

Entrepreneurial Journey of Women in Science, Technology and Engineering

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Abstract

The true entrepreneur is a doer and not a dreamer. The change of social fabric of the Indian culture, as far as the expanded educational status of women and differing desires for their cut above living. Increased **female entrepreneurial activity** emits progress for women's rights and optimization of their economic and social living index. **Women entrepreneurship** symbolizes women's empowerment. Entrepreneurship is endlessly fascinating as people love the challenge of creating something from nothing and making it work. The need of the hour is to encourage women to set up their own enterprise. Parallel to the male counterparts, female entrepreneurs are catalytic in job creation, innovation and more tactile to the contribution of the Gross National Product of the country. An economy flourishes when women get a level playing field as that of men. **Innovation** and **Technology** are indeed the catalysts for Entrepreneurship. Despite handling all the social hurdles, Indian Women have risen tall from the rest of the crowd and are acclaimed for their achievements in their respective fields. Women-owned business enterprises help in stimulating others as well as generating more employment opportunities in and across the country. In spite of all the huge developments that have been made in gender equality, the transformation of the Indian society, in terms of the educational status of women for better living, still fails to bridge the gap between males and females in the arena of education, employment and entrepreneurship. The objective of this paper is to fill in part of this gap and to explore the studies related to **Women as Entrepreneurs** in the field of engineering. The main significance of our study is to Reveal the profile of women entrepreneurs, determine their problems, Specify the mechanisms which support women and exhibit the expectations and demands of women entrepreneurs.

Keywords- Entrepreneur, Technology, Problems faced

INTRODUCTION

Entrepreneurship is all about creating some value. "An idea that can bring change to the world and status-quo." The purpose of entrepreneurship is continuous improvement and innovation that leads to the creation of value. Woman entrepreneurship

is a process in which women kick off their small businesses, gather all resources, undertake risks, face challenges, providing employment to people and manage them independently. In other words, an organization owned by women for the change in the role of women. In recent years women

entrepreneurs have become highly efficient in tackling various problems proving them to be equally efficient to men. Women entrepreneurs highly employ women in their workplace, proving to be the shapers of women's life as well as the economy by empowering all women in the nation. Women being the reason for quite lower in the society are that they need to face quite a lot of challenging difficulties in their journey ahead. Each and every successful woman entrepreneur has failed and faced all sorts of struggles while trying to sustain their business with their willpower, which impacted society positively by offering many offers and opportunities to many people around.

LITERATURE REVIEW

In general, the entrepreneurial journey is full of entrepreneurship. But in the recent 5 to 10 years, women's participation has increased in many frontiers to mark their steps. The male-gendered concept in Pakistan led woman entrepreneurs down. The Survey done among 100 woman entrepreneurs has identified the various problems and issues confronted by them. The prospectus of woman entrepreneurship involves equal participation of all people, regardless of their gender. A woman should get more exposure in order to extend their work further and stamp their footsteps equalizing men [1].

In India, problems and prospects reveal that the Indian woman was really assertive, potent and willing to take risks [2]. The author mainly focused on the reasons for the slow growth of woman entrepreneurs and suggested various measures for their progress. An example case study of a woman entrepreneur from Ludhiana has been shown to exhibit her steps of success.

Women enter into business due to the success stories of others, to be independent, to generate employment, self-identity and social status, support of family members, need for additional income etc.

Minority Women Entrepreneurs Faced a lot of problems in the Engineering, Mining and Construction Fields. Women entrepreneurs are participating in a minority amount in non-traditional fields like Engineering, Mining and Construction Fields [3]. This paper suggested that the opportunities for women's entrepreneurial education should be made diverse to women in different industries and different races. This study has identified several aspects of the minority female entrepreneurial experience in these fields and sought to elaborate on and validate factors that may differentiate between minority women entering traditional industries from those entering non-traditional ones. The results indicate that women entrepreneurs in non-traditional industries across racial lines do differ on various characteristics. Based on these inferences, the research framework is proposed to analyze and discuss the major issues faced by the female entrepreneurial population. The work was done based on the list of surveys made among woman entrepreneurs. What made women progress slower? What were their background drawbacks? Is gender equity maintained? How do women in non-traditional industries establish themselves? In this research, we try to reason out the answers to these questions to alleviate the female entrepreneurial experience in these fields to prove themselves.

RESEARCH METHODOLOGY

The survey and background analysis of women from engineering fields were thoroughly made to identify the pros and cons of woman's entrepreneurial journey.

