



ASSESSMENT OF GOVERNMENT OF INDIA'S GENDER MAINSTREAMING PROGRAMS FOR WOMEN IN SCIENCE

REF NO: DST/NSTMIS/05/211/2016-17

CATALYSED and Supported by CHORD (NSTMIS)
Department of Science & Technology,
Ministry of Science & Technology
Government of India

NORTHERN REGION
PUNJAB, CHANDIGARH &
JAMMU AND KASHMIR

SUBMITTED BY:
Dr. Maninder Kaur
Regional Principal Investigator



सत्यमेव जयते
Department of Science and Technology
Govt. of India

PROJECT COMPLETION REPORT

Project Title
Assessment of Government of India's
Gender Mainstreaming Programs for
Women in Science

[Northern Region - Punjab, Chandigarh and Jammu & Kashmir]

DST File no. DST/NSTMIS/05/211/2016-17

Submitted by:

Dr. (Mrs.) Maninder Kaur, *Ph.D.*

Regional Principal Investigator

Department of Anthropology, Panjab University,

Chandigarh



National Science and Technology Management Information
System (NSTMIS)

Department of Science and Technology

Government of India

March, 2021

©NSTMIS Division 2021

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without the prior permission of NSTMIS (DST). Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that the above copyright notice appears on all copies.

NSTMIS Division

Department of Science and Technology

Ministry of Science and Technology

Technology Bhawan, New Mehrauli Road, New Delhi-110016

Phone: 91-011-26567373

Website: www.nstmis-dst.org/

About NSTMIS:

The National Science and Technology Management Information System (NSTMIS), a division of Department of Science and Technology (DST) has been entrusted with the task of building the information base on a continuous basis on resources devoted to scientific and technological activities for policy planning in the country.

Citation:

The report may be cited as DST (2019-2021): Report on ‘Assessment of Government of India’s Gender Mainstreaming Programmes for Women in Science’; Dr. Maninder Kaur, Department of Anthropology, Panjab University, Chandigarh, catalysed and supported by CHORD (NSTMIS) Division, Department of Science and Technology, New Delhi, Govt. of India.

Disclaimer:

Every care has been taken to provide the authenticated information. However, the onus of authenticity of data rests with the National Coordinator and Regional Principal Investigators of this Network Mode Project.

Preface

Gender disparity is one of the crucial problems in the academic world and scientific development. Although women have made significant contribution in the field of science, but still received less appreciation for the same. There are three major reasons for low participation of women in science and technology, our cultural set up or our mind set, economic aspect and infrastructure aspect. Unfortunately, women and girls have long been underrepresented in S&T education and employment, though myriad opportunities are offered by governmental agencies in the past, but these have not been sufficient to meet the challenge. Given the focus of the present government on promotion of girl and women education, we need concerted efforts to promote intellectual capacities of women in general and women scientist in particular. From early 2003 to present day, the fund allocation in this direction has been increased manifold, displaying Department of Science and Technology's sincere commitment towards accomplishing the targets.

There is a negative gender stereotypes concerning the perceived suitability of women in science and technology careers at all levels. Although women continue to be underrepresented in science, but the key change is that now they are vocal for the need of change in this stereotype and to professionally empower women in this realm. Therefore, the present document assesses the effectiveness of the various women empowering programs started by the Government of India to bring women back to mainstream. The present study gauged the various aspects concerning professional development in academia, research and professional settings among women beneficiaries from the Punjab, Chandigarh and Jammu & Kashmir. More comprehensive multicentric studies are needed for continuous evaluation of effectiveness of women empowering governmental policies for the larger interest of scientific progress and society.

Acknowledgments

I would like to acknowledge with a deep sense of reverence, my gratitude towards **Dr. Praveen Arora**, Advisor and Head CHORD Division, DST New Delhi, **Dr. HB Singh**, former Scientist, Department of Science and Technology, New Delhi and **Dr. AN Rai**, Scientist G, DST, New Delhi for giving me the golden opportunity to be a part of this multicentric project. I would like to thank them for their critique as well as constructive comments that helped to enhance the quality of this multicentric project. I would like to thank Department of Science and Technology, New Delhi for providing data from various schemes to pursue this study.

This report takes immense efforts, hardwork, ideas, feedback of several brilliant minds with motivation to bring women scientists into mainstream academic and research. It is pleasant to thank all the regional Principal Investigators for their support and valuable suggestions during the LPAC meetings of this project.

- **Dr. P.K. Arya:** Scientist, Chord Division, DST, New Delhi
- **Prof. Anjana Vyas:** CEPT University, Ahmadabad
- **Ms. Darshana Rawal:** CEPT University, Ahmadabad
- **Dr. Vandana Singh:** Scientist E, Department KIRAN, DST, New Delhi
- **Dr. Namita Gupta:** Scientist F, SEED Division, DST, New Delhi
- **Prof. Ekta Menghani:** JECRC University, Jaipur, Rajasthan
- **Jatinder Kaur:** Research Scholar, Department of Anthropology, Panjab University, Chandigarh
- **Mankamal Kaur:** Research Scholar, Department of Anthropology, Panjab University, Chandigarh

Table of Contents

Preface.....	iii
Acknowledgments.....	v
Table of contents.....	vii
List of figures.....	ix
List of tables.....	xii
Executive Summary.....	xv
CHAPTER 1: INTRODUCTION.....	1
1.1 Introduction.....	1
1.1.1 Various Gender Mainstreaming programs for women in Science.....	2
1.2 Aim.....	7
1.3 Objectives.....	7
1.4 Methodology:.....	7
1.5 Chapter Scheme:.....	7
CHAPTER 2: REVIEW OF LITERATURE.....	9
CHAPTER 3: METHODOLOGY.....	13
STUDY REGION.....	13
3.1. Introduction.....	13
3.2. About the States.....	13
3.2.1 Chandigarh.....	13
3.2.2 Punjab.....	15
3.2.3 Jammu & Kashmir.....	17
3.3. Education and Literacy Scenario of the study region.....	19
3.3.1 Chandigarh.....	19
3.3.2 Punjab.....	20
3.3.3 Jammu & Kashmir.....	21
3.4 Situation on STEM in the study region.....	22
3.5. Benefits for this study to the study region.....	24
METHODOLOGY.....	25
3.6 Introduction.....	25
3.7 Survey Questionnaire and Methodology for Getting Responses.....	25
3.8 Methodology for collecting other (Secondary) Data.....	35
3.9 Problems and Challenges.....	36

CHAPTER 4: DETAILED ANALYSIS OF THE DATA.....	39
4.1 Introduction:.....	39
4.2 Women scientists responses.....	39
4.3 Inference from statistical analysis.....	87
CHAPTER-5 RESULT AND DISCUSSION.....	90
5.1 Introduction.....	90
5.2 Specific Issues raised in the analysis as a part of Suggestions	91
CHAPTER-6 FINDINGS/SUMMARY AND RECOMMENDATIONS	95
6.1 Summary.....	95
6.2 Recommendations.....	97
6.2.1 Discussion on the Strategy which can be adopted for successful Implementation by the stakeholders – Government, Beneficiaries.	97
MODEL RESEARCH SUMMARY.....	99
REFERENCES	xvii
APPENDIX I	xix
APPENDIX II	xxiii
APPENDIX III	xxvi
APPENDIX IV	xxviii
APPENDIX V	xxxii
APPENDIX VI	xl

List of Figures

Figure 3.1	Map showing various zones of the study	27
Figure 4.1		
a)	Number of Projects sanctioned each year in Punjab.....	40
b)	Number of Projects sanctioned each year in Chandigarh	41
c)	Number of Projects sanctioned each year in Jammu & Kashmir	41
Figure 4.2	Status of the projects granted in Punjab, Chandigarh and Jammu & Kashmir	42
Figure 4.3	Break in career among women scientists from Punjab, Chandigarh and Jammu & Kashmir	43
Figure 4.4	Duration of break in career of women scientists in Punjab, Chandigarh and Jammu & Kashmir.....	44
Figure 4.5		
a)	Reasons of break in career among women scientists from Punjab region	46
b)	Reasons for break in career among women scientists from Chandigarh.....	46
c)	Reasons for break in career among women scientists from Jammu & Kashmir	47
Figure 4.6	Marital statuses of the Principal investigators from Punjab, Chandigarh and Jammu & Kashmir.....	48
Figure 4.7		
a)	Field of specialization of women scientists from Punjab	49
b)	Field of specialization of women scientists from Chandigarh.....	50
c)	Field of specialization of women scientists from Jammu & Kashmir.....	50
Figure 4.8		
a)	Mentor's Support to Principal Investigators from Punjab	51
b)	Mentor's Support to Principal Investigators from Chandigarh.....	52
c)	Mentor's Support to Principal Investigators from Jammu & Kashmir.....	52

Figure 4.9		
	a)	Institutional Support to Principal Investigators from Punjab53
	b)	Institutional Support to Principal Investigators from Chandigarh.....54
	c)	Institutional Support to Principal Investigators from Jammu & Kashmir54
Figure 4.10		Number of projects availed by women scientists in Punjab, Chandigarh and Jammu & Kashmir.....55
Figure 4.11		Eligibility test cleared by principal investigators from Punjab, Chandigarh and Jammu & Kashmir.....56
Figure 4.12		
	a)	Educational status (before and after sanction of project) among women Scientists of Punjab57
	b)	Educational status (before and after sanction of project) among women scientists of Chandigarh58
	c)	Educational status (before and after project) of women scientists from Jammu & Kashmir.....60
Figure 4.13		
	a)	Family support received by women scientists for research in Punjab61
	b)	Family support received by women scientists for research in Chandigarh.....61
	c)	Family support received by women scientists for research in Jammu & Kashmir61
Figure 4.14		Number of publications out of the project awarded to women scientists from Punjab, Chandigarh and Jammu & Kashmir63
Figure 4.15		
	a)	Employment status (before and after the sanction of project) among women scientists from Punjab64
	b)	Employment status (before and after project) among women scientists from Chandigarh65
	c)	Employment status (before and after sanction of project) among women scientists from Jammu & Kashmir.....66
Figure 4.16		Request for extension of duration of the sanctioned project.....68

Figure 4.17	Reasons of extension among women scientists from Punjab, Chandigarh and Jammu & Kashmir.....	69
Figure 4.18	Category wise distribution of women scientists from Punjab, Chandigarh and Jammu & Kashmir.....	70
Figure 4.19	Rating to the programme/ Scheme in Punjab, Chandigarh and Jammu & Kashmir	72
Figure 4.20	Satisfaction level with the programme/ Scheme in Punjab, Chandigarh and Jammu & Kashmir.....	73
Figure 4.21	Status of skill developed among women scientist from Punjab, Chandigarh and Jammu & Kashmir.....	75
Figure 4.22	Number of projects transferred to other institutions in Punjab, Chandigarh and Jammu & Kashmir.....	76
Figure 4.23	Accreditation status of the host institution in Punjab, Chandigarh and Jammu & Kashmir	80
Figure 4.24		
	a) Number of conferences/seminars attended by women scientists of Punjab, Chandigarh and Jammu & Kashmir	82
	b) Number of papers presented in National and International seminars by women scientists of Punjab, Chandigarh and Jammu & Kashmir	82
Figure 4.25		
	a) Number of workshops attended by women scientists at National and International level by women scientists from Punjab, Chandigarh and Jammu & Kashmir.....	84
	b) Number of papers presented at National and International level by women scientists from Punjab, Chandigarh and Jammu & Kashmir	
Figure 4.26	Involvement of women scientist's in organizing extension activities in Punjab, Chandigarh and Jammu & Kashmir	86
Figure 4.27	Factors motivated women scientists to undertake the programs in Punjab, Chandigarh and Jammu & Kashmir	87

List of Tables

Table 3.1:	Demographic profile of Chandigarh	20
Table 3.2:	Demographic profile of Punjab.....	21
Table 3.3:	Demographic profile of Jammu & Kashmir	22
Table 3.4:	Regions assigned to various principal investigators	26
Table 4.1:	Overall statistics of data collected from Punjab, Chandigarh and Jammu & Kashmir	39
Table 4.2:	Status of the projects sanctioned in Punjab, Chandigarh and Jammu & Kashmir	42
Table 4.3:	Break in career among women scientists from Punjab, Chandigarh and Jammu & Kashmir	43
Table 4.4:	Duration of break in career of women scientist in Punjab, Chandigarh and Jammu & Kashmir.....	44
Table 4.5:	Reasons for break in career among women scientists from Punjab, Chandigarh and Jammu & Kashmir.....	45
Table 4.6:	Marital status of the Principal investigators from Punjab, Chandigarh and Jammu & Kashmir.....	47
Table 4.7:	Field of specialization of women scientists from Punjab, Chandigarh and Jammu & Kashmir.....	49
Table 4.8:	Mentor's Support to Principal investigators from Punjab, Chandigarh and Jammu and Kashmir	51
Table 4.9:	Institutional Support to Principal Investigators from Punjab, Chandigarh and Jammu & Kashmir.....	53
Table 4.10:	Number of projects availed by women scientists from Punjab, Chandigarh and Jammu & Kashmir.....	55
Table 4.11:	Eligibility test cleared by Principal investigators from Punjab, Chandigarh and Jammu & Kashmir.....	56
Table 4.12:		
	a) Educational status (before and after project) of women scientist of Punjab	57
	b) Educational statuses (before and after completion of project) among women scientists from Chandigarh.....	58

c)	Educational status (before and after sanction of project) among women scientists from Jammu & Kashmir.....	59
Table 4.13:	Family support received by women scientists for research from Punjab, Chandigarh and Jammu & Kashmir.....	60
Table 4.14:	Number of Publications out of the project awarded to women scientists in Punjab, Chandigarh and Jammu & Kashmir.....	62
Table 4.15:		
a)	Employment status (before and after project) of women scientists of Punjab	64
b)	Employment status (before and after the sanction of project) among women scientists from Chandigarh.....	65
c)	Employment status (before and after sanction of project) among women scientists from Jammu & Kashmir	66
Table 4.16:		
a)	Request for extension of duration of the sanctioned project.....	67
b)	Request for extension granted or not in Punjab, Chandigarh and Jammu and Kashmir.....	67
c)	Duration of the extension granted in Punjab and Chandigarh	68
Table 4.17:	Reasons of extension among women scientists from Punjab, Chandigarh and Jammu & Kashmir.....	69
Table 4.18:	Category wise distribution of women scientists in Punjab, Chandigarh and Jammu & Kashmir.....	70
Table 4.19:	Overall remarks / experience of women scientists for women centric schemes from Punjab, Chandigarh and Jammu & Kashmir	71
Table 4.20:	Rating to the programme/ Scheme in Punjab, Chandigarh and Jammu & Kashmir	72
Table 4.21:	Satisfaction level with the programme/ scheme in Punjab, Chandigarh and Jammu & Kashmir.....	73
Table 4.22:	Problems faced by women scientists during project in Punjab, Chandigarh and Jammu & Kashmir.....	74
Table 4.23:	Status of skill developed among women scientists from Punjab, Chandigarh and Jammu & Kashmir.....	75

Table 4.24:	Number of projects transferred to other institutions in Punjab, Chandigarh and Jammu & Kashmir.....	76
Table 4.25:	Reasons for transfer of projects to other institutions in Punjab, Chandigarh and Jammu & Kashmir.....	76
Table 4.26:		
a)	Number of projects sanctioned in Punjab with respect to the various institutions	77
b)	Number of projects sanctioned in Chandigarh with respect to the various institutions	78
c)	Number of projects sanctioned in Jammu & Kashmir with respect to the various institutes	79
Table 4.27:	Accreditation status of the host institution in Punjab, Chandigarh and Jammu & Kashmir.....	79
Table 4.28:	Number of conferences/seminars attended and the no of paper presented in national and international seminar by women scientists of Punjab, Chandigarh and Jammu & Kashmir.....	81
Table 4.29:	Number of workshop attended and number of paper presented in national and international workshop by women scientists from Punjab, Chandigarh and Jammu & Kashmir.....	83
Table 4.30:	Involvement of women scientists in organizing extension activities in Punjab, Chandigarh and Jammu & Kashmir	85
Table 4.31:	Factors motivated women scientists to undertake the programs in Punjab, Chandigarh and Jammu & Kashmir.....	86

EXECUTIVE SUMMARY

UNESCO Science Report: Towards 2030 stated that though the global proportion of women students and graduates in higher education have increased steadily in the past decades, women are still a minority in the domain of Science, both at doctorate level as well as in the research profession. Gender equality in STEM therefore implies to encourage as well as promote further participation of women and girls throughout all levels of education, and facilitating equal opportunities for them all through their careers.

The present study was a multicentric project supported by the National Science and Technology Management Information System (NSTMIS) of Department of Science and Technology, Government of India. The general objective of the study was to evaluate the impact of women centric programmes sponsored by the government to reduce the gender gap in science, technology, engineering and mathematics (STEM) domains. This will also facilitate the policy makers to improve the women centric programmes and to identify the gap, if any. For this purpose a well designed elaborate questionnaire was prepared by all the regional principal investigators. Thereafter exhaustive and extensive field work through personal visits in universities, e-mails, and telephonically was conducted to get information about the women beneficiaries. Although during this phase of the study, many hindrances were faced by the regional principal investigator and her team. Incomplete data provided by the DST, reluctance of some women beneficiaries to give information, abrogation of article 370 in Jammu and Kashmir and lockdown due to Covid 19 pandemic were the major obstacles in gathering information of the women beneficiaries.

Data thus collected was subjected to data analysis employing Statistical Package for the Social Sciences (SPSS) version 16. To illustrate the graphs in present study, Microsoft chart wizard was used and text and tables have been made in Microsoft word and Microsoft excel. Analysis of data highlighted an increment in the number of projects sanctioned to women scientists from year 2003 to 2019. Most of the women beneficiaries had break in their career and family responsibility was the major reason for this break in all the three regions under consideration. A substantial proportion of women scientists were satisfied from their mentor's, host institutes and family

support. Women scientist from Punjab, Chandigarh and Jammu & Kashmir revealed a little mobility for transferring projects from one state to another. A significant proportion of women scientists had enhanced their educational qualification from postgraduate to doctorate during their research project.

In the present study maximum number of women scientists belonged to life sciences. Very few women scientist from Punjab represented chemical sciences (4.48%), engineering (5.97), mathematical sciences (2.99%) and engineering and technology development (2.99%) as their field of specialization. No woman scientist from Chandigarh and Jammu & Kashmir received any project in engineering and mathematical sciences. Similarly, health food and nutrition as well as earth science were not very popular among women scientist. It is clearly noticeable from the analysis that out of the total respondents a considerable percentage of the women scientist (35.82%) in Punjab and Chandigarh (42.86%), Jammu & Kashmir (20.59%) have not published even a single research paper from the projects awarded to them. A substantial proportion of women beneficiaries published one to two research papers only. It is also found that most of the projects were sanctioned to the host institute located in the regions with higher literacy rates.

Hence the present study from Punjab, Chandigarh and Jammu and Kashmir regions of north India recommended Policy makers should encourage women scientist from all backgrounds to explore scholarly and scientific careers, thereby contributing to their research excellence. Duration of the projects should be increased for better outcome of the projects. There is a disparity in terms of rules and regulations between the university and the funding institutions, so the projects should be governed by the rules and regulations of DST to avoid any hindrance in the governance of the projects. To empower women and as a matter of human rights, promoting women in Science is an overarching priority of government of India. Findings of the present study confirmed the fruitful results of the efforts of government of India in term of women centric schemes.

CHAPTER 1: INTRODUCTION

1.1 Introduction

Science and Technology plays a prominent role in promoting and strengthening of the economic and social development of the country. In the emerging scenario, Science and Technology is crucial not only for the achievement of internationally recognized developmental targets, but also aiding attempts to eliminate poverty, achieve food security, combating diseases, improve education, and counter the challenges of climate change. It has also emerged as a significant medium for countries to improve productivity and competitiveness and to generate decent work opportunities.

After Independence of the country, our leadership envisioned the contribution of Science and Technology for fulfilling the basic requirements of the country and the parliament passed the Scientific Policy Resolution in 1958. India has developed its own model of R&D planning which include a two-way process involving broad policy guidelines from the Planning Commission and ensuring interaction with scientists at national, agency, laboratory and university levels (Rajaram, 2005). Department of Science and Technology (DST) was established in year 1971, with the objective of building up new domains of Science and Technology and serve as a nodal agency for organising, coordinating and encouraging Science and Technology activities in the country. Its prime responsibilities were to formulate and promote the policies relating to Science and Technology in addition to matters concerning the institutional capacity building including setting up of new institutions and their infrastructure. For holistic development special emphasis was also given to boost Science and Technology at grass- roots i.e. the state, district, and village levels through State Science and Technology Councils and other mechanisms. The promotion of application of Science and Technology for weaker sections, women and other disadvantaged sections of the society was also given special consideration.

The rapid development of Science and Technology in all the aspects of life has raised the issue of gender debate. Unfortunately, women and girls have long been underrepresented in Science and Technology education and employment, though there have been several efforts in the past, but these have not been sufficient to meet the challenge. Various studies have observed the negative impact of gender inequality on

sustainable well-being, growth, governance and poverty reduction. Hence Department of Science and Technology (DST) has incorporated a gender perspective, while making critical decisions for allocation and investment of resources, education and training. Women act as both the cornerstone of the society and forbearer of the changing world, as their contribution in science determine the relationship between science and society in various ways. The DST had made various efforts after analyzing women component plan under gender budgeting and report of the Task force and finally constituted several actions for “women in science” for initiating gender schemes in the country.

Presently, a large number of well qualified women scientists have been left out of mainstream research because the existing paradoxes in our social milieu discriminate against women and are potential barriers to the entry and progress of women in the Science and Technology. The broad process of women's empowerment through Science and Technology should drive into them to realize their potentials and shape their lives in accordance with their aspirations and also strengthen the advancement of science and wealth accumulation.

1.1.1 Various Gender Mainstreaming programs for women in Science

Responding to emergent need of under-representation of women in STEM education, research and professional practice, the Department of Science and Technology (DST) has introduced various programs. From early 2003 to present day, the fund allocation for this purpose has shown an upward trend, projecting DST's commitment toward accomplishing the goals. For inspecting the implementation of various schemes, a standing committee has been constituted under the chairmanship of the Ministry of Science and Technology. Hence, the women centric programs in science has attained a new epoch in the country.

Various programs introduced over time are brought under one umbrella with KIRAN (Knowledge Involvement in Research Advancement through Nurturing) scheme. Women Scientist scheme was introduced to support highly educated, unemployed women with demonstrable research experience. The main objective of the program is to build network support with R&D Institutions, Scientific Institutions, including Universities and Colleges and S&T based field groups (NGOs) in developing appropriate technology packages for women. The gender sensitivity, nonconventional approach and involvement of Science and Technology based voluntary organizations

with strong linkages at the grass root level have proven to make a distinct impact in the research field.

Women Scientists Scheme - A (WOS-A)

Women Scientists Scheme - A (WOS-A) program is focused on supporting research in pure and applied science. This is one of the major schemes established by the Department of Science and Technology, which inspires and empowers women scientists and furnishes opportunities for pursuing research in frontier areas of science and engineering. The foremost purpose of the scheme is to provide an opportunity to women scientists to re-enter into mainstream academic, research, design and development work, who have had a break in their careers due to unavoidable reasons.

Women Scientists Scheme - B (WOS-B)

Women Scientists Scheme- B (WOS-B) program was designed as Science and Technology intervention for societal benefit. WOS B is the scholarship program floated by DST which focuses on women scientists and technologists who had a 'break in their careers' due to social responsibilities but still have the inclination to rebound to mainstream science. During 12th Plan, WOS-B has been renamed as Societal Research Fellowship (SoRF) under KIRAN programme for Women Scientists. This scheme is made available to the aspiring women scientists willing to work for the research, design, adaptation and demonstration of science and technological skills and techniques for improving the income generating enterprise and reducing the struggle of weaker sections of our society.

Women Scientists Scheme - C (WOS-C)

WOS-C program is focused on providing internship in intellectual property rights (IPR) for the intent of self-employment. This scheme of the Department of Science & Technology (DST) is implemented by the Patent Facilitating Centre of Technology Information Forecasting & Assessment Council (TIFAC). The objective of the scheme is to train women with qualifications in science/ engineering/medicine or allied areas in the field of Intellectual Property Rights (IPR) and their management for a period of one year. Training include one month of intensive orientation programme on IPR followed by specialized workshops and hands-on-training in agencies engaged in proceedings of IPR. The purpose of this scholarship is to create a large pool of trained women workforce with experience in the diverse areas and build up a professional network.

Biotechnology Career Advancement and Re-orientation Programme (Bio-CARe)

The department of biotechnology initiated a career enhancement programme i.e. Bio-Care to boost the involvement of women scientist in research field. This scheme supports both employed and unemployed women (having Bio-care as the first extramural grant) in science upto 55 years of age. The main purpose of this scheme is to escalate the research opportunities for women who are either unemployed or employed fulltime in universities, small research laboratories, after a break in their career, and keen to undertake an independent R&D Project. Women from different realms of Life Sciences or Biology (including agriculture, veterinary science and medicine) are qualified for this scheme.

UGC- Post Doctoral Fellowship for Women

This scheme was launched by University Grants Commission to support unemployed women scientist holding doctorate degree in different subjects/ fields. It was an effort of UGC to bring such talented women in the mainstream and to boost up their interest of research. The tenure of this fellowship is five years, with no further extension. Every year around 100 women are selected to avail this fellowship.

Mobility Scheme

Another landmark programme, named as, "Mobility Scheme" has been recently launched under KIRAN which will address relocation concern of women scientists working in regular position in Government Organizations. The Mobility Scheme is aimed to provide an opportunity to women scientists who are facing difficulties in their present job due to relocation issues (marriage, transfer of husband to any other location within the country, attending ailing parents, and accompanying children studying in different city) and will act as filler while searching other career option at new place. The initiative intends to provide a harmonious environment during early phases of women scientists, where they would like to stay active in research in addition to attending and accomplishing other responsibilities in the domestic front. It offers a contractual research award to women scientists and enables them for independent research.

