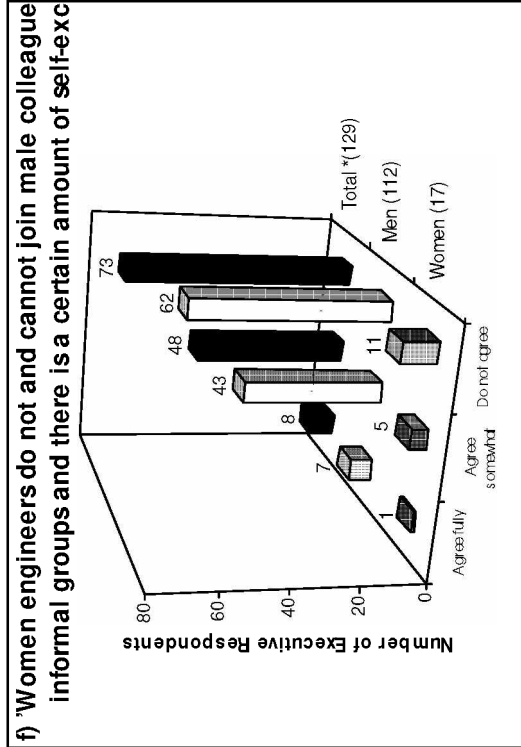
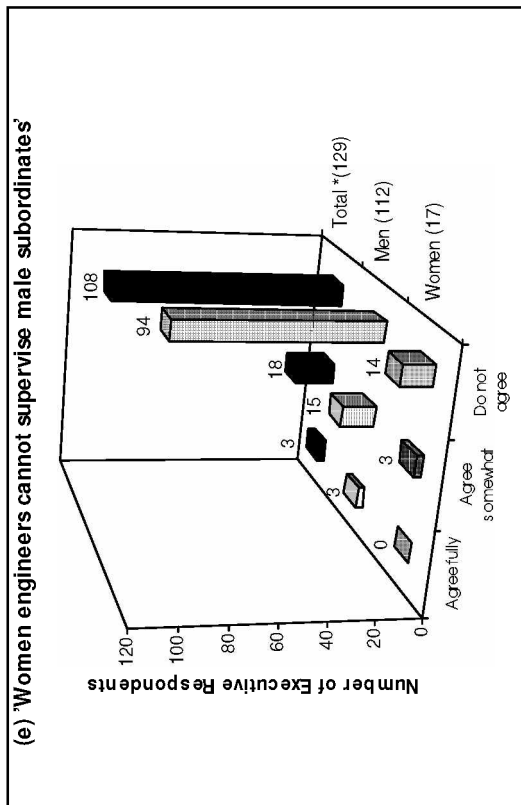
Many women engineer respondents of the current as well as the previous study have stated that during job interviews questions are asked whether they would leave the job on getting married. Such questions reflect concern about losing the incumbent. Since such a concern could adversely influence employment of women

**Figure-6.4 Views on the Barriers Faced by Women Engineers in the Course of their Career [QU16b]**



\* Total number of executives responding to the question

**Figure-6.4 Views on the Barriers Faced by Women Engineers in the Course of their Career [QU16b]**



\* Total number of executives responding to the question

engineers, the views of the executives were sought on the issue through a direct question asking ‘While interviewing a woman engineer for a job are you worried that if appointed she may leave the job upon getting married?’ The response is presented in Table-6.20a. It can be seen that a large number of men as well as women have such a concern. Percentage of women having this concern is lesser than those not having the same, which is different than the response of men. As regards women, a larger number, 10 out 17 do not have this concern and a smaller number, 7 out 17 have the concern. The response of men to the question is definitely different from that of women. It is clearly projected by Figure-6.5a. It is a revealing finding that women harbour such a concern.

**Table-6.20a Concern that a Woman will get Married and Leave the Job? [QU17a(i)]**

	Men	Women	Total
Yes	66 ( 58.9)	7 ( 41.2)	73 ( 56.6)
No	46 ( 41.1)	10 ( 58.8)	56 ( 43.4)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

#### **b) Concern that a Woman may need Maternity Leave**

A woman needing maternity leave is the other concern that the employing executive may have. Although it is not so openly stated, receiving subtle hints about it is not uncommon. Views of the responding executives on this facet, through another question, are tabulated in Table-6.20b (Figure-6.5b). Responses of men and women executives are not very different on the issue. Larger numbers of both men and women have negated having such a concern. This need of women seems to have greater acceptance than that of leaving the job due to marriage. The overall picture is positive.

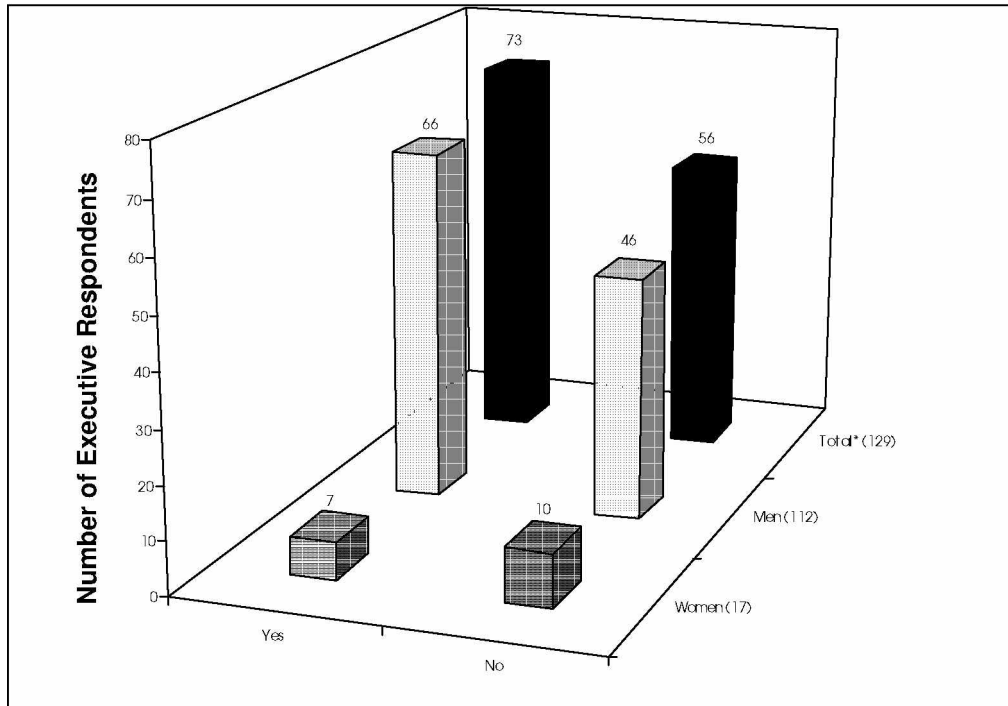
**Table-6.20b Concern About Women Engineers Needing Maternity Leave [QU17a(ii)]**

	Men	Women	Total
Yes	27 ( 24.1)	2 ( 11.8)	29 ( 22.5)
No	79 ( 70.5)	14 ( 82.3)	93 ( 72.1)
No Response	6 ( 5.4)	1 ( 5.9)	7 ( 5.4)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

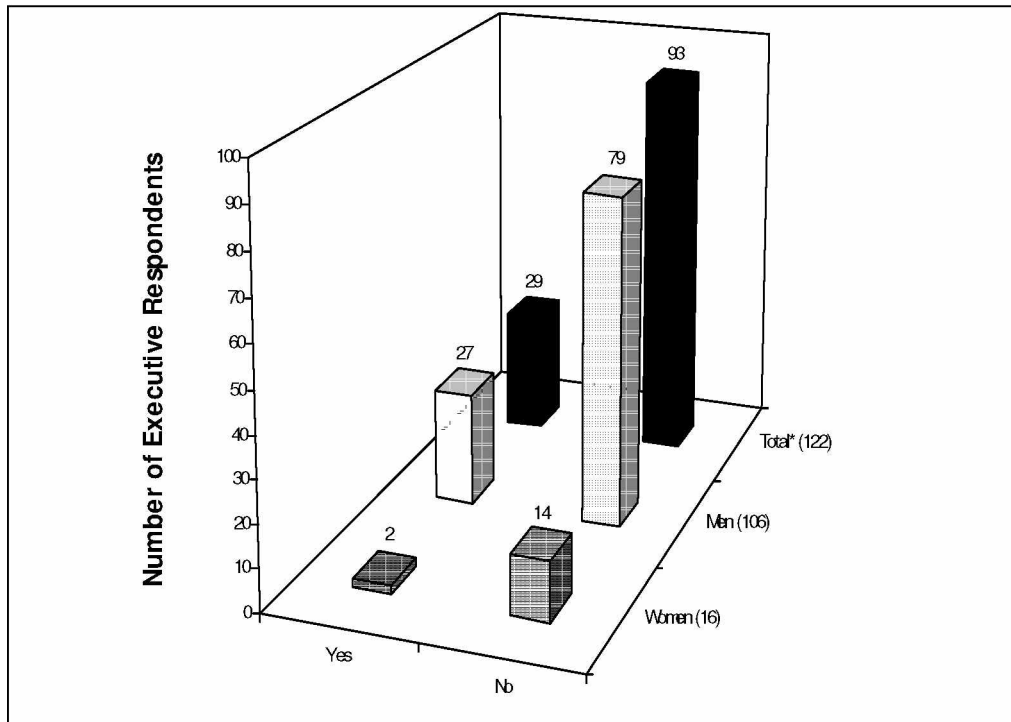
### **Recognising the Need for Special Provisions for Young Mothers**

Balancing a career and a family becomes particularly difficult for young mothers having small children at home. It will help considerably if some support is made available to them in form of special provisions. To find out whether the respondents recognise the need for having policies that allow young mothers to balance family and career, a directed question was put to the executives.

**Figure-6.5a Concern During an Interview about a Woman Engineer Leaving the Job due to Marriage [QU17a(i)]**



**Figure-6.5b Concern During an Interview about a Woman Engineer Needing Maternity Leave [QU17a(ii)]**



\* Total number of executives responding to the question

Table-6.21a presents the response to the question in regard to providing 'Flexible time slots'. A majority of the respondents, both men and women, recognise this need for young mothers. This response is not in tune with the data presented in Table-6.10 where a majority of the responding organisations do not have provision of 'Flexible time slots'. This situation can be summarised by stating that the need of the provision is recognised, but it is not yet available.

**Table-6.21a 'Flexible time slots' [QU17b(i)]**

	<b>Men</b>	<b>Women</b>	<b>Total</b>
Yes	<b>83 ( 74.1)</b>	<b>14 ( 82.3)</b>	<b>97 ( 75.2)</b>
No	22 ( 19.6)	3 ( 17.7)	25 ( 19.4)
No Response	7 ( 6.3)	0 ( 0.0)	7 ( 5.4)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

Regarding the provision for 'Working from home', men and women have responded differently. A lesser number of men recognise the need for the provision whereas a large fraction of women respondents feel the need for such a provision. On the whole, the opinion seems to be divided (Table-6.21b). It is necessary to recall that 88 out of 104 organisations have stated that they have no provision of working from home (Table-6.10).

**Table-6.21b 'Work from home' [QU17b(ii)]**

	<b>Men</b>	<b>Women</b>	<b>Total</b>
Yes	44 ( 39.3)	<b>11 ( 64.7)</b>	55 ( 42.6)
No	<b>56 ( 50.0)</b>	6 ( 35.3)	<b>62 ( 48.1)</b>
No Response	12 ( 10.7)	0 ( 0.0)	12 ( 9.3)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

The need for provision of a 'Part-time job option' has received a better response, more so from women executives (Table-6.21c). 62 out of 112 men and 16 out of 17 women have affirmed the need for a 'Part-time job option' for young mothers. Although quite a significant number of the respondents recognise the need for such an option, the concept has not found a place in organisational policies (Table-6.10).

**Table-6.21c 'Part-time job option' [QU17b(iii)]**

	<b>Men</b>	<b>Women</b>	<b>Total</b>
Yes	<b>62 ( 55.4)</b>	<b>16 ( 94.1)</b>	<b>78 ( 60.5)</b>
No	40 ( 35.7)	1 ( 5.9)	41 ( 31.8)
No Response	10 ( 8.9)	0 ( 0.0)	10 ( 7.7)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

Need for 'Availability of a crèche' has received a positive response (Table-6.21d). It is comparable to the response about 'Flexible time slots' with 92 out of 129 respondents affirming the need for a policy regarding crèche availability. The

organisational data is contrary to this (Table-6.10). A majority of the organisations do not provide crèche facilities.

**Table-6.21d 'Availability of a crèche' [QU17b(iv)]**

	Men	Women	Total
Yes	76 ( 67.9)	16 ( 94.1)	92 ( 71.3)
No	24 ( 21.4)	1 ( 5.9)	25 ( 19.4)
No Response	12 ( 10.7)	0 ( 0.0)	12 ( 9.3)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

Figure-6.6a to 6.6d presents the responses concerning the need for special provisions for women engineers.

In addition to the special provisions discussed above, some suggestions have been received through the space for free expression under 'Others'. 'Provision of a little extra salary to cater to the expenditure needed to take care of young children' and 'provision of special leave for young mothers' has been suggested to be included in the policies for the benefit of young mothers.

## Legal Implications of the Questions Asked in Interview

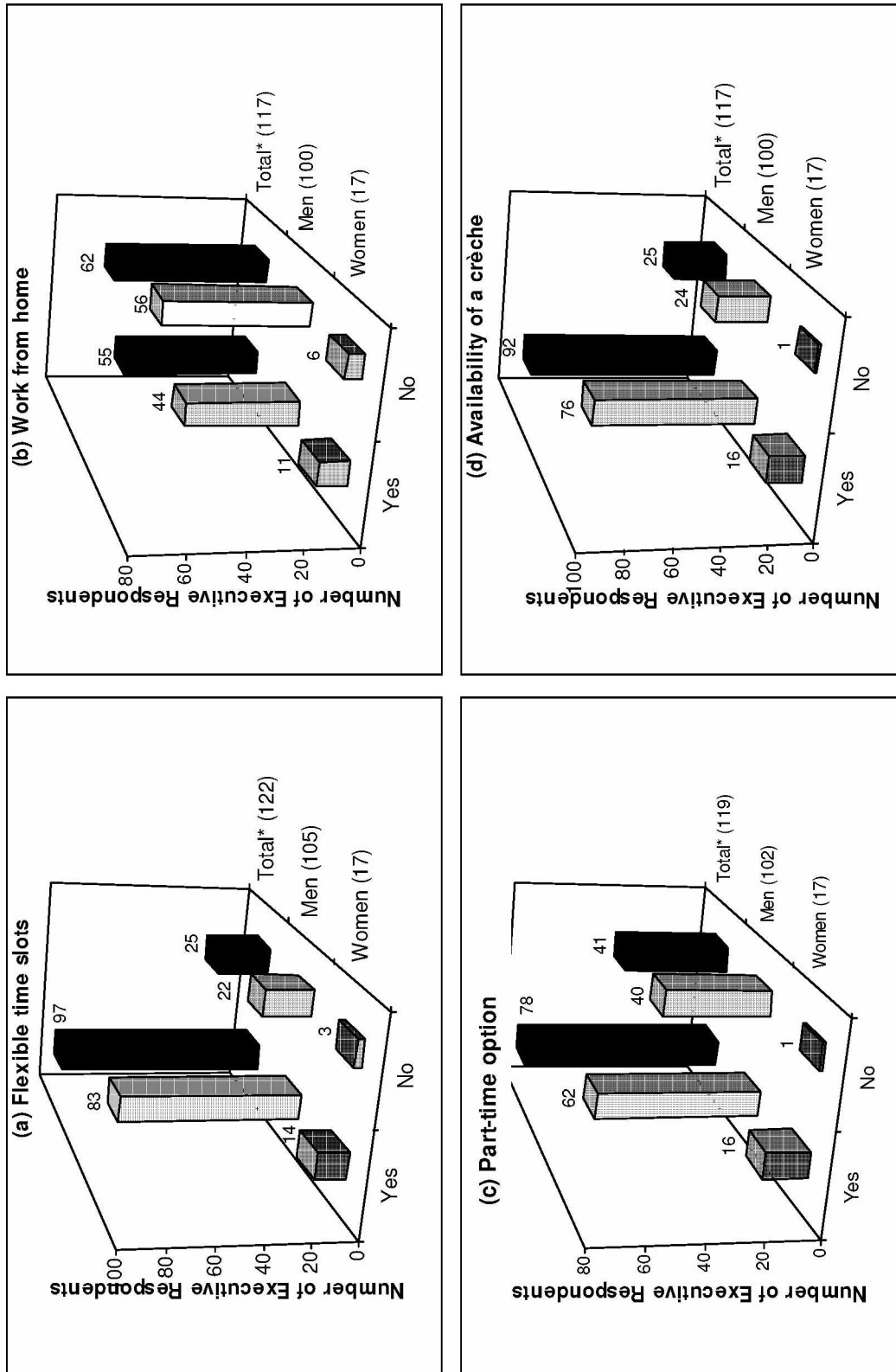
Views of the executives have been obtained about 'Necessity to recognise appropriate processes and their legal implications about the questions asked to women engineers at the time of interview/promotion that are different from the ones asked to a male engineer'. The response is tabulated in Table-6.22. Surprisingly, 80 out of 129 executives have responded with a 'No' meaning thereby that they do not feel the necessity to recognise such issues and their legal implications. In the current era, when gender equality is being stressed through legal provisions, this response is disappointing. Congenial and comfortable workspaces and gender mainstreaming are the essential components of a healthy work atmosphere. Job interview is the very first stage of a professional association with an organisation. This response shows that majority of those involved in interviewing and recruitment processes are not even aware of the likely legal implications of women being questioned differently at the interview. This is as much true for women respondents as for men. Either they have not been exposed to the subject or they do not care. In either case the situation calls for correction.

**Table-6.22 Questions Women Engineers are Asked During an Interview [QU17c]**

Need for Recognising Legal Implications	Men	Women	Total
Yes	35 ( 31.2)	5 ( 29.4)	40 ( 31.0)
No	73 ( 65.2)	7 ( 41.2)	80 ( 62.0)
No Response	4 ( 3.6)	5 ( 29.4)	9 ( 7.0)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>



Figure-6.6 Recognising the Need for Special Provisions for Young Mothers [QU17b]



\* Total number of executives responding to the question

## EXPERIENCES AND PERCEPTIONS

The response to some of the questions in the questionnaire is expected to be based upon experience. The responses may emerge either from direct experiences or from perceptions that could have been acquired from the experience of others. Presented in the following paragraphs is the analysis of the responses to such questions.

### Skills and Characteristics of Women and Men Engineers

The respondents were asked to comment on the differences between the skills and characteristics that women engineers and men engineers bring to their tasks as engineering professionals (Table-6.23). 77 out of 112 men and 12 out of 17 women do not perceive any difference.

**Table-6.23 Skills and Characteristics that Women and Men Engineers Bring to Their Task as Engineering Professionals [QU18a]**

Whether Different?	Men	Women	Total
Yes	31 ( 27.7)	4 ( 23.5)	35 ( 27.1)
No	<b>77 ( 68.7)</b>	<b>12 ( 70.6)</b>	<b>89 ( 69.0)</b>
No Response	4 ( 3.6)	1 ( 5.9)	5 ( 3.9)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

In continuation with the direct question, reactions were sought in comment form on the characteristics and outstanding strengths, which women or men bring to their tasks as engineers. Separate spaces were provided for responses with respect women and men engineers.

Sincerity, meticulousness, diligence, patience, perseverance and devotion to work are the attributes, which have been frequently stated as characteristics and strengths of women engineers. Hardworking, willingness to take up repetitive jobs and amenability to discipline are also seen as the strengths of women engineers in addition to their better understanding of interpersonal relationship with judicious mixing of firmness and compassion. They are considerate and at the same time believe in a 'No nonsense approach'.

Initiative and drive, capacity to take a tough stand and firm decisions, courage, wider exposure and vision, physical strength, stamina and leadership quality have been mentioned as the characteristics and strengths of men engineers. Broader view, availability beyond office hours and on holidays, capacity to work in hostile environment, career orientation, risk taking, outgoing and being less emotional are also listed as characteristics and strengths of men engineers. On the other hand, ego gets frequently mentioned as the negative trait of men engineers. It has also been stated that ego comes in way of working in a team and in their interpersonal relationships.

Clearly both women and men engineers bring a variety of characteristics and strengths to their tasks as engineers. Although many of the characteristics are common amongst men and women, there is a long list of men specific and women specific attributes that make them more suitable for certain kind of work and environment and less suitable for certain other kind. The mix of the two would definitely be complementary for an overall improvement in the work environment as well as task/result orientation in a given situation.

## Performance of Women as Compared to Men Counterparts

Information on the performance of women engineers in comparison to male counterparts was sought from the respondents on the basis of their own experiences. This was a directed question where seven performance facets were specified and answers were sought as to whether the performance is 'Better than', 'Same as' or 'Lesser than' men engineers (Table-6.24a to 6.24g and Figure-6.7a to 6.7g).

### a) Technical Skill

The performance of women engineers with respect to 'Technical skill' has been specified to be 'Same as men engineers' by 112 out of 129 respondents. A majority of both men and women executives have expressed the view that the technical skills of men and women engineers are similar.

**Table-6.24a Performance with Respect to 'Technical Skill' [QU19(a)]**

Level of Performance	Men	Women	Total
Lesser than Men Engineers	5 ( 4.4)	2 ( 11.8)	7 ( 5.5)
Same as Men Engineers	<b>98 ( 87.5)</b>	<b>14 ( 82.3)</b>	<b>112 ( 86.8)</b>
Better than Men Engineers	6 ( 5.4)	1 ( 5.9)	7 ( 5.4)
No Response	3 ( 2.7)	0 ( 0.0)	3 ( 2.3)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

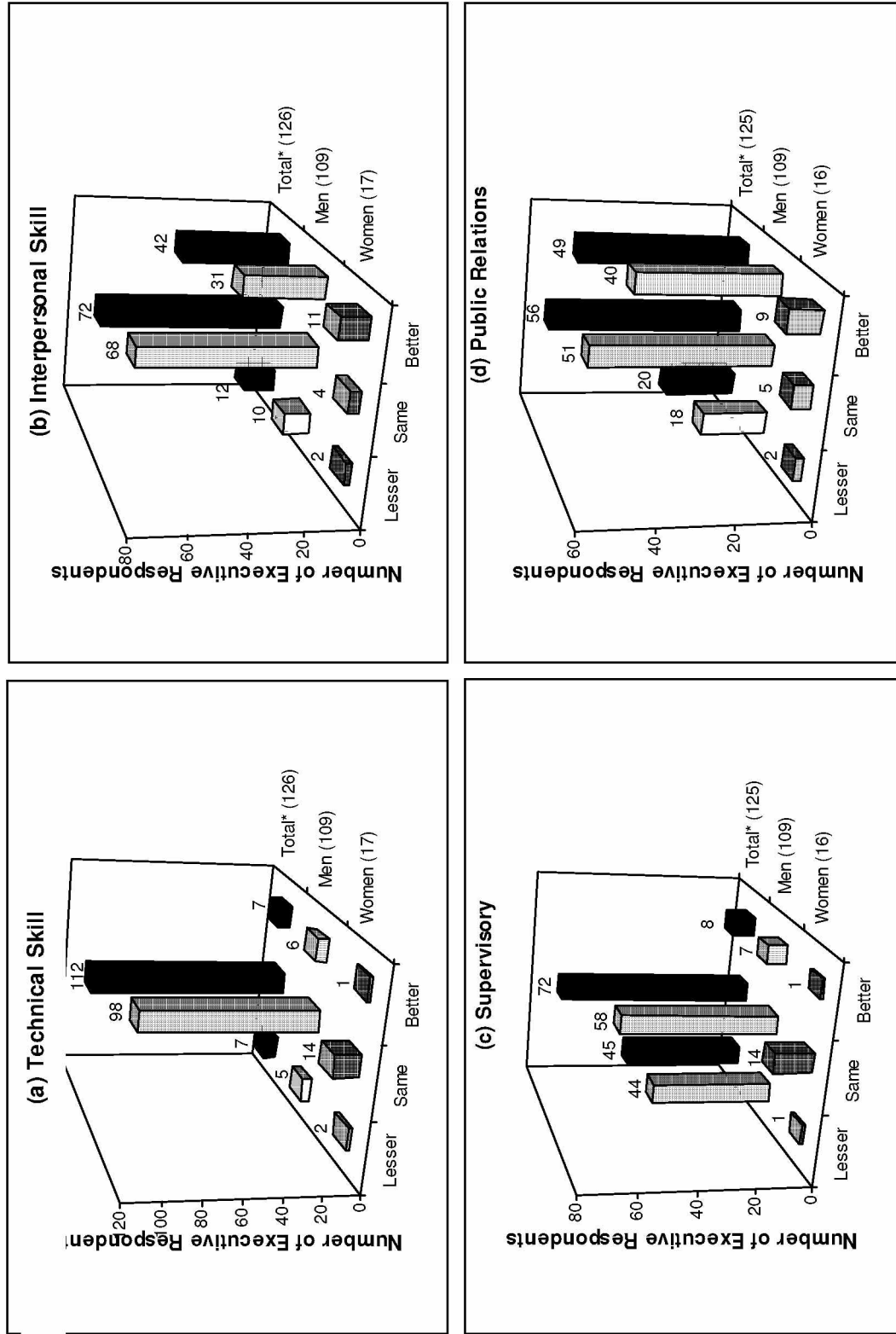
### b) Interpersonal Skill

As regards 'Interpersonal skill' there is a distribution between 'Same as men engineers' and 'Better than men engineers'.

**Table-6.24b Performance with Respect to 'Interpersonal Skill' [QU19(b)]**

Level of Performance	Men	Women	Total
Lesser than Men Engineers	10 ( 8.9)	2 ( 11.8)	12 ( 9.3)
Same as Men Engineers	<b>68 ( 60.7)</b>	4 ( 23.5)	<b>72 ( 55.8)</b>
Better than Men Engineers	31 ( 27.7)	<b>11 ( 64.7)</b>	42 ( 32.6)
No Response	3 ( 2.7)	0 ( 0.0)	3 ( 2.3)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

**Figure-6.7 Performance of Women as Compared to Men Counterparts [QU19]**



\* Total number of executives responding to the question

11 women executives feel that women engineers are 'Better than men engineers' while 4 feel that they are the 'Same as men engineers'. On the other hand, 31 men executives feel that women engineers are better, while 68 feel that they are the same. On the whole, 55.8% feel that they are the same as far as 'Interpersonal skill' is concerned.

### c) Supervision

Contrary to the cases of 'Technical skills' and 'Interpersonal skills' the experiences of men and women respondents seem to be different with respect to 'Supervision'. 44 out of 112 men executives state that women performed less in comparison with the men counterparts with respect to 'Supervision'. This is different from the responses of women executives most of whom have responded with 'Same as men engineers'. On the whole, however the largest number is 'Same as men engineers'.

**Table-6.24c Performance with Respect to 'Supervision' [QU19(c)]**

Level of Performance	Men	Women	Total
Lesser than Men Engineers	44 ( 39.3)	1 ( 5.9)	45 ( 34.9)
Same as Men Engineers	<b>58 ( 51.8)</b>	<b>14 ( 82.3)</b>	<b>72 ( 55.8)</b>
Better than Men Engineers	7 ( 6.2)	1 ( 5.9)	8 ( 6.2)
No Response	3 ( 2.7)	1 ( 5.9)	4 ( 3.1)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

### d) Public Relations

Women engineers are rated either 'Same' or 'Better than men engineers' in 'Public relations'. This is the experience of 91 out of 112 men and 14 out of 17 women.

**Table-6.24d Performance with Respect to 'Public Relations' [QU19(d)]**

Level of Performance	Men	Women	Total
Lesser than Men Engineers	18 ( 16.1)	2 ( 11.8)	20 ( 15.5)
Same as Men Engineers	<b>51 ( 45.5)</b>	5 ( 29.4)	<b>56 ( 43.4)</b>
Better than Men Engineers	40 ( 35.7)	<b>9 ( 52.9)</b>	49 ( 38.0)
No Response	3 ( 2.7)	1 ( 5.9)	4 ( 3.1)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

### e) Communication

Performance of women engineers in regards to 'Communication' is rated 'Same as men engineers' by a majority of the respondents. The same predominates in the

responses of men executives, whereas 'Better than men engineers' is the response of larger fraction of women executives. Between 'Same as men engineers' and 'Better than men engineers' the numbers sum up to 118 out of 129.

**Table-6.24e Performance with Respect to 'Communication' [QU19(e)]**

Level of Performance	Men	Women	Total
Lesser than Men Engineers	7 ( 6.3)	0 ( 0.0)	7 ( 5.4)
Same as Men Engineers	<b>74 ( 66.1)</b>	5 ( 29.4)	<b>79 ( 61.3)</b>
Better than Men Engineers	28 ( 25.0)	<b>11 ( 64.7)</b>	39 ( 30.2)
No Response	3 ( 2.7)	1 ( 5.9)	4 ( 3.1)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

#### f) Level of Confidence

Men and women executives seem to have had similar experiences about the performance of women engineers with respect to 'Level of confidence'. The numbers under 'Same as men engineers' predominate in the experience of both men as well as women. On the whole, the numbers responding with 'Lesser than men engineers' is slightly higher as compared to the number 'Better than men engineers'.