Women's entrepreneurial growths of countries worldwide were analyzed to identify the position of woman entrepreneurs and their progress in our country. In this study, the respondent's answer plays a quite crucial role.

The study covers a sample size of 500 women entrepreneurs and 500 women non-entrepreneurs. For this study, we analyzed both primary and secondary data. Primary data are collected from 500 women and women non-entrepreneurs. The primary data collection is done through a structured questionnaire prepared on the basis of a review of the literature, and the variables were selected from those. Secondary data are collected

from media like journals and publications and some of the relevant websites. Data extraction from the respondents is collected through a structured questionnaire. Simple percentage methods and weighted ranking methods are used for analyzing the collected data.

Table 1 shows the comparison of demographical factors of our respondents. On analysis, we have found that the two groups– women entrepreneurs and non-women entrepreneurs were different in terms of their age, education, work experience and childhood background. Women entrepreneurs were found to be more matured in terms of age, more educated, and equipped with work experience in comparison to non-entrepreneurs. With respect to childhood background, women entrepreneurs seem to come from all walks of life, unlike the non-entrepreneurs who appear to be primarily from towns.

Table 1: Demographic factors of women respondents

Demographic Factors	Women Entrepreneurs=500		Women Non-Entrepreneurs=500	
	Number	%	Number	%
Age				
20-30	100	20	120	24
31-40	123	24.6	145	29
41-50	89	17.8	63	12.6
51-60	39	7.8	2	0.4
> 60	24	4.8	0	0
Education (Engineering)				
Masters	78	15.6	0	0
Bachelors	278	55.6	114	22.8
Diploma	46	9.2	159	31.8
Others	12	2.4	0	0
Working Experience				
Yes	352	70.4	196	39.2
No	36	7.2	87.2	17.44
Childhood Background				
City	94	18.8	23	4.6
Town	176	35.2	265	53
Village	76.3	15.26	52	10.4

In this study, the demographic profile of women entrepreneurs shows that these women are basically below the age of forty. Out of the 500 respondents, the majority of them (44.6%) lie between the ages of 20-40. Comparatively, woman entrepreneurs are found to be more educated, where almost half of the respondents are degree holders. In fact, the educated generation is more likely to become women entrepreneurs and become self-employed.

With reference to childhood background, nearly 35% of the women entrepreneurs seem to come from all types of background, unlike the non-entrepreneurs who appear to be primarily from towns. This varying background indeed serves as an encouraging factor for these women to try

something new and explore the inner talents they possess.

Moving onto work experience, Women entrepreneurs are well endowed in comparison to non-entrepreneurs. 70.4 percent of women have got some previous working experience, shows their desire to have their own favourable working style and change in working experience may explain why they have decided to become entrepreneurs.

ANALYSIS AND INTERPRETATION

Through the demographical factors that we got from the questionnaire, the following problems, as illustrated in Table 2, have been majorly faced by the respondents. These issues prove to down their progress a lot.

Table 2: Obstacles faced during entrepreneurial

PROBLEMS	NO. OF RESPONDENTS	PERCENTAGE
Inadequate infrastructure facility	9	7%
Lack of skilled labor	17	14%
Non availability of raw material	13	10%
Lack of training	5	4%
Marketing problem	16	13%
Inadequate finance	38	28%
Lack of govt. support	17	14%
Lack of age maturity	10	10%
Total	125	100