Women Technology Program (WTP)

Women technology program (WTP) is targeted at livelihood of women by focusing on location-specific projects in areas of agriculture, horticulture, health, sanitation,

livestock management, aquaculture, textile and handloom etc. The Department of Science & Technology has been implementing a scheme “Science & Technology for Women” with a view to empower women through inputs of Science and Technology. The broad objectives of this scheme are to promote development and adaptation of appropriate technologies, transfer of proven technologies and demonstration of live technology models to benefit women. Numerous priority areas, with women as specific target groups, have been identified for proper scientific/technical interventions in the existing methodologies for empowerment and sustainable livelihoods. Besides individual projects for technology development, up gradation, modulation and replication, the scheme also focuses on establishing Women Technology Parks (WTP) that are envisaged to act as a resource centre where all necessary support is made available to women from a single platform for improving the living condition of the women by reducing their struggle, improving health and environment and by providing opportunities for income generation through application of Science and Technology for economic development with equity and social justice. Recognizing the likely benefits of an improved and structured mechanism for delivering technologies to the women in rural areas, a number of Women Technology Parks were set up in different geographic / agro climatic regions of the country. These Women Technology Parks would act as windows for providing information, creating awareness, giving training for appropriate technologies leading to skill up gradation and also to help establish all the important forward and backward linkages for income generation through micro enterprises for women besides doing on field trials for research and developments and modulation of the technology packages to address location specific needs.

Consolidation of University Research for Innovation and Excellence in Women Universities (CURIE)

Consolidation of University Research for Innovation and Excellence in Women Universities (CURIE) program is introduced to enhance infrastructure at women universities. Seven women universities have benefitted from this scheme in developing scientific and research infrastructure and other capacity building efforts. Research facilities in nine women universities have been enhanced with support from the CURIE (Consolidation of University Research for Innovation & Excellence in Women Universities) initiative of the Department of Science & Technology, (DST) Artificial

Intelligence facilities have been set up in 6 women universities with support from the CURIE-AI facility initiative.

The women universities have received total support of Rs 40 crore from the CURIE initiative started in the year 2008-09, and Rs. 4.20 crore from the CURIE-AI facility initiative started in the year 2019. It is primarily aimed to bring gender parity in the science and technology sector by inducting more women talent in the research & development domain through various programs. CURIE & CURIE-AI facility of the department under the KIRAN scheme, including other schemes, empowers women in science and technology. CURIE support resulted in a significant increase of student enrolment at undergraduate, postgraduate, and Ph.D. levels in CURIE supported universities.

CURIE support has been extended to 09 Women Universities in the country namely;

1. Avinashilingam Women University, Coimbatore (Tamil Nadu),
2. Banasthali University, Rajasthan,
3. SNDT Women University, Mumbai (Maharashtra),
4. Sri Padmavati Mahila Visvavidyalayam, Tirupati (Andhra Pradesh),
5. Mother Teresa Women University, Kodaikanal (Tamil Nadu),
6. Karnataka State Women University, Bijapur (Karnataka),
7. Indira Gandhi Delhi Technical University for Women, Delhi (Delhi)
8. Rama Devi Women University, Bhubaneswar (Odisha).
9. Bhagat Phool Singh Mahila Vishwavidyalaya, Sonapat (Haryana).

Given the focus of the present government on promotion of girl and women education we need concerted efforts to promote intellectual capacities of women in general and women scientist in particular. In this direction, Department of Science and Technology initiated various funding schemes and programs, but it is impractical for funding agency to assess and track the impact merely on the basis of the data submitted by the beneficiaries at the completion of the project. Since, the nature of support is targeted toward overall professional development, the resulting impact can only be determined by tracking individual's progress over period of time, long enough after funding support stopped. For determining overall effectiveness, the analysis should span across

schemes to evaluate demography of beneficiaries to reveal any trends or patterns. Therefore, in order to evaluate impact of multiple funding programs, appropriate analytical framework and systematic study is required. This proposal offers an approach to perform such analysis for DST's programs targeted at gender mainstreaming.

1.2 Aim

To assess the impact and effectiveness of various gender mainstreaming programs initiated by Government of India.

1.3 Objectives

- To assess the impacts of the various government schemes on the Women Beneficiaries (W-PIs) in S&T using appropriate statistical methods during 2003 to 2018.
- To suggest an indicative framework including identification of 'best practices' for strengthening of the gender mainstreaming programs of various departments.

1.4 Methodology:

In the present cross-sectional study, the women scientist who received any project in women empowering schemes i.e. WOS A, WOS B, WOS C , Bio Care or UGC PDF from 2003 to 2018 were enrolled. To get detailed information, a questionnaire was prepared by the all regional and national PI and its feasibility was checked with selected women scientists and university professors. Questionnaire had both close ended as well as open ended questions. Pilot study was performed and the process of data generation was started. Data thus collected was subjected to statistical analysis to achieve objective of the study.

1.5 Chapter Scheme:

The regional report of present study is divided into six chapters. First chapter is Introduction which encompasses introduction of the subject, aims, objective and methodology used in the present study. Second chapter includes review of previous

studies conducted in this realm. Third chapter gives a detailed account of study region, their education as well as literacy rate scenario. This part of the report highlights the situation of stem and benefits of this study in the Punjab, Chandigarh and Jammu & Kashmir. This chapter also explains about survey questionnaire and methodology employed in getting primary data as well as secondary data. It narrates the various problems and challenges faced by regional Principal investigators during data collection. Fourth chapter includes the analysis as well as interpretation of all the indicators of questionnaire to achieve the objectives of the study. Chapter five provides suggestions and strategies should be adopted for successful implementation of the schemes by the Government followed by the concluding remarks of the study.

CHAPTER 2: REVIEW OF LITERATURE

Since Independence, India has enhanced its infrastructure and resources for the field of science and technology. An attempt had been made by Gupta et al., 1996 to analyze the various research projects (1985-1990) in terms of their pattern of funding, type of institution, subject areas, research publication and processes developed from these projects. The analysis of data revealed that out of the total 987 R&D projects, 38% of financial support was received by biological sciences followed by Chemical sciences (29%). It was also observed that majority of projects were sanctioned to academic institutions (83%), whereas 10% were granted to Institutes of National importance and remaining 7% to National laboratories and others. From 1985-1990, a total-number of 2283 research papers were published in various National and International Journals from 693 projects. It was also reported that 459 Ph.Ds and 220 M.Phils were supported by these 693 R&D projects.

The growth various fields of science and technology helps for stimulating and strengthening the economic and social development of the country. The impact of various extramural R&D projects funded by major central government S&T Departments/ agencies during 1990-1995 in terms of pattern of funding by types of institutions and by subject areas was investigated by Gupta et al., (1998). The analysis of data depicted that a total number of 6791 projects were approved by 22 government agencies during this period. On an average maximum number of projects were sanctioned by DST (362), followed by 159 by UGC and 158 by CSIR per year. Out of the total eight subject areas, Biological sciences, engineering, medical sciences and agricultural sciences received 70% of the total projects. The results also revealed that the DST (28%) and DBT (24%) were the two major contributors to extramural R&D support in India.

A number of nations evidence gender inequality in science as the most common problem, which is the product of their socio-cultural environment. Gupta and Sharma, (2002) analyzed the overall experience of women in science including the problems faced in elite institutes of science and technology and their coping strategies. A combination of structured questionnaires, interviews and case studies were used for data collection. They observed that male dominance at work place,

isolated feeling among women scientist and dual burden of being a women and a scientist were the three major significant problems experienced by women in academic sectors. After analysing the experiences of women, they concluded that collective efforts are required to solve their problems.

Although there are concept of 'Universalism in Science' and irrelevance of social attributes in judging scientific claims, the male dominance in the field of science and our social structure regulated by men creates hidden barriers for women scientist. Gupta et al., (2005) compared the social organization in science and also the various barriers created by gender-role in India, Germany and U.S. Their analysis confirmed that instead of being at different stages of economic, political and social development, there is gender related discrimination and stress among women scientist, in all the above three regions. The major reasons observed for low positions of women in science are absence of Universalism in science, burden of domestic responsibilities and lack of informal networking.

Women plays a vital role in educating the entire family and also in maintaining its health in the developing country. Munshi and Srivastava, 2006 studied the achievements and recognition of Indian Women scientists in relation to the institutions, subject areas, authorship pattern, core competencies and preferences. The analysis of data from 1950/51 and 2000/01 revealed a steady growth in the percentage of women enrollment i.e. from 10.9% to 39.4% respectively. Among the states of India, Kerala had more than 50 % of women enrolled in most of the subject areas. After analyzing 186,029 research papers, they concluded that higher proportion of women appeared as first and second author, which indicated that the role of women as leading researchers cannot be overlooked.

Gender hierarchy as an organizing factor plays a vital role in shaping all the social activities including research in science. Subhranian, (2007) documented the experiences of women scientists in various research institutions of India. The data was collected both from the women scientists (their narratives and structured interviews) and from the various research institutions. They also attempted to problematise the notion that a person inherits the talent of doing scientific research and irrespective of its external conditions it will reveal itself. After analyzing the

interviews of women scientist, Subhramanian concluded that there is lack of recognition and nurturing among women competence as compared to that received by men. the structure and organisations of science institutions must be transparent and democratic in their approach for letting the women scientist equal opportunities in their scientific endeavour.

The statistics about the percentage of enrollment of women varies in various disciplines and at different degree levels. Goel, 2007 analyzed the status of women in engineering, and also discussed the underlying factors responsible for lack of interest among women towards engineering. After analyzing the MHRD data (1950-2001), he revealed that number of women enrolling in sciences has improved much more as compared to engineering. The factors like male dominance, lack of inspiring role models, women getting little societal and institutional support for higher education and negative professional images in the society were accountable for lower number of women in engineering. He concluded that for upliftment of number of women in this field, these major hurdles are needed to be addressed.

Education plays a very crucial role to empower women in the field of science, technology, engineering and mathematics (STEM). Namita Gupta (2009) analyzed the various reports to assess the status of women in Science and Technology. She observed that there has been remarkable enhancement in the number of women enrolled in higher education i.e. from 32.3% to 47.9% in various institutes from 1990 to 2017. She also mentioned the various social and hidden factors such as family support, economic stability and gender etc. which are the major constraints for women pursuing higher education. Therefore, the Government of India has initiated numerous programmes dealing with women centric issues such as break in career, self-employment, part-time career and relocation, etc. to retain their participation in field of science. She concluded that more than making a policy, a strong commitment to gender mainstreaming is required to bring them back in mainstream.

Across the globe continual exclusion of women from scientific careers has been a matter of concern. To promote the participation of women in field of science and technology in India, various number national policies and programmes have

been implemented. Sharma and Dhal, 2016 examined the outreach and impact of Women Scientist Scheme (WoS). This study also investigated the social situations of respondents and the gender perspective to the SoRF (Societal Research Fellowship) programme. They observed that Women Scientist Scheme was essential for building self-confidence and enabling them to re-enter into professional roles in science and research.

Since the long time, Science as the supreme branch of knowledge has been highly patriarchal with uneven representation of women as compared to men. Various studies confirm that In India, the contribution of women in research remain invisible. Rath and Mishra, (2017) reviewed the existing literature to analyze both the women's role in scientific field and the existing policies protecting and promoting women's continuation in scientific professions. They observed that there are many governmental provisions for increasing the participation of women in higher education, but in reality these provisions are still influenced by patriarchal structure and gender stereotypes. After observing the Indian Scenario, they concluded that changing attitude towards the productive role of women, identification of their skills and equal participation of both men and women in the care economy can bring a change in the traditional roles of women. Hence providing them liberty to participate in scientific endeavours with confidence.

CHAPTER 3: METHODOLOGY

STUDY REGION

3.1. Introduction

A large number of projects from different women centric schemes were sanctioned from year 2003 till date, it is impossible for funding agency to gauge and track the impact merely based on the data submitted by the beneficiaries at the end of funding support. In order to track individual's progress over period of time, the present multicentric study was undertaken. For determining the overall effectiveness of basic objective to professionally empower women, the whole country was divided in to thirteen zones under the supervision of a national coordinator. The present study encompasses the north zone representing Punjab, Chandigarh and Jammu & Kashmir regions. For any research first step is to define the geographical area where the possible research problem is to be explored. This Chapter deals with the details about the area to which the participants forming the data base of the present study belong.

3.2. About the States

3.2.1 Chandigarh

Chandigarh is the best-planned city of India, with world-renowned architecture and an unparalleled quality of life. As the capital of the states of Punjab and Haryana, and as the Union Territory it is a prestigious city. Chandigarh is the manifestation of a dream that Pt. Jawahar Lal Nehru envisaged and Le Corbusier executed. Chandigarh is a rare epitome of modernization co-existing with nature's preservation. It is here that the trees and plants are as much a part of the construction plans as the buildings and the roads. It is considered as the India's first planned city, which is rich, prosperous, spic and span, green city and rightly called "**The City Beautiful**". Chandigarh derives its name from the temple of "Chandi Mandir" located in the vicinity of the site selected for the city. The deity 'Chandi', the goddess of power and a fort of 'garh' laying beyond the temple gave the city its name "Chandigarh".

The city has a pre-historic past. The gently sloping plains on which modern Chandigarh exists, was in large variety of aquatic and amphibian life, which was supported by that

environment. About 8000 years ago the area was also known to be a home to the Harappans. Since the medieval period through modern era, the area was part of the large and prosperous Punjab Province which was divided into East & West Punjab during partition of the country in 1947. The city was conceived not only to serve as the capital of East Punjab, but also to resettle thousands of refugees who had been uprooted from West Punjab. In March, 1948, the Government of Punjab, in consultation with the Government of India, approved the area of the foothills of the Shivaliks as the site for the new capital. The location of the city site was a part of the erstwhile Ambala district as per the 1892-93 gazetteer of District Ambala. The foundation stone of the city was laid in 1952. Subsequently, at the time of reorganization of the state on 01.11.1966 into Punjab, Haryana and Himachal Pradesh, the city assumed the unique distinction of being the capital city of both, Punjab and Haryana, while it itself was declared as a Union Territory and under the direct control of the Central Government.

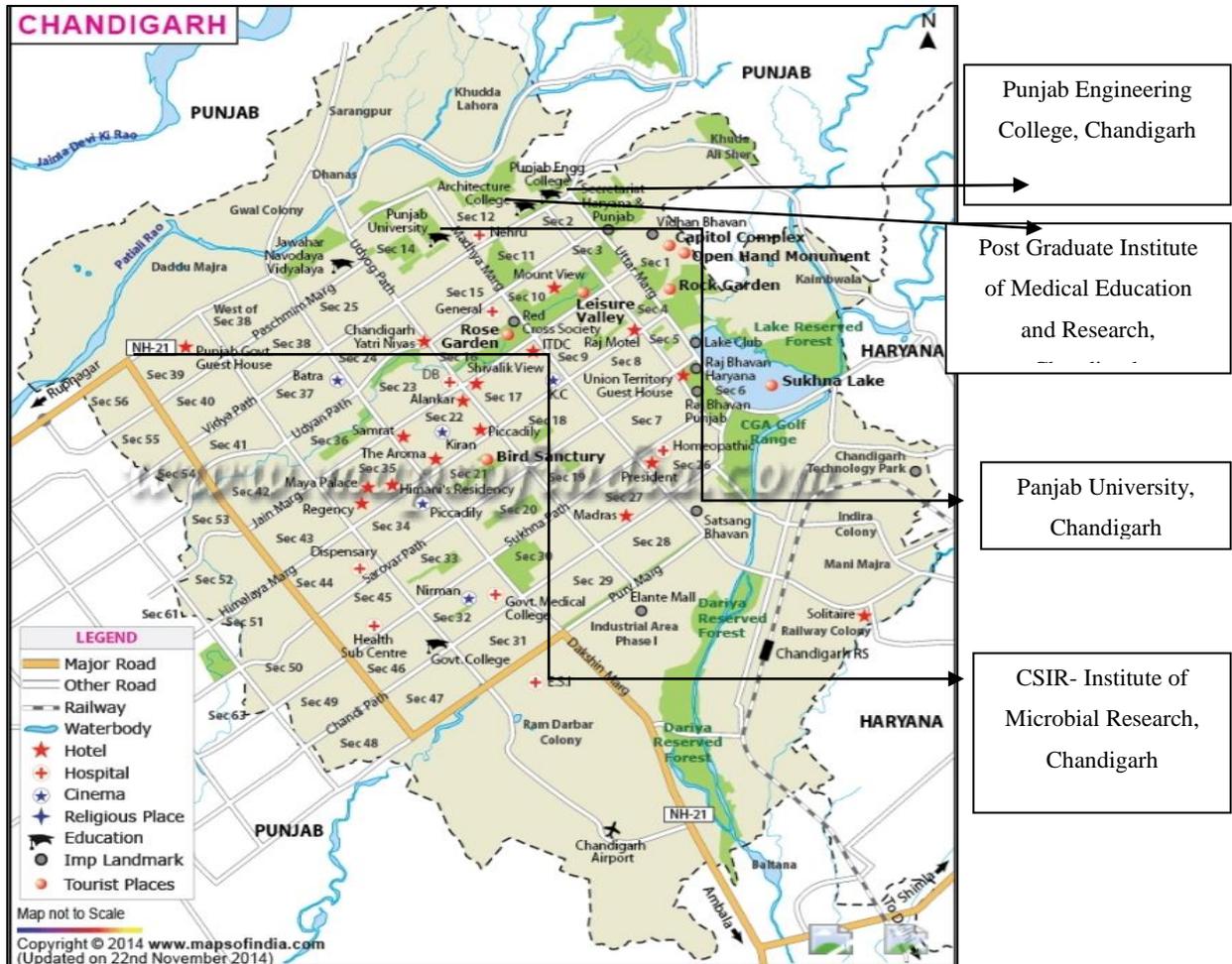
Geology

Chandigarh is located about 165 miles (265 km) north of New Delhi. The territory is bounded by the state of Haryana on the east and by the state of Punjab on all other sides. It is situated on the Indo-Gangetic Plain, which is at a short distance southwest from the Siwalik Range (Shivalik Range), between two seasonal hill torrents, the Sukhna and Patiali rivers. The geographical coordinates of the city are 30.74°N 76.79°E.

Climate

The area experiences four seasons: (i) Summer or hot season (mid-March to Mid-June) (ii) Rainy season (late-June to mid-September); (iii) Post monsoon autumn/transition season (mid of September to mid-November); (iv) Winter (mid of November to mid-March). The period from May and June are the hottest months of the year with the mean daily maximum and minimum temperatures being about 37°C & 25°C, respectively. Maximum temperatures can rise up to 44°C. The variation in annual rainfall on year to year basis is appreciable i.e. 700 mm to 1200 mm. January is the coldest month with mean maximum and minimum temperatures being around 23°C and 3.6°C respectively.

Geographical Map of Chandigarh



Source: www.mapsofindia.com

Language and Religion: English is the sole official language of Chandigarh. The majority of the population speaks Hindi (73.60%), while Punjab is spoken by 22.03%. Hinduism is the predominant religion of Chandigarh, which is adhered by 80.78% of the population. Sikhism is the second most popular religion in the city, followed by 13.11% of the people. In Chandigarh city minorities are Islam (4.87%), (0.83%), Jains (0.19%), Buddhists (0.11%).

3.2.2 Punjab

Punjab is one of the most prosperous state of India, which is located in the northwestern part of the subcontinent. It is bounded by the state of Jammu and Kashmir to the north, Himachal Pradesh to the northeast, Haryana to the south and southeast,

and Rajasthan to the southwest and by the country of Pakistan to the west. Punjab in its present form came into existence on November 1, 1966, when most of its Hindi-speaking areas were separated to form the new state of Haryana. Union territory Chandigarh is the joint capital of Punjab and Haryana. The name Punjab is made of two words Punj (Five) + Aab (Water) i.e. land of five rivers. These five rivers of Punjab are Sutlej, Beas, Ravi, Chenab, and Jhelum. Only Sutlej, Ravi and Beas rivers flow in today's Punjab. The other two rivers are now in the state of Punjab, situated in Pakistan. The Punjab State is divided into three regions: Majha, Doaba and Malwa.

Geology:

Punjab extends from the latitudes 29.30° North to 32.32° North and longitudes 73.55° East to 76.50° East. The total area of the state is 50,362 square kilometers (19,445 square miles), with the cultivable area being under assured irrigation. Its average elevation is 300 meters (980 ft) above sea level, with a range from 180 meters (590 ft) in the southwest to more than 500 meters (1,600 ft) around the northeast border.

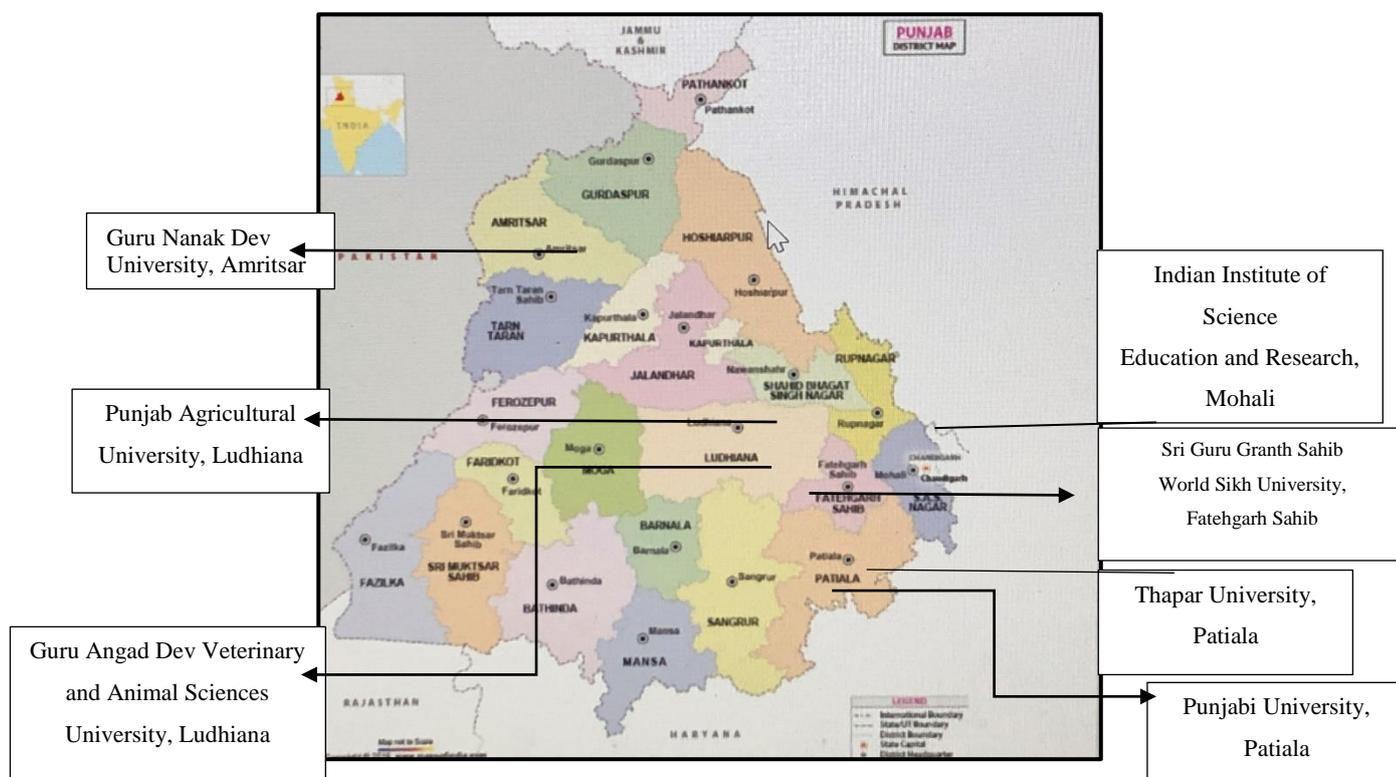
Climate

The state has a balanced amalgamation of heat in summer, rain in monsoon and cold in winter. The three seasons are so distinctly distributed that you can enjoy each of them individually. Punjab experiences both summer and winter to its extreme. It even receives abundant rainfall, which makes the state a very fertile land. The region lying near the foot hills of Himalayas receive heavy rainfall, whereas the region lying at a distant from the hills, the rainfall is scanty and the temperature is high. The summer months span from mid April to the end of June. The rainy season in Punjab is from early July to end of September. October marks the beginning of the winter season. From December onwards, the winter becomes chilly. The major festivals of Punjab are Lohri, Holla Mohalla, Diwali, and Dussehra.

Demographic trends:

As per details from Census 2011, the total population of Punjab is 27,743,338 of which male and female are 14,639,465 and 13,103,873 respectively. The population of Punjab forms 2.29 percent of total Indian population.

Map of Punjab



Source: www.mapsofindia.com

Language

Punjabi, the official language of the state, is the tenth most widely spoken language in the world. It is also the fourth most spoken language in Asia. It is the only living language among the Indo-European languages which is a fully tonal language. Punjabi is written in the Gurmukhi Script. Besides Punjabi, Hindi, Urdu and English are the languages that are spoken in Punjab.

3.2.3 Jammu & Kashmir

Jammu & Kashmir, earlier a union territory of India, but after abrogation of article 370, Jammu & Kashmir is reorganised as a Union Territory with an Assembly, and Ladakh a separate Union Territory with no legislature. It is located in the northern part of the Indian subcontinent in the vicinity of the Karakoram and western most Himalayan mountain ranges. The territory is part of the larger region of Kashmir, which has been the subject of dispute between India, Pakistan, and China since the partition of the subcontinent in 1947. Jammu & Kashmir, formerly one of the largest

princely states of India, is bounded to the northeast by the Uygur Autonomous Region of Xinjiang (China), to the east by the Tibet Autonomous Region (China) and the Chinese-administered portions of Kashmir, to the south by the Indian states of Himachal Pradesh and Punjab, to the southwest by Pakistan, and to the northwest by the Pakistani-administered portion of Kashmir. The administrative capitals are Srinagar in summer and Jammu in winter.

Geography

The approximate geographical area of the state is 39,146 square miles (101,387 square km). The vast majority of the state's territory is mountainous, and the physiography is divided into seven zones that are closely associated with the structural components of the western Himalayas. From southwest to northeast those zones consist of the plains, the foothills, the Pir Panjal Range, the Vale of Kashmir, the Great Himalayas zone, the upper Indus River valley, and the Karakoram Range.