**Table-6.24f Performance with Respect to 'Level of Confidence' [QU19(f)]**

Level of Performance	Men	Women	Total
Lesser than Men Engineers	23 ( 20.5)	4 ( 23.5)	27 ( 20.9)
Same as Men Engineers	<b>76 ( 67.9)</b>	<b>9 ( 53.0)</b>	<b>85 ( 65.9)</b>
Better than Men Engineers	10 ( 8.9)	4 ( 23.5)	14 ( 10.9)
No Response	3 ( 2.7)	0 ( 0.0)	3 ( 2.3)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

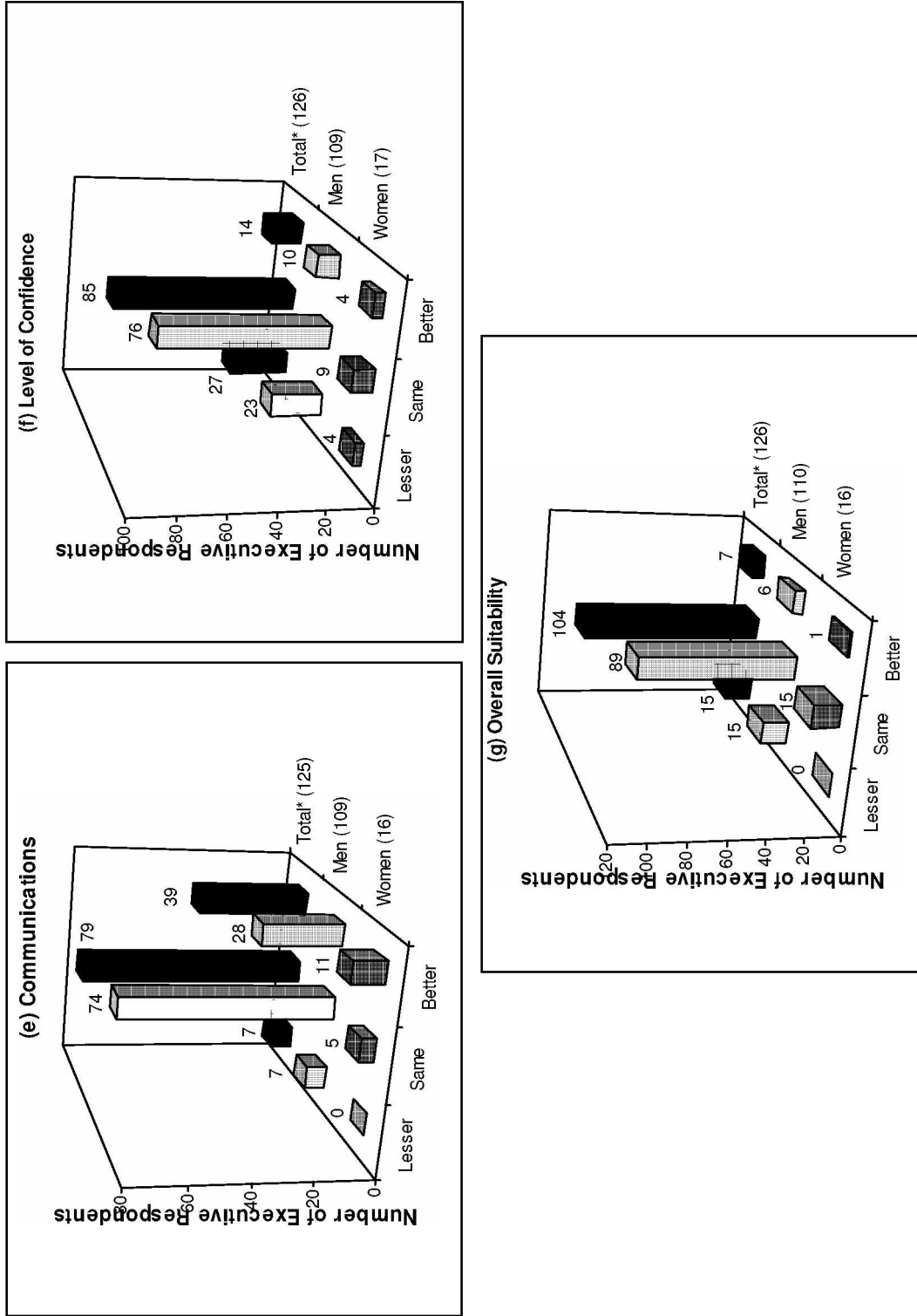
#### g) Overall Suitability

'Same as men engineers' is the predominant response in regard to the 'Overall suitability'. 104 out of the 129 respondents echo this sentiment.

**Table-6.24g Performance with Respect to 'Overall Suitability' [QU19(g)]**

Level of Performance	Men	Women	Total
Lesser than Men Engineers	15 ( 13.4)	0 ( 0.0)	15 ( 11.6)
Same as Men Engineers	<b>89 ( 79.5)</b>	<b>15 ( 88.2)</b>	<b>104 ( 80.6)</b>
Better than Men Engineers	6 ( 5.3)	1 ( 5.9)	7 ( 5.4)
No Response	2 ( 1.8)	1 ( 5.9)	3 ( 2.4)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

**Figure-6.7 Performance of Women as Compared to Men Counterparts [QU19]**



\* Total number of executives responding to the question

The response discussed above are based upon the experience of the executives while working with women engineers. The overall picture is quite positive and projects women engineers to be as good or better than men in most respects. This does not agree with the job and career scenario of women engineers. If the employing executives find the performance of women engineers to be good, what is hindering the employment of women as professionals?

## **Influence of Role of Women Engineers as Women**

Women have to shoulder the dual responsibility of a job and a home. Apprehensions are often expressed that their role as a woman or householder may adversely influence their professional performance. Perceptions of the executives and employers were obtained on this aspect. Separate responses were sought regarding the possibility of adverse influence on 'Job assignment and responsibility', 'Job performance' and 'Advancement opportunities'. Responses are contained in Table-6.25a-6.25c and depicted in Figure-6.8a to 6.8c.

### **a) Influence on Job Assignment and Responsibility**

A majority of the respondents, men as well as women, do not perceive an adverse influence of the role of women engineers as women on 'Job assignment and responsibility', although the number of men who perceive adverse influence is not insignificant (24 out of 112). Only 1 out of 17 women perceive such adverse influence.

**Table-6.25a Influence with Respect to 'Job Assignments and Responsibilities'**  
[QU20(a)]

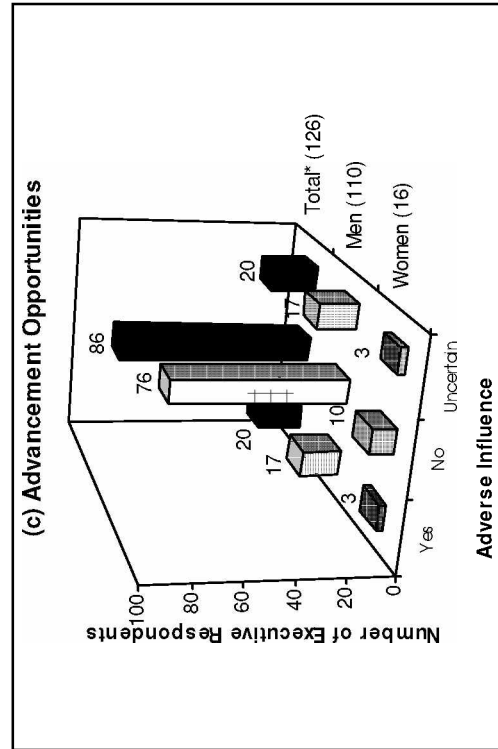
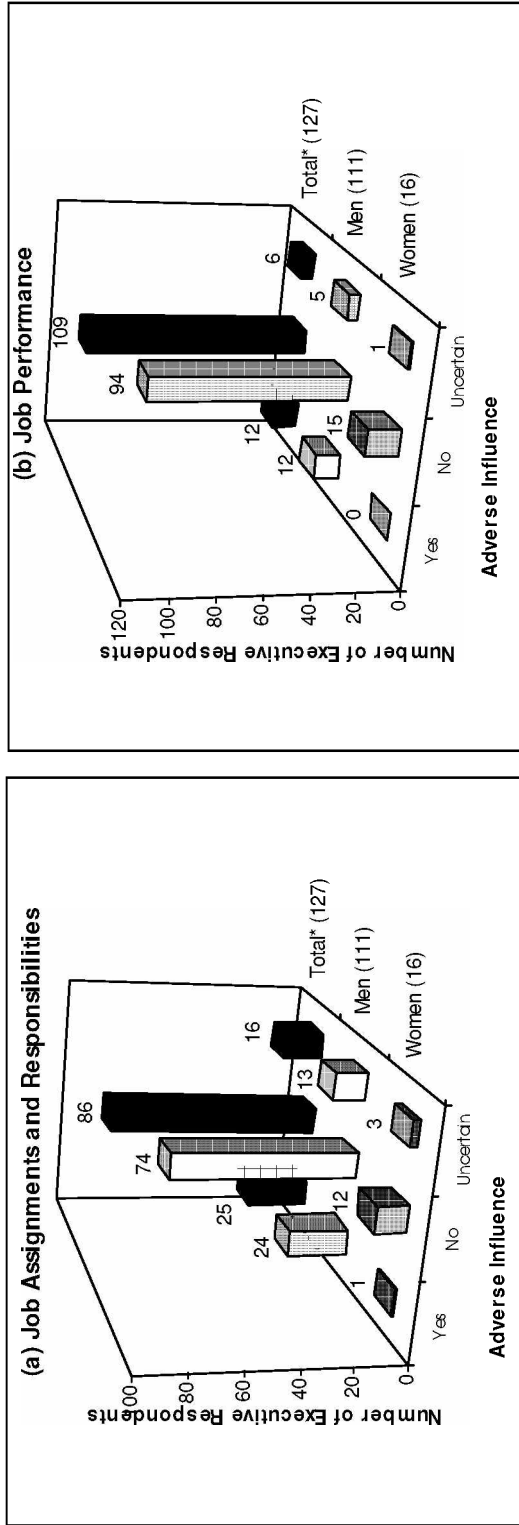
<b>Adverse Influemnce</b>	<b>Men</b>	<b>Women</b>	<b>Total</b>
Yes	24 ( 21.4)	1 ( 5.9)	25 ( 19.4)
No	<b>74 ( 66.1)</b>	<b>12 ( 70.5)</b>	<b>86 ( 66.7)</b>
Uncertain	13 ( 11.6)	3 ( 17.7)	16 ( 12.4)
No Response	1 ( 0.9)	1 ( 5.9)	2 ( 1.5)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

### **b) Influence on Job Performance**

As regards influence on 'Job performance' the response is more direct with 109 out of 129 respondents stating that there is no adverse influence. The number of men perceiving adverse influence is much smaller (12 out of 112) than those who perceive adverse influence with respect to 'Job assignment and responsibility'.



**Figure-6.8 Influence of the Role of Women Engineers as Women [QU20]**



\* Total number of executives responding to the question

**Table-6.25b Influence with Respect to ‘Job Performance’ [QU20(b)]**

<b>Adverse Influence</b>	<b>Men</b>	<b>Women</b>	<b>Total</b>
Yes	12 ( 10.7)	0 ( 0.0)	12 ( 9.3)
No	<b>94 ( 83.9)</b>	<b>15 ( 88.2)</b>	<b>109 ( 84.5)</b>
Uncertain	5 ( 4.5)	1 ( 5.9)	6 ( 4.6)
No Response	1 ( 0.9)	1 ( 5.9)	2 ( 1.6)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

**c) Influence on Advancement Opportunity**

The response regarding ‘Advancement opportunity’ is similar to the one received with respect to ‘Job assignment and responsibility’ and is less positive than the one with respect to ‘Job performance’. This is understandable because many times women do refuse promotions and better jobs because of the requirement of change of place.

**Table-6.25c Influence with Respect to ‘Advancement Opportunities’ [QU20(c)]**

<b>Adverse Influence</b>	<b>Men</b>	<b>Women</b>	<b>Total</b>
Yes	17 ( 15.2)	3 ( 17.6)	20 ( 15.5)
No	<b>76 ( 67.8)</b>	<b>10 ( 58.8)</b>	<b>86 ( 66.7)</b>
Uncertain	17 ( 15.2)	3 ( 17.7)	20 ( 15.5)
No Response	2 ( 1.8)	1 ( 5.9)	3 ( 2.3)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

The overall response to this question concerning the influence of the role of women engineers as women is rather revealing. The experience seems to be that whatever the job, they do not allow their performance to be affected by their womanly responsibilities. Knowingly and consciously, for the benefit and comfort of their family, women do refuse professional opportunities of various kinds as rightly perceived by the executives/employers more so by women executives/employers. The difference in the responses of men and women, though subtle, does convey a reality.

**Treatment of Women Engineers Compared to Men Engineers**

It is not uncommon to hear that the treatment meted out to women engineers is different than the one to men engineers. The difference lies in the nature of responsibility given to them and the response to their suggestions in important matters. To assess this aspect, perceptions of the executives were obtained for three different situations, as a colleague in the workplace, as a subordinate and as a superior (Table-6.26a to 6.26d).

### a) As a Colleague in the Work Place

Women engineers being treated equal to others and being equally accepted is the predominant response. 104 out of 129 perceive that women as colleagues are treated at par. It is interesting to note that some respondents (11 men and 1 woman) perceive preferential treatment to women engineers. 10 out of 129 respondents perceive discriminatory treatment to women engineers.

**Table-6.26a As a Colleague in the Workplace [QU21]**

Perception About the Treatment	Men	Women	Total
Perception About the Treatment	11 ( 9.8)	1 ( 5.9)	12 ( 9.3)
Equal to others/Equally accepted	<b>91 ( 81.3)</b>	<b>13 ( 76.5)</b>	<b>104 ( 80.6)</b>
Discriminatory/Not readily accepted	8 ( 7.1)	2 ( 11.7)	10 ( 7.8)
No Response	2 ( 1.8)	1 ( 5.9)	3 ( 2.3)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

### b) As a Subordinate

As a subordinate also, equal treatment to both men and women engineers is perceived by the majority. The numbers under preferential treatment are larger than those with respect to 'Colleague in the workplace'. Only 4 out of 129 (3 men and 1 woman) have stated discriminatory treatment of women engineers as subordinates. The total number belonging to 'Equal' category is lesser as compared to the case of colleagues.

**Table-6.26b As a Subordinate [QU21]**

Perception About the Treatment	Men	Women	Total
Preferential/Readily accepted	16 ( 14.3)	5 ( 29.4)	21 ( 16.3)
Equal to others/Equally accepted	<b>89 ( 79.4)</b>	<b>10 ( 58.8)</b>	<b>99 ( 76.7)</b>
Discriminatory/Not readily accepted	3 ( 2.7)	1 ( 5.9)	4 ( 3.1)
No Response	4 ( 3.6)	1 ( 5.9)	5 ( 3.9)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

### c) As a superior

As a superior, preferential treatment to women engineers is totally denied by women respondents whereas there are a small number of men executives who do perceive senior women engineers getting preferential treatment. The majority, 76 out 112 men and 10 out of 17 women feel that both men and women as superior are treated equally. It is interesting to note that for women engineers as a superior, response under 'Not readily accepted' is significantly higher from both men and women. This is not surprising. This is likely to be true generally and not just for the field of engineering.

**Table-6.26c As a Superior [QU21]**

Perception About the Treatment	Men	Women	Total
Preferential/Readily accepted	5 ( 4.5)	0 ( 0.0)	5 ( 3.9)
Equal to others/Equally accepted	<b>76 ( 67.9)</b>	<b>10 ( 58.8)</b>	<b>86 ( 66.7)</b>
Discriminatory/Not readily accepted	24 ( 21.4)	6 ( 35.3)	30 ( 23.2)
No Response	7 ( 6.2)	1 ( 5.9)	8 ( 6.2)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

Table-6.26d and Figure-6.9a to 6.9c is the summary of all the three responses. Equal treatment predominates for all the three- as colleagues, subordinates and superiors.

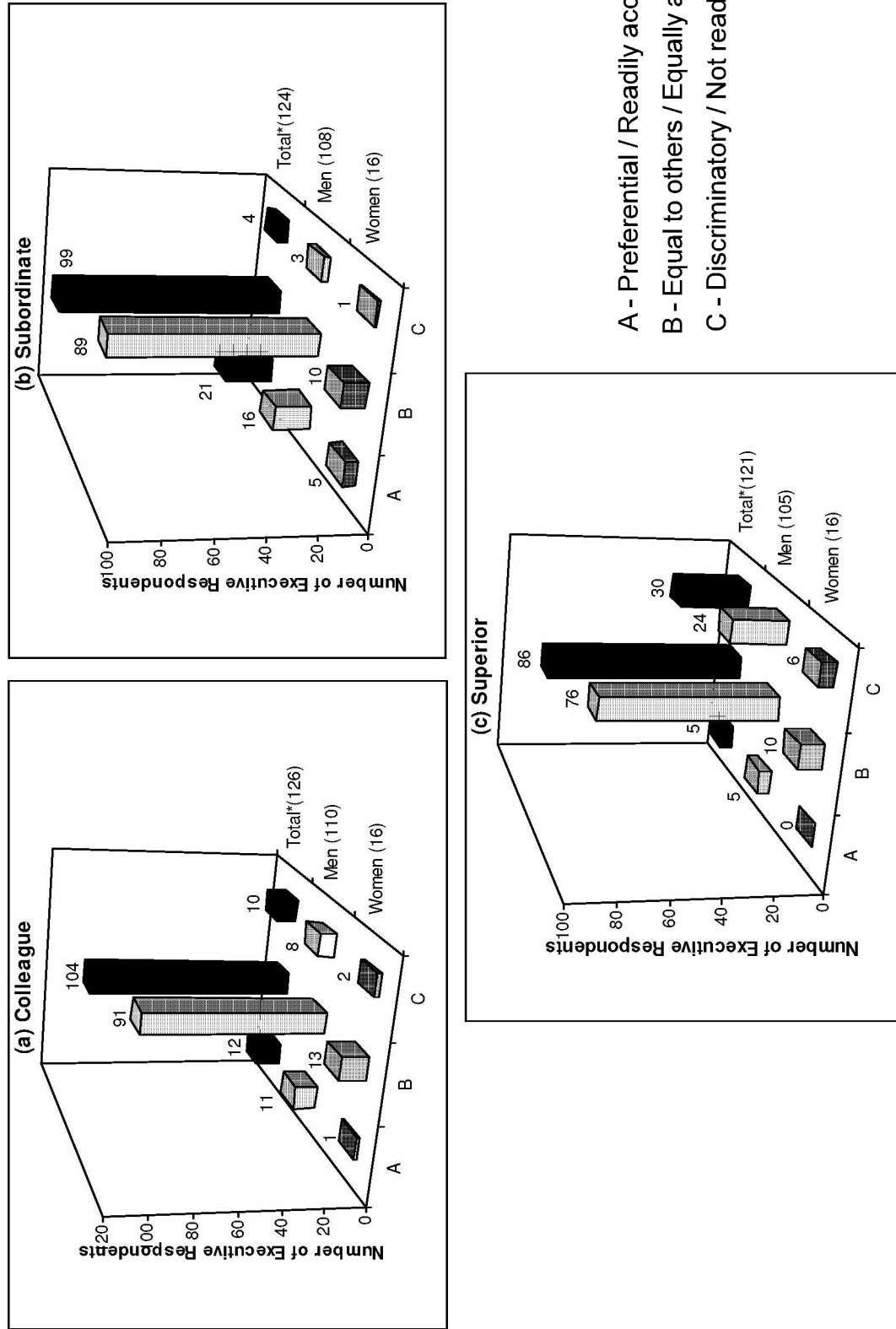
**Table-6.26d Summary of the Responses on Perception about the Treatment of Women Engineers Compared to Men Engineers in the Same Position [QU21]**

Perception About the Treatment	As a Colleague	As a Subordinate	As a Superior
Preferential/Readily accepted	12 ( 9.3)	21 ( 16.3)	5 ( 3.9)
Equal to others/Equally accepted	<b>104 ( 80.6)</b>	<b>99 ( 76.7)</b>	<b>86 ( 66.7)</b>
Discriminatory/Not readily accepted	10 ( 7.8)	4 ( 3.1)	30 ( 23.2)
No Response	3 ( 2.3)	5 ( 3.9)	8 ( 6.2)
<b>Total</b>	<b>129 (100.0)</b>	<b>129 (100.0)</b>	<b>129 (100.0)</b>

At the end of the question, a space for free expression was provided on the issue of treatment of women engineers as compared to men engineers. The respondents were requested to elaborate on their reply. A large number have responded emphasizing that there is no difference in treatment of men and women engineers. Some of the responses quoted below duly reflect this. Each quote is preceded by a code which is the reference number relating to the particular response. The code also includes the name of the state (AP, DEL, GUJ, KAR, KER, MAH and TN) and an indication whether the respondent is a man or a woman (m or w).

- 13/MAH/m *"It is a relationship between two professionals, hence no barrier for easy communication and interaction."*
- 37/MAH/m *"Competence to manage the show is more important, irrespective of the gender"*
- 60/KAR/m *"The time has now changed. No longer are women given the advantage or discriminated against."*
- 67/MAH/w *"I found my colleagues (junior as well as senior) totally asexual. I was never ever conscious of my gender even while I was in IIT (one in 2000 boys)."*

**Figure-6.9 Perception About the Treatment of Women Engineers Compared to Men Engineers in the Same Position [QU21]**



\* Total number of executives responding to the question

- 76/GUJ/m *“Women engineers are treated same as men engineers.”*
- 79/GUJ/m *“Male and female engineers in our organisation perform equally well and hence can be treated at par with male engineers.”*

Some typical responses with perception of discriminatory treatment are presented below:

- 25/GUJ/m *“Due to male ego, superior women engineer may not be readily accepted and due to limitations of working, not accepted as subordinates also.”*
- 39/AP/m *“Over the years I feel that woman by their merit have overcome discriminatory treatment given to them. However, our male dominated society is yet to accept the concept of women as boss.”*
- 77/GUJ/w *“The male colleague/subordinates/superiors are often threatened by our presence and any success bestowed upon us is inferred because of our gender, not capability.”*
- 82/GUJ/m *“Women engineers are underestimated as a colleague.”*
- 95/DEL/w *“Many men find it difficult to accept woman as their superior however better educated etc. he may be. But age difference may help.”*
- 123/GUJ/m *“Because of family reasons, men feel women cannot handle higher posts. But as subordinates they are accepted, because they are sincere.”*
- 124/MAH/w *“The attitude towards women engineers depends to a great degree on organisational policies, extent of training and job exposure, there have been some notable success (as in the case of men engineers).”*

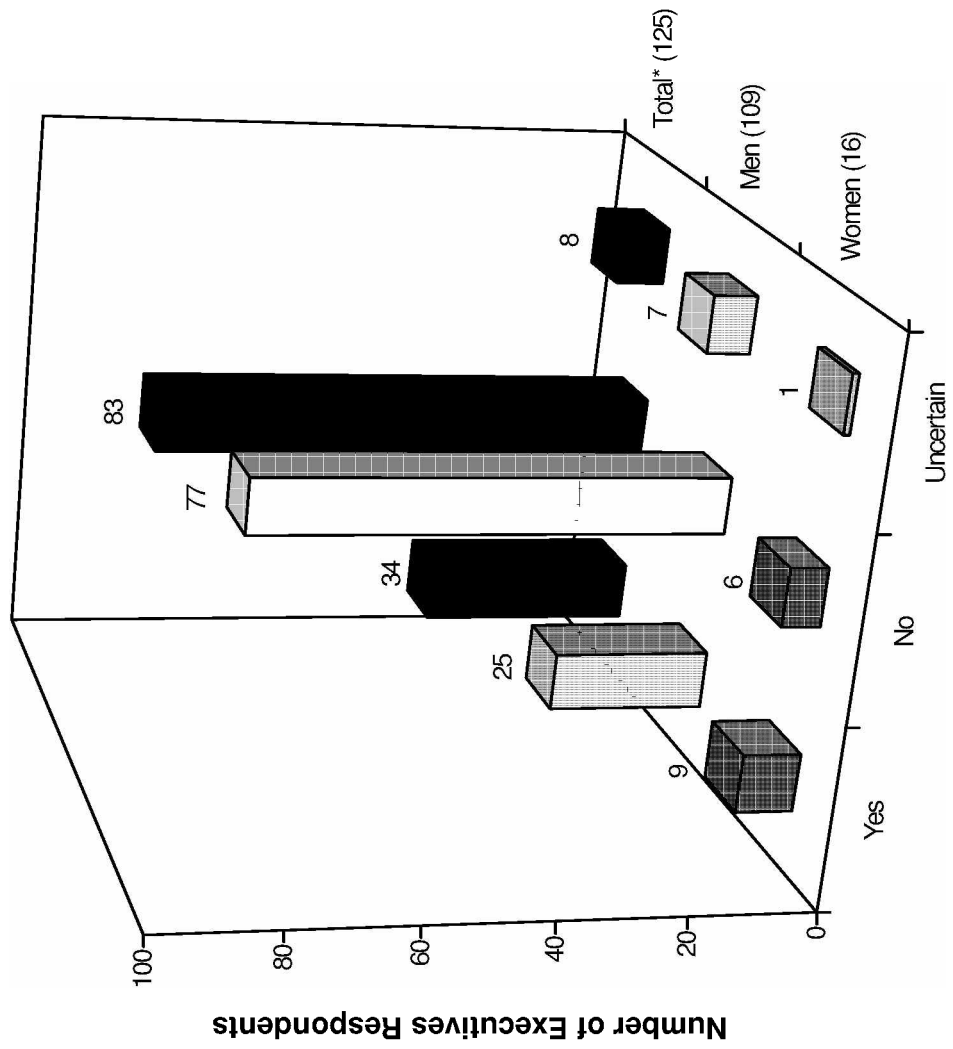
The only response with a perception of preferential treatment:

- 80/DEL/w *“Preferential treatment-mainly because of our culture and upbringing wherein we are taught to respect women. As a subordinate-because of the delicate social structure and strict law against misbehavior with women. Men are conscious to give little bit preferential treatment to women as a subordinate/senior.”*

## **Do Women Engineers have to Work Harder to Prove Themselves?**

It is often said that women engineers have to work harder to prove themselves and to earn the same credibility as men engineers in the same positions. The executives were requested to give their views based upon their own experiences. Their responses are given in Table-6.27 & Figure-6.10.

**Figure-6.10** Views on the Statement: 'Women engineers have to work harder to prove themselves to earn the same credibility as male engineers in similar positions' [QU22]



\* Total number of executives responding to the question

**Table-6.27 Views on the Statement ‘Women engineers have to work harder to prove themselves to earn the same credibility as male engineers in similar positions’ [QU22]**

<b>Women Engineers Have to Work Harder</b>	<b>Men</b>	<b>Women</b>	<b>Total</b>
Yes	25 ( 22.3)	<b>9 ( 52.9)</b>	34 ( 26.4)
No	<b>77 ( 68.7)</b>	6 ( 35.3)	<b>83 ( 63.3)</b>
Uncertain	7 ( 6.3)	1 ( 5.9)	8 ( 6.2)
No Response	3 ( 2.7)	1 ( 5.9)	4 ( 3.1)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

Although a large number of men (77 out of 112) feel that this is not a correct statement, a significant number (25 out of 112) agree to the same. Amongst women respondents, the number agreeing to the same is larger than those negating it. There does seem to be some truth in the statement and women perceive it to a greater extent.

Comments were also invited on the statement in the space provided for free expression. The comments reveal that women generally agree with the statement. They take it as a challenge and want to change this situation. This is duly reflected by the quotation presented below:

22/MAH/w *“I think women take it on themselves to prove their competency and ability.”*

Some women have taken working harder as a compliment, the same being their inherent attribute. Given below are some responses from women:

59/MAH/w *“They tend to work harder because of their commitment.”*

77/GUJ/w *“She has to constantly prove herself.”*

81/GUJ/w *“Women professionals have to work twice as hard is what I feel. (This has been my experience).”*

124/MAH/w *“This perception will change if more women engineers go into industry.”*

It is interesting to note that some women have chosen to refute the statement. A sample quote to this effect is given below:

80/DEL/w *“A good engineer is a good engineer and will remain so. Bosses in general are capable of evaluating the ‘worth’ of their juniors.”*

27 men have provided comments in the space for free expressions and many of them have agreed to the statement. Some typical expressions from men are given below:



- 2/MAH/m *“Everyone is keen to find faults.”*
- 5/GUJ/m *“This is true for everyone who is in minority in an organisation.”*
- 13/MAH/m *“This is due to age-old misconception about the capability of a woman.”*
- 21/MAH/m *“This is because most women engineers are facing job situation in which more experienced people don’t exist to help.”*
- 82/GUJ/m *“Women engineers are under-utilised and most of them are reluctant to accept the challenges because of prevailing social conditions.”*
- 125/DEL/m *“It is an unfortunate gender bias, which still exists.”*

A comparable number of men have expressed their clear disagreement with the statement as projected by the quotes below:

- 4/KAR/m *“I do not believe this.”*
- 14/MAH/m *“Not true for educational institutes”*
- 18/KAR/m *“Both women and men engineers are recognised equally for similar efforts and jobs irrespective of the sex.”*

Some men have negated the statement while complimenting women engineers.

- 50/GUJ/m *“Women engineers are more knowledgeable and more focussed, when compared to their male counterparts.”*

Interestingly, some men respondents have negated the statement and have expressed the situation to be otherwise. They feel that women engineers being women and lesser in number attract attention and earn recognition faster than men. This is clearly indicated by the quotes given below:

- 116/MAH/m *“They are recognised faster than men being lesser in number and getting more attention.”*
- 126/TN/m *“More credibility to women compared to men if their performance is good.”*

## **Problems/Difficulties that Women Engineers Experience in the Workplace**

Perceptions were sought regarding the problems/difficulties in the workplace that are experienced by women engineers and not experienced by men engineers. A large number of men and women, 58 out of 112 men and 9 out of 17 women have affirmed existence of problems that are faced only by women engineers. A comparable number have denied existence of such problems. As such therefore the response on

this issue is a divided one (Table-6.28a). In summary, it can be stated that the response to this question is different from men and women. The responses from men are mixed; some agreeing, some disagreeing, whereas a large number of women find that the statement is true.