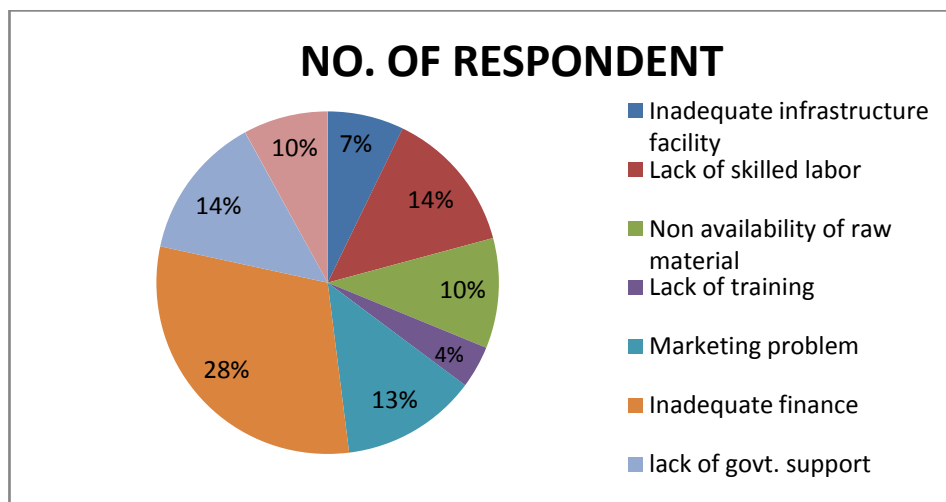


Fig. 1: Stumbling blocks of entrepreneurial journey

The findings of the study, as shown in Fig. 1, indicate that majority of the respondents (28%) say their problem is inadequate to finance. It is found that lack of government support (14%) and problems related to marketing (13%) is quite not well. Government and Financial Institutions should provide special assistance and incentives for encouraging women's entrepreneurship. Women entrepreneurs should come to know about the various financial assistance in areas of marketing, distribution, etc. of the women's entrepreneurship products.

Great entrepreneurs have the ability to change the way we live and work. Simply put, entrepreneurship is one of the few ways to explore all your potential as a human being. Being in Entrepreneurship will make us encounter plenty of people who have ideas of their own. They will share their background and won't be afraid to share their political beliefs. Exchanging ideas, coming up with blueprints to build the foundation for the business, how to work with money, invest and save, and most importantly, one will learn how to manage the business. Unlike all the other degrees, we can't just study entrepreneurship as a

chapter of the book to pass a semester then sell it off because those books are literally going to be our life. Entrepreneurship is undoubtedly an eye-opener as it helps us to think of things that we never probably thought of before. Interestingly entrepreneurs are those people who know what they want and when they want. An entrepreneur looks at the world as a series of obstacles that can be more overcome, and then they remove those obstacles so that the next person, hopefully, another entrepreneur, will look at the world in a new light! The following representation of figures portrays a clear picture.

Having a small startup enterprise is definitely not a bed of roses for women. According to a study carried out in 40 countries and territories by the Global Entrepreneurship Research Association, female entrepreneurialism is made based on necessity which is illustrated in Fig. 2. The researchers distinguish between necessity-driven entrepreneurship, which can be caused by a lack of formal employment opportunities in a country, and innovation-driven entrepreneurialism, which exists in countries with well-developed formal job markets.

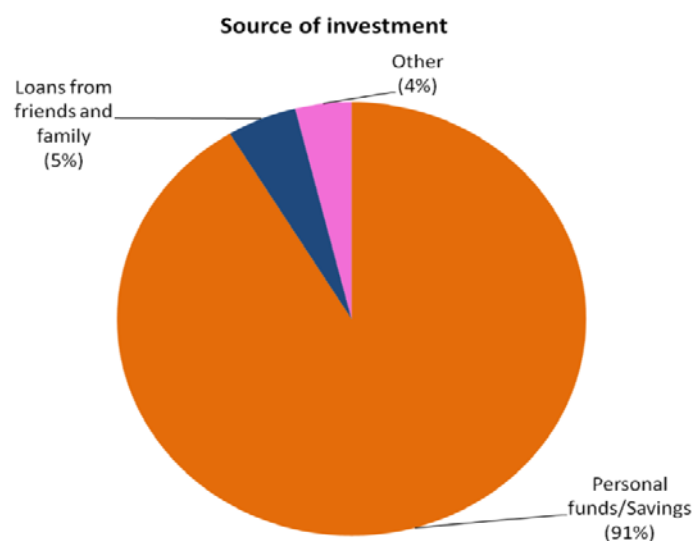


Fig. 2: Sources of investment for startups by women

In the majority, 91% of women use their personal funds and savings to start their business, making women the largest untapped reservoir in the world.

Obstacles Faced in the Entrepreneurial Journey

Fig. 3 illustrates the educational background of women, and it is clear that 51% of the respondents have done their under graduation, and surprisingly, 43% have moved steps ahead. Women often face a rough sea of challenges making it in the business world. These challenges tend to make them more capable and possibly even more successful than their male compeers. Women naturally have

extraordinary common sense, sharp intuition and great focus on people. These are extremely valuable characteristics in entrepreneurship and can help set them apart as a leader.

The motivation for starting a business is shown in Fig. 4, which lies in self-achievement and in making money. The ability to stay motivated is the primary driver as an entrepreneur to get things done. When the motivation level is high, women will be more focused on spending additional time in getting their product right. In order to get to the top, one should enroll others.