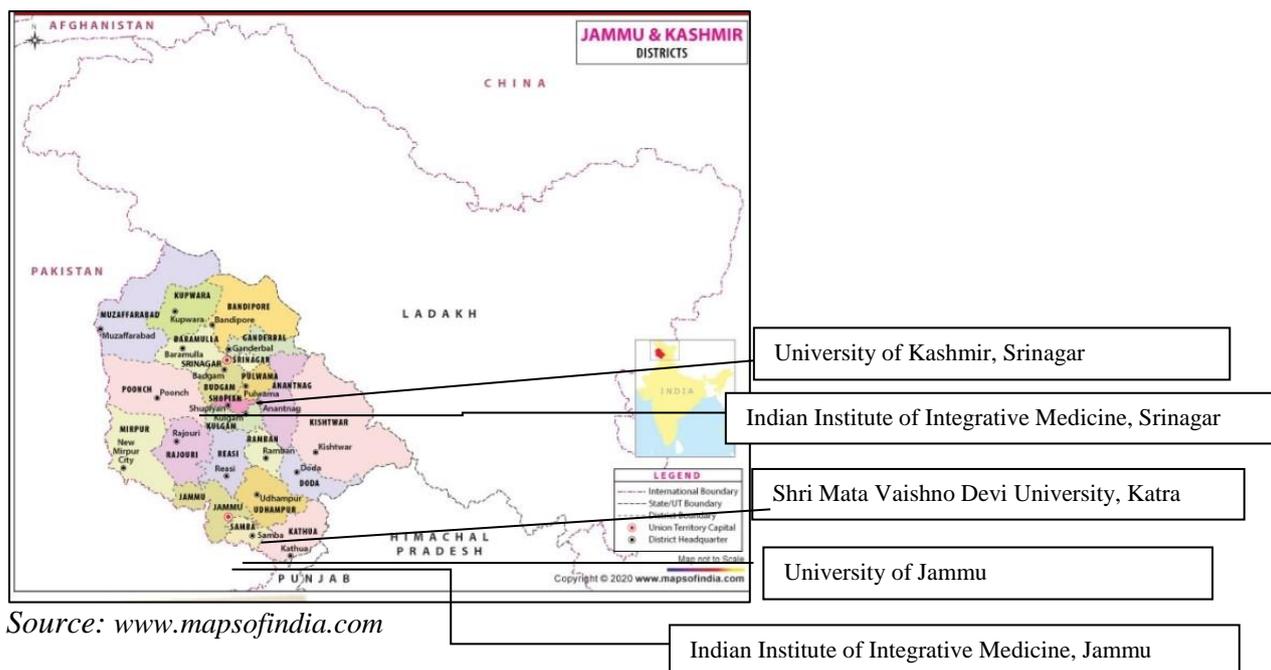
Climate and People

The climate varies from alpine in the northeast to subtropical in the southwest. In the alpine area, average annual precipitation is about 3 inches (75 mm), but in the subtropical zone (around Jammu) rainfall amounts to about 45 inches (1,150 mm) per year. The cultural, ethnic, and linguistic composition of Jammu & Kashmir varies across the state by region. About two-thirds of the population follows to Islam, a greater proportion than in any other state of India. There also are small minorities of Hindus, Sikhs and Buddhists. Urdu is the state's official language of the state.

Demographic trends

The population of Jammu & Kashmir continued to increase fairly rapidly from the late 20th into the early 21st century, growing by nearly one-fourth between 2001 and 2011. According to census 2011, the actual population of the state is 12,541,302. The state has remained largely rural, nearly three-fourths of its people living in towns and villages, but urbanization has increased. Nearly two-fifths of the urban population resides in the Srinagar region. The sex ratio is relatively poor, about 890 females per 1,000 males at the 2011 census, lower than it was in the 2001 census (900 females per 1,000 males).

Map of Jammu & Kashmir



3.3. Education and Literacy Scenario of the study region

3.3.1 Chandigarh

Chandigarh is the ever-popular educational destination not only for the natives of Chandigarh, but also for the students of every part of the country. The institutes with national importance are also located in the city and right from primary education to higher studies it has an extensive web of education. Higher education institutes include Panjab University, Post Graduate Institute of Medical Education and Research (PGIMER), Punjab Engineering College, Post Graduate Government College, Sector 11, Chandigarh, and DAV College.

Literacy rate in Chandigarh

It is significant to note the literacy level and the occupations of the people reflect the nature of a city and the abilities of its people. Chandigarh ranked fifth in the literacy levels among the Indian States and Union Territories in Census 2001 and seventh in 2011 with higher literacy rates among males than females. In 1961 female literacy rate was 49 percent that was increased upto 71 percent in 1971, 77 percent in 2001 and 81 percent in 2011. The gap between male-female literacy rates was more in 1961, 15

percent and 12 percent in 1971. Since 1981 this gap has remained the same at about nine percent. The gap was initially more in the rural areas of the Union Territory.

Literacy rate in Chandigarh has seen upward trend and was 86.05 % as per 2011 population census. Of that, male literacy stands at 89.99 %, while female literacy was at 81.19 %. In actual numbers, total literates in Chandigarh stands at 805,438 of which males were 465,346 and females were 340,092.

Table 3.1 Demographic profile of Chandigarh

Description	According to census 2011
Total population	1,055,450
Male	580,663
Female	474,787
Sex ratio	818
Male literacy rate	89.99 %
Female literacy rate	81.19 %

3.3.2 Punjab

In addition to the government, private organizations have played a significant role in the extension of education at the primary, secondary, and tertiary levels throughout the state. Education is compulsory and free for pupils aged 6 to 11. Secondary education is also free in state schools. Broadcasting has been especially important in the dissemination of vocational and cultural education throughout the state. Punjab has several state universities, including Punjabi University (1962) in Patiala, Guru Nanak Dev University (1969) in Amritsar, Panjab University (1956) in Chandigarh, Punjab Agricultural University (1962) in Ludhiana, Punjab Technical University (1997) in Jalandhar, and Baba Farid University of Health Sciences (1998) in Faridkot. In addition, there are more than 200 specialized colleges and technical institutions in Punjab.

Literacy rate in Punjab has seen upward trend and was 75.84 percent as per 2011 population census. Of that, male literacy stands at 80.44 percent, while female literacy was at 70.73 percent. In actual numbers, total literates in Punjab stands at 18,707,137 of which males were 10,436,056 and females were 8,271,081. Sex Ratio in Punjab was 895 for each 1000 male, which is below national average of 940 (census 2011). The participation of women in Punjab was less as compared to their male counterpart and it varied from one region to another. This is because of the low mobility of women from the villages, due to religious and social restriction. On the supply side, reproductive work and domestic roles prove to be significant variables in influencing female labour force participation (Nagaich and Sharma, 2014).

Table 3.2 Demographic profile of Punjab

Description	According to census 2011
Total population	27,743,338
Male	14,639,465
Female	13,103,873
Sex ratio	895
Male literacy rate	80.44 %
Female literacy rate	70.73 %

3.3.3 Jammu & Kashmir

Education is free at all levels. Literacy rates are comparable to the national average, but female literacy is considerably lower than that for males. The two major institutes of higher education are the University of Kashmir at Srinagar and the University of Jammu, both founded in 1969. In addition, agricultural schools have been established in Srinagar (1982) and Jammu (1999). A specialized institute of medical sciences was founded in Srinagar in 1982.

District Jammu has highest female literacy rate among all the districts of Jammu & Kashmir from 1981 to 2011, but remain less at state level. In urban- rural comparison,

it is observed that the female literacy rate in urban areas was more than rural area of Jammu & Kashmir from census 1981 to 2011. The reason for low female literacy in Jammu & Kashmir is due to lack of female teachers in schools, colleges and universities and the establishment of these institutions in distant places (Rashid and Maharashi, 2015).

Table 3.3: Demographic profile of Jammu & Kashmir

Description	According to census 2011
Total population	12,541,302
Male	6,640,662
Female	5,900,640
Sex ratio	889
Male literacy rate	76.75 %
Female literacy rate	56.43 %

3.4 Situation on STEM in the study region

Punjab: After the reorganization of Punjab in 1966, the State Government has made many conscientious efforts to develop and expand educational facilities in the State. All these planned efforts, though limited in nature, have led to establishment of large number of colleges either in the public sector or in the aided private sector. As a major initiative to boost education, two universities – Punjabi University, Patiala and Guru Nanak Dev University, Amritsar were established in the year 1962 and 1969, respectively. There are total 20 Universities in Punjab of which 10 are Government Universities and 9 are Private Universities while one is central University. Today, there are 506 Colleges in Punjab of which 48 are Govt. Colleges, 136 Private Aided Colleges, 19 University Constituent Colleges and 303 non-aided degree colleges.

With an overall Gross Enrolment Ratio (GER) of 19.4%, Punjab ranks 8th among all major States in India. In terms of gender, enrolment is skewed at 65.3% comprising of males, whereas it's merely 34.7% of the enrolment which constitutes females,

demonstrating significant gender disparity. The GER for males (23.6%) which is comparatively much higher than GER for females (14.5%), resulting in the gender parity index of just 0.62% (which is lower as compared to 0.86%) at all-India level. The GER of SCs (7.3%) is lower than the State GER of 19.4%.

<http://rusa.nic.in/download/156/shep/3113/state-higher-education-plan-punjab.pdf>

Chandigarh: Realizing human resource potential to its fullest in the higher education sector with access, equity, quality and excellence, which leads to holistic development of the personality of the youth with special emphasis on professional qualifications in the field of higher education. The Gross Enrolment Ratio (GER) of women in higher education in the city might be the highest in India once again at 67.7 per cent, but has recorded a downward trend in the last three years. According to the All India Survey of Higher Education (AISHE) 2017-18, the overall GER of the city recorded at 56.4 per cent is also the highest in India. It is a marginal improvement from 56.1 per cent in 2016-17 despite that fact that Chandigarh has only 8 per cent private-unaided colleges, one of the lowest in India. The city's total student strength stands at 1,05,829, with average enrolment per college at 2,052. However, for women, the GER has recorded a dip of at least 1.1 percentage point from 2016-17. The GER was 68.8 per cent, according to the 2016-17 AISHE report. In 2016-17, the same figure registered a drop of 1.6 percentage point, compared to 70.4 per cent in 2015-16. At least five out of 11 city colleges are exclusively for women, and yet the GER has recorded a marginal downward trend in the last three years. The same trend was upward from 2010-11 to 2015-16.

Jammu & Kashmir

In Jammu & Kashmir number of Government Degree Colleges providing education in 1950-51 was just 07 out of which 01 college was for females. Until 1999-2000, the number of colleges increased to 33 including 07 women colleges. By the year 2016-17, the number of colleges increased to 96 including 12 women colleges. The students enrolled during 2017-18 in these 96 degree colleges were 1,59,463. There are two Central Universities, two Cluster Universities, two Agriculture Universities, five state universities including three Govt. aided universities SMVDU, BGSBU, IUST

functional in the State. The Gross Enrolment ratio for the state of J&K was 10.36% in 2007-08 which has increased to 18.2% (provisional) in 2011-12 which is higher than the national GER of 15%.

<http://www.jkhighereducation.nic.in/index.html>

3.5. Benefits for this study to the study region

The present study intends to assess the success of various women empowering schemes in Punjab, Chandigarh and Jammu & Kashmir regions of North India on the basis of data collected from women beneficiaries. This study gauged the overall effectiveness of the schemes by analyzing trends or patterns of various indicators of professional development. This study is helpful in evaluating problems and limitation of women beneficiaries with respect to the local problems of the area. Such studies enhance the scope of government's initiative to bring more women scientist in the mainstream.

METHODOLOGY

3.6 Introduction

In social science, research may be defined as “methodical and systematic study of a subject with the aim to generate new information, verify the existing knowledge in the subject, and reach a new understanding” (Srivastava , 2004). In the present study online questionnaire were e-mailed to all the women scientists who were granted research projects from early 2003 to 2018 in various women centric schemes of DST to get detailed information of various indicators for evaluating the impact of these initiatives.

3.7 Survey Questionnaire and Methodology for Getting Responses

The present cross-sectional study is an attempt to assess the overall effectiveness of different women centric schemes of Government of India (2003-2018) by tracking individual women scientist's progress over time from Chandigarh, Jammu & Kashmir and Punjab states of North India.

In the present multicentric study, the entire country was divided in six zones (Figure 3.1) and thirteen regions. Each region was assigned to one regional Principal investigator and overall research work was coordinated by the national coordinator. The following table 3.4 shows different Principal investigators working in the thirteen regions of India. The present report involves the information about Punjab, Chandigarh and Jammu & Kashmir areas of North India.

Inclusion criteria: All the women scientist sanctioned any project from 2003 to 2018 in women empowering schemes i.e. WOS A, WOS B, WOS C , Bio Care or UGC PDF were included in the study.

Appointment of Project fellows:

Two project fellows Ms Jatinder Kaur and Ms Mankamal Kaur have been appointed in the project.

Table 3.4: Regions assigned to various Principal Investigators

Name of PI	Institution Address	Zone	States
Dr. Anjana Vyas	Center for Applied Geomatics, CRDF, CEPT University, Ahmedabad, Gujarat-380009	Western Zone	Gujarat, Maharashtra
Dr. Ekta Menghani	JECRC University, Plot No. IS-2036 to IS-2039, Ramchandrapura Industrial Area Jaipur, Sitapura, Vidhani, Rajasthan-303905	Western Zone	Rajasthan, Madhya Pradesh
Dr. Maninder Kaur	Department of Anthropology, Punjab University, Sector 14, Chandigarh-160014	North Zone	J&K, Chandigarh, Punjab
Dr. Brajeshwar Chandelia	TIFAC, 'A' Wing, Vishwakarma Bhavan, Shaheed Jeet Singh Marg, New Delhi, Delhi-110016	North Zone	Himachal Pradesh, Uttara Khand, Uttar Pradesh
Dr. Vimmi Malhotra	Dronacharya Collage of Engineering, Plot no. 76 P, Part - III, Sector - 5, Gurgaon, Haryana-122001	North Zone	Haryana, Delhi
Dr. S. Jyotsna	Krishi Vigyan Kendra, Hengbung, P.O. Kangpokpi, Senapati District, Manipur-795129	North East Zone	Assam, Manipur, Arunachal Pradesh, Nagaland, Meghalaya, Mizoram, Tripura, Sikkim
Dr. Tanuja Singh	PG Dept.of Botany,T.P.S College,Patliputra University, Chitragupta Nagar Rd, Munna Chak, Kankarbagh, Bankman Colony, Patna, Bihar-800020	Eastern Zone	Bihar, Jharkhand, Chhattisgarh
Dr. H. M. Padhy	Sophitorium Institute of Technology & Lifeskills, College Road, Jatni, Khurda, Odisha-752050	Eastern Zone	West Bengal, Odisha
Dr. S. Sophia	Department of ECE, Sri Krishna College of Engineering and Technology, Coimbatore, Tamilnadu-641008	South East Zone	Tamilnadu, Pondichery
Dr. P. Satheesh	Institute of Bioinformatics and Computational Biology (ICB) Visakhapatnam, Andhra Pradesh- 530017	South East Zone	Andhra Pradesh
Dr. Archana Reddy	SR Engineering College Ananthasagar, Hasanparthy (M), Warangal Urban, Telangana-506371	South East Zone	Telangana
Dr. Geetha B. S.	Kerala State Council For Science, Technology and Environment (KSCSE), Thiruvananthapuram, Kerala-695004	South West Zone	Kerala, Goa
Dr. Bharathi Salimath	Department of Biotechnology, Manasagangotri, Mysore-570006	South West Zone	Karnataka

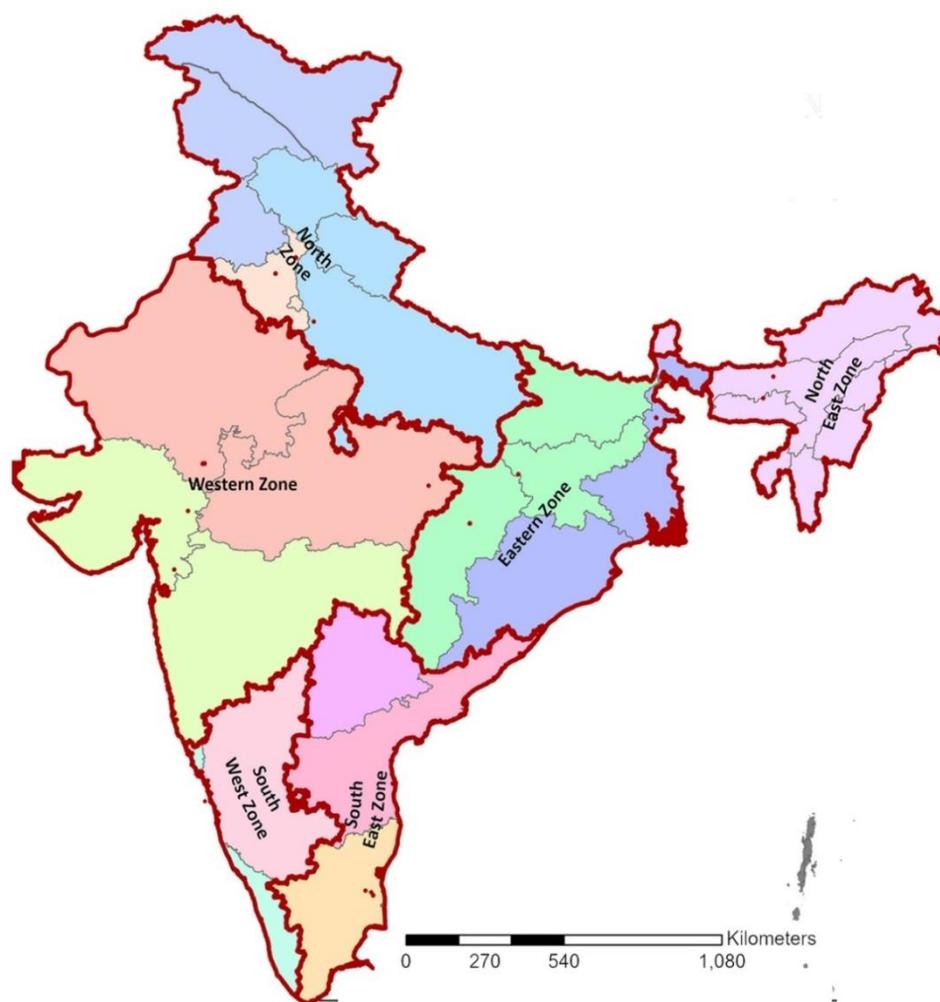


Figure 3.1 Map showing various zones of the study

Questionnaire for the study:

A questionnaire was prepared by all the regional and national PI to get detailed information on the topic. Before proceeding to the field the feasibility of online form was checked with selected women scientists and university professors from Punjab, Chandigarh and Jammu & Kashmir (Appendix V). A pilot study was performed to understand the impediments that may come across while performing the data collection .A questionnaire with total 68 questions including sub categories was finalized. It had both close ended as well as open ended questions and the process of data collection was initiated. The information about women scientist's name, date of birth, residential address, email id, marital status, category, educational qualification at present,

information about currently affiliated institution was recorded in well prescribed questionnaire. Questionnaire also consisted information regarding the source of information of the scheme, break in career, duration and reasons for break in career, any eligibility test cleared by the PI's, family support received for research, year wise number of projects sanctioned, broad subject area, area of specialization, project id, date of sanction and completion of the project, duration and status of the project, request and reasons for extension, name and address of the host institution, information about mentor, mentor's and institutional support received during the project, whether the project was transferred to another institution or not, any reason for the transfer, name and address of the institution where the project transferred and completed, information about new mentor, new mentor and new institutional support, educational background of the PI's at the time of the grant of the project and after the completion of project, awards and honors received during the project period, number of publications from the project awarded, h index, number of workshops or seminars attended during the project at national and international level, no of paper presented in workshops or seminars during the project at national and international level. Additional information on women scientist's involvement and organizing extension activities, special achievements, innovations and number of patents from the project, societal technology, status of any skill development, status, duration, nature of employment before and after the project, current employment status of women scientists and their satisfaction level with current job, rating to the programme/ scheme, satisfaction level with the programme/ scheme, problems related to receiving and spending grants of women scientist, what motivated women scientist to undertake programme or project and overall remarks / experience of women scientists was also gathered to get in-depth information about each participant. Field work was carried out from April 2019 to October 2020 on women scientist, who have received any project under women centric scheme.

Methods Adopted to Approach Women Scientists:

Online questionnaire was emailed to all the women scientists of the area under study. Many women scientist responded positively and filled the questionnaires with full enthusiasm. A key challenge was to locate the women scientist who had completed their research projects long ago and their contact numbers were not available with

either DST or their host institute. Hence the following different approaches were adopted to contact them;

By approaching their mentors: The mentors of the women scientists were contacted to get information about the women beneficiary, who had worked under their supervision.

By visiting their departments/Universities: Some women scientists were apprehensive about sharing their details. Regional PI and project fellows also visited to different departments of various universities of Chandigarh, Jammu & Kashmir and Punjab to get the information of women scientist. During personal visits in different universities, information on some women scientists beyond the list provided by DST also recorded. Following are the institutes visited by regional PI and her team to approach women scientist;

Chandigarh

- ❖ Institute of Microbial Technology, Sector-39
- ❖ Postgraduate Institute of Medical Education and Research , Sector- 12
- ❖ Panjab University, Sector-14
- ❖ Punjab State Council for Science & Technology, Sector-26
- ❖ Goswami Ganesh Dutta Sanatan Dharma College, Sector-32

Jammu & Kashmir

- ❖ Indian Institute of Integrative Medicine, Canal Road, Jammu
- ❖ Shri Mata Vaishno Devi University, Katra
- ❖ Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu, Jammu

Punjab

- ❖ Indian Institute of Science Education & Research (IISER), Mohali
- ❖ Institute of Nanoscience and Technology, Mohali
- ❖ National Institute of Pharmaceutical Education and Research (NIPER), Mohali
- ❖ Indian Institute of Technology, Ropar
- ❖ Thapar University, Patiala
- ❖ Sri Guru Nanak Dev University, Amritsar
- ❖ Punjabi University, Patiala

- ❖ GSSDGS Khalsa College, Patiala
- ❖ Punjab Agricultural University (PAU), Ludhiana
- ❖ Punjab Agricultural University (PAU), Regional Station, Faridkot
- ❖ Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana
- ❖ DAV University, Jalandhar
- ❖ SUS College of Engineering and Technology, Tangori
- ❖ Central University of Punjab, Bathinda
- ❖ Shaheed Bhagat Singh State Technical Campus, Ferozpur

By personal visits at their residence: Some women scientists had completed their research projects and their departments had no information about them. Some women beneficiaries had not responded to the repeated e-mails, so the project fellows personally visited their residence to establish rapport with them and get information about them. Many women scientists also questioned about the purpose for collecting this information. It was only after they were convinced and then willingly came forward to cooperate.

Through Research publications: For some women scientists information regarding their present residence or any contact number was not available. Email ids of some women scientist were not functioning; we tried to search them from their research publications on research gate, Linked in and other social media etc.

Through their Head of the Department: Women Scientists who were reluctant to fill the questionnaires for various reasons, their head of the departments were also approached to request them to fill the online form.

The following success stories of the women scientists were covered:

From Punjab

- Dr. Monica Singh
- Dr. Jyoti
- Dr. Nidhi Rani Gupta
- Dr. Meenakshi Malhotra
- Dr. Jayeeta Bhaumik

From Chandigarh

- Dr. Madhuri Patil
- Dr. Reetinder Kaur
- Dr. Sahila Chopra

From Jammu & Kashmir

- Ms. Ruchi Shah
- Dr. Sheetal Ambardar
- Ms. Bisma Teli

Ethical consideration: Addressing ethical commitment is a priority of every research. In this study, non disclosure agreement was also signed by regional Principal Investigator to maintain the privacy and confidentiality of all the data. Various local Programme Advisory Committee (LPAC) meetings were attended at different regions of the country.

1st LPAC meeting: First meeting of multicentric project entitled “Assessment of Government of India’s Gender Mainstreaming Programs for Women in Science” was held on 1st February 2019 at CEPT University, Ahmedabad. In this meeting online form was finalized. It was decided that the finalized form will be tested with selected women scientists and the university professors. On the basis of their response and comments online form will be improved and the same will be circulated to all regional PI’s until 8th April, 2019 to initiate the data collection.

2nd LPAC meeting: 2nd review meeting of Network Mode Project was held on 20th June 2019 at Parwanoo, Himachal Pradesh. In this meeting all the regional PI’s explained the status of their data collection. They also discussed the different methods used to approach the women scientist and also gave their suggestions to expedite the data collection for better program management. It was also decided that all the members of the multicentric project will be authorised by the Department of Science and Technology, Government of India to collect the information. Non disclosure agreement was also signed by all the regional PI’s as well as national PI to maintain the privacy and confidentiality of all data. The confidential or personal data or information of the women beneficiaries will not be disclosed to anyone other than DST, New Delhi.



3rd LPAC meeting: 3rd review meeting of Network Mode Project was held on November 8th, 2019 at International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad. In this meeting scheme-wise progress review statistics including number of database received from national PI and number of women scientist approached, methods adopted to approach women scientist, challenges/ problems/ issues faced by the regional PIs, and problems-wise solutions/ action taken were thoroughly discussed. Discussion about the observation on data discrepancy and statistical analysis of information received so far were also carried out. Analysis of data (received till 8th November) was also performed by the regional PIs with reference to projects-wise percentage of women scientist, schemes-wise distribution of women scientist, continuation versus gap as well as pre – post situation placement of women scientist in Punjab, Chandigarh and Jammu & Kashmir.



4TH LPAC Meeting: The 4th meeting with all the stakeholders from the Central Government Ministries, Departments and Regional PIs of the project entitled “Assessment of Government of India’s Gender Mainstreaming Programs for Women in Science’ was held on 20th February 2020 at Administrative Staff College of India, New Delhi. This meeting was more inclusive and comprehensive due to the participation of both stakeholders and Regional PIs. National coordinator gave a detailed presentation about the multicentric project and work undertaken by regional Principal Investigators.

5TH MEETING

Due to pandemic of COVID-19, the 5th meeting with all the Regional PIs of the project was held online on 6th May 2020. An online Google sheet was circulated among all the RPI's, prior to this meeting, to fill respective state statistics on the responses received. An excel sheet was prepared at national level, including zone-wise and state-wise on the total number of the women beneficiaries, all at project-wise on the responses received till date. A discussion revealed that some states have performed better during the time of lock down. The monitoring tracks scheme-wise statistics and provides a relative understanding of pending responses to the total data available of the women beneficiaries from GOI. It supports to understand the overall progress of the project, day to day state performance and accordingly provides assistance to make the decision.