**Table-6.28a Do Problems/Difficulties exist that Women Engineers Experience in the Workplace and are not Experienced by Male Engineers [QU23]**

<b>Do problems exist?</b>	<b>Men</b>	<b>Women</b>	<b>Total</b>
Yes	<b>58 ( 51.8)</b>	<b>9 ( 52.9)</b>	<b>67 ( 52.0)</b>
No	52 ( 46.4)	7 ( 41.2)	59 ( 45.7)
No Response	2 ( 1.8)	1 ( 5.9)	3 ( 2.3)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

In order to obtain specific answers, comments were invited on the subject. The problems mentioned in the comments are listed in Table-6.28b along with the corresponding frequency of mention. Only problems mentioned by three or more respondents are included.

**Table-6.28b Problems/Difficulties that Women Engineers Experience in the Workplace, that are not Experienced by Male Engineers [QU23]**

<b>Problems/Difficulties</b>	<b>Count</b>	<b>Rating</b>
a) Feeling of loneliness/Being in minority/ Feeling neglected in male dominated environment	5	4
b) Improper toilet facility	3	6
c) Not being acceptable to male subordinates	6	3
d) Resentment from fellow engineers	5	4
e) Non-recognition from superiors	7	2
f) Balancing health, family & work	6	3
g) Difficulties in taking up travelling	5	4
h) Difficulties involved in late night working and working beyond office hours	<b>15</b>	<b>1</b>
i) Field work/Outdoor duty	5	4
j) Difficulty in formal and informal groups	4	5
k) Need for careful behaviour and attire	3	6
l) Need for physical hard work	3	6
m) Physical inconvenience and difficulties	4	5
n) Sexual overtones/Harassment	6	3
o) Participation in decision making	4	5
p) Need for endorsement of superior in taking difficult decision & lack of confidence	3	6

It can be seen that 15 respondents have mentioned 'Late night working and working beyond office hours' as a problem/difficulty faced by women engineers. This is the highest count. It is pertinent to mention that out of the 15 respondents mentioning this problem, only 3 are women. It is rather important to note that despite long and odd working hours, this problem is rarely mentioned in the context of professions like medicine. Doctors and nurses have to work at all hours but one does not find the requirement of late night working being considered as a serious reason for not hiring women doctors or discouraging women from taking up medical profession.

The response pattern shows that men perceive the difficulties faced by women engineers rather strongly. Affirmation concerning existence of difficulties and problems can have both positive and negative consequences. On the positive side, sensitivity towards difficulties may help making a conscious effort towards resolving the situation. On the other hand, the possibility of using the presence of problems as an excuse for not employing women engineers cannot be ruled out.

## Opportunity for Advancement of Women Engineers

Perceptions of the executives concerning 'The opportunity for advancement of women engineers as compared to their male counterparts in the same position' were sought through an objective question. Separate response was collected for lower, middle and upper management levels (Table-6.29a-6.29c). The response had to be in form of one of the three options; 'Less', 'Same' and 'Greater'. 'Same' predominated for all the three management levels. It is however necessary to note that the number of respondents under 'Same' category is largest for the middle level and smallest for the upper level. For the upper level, a significant fraction of men and women perceive the advancement opportunity of women engineers to be lesser. The fraction of women respondents who perceive lesser opportunity for women engineers is larger than the fraction of men respondents. On the other hand, none of the women respondents perceive it to be lesser for the middle management level. It is also important to note that very few men and women respondents perceive greater opportunity for advancement of women engineers.

**Table-6.29a Upper Level [QU24]**

<b>Opportunities</b>	<b>Men</b>	<b>Women</b>	<b>Total</b>
Less	35 ( 31.2)	<b>10 ( 58.8)</b>	45 ( 34.9)
Same	<b>69 ( 61.6)</b>	5 ( 29.4)	<b>74 ( 57.4)</b>
Greater	5 ( 4.5)	1 ( 5.9)	6 ( 4.6)
No Response	3 ( 2.7)	1 ( 5.9)	4 ( 3.1)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

**Table-6.29b Middle Level [QU24]**

<b>Opportunities</b>	<b>Men</b>	<b>Women</b>	<b>Total</b>
Less	9 ( 8.0)	0 ( 0.0)	9 ( 7.0)
Same	<b>99 ( 88.4)</b>	<b>15 ( 88.2)</b>	<b>114 ( 88.4)</b>
Greater	3 ( 2.7)	1 ( 5.9)	4 ( 3.1)
No Response	1 ( 0.9)	1 ( 5.9)	2 ( 1.5)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

**Table-6.29c Lower Level [QU24]**

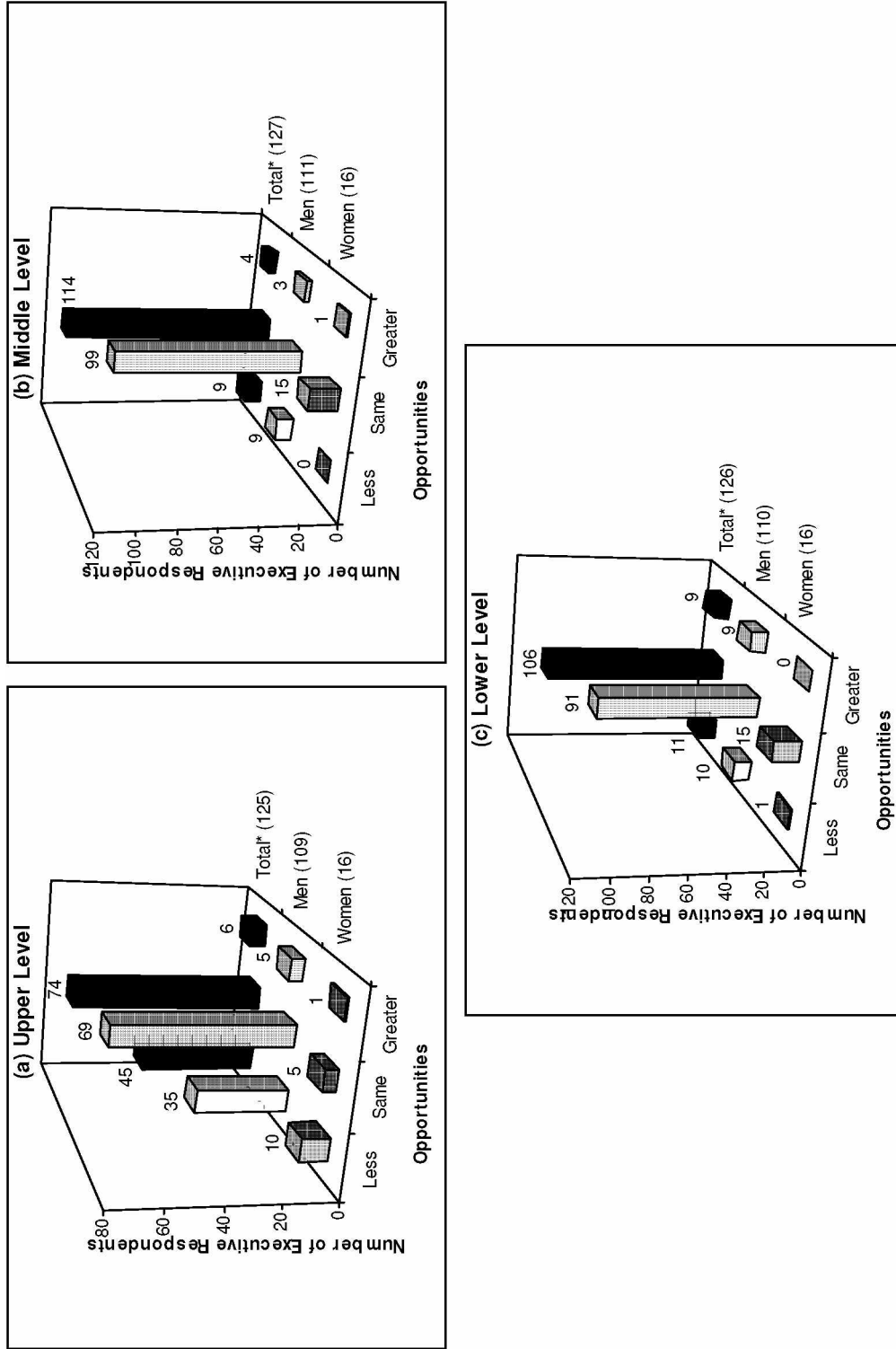
<b>Opportunities</b>	<b>Men</b>	<b>Women</b>	<b>Total</b>
Less	10 ( 8.9)	1 ( 5.9)	11 ( 8.5)
Same	<b>91 ( 81.3)</b>	<b>15 ( 88.2)</b>	<b>106 ( 82.2)</b>
Greater	9 ( 8.0)	0 ( 0.0)	9 ( 7.0)
No Response	2 ( 1.8)	1 ( 5.9)	3 ( 2.3)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

Figure-6.11a to 6.11c presents the responses concerning advancement opportunities of women engineers as compared to their male counterparts in the same position.

## **Engineering Specialisation Best Suited for Women Engineers**

'For which engineering specialisation are women best suited?' was one of the questions included in the questionnaire. The question was provided with six options; Architecture, Civil Engineering, Electrical Engineering, Electronics Engineering, Mechanical Engineering, and Computer Science and Engineering. A seventh option 'Any other' was also provided for responses which may be different from the given six options. This question has received varied response. Analysis has been based upon the count of votes received for each specialisation. Table-6.30 presents this data. The number against each of the specialisation shows the number of respondents considering it suitable for women engineers. This number includes the responses where either the given specialisation is considered as the best suited one or it is one of many. It can be seen that Computer Science and Engineering has received highest number of votes followed by Electronics Engineering. Architecture closely follows the specialisation of Electronics Engineering. Electrical Engineering having received 44 votes is the next, although much lower than Architecture.

**Figure-6.11 Opportunity for Advancement of Women Engineers as Compared to their Male Counterparts in the Same Position [QU24]**



\* Total number of executives responding to the question

**Table-6.30 Engineering Specialisation Best Suited for Women Engineers [QU25a]**

Branch	Count	Rating
a) Architecture	93	3
b) Civil Engineering	26	5
c) Computer Science/Engineering	<b>113</b>	<b>1</b>
d) Electrical Engineering	44	4
e) Electronics Engineering	98	2
f) Mechanical Engineering	18	6
g) Others	8	7

### Job or Assignment Best Suited for Women Engineers

Through another complementary question, views were sought regarding the type of job or assignment that would suit women engineers best. 12 options were provided for the response. The response to this question has been analysed in the same way as the earlier question on engineering specialisations. Table-6.31 presents this data. As per this response 'Teaching' emerges as the type of job best suited for women followed by 'Design', which in turn is closely followed by 'EDP' and 'R&D'. It is necessary to note that all these can be categorised as 'Desk type' jobs. 'Consultancy', 'Project Planning' and 'Management' are the next and have received comparable response followed by 'Finance' and 'Marketing', in that order. The least number of counts have been received by 'Production', 'Maintenance and Troubleshooting' and 'Construction/Erection/Commissioning'. These jobs are of the 'Shop-floor' or 'Field' types. This response is interesting and confirms the traditional perception of employers about unsuitability of women engineers for the shop-floor and field jobs.

**Table-6.31 Job or Assignment Best Suited for Women Engineers [QU25b]**

Job/Assignment	Count Given	Count Given	Total Count	Rating
	by Male Respondents	by Female Respondents		
a) Teaching	<b>84</b>	11	<b>95</b>	<b>1</b>
b) R&D	67	9	76	4
c) Design	75	<b>12</b>	87	2
d) Production	8	2	10	10
e) Maintenance & Troubleshooting	6	3	9	11
f) Construction/Erection/Commissioning	5	2	7	12
g) EDP/Computers	70	7	77	3
h) Consultancy	46	11	57	5
i) Project Planning	47	8	55	6
j) Marketing	30	7	37	9
k) Finance	38	6	44	8
l) Management	41	9	50	7

This data has also been analysed for the response from men and women separately. The ranking based upon the response of men remains same as that for total response. However, the response from women engineers places 'Design' as the most suitable type of job closely followed by 'Teaching' and 'Consultancy'. 'Management' and 'R&D' occupy the third place.

In the present project, women pursuing higher studies were asked a question about what they perceived as their best career plan. The number of girls who perceived R&D jobs as their preferred career plan far exceeded those perceiving a teaching career. These aspirations of women engineers regarding their preferred career plan do not match with their job status or the perceptions of the employers. This indicates that women engineers are not getting what they aspire to in terms of jobs and career opportunities.

## SPECIAL MEASURES AND POLICIES

### Company Directive/Policy to Avoid Gender Bias

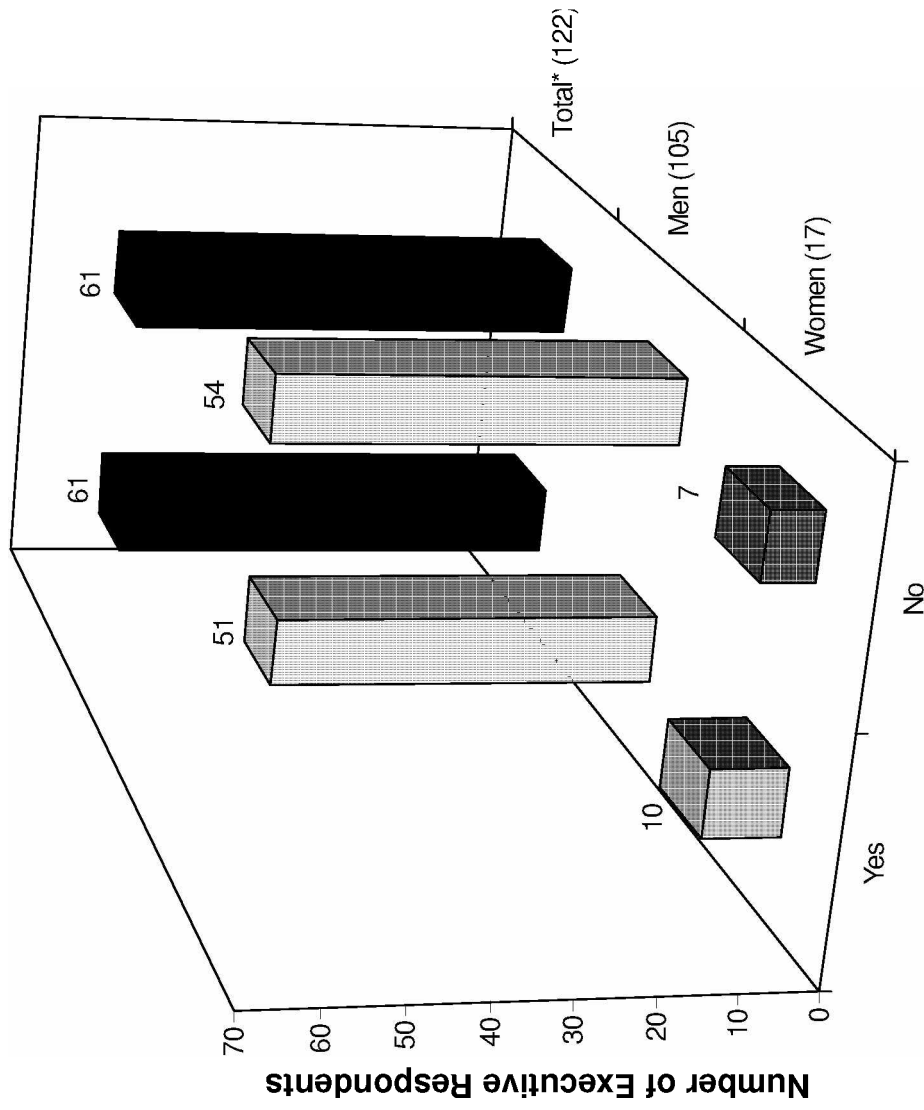
Table-6.32 presents the response regarding the 'need for having a company directive to executives involved in the process of selection of the engineering staff in order to avoid gender bias'. 54 out of 112 men respondents have opposed the need for such a directive and 7 have not responded to this question. 51 men and 10 out of 17 women respondents have affirmed the need. On an overall basis, the opinion is equally divided. The percentage of women feeling the need is larger than the percentage of men. This response reveals that quite a few employers/executives are not aware of the problems caused by gender bias in the engineering profession. They therefore do not see the need for having a company policy to avoid the same. The response is depicted in Figure-6.12.

**Table-6.32 Need for Having a Company Directive/Policy for Executives who are Engaged in the Process of Selection of Engineering Staff [QU26(a)]**

Need of Directive	Men	Women	Total
Yes	51 ( 45.5)	10 ( 58.8)	61 ( 47.3)
No	54 ( 48.2)	7 ( 41.2)	61 ( 47.3)
No Response	7 ( 6.3)	0 ( 0.0)	7 ( 5.4)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

Out of 61 respondents who have expressed that there is no need for a company directive/policy to avoid gender bias, 16 have provided comments in the reply to this question. According to them, having a company directive and policy is not necessary on the grounds of either non-existence of gender bias in their organisations or because they feel that equal opportunity to men and women is a matter of basic human right and does not need to be emphasised through a directive. Some have

**Figure-6.12** Need for having a Company Directive / Policy for Executives who are Engaged in the Process of Selection of Engineering Staff [QU26a]



\* Total number of executives responding to the question



also stated that in the interest of the organisation, merit has to be the main consideration for selection. Hence no such policies are needed. The point that has perhaps been missed by these respondents is that the said policies are needed to ensure that women are not discriminated against and not for favouring them or compromising on the merits of the candidates.

Amongst the 61 who have expressed the need for a company directive, 28 have provided comments in the space given for free expression. Need for company directives are stressed to avoid any discrimination and to recognise and appreciate capabilities of women engineers. Many have specified that the company directives should be there to exercise restraint in questioning during the interview. They feel that the management policy will definitely help remove any bias including gender bias. The presence of a woman member in the selection committee is one of the measures towards removal of gender bias during an interview. It has also been suggested that the employing organisations, in their advertisements, should mention that they are equal opportunity employers.

### Identification of Women Engineers with Managerial Potential

Executives were asked if they would 'advocate identification of women engineers with managerial potential and creation of a fast track for them?' This query was in the form of a question to which the respondents could reply with a 'Yes' or a 'No' and also in the form of their suggestions or comments on the concept. The response is tabulated in Table-6.33 and depicted in Figure-6.13.

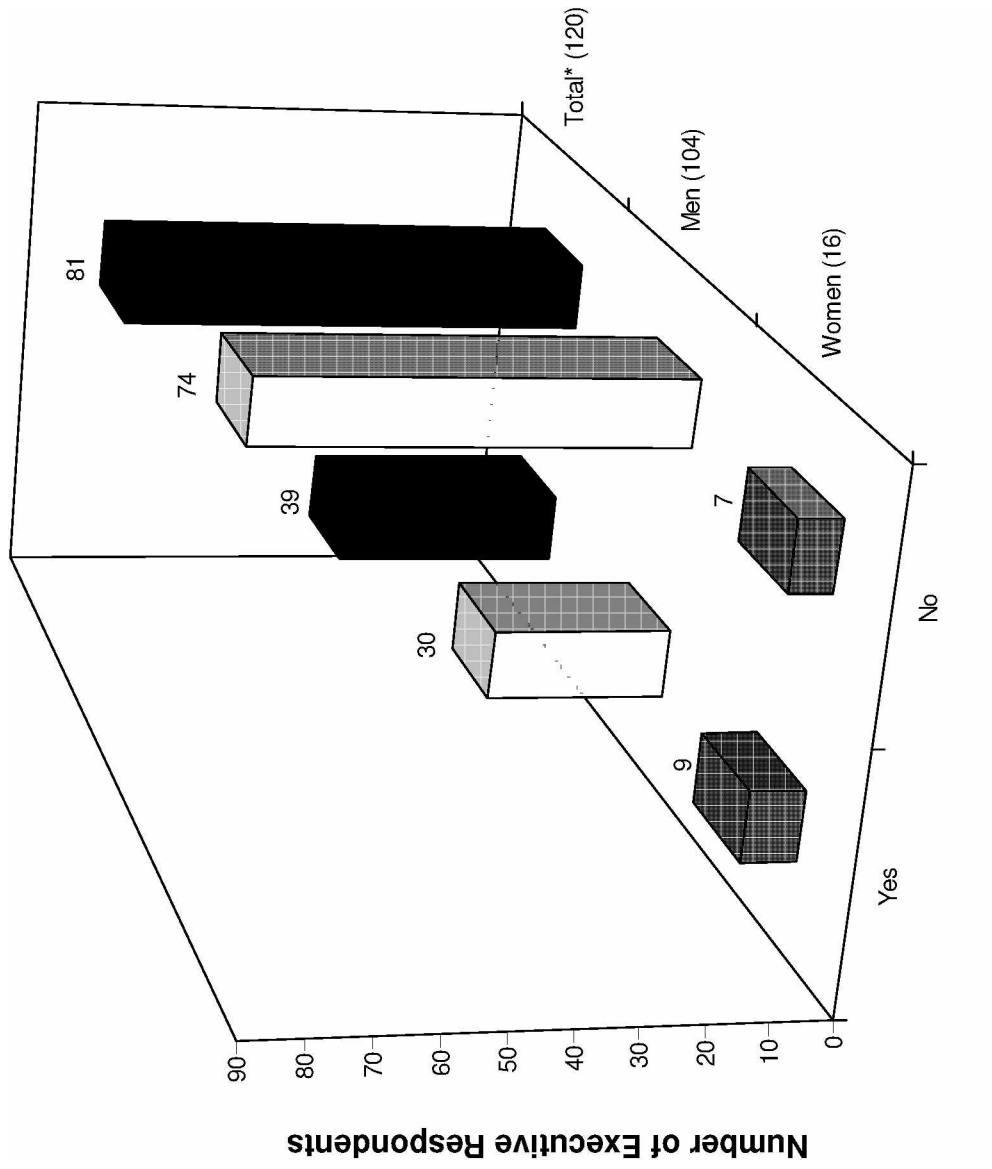
Identification of women engineers with managerial potential and creation of a fast track for them is not considered necessary by 74 out of 112 men. Similarly 7 out of 17 women also do not consider it necessary. On the whole, the answer emerges as 'No', meaning that the majority does not advocate such a provision.

**Table-6.33 Identification of Women Engineers with Managerial Potential and Creation of a Fast Track for Them [QU26(b)]**

<b>Advocated</b>	<b>Men</b>	<b>Women</b>	<b>Total</b>
Yes	30 ( 26.8)	<b>9 ( 52.9)</b>	39 ( 30.2)
No	<b>74 ( 66.1)</b>	7 ( 41.2)	<b>81 ( 62.8)</b>
No Response	8 ( 7.1)	1 ( 5.9)	9 ( 7.0)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

In all 47 respondents have provided some comments, not necessarily suggestions. Out of these 47, 16 have confirmed their negation. Those who have negated the need, seem to have done so, thinking that women in course of time, will earn their position and that there is no need for making any special provisions for them. Instead they have advocated a conscious effort of giving women engineers more exposure through training, a free hand for taking decisions and challenging tasks. 'It is not the special treatment but equal opportunities which will bring the best out of them' is emphasised. The remaining 31 who have favoured identification of women engineers with managerial potential and creation of a fast track for them have done so with a

**Figure-6.13 Identification of Women Engineers with Managerial Potential and Creation of a Fast Track for them [QU26b]**



\* Total number of executives responding to the question

perception that such a provision would enhance confidence of women engineers, motivate them and eliminate the traditional perceptions of women not being capable of handling stressful assignments.

## Low Representation of Women in the Engineering Profession

Enrollment of women in the engineering courses and the out-turn rates have rapidly increased in the last decade. Women engineers are estimated to be about 20-25% of the total annual out-turn currently. The presence of women engineers in the professional job market, however, does not match this estimate [QU27].

Respondents of the executive questionnaire were requested to comment on the possible reasons for the situation. The reasons for low presence of women received through such comments are of three types. The first type is typically women specific. Personal reasons like family priorities/responsibilities, marriage, pregnancy, children and husband's job are mentioned. Deliberate effort on the part of women engineers to be professionally inferior to their husbands, locational preferences and restrictions and lesser mobility also fall under this category. Women engineers getting married to NRIs and leaving the country is also given as a reason.

The second type of reasons can be categorised as 'personal cum professional'. Type of job and type of work, commitment of women to career and job, lack of confidence, career consciousness, career aspirations and determination, reluctance to take up jobs involving travel, preference for desk type jobs etc. fall under this category.

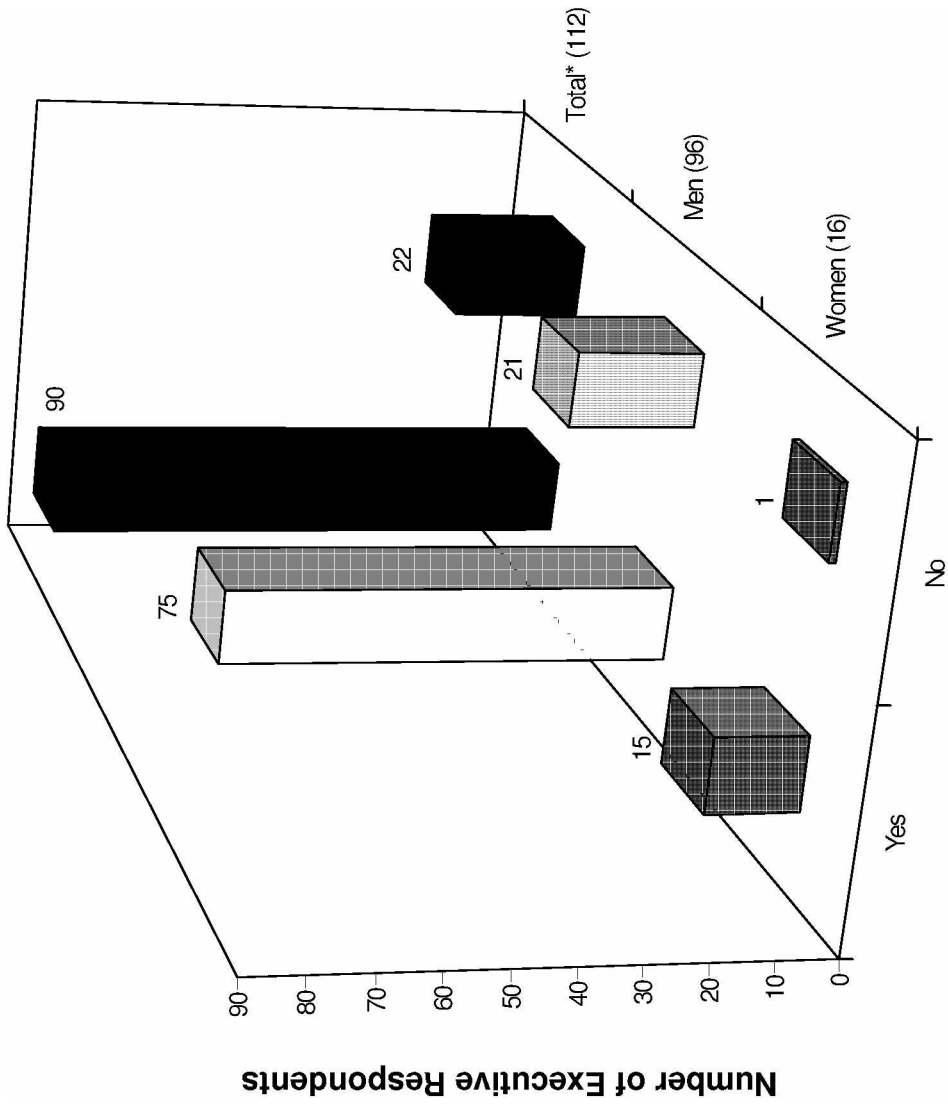
The third category of reasons relates to the attitudes of executives and employing organisations. The belief that engineering is not a field for women is prevalent even today. It severely limits the professional opportunities for women engineers. Lack of confidence of the employer in the technical competence of women engineers, misconceptions about women being physically weak and incapable of working long hours and that they are suitable only for desk type jobs like teaching, debar them from many kinds of engineering jobs.

Whether or not, it is possible to remedy the situation of low representation of women engineers in the professional job market is the logical question that follows [QU28]. The response to this question has been positive both from men and women executives. Most respondents feel that it is possible to correct the situation. Rather paradoxical is the fact that the remedial approaches suggested in previous two questions [QU26a and QU26b] are not quite agreed to but the possibility of remedying the situation is positively affirmed (Table-6.34a & Figure-6.14).

**Table-6.34a Possibility of Remedying the Situation of Low Representation of Women in the Professional Job Market [QU28]**

Remedying Possible	Men	Women	Total
Yes	75 ( 66.9)	15 ( 88.2)	90 ( 69.8)
No	21 ( 18.8)	1 ( 5.9)	22 ( 17.0)
No Response	16 ( 14.3)	1 ( 5.9)	17 ( 13.2)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

**Figure-6.14 Possibility of Remedying the Situation of Low Representation of Women in the Professional Job Market Despite Large Out-turn from Engineering Colleges [QU28]**



\* Total number of executives responding to the question

The respondents have suggested a variety of remedial measures. A list of these is presented in Table-6.34b.

**Table-6.34b Remedies for Reducing Low Representation of Women Engineers in the Job Market [QU28]**

Remedies/Solutions	Count
a) Change of social norms/socio-economic changes	25
b) Support of family/husband	13
c) Making men equally responsible for family affairs	2
d) Better education for women/compulsory education	8
e) Women engineers should be more confident/self-reliant /assertive	4
f) Women engineers should be ready to travel, work for longer hours	2
g) Women engineers should be more career minded	4
h) Women should develop their physical & mental strength to cope with society/to cope with the double commitment of family and profession	3
i) Making women engineers aware of the opportunities of employment	2
j) Women should sacrifice a little and make at least an entry into job market	2
k) Equal opportunity employers (no discrimination)	2
l) Unbiased climate of work, removal of gender bias	7
m) Assign more duties/responsibilities to women engineers	2
n) Preference for women engineers in fields considered more suited to them	2
o) Improve awareness about career of women engineers	3
p) Enhanced role of media	3
q) Need of role models	2
r) Policies to encourage women engineers	2
s) Job reservation for women	2
t) Gender sensitising of colleagues/Increase men and women interaction/Provide support system	4

The remedial measures can be classified under three categories, viz. family support, attitudes and performance of women engineers and policies and efforts of the employers. A large number feel that social norms and support of the family/husband can play a key role in increasing the visibility of women in the engineering job market. This factor also predominates as a reason for low visibility. This is really intriguing since it is a factor related to general women issues. Very little about it is specific to women in engineering. The number of working women is increasing so rapidly then why not women engineers, despite an increase in the numbers graduating with an engineering degree?