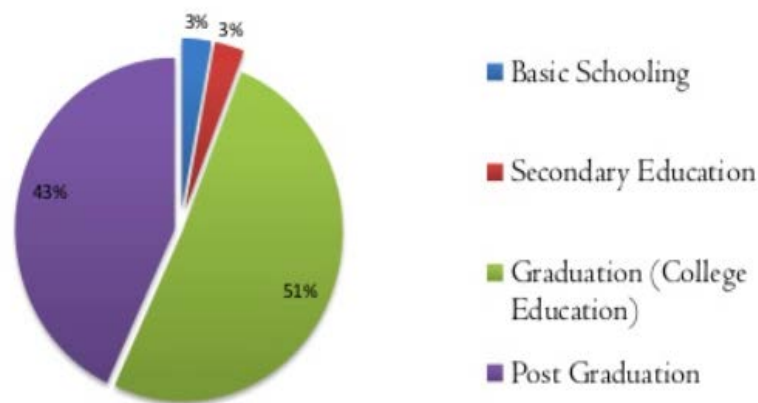


Fig. 3: Educational background of women

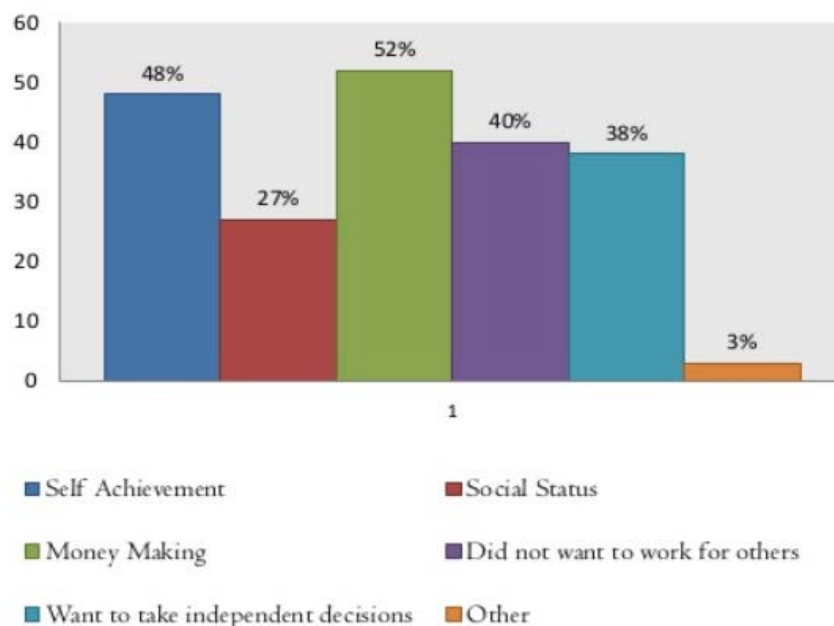


Fig. 4: Motivation for startups

Table 3: Women entrepreneurial journey interferences

Particulars	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
	1	2	3	4	5	
Lack of Awareness	8%	28%	42%	22%	0%	100
Lack of manpower	5%	32%	50%	13%	0%	100
Lack of resources	8%	37%	45%	10%	0%	100
Competition	6%	9%	28%	38%	19%	100
Financial/Liquidity Problems	16%	45%	29%	9%	1%	100
Gender Discrimination	69%	15%	10%	5%	1%	100
Family and Work Life Balance	38%	19%	18%	14%	11%	100
Technological Problems	28%	28%	26%	16%	2%	100

The obstacles faced by the women entrepreneurs are analyzed and tabulated in the source survey, as shown in table 3.

There are many reasons which act as roadblocks to women in their entrepreneurial journey:

Women are not treated equally to men, serving as a barrier to women's entry into the business. So it is becoming difficult for women to launch their entrepreneurship on a large scale in this male-dominant society. Only very few women try to step out of their comfort zone so as to build entrepreneurial networks, which helps to socialize as well as to win customers. Whether it is big or small- finance is treated as the 'life-line' for any business. Women generally do not have properties in their names, and banks also consider women's repayment of money and discourage women borrowers on the belief that they might leave their business at any time and cause. Apart from this, many financial schemes have been formulated by the Government of India to uplift women financially.