6TH MEETING

The 6th online meeting with all the Regional PIs was held on 12th Sept 2020. The meeting began with a discussion on the state-wise progress of the project, about the number of responses received and responses yet to be received. An online Google sheet was circulated among all the RPI's, after the meeting, to fill respective state statistics on the responses received as on date. It was suggested to compiling the strategies adopted and, share the experiences/issues faced during the journey of receiving responses in the report. This will help the government to understand and evaluate the performance of the women beneficiaries and suggest recommendations for decision making as to the best course of action. As the discussion proceeded, few of the RPI's shared their innovative methods and experiences towards the data collection. Many RPIs have suggested to freeze the process of data collection as it is difficult to reach the beneficiaries due to severe COVID conditions across the country.

3.8 Methodology for collecting other (Secondary) Data

The secondary data in this study was collected from journals, books, census and governmental web portals. To obtain a detailed account of educational as well as literacy picture of Punjab, Chandigarh and Jammu & Kashmir, Census report 2011 was consulted. Literature was resourced from the web site of Department of Science and Technology, New Delhi to get a holistic perspective about various women empowering schemes.

3.9 Problems and Challenges

Many problems/challenges were faced by the regional PI and her team during data collection. Some women scientist who had completed their research projects long ago and their contact numbers were not available with either DST or their host institute.

Some women scientist had not responded to the repeated e-mails. Email ids of some women scientist were not functioning.

Due to abrogation of article 370 in J&K, mobile as well as internet services have been suspended in parts of the state, so it is difficult to contact women scientist. But still regional investigator and her team tried to approach women Scientist by snowball sampling method. Due to limited internet services they are not able to fill the online form, so the forms are being filled through telephonic conversations.

Sudden lockdown due to pandemic of Covid 19, personal visit to various universities of the region under consideration was not possible, so repeated requests were send to the women scientist to fill the online form, but some women scientist didn't agree to provide their details.

Despite all these challenges we tried to extract maximum data from the Punjab, Chandigarh and Jammu & Kashmir.

Statistical Analysis The analysis of collected data was carried out using Statistical Package for the Social Sciences (SPSS) version 16. To illustrate the graphs in present study, Microsoft chart wizard was used and text and tables have been made in Microsoft word and Microsoft excel. The level of significance for all analyses was assumed at $p < 0.05$ and a confidence interval of 95% were taken for all statistical analyses. The statistical significance of the different categories of a variable was estimated by chi-square test. Chi-square is a statistical test commonly used to compare observed data with data which is expected to obtain according to a specific hypothesis. It is a test of independence and used to determine if there is a significant relationship between two nominal variables. The frequency of one nominal variable is

compared with different values of the second nominal variable. The Chi Square is denoted by X^2 and the formula is:

$$X^2 = \sum \frac{(O - E)^2}{E}$$

here, O = Observed frequency, E = Expected frequency, \sum = Summation, X^2 = Chi Square value

The difference in the paired variables was estimated by Wilcoxon signed rank test.

The Wilcoxon signed-rank test is a popular, nonparametric substitute for the t-test. It assumes that the data follow a symmetric distribution. The test is computed using the following steps.

1. Subtract the hypothesized mean, μ_0 , from each data value. Rank the values according to their absolute values.
2. Compute the sum of the positive ranks S_p and the sum of the negative ranks S_n . The test statistic, W_R , is the minimum of S_p and S_n .
3. Compute the mean and standard deviation of W_R using the formulas

$$\mu_{W_R} = \frac{n(n+1)}{4}$$

$$\sigma_{W_R} = \sqrt{\frac{n(n+1)(2n+1)}{24} - \frac{\sum t^3 - \sum t}{48}}$$

where t represents the number of times the i^{th} value occurs.

4. Computing the z-value using

$$Z_W = \frac{W_R - \mu_{W_R}}{\sigma_{W_R}}$$

The significance of the test statistic is determined by computing the p-value using the standard normal distribution. If this p-value is less than a specified level (usually 0.05), the null hypothesis is rejected in favor of the alternative hypothesis. Otherwise, no conclusion can be reached.

CHAPTER 4: DETAILED ANALYSIS OF THE DATA

4.1 Introduction:

Analysis section of the present report has an analytical description of all the variables in the form of tables and bar diagrams to gauge the trends and patterns based on various indicators.

4.2 Women Scientists Responses:

Table 4.1 depicts the overall statistics of data received from DST and online forms filled by women beneficiaries under various schemes from Punjab, Chandigarh and Jammu & Kashmir. It is evident from the table that in Punjab, total 113 research projects were sanctioned under different schemes and 67 women scientist filled the online forms. Out of the total 41 research projects, 35 online forms were received from women scientists in Chandigarh region, whereas in Jammu & Kashmir filled online forms were received from 34 women scientists.

Table 4.1 Overall statistics of data collected from Punjab, Chandigarh and Jammu & Kashmir

Scheme		Punjab	Chandigarh	Jammu & Kashmir
WOS-A	Received	57	26	44
	Forms filled	49 (85.96%)	25 (96.15%)	27 (61.36%)
WOS-B	Received	05	03	01
	Forms filled	04 (80%)	03 (100%)	00 (0%)
WOS-C	Received	17	03	01
	Forms filled	01 (5.88%)	01 (33.33%)	00 (0%)
Bio-Care	Received	16	03	07
	Forms filled	12 (75%)	03 (100%)	07 (100%)
PDFWM	Received	18	06	01
	Forms filled	01 (5.56%)	03 (50%)	00 (0%)
Total	Data Received	113	41	54
	Forms filled	67 (59.29%)	35 (85.37%)	34 (62.96%)

It was also found that under WOS A and WOS B schemes maximum response was received in Chandigarh and it was 96.15% and 100% respectively. Only one confirmation was received from both Punjab and Chandigarh under the WOS-C scheme. In Punjab, 75% response was received under Bio-Care and it was 100% in both Chandigarh and Jammu & Kashmir. Under PDFWM schemes 50% response rate was observed in Chandigarh and it was only 5.56 % in Punjab. So, response rate was maximum in Chandigarh (85.37%) followed by Jammu & Kashmir (62.96%) and Punjab (59.29%).

Number of projects sanctioned under various women centric schemes from year 2003 to 2019 in Punjab, Chandigarh and Jammu & Kashmir are portrayed in figure 4.1(a) to 4.1(c). In all the three states, number of projects sanctioned from 2003 to 2019 exhibited a fluctuating trend, although number of projects sanctioned in recent years was more than the earlier years.

Figure 4.1 a): Number of projects sanctioned each year in Punjab

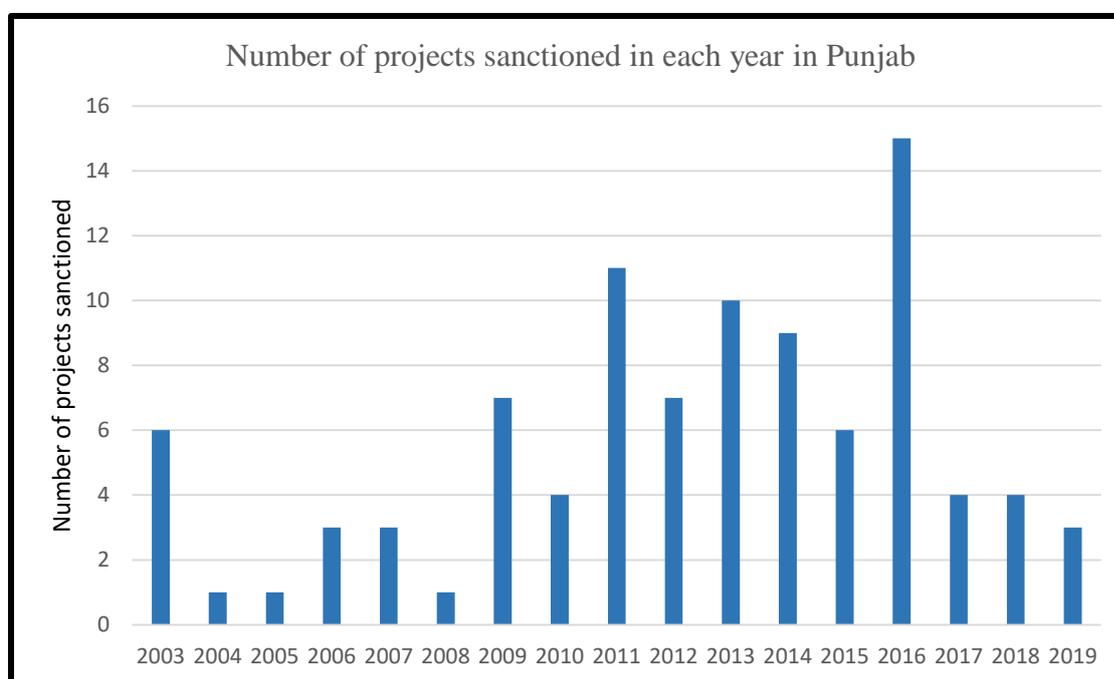


Figure 4.1 b): Number of Projects sanctioned each year in Chandigarh

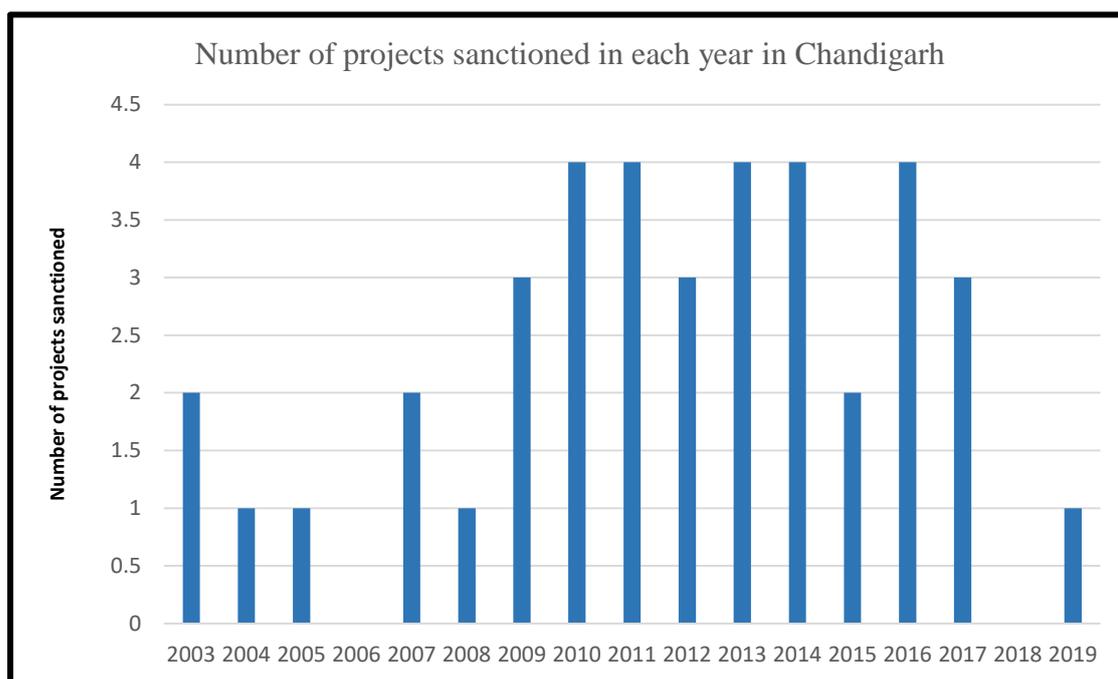


Figure 4.1c): Number of Projects sanctioned each year in Jammu & Kashmir

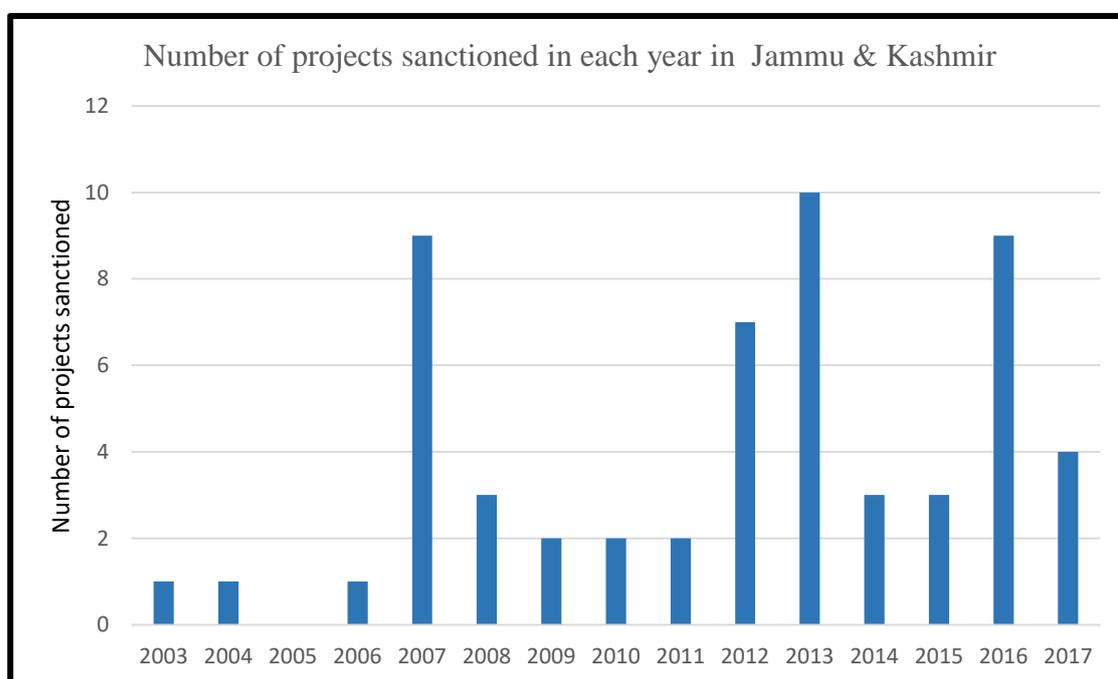


Table 4.2 illustrates the status of the sanctioned research project in Punjab, Chandigarh and Jammu & Kashmir. It was observed that out of the total projects sanctioned in Punjab from year 2003 to 2018, 34.33% were still ongoing, while 62.69% of the projects were already completed and few sanctioned projects (2.99%) were left in

between. Similar trend was observed in Chandigarh region where the percentage of projects still under progress was 28.57%, while 65.71% were completed and 5.71% were left in between (Figure 4.2).

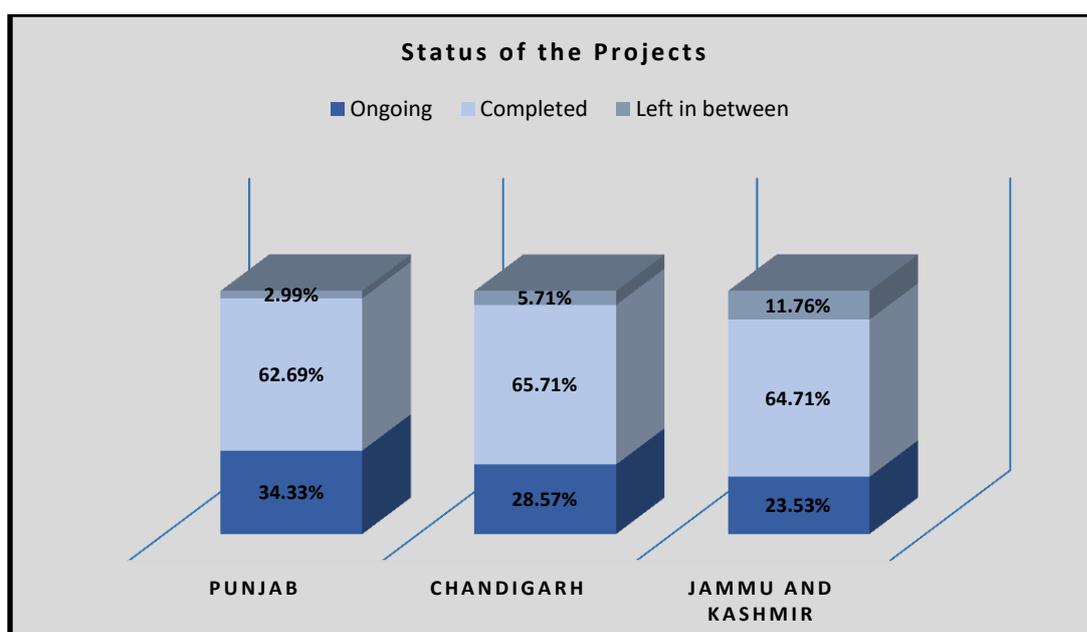
In Jammu & Kashmir 64.71% of the sanctioned projects were completed successfully followed by 23.53% ongoing projects and 11.76% of the research projects were not accomplished due to various reasons. The chi square analysis depicted statistically significant differences among the three categories in all the three regions under consideration i.e. Punjab (p-value 35.851**), Chandigarh (p-value 19.257**) and Jammu & Kashmir (p-value 15.765**). In all the three areas, few women scientists had left their project in between either due to some personal reasons or they got permanent employment.

Table 4.2: Status of the projects sanctioned in Punjab, Chandigarh and Jammu & Kashmir

Status of the project	Punjab	Chandigarh	Jammu & Kashmir
Ongoing	23 (34.33%)	10 (28.57%)	08 (23.53%)
Completed	42 (62.69%)	23 (65.71%)	22 (64.71%)
Left in between	02 (2.99%)	02 (5.71%)	04 (11.76%)
p-value	35.851**	19.257**	15.765**

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

Figure 4.2: Status of the projects granted in Punjab, Chandigarh and Jammu & Kashmir



The career profile of women scientist with or without break from Punjab, Chandigarh and Jammu & Kashmir is presented in Table 4.3. It is clear from the table that majority of the Principal Investigators in Punjab (70.15% vs 29.85%), Chandigarh (74.29% vs 25.71%) and Jammu & Kashmir (61.76% vs 38.24%) had an interruption in their career, while lesser percentage of Principal investigators had not faced such phase in their academic journey (Figure 4.3). Results of Chi-square test revealed statistically significant difference in both the phase in Punjab (p value 10.88*) and Chandigarh (p value 8.26*), whereas Jammu & Kashmir (1.88) exhibited non-significant differences.

Table 4.3: Break in career among women scientists from Punjab, Chandigarh and Jammu & Kashmir

Break in career	Punjab	Chandigarh	Jammu & Kashmir
Yes	47 (70.15%)	26 (74.29%)	21 (61.76%)
No	20 (29.85%)	09 (25.71%)	13 (38.24%)
p-value	10.88*	8.26*	1.88

Level of significance: p<0.05*; p<0.01**

Figure 4.3: Break in career among women scientists from Punjab, Chandigarh and Jammu & Kashmir

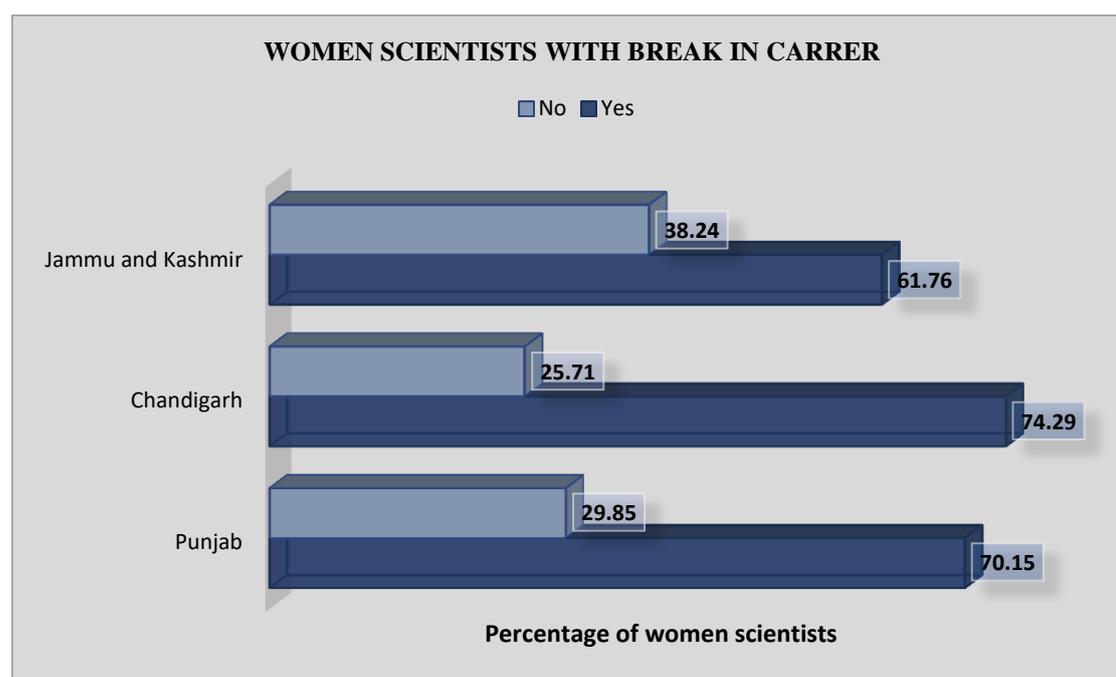
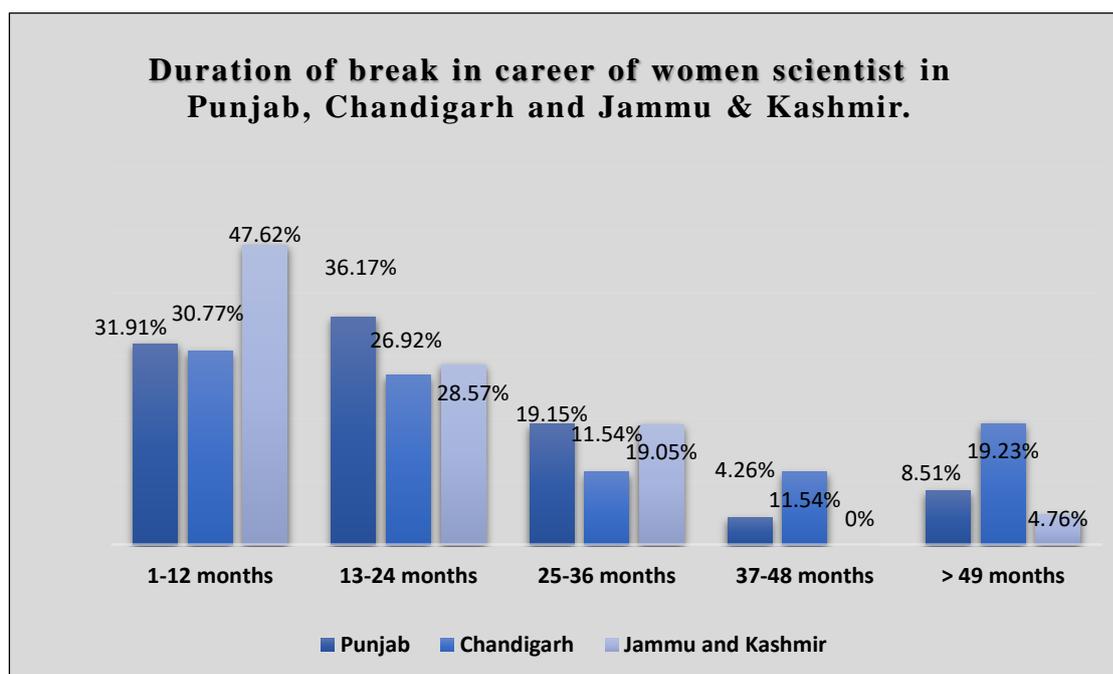


Table 4.4 Demonstrate the duration of break in career of various women scientists from Punjab, Chandigarh and Jammu & Kashmir. It is evident from the table that in state Punjab 36.17% of women scientists had duration of break between 13 to 24 months followed by 31.91% which had break of 1to12 months. There were only 4.26% of women scientists whose break was ranged from 37 to 48 months. In Chandigarh region, majority (30.77%) of women scientists had 1 to 12 months as the time of break in their academic career. In Jammu & Kashmir 47.62% and 4.76% of women scientists mentioned 1 to 12 months and more than 49 months of break in their career respectively.

Table 4.4: Demonstrate the duration of break in career of various women scientists from Punjab, Chandigarh and Jammu & Kashmir

Duration of break	Punjab	Chandigarh	Jammu & Kashmir
1-12 months	15 (31.91%)	08 (30.77%)	10 (47.62%)
13-24 months	17 (36.17%)	07 (26.92%)	06 (28.57%)
25-36 months	09 (19.15%)	03 (11.54%)	04 (19.05%)
37-48 months	02 (4.26%)	03 (11.54%)	--
≥49 months	04 (8.51%)	05 (19.23%)	01 (4.76%)
p-value	18.43*	4.00	8.14*

Figure 4.4: Duration of break in career of women scientists in Punjab, Chandigarh and Jammu & Kashmir



The various reasons for break in career among women scientist from Punjab, Chandigarh and Jammu & Kashmir are displayed in Table 4.5. It was clearly observed that family responsibility was the primary reason for the interruption in career among women scientists of Punjab (47.76%), Chandigarh (48.57%) and Jammu & Kashmir (55.88%). In Punjab, family responsibility followed by maternity issues (14.93%), financial problem (10.45%), mobility (10.45%) and lack of job opportunity (10.45%) were documented as the frequently occurring reasons of career gap. Whereas only a few women researchers reported health issues (2.99%) as well as preparation of competitive exams (2.99%) as the cause of their break in career (figure 4.5 a).

Table 4.5: Reasons for break in career among women scientists from Punjab, Chandigarh and Jammu & Kashmir

Reason for break in career	Punjab	Chandigarh	Jammu & Kashmir
Family responsibilities	32 (47.76%)	17 (48.57%)	19 (55.88%)
Lack of job opportunity	07 (10.45%)	07 (20%)	06 (17.65%)
Migration	07 (10.45%)	03 (8.57%)	0 (00%)
Health issues	02 (2.99 %)	03 (8.57%)	0 (00%)
Financial problem	07 (10.45%)	00 (00%)	06 (17.65%)
Maternity	10 (14.93%)	05 (14.29%)	03 (8.82%)
Preparation for competitive e	02 (2.99%)	00 (00%)	00 (00%)
p-value	66.63**	19.43*	18**

Level of significance: $p < 0.05^*$; $p < 0.01^{**}$

Similarly, in Chandigarh region, out of the total responses, majority of women delineated family commitments (48.57%) and unavailability of job opportunities (20%) as reasons for their discontinuity in career (figure 4.5 b). The female investigators of Jammu & Kashmir specified issues such as lack of job opportunity (17.65%), financial stringency (17.65%) and maternity issues (8.82%) as the reasons for pause in their academic course (Figure 4.5 c). Chi-square test demonstrated statistically significant difference for different reasons of break in career in Punjab (p value 66.63**), Chandigarh (p value 19.43**) and Jammu & Kashmir (p value 18**).