The second set of remedial measures pertains to the attitudes and attributes exhibited by women. It is suggested that women should be more confident, determined, self-reliant, assertive and career minded. They should be ready to travel and work for long hours. Determination of women to cope with the personal, societal and professional needs are the factors, which can play important role in opening of

the job market for them. Being less choosy about the job, at least at the entry level, can also help.

The situation can be remedied by having appropriate organisational policies for encouraging women engineers. To start with, even a mention that the organisation is an 'equal opportunity employer' will help. Some facilities such as placement of husband and wife in the same city, provision of accommodation near work place and flexi-timings can surely help women take up jobs, perform their dual duties proficiently and not leave jobs under stress.

Presence of role models can help in several ways including enhancing the confidence of employers in the technical competence of women engineers. Media also has an important role to play in correcting the situation. Job reservations for women engineers have also been suggested as a remedial measure.

Organisations can help in providing an unbiased climate of work, gender sensitisation through increased interaction of men and women and assigning challenging responsibilities to women engineers. In the long run, such measures will contribute towards career growth of women engineers, which in turn would further catalyse their employment as engineering professionals.

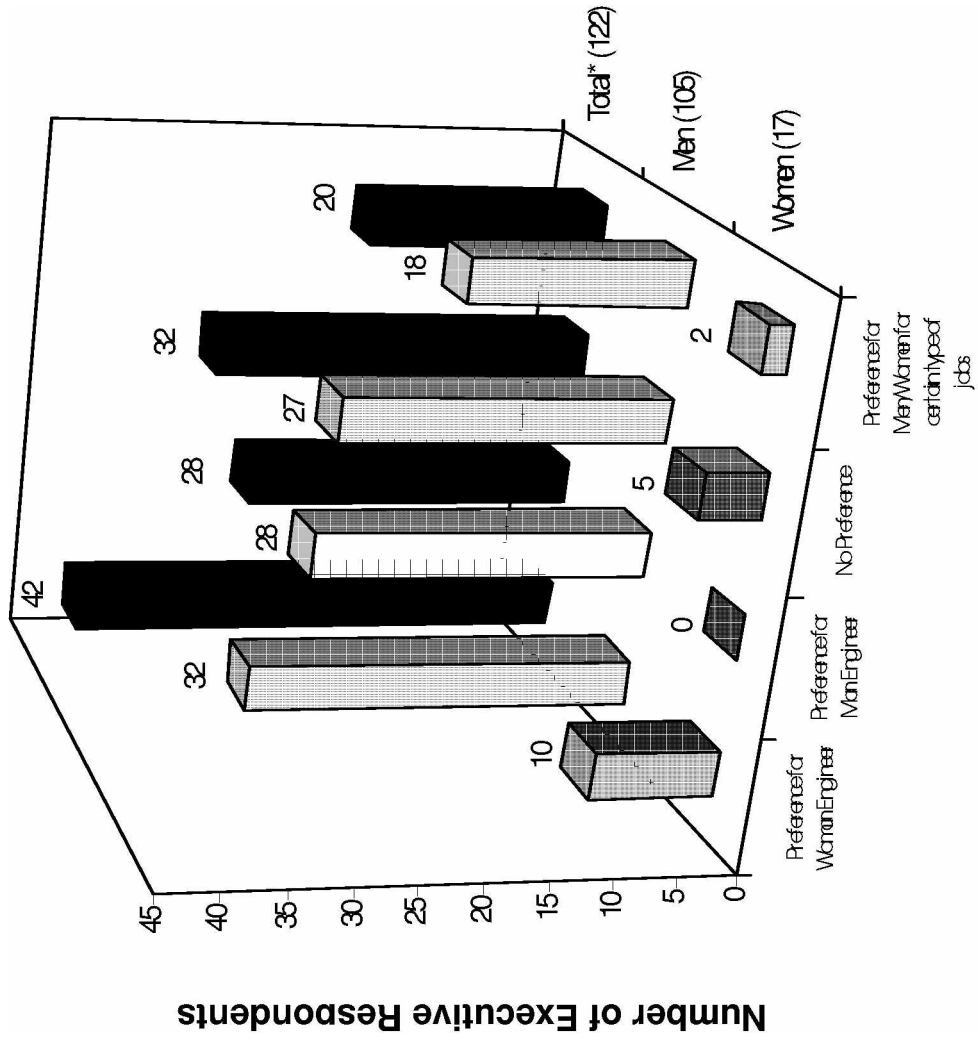
## Preference in Selection of Engineers

In a direct question, an answer was sought from the executives as to whom would they accord preference in selection, men or women, if both were equally qualified, experienced and intelligent engineering professionals? The response to this query is contained in Table-6.35 and depicted in Figure-6.15. It is to be noted that 32 out of 112 men and 10 out of 17 women have stated their preference for women engineers. It is equally important to note that none of the women respondents have stated their preference for men engineers. 'Preference for man engineer' has 25% of the responses from the men executives. 'No preference' category though lower in number, is of significant magnitude both for men as well as women executives. A fourth category, viz. preference for men/women for certain types of jobs, has emerged from the comments provided in space for free expression at the end of the question. It is important to note that 20 out of 129 respondents have indicated this preference. The overall picture painted by this response is encouraging.

**Table-6.35 Preference in Selection of Equally Qualified, Experienced and Intelligent Engineering Professionals [QU29]**

Preference for	Men	Women	Total
Woman Engineer	32 ( 28.6)	10 ( 58.8)	42 ( 32.6)
Man Engineer	28 ( 25.0)	0 ( 0.0)	28 ( 21.7)
No Preference	27 ( 24.1)	5 ( 29.4)	32 ( 24.8)
Men/Women for certain type of jobs	18 ( 16.1)	2 ( 11.8)	20 ( 15.5)
No Response	7 ( 6.2)	0 ( 0.0)	7 ( 5.4)
<b>Total</b>	<b>112 (100.0)</b>	<b>17 (100.0)</b>	<b>129 (100.0)</b>

**Figure-6.15 Preference in Selection of Equally Qualified, Experienced and Intelligent Engineering Professionals [Q129]**



*\* Total number of executives responding to the question*

On further enquiry concerning the reason for the mentioned preference, the following emerged:

- (a) Discipline, punctuality, hard work and obedience are stated to be the qualities of women engineers due to which the respondents would like to exercise a preference in their favour. Women being more dedicated and more goal-oriented is also a reason for the preference, as much as being methodical and having a balanced approach. Preference to women engineers is also due to the perception that women engineers are less corrupt and are responsible, thereby needing less supervision. Interestingly, most of the reasons or bases for which the respondents would accord a preference to a woman engineer relate to their personal attributes. None of the respondents, men or women, have expressed their preference on the basis of intelligence, technical skills, drive or initiative of women engineers. This response is indicative of the typical traditional attitudes where a woman, whether engineer or not, is perceived as an obedient, submissive individual sincerely doing her assigned job. Originality and drive are probably not expected of them. This does not quite match with response received concerning the type of job suitable for women engineers where a large number of respondents have indicated their suitability for R&D and Design.
- (b) Preference to men engineers seems to be mainly to avoid certain constraints that women engineers may have. For example, working in shifts, working under harsh conditions, lesser chance of leaving the job after marriage, site/field work, jobs involving travel are the situations for which men would be preferred to women engineers.
- (c) The 'No preference' response is based on 'Equal opportunity' and 'No discrimination' concepts. 'Only merit and competence should govern the selection of candidate' is an often expressed sentiment.
- (d) Some of the respondents have stated that they would accord preference to men or women on the basis of the type of job profile. They would prefer men for heavy physical jobs, jobs calling for late working and involving travel and transfer. They would prefer men for production, maintenance, erection and commissioning jobs and also the jobs involving control of labour. On the other hand for teaching, R&D, consultancy, computer/EDP and HRD they would prefer women engineers since the same would involve slightly less physical activities and limited interaction with labour.

## **General Observations By the Respondents**

Executives/Employers were requested to provide general inputs on the subject of women in the engineering profession through a separate question. The inputs requested were supposed to cover some issues, which in the respondent's opinion may not have been covered in the questionnaire. A variety of responses has been received. The issues raised or the opinions expressed are reflected in the quotations given below.

25/GUJ/m     *"In my opinion traditional activities in which women are involved are demanding utilising the strengths of women (gender as a whole) and*



*by no means less important for society as whole. Then why should women be involved in an activity like engineering? The question is not what women can do as an engineer but the question is why women should do it. Their strengths and skills can be better utilised in traditional activities. In USA (I have read somewhere) women are known as domestic engineer."*

- 5/GUJ/m *"In case a female engineer is employed she has to look after the family and children without active participation from the husband. This amounts to exploitation. In no case this should be encouraged."*
- 41/MAH/m *"Engineering is a knowledge-based work. If women are intelligent and have aptitude, they are equally suitable. Future work environment is going to be more of knowledge than physical (labour-oriented). Women engineers are equally acceptable in the engineering profession as male engineers."*
- 113/TN/m *"The equality between women and men is well established. There is a need to encourage them to excel in their efforts and give them opportunity to establish their abilities and rightful place in the work place and society as well."*

It can be seen that there are employers/executives who feel that women engineers should not be given jobs. There is another category that feel that the majority of the engineering jobs are now knowledge based. Women should therefore be encouraged and be given equal job opportunity. Need for women taking up engineering profession, not for its value and prestige but for commitment to profession is an advice given to women engineers. Genuine interest in the field and not the social pressure and want of social status should make them take up the engineering profession. The same is reflected by the two quotations given below:

- 14/MAH/m *"Ladies, who have aptitude and liking for the profession, should take up engineering profession. The profession should not be taken just because it sounds fascinating and prestigious."*
- 82/GUJ/m *"Women engineers in the country are underutilised and most of seats in the engineering colleges are wasted. The professional education of women engineers is for status only for getting a good match."*

The inputs below suggest that women have some inherent attributes, capabilities and also weaknesses that should be kept in mind while taking up a job or offering a job to women engineers.

- 126/TN/m *"Women engineers may not be preferred to come on duty during night and odd hours."*
- 27/GUJ/m *"Where working environment is not structured and requires considerable travelling, working for prolonged hours or unscheduled working hours etc., a woman engineer will find it difficult to maintain balance between the requirements/expectations from office and family/society."*

48/GUJ/m *“I do agree that women engineers are more competent, intelligent, possess more integrity and are more efficient than men engineers, but despite their full willingness to perform their duty perfectly they are not able to meet the requirements of the organisation in which they are employed, due to their personal and family responsibilities.”*

Importance of family responsibilities, including bringing up of children, should not be underestimated even if that means taking off from the career for a few years. Investment of the country towards education of women engineers is a reason enough for them to get equal career opportunities and women must also take it seriously.

83//GUJ/m *“For giving engineering education the government makes equal expenses for men and women. When women do not work, and it is rare that a woman works till retirement, the education expenses are wasted.”*

95/DEL/w *“In research environment it is common to see men and women participating equally in all activities with equal enthusiasm. Performance wise women are known to excel because of their zeal and commitment. Once settled in personal life, a woman can contribute in a wholesome manner.”*

QU30 proved a scope of free expression to the executive respondents to express their views on certain issues, which might not have been covered in the Questionnaire. Selected responses to this question are appended as Annexure-3 of the report. Importance of these responses lies in the fact that the overall scenario painted by these differs from the one that emerges otherwise through replies to all other questions. Reservations about employment of women engineers and overhangs of the traditional notions nurtured by the respondents are reflected with a different complexion in their quotes in the annexure.

## **SUMMARY**

### **THE RESPONDING ORGANISATIONS**

1. The response to the 'Questionnaire for Employers/Executives' has been obtained from 104 organisations. The responding organisations cover a complete spectrum, type-wise, viz. Private Industries, PSUs, TEIs, R&D organisations and other Govt. and Semi-Govt. organisations. The largest response has been received from TEIs and industries. TEIs have responded to the mailings, but industries had to be persuaded to respond through a personal approach.
2. Categorisation of the responding organisations on the basis of their activity shows that they have teaching, consultancy, design and development, and research and development or production as their predominant activities.

3. The employment data of the responding organisations shows that women engineers constitute about 21% of the engineering staff of TEIs, whereas in industries, the percentage is only 3.5%. On the whole for the 82 organisations which have provided the employment data, the percentage of women engineers works out to be only 6.1%.
4. Participation of women engineers in management is low. It decreases with increase in the level of management. Amongst all types of organisations, industries rank the lowest as far as participation of women engineers in management is concerned. It is only 7.6% at the lower management level and decreases to 2.4% at the upper level. In contrast, in TEIs the participation of women in management is relatively good. It is 22.9% at the lower management level and decreases to 5.7% at the upper level.

A positive feature of the data pertains to the R&D organisations and Govt./Semi-Govt. and Other organisations where participation of women in management does not decrease with level of management.

5. As far as formation of working groups is concerned, 85.6% of the organisations report that they have mixed working groups. Only 9 out of 104 organisations state that they have 'All men' working groups.
6. 71.1% of the responding organisations have a rating system for promotion. Out of these, 85.1% have a formal system. Almost all organisations have the same rating system for men and women engineers irrespective of the level of management. Only, three of the organisations have different rating systems for men and women.
7. Most organisations (90 out of 104) have provision for maternity leave. Only 3 have no provision and 11 have not responded to this question. The most frequent maternity leave provision ranges between 90 to 135 days. Re-entry/re-induction programmes for women after maternity leave are non-existent.
8. Special provisions for women such as flexible-time slots, option of working from home, part-time job option and availability of crèche etc., exist in a very limited number of organisations. The need for such provisions is apparently not felt by the employers. Corrective measures have to include a programme of sensitisation of the employers on these issues.
9. Only 20 out of 104 organisations have a policy regarding employment of both husband and wife. Out of these, 3 organisations discourage employment of husband and wife, while 13 encourage the same.
10. As regards having any special policy for encouraging women engineers is concerned, 88 out of 104 organisations state that they have no special policy.

## **THE RESPONDING EXECUTIVES**

11. 129 executives have responded to the questionnaire. Out of these, 17 are women. 'Administration' and 'Management' predominate as far as the nature of

responsibility of the respondents is concerned. 82 belong to the 'Upper management level', while 43 are from 'Middle management level'.

12. 112 out of the 129 executives are engineers (including 5 architects). Out of these over 60% have a post-graduate qualification. Most of them have a long working experience.

### **Views and Perceptions on Various Statements**

13. 'Women are competent enough to be successful in the engineering field'. Accepted fully by a large majority of the men respondents (80.4%) and all women executives.
14. 'It is acceptable for women to assume leadership roles in industry as often as men'. Agreed to fully by about 70% of the men and women respondents.
15. 'Women possess the self-confidence required of a competent engineer'. 67.9% of the men and 76.5% of the women 'Agree fully' with this statement. The numbers under 'Agree somewhat' category are however significant (28.7%).
16. 'To be a successful engineer, a woman does not have to sacrifice her femininity'. The majority of the respondents (68.8%) men and 94.1% women 'Agree fully' with this statement. However a significant but small number (9.3%) 'Do not agree'.
17. 'There is no difference between the experience, knowledge and interaction style of men and women engineers'. Opinion on this statement is also positive. About half (48.1%) 'Agree fully' and the other half (51.2%) 'Agree somewhat'. 'Do not agree' category is negligible.
18. 'The possibility of pregnancy does not make a woman less acceptable as an employee'. The response is mixed. 45.0% 'Agree fully', but 37.2% 'Agree somewhat' and 15.5% 'Do not agree'. Clearly the possibility of pregnancy is an issue that influences the employment of women.
19. 'A full time employed mother of pre-school children is just as good as any other employee'. Only 38.0% 'Agree fully' with this statement. 41.9% have some reservations in 'Agreeing' and 19.4% 'Do not agree'.
20. The response to the statement, 'It is equally important for a wife to have a career as to help her husband with his career' is generally positive. More than half (57.4%) 'Agree fully', while 28.7% 'Agree somewhat'.
21. Very few men and no women respondents agree with the statement 'Women engineers cannot work on the shop-floor'.
22. The opinion on the statement 'Women engineers cannot work beyond office hours and/or on weekends' is divided. A significant number of men and women (27.9%) agree, but a larger number (37.2%) do not agree with the statement. On the whole, working beyond office hours is not perceived to be a major barrier in employing women engineers.

23. 'Women cannot take up jobs involving travel'. A large majority of the men and women respondents do not see the travel needs of jobs as a barrier for employing women engineers.
24. 'Women cannot handle tough negotiations'. This statement is totally refuted by the respondents. 76.7% 'Do not agree'.
25. 'Women engineers cannot supervise male subordinates'. Supervision of male subordinates is not perceived as a problem. Almost all the respondents disagree with the statement.
26. 'Women engineers do not join the male colleagues in informal groups and there is a certain amount of self-exclusion'. 56.6% of the respondents 'Do not agree' with this statement.
27. The majority perceives fully or to some extent that 'Women cannot balance their work with their family as they would have to give priority to children'.
28. A significant fraction of men have affirmed their concern about women engineers getting married and leaving the job. Surprisingly, a significant number of women respondents has also expressed such a concern. A comparatively lesser number of men and women are concerned about women needing maternity leave. 93 out of 129 have not expressed a concern on this count.
29. Special provisions like 'Flexible time slots' for young mothers and 'Provision of crèche' have been widely supported by a majority of the respondents. On the other hand, their views regarding provisions like 'Working from home' and 'Part-time job option' are divided.
30. A majority of the executives, both men and women, involved in interviewing and recruitment process do not seem to be aware of the legal implications of women being questioned differently at the interview. A definite awareness programme in this respect seems to be a necessity.
31. Most of the executives do not think there is any difference in the skills and characteristics of men and women engineers. Nevertheless, on further enquiry, they have given a long list of men-specific and women-specific qualities.
32. Women have been rated 'Same as men engineers' with regards to 'Technical skills' by a majority of the respondents, men as well as women. Although 'Same as men engineers' predominates with respect to other performance facets also, a significant number of men find the performance of women engineers 'Lesser than men engineers' with regards to 'Supervision'. A significant number feel that they are 'Better than men engineers' with respect to 'Interpersonal skills', 'Public Relations' and 'Communication'. As regards 'Overall suitability' almost all respondents have rated women 'Same as men engineers'.
33. A majority of executives perceive that there is no 'Adverse influence of role of women engineers as women' on their 'Job assignment & responsibilities', 'Job Performance' and 'Advancement opportunity'. The experience seems to be that women engineers do not allow their job responsibility to be affected by their

personal responsibilities. The data also reveals that some women refuse professional opportunities to cater to family needs rather than accepting the same and not performing adequately.

34. The responding executives feel that women engineers are treated equal to others and are accepted as equals. This is true whether they are colleagues in the work places, subordinates or superiors. There are only a few responses, which mention 'Discriminatory' or 'Preferential treatment'.
35. The statement 'Women engineers have to work harder to prove themselves to earn the same credibility as male engineers in similar positions' has received mixed response. Whereas a very large number of men do not find the statement correct, the same is not the case with women. This is reflected in the data as well as through the comments provided by the respondents.
36. There is a mixed response in regards to the existence of problems/difficulties that women engineers experience in the work place. Difficulties involved in late night working and working beyond office hours have been mentioned most frequently along with many other personal, inter-personal and professional problems.
37. 'Opportunity for advancement' for women engineers is perceived equal by majority of the respondents for the middle and lower management levels. However, it is not so strongly reflected for the upper management level where significant numbers perceive lesser opportunity for advancement of women engineers.
38. Computer Science/Engineering has been considered as the specialisation best suited for women followed by Electronics Engineering and Architecture.
39. Teaching emerges as the job best suited for women engineers followed by Design, EDP and R&D, in that order.

### **Special Measures and Policies**

40. Opinion regarding the need for having a company directive to avoid gender bias in the process of selection of engineering staff is equally divided. Negation is based on the premise that selection has to be merit-based and does not need any policies. On the other hand, advocates of a company directive stress the need for the same so that any discrimination against women engineers can be avoided. Amongst several suggestions given by the respondents, two important ones are; (i) to have a women member in the selection committee and (ii) to mention in the advertisements that the company is an 'equal opportunity employer'.
41. A majority of the respondents do not find it necessary to identify women engineers with managerial potentials and to create a fast track for them. The premise is that equal opportunity and not special treatment will bring the best out of them.

42. Respondents feel that the reasons for low visibility of women in the engineering job market are of three types: typically women-specific personal reasons, personal-cum-professional reasons and reasons related to the work environment and attitudes of the employer.

A majority of the respondents feel that it is possible to correct this scenario of low visibility of women in the engineering job market. In order to do so, inputs have to come from the family, from women themselves and also from the employers. The family has to provide support, women engineers have to perform and the employers have to formulate policies to avoid any bias against women.

Regarding the possibility of giving preference in selection to men or women if both were equally qualified and experienced professionals, a larger number of respondents have expressed their preference for a woman engineer. Discipline, punctuality, hard work and obedience are stated to be qualities of women engineers due to which respondents would like to exercise a preference in their favour.

## Chapter – 7

### **RECOMMENDATIONS FOR ACTION**

This study is a follow-up to the previous detailed broad-based study on the participation of women in the engineering courses and in the engineering profession, conducted about decade ago, for the period 1975-90. It was established then that the percentage of women taking up engineering had increased from around 1% in 1975 to about 10% in 1990. The study also indicated that the engineering job market was not open to accepting women as engineering professionals. Over 26% of them were unemployed. The unemployment problem manifested itself more severely in the states and in the branches having higher enrollment rates and a larger population of women engineers. It was found that job opportunities for women engineers were limited in terms of sector of employment and that the pace of their career growth was rather slow.

The enrollment rate of women in the engineering courses has increased enormously since then. Indications are that it has crossed the 30% level. Taking into account the fact that there has been a substantial increase in the number of engineering colleges, the annual out-turn of women engineers has increased many fold. Compared to the previous years, the population of women engineers is increasing at a much higher pace. If the previously established job and career problems were to continue, they could adversely influence the participation of women in the engineering profession. It was therefore considered necessary to determine the current job and career co-ordinates of women engineers. The present study was designed to be an exercise to re-assess the employment and career status under the changed scenario. Women engineering graduates of the years 1994-98 from seven specified states and six branches of specialisation, constituted the study sample of this exercise.

An additional and important intent of the current study was to probe the reasons for the non-acceptability of women as engineering professionals. For this purpose, employers'/ executives' viewpoints on hiring women engineers were obtained and the reasons for their reluctance or hesitation analysed.

The corrective measures listed below have emerged from the inferences drawn from the analysis and the findings in regards to the job and career status.

The estimated out-turn for the year 1998, the last year of the duration chosen for the present study, is 24,900. This is nearly 10 times the estimate for the year 1990. The total out-turn for the chosen period is estimated to be 99,500 which is five times the estimate of the total national stock in 1990. The unemployed fraction in the present study is found to be 30.6%, which corresponds to about 30,000 women. The importance of the present initiative and the urgency for formulation of appropriate



corrective measures is thus apparent. Although there are no simple solutions to such socio-technical problems, nevertheless, attempts to tackle the same are certainly warranted. The problems will need to be tackled on many fronts and on a continuing basis. It will be necessary to adopt a multi-pronged approach involving both governmental and non-governmental agencies.

Even employed women engineers have a difficult time within the profession. Being assigned mundane work not quite commensurate with their qualifications and capabilities is common. Such problems originate from the prevalent traditional value system and notions about the capabilities of women. This mars their career growth. There is an urgent need to infuse certain value changes.

Data and analysis of the present study and the findings of the previous study clearly establish that the subject of women in engineering is beset by variety of issues and problems. The problems relating to their participation in the engineering courses are now receding as evinced by a rapid increase in the enrollment rates. The problems relating to the job and career still persist and are on the increase. Interview, employment, career growth etc. are the component issues. The controlling aspects of this domain include 'employers' viewpoint', 'organisational policies', 'atmosphere at work place', 'attitudes of the colleagues' and the 'attitudes of women engineers themselves'. Values nurtured by the parents/family also constitute an element of importance in this context.

Limited acceptance of women in the engineering profession gives rise to problems like not being called for interview, facing embarrassing questions during interviews, not being assigned interesting work and not being professionally rewarded in terms of career advancement. Even today numerous employers announce that women are not to apply for their jobs. They are turned away and are not even interviewed by these organisations. This has been reported to be a very frequent occurrence in campus interviews. Such discriminatory practice certainly needs to be curbed through proper instruments. The discrimination starts at the time of issuing calls for interviews. Even if a call is issued, embarrassing questions are asked to the girls at the interview. In the end, the job is not offered to them in most cases. If some fortunate women do happen to get a job, they are frustrated by lack of interesting assignments and by the slower pace of professional growth. Immediate corrective measures are warranted to stop such happenings.

Given below is a list of recommendations about the corrective measures required in respect of job and career problems. These have emerged from the findings of the study and the suggestions made by the participants, both the women engineers and the employers/executives. Some of the suggested measures are the same as in the previous study.

## **AWARENESS PROGRAMME FOR EMPLOYERS**

Education of employers and creation of awareness amongst employers about the capabilities of women engineers can play an important role. Such awareness programmes should be in the form of multi-faceted campaigns conducted through popular media channels. Publicising the success stories of women engineers

through the media will help the situation with regard to women securing a job, assignment of interesting work and therefore pace of career advancement.

The mushrooming of new engineering colleges has resulted in the starting of many new courses. Many a time new course names are used with only marginally changed course contents. Employers not being aware of these names and the contents of these courses leave the graduates without a job. It is necessary that the employers are duly educated on this aspect and are made aware of the names and contents of such new and lesser-known courses. This will delete at least one of numerous factors hindering the entry of women in the engineering profession.

#### AWARENESS PROGRAMME FOR PARENTS AND SOCIETY

Amongst the reasons for not being able to get a job, parental constraints figure quite prominently. In fact, the same is mentioned much more vehemently and frequently than problems like lack of job opportunity, lack of experience, lack of accommodation and other physical facilities, etc.

Many parents equip their girls with an engineering degree only to make them eligible for a good match. They are not interested in their daughter getting a job. They do not even permit them to apply for a job. Such girls can seek a job only after marriage. They remain without a job while waiting for marriage.

Parents are reluctant to send their daughter alone for interviews. Either the father or the brother has to accompany her. This makes it expensive and infeasible due to several reasons including financial constraints. If she somehow does manage to secure a job, the parents are not willing to let her stay alone in a distant unknown place.

For the girls who do not even make efforts to get a job, none other but they themselves and their parents are responsible for their unemployment. The only corrective action that can be recommended in such cases is to conduct education and awareness programmes for parents. The media can be the only route through which this can be accomplished, again through publicising of success stories.

#### ADEQUATE REPRESENTATION OF WOMEN

Certain regulatory approaches need to be adopted to ensure that an adequate number of women engineers are employed in different types of organisations. A mandatory annual statement of employment of engineering staff with a specific mention regarding the number and percentage of women engineers employed could help. This is a passive approach that would make the existence of women engineers known to the employer and put them on guard.

An active regulatory control could consist in instituting a requirement that a certain number of engineering staff has to be women. The investigators do not think this to be a desirable approach. The respondents, however, have strongly expressed that reservation at the college level should be sequenced with job reservation. If the

passive approach proves ineffective, this maybe considered in view of the large number and percentage of women engineers remaining unemployed.

## CAREER GUIDANCE

Many women respondents have stated the lack of career guidance to be one of the main reasons for not being able to secure a job. They belong to small towns and have little access to information about jobs and the process of getting a job. Such guidance is rarely available from the family. They do not know where to apply, how to apply and how to perform in an interview. Professional help in this regard is an earnest necessity. Respondents have stressed the necessity of active career guidance centres on each campus. Such special cells may also be established external to the teaching institutions, city-wise. Establishing such centres, is a necessary step which should be taken up immediately.

## CAMPUS INTERVIEWS

Many of the participants of the study report that they have never attended a campus interview, as their college did not have campus selections. This is a very detrimental situation and needs to be remedied. Women engineers residing in small towns and distant places are unable to reach venues of interviews. Once they get their degree and leave the college, they practically leave the profession. Such women could be really helped in securing a job through campus interviews. This can happen only if there are campus interviews and women are given the opportunity to attend the same. College authorities may need to be educated on the issue. Colleges must make a deliberate effort to get as many employers as possible for campus interviews. Such an effort would definitely help those who otherwise have no other access to interviews after leaving the college.

A regulatory requirement may need to be imposed on the colleges to have a certain minimum number of campus interviews and to make sure that girls are not denied opportunities to appear in the same. They should be required to submit an annual record of this data to an appropriate office.

## JOB MARTS

Organisation of periodic well-publicised 'Job Marts', attended by employers is a technique used in the West. In such events, the employers are invited, resumes are circulated, interviews are held and the employment process is initiated for entry-level jobs. These could be organised by groups of colleges for the boys and girls still in college. Professional bodies like the Institution of Engineers, Industries Associations and bodies like CII have been suggested to make this approach effective and fruitful.

## INTERVIEWS AND EXAMINATIONS FOR JOBS

Examination centres or government jobs are located only in bigger cities. The same is true for the venues of tests and group discussions for big companies. Distantly located girls are not able to reach these places. Expenses involved in travel and stay at the location proves to be a serious constraint. Parents being reluctant to send a

girl alone and wanting to accompany her add to the expenses and make the situation worse. Thus a distant place of interview becomes a real hindrance in getting a job. Many girls remain without a job due to this reason. It has been strongly suggested that the number of centres for examinations and interviews be increased to ease the approach to the same, at least in the case of government jobs.