Due to her total involvement in the family, she is left with no energy and also no time to devote to their business. Lack of awareness, manpower and

resources also play a critical role. Indian companies recruit students mostly from campuses, making it clear that both male and female students should get equal career opportunities as well. As a result of which high levels of youth unemployment can be rectified. According to the last report by GEM (Gender Empowerment Measure), the Total Entrepreneurial Activity among women has increased by 10%, and the gender gap has almost narrowed by 5%. Women should be able to "Think Big" and never try to close their "Ambition Gap," which automatically will lead to the "Achievement Gap." Young Women Entrepreneurs who wish to take up powerful leadership positions and roles must put up with negativity. Above all the society should take positive steps to improve women's participation. Everyone deserves equal appreciation and recognition for their work. So are women. Equal nominations and recognition to that of males must be ensured. As regions compete for business in the future, the regions with environments that are equally sustainable to both men and women captivate more and will succeed in economic expansion.

CONCLUSION

Owing to a Healthy economic expansion with a strong educational foundation, expanding non-profit activities, praising the valuable female talents, and providing opportunities to encourage women on a large scale. In the near future, woman entrepreneurs should be encouraged as role models. Successful women entrepreneurs' journeys should also be narrated like men. There should be a day where there should be no need for special awards for women because they should be in a position of equal recognition to men. The civilization that achieves this goal might even double its output without using its natural resources or recruiting a new population from another region. Women today are creating exceptional and ground-breaking accomplishments in every sphere of life and are optimistic about what the future holds for them. Strong financial support in the form of schemes for budding women entrepreneurs to turn their dreams into reality. With the increased supportive initiatives by the government, management boards, peer-to-peer platforms, families and support-systems, gender-based roadblocks are now being rapidly eliminated in the entrepreneurial journey of a woman.

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APPENDIX A. QUESTIONNAIRE FOR WOMEN ENTREPRENEURS

A.1. Demographic profile of women entrepreneurs

A) Personal information

1. Name and address
2. Age
3. Religion
4. Caste (please specify your particular caste)
5. Marital status
6. Educational qualifications

B) Information about family background

1. Nature of family
2. No. of family members (including respondent)
3. No. of children
4. Annual income of family (excluding respondent)

A.2. Occupational profile of women enterprises

1. Name and address of venture
2. Location of venture -rural/urban
3. Occupation of respondent before starting the venture
4. Age of respondent at the time of starting the venture
5. Year of establishment of venture
6. Nature of enterprise/business/venture
7. Classification/types of venture
8. Form of organization of venture
9. Main reason for starting venture in particular area
10. Do you have employees in your venture?
11. A) do you give preference to female employees? Yes /no

B) If yes, what are the facilities given to them?

12. A) do you give training to the employees? Yes/no
- B) if yes, what are training methods used?

A.3. Problems of women entrepreneurs

1. Have you faced any problems while running your business enterprise? Yes/no
2. What types of problems you have faced as an entrepreneur?
 1. Personal problems
 2. Social problems
 3. Financial problems
 4. Human resources problems
 5. Technological problems
 6. Governmental support problems

4. Raw-materials problems

8. Occupational mobility problems

5. Marketing problems

9. Any other (please specify)

3. Do you face any personal problems as an entrepreneur?

i) no personal problem ii) lack of self confidence iii) lack of initiative iv) lack of risk bearing capacity v) lack of leisure time vi) absence of need for achievement vii) avoidance of economic risk viii) any other (please specify)

4. Do you face any social problems as an entrepreneur?

i) no social problem ii) lack of confidence in women's ability iii) lack of appreciation in the family iv) lack of social contacts v) dual role in home & business vi) male dominance vii) non-co-operative attitude of family viii) any other (please specify)

5. Do you face any financial problems as an entrepreneur?

i) no financial problem ii) lack of collateral security iii) limited working capital iv) delayed payments of bills v) negative attitude of banks towards women vi) ignorance about banking procedures & formalities vii) poor knowledge of financial management viii) any other (please specify)

6. Do you face any raw-material problems as an entrepreneur?

i) no raw materials problems ii) don't use any raw-materials iii) non availability of raw materials iv) lack of continuous supply of raw materials v) delay in procurement of raw materials vi) time consuming procedures of getting raw materials vii) variations in raw materials prices viii) poor knowledge of materials management ix) any other (please specify)

7. Do you face any marketing problems as an entrepreneur?

i) no marketing problem ii) cut throat competition iii) inadequate advertising & publicity iv) lack of sufficient stock of products v) delayed collection of bills vi) lack of traveling capacity vii) poor knowledge of marketing management viii) any other (please specify)