Figure 4.5 a): Reasons of break in career among women scientists from Punjab region

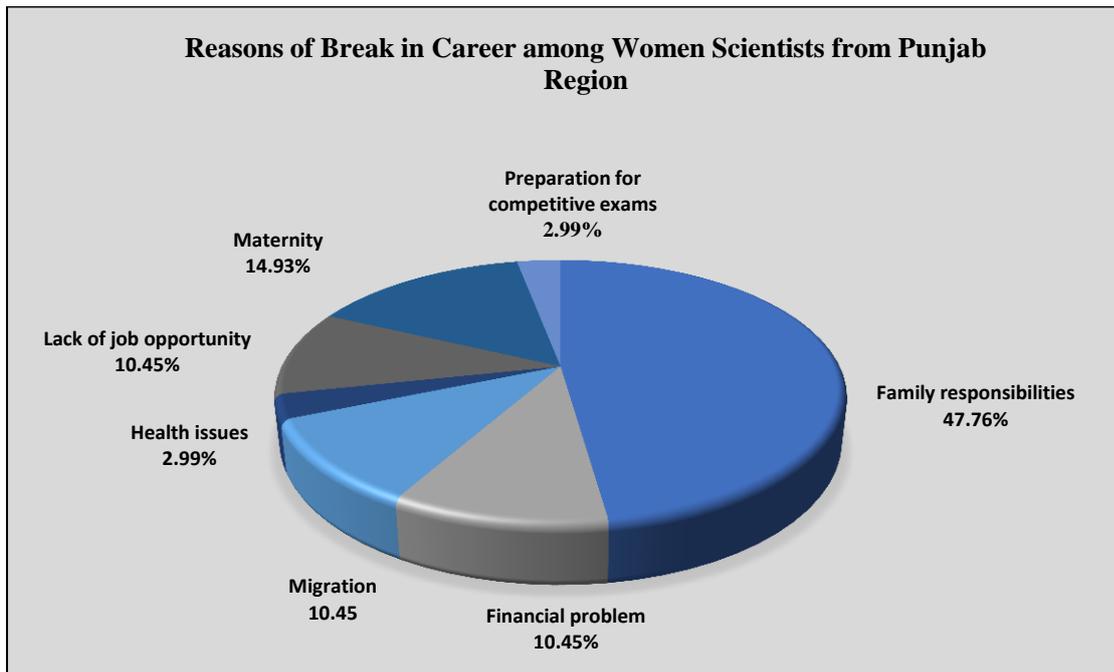


Figure 4.5 b): Reasons for break in career among women scientists from Chandigarh

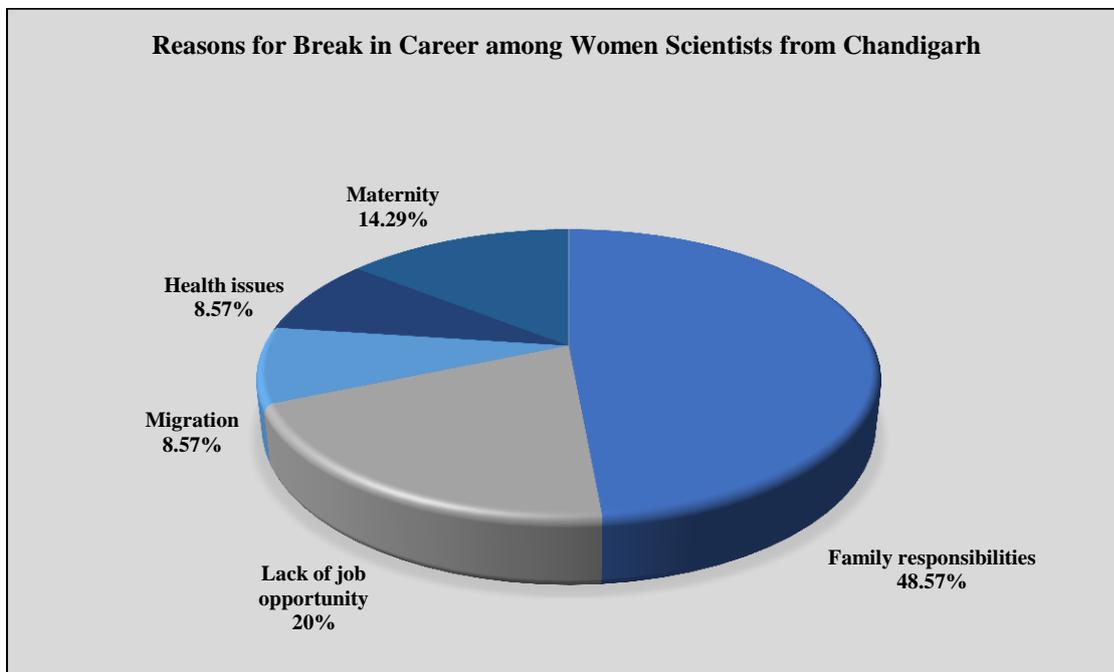


Figure 4.5c): Reasons for break in career among women scientists from Jammu & Kashmir

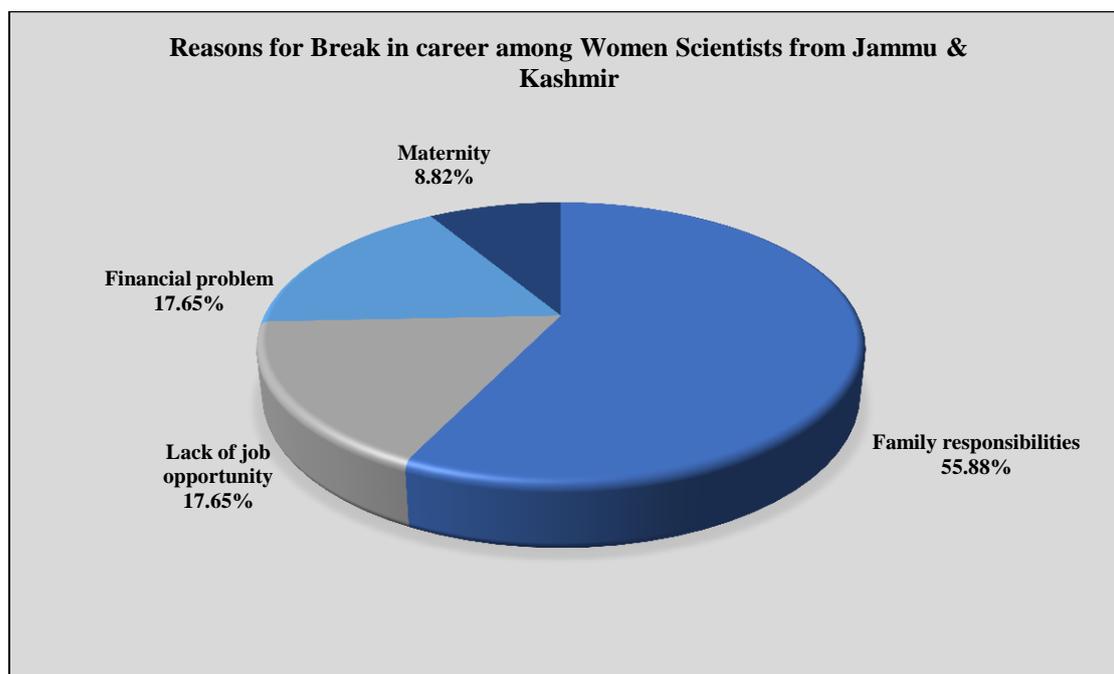


Table 4.6 presents the marital status of Principal investigators from Punjab, Chandigarh and Jammu & Kashmir. It can be clearly observed from figure 4.6 that out of the total respondents of Punjab majority (89.55%) were married, while only 8.96% and 1.49% of them were unmarried or divorced respectively. Similar observations were noticed in both Chandigarh (82.86% and 76.47%) and Jammu & Kashmir region (17.14% and 23.53%), where the frequency of married women scientists was higher than unmarried respectively. A statistically significant p value were noted in three categories of marital status in Punjab (95.851**), Chandigarh (15.114**) and Jammu & Kashmir (9.529*).

Table 4.6: Marital status of the Principal investigators from Punjab, Chandigarh and Jammu & Kashmir

Marital Status	Punjab	Chandigarh	Jammu & Kashmir
Married	60 (89.55%)	29 (82.86%)	26 (76.47%)
Unmarried	06 (8.96%)	06 (17.14%)	08 (23.53%)
Other	01 (1.49%)	00 (00%)	00 (00%)
p-value	95.851**	15.114**	9.529*

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

Figure 4.6: Marital status of the Principal investigators from Punjab, Chandigarh and Jammu & Kashmir

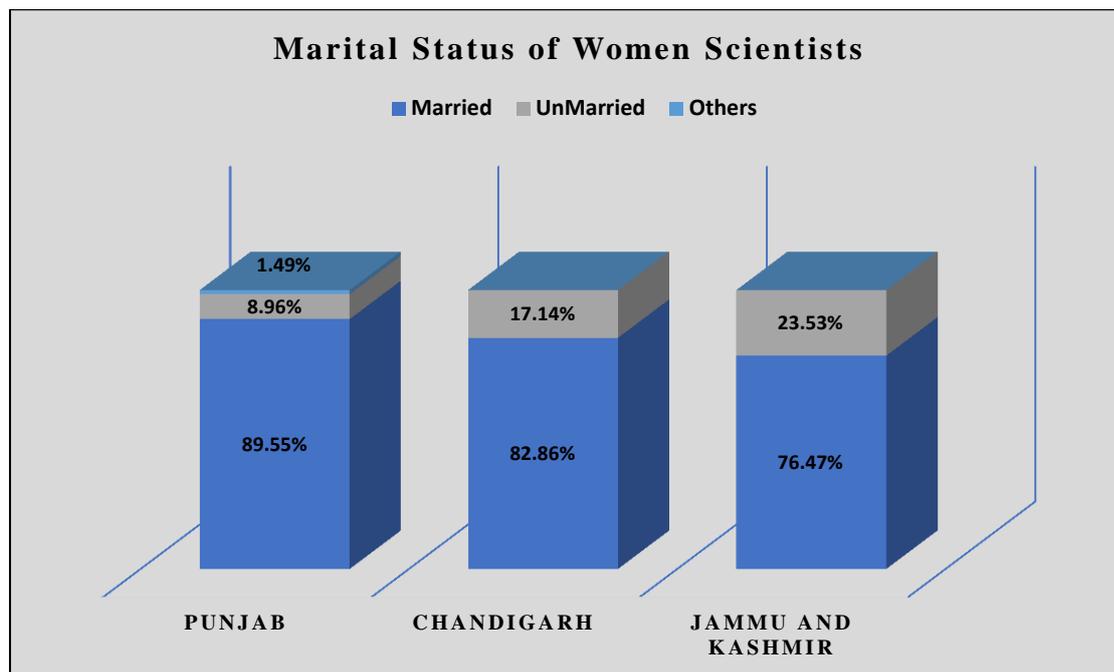


Table 4.7 depicts the field of specialization of women scientists from Punjab, Chandigarh and Jammu & Kashmir. It can be seen from the table that in Punjab, maximum number (55.22%) of women scientists belonged to life sciences followed by physical sciences (17.91%) and agriculture and allied sciences (7.46%). Women scientists in health food and nutrition (1.49%) and earth sciences (1.49%) received less support. Figure 4.7 (a) displays that very few women scientists represented chemical sciences (4.48%), engineering (5.97%), mathematical sciences (2.99%) and Engineering and technology development (2.99%) field of specialization.

In Chandigarh also, women scientists from life sciences (74.29%) were the main recipients of projects followed by chemical sciences (14.29%). In Jammu & Kashmir 64.71% of women scientists had life sciences as their field of specialization and 8.82% women scientists were from physical sciences, 14.71% from chemical sciences, 5.88% from agriculture and allied sciences, 2.94% from earth sciences and 2.94% of women scientist belonged to engineering and technology development. No woman scientist from Chandigarh and Jammu & Kashmir received any project in engineering and mathematical sciences.

Table 4.7: Field of specialisation of women scientists from Punjab, Chandigarh and Jammu & Kashmir

Field of specialisation	Punjab	Chandigarh	Jammu & Kashmir
Life sciences	37(55.22%)	26(74.29%)	22 (64.71%)
Physical sciences	12(17.91%)	1 (2.86%)	03 (8.82%)
Chemical Sciences	03 (4.48%)	05(14.29%)	05 (14.71%)
Engineering	04 (5.97%)	-----	----
Mathematical Sciences	02 (2.99%)	----	----
Agriculture and allied sciences	05 (7.46%)	01 (2.86%)	02 (5.88%)
Engineering and technology development	02 (2.99%)	01 (2.86%)	01 (2.94%)
Health food and Nutrition	01 (1.49%)	01 (2.86%)	----
Earth Sciences	01 (1.49%)	----	01 (2.94%)
p-value	144.30**	85.86**	58.47**

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

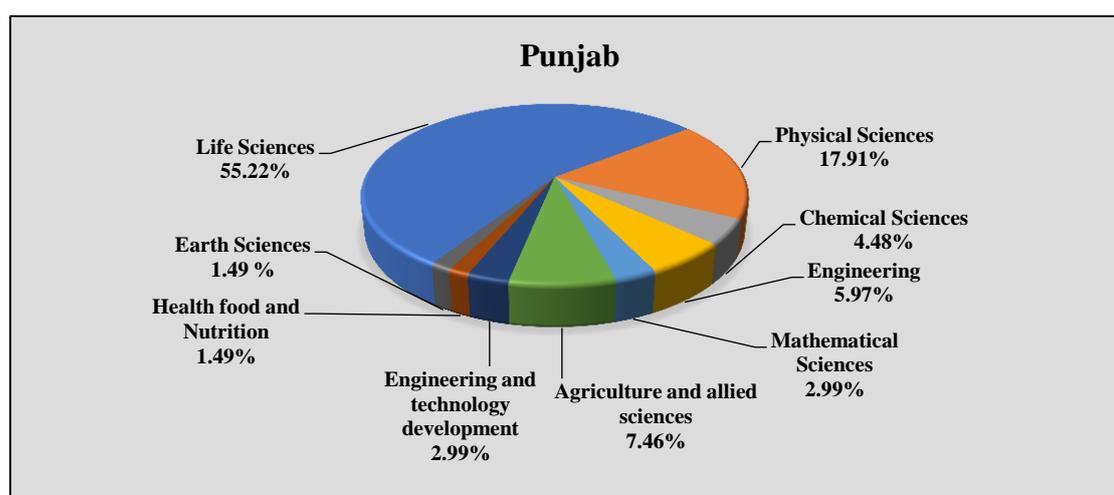
Figure 4.7 a): Field of specialisation of women scientists from Punjab


Figure 4.7b): Field of specialisation of women scientists from Chandigarh

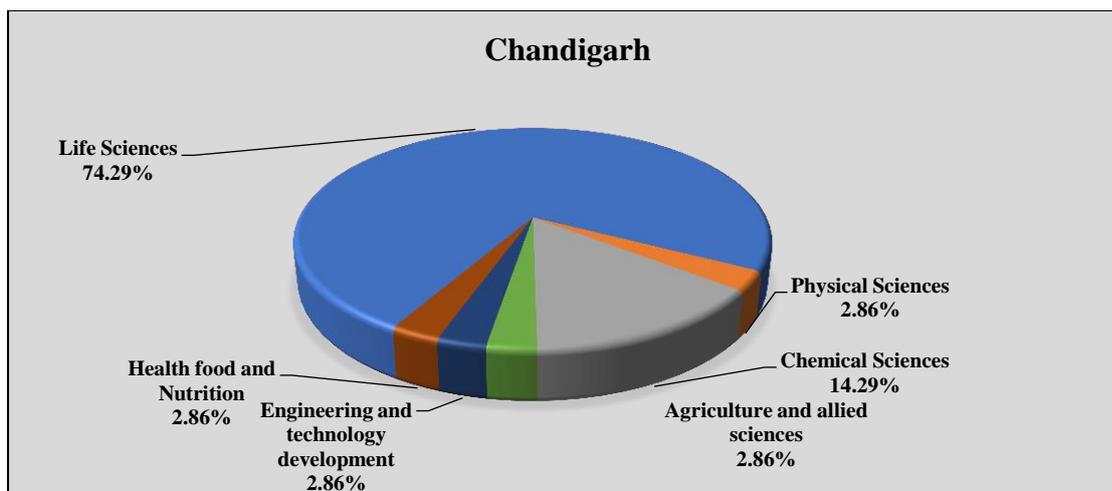
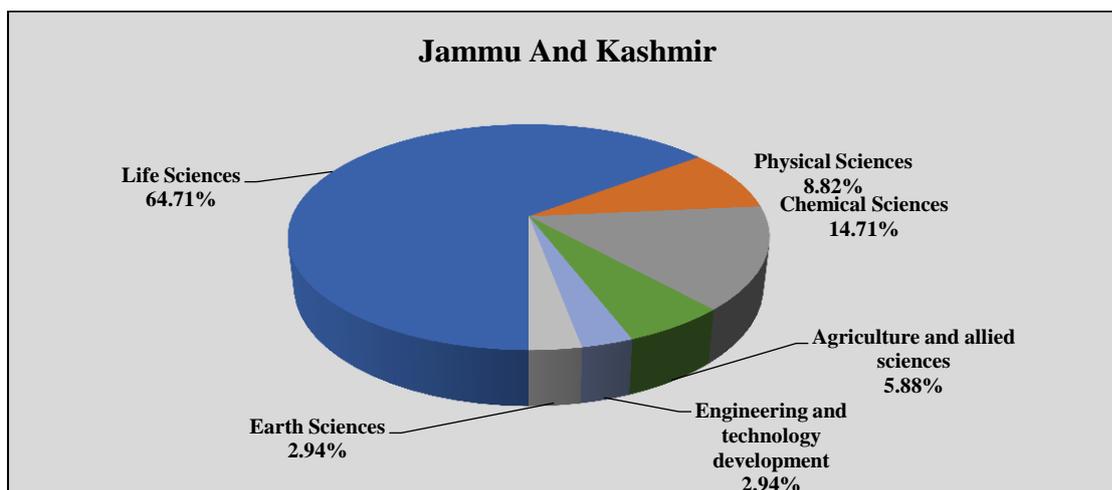


Figure 4.7c): Field of specialisation of women scientists from Jammu & Kashmir



Similarly, health, food and nutrition as well as earth science were not very popular among women scientist. Results of chi square test also demonstrated statistically significant difference among all the categories of specialization in Punjab (144.30**), Chandigarh (85.86**) and Jammu & Kashmir (58.47**).

Table 4.8 demonstrates the level of support Principal investigators have from their Mentors from Punjab, Chandigarh and Jammu & Kashmir. It was clearly presented in the Table that out of the total responses received from Punjab, majority of women scientist were extremely satisfied (70.15%), followed by very satisfied (20.89%), moderately satisfied (5.97%) and a very few (2.99%) of them were discontented with their mentor's support and guidance (Figure 4.8a).

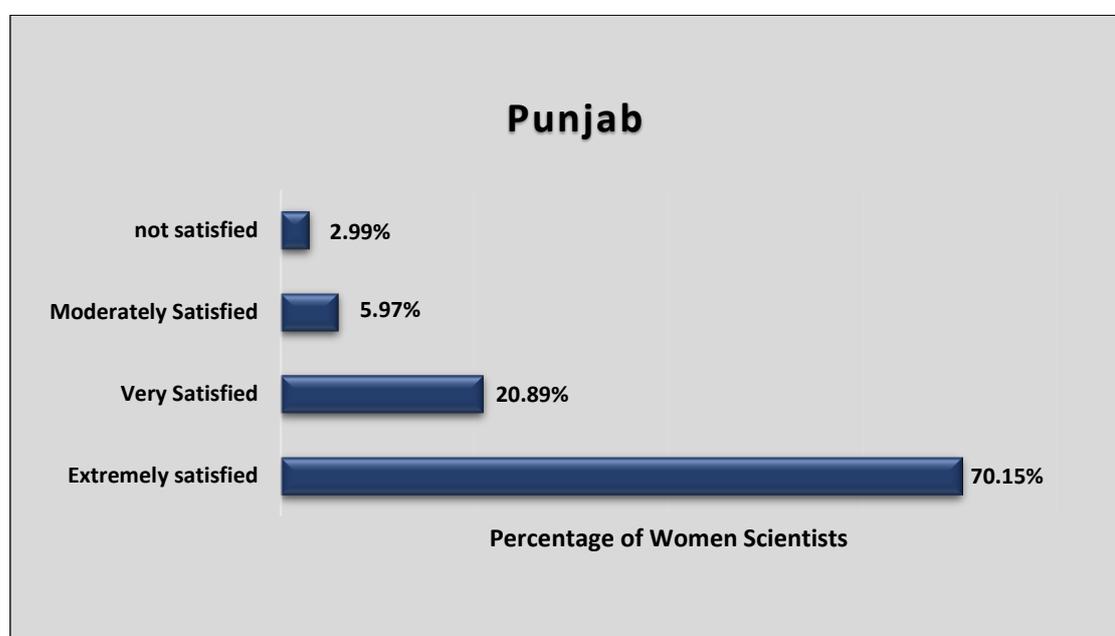
Table 4.8: Mentor's Support to Principal investigators from Punjab, Chandigarh and Jammu & Kashmir

Mentor's Support	Punjab	Chandigarh	Jammu & Kashmir
Extremely Satisfied	47 (70.15%)	18 (51.43%)	24 (70.59%)
Very Satisfied	14 (20.89%)	11 (31.43%)	07 (20.59%)
Moderately Satisfied	04 (5.97%)	03 (8.57%)	01 (2.94%)
Slightly Satisfied	00 (00%)	00 (00%)	01 (2.94%)
Not Satisfied	02 (2.99%)	03 (8.57%)	01 (2.94%)
p-value	77.78**	17.91**	58.35**

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

In Chandigarh region, 51.43% of the female respondents were immensely satisfied with their mentor's support, 31.43% were very satisfied, while 17.14% of investigators exhibited lower level of satisfaction as portrayed in figure 4.8b.

Figure 4.8 a): Mentor's Support to Principal investigators from Punjab



It was also observed that 70.59% of women scientists from Jammu & Kashmir were intensely contented with their mentor's support, 20.59% were very satisfied, while only a few respondents (8.82%) showed moderate to entire dissatisfaction (figure 4.8 c).

Results of p values recorded statistically significant differences in all the categories from Punjab (77.78**), Chandigarh (17.91**) and Jammu & Kashmir (58.35**), there by confirming that women scientist from all the three regions were extremely satisfied from the support of their mentors.

Figure 4.8 b) Mentor's Support to Principal investigators from Chandigarh

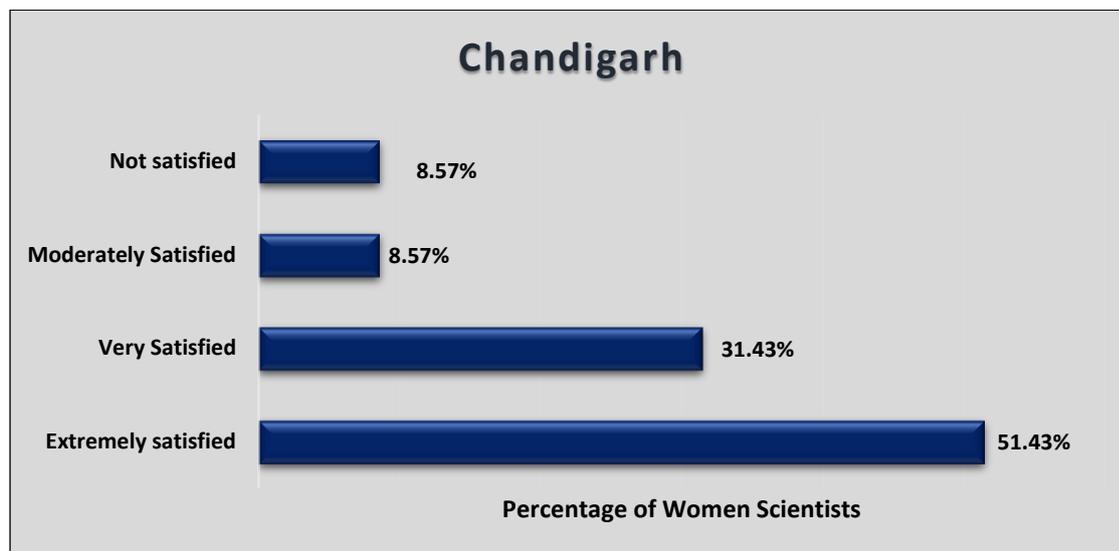
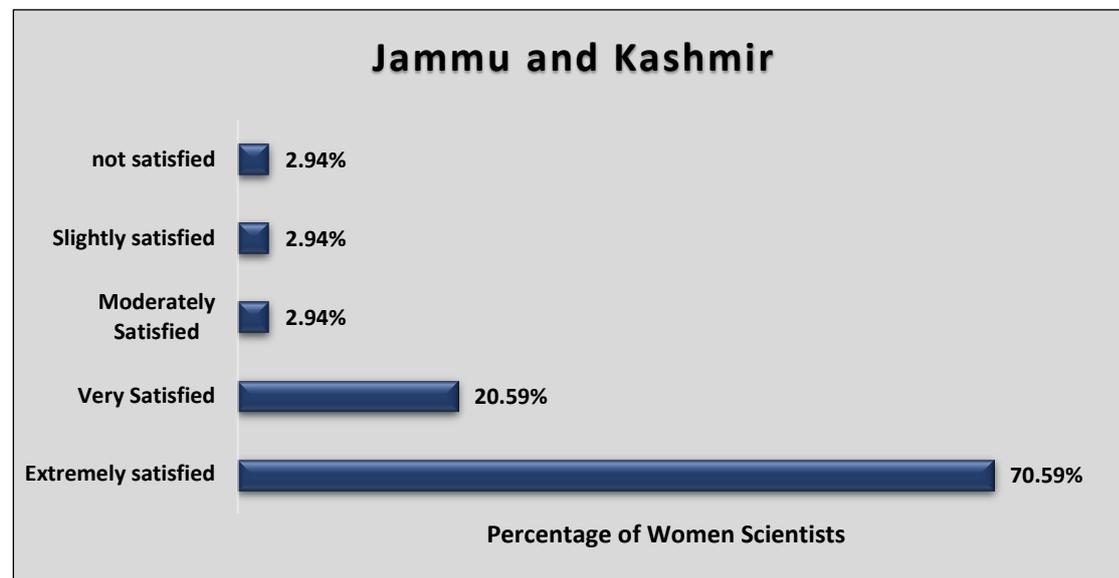


Figure 4.8 c) Mentor's Support to Principal investigators from Jammu & Kashmir



An analysis of host institute's support to their women scientist for research in Punjab, Chandigarh and Jammu & Kashmir is illustrated in Table 4.9. The results showed that 50.75% of women scientists in Punjab, 42.86% in Chandigarh and 61.76% in Jammu & Kashmir were extremely satisfied with the support of their host institute. Figure 4.9(a) depicts that 35.82% women scientist were very satisfied and 13.43% were moderately

satisfied from the support of their host institute. In Chandigarh as it is clear from the figure 4.9b , 40% women scientist were very satisfied, 11.43% were moderately satisfied , while 5.71% women scientists were not satisfied with the support provided by their institute (Figure 4.9 b).