## PRESENCE OF A WOMAN MEMBER IN INTERVIEW BOARDS

The presence of a woman member in interview boards is a practice adopted by some organisations. Such a practice can prove potentially beneficial in preventing undesirable situations reported by many women engineers. This should be made mandatory particularly for situations involving large-scale recruitment.

## COMPULSORY APPRENTICESHIP FOR EXPERIENCE AND EXPOSURE

Numerous respondents have expressed the view that the present curriculum and course contents are nowhere near the real life situation. They strongly suggest that either a very strong industrial training programme should constitute a part of the curriculum or the degree programme should be followed by a compulsory apprenticeship period similar to that in medical sciences to help them get prepared for a job.

Experience has become a pre-requisite for getting a job. No job, no experience and no experience, no job. This is true for IT jobs also. The situation could partially be resolved through having the suggested apprenticeship period. It could help women engineers gain some experience and exposure to real life situations. This may or may not fetch them a job but will surely prepare them for a job. Implementation of such a scheme will mean involvement of all categories of employing organisations through regulatory requirements of accommodating a specified minimum number for training.

## PHYSICAL FACILITIES FOR WOMEN ENGINEERS

### Accommodation

Many women engineers remain unemployed due to lack of suitable accommodation near the place of work. Parents generally do not permit their wards to take up a job unless they are sure of their safety and security. This has been expressed by a very large number of participants of this study. Provision of accommodation near the workplace becomes crucial in this context. It would improve the employment opportunity for women engineers from distant places, small towns and villages. Setting up a chain of working women's hostel emerges as an immediate and essential requirement in this regard.

### Child-care facilities and crèches

Another problem, which is often faced by married women engineers, is the lack of professional child-care facilities. These facilities include crèches for small children as well as 'out of school' care in the early mornings, late afternoons and during school

holidays for the school age children. Rarely are such facilities available in our country. This aspect needs careful attention.

## ORGANISATIONAL PROVISIONS AND POLICIES

Formulation of positive steps to encourage women engineers has to receive attention from many quarters. Presently, the work format is so designed that a person works for thirty or more years, five or six days a week in office or factory, the domestic needs being taken care of by another individual, usually the wife. This work format applies to all may it be a foundry engineer or a university professor. It does not accommodate the needs of a woman professional. The following organisational provisions would help women professionals.

### Leave and flexible working hours

Modifications in certain rules will greatly help women professionals to cope with their dual responsibility of home and the profession. Sanctioning of leave upto one year (twice in the professional career) and flexible working hours are recommended on this count. These facilities are relevant to the child bearing and rearing period.

### Part-time job and working from home option

At least for some years of her life, a woman engineer needs to be provided with the option of part-time job. With the upsurge of IT, working from home is an accepted practice in most advanced countries. It is non-existent in India so far. The culture of working from home must also be brought in and practised at least by the relevant sectors of employment.

### Employment and transfers of husband and wife

The organisational policies should support employment of both husband and wife and their transfers together. Rules regarding employment and transfer similar to those practised in Administrative Services should be made applicable. Such policies would enable married couples in transferable jobs to live together.

Such policies would also help in minimising the hesitation of the employers regarding a woman engineer getting married and leaving a job.

### Equal opportunity

Every employer should have an organisational directive to avoid gender bias in the process of selection of engineering staff. The directive should stress the need for avoiding any discrimination against women engineers. In the advertisement for jobs, a mention that the organisation is an 'Equal opportunity employer' should become mandatory.

### Questions asked at interviews

Executives both men and women, involved in interviewing and recruitment process should be made aware of the legal implications of women being questioned

differently at the interview. Definite programmes in this respect are necessary and should be taken up.

### Shop-floor and field jobs

Working on shop-floor and at the field sites implies exposure to real life situations. No amount of training can substitute this kind of job experience. Such experience and exposure helps an engineer in making proper career choices. Debarring women from such assignments under the presumption that women engineers do not suit such assignment, amounts to denying them to have a basic professional foundation. This is harmful for their career development. Those women engineers who opt for such jobs must be considered and offered the same, subject to their merits. A programme of sensitisation of employers on such professional and career issues is strongly recommended.

### MEMBERSHIP OF PROFESSIONAL BODIES

It has been found that most of the women engineers, at the time of graduation, are practically unaware of existence of professional bodies and their activities. This is true for men engineer also. Professional bodies are the forums which provide a congenial atmosphere conducive for networking and social mixing. Networking and mixing are potential contributors to career growth and advancement.

Participation in the activities of professional bodies can be of help in several ways in growth and advancement of career. It helps in keeping abreast with the latest technological developments and remaining in touch with peers and leaders of the field.

Colleges need to make deliberate efforts to create such awareness. Students need to be educated about the important role such bodies can play in helping them secure a job and later in advancement of their career through networking. Having student chapters of reputed bodies on the campus is one such measure recommended in this respect.

### INSTITUTION OF PRIZES AND AWARDS

It is important that women engineers are encouraged and helped to establish themselves as professionals. They need to be given opportunities to enhance their professional image through the institution of prizes and awards for their contributions. This will immensely contribute to creating awareness amongst employers, parents, teachers and school girls themselves.

### ROLE OF THE NATIONAL COMMISSION ON WOMEN IN CORRECTING THE SITUATION

Strategic planning at the grass roots level through a national body has been widely advocated in the context of the above recommendations. The National Commission on Women should address the issues concerning women engineers. Initiating

corrective approaches, ensuring their implementation and monitoring the effectiveness of the approaches will need to be taken up as activities of the Commission.

#### FORMATION OF A FORUM OF WOMEN ENGINEERS

The formation of a forum of women engineers (with chapters in each state), which can take up the issues, related to women engineers has been often suggested. It is a long felt urgent need, which needs to be attended to without any delay. This forum should take up the organisation of meetings and workshops on various facets on the subject of women in engineering. Maintaining a website with links to job lists and a resume bank are also some of the potentially beneficial activities that the forum can take up for helping women engineers. This in turn would help in creating awareness and in getting employment to women engineers.

## **ANNEXURE-1**

### **ESTIMATE OF THE NATIONAL STOCK OF WOMEN ENGINEERS OF THE SAMPLE DEFINITION**



## ESTIMATE OF THE NATIONAL STOCK OF WOMEN ENGINEERS OF THE SAMPLE DEFINITION

The estimate given below is based upon the enrollment data of the Technical Educational Institutions (TEIs), published by UGC and DST [4, 5, 6].

Enrollment Year	Graduation Year	Number of Women Enrolled in the Engineering Courses in the Country
1990-91	1994	17,100
1991-92	1995	18,300
1992-93	1996	19,200
1993-94	1997	20,000
1994-95	1998	24,900
Total		99,500

Considering that the sample definition includes only the selected states and branches of specialisations, the estimated size of the globe conforming to the sample definition works out to be between 55,000 to 65,000.

Estimated out-turn of women engineers during 1994-98 (on a nationwide basis and taking into account all branches)	99,500
Estimate of the globe for the sample definition	60,000 (100.00%)
Total number of the sample members located (TS)	11,778 ( 19.63%)
Number with whom a direct contact was established (DS)	2,310 ( 3.85%) = 19.61% of TS
Number from whom the Questionnaire Response Received (QRS)	1,020 ( 1.70%) = 44.15% of DS
and	8.66% of TS

Though QRS is 1.7% of the estimated Globe, it is 19.61% of TS and 44.15% of the DS. Similarity of the state-wise, branch-wise and graduation year-wise distribution pattern given in Chapter-2 amply demonstrates that QRS is a representative sample of the TS and DS. Thus the inferences drawn on the basis of analysis of the data received from the QRS members can be assumed to be representative of the overall scenario.

## **ANNEXURE-2**

**FROM THE WOMEN ENGINEERS  
– IN THEIR OWN WORDS**

## FROM THE WOMEN ENGINEERS – IN THEIR OWN WORDS

Given below are some views expressed by the women engineer participants of this study. Out of about 1000 such expressions, the following have been selected to convey their views and sentiments on certain issues arising out of their experiences of being in the profession; as students, as job seekers and also as employed professionals. The facets covered in the quotes are their perceptions regarding their current job and career status and the factors responsible for the same. Many aspects that were not touched in questionnaire have surfaced through these quotes. Amongst these, the parental constraints and societal restrictions have been found to be hindering the entry and progress of women as engineering professionals. New course names, absence of campus interviews in newer distant colleges, requirements of a bond for jobs, corruption and unofficial payment requirements for jobs, payment requirements for training periods etc. are some of the added facets which seem to be some of the serious impediments in the career path of women engineers. These are not too many quotes! These reflect too many undocumented issues and problems with crying need for attention. Sadly, many of these do not have unique and simple solutions!! However knowing the problem in all its dimensions is as important. Hence the inclusion as below.

The quotes have been organised on the basis of the issues they raise, starting with the appreciation and criticism in regards to the questionnaire and the study. Numerous respondents have appreciated the educative value of the questionnaire whereas as many have identified shortcomings of the questionnaire. Going through the questionnaire has made them think about their job and career in a manner that had never occurred to them earlier. The same is also projected through the quotes presented below;

### ABOUT THE QUESTIONNAIRE

- 155/GUJ/CV/98 *“The questionnaire should contain some more questions regarding the kind of job women would be interested in taking up. Also it should contain some questions regarding their contribution to their family financially. Some questions regarding the attitudes of their family members and male friends or colleagues towards them may be added. This would portray the actual extent to which women have been accepted in the work place.”*
- 305/TN/EL/98 *“A column can be provided for the employees who are working as professionals and are also trying for higher studies. There may be some people like me, where we have an idea of undergoing higher studies either part time or through correspondence. Other than this, the questionnaire really helps to know the information needed for the study. It’s really a very good project and I am ready to help with all information that I know in order to make this project a grand success. On behalf of my friends, I congratulate you for taking this project, which will help us to know better. I am eager to know the results of the project.”*
- 399/GUJ/ME/95 *“Glad to receive such nice information/queries. If you further want to extend your work upto ‘Women in UG programme’ you can contact me at the given address. Also let me know that whether the same topic can be taken as a Ph.D. work?”*

- 336/GUJ/AR/95 *"I feel you should also cover academic life regarding how professors regard female students, how fellow male students regard female colleagues. Sometimes I feel a lot of prejudices and biases are formed at home, from parents, relatives etc., girls and boys form perceptions of accepted social type roles, professional or otherwise, from home. It might help to discuss this aspect with women?"*
- 566/MAH/CV/96 *"I am a self-employed woman and did not find anything in the part III, it implies that you have not considered a possibility that women can do business of her own in the short span of 4 years i.e. (since 94). But certainly I would be glad to give you any other information needed by you. Till now I am not a member of any professional society/associations but would like to be member of one. The study you have undertaken is very welcome. It is a long pending need."*
- 1000/DEL/AR/94 *"Questionnaire is quite detailed and it has given me ample time for self-assessment and analysis, which is very much required in today's life, which is ever changing with each day. It has given me a good chance to rearrange priorities (both professionally and personally) especially now when my marriage is going to be 2 years old."*
- 1013/TN/CV/97 *"I belong to Architecture field, which is different from engineering field. It is a 5 year course whereas engineering is 4 year course. Questionnaire could have been slightly different taking care of Architecture students. Here few questions were not applicable to us, and few, which were related to us, were not taken into consideration."*

## **ABOUT THE STUDY**

- 188/MAH/EN/98 *"In my opinion the study which you are carrying is a very good project and it is actually making the women engineers to think more deeply about her career and if you provide suggestions and if you draw proper conclusions and if you let it be know to us, it will be useful to us."*
- 505/MAH/EN/98 *"I congratulate you for taking up this project and I deeply appreciate the efforts put in by you. During my engineering studies I came across many women engineers studying with me. I observed one thing in many of them that they were sincerely interested in making a good professional career for themselves. It was not that, their parents have sent them to the college and so they are there. Instead they planned it that way. I somewhat agree, with you that there are limited career opportunities for women engineers, but at the same time, I feel that women engineers are also trying to explore the other possibilities in which their engineering degree will help them a lot."*
- 808/KAR/CV/98 *"I would like to know your opinion about working women since you are also a professional and well placed. After filling this questionnaire, I have one more doubt, whether this will be useful for me or not. If useful then in what way, if I am not benefitted it is O.K. but in what way you are being benefitted after going through this questionnaire. If you get the statistics of working women from all over India will you be able to help those girls who are not employed. If yes, let me know."*

963/DEL/CV/97 *"The programmes like the one that you are carrying out and this research are supportive to the extent of providing the right initiative towards a better opportunity for women in the engineering profession. But what is really required is a positive approach to women both in the professional and academic circles. I remember one of my workshop laboratory co-ordinators actually saying 'Women are not fit for engineering' - if this is the attitude of the people who make us engineers, I don't see how we can look forward to co-operation and support from our colleagues."*

## **NEW COLLEGES / LESSER KNOWN COURSE NAMES / INADEQUATE COURSE CONTENTS**

### **Private Engineering College / No campus Interview**

162/MAH/CS/98 *"In questionnaire you asked why you weren't called/invited for interview? We are graduates of NMU (North Maharashtra University), people will give us job by seeing name of university and having no experience but until someone gives us a single job then how can we get experience. And at our college there is no campus interviews like at Poona or Bombay so in questionnaire you should ask have you got a job that you like and are you fully satisfied and what type of job one wanted? There is big difference between liking and getting of a job."*

306/DEL/CS/97 *"Well, I want to express myself as I really appreciate your move and what I have experienced is that, when we pass out from the private engineering college then the main problem was the experience as here freshers are not welcome. I had to struggle a lot as there were no campus interviews in our college and also in Delhi none of the good company considers the engineering degree from private institute good."*

831/AP/EN/96 *"Since I am from a private college I face many problems. Even in my office they have discrimination between Govt. colleges and private colleges. Our performance is rated low; even if we work harder than what is required."*

### **Lesser Known Areas of Specialisation**

222/KAR/ME/98 *"As far as I know, most of our seniors also suffered, running around for the job. So some of them continued to do higher studies for want of job and later they were placed in a job. The recognition is '0%' for our branch. I hope that with the help of your survey we would get some recognition for our branch. Previously it was known as Industrial Production now it is known as 'Industrial Engineering & Management' wherein we cover most of the management subjects. Most of the companies are not aware about our syllabus. In spite of having 71% aggregate, I am not able to find a job because of less recognition. I strongly stress upon the point 'our branch requires more recognition'."*

### **Course Contents /Career Guidance**

364/TN/CV/96 *"As far as civil is concerned the pattern of syllabus should be changed. There are lot of differences for the theoretical knowledge and practical one. During the time of studying the professional course itself one should be able to design, estimate etc. as they do practically as far as our profession is concerned. Another point I wish to say is for woman as a*

*professional she has to face many breaks in her career i.e. marriage, she isn't able to shine individually as the male engineers do. I finally thank you for giving me this opportunity to express my views and idea."*

576/KAR/CS/98 *"As a fresher I am experiencing lot of problems in our under graduation we didn't have the opportunity to study new languages like C ++ or VB or VCTT etc. At present these are the languages we must know before going for a job. So even after completing my graduation with first class, I am feeling as if I am out of this software world."*

755/TN/EN/98 *"The number of women engineers is on increase. But job opportunity is not at par. I am in a job totally unrelated to my branch of specialisation (Instrumentation & Control Engineering). Also some of the course contents need to be rethought about and the curriculum has to undergo a massive restructuring. The students are in no way equipped for the real scenario at their place of work (if they are lucky enough to get a job). In lot of colleges including mine, girls are considered unfit for and a misfit for these engineering courses around, although at school as well as in colleges, girls fare far better than the boys. So the discrimination is totally unfair and baseless."*

34/KER/EL/97 *"Nowadays, for getting a job, having an engineering degree is not at all enough. Higher studies in the same field (like M. Tech.) are only limited. So one is compelled to pursue other studies like computer, etc. Now the job opportunities in the field of engineering are scarce. It is necessary to create job opportunities or they should improve the course contents of the B. Tech. degree, thereby the students are upto date on advancement in technology or they should be kept informed about the changing job environment, in the college itself Proper career guidance should also be provided in the college itself"*

### **Practical Training**

94/MAH/CS/98 *"Government should take initiatives to impart short-term industrial training to the graduate women. This may help us to get employment."*

877/GUJ/CV/98 *"The fresh degree holders do not have suitable training programme facility from government and private companies do not have interest in fresh degree holders other than to exploit."*

893/TN/ME/98 *"Compulsory training programme should be given for one year after finishing the 4<sup>th</sup> year of graduation as given to the medical students in the name of house surgeons. This will be more useful for those students who want to begin their own industry."*

## **INTERVIEWS**

### **Interview in Other Cities**

620/KER/EN/97 *"I always respond to job advertisements. In most cases, the examination centre will be in Bangalore or in Nashik, i.e. far away from my home. It is impossible for a girl to travel such a distance without the company of some person. In my case, father is aged and brother is not available, the result is to scoot the exams. I am in desperate situation. Now I am in Kannur where there is no scope for electronics."*

26/KER/EL/98 *"Nowadays most of the branches of engineering in N.S.S. college of engineering PKD have more girl students than boy students. Also most of the rank holders in pre-university exams in Kerala are girls. Still when considering the case of students who got job through campus selection the number of girls students is very less. Also after graduation most of the boys are trying to get job in other states. Main reason is that job opportunities are less in Kerala. Most of the jobs need experience of 2-5 years. When boys get experience from other states they come here and get selected for the jobs. But most of the girls can't go to places where job opportunities are more because parents won't allow them. Same is the case of higher studies. Parents are reluctant to send girls away from home alone because of safety problems. It is unsafe to go to strange place whether it is for an interview or for a test or for higher studies. This is the case of most of the educated women in Kerala. If a woman protests against this, she will be blamed by the society."*

### **Questions Asked During interviews**

4/KER/EL/98 *"I just entered a job and hence I was unable to answer a few questions but I would like to mention one major problem I faced during my job hunt. Most companies (software) have bonds and during interviews, a standard and expected question is 'what will you do when you get married?' This question is only asked to female candidates despite the fact that men tend to change jobs more often (as I have seen). A question about your future is quite hard to answer and I have felt this has been a major reason for rejection. A few companies, which came to college, also clearly stated they did not require female engineer "*

79/KER/ME/95 *"Almost all of the public sector organisations allow the women candidates to attend the tests and if they qualify, they are called for the interview. But only to get discouraged and humiliated by the interview board, by asking questions such as how you will be able to do this work because you are a woman. If they do not intend to take girls, why do they call us for the interview? This results in financial and energy loss and loss of precious time."*

266/MAH/CV/97 *"Due to unknown reasons only one campus interview held. First question they ask to girl candidate is about her marriage plans. Being Civil Engineering graduate and a girl I think people/agencies prefer boys as they can be working on sites or desks. They ask about ability to work on sites. Nature of the jobs offered (other than campus interviews, were of site engineers. We were discouraged to send the bio-data by our placement co-ordinator."*

647/GUJ/CS/96 *"Views/Questions of employer while interviewing a woman candidate; - how long would you stay employed with us? In case you are married what about the time and training we spent on you? A female candidate has to convince or give confidence to the employer that right now for 2-3-4 years she has no plans to get married."*

## **EMPLOYMENT AND CAREER DIFFICULTIES**

### ***Lack of Confidence of Employers***

- 448/KAR/ME/97 *"The basic problem in recruiting women in engineering profession (as I faced) is that people have lower impression about their capabilities. They are therefore not trusted with important work. The problem of advancement in career is due to the dual role to be played by the women (both at home and outside). We need to work hard to do our best both at home and in the profession. By having confidence on ourselves, we can certainly achieve it."*
- 556/DEL/EL/95 *"My job is essentially a marketing job, in particular international marketing. The company gives preference to my male colleagues in case of travelling abroad since they feel it is not safe to send me. Also travelling at night alone can be difficult. In many case a woman has to seek permission from father/husband to travel out of station. All these retard the growth opportunity to a large extent. Moreover a woman has to put in far greater effort to make her importance felt. A woman does not remain so committed to her profession after marriage due to family pressures therefore the company is reluctant to invest in a woman engineer."*

### ***Women Considered Less Capable***

- 501/MAH/AR/95 *"Your questionnaire has covered almost all the points. But regarding the pay-scale I would like to bring to your notice that even though better than men, the pay-package is very less for women in the field of Architecture. It's just because of the men's attitude towards women in society, they always consider women as less capable."*
- 954/GUJ/ME/95 *"I can say only one thing that being a lady engineer in field job people will not take us seriously or rather they have no confidence that we can work like other engineer. They have always doubted our capacity and assign us mundane work. They never think that we are also engineers. (Women assigned routine work)"*

### ***Jobs Considered Unsuitable for Women***

- 168/AP/EL/95 *"Some points for engineering jobs requiring tours should have been included. Some points for engineering jobs in the field (e.g. Production dept in manufacturing/process industry) should have been included. These two fields are considered to be a strict NO-NO for women now also."*
- 196/MAH/EN/97 *"There are some hardcore engineering fields like mechanical, instrumentation, civil etc. wherein one is required to go often to site and even site experience is very important. But it is often noticed that people do not prefer girls to go to site and they are also often unheard."*

### ***Being Women***

- 198/KER/EL/98 *"Being a woman many of the industrial firms refused to give me the job. I didn't take campus interviews seriously because I had a little hesitation to move from my hometown besides I was sure that vacancies would be there for a B. Tech. graduate. I am married and my husband is working in a central government organisation. He is placed in Calicut itself. We have*



*decided not to have children till I get a permanent job. Since ours is a joint family my in-laws are not ready to accept this and mentally I am suffering much. It's going to be one year after my graduation. In Kerala job opportunities is less in engineering profession and I don't know how long I will have to wait to get a permanent job. I do give importance to my career than anything else I want to do much but can't do anything, I am forced to believe that I can't go beyond the limits of a woman."*

- 700/TN/EL/98
- "1. We find that tall talks are made on opportunities to qualified women but in reality this is false.*
  - 2. Corporate level we find that they do not prefer women though they pose for it.*
  - 3. Corporate level are not interested in employing freshers in technical field. They need only experienced ones - They outright reject the applications of freshers. Merit has little value.*
  - 4. Many of my colleagues are unemployed due to nil opportunity for freshers.*
  - 5. Influence, money, power, contacts are vital for getting the right job.*
  - 6. A job of our desire is only a dream and rare to be achieved. Unless a mass movement by women power is made no tangible result can be achieved in women's world of employment."*

#### **Job Difficulties / Lack of Opportunity**

436/TN/CS/97 *"I want to say about the programming line. Nowadays they are not taking freshers in software companies, they are asking for experience, how can we get experience, without giving any opportunity for us.*

- 1. After finishing B.E. I sought job for 8 months no use, after that because of parents compulsion I joined in a matriculation school as a computer teacher There they treated me like a typist and this is not proper treatment for an engineering graduate.*
- 2. After that I worked for 1 year and this year starting I decided to join the advanced Computer Courses (i.e.) Visual Basic, Oracle. I finished the course by July itself, but still I am without job. Side by side I am attending interviews but no use. Now I am trying for faculty posts in colleges also but no proper response.*
- 3. If you don't mind please give a correct idea for my further improvement, I didn't want to waste my B.E. because I got this seat with lot of difficulties, at the same time I want to fulfil my parents needs. Really I am very fed-up of not getting job. I disappointed my parents who are expecting a lot from me."*

490/AP/CS/97 *"I just want to make a point clear in order to get job soon after graduation. Because I am from a software background I can tell what difficulties I had and would like to advice only software professionals. The lesson I learnt was never waste a second after graduation. If you are lucky enough in getting through the campus interview, well and good, if not try at least to get into one or the other company (even if it is a small unknown company). Never bother about the salary. But don't be idle. Because once there is a gap you have to face a lot of problem later, to get an opening in the development side."*

## **Frustration**

- 313/KAR/CS /98 *"Would you please arrange some facility so that women graduate who are unemployed get at least an opportunity to attend the interviews and prove their worth. At least, some provision to make people understand that people with marks less than 70% are not dumb and worthless."*
- 320/GUJ/EL/98 *"I want to state the following:*
- 1. In some states, like in our Gujarat, ladies seats (15%) are reserved. But if after completion of B.E. there is no scope to work as an engineer then what is the use of reserving these seats for women.*
  - 2. There are above 50% seats reserved for (ST-SC-OBC) candidates in Government service. Then why ladies seats are not reserved in Government and Semi-Government in our Gujarat state.*
  - 3. If hard work, costly education like B.E. is not able to give us a job (even if at Rs. 3000) then what is the meaning behind it. In future women will think before or we can say that no lady will take admission in this type of field."*
- 378/MAH/CS/97 *"People even in this modern age do not accept women as an engineer. Though I have achieved my degree after a lot of hard work and with good mark (73%) wherever I go for interview, people first consider that I am a woman and then an engineer. Because they still think that a woman can never have creative ideas, she cannot handle crucial situations, she does not have career as such, but only works for money, she cannot give a promise to continue job, as she has to look after home and children. In one word people don't want to give same career opportunities to woman compared to man."*
- 628/DEL/CV/94 *"I was continuously working for about 2 years since my graduation in small scale, private firms. It is only because I was reluctant to leave my baby in a crèche, that I had to quit my job. When my son was 1 and 1/2 years old, we shifted from Kerala to Delhi. After coming to Delhi, my son is going to a play school, he can be sent to crèche. All facilities are available. But I have to find a suitable job. Presently, I have got a temporary assignment in All India Radio (Malayalam News) and I am also doing some translation works at home. If I have to pursue my career in civil engineering, I have to start job hunting and the job I can get now is that for a fresher in the field. After meeting personal/crèche expenses, what I get will not compensate for 6 day-week work. Also in a private construction firm, the job will be just estimation or drafting, the same work all the days. I am proud that I am a civil engineering graduate, but sad to say I could not pursue my career in civil engineering."*
- 1016/GUJ/EN/94 *"Even if you have proved your sincerity and competence to your employer for a long period of time all your abilities are questioned once you get married. Employers take taking even 15 days leave after marriage for personal reasons negatively. Going on maternity leave is a sin. Employers take it as an unnecessary loss of workforce for them. Male colleagues are highly cynical towards their female colleagues when they go for maternity leave. Chances of promotion get badly hampered if you take maternity leave. In Indian scenario, promotions and all depends much on your personal relationship with your boss. Being a woman it becomes difficult to develop such a relation (being involved in his personal chores-inviting his family for dinner and all). Hence compared to males, growth prospect remains bleak."*

### **Rewards / Recognition**

810/GUJ/CV/94 *“Although most of the points have been covered in the questionnaire, I would like to say that for a woman to get recognition for the same job as done by a male is still difficult. The attitude has to change. Except for software profession there is no other field (Engineering) especially Civil, Mechanical & Electrical where it is easy to perform and get recognition. Of course, exceptions are always there. Employers hesitate to some extent to employ woman as deep down they feel that woman cannot perform to the same extent as a male. Employers presume that in case of crisis a male subordinate is preferable.”*

### **Non-acceptance by Colleagues**

444/GUJ/CV/95 *“Since the focus of the study is to pinpoint the existing lacunae in jobs for/of engineers (women), I have the following points to share: I am a B.E. (Civil) graduate. Acceptance of women engineers is very low. Contrarily, I faced no problems from contractors or unskilled labourers. Management is very hesitant of assigning site jobs to women engineers. Skilled workers pose a problem. They are rude, uncommunicative and dismissive of orders given by women engineers. As a result, women engineers accept desk jobs where they do not face rejection and those who cannot reconcile to this demotion leave their jobs to pursue higher studies or more to design part of engineering profession. I took up MBA studies because I wanted a line function in any organisation.”*

### **Jealousy**

549/KAR/EN/94 *“I feel that since you have created such a database it would be easy for you to take up a survey on sexual harassment faced by professional women. I don't mean physical abuse but a subtle form of mental abuse wherein women are forced to work twice as hard as men to be accepted as half as good. There are many men bosses who resent the fact that women get equal salary as men and that they usually have the benefit of double incomes. Such men overload, harass, scold and hound women out of workplaces. I have personally faced this kind of abuse when I was pregnant. I was overworked under the pretext that only I was efficient and capable of completing the work.”*

790/KAR/EN/98 *“A woman is seen more sympathetically but her abilities are over looked most of the times. She is seen as strengthening her husband's financial set-up. This results in other kinds of discriminations like lack of identity, very low salaries to women, belittling amongst the colleagues, less technical job assignments. Women achievers are not even respected in family, squeezing up more than their capacity to work. Women are seen mostly as cheap labour.”*

### **Harassment**

520/KER/CV/97 *“In the case of industries, private sectors and PSUs, the superior-subordinate relationship may not be a healthy one, especially for a female employee in this male dominating society. If a female is found to be single, she has to undergo extreme mental harassment with the result that she will lose interest in pursuing her job and career. This will happen even in state and central govt. offices. The attitude of male superiors towards a single (widowed) female subordinate must change for an effective favourable environment to work with.”*

890/KAR/EN/97 *"It is necessary to include the question, 'What are the problems as a woman you have faced in the college from your peers, seniors, lecturers etc?'* Male counterparts view woman as inferior to them. Ragging is a severe problem in some of the colleges. It creates emotional disturbance and affects the studies as well. Sometimes lecturers tend to do subtle teasing."