8. Do you face any human resource problems as an entrepreneur?

i) no human resource problem ii) non-availability of skilled of employees iii) non co-operative attitude of employees iv) skilled employees leave their job after getting experience v) hesitation of male employees to work under women entrepreneurs vi) poor knowledge of human resource management vii) any other (please specify)

9. Do you face any technological problems as an entrepreneur?

i) no technological problem ii) don't use any technology iii) lack of technological skills iv) high cost of technology acquisition v) inadequate technology support for machinery utilization vi) any other (please specify)

10. Do you face any government support problems as an entrepreneur?

i) no problem of government support ii) harassment by government employees iii) non-co-operative attitude of government employees iv) corruption in sanction of subsidy, incentive & loan v) discrimination with

women entrepreneurs vi) lack of co-ordination among different government departments vii) poor knowledge of government support schemes viii) any other (please specify)

11. A) do you lack occupational mobility (i.e., shifting from one business to another) as an entrepreneur? Yes/no

B) if yes, what are the reasons for lack of occupational mobility?

i) lack of financial resources ii) lack of self-confidence iii) preference for stability in existing business iv) lack of human resources v) dual duties of home & business vi) poor knowledge of business opportunities for women vii) lack of marketing resources viii) any other (please specify)

14. How do you solve your various problems as an entrepreneur?

i) with own experience & knowledge ii) with the co-operation of family members iii) with the co-operation of friends iv) with the advice of experts in respective fields v) with the help of government machinery vi) any other (please specify)

15. Do you feel stress while discharging the dual duties of a business-woman & a housewife? Yes/no

16. In your opinion how can a businesswoman successfully discharge dual duties in business & house?

i) poor division of time for business & house ii) automation of household work iii) co-operation from family members iv) co-operation from employees v) any other (please specify)

A.4. Prospects of women entrepreneurs

1. What is your opinion about making of women entrepreneurs? (Choose any one)

i) they are born ii) they are made iii) they are born & can also be made

2. A) do you think, whether women are having more business opportunities because of changing social environment or not? Yes/no

B) if yes, what are the social environmental factors that have increased the prospects of women entrepreneurship?

i) increasing spread of education among women ii) increasing no. of successful women in the society iii) increasing automation of household work of women iv) increasing awareness of women about economic independence v) increasing women activism vi) increase equality status of women vii) increasing social recognition to women viii) any other (please specify)

3. A) do you think, whether special “entrepreneurship development programmes” (edps) for women will increase the prospects of women entrepreneurship or not? Yes /no

B) if yes, choose the areas of entrepreneurship development programmes (edps) for women entrepreneurs from the following areas.

i) small enterprise management	ii) identification of business opportunities
iii) technical skill development	iv) information technology
v) stress management	vi) total quality management
vii) increasing social recognition to women	viii) any other (please specify)

4. In your opinion, which type of business enterprise has more opportunities to women entrepreneurs?
Service/trading/manufacturing

5. In your opinion, what are the reasons for more opportunities to women entrepreneurs in service enterprise?

i) it can be operated from house itself ii) it can be operated as per convenience of time iii) it matches with women temperament iv) it requires less amount of finance v) it requires less traveling to women. Vi) it requires less employees vii) any other (please specify)

6. In your opinion, what are the reasons for more opportunities to women entrepreneurs in trading enterprise?

i) it enables women to handle home & business easily ii) it can be operated on smaller scale iii) it requires lesser amount of finance than manufacturing iv) it is easy to operate than manufacturing v) it requires less employees vi) any other (please specify)

7. In your opinion, what are the reasons for more opportunities to women entrepreneurs in manufacturing enterprise?

I) it is more profitable ii) it is more creative & innovative business line iii) it gives satisfaction of producing own production iv) it is more suitable for skilled entrepreneur v) any other (please specify)

A.5. Struggles faced by women ventured startups

1. Who is selling the product?

1. Your self 2. Family members/husband 3. Sales girls/boys.

2. Where do you sale?

1. At local level 2. At the state level 3. At the national level 4. At the international level

3. Advertisement of product:

1. In newspapers 2. Pamphlets 3. T.V. channel 4. Others

4. Do you face competition in business? Yes/no.

5. Do you give credit facility? Yes/no.

6. Is the prepared product rejected / leftover? Yes/no

7. If yes_____ 1. Thrown away 2. Taken by workers. 3. Sold at reduced price. 4. Others.

A.6. Remarks

9. Any remarkable experience?