Table 4.9: Institutional Support to Principal Investigators from Punjab, Chandigarh and Jammu & Kashmir

Institutional Support	Punjab	Chandigarh	Jammu & Kashmir
Extremely Satisfied	34 (50.75%)	15 (42.86%)	21 (61.76%)
Very Satisfied	24 (35.82%)	14 (40%)	09 (26.47%)
Moderately Satisfied	09 (13.43%)	04 (11.43%)	04 (11.76%)
Slightly Satisfied	----	----	----
Not Satisfied	----	02 (5.71%)	----
p-value	14.18*	15.40*	13.47*

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

In Jammu & Kashmir all the women beneficiaries were satisfied from the support of their host institute, interestingly no women scientist complains about non-cooperation by host institute. Statistically significant differences were noticed in all the categories from Punjab (14.18*), Chandigarh (15.40*) and Jammu & Kashmir (13.47*).

Figure 4.9a) Institutional Support to Principal investigators from Punjab

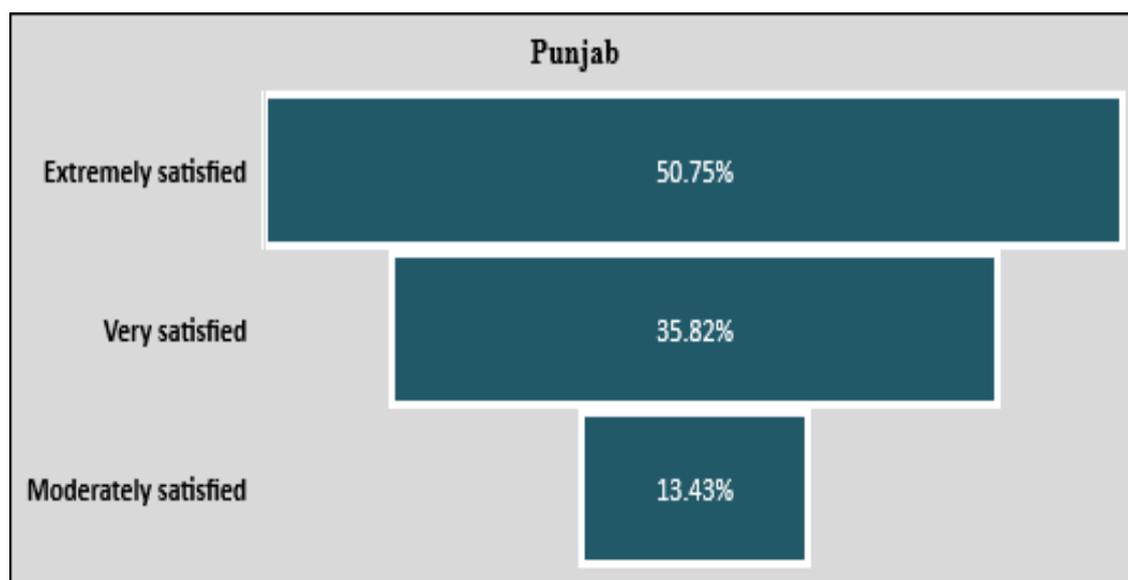


Figure 4.9b) Institutional Support to Principal investigators from Chandigarh

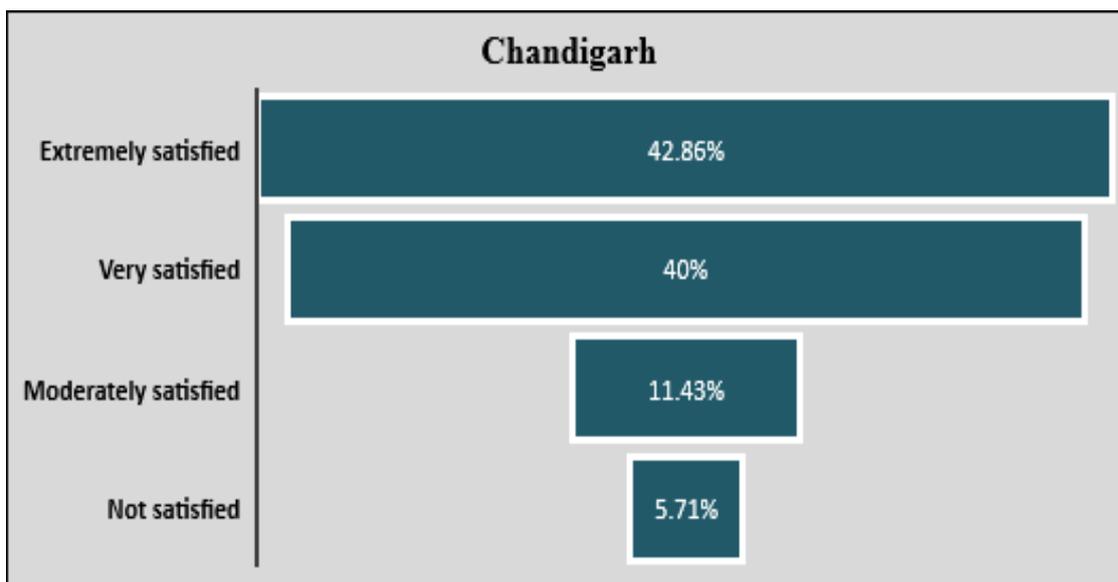


Figure 4.9c): Institutional Support to Principal Investigators from Jammu & Kashmir

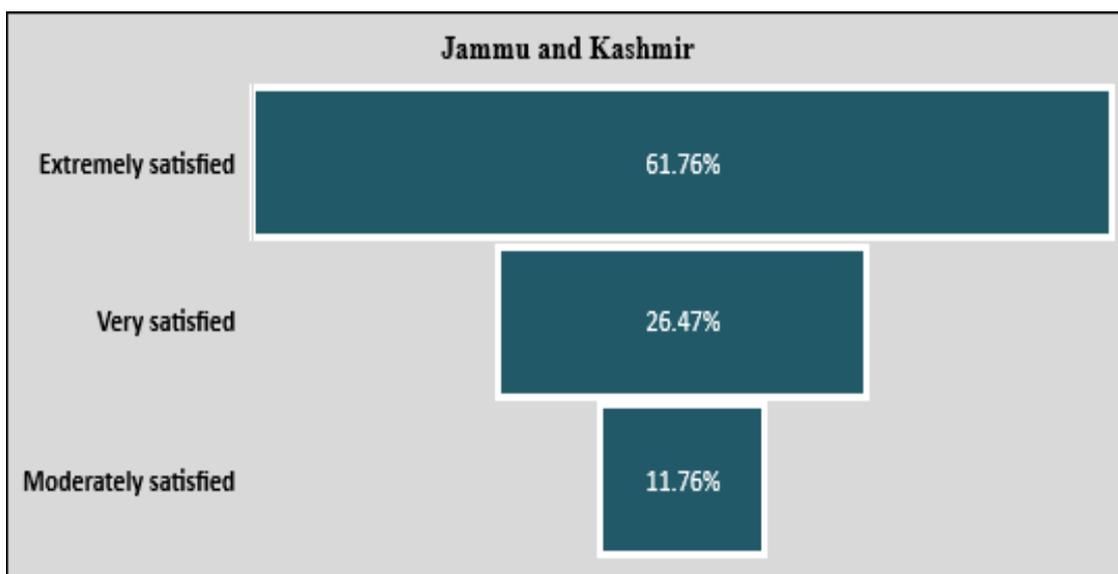


Table 4.10 depicts the number of projects availed by women scientists under the Government of India's Gender Mainstreaming Programme in all the three regions under consideration. It was clearly evident from the table that in Punjab 88.06% of women scientist have been granted only one project, 8.96% women scientist availed two projects and approximately 2.98% of women scientist received three to four research projects under these women centric schemes. Surprisingly, all the respondents (100%) of Chandigarh have availed one research project under Government of India's Gender Mainstreaming Programme. Whereas in Jammu & Kashmir 94.12% and 5.88%

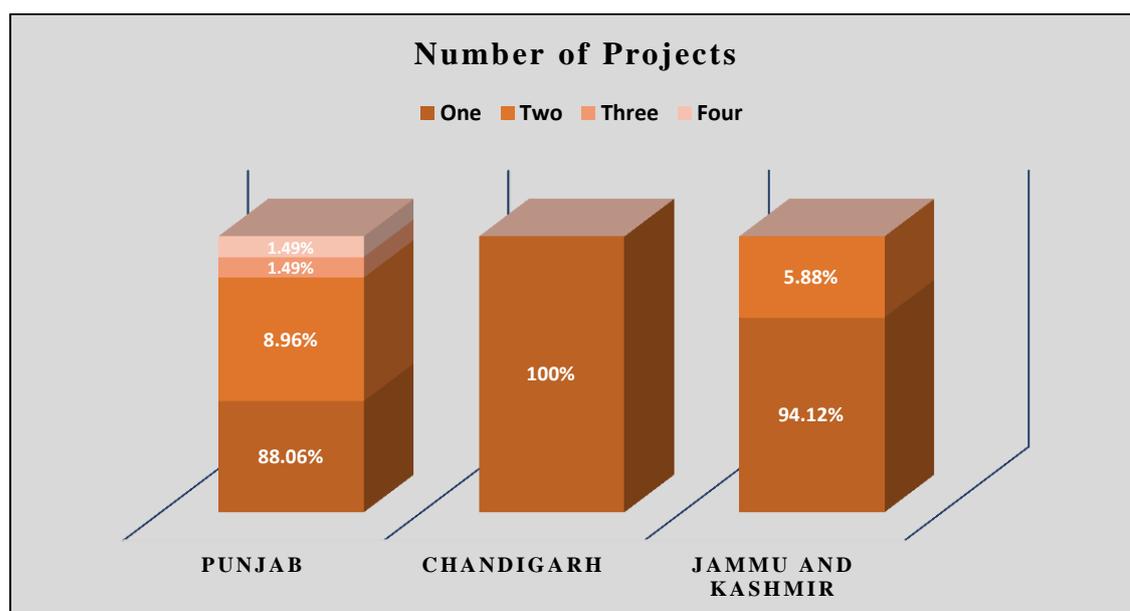
of the total respondents have received one and two research projects respectively (Figure 4.10). Statistically significant difference were noticed in different categories in Punjab (143.09**) and Jammu & Kashmir (26.47**).

Table 4.10: Number of projects availed by women scientists from Punjab, Chandigarh and Jammu & Kashmir

Number of projects availed	Punjab	Chandigarh	Jammu and Kashmir
One	59 (88.06%)	35 (100%)	32 (94.12%)
Two	06 (8.96%)	----	02 (5.88%)
Three	01 (1.49%)	----	----
Four	01 (1.49%)	----	----
p-value	143.09**	--	26.47**

Level of significance: $p < 0.05^*$; $p < 0.01^{**}$

Figure 4.10: Number of projects availed by women scientists in Punjab, Chandigarh and Jammu & Kashmir



The eligibility test cleared by women scientists before the grant of the project is demonstrated in Table 4.11, Figure 4.11 in Punjab, Chandigarh and Jammu & Kashmir. It is evident from the Table 4.11 that in Punjab about 13.43% women beneficiaries cleared UGC-NET eligibility test, while 22.39% cleared CSRI-NET, 13.43% cleared ICAR and 50.75% qualified other eligibility examination. In Chandigarh 22.86% women scientists qualified UGC-NET, 34.29% CSRI-NET, 5.71% ICAR, 2.86% ICMR and 34.29% other examination. In Jammu & Kashmir only 8.82% women scientist qualified UGC-NET examination, a considerable percentage of women

(44.12%) cleared CSRI-NET, 5.88%, ICMR, 5.88% SLET and 35.29% qualified other examinations. Statistically significant difference were noticed by applying chi-square in different categories of eligibility test from Punjab (p value= 25.12**), Chandigarh (p value= 16*) and Jammu & Kashmir (p value= 22.77**).

Table 4.11: Eligibility test cleared by principal investigators from Punjab, Chandigarh and Jammu & Kashmir

Eligibility Test	Punjab	Chandigarh	Jammu & Kashmir
UGC-NET	09 (13.43%)	08 (22.86%)	03 (8.82%)
CSRI-NET	15 (22.39%)	12 (34.29%)	15 (44.12%)
ICAR	09 (13.43%)	02 (5.71%)	----
ICMR	----	01 (2.86%)	02 (5.88%)
SLET	----	----	02 (5.88%)
Others	34 (50.75%)	12 (34.29%)	12 (35.29%)
p-value	25.12**	16*	22.77**

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

Figure 4.11 Eligibility test cleared by principal investigators from Punjab, Chandigarh and Jammu & Kashmir

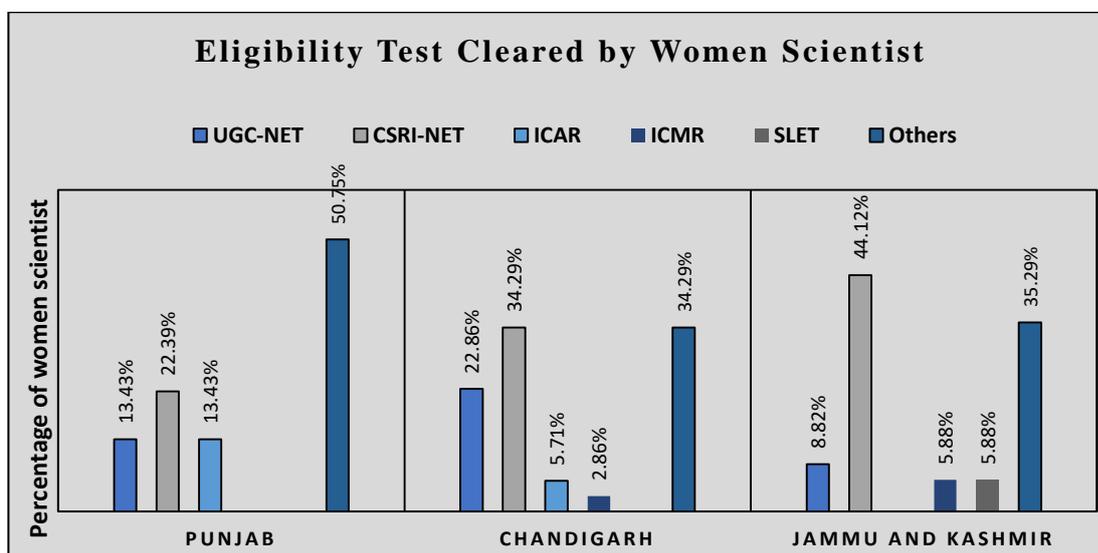


Table 4.12 (a) demonstrated the educational status (before and after receiving the project) of women scientist of Punjab. Prior to taking the research project 58.21% women scientist had already completed their Ph.D. 31.34% were postgraduates, 7.46% and 2.99% were post doctorate and M. Phil respectively.

Table 4.12 a): Educational status (before and after project) of women scientists of Punjab

Educational Qualification	Punjab		z-value
	At the time of grant of project	At the time of completion of project	
Post-graduation	21 (31.34%)	07 (10.45%)	-3.724**
M.Phil.	02 (2.99%)	02 (2.99%)	---
Ph.D.	39 (58.21%)	45 (67.16%)	-2.828**
Post-Doctorate	05 (7.46%)	13 (19.40%)	---

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

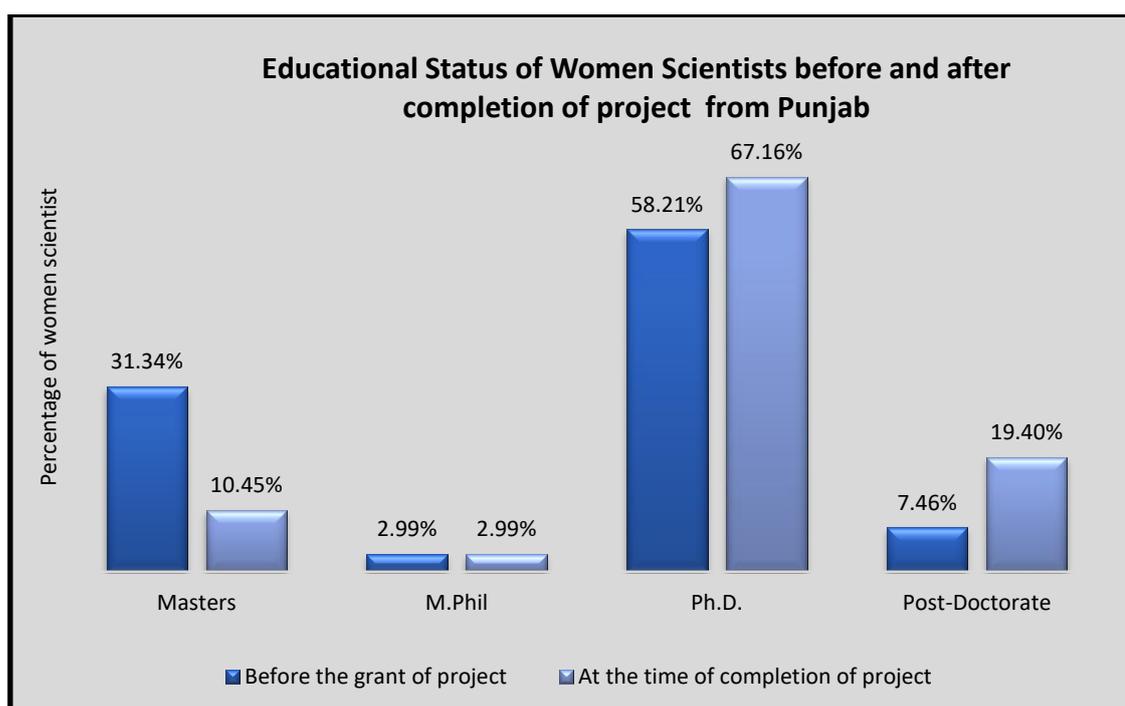
Figure 4.12a): Educational status (before and after sanction of project) among women scientists of Punjab

Figure 4.12 (a) showed that after completion of the project 67.16% women scientists were Ph.D. and 19.4% post doctorate and 10.45% were postgraduates. Only 2.99% women had M.Phil. as their highest qualification. Comparative analysis documented that after completion of the project percentage of doctorates increased significantly from 58.21% to 67.16% and percentage of women scientist with master's degree as highest qualification at the time of grant of project decreased significantly 31.34% to

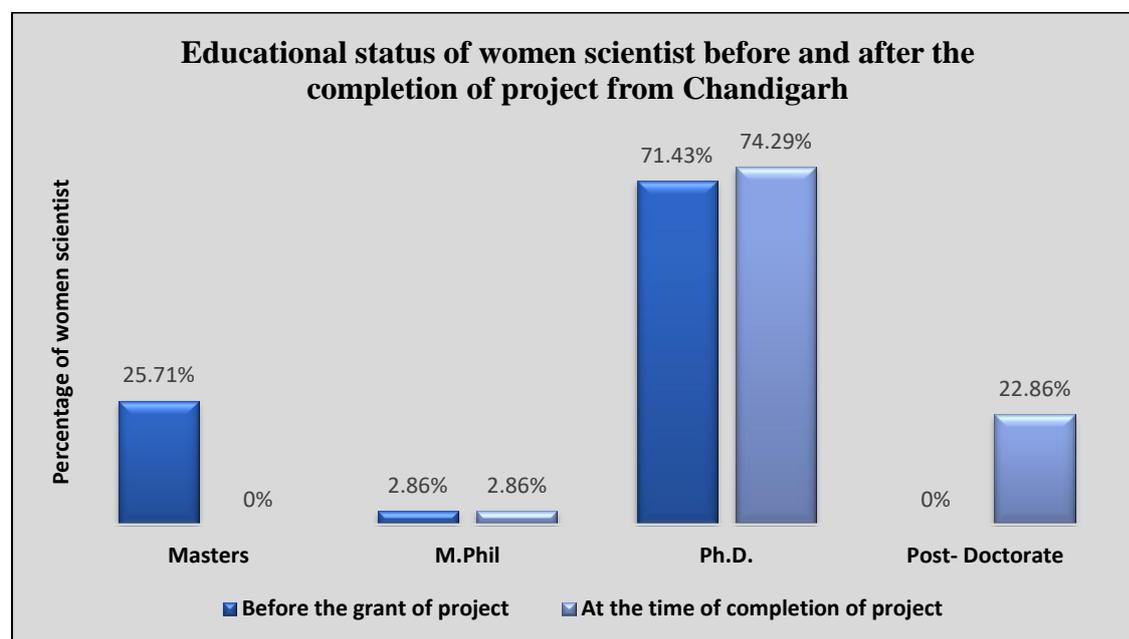
10.45% after the completion of project. Analysis of Wilcoxon signed rank test displayed statistically significant values in before and after time of completion of project in post-graduation (-3.724**) and doctorate categories (-2.828**) only.

Table 4.12 (b): Educational status (before and after completion of project) among women scientists from Chandigarh

Educational Qualification	Chandigarh		z-value
	At the time of grant of project	At the time of completion of project	
Post-graduation	09 (25.71%)	----	-2.807*
M.Phil.	01 (2.86%)	01 (2.86%)	---
Ph.D.	25 (71.43%)	26 (74.29%)	-2.646*
Post-Doctorate	----	08 (22.86%)	--

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

Figure 4.12 (b): Educational status (before and after sanction of project) among women scientists of Chandigarh



Educational status before and after the completion of sanctioned project among women scientists of Chandigarh is depicted in the Table 4.12 (b). The table clearly showed that before sanction of the project 71.43% of women scientist were Ph.D. and 25.71% were post graduates. It is evident from the figure 4.12 b that after the completion of the project no women beneficiaries were having post-graduation as their highest degree.

Before the sanctioning of project no participant was post doctorate, but after the completion of project 22.86% were post doctorate, thereby indicating the enhanced academic performance with sanctioning of the project. Result of Wilcoxon signed rank test revealed statistically significant values in before and after time of completion of the project in post-graduation (-2.807*) and doctorate categories (-2.646*) only.

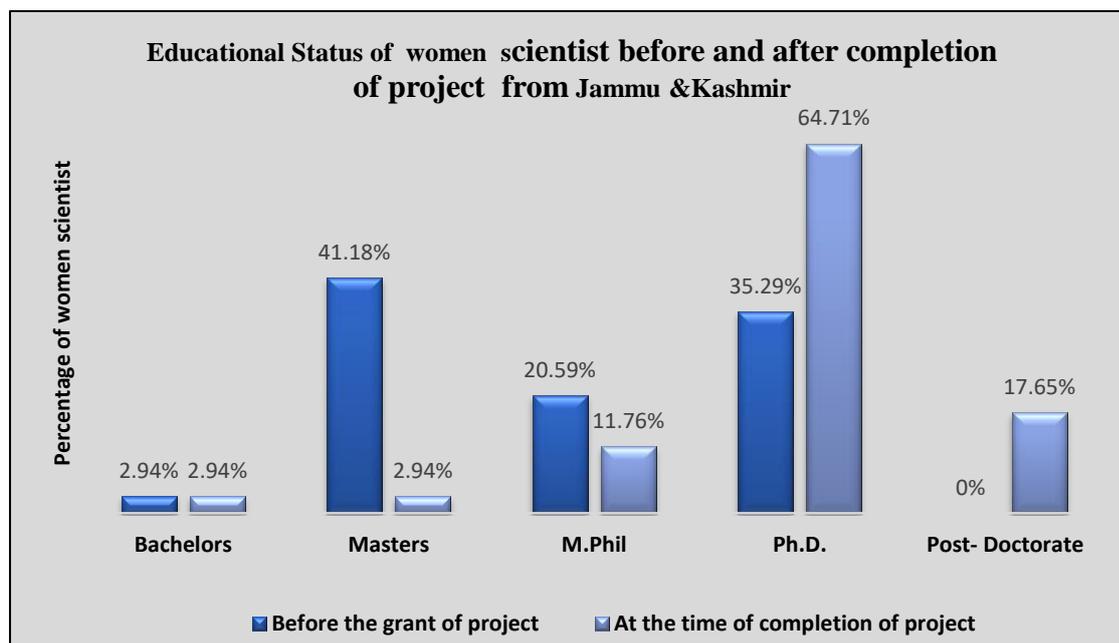
Table 4.12 (c) Educational status (before and after sanction of project) among women scientists from Jammu & Kashmir

Educational Qualification	Jammu and Kashmir		z-value
	At the time of grant of project	At the time of completion of project	
Bachelors	01 (2.94%)	01 (2.94%)	---
Post-graduation	14 (41.18%)	01 (2.94%)	-3.269*
M.Phil.	07 (20.59%)	04 (11.76%)	-2.646*
Ph.D.	12 (35.29%)	22 (64.71%)	-2.449*
Post-Doctorate	----	06 (17.65%)	---

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

In Jammu and Kashmir, the educational status (before and after sanction of project) among women scientists is presented in Table 4.12 (c). At the time of the grant of project, 41.18% women scientist were postgraduates, 35.29% doctorate, 21% M.Phil and 2.94% were graduates. After completion of the project, 17.65% women scientist were post doctorate fellow and 64.71% were Ph.D. holders. Percentage of doctorates were almost double after the completion of the project and percentage of women beneficiaries with post-graduation as the highest degree reduced significantly 41.18% to 2.94%. Wilcoxon signed rank test indicated statistically significant result in before and after time of completion of project in post-graduation (z value= -3.269*), M. Phil (z value= -2.646*) and doctorate categories (z value= -2.449*) only.