984/TN/EL/95 *"A bigger role by women movements is required. The present movements are labelled as 'feminist' and do not do much for women professional. They are merely shouting with no actions. No words and full action would definitely benefit women.*

*Harassment of women in workplaces is very common. Organisations like WIPS and similar organisation must take upon themselves to find the problems of career women and to undertake to solve these problems. I am much satisfied with my organisation in general. But I have been posted in a department of least importance and moreover the one located very far away (some 3km) isolated from the main buildings with limited accessibility facilities."*

### **Entrepreneur / Self Employed / Freelance**

324/GUJ/EL/95 *"I am not filling lot of tables because as soon as I completed my graduation I started work on my own business. As a woman engineer, I feel very proud. As for my professional life, I am very much happy. In my professional career, I am working as an executor. From sales order received to the commissioning of the site."*

604/MAH/AR/95 *"The questionnaire should also include questions for the women who are not employed, but are doing their own job, having their own office. What problems they have to face with their employees, their clients and other technical persons related to their job. Do they get equal co-operation from client or others as a man can get?"*

666/DEL/AR/97 *"A question on hindrances faced while setting up one's own practice can be included. In case of a consultancy; the problems are of being correctly remunerated by the client. Schools of Architecture have no campus interview. Questions on the same are therefore irrelevant. Often there are instances of women who themselves don't take their work as seriously."*

### **Payment needs for getting a Job**

449/KAR/EN/98 *"I am unemployed because: 1. I come from a poor family, 2. I am not having any influence, 3. My parents are not having that much ability to settle the amount (demanded by the factory) to get job. Really, I am very much interested in job and I want to do something for my parents and for my house, because they struggled too much in my study days. Hope in future I may get a good job."*

639/KAR/CS/98 *"Out of 9 responses which I have got from the organisations, in 5 places I have been asked to pay cash which I was not able to pay and for the remaining ones results are awaited. I am staying here in Bangalore in search of job in a hostel."*

## **No Gender Discrimination (Esp. in Software)**

717/TN/CV/98 *"I'm in IT industry. Here woman doesn't face too many problems. There maybe some problems due to ego (some cases are there) but I have never faced such problems. One of my friends who is working in our line; Civil Engg. (designing work) is facing problems in her office. Most of them are ego problems. I think that women belonging to profession other than IT are facing more problems in their career."*

845/TN/CS/97 *"In south, the marking system is different. Here especially in Chennai (T.N.) almost everybody has 75% + marks, whereas in north that's not the case so, when people like me come here we lose on those points. Of course our college name does matters but...."*

*General comments: I feel, women have equal opportunity as their male counterparts when it comes to software field. In IT industry, gender has the least priority, may it be some offshore project or be it a promotion. Even if there are discrimination that's negligible."*

## **PARENTAL / FAMILY AND SOCIETAL AND PERSONAL CONSTAINTS**

### **Parental or Family Constraints / Restrictions**

1/TN/ME/98 *"Reasons for not being employed;*

- 1. Lack of independency given by parents especially father. Parents think that an unmarried woman is always or should act only to their words.*
- 2. I have not been sent for a job, which I got selected for, because I should stay away from my parents.*
- 3. An important thing in Tamil Nadu is immediately a woman completes her graduation they go into the act of getting her married.*
- 4. I could not apply for many interviews because I did not have my own money.*
- 5. Lots of discouragement from the parents as whole from the male community. e.g.: - a male who wants to marry me does not like to send me to a job, in spite that he is also an engineer.*

*The organisations badly hesitate to hire a mechanical engineer. In both companies for which I applied and got selected, they were not ready to risk employing a female, whom they thought would never perform uninterruptedly."*

212/TN/EN/98 *"As far as my case is concerned it is only one year I have been with this organisation and have enjoyed my work immensely. Your perspective of questionnaire deals only with the problems women are facing at office. Mine is from home saying that I should be married and leave my job which I don't want to do. This also hinders woman's development in the society. So the questionnaire can also include the pressures from home towards career development of woman."*

### **Societal Constraints**

822/KAR/CS/97 *"Although, winds of professional attitude seem to have blown in from the West, a lot remains to change in the Indian mindset. Nobody is to blame - it is a slow process of change. For example, young women who are unmarried may not be given responsible senior positions in the fear that*

they may quit the job as soon as they get married. This conclusion is supported by the fact that most women do leave their job after marriage even if to work elsewhere. It is quite true that a woman has to work doubly as hard as a man to prove herself - first to break out of the assumptions that girls need help from men to get their work done, She is subject to easy criticism on flimsy pretexts. Most top level managers do appreciate and treat men and women professionals equally. Something that they learn by experience, but new recruit usually have strong view-points against women professionals. Most organisations have no special provision for women like working hours or crèche facilities. Things are improving though. Even bathrooms for women don't have any thoughtfulness in design. Prospects for higher education of women, especially beyond graduation are still quite remote even in the so-called 'forward' families especially for reasons of marriage getting delayed or difficulties in finding a matching groom. The family for the same reasons also rejects long-term trips for official purposes to far-away countries. In some cases, even though a man and a woman may be considered equal at work, safety considerations for the woman often come in the way of career enhancement when travel to far off places is required. This is a very difficult situation for a woman-especially if one has to stay alone in a foreign country.

This survey may be made online to obtain greater and prompt number of responses. Most engineers (especially software) have access to email and would be more willing to type in data than put down on paper ”

### **Traditional Values / Hindrances**

178/KAR/EN/94 “I would like to share something here. That is concentrating solely on profession is not correct for a woman. Consider the case in which anyone (male/female) has to slog in the company to prove his ability. This is possible for a male because his duty is to earn and look after his family (this is what everyone believes). But assume a lady is working, earning more than a male financially supporting the family etc., in how many families, I mean will our own people support a woman working fully dedicated to office??? Isn't this the cause for the hindrance of a woman's growth?? When our own people cannot accept that their lady is growing, how will the society accept it???”

### **Dual Responsibility**

500/MAH/CV/97 “In my view career is not just job but it is achievement of some position in profession. It is not easy to achieve professionally sound position for woman since she is supposed to bear other responsibilities like looking after her family and children. It is sort of joint effort from her family to help her achieve her professional goals. Since it needs 100% attention and efficiency to prove yourself better than others, she has to spend more time in the initial phase at job, which should be understood by her family members. The study should also project the willingness of women to continue in their profession.”

### **Priority to Family**

612/MAH/CS/98 “I am engineering graduate, and am working currently as a software developer, I feel the present unemployment condition exists due to women opting for jobs meant for men. Many girls do engineering but don't

*pursue a career. In one way I feel guilty of taking engineering because after my marriage anyway I am not going to work, because I believe in looking after my family more when they need me. If my children become independent and can look after themselves, I would like to work."*

1007/MAH/ME/94 *"I believe strongly that a woman's choice of career and how much she is willing to sacrifice for it on the personal front, should be entirely her own choice. I have chosen the middle path-a career that allows flexible timings (within limits) and no work pressure; while being completely devoted to motherhood, this choice is entirely mine. Being the child of a working mother, I have been fully aware of the child's point of view, while I am proud of my mother, who brought us up so well, I would still have preferred to have more time and attention from her. And I do therefore try to give my child top priority."*

### **Support From Family**

437/MAH/AR/95 *"Choice does not only depend upon the opportunities available but also on kind of environment around, the mentality of husband and in-laws. One cannot play a role of working woman without sacrificing household responsibilities. It becomes difficult to stay back in the work place for longer time even though you are needed there because house becomes the first priority. As my husband is not familiar with kind of work environment or responsibilities of an architect, he is not sure how people will treat a lady architect on site. According to him it is not safe to go on sites. These are various problems a working woman faces in small towns. Support of family is crucial for facing these problems."*

506/DEL/AR/98 *"I would like to mention that though one is a highly qualified person, as a woman one comes across many restrictions; social, financial, emotional and physical. So if she is strong enough in all respects then and then only she reaches the top. Woman's career success also depends upon her family, in-laws, and her husband's attitude towards married life. Her capabilities can't have their 'Full Blossom' until she gets emotional, social security. There should be proper blend of traditional and contemporary thoughts instead of just asking for women's rights. She should prove herself to be capable of fulfilling her own responsibilities towards her family members and her husband etc. and also towards the society she lives in. I would like to have a job, which offers opportunity to be creative and perceptive. And where I am satisfied with the salary."*

### **Teaching**

781/MAH/CV/98 *"I am interested in educational field. I want to become a good teacher so I have tried for lectureship. Only once or twice I submitted application for other type of work."*

889/MAH/EN/95 *"Being an electronics engineer, I wish I could do some research and development projects in some company. I feel I am not utilising my technical knowledge fully and as an engineer my contribution to the industry is very poor. But I have no other option since I won't be able to give more than 7 to 8 hours daily and in a company one has to often stay overtime. I have to pay attention at home also. Since I am married now, I shouldn't ignore this responsibility either. So I have sorted a balance between my career and household activities by choosing teaching profession even though I would have liked an industry job more."*

## **Marriage**

113/GUJ/CS/98 *"I would like to point out though it may be obvious, that as far as my field of specialisation is concerned i.e. Computer Science, there are good job opportunities for a good experienced person irrespective of his/her sex. At least in few cities like Bombay, Delhi, Bangalore, Pune and Hydrabad we have ample opportunities. But the only problem that causes a hindrance to my career is staying alone in these big cities. Even if I agree to face any hardship my parents are reluctant. Another problem is of women professionals sacrificing their careers for marriage. I have a few female colleagues leaving their jobs after serving for only a few months. This definitely has a negative impact on other female professionals as this discourages our employers to recruit new female engineers. They definitely prefer male engineers to female ones as the former remain long time options."*

## **SOME OTHER IMPORTANT FACETS AND ISSUES**

### **Reservation**

745/GUJ/ME/96 

1. *Many industries still do not prefer women engineers.*
2. *Industries should be encouraged to recruit women engineers. There should be some percentage for it.*
3. *In Gujarat there is women quota to get into engineering profession but then what would a woman engineer do after her graduation since the industries do not prefer them. They have to remain unemployed or end up doing other clerical jobs, which is not their field."*

434/GUJ/ME/95 *"After marriage. I had appeared for at least 8 interviews, but I feel I am not considered every time being married woman or just woman. I strongly feel Govt. of India should keep some percentage of reservations for women in govt. colleges and Industry according to rank."*

### **Bond**

453/MAH/EN/95 *"Some time it happens that women have to refuse a job offer due to some reason or other. In my case it had happened in two cases where I had to refuse two good job offers. They wanted me to sign a two-year bond and my parents didn't want me to sign, as they wanted me to get married within two years. It might have happened with many other women also."*

672/MAH/CS/97 *"I would just like to say that in all the jobs which I have done, they have taken into consideration my merits and not gender, there was not any biasing as such among the other male candidates, And I think in big cities like Mumbai the percentage of gender biasing is very less as compared to other towns and cities. But there is one thing in computer industry, there is a concept of bond i.e. at the time of joining you have to sign some legal papers stating that you will serve the company for minimum of 2 years or more, I feel being a girl and being in marriageable age, and if the would-be husband is settled at some different place it becomes quite difficult for a girl, to leave the job in fear of some legal complications or loose a good prospect."*



### **Girls from Village and Non-metro background**

536/KAR/EN/95 *"I am from a village background. I am the only person who reached such a position in my village. I think we should do something especially for the girl students who are from villages, and who find it difficult to come up due to lack of awareness and opportunities. The financial condition also matters a lot. In Kerala, the entrance exam needs a special kind of coaching, irrespective of the intellectual abilities. So financial aid becomes very important. Or some change should be done to the whole system. It is high time to think about it."*

### **Women Vs. Women**

123/AP/EN/95 *"In most of the cases, I have observed that women superiors never support women subordinates whereas men superiors support us in all difficult situations. In other words, women superiors tend to be more egoistic compared to their men counterparts (only in very high management levels)."*

## **WOMEN AND THEIR NEEDS FOR SPECIAL PROVISIONS**

741/TN/CS/98 *"I really appreciate the effort put into this questionnaire. What I feel strongly about women in the corporate world is that women should be treated as 'women professionals' and not merely as professionals as the word professional still has a largely male connotation. We are not replacements for male-defined jobs. I think that rules must be redefined for women starting from working hours to travel schedules and various other corporate dictums."*

### **Flexible Timings**

503/MAH/EN/95 *"I really appreciate this project and would like to take this opportunity to point certain points. I was working in private industry for three years out of which 2 years were before marriage. But I had experienced that the attitude of office/industry colleagues changes. You have to really work hard to assure others that you are the same person with same efficiency and sincerity even though now you are married. Another point is that whatever maybe the educational background or professional responsibility, Indian women have to take family responsibilities. Just to adjust with the family responsibilities, I have changed my field, which will give me flexible timings. Now, I have to manage my professional and family life in such a way that it should not affect on my bringing up my 3-month old daughter."*

701/KAR/ME/98 *"Certainly a woman is efficient enough to manage at both home and job, provided there is co-operation of family members. Mother is the first teacher and quite obviously, a person's life and mental condition are affected by the care shown and brought up in childhood. Being interested in career does not mean that one should not have children. Of course it is a personal decision. In some fields compared to a man, a woman may not be accepted fully into a fully professional working group. The physical structure and the workload at both home and office are certainly their main constraints. My classmates, who stood always first in class, have shifted to software and the main reason was 'it is difficult for girls to work in mechanical field'. At least, time flexibility should be allowed by necessary modifications in the job structure. We all wish your efforts to come out fruitful."*

### **Part Time Job**

693/MAH/CV/95 *"I think we should try to create part-time jobs for women so that they can work as well as look after their family. Family is the basic and most important unit of society; therefore, if we neglect our family for our careers, the future generation will not be properly developed. At the same time to retain our individuality and self-respect it is necessary to have a financial source of income. This problem of having best of both the worlds can be solved by part-time jobs or such work, which women can do from their home with the advances in computers and networking it is possible to do your work at home and you need not go to a office for work. Development in this area is necessary."*

### **Work from Home**

968/MAH/EN/96 *"Many of the remarks about women getting equal treatment in the industry apply to software field. I feel that there is no difference between men and women as far as work is concerned. Similarly, career not getting affected by motherhood could be true for software industry because one can work from home."*

## **SUCCESS STORIES**

262/GUJ/AR/98 *"I left my job due to marriage and also due to not being satisfied with the job. Started my own practice and at present have 3 projects on my own. This has made me achieve more identity, work satisfaction and of course better income."*

420/KAR/CV/98 *"The place where I am working now, there is no differentiation between men and women. At times I feel it should be there, i.e., when work is more I also (like my colleagues) have to stay back. I am not allowed my concession for being a woman. Otherwise I am more than satisfied with my job as a woman. There is no problem/full security and freedom for girls in my organisation."*

450/DEL/CS/96 *"I come from a professional background with both working parents; mother a doctor, father engineer. We were brought up in an atmosphere of equality, career mindedness and with due importance given to exploring opportunities of a good education, developing our extra curricular totals to the fullest. Financial independence, responsibility for our lives and career mindedness were not things to strive for but rather natural in our family environment. I have not yet found a career opportunity where I have not been given due credit for my work, capability or achievement due to my sex. I have never faced harassment of any sort. My husband and I chose each other and chose not to interfere in the advancement of our individual careers. We mutually support each other through everything. My parents had their careers but our house or us children, never lacked for any love, attention or opportunity. It perhaps helped us be better, more responsible individuals with a better and more equal outlook to life. I don't see why my children should be adversely affected either. They will grow up as healthy, happy and settled as we did. Perhaps I am lucky."*

## **ANNEXURE-3**

**FROM THE EMPLOYERS / EXECUTIVES  
– IN THEIR OWN WORDS**

## FROM THE EMPLOYERS/EXECUTIVES - IN THEIR OWN WORDS

This annexure contains some important quotes of the employers/executives. The viewpoints that get expressed through these quotes are different and beyond what has come through the replies to the questions contained in the questionnaire. The quotes are the expressions of their outlook towards various facets and issues concerning women in engineering and are therefore important. These quotes have been arranged in a particular sequence. The last seven quotes spell out the need for some measures to be taken to facilitate working life of women engineers. The code assigned to each quote has been explained in the previous chapters.

- 5/GUJ/m *“In absence of plenty of jobs for qualified engineers, it is desirable that each family has at least one earning member, as it goes a long way in supporting the family and for the growth of the next generation. This policy will reduce the disparity among engineers whether male or female. In case of a female engineer being employed she has to look after the family and children without active participation from the husband. This amounts to exploitation. In no case this should be encouraged. Unless our social fabric changes this is going to create many other problems if male and female both are employed in a family.”*
- 25/GUJ/m *“In my opinion the activities in which women are traditionally involved are much more demanding, requiring/utilizing the strengths of women (gender as a whole) and by no means less important for society as a whole, why women should be involved in such activities as engineers. The question is not of what women can do as an engineer but the question is why they should do it. They may be equally or more competent but their skills and strengths are and can be better utilized in traditional activities also. In USA (I have read somewhere) housewife is also known as domestic engineer ”*
- 82/GUJ/m *“Woman engineers in the country are under-utilised and most of these seats in the engineering colleges are wasted. The professional education of women engineers is for status only, for getting good match. This situation needs to change for better utility of women engineers.”*
- 83/GUJ/m *“For giving education the government incurs expenses equally for men engineer and women engineer After completion of education, in practice many a time it is noticed that returns to the nation and society are less in case of women engineer. In professional life it is a very rare that a women engineer will serve throughout her life. This is waste of resources.”*
- 111/TN/m *“In the cultural setup (country specific) in India, men pursue economic activities and women pursue more family oriented activities which I see as the strength rather than weakness. As inter-dependency is the best option than just independency.”*

- 126/TN/m *“Women engineers may not be preferred to come on shift duty during night and odd hours. In any electrical emergency like breakdown occurs at odd hours, women engineers may not be able to attend the rectification work.”*
- 43/TN/m *“In case of transferable job, due to the present socio-economic culture, man engineer is preferred. This is because family generally moves with the husband or he can commute from his place of work to his permanent residence. The similar practice is generally not preferred in case of woman engineer.”*
- 27/GUJ/m *“Women engineers have definitely some advantages when they work in a male dominated work-group particularly in Design, Marketing, Finance, HRD, Banking industries etc. However where working environment is not structured or requires considerable traveling, working for prolonged hours or unscheduled working hours etc. they find it difficult to maintain balance between requirement/expectations from office/company and family/society. This situation is at peak particularly for women in age groups of 30-32 to 40-45 years.”*
- 35/MAH/m *“With the nature of business we are in, we need engineers to mainly work in plants and fields for new projects etc. Hence we prefer to have male engineer to take care of odd hours of working, out-door working on projects and engineering jobs. Though we don't have women engineers, we have got more than 100 women working for the organisation in different capabilities and positions like Accounts, Advertising & Publicity, HRD, R&D and General Administration as support function. Our experience says that they are equally capable of performing their duties and are more committed towards their responsibilities. Based on my 30 years of experience in the field it has been generally observed that women's limiting factor career wise is her commitment towards her family.”*
- 48/GUJ/m *“I do not have specific bias for women engineers. I do agree that they are more competent, intelligent, possess more integrity, and are more efficient than men engineers but they are helpless. In spite of their full willingness to perform their duty perfectly they are not able to meet with the requirement of the organisation in which they are employed due to family responsibilities like their responsibilities towards their children, in-laws, parents and other social obligations towards family, illness etc. In Indian culture men expect everything from women. This is possible only if their family members including husband, in-laws, understand, co-operate, encourage women and help them out in performing their duty to the full extent.”*
- 13/MAH/m *“The only related issue pertains to a temptation to take undue advantage of being a woman employee. In the age of equality, men and women employee must deliver an equal output except in case where physical labour is involved and physical constraints are involved. But in other areas the treatment to both should be similar.”*

- 14/MAH/m *“Ladies who have aptitude and liking for the profession should take up engineering. The profession should not be taken up just because it sounds fascinating and prestigious. Ladies should do all kinds of job required by the profession and give up inhibitions.”*
- 22/MAH/f *“We need to check at the class 12<sup>th</sup> level whether candidates opting for popular fields such as ‘Medical’ and ‘Engg.’ are opting for it because they have an aptitude and genuine interest in the field or whether they are opting due to social pressure/status? Are their careers clear to them? Do they know what they really want from these professions? Such questions need to be clarified at a young age. Counseling and guidance needs to be given.”*
- 21/MAH/m *“Main problem in countries like ours is the hierarchical orientation of organisations, which increases the bias against females just as it exists in society at large. Facts and logic orientation is bound to win in the long run. If women engineers get a special orientation, they may be able to overcome the handicap.”*
- 113/TN/m *“Even educated women suffer from psychological handicap, in the world of men, due to their inherent nature and attitude. The equality between women and men are well established. There is need to encourage them to excel in their efforts and give them a level playing field to establish their abilities and rightful place in the workplace and society as well.”*
- 67/MAH/f *“1. Women engineers should not accept any preferential treatment. There are so many working women, what is so special about women engineers.*  
*2. There should not be 30% reservation for women in colleges. Since women are no lesser human beings.*  
*3. Women should face their career with full knowledge that they have nature’s duty as a mother and they have to compromise.*  
*4. Bringing up children is no less important duty. Women engineers can do it better than any other person. They should be proud of it.*  
*5. Sacrificing a few years in early career does not matter at all in the long run.”*
- 104/TN/m *“Any reservation, by itself, has assumed that on an ‘equality basis’ things do not happen. This in another sense means that the ‘two’ are incapable of being equal anytime and so consciously it has been decided to accept, an unequal component in the intake. This in turn means any gradation; inefficiency and delay in the output has to be tolerated. So, decide, if you want some ‘show of results’. Don’t ask for both and don’t claim equality and all that. The very fact that there is a gender difference in nature, it is required to be that way and each one has the best to offer in one’s own way. Let us take advantage of it.”*
- 95/DEL/f *“Being a woman having now spent nearly 24 years in my profession I have had different experiences in different environment. But, some commonalties emerge. Nuggets are: In research environment it is*

common to see men and women participating equally in all activities with equal enthusiasm - Performance wise, women have been known to excel because of their zeal and commitment and men for their fastidious approach.

In industry it is foolhardy for employers to trust women who join them pre-marriage and use the job as a stop hop for change. So, only after assessing the basic parameters, women are given responsible position. At the junior executive level, sometimes a job can be demanding and taxing and it is good testing ground to check future potential of suitable male/female candidates. Rapid development is possible here with the right attitudes. Once settled in personal life a woman can contribute in wholesome manner. In fact, opportunities are equal. Yet, few women have reached heights despite the open policy of fair dealing to women. Reasons would be many, mainly lack of networking/social mixing etc.”

- 2/MAH/m **“The society is male dominated in fact some religions do not even offer basic ‘Rights’ to women. Upbringing right from day one is to make women subordinates. This is a barrier in their progress. The social change is taking place is for the good.”**
- 15/KAR/m **“With rapid improvement in our telecommunication system and frog leap to internet, ‘work from home’ would be the most satisfactory and efficient mode of employment for Indian women in the future. This would require appropriate job classification for women and adequate training in the IT field.”**
- 41/MAH/m **“Engineering is knowledge-based work. If women are intelligent they are equally suitable. The future work environment is going to be more of knowledge based than physical labour oriented. Women engineers are equally acceptable in the engineering profession as male engineers.”**
- 92/GUJ/f **“In my opinion ladies face lots of responsibilities and there should be provision for part-time job for them. Most of them are not very keen to work only for money but they want to fruitfully utilise their time. To keep a balance they need to work at home as well as in office. Flexi-time or part-time job is more suitable.”**
- 122/MAH/m **“As far as possible women engineer should be placed/posted to such organisation/station where their husbands are. Transfer of women engineers should not be done merely as a policy matter. A humane approach is required as it affects the complete family.”**
- 125/DEL/m **“Women deserve to be better represented in the engineering profession. However, their role as a mother is equally important. Some facilitating measures should be adopted to enable them to continue their career at their own pace -measures which could not have been thought possible earlier, but are possible today because of better communication, internet etc.”**
- 38/MAH/m **“Gender sensitive awareness to interview committee would be helpful.”**

**ANNEXURE-4**

**COPY OF THE ADVERTISEMENT**



## ADVERTISEMENT

TUESDAY, JUNE 2, 1998



# INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY

Powai, Mumbai 400 076.

Advertisement No. L-40/98-99

## WOMEN IN THE ENGINEERING PROFESSION

The Indian Institute of Technology, Bombay, is conducting a project on "Women in the Engineering Profession" under the sponsorship of the Department of Science and Technology, Government of India. This project is a sequel to a project that was taken up during 1986-89 to study trends in the enrolment of women in engineering colleges. The study showed that whereas the number of girls taking up engineering was on the increase, the job and career opportunities for women engineers were limited. Since the period of the previous study, enrolment levels have increased further. The present study aims at studying in detail the current employment status and career opportunities of women engineers. An important facet of the project consists in obtaining the employers' viewpoint on hiring women engineering professionals. As a result, it is expected that recommendations leading to some policy initiatives will emerge. The study will focus on the seven states of Andhra Pradesh, Delhi, Gujarat, Karnataka, Kerala, Maharashtra and Tamil Nadu, since these states have the highest percentages of graduating women engineers. This announcement is for women engineers who have obtained or will obtain their Bachelor's degree in engineering or technology during the period 1994 - 1998 and are presently located in the states mentioned above. Your participation in the study is crucial to its success. Please write to us giving your name, address, year of passing, and the branch of specialisation. We will contact you subsequently through a questionnaire for more information on your professional experiences.

Prof. P. P. Parikh/Prof. S. P. Sukhatme  
*Department of Mechanical Engineering.*

(TIMES OF INDIA, HINDU, MALAYALA MANORAMA, DATED 2<sup>ND</sup> JUNE, 1998)

**ANNEXURE-5a**

**FORMAT AND LETTER TO INDUSTRY**



**Prof. (Mrs.) P. P. PARIKH**  
**Prof. S. P. SUKHATME**

## WOMEN IN THE ENGINEERING PROFESSION

DST SPONSORED PROJECT (NSTMIS)  
(Project No. DST/NSTMIS/05/05/97)  
Department of Mechanical Engineering  
Indian Institute of Technology, Bombay  
Powai, Mumbai 400 076, India.

Phone : 572 2545 (Extn. 7548 / 8385)  
          : 572 3496 / 576 7548 (Direct)  
Fax      : 572 3480 / 572 3496  
email   : parikh@me.iitb.ac.in

**IIT  
BOMBAY**

Ref. : WOM2/

Date :

Dear

The Indian Institute of Technology, Bombay has taken up a project on **Women In The Engineering Profession** under sponsorship of the Department of Science and Technology, Govt. of India. The broad objectives of the project are to assess the level of participation of women in the engineering profession, to study the current job status and career opportunities, and to suggest corrective approaches and policy initiatives based upon the findings. The project is a sequel to an earlier study taken up in 1986–89. This study was concerned with determining trends in the enrolment of women in the engineering courses and also in the engineering profession. It revealed that the number of girls taking up engineering as a career had increased significantly from 1975 to 1990, but that job and career opportunities were limited. The present study is motivated by the concern caused by the findings of the previous study.

Since the period of the previous study, the enrolment of women in engineering courses has increased all over the country. An attempt will be made to quantify this increase in the present study. Since the numbers are much larger now than ever before, the current exercise acquires additional importance so that corrective approaches can be taken to facilitate the entry of women in the engineering profession after they graduate. In the absence of such corrective approaches, there is every likelihood that the percentage enrolment of women in engineering may start levelling out or even decrease. UNESCO's World Science Report 96 reports that such a decline has already been observed in some places.

The present study will focus on **women engineers who have obtained their Bachelor's degree in engineering or technology or architecture during the period 1994–98 and are presently located in the states of Andhra Pradesh, Delhi, Gujarat, Karnataka, Kerala, Maharashtra and Tamil Nadu**. These states have been selected because at the moment they have the highest percentages of graduating engineers.

Two pathways will be followed in the study. In the first path it is proposed to contact the women engineers concerned directly and develop a profile of the jobs they do, the career paths they follow and the problems that they encounter. In order to do this, a database of women engineers has to be first prepared and it is for this reason that this letter is being



written to seek your co-operation in the present study. We request you to please give us a list of women engineering graduates employed in your organisation. Format-A is enclosed for this purpose. We will contact these persons subsequently in order to achieve the objectives mentioned earlier. Please inform them about this study and oblige.

**We would like to request you to kindly fill up the format even if no woman engineer is employed in your organisation, giving us all the other details.**

The earlier study has clearly shown that faced with a new situation of a rising output of women engineers, employers were showing some reluctance to hire them. Clearly the viewpoints of employers need to be understood carefully. Obtaining the employer's views through a carefully structured questionnaire as well as through personal discussions will thus form the second pathway for this study. Later, we would be approaching you for this purpose also.

Your co-operation in filling up the enclosed format will be deeply appreciated. We look forward to the favour of an early response.

Thanking you and with kind regards,

Yours sincerely,

**Encl. : Format A for the Women Engineers employed in your organisation**

## FORMAT-A

Please return the completed format to:

Prof. (Mrs.) P. P. Parikh  
Department of Mechanical Engineering,  
Indian Institute of Technology, Bombay  
Powai, Mumbai 400 076

### INFORMATION FOR DATABASE ON WOMEN ENGINEERS

NAME OF THE ORGANISATION: \_\_\_\_\_

CONTACT PERSON: \_\_\_\_\_

ADDRESS: \_\_\_\_\_ Phone: (    ) \_\_\_\_\_

\_\_\_\_\_ Fax: (    ) \_\_\_\_\_

\_\_\_\_\_ Email: \_\_\_\_\_

TYPE OF ORGANISATION\* ( Please see the list below ): \_\_\_\_\_

TOTAL NUMBER OF ENGINEERING GRADUATES EMPLOYED: \_\_\_\_\_

TOTAL NUMBER OF WOMEN ENGINEERING GRADUATES EMPLOYED: \_\_\_\_\_

### DATA ON WOMEN EMPLOYED IN THE ORGANISATION

Sr. No.	Name	Position Held	Qualification	Year of Passing	Branch / Specialisation during Graduation	Contact Address
1						
2						
3						

\*1. Private Industry (Large Scale)    3. Private Industry (Small Scale)    5. Public Sector Unit (PSU)    7. R&D Organisation (Govt.)

2. Private Industry (Medium Scale)    4. Defence Services    6. R&D Organisation (Private)    8. Any other please specify.....[2]

Sr. No.	Name	Position Held	Qualification	Year of Passing	Branch / Specialisation during Graduation	Contact Address
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						

Sr. No.	Name	Position Held	Qualification	Year of Passing	Branch / Specialisation during Graduation	Contact Address

Please duplicate this if additional pages are required.

**ANNEXURE-5b**

**FORMAT AND LETTER TO INSTITUTES**



## WOMEN IN THE ENGINEERING PROFESSION



**Prof. (Mrs.) P. P. PARIKH**  
**Prof. S. P. SUKHATME**

DST SPONSORED PROJECT (NSTMIS)  
(Project No. DST/NSTMIS/05/05/97)  
Department of Mechanical Engineering  
Indian Institute of Technology, Bombay  
Powai, Mumbai 400 076, India.

Phone : 572 2545 (Extn. 7548 / 8385)  
          : 572 3496 / 576 7548 (Direct)  
Fax      : 572 3480 / 572 3496  
email   : parikh@me.iitb.ac.in

**IIT  
BOMBAY**

Ref. : WOM2/

Date :

Dear

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Since the period of the previous study, the enrolment of women in engineering courses has increased all over the country. An attempt will be made to quantify this increase in the present study. Since the numbers are much larger now than ever before, the current exercise acquires additional importance so that corrective approaches can be taken to facilitate the entry of women in the engineering profession after they graduate. In the absence of such corrective approaches, there is every likelihood that the percentage enrolment of women in engineering may start levelling out or even decrease. UNESCO's World Science Report 96 reports that such a decline has already been observed in some places.

The present study will focus on **women engineers who have obtained their Bachelor's degree in engineering or technology or architecture during the period 1994–98 and are presently located in the states of Andhra Pradesh, Delhi, Gujarat, Karnataka, Kerala, Maharashtra and Tamil Nadu**. These states have been selected because at the moment they have the highest percentages of graduating engineers.

Two pathways will be followed in the study. In the first path it is proposed to contact the women engineers concerned directly and develop a profile of the jobs they do, the career paths they follow and the problems that they encounter. In order to do this, a database of women engineers has to be first prepared. The findings of the previous study brought



out the fact that a large number of women engineers take up teaching in Technical Educational Institutions and that these are the largest employers of women engineers. Through this letter we are approaching you to seek your co-operation in the present study. We request you to please give us a list of women engineering graduates employed in your institution. Format-A is enclosed for the purpose. We will contact these persons subsequently in order to achieve the objectives mentioned earlier. Please inform them about this study and oblige.

We also request you to kindly provide us data on the women who have graduated from your institution during 1994-98. Those who are to graduate in 1998 are also to be included in the list. Format B enclosed herewith for this purpose.

Obtaining the employers' viewpoint about hiring women engineering professionals is the other main focus of this project. The earlier study had clearly shown that faced with a new situation of a rising output of women engineers, employers are showing some reluctance to hiring them. Clearly the viewpoints of employers need to be understood carefully. Obtaining the employer's views through a carefully structured questionnaire as well as through personal discussions will constitute the second pathway for this study. Later, we would be approaching you for this purpose also.

Your co-operation in filling up the enclosed format will be deeply appreciated. We look forward to the favour of an early response.

Thanking you and with kind regards,

Yours sincerely,

**Encl. : Format A: For Women Engineers employed in your Institution**  
**Format B: For Women Graduates from the Institution**

## FORMAT-A

Please return the completed format to:

Prof. (Mrs.) P. P. Parikh  
Department of Mechanical Engineering,  
Indian Institute of Technology, Bombay  
Powai, Mumbai 400 076

### INFORMATION FOR DATABASE ON WOMEN ENGINEERS

NAME OF THE ORGANISATION: \_\_\_\_\_

CONTACT PERSON: \_\_\_\_\_

ADDRESS: \_\_\_\_\_ Phone: (    ) \_\_\_\_\_

\_\_\_\_\_ Fax: (    ) \_\_\_\_\_

\_\_\_\_\_ Email: \_\_\_\_\_

TYPE OF ORGANISATION\* ( Please see the list below ): \_\_\_\_\_

TOTAL NUMBER OF ENGINEERING GRADUATES EMPLOYED: \_\_\_\_\_

TOTAL NUMBER OF WOMEN ENGINEERING GRADUATES EMPLOYED: \_\_\_\_\_

### DATA ON WOMEN EMPLOYED IN THE ORGANISATION

Sr. No.	Name	Position Held	Qualification	Year of Passing	Branch / Specialisation during Graduation	Contact Address
1						
2						

\* TE11 – IIT

TE12 – REC

TE13 – Govt. Engg. College

TE14 – Private Engg. College

University / Department

Any Other (Please Specify)

.....[2]

Sr. No.	Name	Position Held	Qualification	Year of Passing	Branch / Specialisation during Graduation	Contact Address
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						



## **FORMAT- B**

Please return the completed format to:

Prof. (Mrs.) P. P. Parikh  
Department of Mechanical Engineering,  
Indian Institute of Technology, Bombay  
Powai, Mumbai 400 076

### **INFORMATION FOR DATABASE ON WOMEN ENGINEERS**

**NAME OF THE ORGANISATION:** \_\_\_\_\_

**CONTACT PERSON:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_ **Phone:** (    ) \_\_\_\_\_

\_\_\_\_\_ **Fax:** (    ) \_\_\_\_\_

\_\_\_\_\_ **Email:** \_\_\_\_\_

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**TOTAL ANNUAL OUT TURN OF ENGINEERING GRADUATES[AVERAGE] :** \_\_\_\_\_

### **NAMES AND ADDRESSES OF WOMEN WHO HAVE OBTAINED THEIR BACHELOR'S DEGREE IN ENGINEERING OR TECHNOLOGY DURING THE PERIOD 1994 - 98**

<b>Sr. No.</b>	<b>Name</b>	<b>Position Held</b>	<b>Qualification</b>	<b>Year of Passing</b>	<b>Branch / Specialisation during Graduation</b>	<b>Contact Address</b>
1						
2						
3						

Sr. No.	Name	Year of Passing	Branch of Specialisation	Postal Address
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				

Sr. No.	Name	Year of Passing	Branch of Specialisation	Postal Address

*Please duplicate this if additional pages are required.*



**FORMAT-D***Completed format may please be mailed to:*

Prof. ( Mrs.) P. P. Parikh  
 Department of Mechanical Engineering  
 Indian Institute of Technology, Bombay  
 Mumbai 400 076 , India

Name of the Institution:

**YEAR & BRANCH-WISE DISTRIBUTION**

BRANCH / YEAR	1994	1995	1996	1997	1998
	Boys Girls	Boys Girls	Boys Girls	Boys Girls	Boys Girls
ARCHITECTURE					
CIVIL ENGG.					
COMPUTER SCIENCE/ENGG.					
ELECTRICAL ENGG.					
ELECTRONICS ENGG.					
MECHANICAL ENGG.					
*					
TOTAL					

*\* Any other branch related to the above mentioned branches*

**ANNEXURE-5c**

**FORMAT AND LETTER TO WOMEN ENGINEERS**

## WOMEN IN THE ENGINEERING PROFESSION

DST SPONSORED PROJECT (NSTMIS)

(Project No. DST/NSTMIS/05/05/97)

Department of Mechanical Engineering  
Indian Institute of Technology, Bombay  
Powai, Mumbai 400 076, India.

Phone : 572 2545 (Extn. 7548 / 8385)

: 572 3496 / 576 7548 (Direct)

Fax : 572 3480 / 572 3496

email : parikh@me.iitb.ac.in

IIT  
BOMBAY



Prof. (Mrs.) P. P. PARIKH

Prof. S. P. SUKHATME

Ref. : WOM2/

Date :

Dear

The Indian Institute of Technology, Bombay has taken up a project on **Women in The Engineering Profession** under sponsorship of the Department of Science and Technology, Govt. of India. The broad objectives of the project are to assess the level of participation of women in the engineering profession, to study the current job status and career opportunities, and to suggest corrective approaches and policy initiatives based upon the findings. The project is a sequel to an earlier study taken up in 1986–89. This study was concerned with determining trends in the enrolment of women in the engineering courses and also in the engineering profession. The study showed that whereas the number of girls taking up engineering as a career had increased significantly from 1975 to 1990 but the job and career opportunities for women engineers were limited. The present study is motivated by the concern caused by the findings of the previous study.

Since the period of the previous study, the enrolment of women in engineering courses has increased all over the country. An attempt will be made to quantify this increase in the present study. Assessment of the current employment status and career opportunities of women engineers shall constitute the main focus of the study. Since the numbers are much larger now than ever before, this exercise acquires additional importance so that corrective approaches can be taken to facilitate the entry of women in the engineering profession, after they graduate. In the absence of such corrective approaches, there is every likelihood that the percentage enrolment of women in engineering may start leveling out or even decrease. UNESCO's World Science Report 96 reports that such a decline has already been observed, in some places.

The present study will focus on women engineers **who have obtained their Bachelor's degree in engineering or technology or architecture during the period 1994–98 and are presently located in the states of Andhra Pradesh, Delhi, Gujarat, Karnataka, Kerala, Maharashtra and Tamil Nadu**. These states have been selected because at the moment they have the highest percentages of graduating engineers.

Two pathways will be followed in the study. In the first path, it is proposed to contact the women engineers concerned directly and develop a profile of the jobs they do, the career paths they follow and the problems that they encounter. The earlier study had clearly shown that faced with

.....Cont.



a new situation of rising output of women engineers, employers are showing some reluctance in hiring them. Clearly the viewpoint of employers is an important factor to be taken into account in the job situation analysis. Obtaining the employer's views on hiring women engineering professionals will thus form, the second pathway for achieving the set objectives of this study.

Through this letter we are approaching you to seek your participation and co-operation in the present study. We are sending this letter to an address, which has been obtained from a friend, classmate or colleague of yours. Please acknowledge the receipt of this communication and confirm your particulars and the postal address. Kindly send us the names and addresses of other women engineering graduates whom you may know as classmates, friends or colleagues in the enclosed Format-C. A self addressed stamped envelope is also enclosed for your convenience.

Your participation in the study is crucial to its success. We shall deeply appreciate your filling up the enclosed format. We shall be approaching you again through a questionnaire for more information on your professional experiences.

We look forward to the favour of an early response.

Thanking you and with kind regards,

Yours sincerely,

**FORMAT- C**

Please return the completed format to:

Prof. (Mrs.) P. P. Parikh  
Department of Mechanical Engineering,  
Indian Institute of Technology, Bombay  
Powai, Mumbai 400 076, INDIA.

**MY PARTICULARS ARE AS FOLLOWS:**

**FIRST NAME & FAMILY NAME (Maiden) :** \_\_\_\_\_

**FIRST NAME & FAMILY NAME (After Marriage) :** \_\_\_\_\_

**YEAR OF GRADUATION:** \_\_\_\_\_ **DEGREE OBTAINED:**  B.E.  B.Tech.  B.Sc. ( Engg.)  
(Please ✓ appropriately) Any other please specify: \_\_\_\_\_

**BRANCH IN WHICH GRADUATED:** \_\_\_\_\_

**NAME AND ADDRESS OF THE INSTITUTION** \_\_\_\_\_

**FROM WHERE GRADUATED** \_\_\_\_\_

**TYPE OF INSTITUTION:**  IIT  REC  Govt. Engg. C  Pvt. Engg. C (Aided)  Pvt. Engg. C (Unaided)  
(Please ✓ appropriately) Any other please specify : \_\_\_\_\_

**NAME & ADDRESS OF ORGANISATION WHERE EMPLOYED :** \_\_\_\_\_

**TYPE OF ORGANISATION\* :** \_\_\_\_\_  
(Please see the list below)

**CURRENT ADDRESS:** \_\_\_\_\_

**POST HELD:** \_\_\_\_\_

**PERMANENT ADDRESS:** \_\_\_\_\_

- \*1. Government                      3. Private Industry  
2. Defense Services                4. Educational Institution

5. Public Sector Unit ( PSU )                      7. R&D Organisation (Pvt.)  
6. R&D Organisation (Govt.)                    8. Any Other ( Please Specify)

**FORMAT-C**

*Contd.*

**PARTICULARS OF OTHER WOMEN ENGINEERS KNOWN TO ME ARE AS FOLLOWS:**

<b>Sr.No.</b>	<b>Name</b>	<b>Qualification*</b>	<b>Graduation Year</b>	<b>Branch/ Specialisation</b>	<b>College &amp; University</b>	<b>Current Postal Address</b>
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

\* B.E., B. Tech., B.Sc. (Engg.) etc.

*Please attach additional sheets if necessary.*

## **ANNEXURE-6**

### **QUESTIONNAIRE FOR WOMEN ENGINEERS**

# **WOMEN IN THE ENGINEERING PROFESSION**

**A Study Sponsored by the Department of Science and Technology (DST)**

**Government of India**

[DST/NSTMIS/05/05/97]

## **Questionnaire** **for** **Women Engineer Participants**



Department of Mechanical Engineering

**INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY**

Mumbai-400 076, INDIA

(1999)



**INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY**  
**Department of Mechanical Engineering**  
**Powai, Mumbai 400 076**

Ref.: WOM2/Quest/WE

Date: May 15, 1999

Dear Madam,

**Sub.: Women In The Engineering Profession**

The Indian Institute of Technology, Bombay has taken up a project on **Women in the Engineering Profession** under the sponsorship of the Department of Science and Technology, Govt. of India. The broad objectives of the project are to assess the level of participation of women in the engineering profession, to study the current job status and career opportunities, and to suggest corrective approaches and policy initiatives based upon the findings. The project is a sequel to an earlier study taken up in 1986–89. This study was concerned with determining trends in the enrolment of women in the engineering courses and also in the engineering profession. The study showed that whereas the number of girls taking up engineering as a career had increased significantly from 1975 to 1990, the job and career opportunities for women engineers were limited. The present study is motivated by the concern caused by the findings of the previous study.

An assessment of the current employment status and career opportunities of women engineers is the main focus of the present study along with a study of the enrolment trends. This exercise acquires much greater importance in view of the increased annual out-turn of women engineers and the fact that their entry into the main stream of the profession still remains limited. Corrective approaches towards facilitating the entry of women in the engineering profession are warranted to prevent any trend reversal as reported in the UNESCO's World Science Report 96.

The present study will focus on **women engineers who have obtained their Bachelor's degree in engineering, technology in Civil, Electrical, Electronics, Computer Science/Engg, and Mechanical Engineering and Architecture during the period 1994–98 and are presently located in the states of Andhra Pradesh, Delhi, Gujarat, Karnataka, Kerala, Maharashtra and Tamil Nadu.**


Two pathways are being followed in the study. The first pathway consists of contacting the women engineers concerned directly and developing a profile of the jobs they do, the career paths they follow and the problems that they encounter. The earlier study had clearly shown that faced with a new situation of rising output of women engineers, employers are showing some reluctance in hiring them. Clearly the viewpoint of employers is an important factor to be taken into account in the job situation analysis. Obtaining the employers' views on hiring women engineering professionals will thus form, the second pathway for achieving the set objectives of this study.

This **Questionnaire** is the instrument for information collection about women engineer participants of this study. It has been formulated keeping in view the objectives of the project. Depending upon whether you have a job or do not have one, some questions may not be applicable to you. Please skip the non-applicable portions and/or write 'NA' appropriately. Please fill in the questionnaire and send it back to us at your earliest convenience. Please use the space provided for free expression within the questions and also at the end of the questionnaire if necessary. Frank and careful response to each of the questions is extremely important and crucial for achieving the objectives of the study. Please help us in deriving precise and useful conclusions. **YOUR REPLY WILL BE KEPT CONFIDENTIAL.** Information supplied by you will be used for the purpose of this study only. Complete anonymity of individual respondents shall be maintained in the final report.

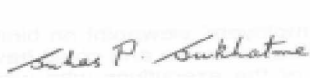
Your participation in the study is crucial to its success. We look forward to the favour of an early response. A self addressed stamped envelope is enclosed for your convenience.

Thanking you and with best regards,

Yours sincerely,



(Dr. ( Mrs.) P. P. Parikh)  
Professor



(Dr. S. P. Sukhatme)  
Professor

# **QUESTIONNAIRE**

## **PART-I GENERAL**

## **PART-II PERCEPTIONS, CAREER GOALS AND VALUES**

## **PART-III JOB STATUS, CAREER EXPECTATIONS AND PROBLEMS**

**III.A To Be Filled-In By Women Engineers  
Employed Continuously After Graduation**

**III.B To Be Filled-In By Women Engineers  
Who Have Not Had A Job After  
Graduation**

**III.C For Women Engineers Pursuing Higher  
Studies, Intermittently Employed, etc.**

**PART-I    GENERAL**

**About You**

(1) Full name (In Block Letters): \_\_\_\_\_  
First Name      Middle Name      Family/Last Name

(2) Address for correspondence:

(a) Present \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ PIN \_\_\_\_\_ STD code \_\_\_\_\_  
Phone(office) \_\_\_\_\_ Phone(Res.) \_\_\_\_\_  
Email \_\_\_\_\_

(b) Permanent \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ PIN \_\_\_\_\_ STD code \_\_\_\_\_  
Phone (office) \_\_\_\_\_ Phone (Res.) \_\_\_\_\_  
Email \_\_\_\_\_

(3) (i) Marital status [Please tick ( ✓ ) the appropriate]

(a) Single                          (b) Married   

**[If the answer to the above question is (a), go to (6)]:**

(ii) Year of marriage \_\_\_\_\_

(iii) Number of children \_\_\_\_\_

(4) Please give the formal educational level of your husband

[Please tick ( ✓ ) the appropriate]:

(a) Post Graduate                                            (b) Graduate                     

(c) High School                                            (d) Secondary                     

(e) No Schooling

**(5) Formal educational level of father, mother, sisters and brothers**

*[Please tick (✓) the appropriate]:*

	<b>Mother</b>	<b>Father</b>	<b>Sister(s)</b>		<b>Brother(s)</b>	
			<b>(1)</b>	<b>(2)</b>	<b>(1)</b>	<b>(2)</b>
<b>(a)</b> Post Graduate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>(b)</b> Graduate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>(c)</b> High School	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>(d)</b> Secondary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>(e)</b> No Schooling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**(6) Your Schooling Background**

**(a) Category of place where you did most of your schooling**

*[Please tick (✓) the appropriate]:*

- (i)** Village       **(ii)** Town       **(iii)** City

**(b) Type of school [Please tick (✓) the appropriate]:**

- (i)** Public   
**(ii)** Kendriya Vidyalaya   
**(iii)** Christian Missionary   
**(iv)** Govt. / Semi-Govt.   
**(v)** Municipal   
**(vi)** Private   
**(vii)** Others[ *Please specify* ] \_\_\_\_\_

**(c) Medium of instruction in which you did most of your schooling**

- (i)** English       **(ii)** Vernacular

**(7) When did you first plan on an engineering career? [Please tick (✓) the appropriate]:**

- (i)** At secondary school stage   
**(ii)** At the higher secondary school stage   
**(iii)** Never planned

**(8) Academic Records/Performance**

**(a) Please list your educational records.**

Examination/ Diploma/ Degree	Board/ University/ Institution	Year of Passing	Specialisation Branch	Remark
Higher Secondary				
BE / B Tech /B Sc (Engg)				
ME / M Tech /PG (Dip)/MBA				
Ph D				

**(b) Approximate rank in the engineering college while passing out**

*[Please tick (✓) the appropriate]:*

- (i) In the upper 10%
- (ii) In the upper 10% - 25%
- (iii) In the upper 25% - 50%
- (iv) In the lower 50%

**(9) Please list your training record.**

Training	Institution/ Organisation	Duration	Nature of training	Remarks (if any)
<b>Training post UG</b> (i) short term (ii) long term				
<b>Training PG</b> (i) short term (ii) long term				
<b>In service training</b>				

**(10) Are you a member/office bearer of any professional society/association, etc.?**

Yes  No

If Yes, please give details in the space below.

---

---

**PART-II PERCEPTIONS, CAREER GOALS AND VALUES**

(11) Rate the contribution of the following personal qualities in achieving your academic and career goals.

	Low	Average	High
(a) Your personal drive and determination	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b) Self confidence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c) Intellectual abilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d) All of the above	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(e) None of the above	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(12) (a) Did you have any specific preference regarding the type of job you wanted at the time of your graduation?

Yes  No

If **Yes**, check the preferred one out of the following:

- (i) Desk type job  (iii) Marketing & management   
(ii) Execution  (iv) Any other [Please specify] \_\_\_\_\_

(b) Has the preference changed since your graduation?

Yes  No

If **Yes**, please specify reasons \_\_\_\_\_

---

(13) As a professionally competent person whom you would prefer as your [Please tick (✓) appropriately]:

	Superior	Subordinate
(a) Would prefer a woman	<input type="checkbox"/>	<input type="checkbox"/>
(b) Would prefer a man	<input type="checkbox"/>	<input type="checkbox"/>
(c) No preference	<input type="checkbox"/>	<input type="checkbox"/>

**(14) Do you agree or disagree with the following statements?**

*[Please tick (✓) the appropriate]*

Statements ↓↓↓	Agree fully	Agree some- what	Disagree some- what	Disagree strongly	No opinion
(a) For a married woman, a career should be secondary to her responsibilities as a wife and mother					
(b) Women will have to do better than men to get equal professional recognition					
(c) Small children suffer when mothers work full time					
(d) A woman who is really interested in her career should not have children					
(e) A working woman can not manage both home and work demands without sacrificing either					
(f) Working women often have to deal with sexual advances from men they work with					
(g) Even today professional women end up in secondary roles doing routine jobs					
(h) Compared to a man, it is harder for a woman to be accepted fully into a professional working group					
(i) In a conflict between a husband's career and a wife's career, the husband's career should come first					
(j) Unless the family / husband provides a supporting role, a woman cannot have a successful career					
(k) Men can raise small children just as woman can					
(l) I would feel uncomfortable if my husband kept house					
(m) The woman's movement has been a major force in opening up professional careers for women					
(n) It is acceptable for women to assume leadership roles in industry as often as men					
(o) Since child rearing is demanding, the present work structure should be modified to enable a woman to continue her career without a break					

**(15) CAREER GOALS**

Rank the desirability of having the following goals in one's professional career. Indicate the extent to which these have been realised by you in your career. [Please rank and tick (✓) the appropriate]

CAREER GOALS ↓↓↓	Rank	Not at all realised	Partially realised	Fully realised
(a) A feeling of security by being self supporting and opportunity for financial advancement				
(b) Opportunity for personal growth and development for independent thought and action				
(c) A sense of one's own identity rather than that of husband / family				
(d) A sense of accomplishment				
(e) Opportunity to influence important decisions by being part of a collective endeavour				
(f) Involvement in challenging and creative activity and opportunity for intellectual stimulation.				

**PART-III    JOB STATUS, CAREER EXPECTATIONS AND PROBLEMS**

**(16) Please specify the group you belong to:**

- (a) Employed continuously after graduation
  - (b) Unemployed since graduation
  - (c) Any other e.g. Pursuing further studies, Intermittently employed since graduation, etc.
- [Please specify].
- 

*Those belonging to group 'a' please answer PART-III.A and ignore PARTS III.B and III.C.*

*Those belonging to group 'b' please answer PART-III.B only.*

*Those belonging to group 'c' please answer PART-III.C only.*



**PART-III.A To Be Filled-In By Women Engineers Employed Continuously After Graduation**

(17) Through which of the following processes of selection, did you secure your present/previous job?

	Present Job	Previous Job
		<i>[If applicable]</i>
i) Campus interview	<input type="checkbox"/>	<input type="checkbox"/>
ii) Response to advertisement	<input type="checkbox"/>	<input type="checkbox"/>
iii) As a sequel to practical training	<input type="checkbox"/>	<input type="checkbox"/>
iv) Through personal contacts or networking	<input type="checkbox"/>	<input type="checkbox"/>
v) Any other <i>[Please specify]</i> _____		

(18) Did you face any problems in being invited for a campus interview?

Yes  No

(19) How many campus interviews did you give?

*[Please tick (✓) the closest/appropriate]*

- |             |                          |         |                          |
|-------------|--------------------------|---------|--------------------------|
| i) About 10 | <input type="checkbox"/> | ii) <5  | <input type="checkbox"/> |
| iii) <2     | <input type="checkbox"/> | iv) Nil | <input type="checkbox"/> |

(20) Were you selected in the campus interview?

Yes  No

(21) If you were not selected, what do you think were the reasons for the same?

- a) \_\_\_\_\_
- b) \_\_\_\_\_
- c) \_\_\_\_\_

(22) Have you had any difficulties in being called for job interviews?

Yes  No

If **Yes**, please elaborate. *[You may use the additional sheet at the end of this questionnaire, if necessary]* \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(23) (a) Have you had any difficulties in getting your job?

Yes  No

If **Yes**, please elaborate : \_\_\_\_\_

---

---

(b) How many months after the graduation, \_\_\_\_\_  
did you secure your first job?

(24) Have you ever rejected a job offered to you?

Yes  No

If **Yes**, what were your reasons for rejecting? \_\_\_\_\_

---

---

If **No**, what was the prime factor which made you take up the job? \_\_\_\_\_

---

---

(25) Was your first job after your graduation in the same field as your specialisation?

Yes  No

(26) Which of the following would constitute to be the nature of your present job?

[Check one or two and rank them]

	Rank		Rank
(a) Teaching	[ ]	(g) EDP/Computer	[ ]
(b) R&D	[ ]	(h) Consultancy	[ ]
(c) Design	[ ]	(i) Project Planning	[ ]
(d) Production	[ ]	(j) Marketing	[ ]
(e) Maintenance & Troubleshooting	[ ]	(k) Finance	[ ]
(f) Construction/Erection/ Commissioning	[ ]	(l) Management	[ ]
		(m) Any Other [Please specify] _____	

**(27) Particulars of the jobs that you have held (including the current one)**  
*(Please begin with the first job that you held after graduation)*

Sr. No.	Name of Employing Organisation	Type of * Employer	Designation	Full time or Part time	Dept./ Section	Last annual salary drawn (Rs./Yr.)	Date of Joining	Date of Leaving	Reasons ** for Leaving	Remarks

**Code**

**\* Type of Employer**

- (a) Govt. or Civil Service
- (b) Private Industry (Large Scale)
- (c) Govt. R&D Organisation
- (d) Private R&D
- (e) Private Industry (Small Scale)
- (f) Public Sector Organisation
- (g) Educational Institution
- (h) Others [Please specify] \_\_\_\_\_

**\*\* Reasons for Leaving**

- (a) Better professional prospects
- (b) Children's care/education
- (c) Transfer not acceptable
- (d) Personal/family transfer
- (e) Husband's/father's transfer
- (f) Not satisfied with type of job
- (g) Others [Please specify] \_\_\_\_\_

**(28) Please rate your current job in terms of the following:**

*[Please circle the appropriate number for each item]*

(a) General atmosphere	<i>[Impersonal — Personal]</i>	1	2	3	4	5
(b) Degree of structure	<i>[Precisely defined — Loosely defined]</i>	1	2	3	4	5
(c) Independence allowed	<i>[No Independence-Full independence]</i>	1	2	3	4	5
(d) Place of work	<i>[Pressurised — Relaxed]</i>	1	2	3	4	5
(e) Reward for effort	<i>[Efforts unrewarded — High reward]</i>	1	2	3	4	5
(f) Professional challenge	<i>[No challenge — Great challenge]</i>	1	2	3	4	5
(g) Your opportunity to advance	<i>[None — No limits]</i>	1	2	3	4	5
(h) Engineers opportunity to advance	<i>[None — No limits]</i>	1	2	3	4	5
(i) Opportunity for women to advance	<i>[None — No limits]</i>	1	2	3	4	5
(j) Climate for women	<i>[Uncomfortable — Very Comfortable]</i>	1	2	3	4	5
(k) How do you fit	<i>[Not at all — Very well]</i>	1	2	3	4	5
(l) My current position is related to my field	<i>[Agree — Disagree]</i>	1	2	3	4	5
(m) Position commensurate with my education and training	<i>[Commensurate — Not Commensurate]</i>	1	2	3	4	5

**(29) Which of the following do you feel your company considers the top three criteria for promotion? [Insert the letter of your choices below]**

- |                                 |   |
|---------------------------------|---|
| <b>a</b> Tenure                 | <b>f</b> Fitting into Corporate Culture |
| <b>b</b> Functional Performance | <b>g</b> Appearance                     |
| <b>c</b> Management Experience  | <b>h</b> Personality                    |
| <b>d</b> Gender                 | <b>i</b> Age                            |
| <b>e</b> Education              | <b>j</b> Personal Connection/Networking |
| <b>k</b> Others                 |   |

*[Please specify]* \_\_\_\_\_

**First Criterion** [ ]

**Second** [ ]

**Third** [ ]

(30) Please rate the following INTRINSIC AND EXTRINSIC factors in terms of their importance to you and the characteristics of your present job [Please circle the appropriate numeral]

<u>Intrinsic factors</u>	<u>Of importance to you</u>	<u>Characteristics of present job</u>
a) Engaged in satisfying work	1	1
b) Utilised skills and abilities	2	2
c) Freedom to manage own work	3	3
d) Opportunity to work an idea	4	4
e) Opportunity to keep abreast	5	5
f) Be original and creative	1	1
g) Variety of technical work	2	2
h) Problems with no readymade solution	3	3
i) Opportunity to help others	4	4
j) Opportunity to contribute to Society	5	5
k) Freedom to select own project	1	1
l) Colleagues who are interested in new development	2	2

(31)

<u>Extrinsic Factors</u>	<u>Of importance to you</u>	<u>Characteristics of present job</u>
a) Co-operative workers	1	1
b) Pleasant workers	2	2
c) Availability of personal leave	3	3
d) Availability of crèche	4	4
e) No pressure to conform in personal life	5	5
f) Desirable location	1	1
g) Knowing the work responsibility	2	2
h) Organisation respects family responsibilities	3	3
l) Job security	4	4
j) Flexible working hours	5	5
k) Freedom from pressure to excel	1	1
l) Opportunity to handle variety of work	2	2

(32) Please rate career advancement factors that are important to you and are characteristics of your job

<u>Career advancement factors</u>	<u>Of importance to you</u>					<u>Characteristics of present job</u>				
	1	2	3	4	5	1	2	3	4	5
a) Supervisor delegates Responsibility	1	2	3	4	5	1	2	3	4	5
b) Opportunity to move into management	1	2	3	4	5	1	2	3	4	5
c) Opportunity to exercise leadership	1	2	3	4	5	1	2	3	4	5
d) Preparation for top level careers	1	2	3	4	5	1	2	3	4	5
e) Assignment in different areas	1	2	3	4	5	1	2	3	4	5
f) Opportunity to travel	1	2	3	4	5	1	2	3	4	5
g) Enhance Social Status	1	2	3	4	5	1	2	3	4	5

(33) Chances for promotion and moving into administrative/management positions

	<u>Most likely</u>					<u>Least likely</u>				
	[1 2 3 4 5]					[1 2 3 4 5]				
a) In your opinion all things being equal such as education, experience and job performance, how likely is it that qualified women in your organisation will be promoted ? <i>[Please circle the number of your choice]</i>										
b) Do you feel, you have as equal a chance as your peers in securing a senior management position in your organisation?	Yes <input type="checkbox"/>					No <input type="checkbox"/>				
c) Do you feel you have as equal a chance as your male colleagues in securing an administration position in your Organisation/Institution?	Yes <input type="checkbox"/>					No <input type="checkbox"/>				

**Please proceed to (50)**

**PART-III-B To Be Filled-In By Women Engineers Who Have Not had A Job After Graduation**

**(34) Have you been seeking employment?**

Yes

No

If **Yes**, how many months have you spent actively looking for employment?