Figure 4.12 (c): Educational statuses (before and after project) of women scientists from Jammu & Kashmir



Family support received by women scientists for research from Punjab, Chandigarh and Jammu & Kashmir is presented in Table 4.13. It is evident from the table that maximum number (76.12%) of women scientists in Punjab received motivational support from their families, while 16.42% had moderate and 2.99% got neutral support. Only 4.48% of women scientists were not satisfied with their family support.

Table 4.13: Family support received by women scientist for research from Punjab, Chandigarh and Jammu & Kashmir

Family support received for Research	Punjab	Chandigarh	Jammu & Kashmir
Motivational	51 (76.12%)	23 (65.71%)	31 (91.76%)
Moderate	11 (16.42%)	09 (25.71%)	03 (8.82%)
Neutral	02 (2.99%)	02 (5.71%)	00 (00%)
Not Satisfied	03 (4.48%)	01 (2.86%)	00 (00%)
p-value	96.28**	35.29**	23.06**

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

In Chandigarh a substantial percentage of women scientists (65.71%) got motivational backing of their families, whereas 25.71% women received moderate and 5.71% received neutral support (Figure 4.13 b).

Figure 4.13 a): Family support received by women scientists for research in Punjab

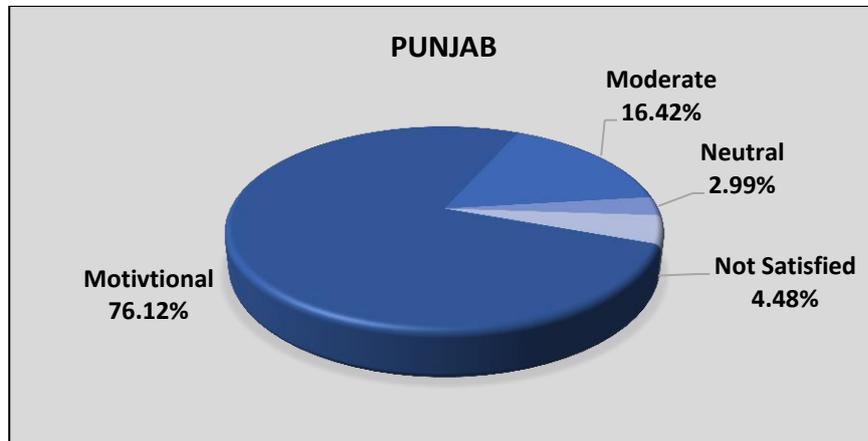


Figure 4.13 (b): Family support received by women scientists for research in Chandigarh

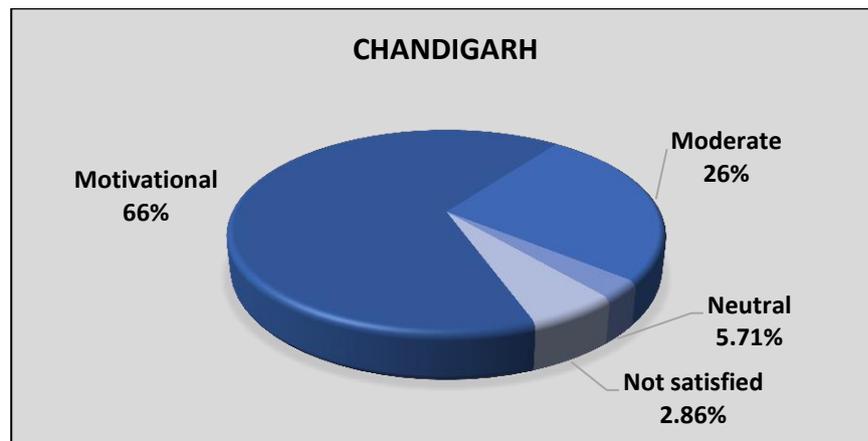
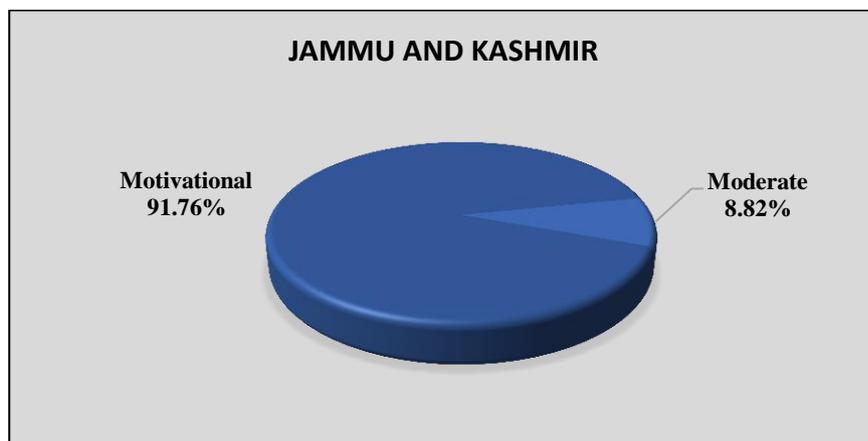


Figure 4.13 (c): Family support received by women scientists for research in Jammu & Kashmir



As far as Jammu & Kashmir is concerned, 91.76% women scientists received motivational encouragement from their families followed by moderate support among 8.82% respondents. It was interesting to observe that there was no women scientist in Jammu & Kashmir, who is not satisfied with the support provided by her family. Chi square test presented statistically significant differences in the various categories of family support received by women scientist from Punjab (p value 96.28**), Chandigarh (p value 35.29**) and Jammu & Kashmir (p value 23.06**).

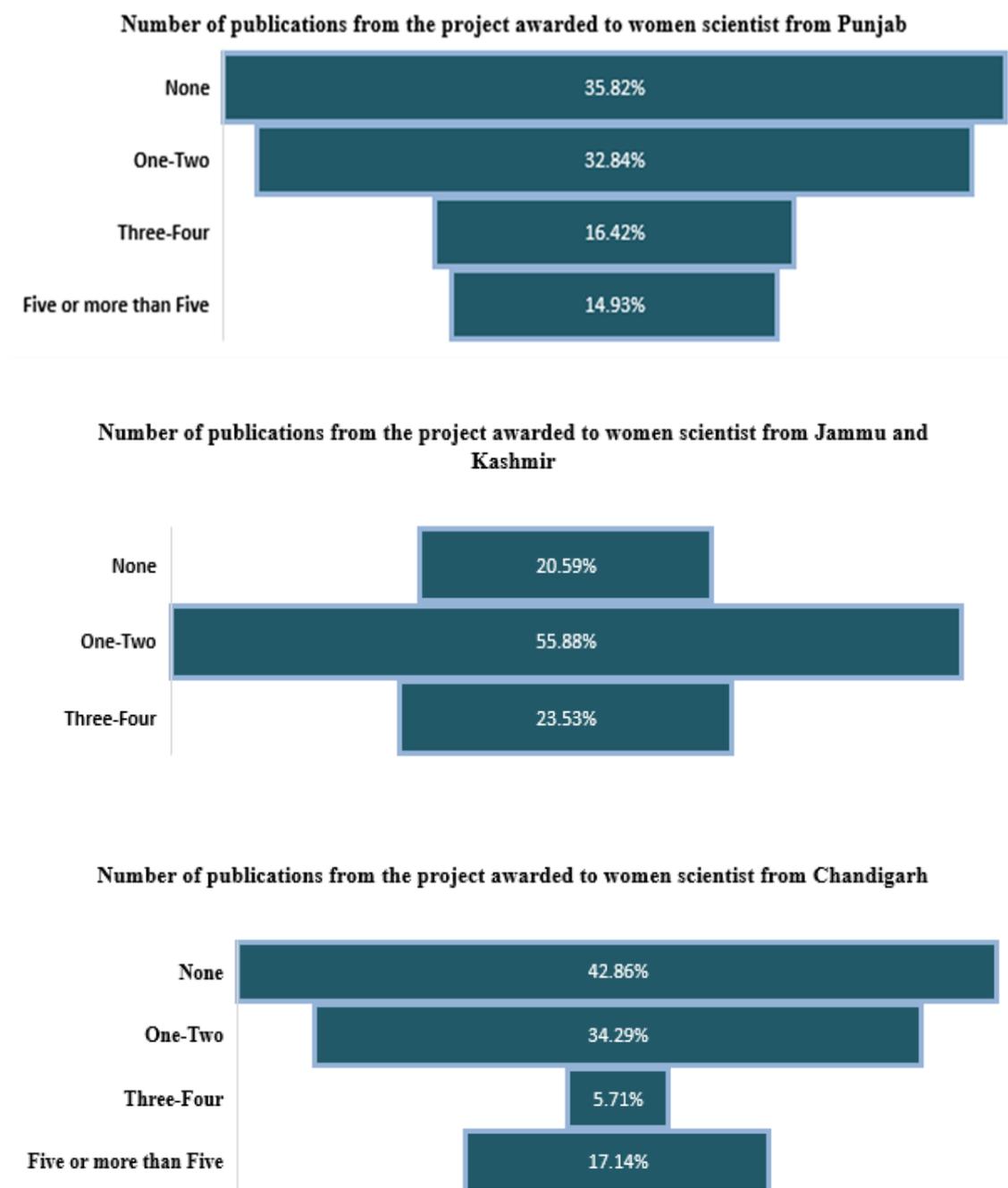
Table 4.14: Number of publications out of the project awarded to women scientists in Punjab, Chandigarh and Jammu & Kashmir

Number of Publications	Punjab	Chandigarh	Jammu & Kashmir
None	24 (35.82%)	15 (42.86%)	07 (20.59%)
One-Two	22 (32.84%)	12 (34.29%)	19 (55.88%)
Three- Four	11 (16.42%)	02 (5.71%)	08 (23.53%)
Five or more than five	10 (14.93%)	06 (17.14%)	----
p-value	8.164	11.74*	23.18**

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

Table 4.14 presents the number of publications Principal investigators have out of their sanctioned projects in all the three states under consideration. It is clearly noticeable from the table that out of the total respondents, a considerable percentage of the women scientist (35.82%) in Punjab and Chandigarh (42.86%) has not published even a single research paper from the projects awarded to them. In Punjab 32.84% women scientists published one to two research papers, while 16.42% and 14.93% published 3-4 and more than five research papers respectively. In Chandigarh figure 4.14 shows that 34.29% published one to two research papers, whereas 5.71% and 17.14% published 3 to 4 and more than five research papers respectively. In Jammu & Kashmir more than half of the respondents (55.88%) have at least one to two publications, while only 20.59% of the PI's delineated no published work from their research projects (figure 4.14). Chi square test presented statistically significant differences in number of papers published in Chandigarh (11.74*) and Jammu & Kashmir (23.18**), while non-significant difference was noticed in Punjab (8.164).

Figure 4.14: Number of publications out of the project awarded to women scientists from Punjab, Chandigarh and Jammu & Kashmir



The employment status of women scientist before and after sanction of the project in Punjab is depicted in Table 4.15 (a). Most of the women scientist (35.82%) of Punjab was engaged in teaching profession (mainly contractual basis) prior to the sanctioning of the project. It was also observed that only 8.96% of principal investigators reported being working as Research Associate before the grant of the recent project.

Table 4.15 a): Employment status (before and after project) of women scientists of Punjab

Employment status	Punjab		z-value
	Before the grant of project	After the completion of project	
Student/Research Fellow	20 (29.85%)	10 (14.93%)	-3.654**
Research Associate	06 (8.96%)	07 (10.45%)	-1.913
Teaching/Assistant/Associate professor	24 (35.82%)	15 (22.39%)	-0.582
Unemployed	17 (25.37%)	13 (19.40%)	-1.987
Ongoing-Project	--	22 (32.84%)	----

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

Further analysis of the data exhibited that after the completion of research project 22.39% respondents were appointed as Assistant/ Associate Professor, while 19.4% women scientist who were not engaged in any kind of profession. Out of the total respondents, approximately, 32.84% were still pursuing their research project (figure 4.15 a). Wilcoxon rank test revealed significant differences only for research fellow (-3.654**), which was decreased after the completion of the project. Analysis of data revealed that proportion of unemployment was declined after availing the research projects from various women centric schemes.

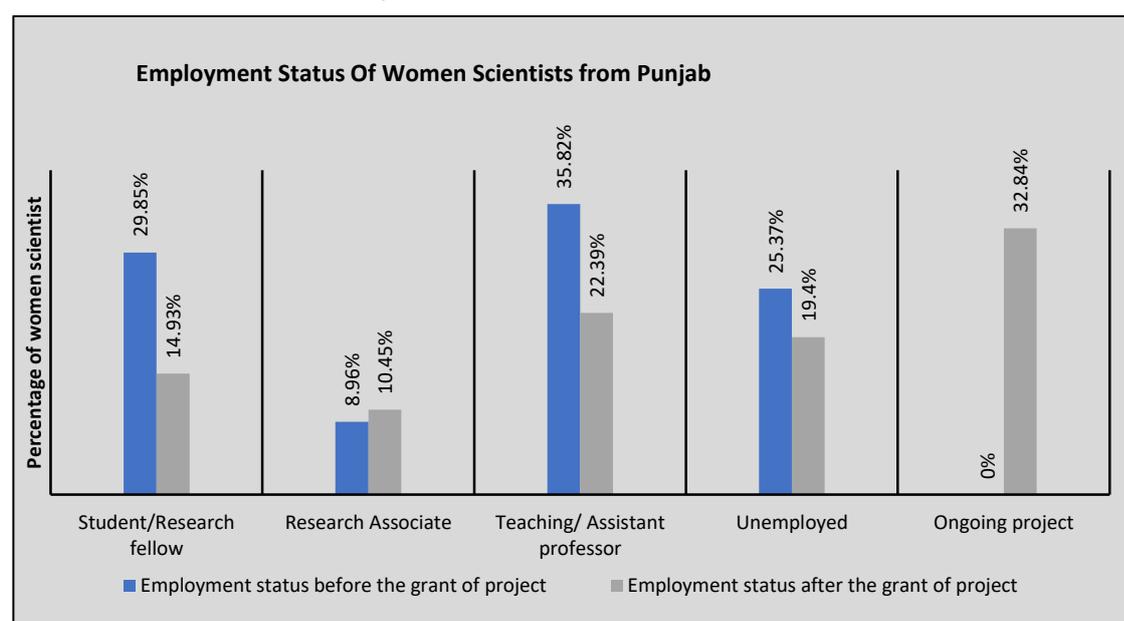
Figure 4.15 a) Employment status (before and after the sanction of project) among women scientists from Punjab

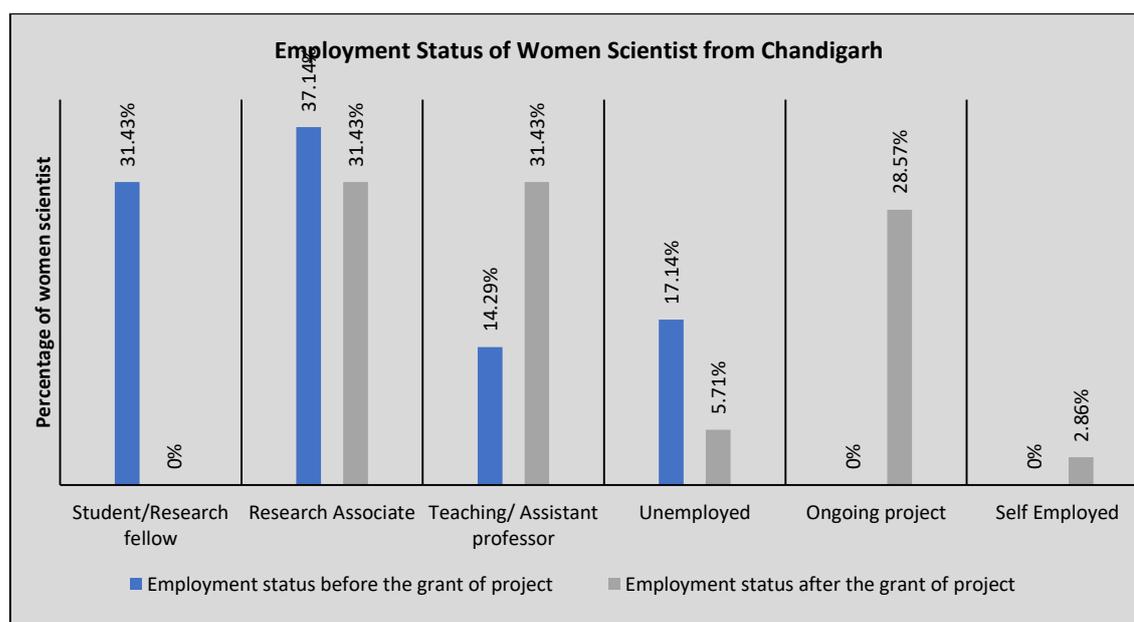
Table 4.15 (b) showed the employment status of women scientist before and after sanction of the project in Chandigarh region. It is clearly evident from the table that before the grant of the project 31.43% of the respondents were student, 37.14% Principal investigators were working as Research Associates in various scientific organizations. The percentage of Assistant / Associate Professors was increased from 14.29% before the project to 31.43% after the project. It is clear from the figure that Research Fellow (-2.989*) and Research Associate (-2.724*) showed significant value by applying Wilcoxon rank test.

Table 4.15 b): Employment status (before and after the sanction of project) among women scientists from Chandigarh

Employment status	Chandigarh		z-value
	Before the grant of project	After the completion of project	
Student/Research Fellow	11 (31.43%)	----	-2.989*
Research Associate	13 (37.14%)	11 (31.43%)	-2.724*
Teaching/ Assistant/ Associate professor	05 (14.29%)	11 (31.43%)	-0.816
Unemployed	06 (17.14%)	02 (5.71%)	-0.816
Ongoing-Project	--	10 (28.57%)	--
Self-employed	--	01 (2.86%)	--

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

Figure 4.15 b): Employment status (before and after project) among women scientists from Chandigarh



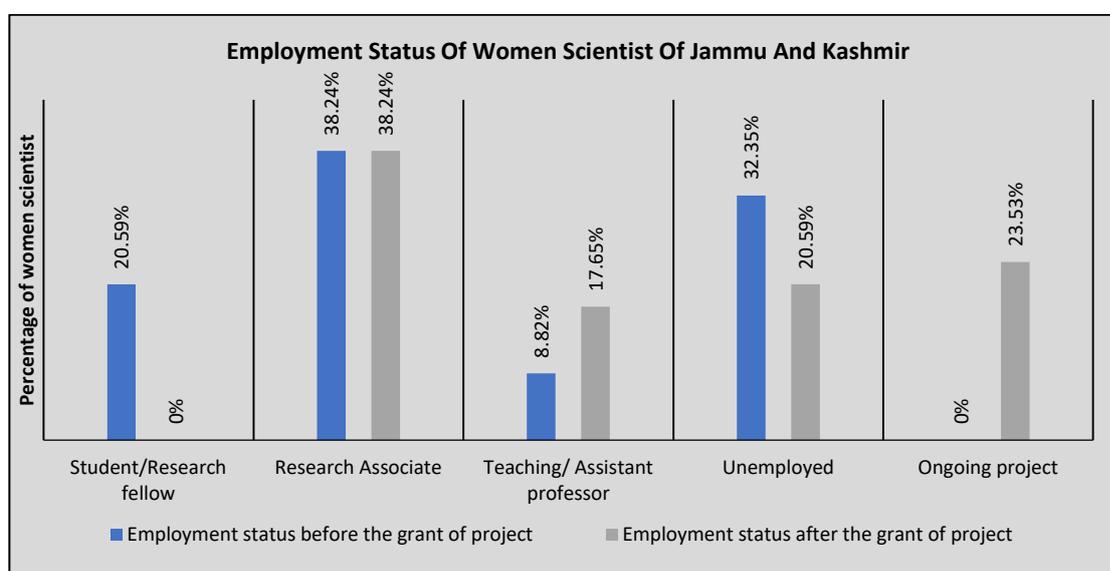
An attempt was made to analyze the position held by the Principal investigators before and after receiving the project in Jammu & Kashmir and the results are presented in the Table 4.15 (c). In Jammu & Kashmir, 38.24% women scientists were working as Research Associate and 20.59% was Student/Research fellow, whereas 8.82% women beneficiaries were Assistant/ Associate professors. An analysis of employment status after completion of the project revealed that the percentage of Assistant/Associate professors was increased from 8.82% to 17.65% (figure 4.15 c). The percentage of unemployed women decreased from 32.35% to 20.59% at the time of completion of the project. On the other hand, 23.53% of women scientists had ongoing research projects. The results of Wilcoxon signed rank test revealed non-significant differences between the two phases in all the categories.

Table 4.15 c): Employment status (before and after sanction of project) among women scientists from Jammu & Kashmir

Employment status	Jammu and Kashmir		z-value
	Before the grant of project	After the completion of project	
Student/Research Fellow	07 (20.59%)	00 (00%)	-2.392
Research Associate	13 (38.24%)	13 (38.24%)	-2.549
Teaching/ Assistant/ Associate professor	03 (8.82 %)	06 (17.65%)	-1.732
Unemployed	11 (32.35%)	07 (20.59%)	-1.473
Ongoing-Project	--	08 (23.53%)	---

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

Figure 4.15 c): Employment status (before and after sanction of project) among women scientist from Jammu & Kashmir



An analysis of the request of extension of the sanctioned project submitted by women scientists from Punjab, Chandigarh and Jammu & Kashmir is demonstrated in table 4.16 (a). It is clearly evident from the table that 20.89% Principal investigators from Punjab and 22.86% women scientists from Chandigarh submitted the request for extension, whereas most of the women scientists from Punjab (79.1%) and Chandigarh (77.14%) completed their work within stipulated period. Interestingly no women beneficiary from Jammu & Kashmir requested for extension of the project. Only Punjab (22.7**) and Chandigarh (10.31*) recorded significant p-values between both the categories of this indicator as suggested by their chi square test.

Table 4.16 a): Request for extension of duration of the sanctioned project

Request for extension	Punjab	Chandigarh	Jammu & Kashmir
Yes	14 (20.89%)	08 (22.86%)	----
No	53 (79.10%)	27 (77.14%)	34 (100%)
p-value	22.70**	10.31*	----

Table 4.16 b): Request for extension granted or not in Punjab and Chandigarh

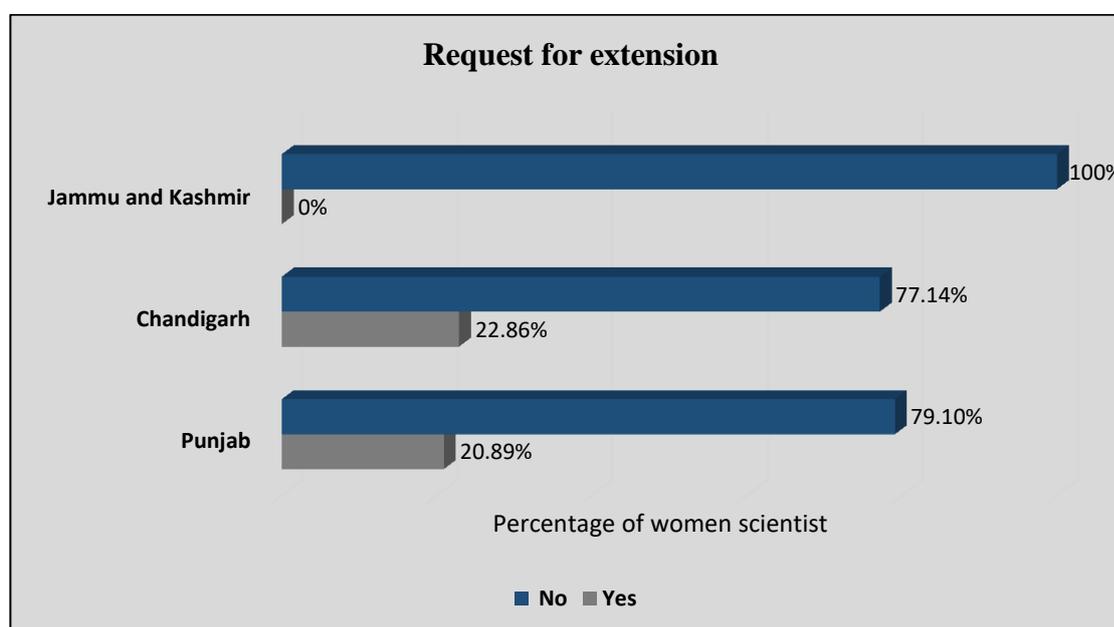
Request for extension Granted/ Not Granted	Punjab (N=14)	Chandigarh (N=08)	Jammu & Kashmir (N=00)
Granted	12 (85.71%)	05 (62.5%)	---
Not Granted	02 (14.29%)	03 (37.5%)	---

Further analysis of the request for extension of research project was granted by Department of Science and Technology or not is presented in Table 4.16 (b). It is clearly visible from the table that out of total extension requests (N=14) in Punjab region majority of extension solicitation (87.71%) were permitted. In Chandigarh 62.5% of the extension applications were allowed, while 37.5% of the requests were not conceded.

Further it was discerned in Table 4.16 (c) that out of the total permitted extension requests in Punjab (N=12) 58.33% of the women scientist were given the extension of 6 months period to complete their research work, followed by 25% and 16.66% who were provided with the extension of 3 months and 10 to 24 months respectively. Figure 4.16 shows that in Chandigarh 60% of the women scientists were given the extension period of 6 months.

Table 4.16 (c): Duration of the extension granted in Punjab and Chandigarh

Duration of the extension	Punjab (N=12)	Chandigarh (N=05)
3 months	03 (25%)	---
6 Months	07 (58.33%)	03 (60%)
10 months	01 (8.33%)	02 (40%)
24 months	01 (8.33%)	---

Figure 4.16: Request for extension of duration of the sanctioned project


An analysis of reasons for extension to complete the research work is presented in the table 4.17. It can be seen from the table that in Punjab, 58.33% of women scientists stated that they need more time to complete their research projects followed by unavailability of funds was the main reason for delay in the research project among 25% women scientists and then family/personal reasons was a reason for extension in 16.67% women scientist. In Chandigarh, majority (60%) of the women scientists require more time to complete their research proposal followed by 20% women scientist had unavailability of funds and equal percentage of women beneficiaries revealed family/personal reasons for request for extension of project.