\_\_\_\_\_months

**(35) Have you ever been called for a campus interview?**

Yes

No

If **Yes**, please state the number of institutions/companies that invited you for a campus interview.

\_\_\_\_\_

Would you like to list some of the institutions/ organisations/industries?

i) \_\_\_\_\_ ii) \_\_\_\_\_

ii) \_\_\_\_\_ iv) \_\_\_\_\_

If **No**, why do you think you were not invited? Please give reasons.

1. \_\_\_\_\_

2. \_\_\_\_\_

**(36) Have you applied for a job?**

Yes

No

If **No**, why not? \_\_\_\_\_

If **Yes**, i) How many applications had you submitted before you received a response? \_\_\_\_\_

ii) How many organisations responded to your application for a job? \_\_\_\_\_

**(37) List the response of organisations to your application for a job.**

*[Please tick (✓) the appropriate]*

Type of Organisation	Responded (Positively)	Responded (With rejection)	Not Responded
i) Private sector large scale	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii) Private sector small scale	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iii) Public sector units	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv) R&D Organisation (Govt)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v) R&D Organisation (Pvt.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
vi) Technical Educational Institution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
vii) Defence services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
viii) Others <i>[Please specify]</i> _____			

**(38) Have you ever rejected a job offer ?**

Yes

No

If **Yes**, give reasons *[Please tick (✓) the appropriate]:*

- a) Lack of hostel facilities / accommodation \_\_\_\_\_
- b) Could not leave present residence \_\_\_\_\_
- c) Lack of suitable educational facilities for children \_\_\_\_\_
- d) Health reasons \_\_\_\_\_
- e) Children too young \_\_\_\_\_
- f) Not economical to have separate establishment \_\_\_\_\_
- g) Not allowed by parents / husband \_\_\_\_\_
- h) Salary too low \_\_\_\_\_
- i) Any other *[Please specify]* \_\_\_\_\_

**(39) What in your perception are the reasons for you not being employed so far?**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Please proceed to (50)**



**PART-III.C For Women Engineers Pursuing Higher Studies, Intermittently Employed, etc.**

**(40 ) Which of the following sub-groups do you belong to?**

- (a) Pursuing higher studies in continuation after completion of graduation
- (b) Pursuing higher studies after doing a job for some time
- (c) Pursuing higher studies for want of a job
- (d) Had jobs intermittently, presently unemployed
- (e) Had jobs intermittently, currently employed
- (f) Any other [Please specify]\_\_\_\_\_

**If you belong to 'a', 'b' or 'c' subgroups please answer questions(41), (42) and (50).  
If you belong to 'd', 'e' or 'f' subgroups please answer all questions from (43) to (50).**

**(41) Which of the following is the main motivation for taking up further studies?**

- (i) Wanted to study further
- (ii) Did not get a job of choice so decided to go in for further studies
- (iii) Realised that teaching would suit better as a career
- (iv) Any other  
[Please specify]\_\_\_\_\_

**(42) What do you perceive to be the best career plan for yourself as an engineering professional possessing higher qualifications? [Please (4) the appropriate]**

- (i) Shop-floor job in industry
- (ii) R&D job in industry
- (iii) R&D job in defence or other govt. R&D establishments
- (iv) Teaching and R&D assignment in institutes of higher learning
- (v) Teaching job in technical educational institutes
- (vi) Any other [Please specify]\_\_\_\_\_

*Please give the main reasons for your answer*\_\_\_\_\_

---

**Please proceed to (50)**

**(43) In your opinion what do you think are the reasons for your not being able to retain your jobs? [Please tick (✓) as appropriate]**

- (a) Needed a part time job
- (b) Maternity leave
- (c) Needs of family
- (d) Needs of children
- (e) Unable to stand up to pressures of work
- (f) Dislike the job atmosphere
- (g) Dislike the attitudes of male colleagues
- (h) No job satisfaction
- (i) Wrong specialisation

**(44) If you were working part time, was it because a full time job was not available?**

Yes

No

NA

**(45) Did you have any break in your career?**

*[Any kind of leave is not to be considered as a break]*

Yes

No

If **yes**, give reason for the break *[Use the code given below]*

---

**Code**

- |   |   |
|---|---|
| i) Marriage   | ii) Lost the job                          |
| iii) Pregnancy  | iv) Family/husband's pressure             |
| v) Poor personal health                                       | vi) Unfavourable professional environment |
| vii) Desire to spend more time with family                    | viii) Low salary                          |
| ix) Change of residence due to transfer of husband or partner | x) Inability to cope with family and job  |
| xi) Inappropriate behaviour of colleagues                     |   |
| xii) Other <i>[Please specify]</i> _____                      |   |

**(46) Reasons for wanting to work after break.** *[Check one or more. Rank if more than one]*

- a) Missed professional work \_\_\_\_\_
- b) Desire to be away from home \_\_\_\_\_
- c) Bored with just being a housewife / being at home \_\_\_\_\_
- d) Need income for myself \_\_\_\_\_
- e) Wanted to be independent and have my own identity \_\_\_\_\_
- f) Received an attractive job offer \_\_\_\_\_
- g) Children did not need my attention any more \_\_\_\_\_
- h) Change in family circumstances \_\_\_\_\_
- i) Got separated / divorced / widowed \_\_\_\_\_
- j) Financial need of family \_\_\_\_\_
- k) Any other *[Please specify]* \_\_\_\_\_

**(47) Difficulties associated with returning to work after a break.**

*[Check one or more. Rank if more than one]*

- a) Suitable job in the field not available \_\_\_\_\_
- b) Difficulty in finding a job in city / town of residence \_\_\_\_\_
- c) No satisfactory help at home for the care of the children \_\_\_\_\_
- d) Satisfactory crèche facility not available \_\_\_\_\_
- e) Lack of confidence to get back to work \_\_\_\_\_
- f) No retraining available to catch-up with professional advancement \_\_\_\_\_
- g) Out of date professional skills \_\_\_\_\_
- h) Age \_\_\_\_\_
- i) Unfavourable family attitude towards resumption of career \_\_\_\_\_
- j) Any other *[Please specify]* \_\_\_\_\_

**(48) Have you ever refused a job?                      Yes                          No**

If **Yes**, give reasons *[Please tick (✓) the appropriate]:*

- a) Lack of hostel facilities / accommodation \_\_\_\_\_
- b) Could not leave present residence \_\_\_\_\_
- c) Lack of suitable educational facilities for children \_\_\_\_\_
- d) Health reasons \_\_\_\_\_
- e) Children too young \_\_\_\_\_
- f) Not economical to have separate establishment \_\_\_\_\_
- g) Not allowed by parents / husband \_\_\_\_\_
- h) Salary too low \_\_\_\_\_
- i) Any other *[Please specify]* \_\_\_\_\_

∞ (49) **Particulars of the jobs that you have held (including the current one)**  
 (Please begin with the first job that you held after graduation)

Sr. No.	Name of Employing Organisation	Type of * Employer	Designation	Full time or Part time	Dept./ Section	Last annual salary drawn (Rs./Yr.)	Date of Joining	Date of Leaving	Reasons ** for Leaving	Remarks

**Code**

\* **Type of Employer**

- (a) Govt. or Civil Service
- (b) Private Industry (Large Scale)
- (c) Govt. R&D Organisation
- (d) Private R&D
- (e) Private Industry (Small Scale)
- (f) Public Sector Organisation
- (g) Educational Institution
- (h) Others [Please specify] \_\_\_\_\_

\*\* **Reasons for Leaving**

- (a) Better professional prospects
- (b) Children's care/education
- (c) Transfer not acceptable
- (d) Personal/family transfer
- (e) Husband's/father's transfer
- (f) Not satisfied with type of job
- (g) Others [Please specify] \_\_\_\_\_



**ANNEXURE-7**

**QUESTIONNAIRE FOR EMPLOYERS / EXECUTIVES**

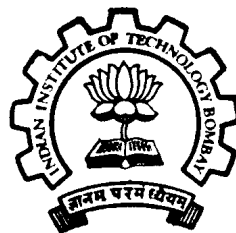
# **WOMEN IN THE ENGINEERING PROFESSION**

**A Study Sponsored by the Department of Science and Technology (DST)**

**Government of India**

[DST/NSTMIS/05/05/97]

## **Questionnaire** **for** **Employing Organisations & Executives** (Industries and Institutions)



Department of Mechanical Engineering  
**INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY**

Mumbai-400 076, INDIA

(2000)

270

भारत सरकार  
विज्ञान और प्रौद्योगिकी मंत्रालय  
विज्ञान और प्रौद्योगिकी विभाग  
टेक्नोलॉजी भवन, नया महरौली मार्ग, नई दिल्ली - 110 016

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फैक्स/Fax : 6864570, 6862418

GOVERNMENT OF INDIA  
**MINISTRY OF SCIENCE & TECHNOLOGY**  
Department of Science & Technology  
Technology Bhavan, New Mehrauli Road, New Delhi - 110016

DST/NSTMIS/05/05/97

Dated : 3.5.2000

## **TO WHOM IT MAY CONCERN**

Sub : Women in the Engineering Progression

The National Science and Technology Management Information System (NSTMIS) under the Department of science & Technology (DST) has sponsored the above research project to Indian Institute of Technology, Powai, Mumbai - 400 076.

IIT, Mumbai is conducting a survey in selected states by means of standard questionnaire cum interview method to obtain employer's view on hiring women engineering professionals in various industrial concerns. The findings of the study are expected to be of immense use to the Government Departments/Industry/Academic Institutions, policy makers and planners in the country.

You are requested to provide a prompt response by filling in the survey questionnaire and return the same to the Indian Institute of Technology, Powai, Mumbai - 400 076 for the timely completion of the study.

I solicit your earnest cooperation in this regard.

  
(Dr. Laxman Prasad)

Adviser & Head (NSTMIS)



# INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY

Department of Mechanical Engineering

Powai, Mumbai 400 076

Ref.: WOM2/Quest/EX

Date: March 15, 2000

Dear Sir/Madam,

**Sub.: Women In The Engineering Profession**

The Indian Institute of Technology, Bombay has taken up a project on **Women in the Engineering Profession** under the sponsorship of the Department of Science and Technology, Govt. of India. The broad objectives of the project are to assess the level of participation of women in the engineering profession, to study the current job status and career opportunities and to analyse the need for any policy initiatives. The project is a sequel to an earlier study taken up in 1986–89. This study was concerned with determining trends in the enrolment of women in the engineering courses and also in the engineering profession. The study showed that whereas the number of girls taking up engineering as a career had increased significantly from 1975 to 1990, the job and career opportunities for women engineers were limited. The present study is motivated by the concern caused by the findings of the previous study and the apprehensions expressed in the UNESCO's World Science Report 96 about a trend reversal in India, in regards to women taking up engineering courses, due to limited job and career opportunities.

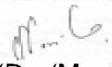
The focus of the present study are the **women who have obtained their Bachelor's degree in engineering/technology in Civil, Electrical, Electronics, Computer Science/Engineering, Mechanical and Architecture during the period 1994–98 and are presently located in the states of Andhra Pradesh, Delhi, Gujarat, Karnataka, Kerala, Maharashtra and Tamil Nadu.**

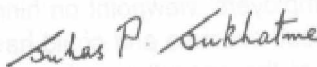
Two pathways are being followed in the study. The first pathway consists of contacting the women engineers concerned directly and developing a profile of the jobs they do, the career paths they follow and the problems they encounter. The earlier study had clearly shown that, faced with a new situation of rising output of women engineers, employers are showing some reluctance in hiring them. **Clearly, the viewpoint of employers is an important factor to be taken into account in the job situation analysis.** Obtaining the employer's views on hiring women engineering professionals, will thus form the second pathway for achieving the set objectives of this study.

This **Questionnaire** is the instrument through which we endeavour to seek the employer's views on hiring women engineering professionals. It has been formulated keeping in view the objectives of the project and findings of the previous study. The questionnaire consists of two parts. Part-I seeks information about the organisation and Part-II aims at obtaining the views of the executives/employers. The views of the executives are to be their personal views based on their own perceptions and experience. Questions relating to the organisation policies have been asked separately, clearly stating so. Please fill in the questionnaire and send it back to us at your earliest convenience. Your frank and careful response to the questions is crucial for achieving the objectives of the study. We look forward to your kind help in deriving precise and useful conclusions. The data and the views obtained through responses to this questionnaire will be used only for the purpose of analysis and will be kept confidential. Please do spare some time out of your very busy schedule and favour us with a response. A business reply envelope is enclosed for your kind convenience.

Thanking you and with very best regards,

Yours sincerely,

  
(Dr. (Mrs.) P. P. Parikh)  
Professor

  
(Dr. S. P. Sukhatme)  
Professor

# **QUESTIONNAIRE**

**PART-I    About the Organisation**

**PART-II    Views of the Executives / Employers**

## PART-I ABOUT THE ORGANISATION

(1) NAME OF THE ORGANISATION / INSTITUTION \_\_\_\_\_  
\_\_\_\_\_

(2) ADDRESS \_\_\_\_\_  
\_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ PIN \_\_\_\_\_ STD code \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_

Email \_\_\_\_\_

(3) TYPE OF THE ORGANISATION / INSTITUTION

[Please tick (✓) the appropriate]:

(a) Private Industry

(i) Large Scale  (ii) Medium Scale  (iii) Small Scale

(b) Public Sector Industry

(c) R&D Organisation

(i) Private / Industrial  (ii) Govt. / Autonomous

(iii) Govt. / Defence  (iv) Others [Please specify]   
\_\_\_\_\_

(d) Defence Services

(e) Technical Educational Institute

(i) IIT  (ii) Regional Engg. College

(iii) Govt. Engg. College  (iv) Private Aided Engg. College

(v) Private Engg. College  (vi) Others [University Dept. etc.]

[Please specify] \_\_\_\_\_  
\_\_\_\_\_

(f) Others

[Please specify] \_\_\_\_\_

(4) YEAR OF ESTABLISHMENT OF THE ORGANISATION \_\_\_\_\_

**(5) NATURE OF ACTIVITY (PREDOMINANT) OF THE ORGANISATION / INSTITUTION**

[Please tick (✓) one or more, maximum three]

- (a) Production  (b) Design & Development   
(c) Consultancy  (d) Research & Development   
(e) Teaching  (f) Information   
(g) Management  (h) Finance   
(i) Others

[Please specify] \_\_\_\_\_

**(6) SIZE OF THE ORGANISATION**

(a) Annual Budget / Turnover (as applicable) : Rs. \_\_\_\_\_

(b) Annual Wage Bill : Rs. \_\_\_\_\_

**(7) ORGANISATIONAL STRUCTURE**

Could you please provide an organisational chart. [Use separate sheets]

**(8) NUMBER OF EMPLOYEES**

NUMBER OF EMPLOYEES	TOTAL	MEN	WOMEN
In the Organisation / Institution			
With Technical Diploma			
With a Degree in Engineering			
With a Post-Graduate Degree (Including management degree)			

**(9) (a) DURING THE LAST FIVE YEARS HOW MANY ENGINEERS HAVE BEEN RECRUITED IN THE ORGANISATION / INSTITUTION?**

NUMBER OF EMPLOYEES	MEN	WOMEN
Engg. Degree holders		
Engg. Diploma holders		

**(b) DURING THE LAST FIVE YEARS HOW MANY ENGINEERS RESIGNED AND LEFT THE ORGANISATION?**

NUMBER OF EMPLOYEES	MEN	WOMEN
Engg. Degree holders		
Engg. Diploma holders		

**(10) PARTICIPATION OF ENGINEERING / TECHNICAL PERSONNEL IN MANAGEMENT**

NUMBER OF TECHNICAL PERSONNEL IN THE	MEN	WOMEN
<b>Lower Management</b> <i>(Superintendents, Technical Managers, Lecturers, Readers, etc.)</i>		
<b>Middle Management</b> <i>(Project Managers, Group Leaders, Professors, Department Heads, etc.)</i>		
<b>Upper Management</b> <i>(i.e. GM, Vice President, Director, CEO, Deans, VC etc.)</i>		

**(11) FORMATION OF WORK GROUPS**

In which way are work groups formed in your organisation?

- (a) All men
- (b) All women
- (c) Mixed groups

**(12) RATING SYSTEM FOR PROMOTION**

(a) Does the organisation have a rating system for promotions?

Yes

No

If Yes, how would you classify it?

(i) Formal

(ii) Informal

**(b) Is the rating system for women engineers the same as that for men engineers?**  
[Please tick (✓) appropriately for different levels of management]:

	Same	Different
(i) Lower management	<input type="checkbox"/>	<input type="checkbox"/>
(ii) Middle management	<input type="checkbox"/>	<input type="checkbox"/>
(iii) Upper management	<input type="checkbox"/>	<input type="checkbox"/>

**(13) PERSONNEL POLICIES OF THE ORGANISATION SPECIFIC TO WOMEN**

**(a) Maternity leave** (*Number of days*) \_\_\_\_\_

**(b) Are there any re-entry / re-induction programs for women engineers following their maternity leave?** Yes  No

If **Yes**, please give brief particulars \_\_\_\_\_

**(c) Do any of the following provisions exist in the organisation?**

- |                                  |                              |                             |
|----------------------------------|------------------------------|-----------------------------|
| (i) Flexible time slots          | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (ii) Work from home              | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (iii) Part-time job option       | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (iv) Availability of a crèche    | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (v) Others[Please specify] _____ |                              |                             |

**(d) Does the organisation have a policy with regard to employment of both husband and wife?**

Yes  No

If **Yes**, please tick [4] the appropriate below:

- (i) The policy encourages employment of both husband and wife
- (ii) The policy is to discourage employment of both husband and wife

**(e) Does the policy cover an issue like transfer to another city?**

Yes  No

(f) Does the organisation have special policies for encouraging women engineers?

Yes

No

If **Yes**, please describe \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## **PART-II    VIEWS OF THE EXECUTIVES / EMPLOYERS**

### **(14) ABOUT THE EXECUTIVE**

(a) Name \_\_\_\_\_

(b) Designation \_\_\_\_\_

(c) Total Experience (years)

Total \_\_\_\_\_

In this organisation \_\_\_\_\_

(d) Nature Of Responsibilities

(i) Shop-floor

(ii) Administrative

(iii) Marketing

(iv) Management

(v) Others [*Please specify*] \_\_\_\_\_

(e) Academic Background

DEGREE (S)	UNIVERSITY/ INSTITUTION	YEAR OF PASSING	REMARKS

**(15) ASSIGNMENT PROFILE**

**(a) Please indicate your position in the organisation**

*[Please tick (✓) the appropriate]*

(i) Middle level management

(ii) Upper level management

**(b) Current area / areas of responsibilities** \_\_\_\_\_

\_\_\_\_\_

**(c) Number of engineers reporting** \_\_\_\_\_

Number of women engineers in the team \_\_\_\_\_

**(16) VIEWS ON WOMEN IN THE ENGINEERING PROFESSION**

**(a) Please express your own views on the following statements:**

*[Please tick (✓) as appropriate]*

	<b>Agree fully</b>	<b>Agree somewhat</b>	<b>Do not agree</b>
(i) Women are competent enough to be successful in the engineering field	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(ii) It is acceptable for women to assume leadership roles in industry as often as men	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(iii) Women possess the self confidence required of a competent engineer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(iv) To be a successful engineer, a woman does not have to sacrifice her femininity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(v) There is no difference between experience, knowledge, and inter-action styles between men and women engineers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(vi) The possibility of pregnancy does not make women less acceptable as employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(vii) A full time employed mother of pre-school children can be just as good as any other employee	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(viii) It is equally important for a wife to have a career as to help her husband with his career	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



**(b) The following are often stated to be THE BARRIERS FACED BY WOMEN ENGINEERS in the course of their career. What are your views?**

	<i>Agree fully</i>	<i>Agree somewhat</i>	<i>Do not agree</i>
<b>(i)</b> Women engineers cannot work on the shop floor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>(ii)</b> Women engineers cannot work beyond office hours and / or on weekends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>(iii)</b> Women cannot take up jobs involving travel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>(iv)</b> Women cannot handle tough negotiations (such as winning a contract for the company or research funding)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>(v)</b> Women engineers cannot supervise male sub-ordinates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>(vi)</b> Women engineers do not and cannot join male colleagues in informal groups and there is a certain amount of self exclusion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>(vii)</b> Women cannot balance their work with their family as they would have to give priority to the children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**(17) YOUR VIEWS ON THE FOLLOWING:**

**(a) While interviewing a woman engineer for a job, are you worried that if she is appointed:**

(i) she will get married and leave the job to follow her husband elsewhere?  
**Yes**  **No**

(ii) she may have to be given maternity leave?  
**Yes**  **No**

**(b) Do you recognise the need for policies that allow young mothers to balance family and career such as:**

**(i)** Flexible time slots **Yes**  **No**

**(ii)** Work from home **Yes**  **No**

**(iii)** Part-time job option **Yes**  **No**

**(iv)** Availability of a crèche **Yes**  **No**

**(v)** Others [*Please specify*] \_\_\_\_\_

- (c) Do you feel that it is necessary to recognise appropriate processes and their legal implications about the questions asked to a women engineer at the time of Interview / promotion that are different from the ones asked to a male engineer?

Yes

No

**EXPERIENCE AND PERCEPTIONS**

- (18) (a) In your experience, do you perceive any differences between the skills and characteristics that women engineers and men engineers bring to their task as engineering professionals?

Yes

No

- (b) What would you consider to be the characteristics and outstanding strengths that:

(i) Women bring to their tasks as engineers \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

(ii) Men bring to their tasks as engineers \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

- (19) CONSIDERING THE WOMEN ENGINEERS WHO HAVE WORKED WITH YOU, HOW WOULD YOU DESCRIBE THEIR PERFORMANCE IN COMPARISON TO THE MEN COUNTERPARTS? [*Please tick (✓) the appropriate*]:

	<u>Lesser than Men Engrs.</u>	<u>Same as Men Engrs.</u>	<u>Better than Men Engrs.</u>
(a) Technical Skill	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b) Interpersonal Skill	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c) Supervisory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d) Public Relations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(e) Communications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(f) Level of Confidence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(g) Overall Suitability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(20) DO YOU EXPECT THAT THE ROLE OF WOMEN ENGINEERS AS WOMEN MAY ADVERSELY INFLUENCE THE FOLLOWING: [*Please tick (✓) the appropriate*]:

- |  | <u>Yes</u>               | <u>No</u>                | <u>Uncertain</u>         |
|--|--------------------------|--------------------------|--------------------------|
| (a) Job Assignments and Responsibilities | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| (b) Job Performance                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| (c) Advancement Opportunities            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

(21) WHAT IS YOUR PERCEPTION ABOUT THE TREATMENT OF WOMEN ENGINEERS COMPARED TO MEN ENGINEERS IN THE SAME POSITION?

[*Please tick (✓) the appropriate*]:

	PREFERENTIAL/ READILY ACCEPTED	EQUAL TO OTHERS /EQUALLY ACCEPTED	DISCRIMINATORY/ NOT READILY ACCEPTED
As a colleague in the workplace			
As a subordinate			
As a superior			

[*Please elaborate*] \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

(22) IT HAS BEEN SAID THAT WOMEN ENGINEERS HAVE TO WORK HARDER TO PROVE THEMSELVES TO EARN THE SAME CREDIBILITY AS MALE ENGINEERS IN SIMILAR POSITIONS. IN YOUR EXPERIENCE HAVE YOU FOUND THIS TO BE TRUE?

- Yes                       No                       Uncertain

Comment: \_\_\_\_\_  
 \_\_\_\_\_

(23) ARE YOU AWARE OF ANY PROBLEMS / DIFFICULTIES THAT WOMEN ENGINEERS EXPERIENCE IN THE WORKPLACE, THAT ARE NOT EXPERIENCED BY MALE ENGINEERS?

- Yes     No

If Yes, would you kindly elaborate: \_\_\_\_\_  
 \_\_\_\_\_

**(24) THE OPPORTUNITY FOR ADVANCEMENT OF WOMEN ENGINEERS AS COMPARED TO THEIR MALE COUNTERPARTS IN THE SAME POSITION IS:**  
*[Please tick (✓) appropriate]*

POSITION / LEVEL ↓	OPPORTUNITY IS →	LESS	SAME	GREATER
Upper Level				
Middle Level				
Lower Level				

**(25) (a) In your opinion, for which engineering specialisation are women engineers best suited?**

- |  |       |                             |     |
|--|-------|-----------------------------|-----|
| (i) Mechanical Engg.                     | [ ]   | (ii) Electrical Engg.       | [ ] |
| (iii) Civil Engg.                        | [ ]   | (iv) Electronics Engg.      | [ ] |
| (v) Architecture                         | [ ]   | (vi) Computer Science/Engg. | [ ] |
| (xiii) Any Other <i>[Please specify]</i> | _____ |                             |     |

**(b) Which type of job or assignment would suit women engineers most so that they may perform best *[Check one or two and rank them]***

- |  |       |  |     |
|--|-------|--|-----|
| (i) Teaching                             | [ ]   | (ii) R&D                                 | [ ] |
| (iii) Design                             | [ ]   | (iv) Production                          | [ ] |
| (v) Maintenance & Troubleshooting        | [ ]   | (vi) Construction/Erection/Commissioning | [ ] |
| (vii) EDP/Computer                       | [ ]   | (viii) Consultancy                       | [ ] |
| (ix) Project Planning                    | [ ]   | (x) Marketing                            | [ ] |
| (xi) Finance                             | [ ]   | (xli) Management                         | [ ] |
| (xiii) Any Other <i>[Please specify]</i> | _____ |  |     |

**SPECIAL MEASURES AND POLICIES**

**(26) (a) Do you think that in order to avoid gender bias there is a need for having a company directive/policy for Executives who are engaged in the process of selection of Engineering Staff?**

Yes

No

Please elaborate \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**(b) Would you advocate identification of women engineers with managerial potential and the creation of a fast track for them?**

Yes

No

If Yes, please give specific suggestions \_\_\_\_\_

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**(27) WOMEN GRADUATES FROM ENGINEERING COLLEGES CONSTITUTE 20-25% OF THE TOTAL OUT-TURN BUT THEIR REPRESENTATION IN THE PROFESSIONAL JOB MARKET IS MUCH LOWER. WHAT DO YOU THINK COULD BE THE REASONS?**

Your comment please: \_\_\_\_\_

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**(28) DO YOU THINK THIS SITUATION COULD BE REMEDIED / CHANGED?**

Yes

No

Please elaborate \_\_\_\_\_

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**(29) IN THE EVENT OF YOU CHAIRING A SELECTION BOARD AND COMING ACROSS EQUALLY QUALIFIED, EXPERIENCED AND INTELLIGENT CANDIDATES, WOULD YOU HAVE A PREFERENCE FOR : [Please tick (✓) the appropriate]:**

Woman Engineer

Man Engineer

Kindly explain the basis for your preference \_\_\_\_\_

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The response from the women engineers has been overwhelming not only in the numbers but also the trust they placed in the investigators while replying to the questionnaire. Their replies have all along reflected a hope that this study and its findings will brighten their career. Going through their replies has been a gratifying source of encouragement. It is necessary to acknowledge this support and put on record the crucial role played by the same in successful completion of the study.

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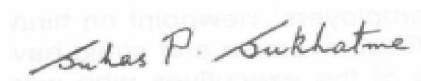
We would be failing in our duties if we do not acknowledge the timely expert advice and help received from Prof. B. S. Bhat, Chairman LPAC, Dr. G. T. Murthy, Mrs. Leza Hattiangadi and Mr. A. G. Puranik, the members of the Local Project Advisory Committee. The members have gone out of their way in helping with data



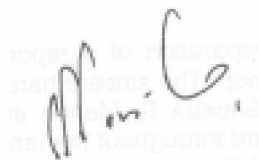
collection particularly for the second part of the project. Our sincere thanks for their time and inputs.

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A handwritten signature in black ink, reading "Sukhatme" in a cursive style.

Prof. S. P. Sukhatme

A handwritten signature in black ink, reading "Parikh" in a cursive style.

Prof. (Mrs.) P. P. Parikh