Table 4.17: Reasons of extension among women scientists from Punjab and Chandigarh

Reason of extension	Punjab	Chandigarh
Unavailability of Funds/Grant	03 (25%)	01 (20%)
Time for completion of research project	07 (58.33%)	03 (60%)
Family/Maternity/ Personal reason	02 (16.67%)	01 (20%)

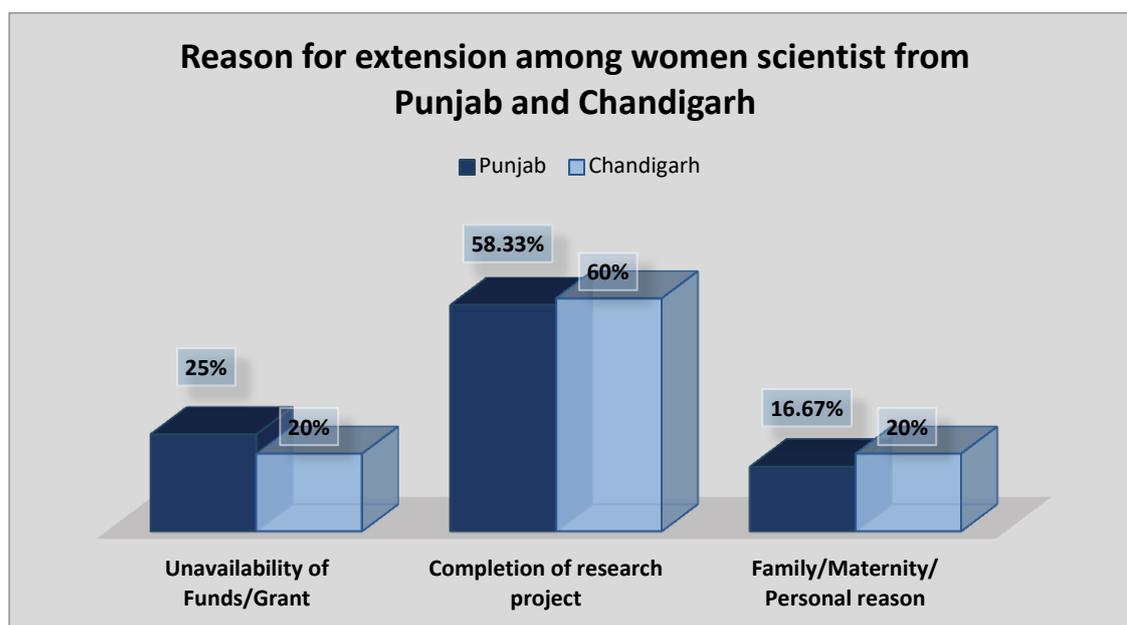
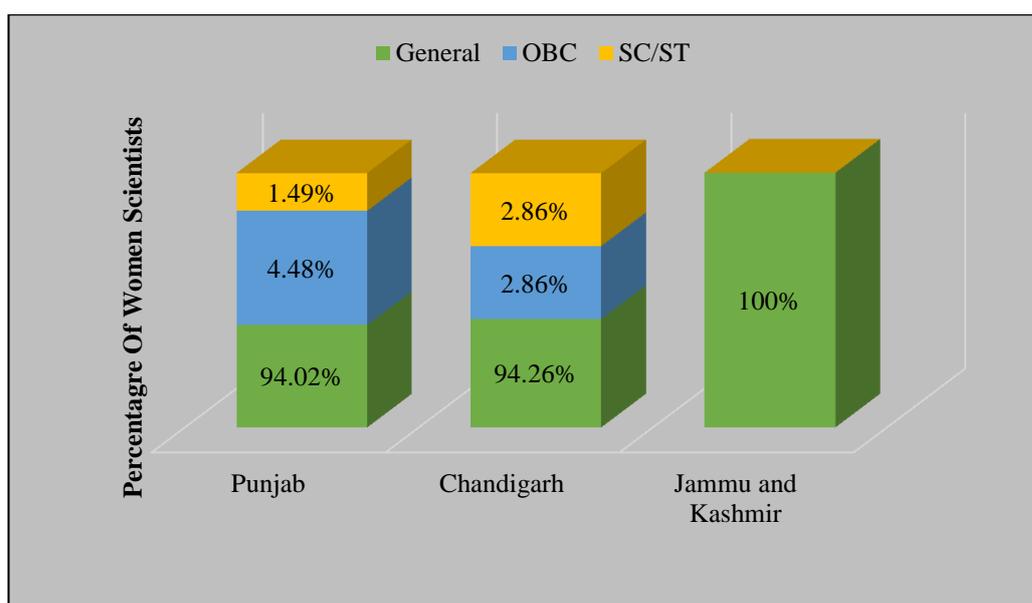
Figure 4.17: Reasons of extension among women scientists from Punjab and Chandigarh

Table 4.18 demonstrated the category wise distribution of women scientists in three states of North India under consideration. In state Punjab, most of the women scientist (94.02%) was from general category, while OBC (4.48%) and SC/ST (1.49%) categories exhibited little representation as is clear from the figure 4.18. Similarly, maximum percentage of principal investigators in Chandigarh belonged to general category ((94.26%), whereas as OBC (2.86%) and ST/SC (2.86%) had meagre participation. In Jammu & Kashmir all (100%) women scientists belonged to the general category. There was no participation of women scientist from OBC as well as SC/ST categories (Figure 4.18). Chi square test exhibited statistically significant differences in different categories of women scientists in Punjab (p value 1.112*) and Chandigarh (p value 8.51**).

Table 4.18: Category wise distribution of women scientists in Punjab, Chandigarh and Jammu & Kashmir

Category	Punjab	Chandigarh	Jammu & Kashmir
General	63 (94.02%)	33 (94.26%)	34 (100%)
OBC	03 (4.48%)	01 (2.86%)	-----
ST/SC	01 (1.49%)	01 (2.86%)	-----
p-value	1.112**	8.51**	-----

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

Figure 4.18 Category wise distribution of women scientists from Punjab, Chandigarh and Jammu & Kashmir.


The overall experience of women scientists for women centric schemes from Punjab, Chandigarh and Jammu & Kashmir is depicted in Table 4.19. It may be seen from the table that the majority of the women were satisfied with the research schemes initiated by Department of Science and Technology. The substantial percentage of principal investigators from Punjab (52.23%), Chandigarh (62.86%) and Jammu & Kashmir (58.82%) were extremely satisfied with the scheme due to the good experience they gained during their research projects.

Table 4.19: Overall remarks / experience of women scientists for women centric schemes from Punjab, Chandigarh and Jammu & Kashmir

Overall Remarks / Experience		Punjab	Chandigarh	Jammu & Kashmir
Satisfied	Extreme Satisfaction	35 (52.23%)	22 (62.86%)	20 (58.82%)
	Improving their Research Experience	11 (16.41%)	05 (14.26%)	06 (17.65%)
	Financial Support For research	05 (7.46%)	----	02 (5.88%)
	Recommencement in Career	05 (7.46%)	01 (2.85%)	----
Not Satisfied	Problem related grants	08 (11.94%)	03 (8.57%)	02 (5.88%)
	Communication with the DST Staff	02 (2.99%)	04 (11.43%)	02 (5.88%)
	Duration of the Project	01 (1.49%)	----	02 (5.88%)

In Punjab, 16.41% women scientist mentioned that this funding helped them to enhance their research activities and 7.46% of them were also satisfied with the financial assistance and 7.46% got a chance to reshape their career in research. It can also be seen from the table that 14.26% and 17.65% of women scientists of Chandigarh and Jammu & Kashmir respectively were of the view that these programs helped in enhancing their research qualities and 5.88% of them received financial support for research in the state Jammu & Kashmir. Further analysis revealed that in Punjab, about 11.94% women did not get funds or mentioned about delay in funding, whereas 2.99% experienced communication hindrance with DST staff. Grant related problems were also experienced by 8.57% of principal investigators in Chandigarh and 5.88% in Jammu & Kashmir.

Table 4.20 demonstrated the ratings given by women scientists to the programme in Punjab, Chandigarh and Jammu & Kashmir. In Punjab State 58.2%, 32.84%, 5.97% and 2.99% Principal Investigator graded extreme, very good, good and average ratings respectively to the schemes under which projects were sanctioned to them. In Chandigarh majority (91.43%) of the Principal investigators appraised their scheme with extreme to good ratings, whereas only 5.71% and 2.86% of them rated the women centric schemes as average and unsatisfied respectively.

Table 4.20: Rating to the programme/ Scheme in Punjab, Chandigarh and Jammu & Kashmir

Rating to the programme	Punjab	Chandigarh	Jammu & Kashmir
Extremely good	39 (58.20%)	22 (62.86%)	27 (79.41%)
Very good	22 (32.84%)	08 (22.86%)	05 (14.71%)
Good	04 (5.97%)	02 (5.71%)	02 (5.88%)
Average	02 (2.99%)	02 (5.71%)	----
Not Satisfied	----	01 (2.86%)	----
P-value	53.90**	44.57**	32.88**

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

In Jammu & Kashmir majority (79.41%) of the respondents scored their programme as extremely good followed by 14.71% and 5.88% who classified the scheme under which project was sanctioned to them as very good and good respectively (Figure 4.19). Majority of the women scientist from three states under consideration rated women centric schemes extremely good. Chi square analysis recorded significant differences in different categories ratings given by women scientists to the programme in Punjab (53.9**), Chandigarh (44.57**) and Jammu & Kashmir (32.88**).

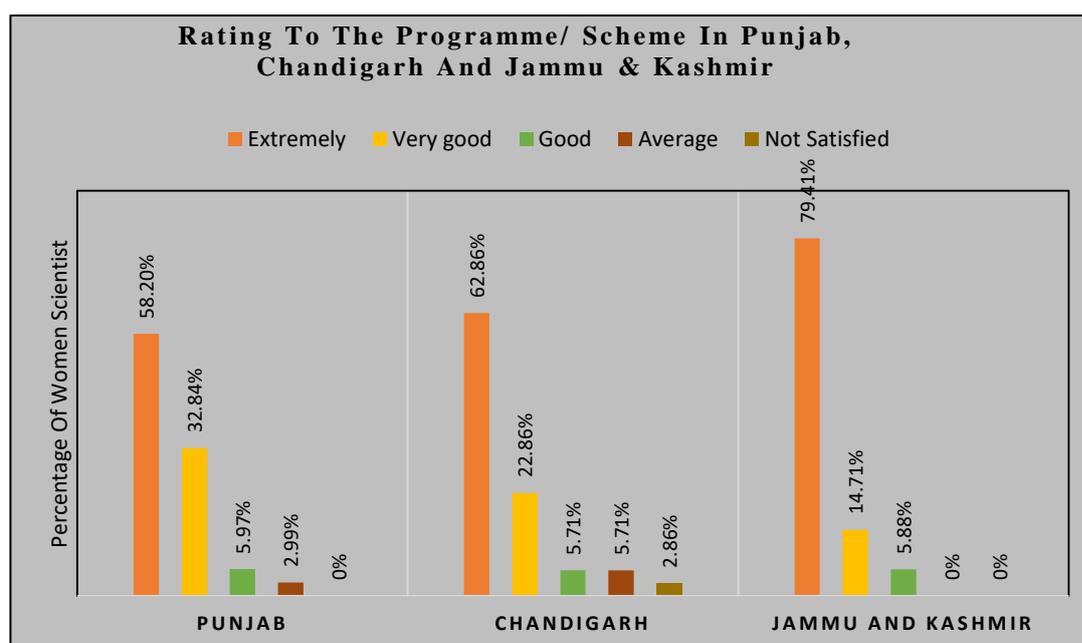
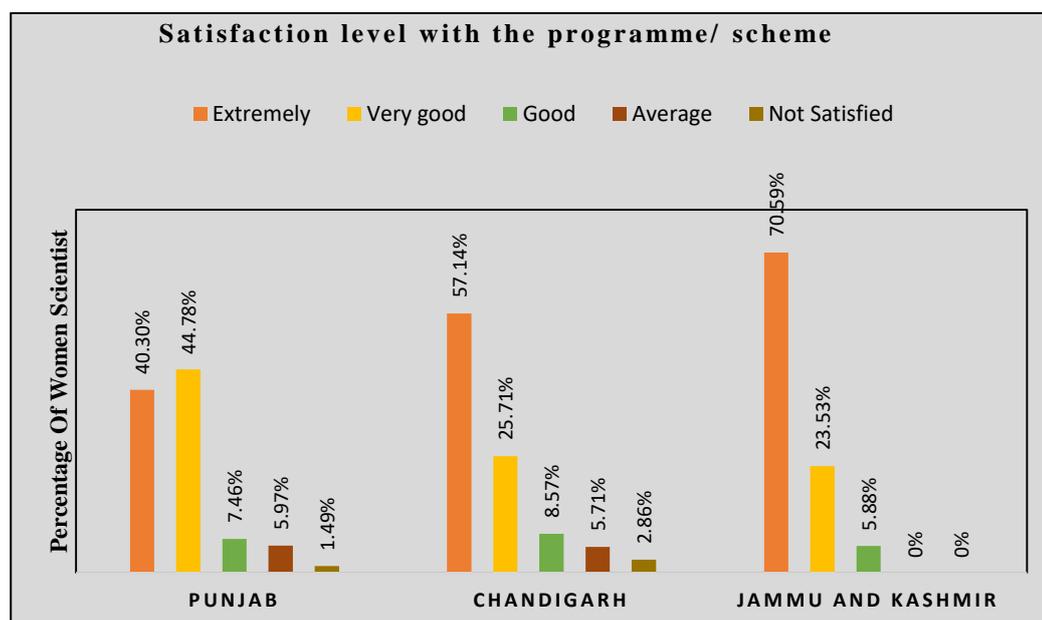
Figure 4.19: Rating to the programme/ Scheme in Punjab, Chandigarh and Jammu & Kashmir


Table 4.21: Satisfaction level with the programme/ scheme in Punjab, Chandigarh and Jammu & Kashmir

Satisfaction with the programme	Punjab	Chandigarh	Jammu & Kashmir
Extremely good	27 (40.30%)	20 (57.14%)	24 (70.59%)
Very good	30 (44.78%)	09 (25.71%)	08 (23.53%)
Good	05 (7.46%)	03 (8.57%)	02 (5.88%)
Average	04 (5.97%)	02 (5.71%)	00 (00%)
Not Satisfied	01 (1.49%)	01 (2.86%)	00 (00%)
p-value	57.70**	35.71**	22.82**

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

Table 4.21 displays the overall satisfaction level with the scheme/program as reported by various women scientists of different regions of North India. It was clearly observed that majority of respondents in Chandigarh (57.14%) and Jammu & Kashmir (70.59%) were extremely satisfied with the scheme under which project was sanctioned to them. Whereas in Punjab state maximum number of women researcher's delineated very good (44.78%) and extreme (40.30%) gratification with the programme. The analysis of data also indicated that very few principal investigators in Punjab (1.49%) and Chandigarh (2.86%) were not satisfied with the programme (Figure 4.20). On the contrary, no women beneficiary from Jammu & Kashmir region revealed lower level of satisfaction with the women empowering policies.

Figure 4.20: Satisfaction level with the programme/ Scheme in Punjab, Chandigarh and Jammu & Kashmir


To ensure growth of women scientist in science, an attempt was made to analyze the problems faced by women scientists in receiving and spending grants in Punjab, Chandigarh and Jammu & Kashmir and the results are depicted in Table 4.22. In Punjab majority of respondents mentioned that they did not face any problem in receiving (52.24%) as well as in spending (89.55%) grants. It was noted that 35.82% women scientists had issues in receiving grants and 7.46% in spending grants.

Table 4.22: Problems faced by women scientists during project in Punjab, Chandigarh and Jammu & Kashmir

Problem faced related to grant	Punjab		Chandigarh		Jammu & Kashmir	
	Receiving grant	Spending grant	Receiving grant	Spending grant	Receiving grant	Spending grant
Yes	24 (35.82%)	05 (7.46%)	09 (25.71%)	04 (11.42%)	10 (28.41%)	02 (5.88%)
No	35 (52.24%)	60 (89.55%)	21 (60%)	30 (85.71%)	20 (58.82%)	32 (94.11%)
Other (Specified)	08 (11.94%)	02 (2.99%)	05 (14.29%)	01 (2.86%)	04 (11.76%)	00 (00%)
p-value	16.51**	95.49**	11.89*	43.60**	11.53*	26.47*

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

Some women scientists mentioned other reasons that acted as a hindrance in receiving (11.94%) and spending grant (2.99%). Similarly, in the Chandigarh region 60% of women scientists received grants on time and 85.71% of women scientists spent their grant without any difficulty, whereas 25.71 % mentioned that they faced problems in receiving grants due to various reasons. In Jammu and Kashmir, timely grant was sanctioned to 58.82% of respondents followed by 28.41% who did not receive grant on time and 11.76 % women scientists mentioned other reasons for delay in receiving grant. Majority of women scientists (94.11%) in the Jammu & Kashmir spend their grant without any difficulty, whereas only a few (5.88%) were there who faced problems in spending grants.

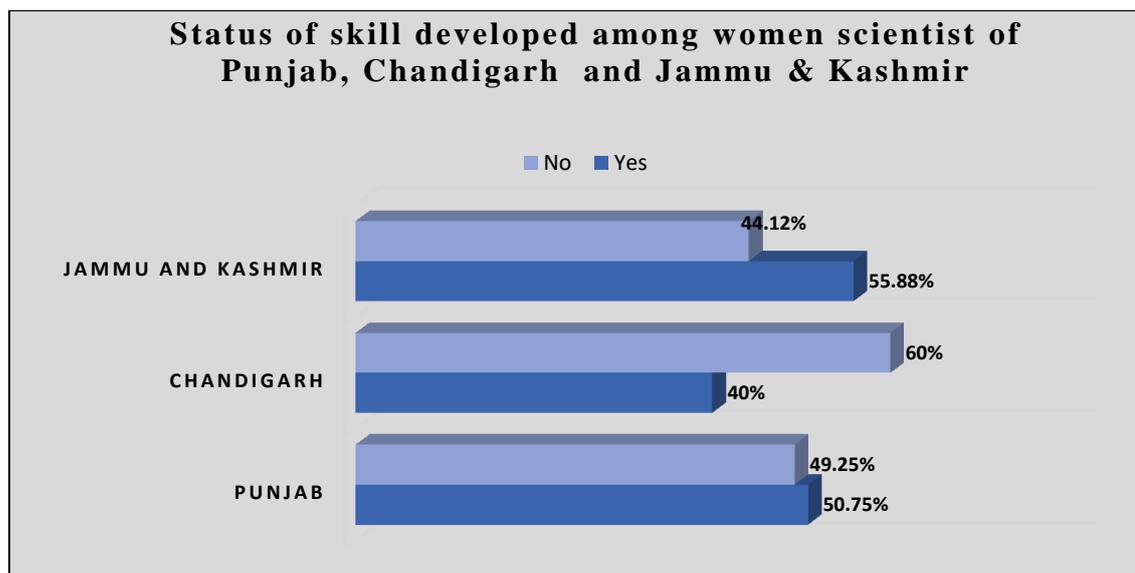
Table 4.23 demonstrate the status of skill development among women scientists from Punjab, Chandigarh and Jammu & Kashmir. It may be seen from the table that in Punjab state approximately half of the respondents (50.75%) gained some sort of skill development during the course of their research project, whereas 49.25% respondents did not developed any kind of skill.

Table 4.23: Status of skill developed among women scientists from Punjab, Chandigarh and Jammu & Kashmir

Any Skill Developed	Punjab	Chandigarh	Jammu & Kashmir
Yes	34 (50.75%)	14 (40%)	19 (55.88%)
No	33 (49.25%)	21 (60%)	15 (44.12%)
p-value	0.015	1.400	0.471

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

About 60% women beneficiaries from Chandigarh and 44.12% from Jammu & Kashmir had developed no skill during the duration of their project (Figure 4.21). Both the categories recorded statistically non-significant differences in Punjab (p value 0.015), Chandigarh (p value=1.4) and Jammu & Kashmir (p value=0.47). This is the crucial area where special attention of governmental agencies are required for bringing and continuance of women scientist in the mainstream.

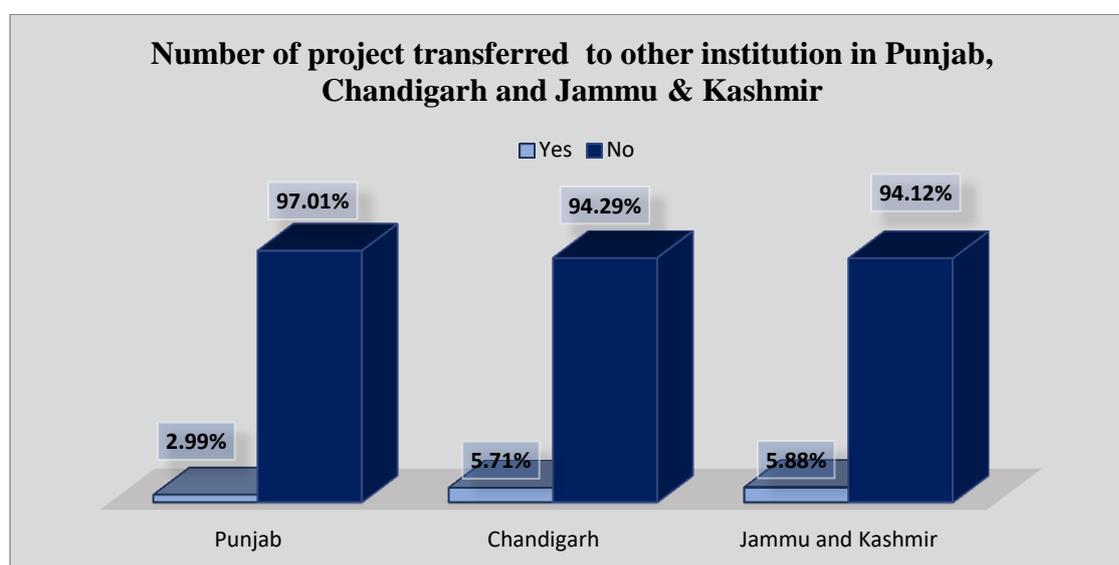
Figure 4.21: Status of skill developed among women scientists from Punjab, Chandigarh and Jammu & Kashmir

To assess the mobility due to various reasons among women scientist, transfer of research projects to other institutes in Punjab, Chandigarh and Jammu & Kashmir was presented in Table 4.24. The analysis of the data revealed that in Punjab only 2.99% of the total projects were transferred to other institutes. Similar observations were noted in Chandigarh region where most of the sanctioned projects (94.29%) were not shifted to other institutions. It is also evident from the table that in state the of Jammu & Kashmir majority i.e. 94.12% of the projects were not relocated to other academic institutions.

Table 4.24: Number of projects transferred to other institutions in Punjab, Chandigarh and Jammu & Kashmir

Transfer of project to another institution	Punjab	Chandigarh	Jammu & Kashmir
Yes	02 (2.99%)	02 (5.71%)	2 (5.88%)
No	65 (97.01%)	33 (94.29%)	32 (94.12%)
p-value	59.24**	27.46**	26.47**

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$.

Figure 4.22: Number of projects transferred to other institutions in Punjab, Chandigarh and Jammu & Kashmir


Results of chi square test revealed statistically significant differences in both the categories of this indicator in all the three regions under study. Women scientist from Punjab, Chandigarh and Jammu & Kashmir revealed little mobility for transferring projects from one state to another.

The major reasons of transfer of research projects from one institute to other among women scientist in Punjab, Chandigarh and Jammu & Kashmir is depicted in table 4.25.

Table 4.25: Reasons for transfer of projects to other institutions in Punjab, Chandigarh and Jammu & Kashmir

Reason of transfer	Punjab	Chandigarh	Jammu & Kashmir
Retirement of mentor	01 (50%)	--	--
Relocation	--	--	01 (50%)
Full time employment / Permanent job	01 (50%)	02 (100%)	01 (50%)

It is clearly evident from the table that in Punjab, Chandigarh and Jammu & Kashmir only two women scientists in each region showed relocation of research project to other institutes. In Punjab out of the two women scientist, in one case retirement of mentor and in second case fulltime employment was the reason for the shifting of project. In Chandigarh both the women beneficiaries informed permanent employment as the reason of transfer of project, whereas one women scientist in Jammu & Kashmir documented relocation due to personal reasons and other receiving permanent job as the major reasons that they had to shift their project to other institutes.

Table 4.26 (a) demonstrates the number of projects sanctioned in Punjab with respect to the host institution. It is clearly evident from the table that in Punjab State highest number of projects were sanctioned to Punjab Agricultural University, Ludhiana (20.90%), followed by Thapar University, Patiala (19.40%), Guru Nanak Dev University, Amritsar (16.42%) and Punjabi University, Patiala (14.92%). Other Institutes such as IIT, Ropar, Central University of Punjab, Shaheed Bhagat Singh State Technical Campus Ferozepur, and GSSDGS Khalsa College, Patiala received only minimal ie. 1.49% out of the total research projects granted in Punjab state. Results from Chi square test also recorded statistically significant difference (p value 73.82**) in all the institution of Punjab

Table 4.26 a): Number of projects sanctioned in Punjab with respect to the various institutions

Name of the Institutions	Number of projects
GADVASU, Ludhiana	03 (4.48%)
Punjabi University, Patiala	10 (14.92%)
Thapar University, Patiala	13 (19.40%)
Guru Nanak Dev University, Amritsar	11 (16.42%)
GSSDGS Khalsa College, Patiala	01 (1.49%)
Institute of Nanoscience and Technology, Mohali	02 (2.99%)
Indian Institute of Science Education and Research	04 (5.97%)
DAV University, Jalandhar	01 (1.49%)
SUS College of Engineering and Technology	01 (1.49%)
Punjab Agricultural University	14 (20.90%)
Central University of Punjab, Bathinda	01 (1.49%)
National Institute of Pharmaceutical Education and Research (NIPER), Mohali	02 (2.99%)
Shaheed Bhagat Singh State Technical Campus, Ferozepur	01 (1.49%)
PAU Regional Station, Faridkot	02 (2.99%)
IIT, Ropar	01 (1.49%)
p-value	73.821**

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

Table 4.26 b): Number of projects sanctioned in Chandigarh with respect to the various institutions

Name of the Institutions	Number of projects
Panjab University, Sector-14, Chandigarh	20 (57.14%)
Post Graduate Institute of Medical Education & Research, Sector-12, Chandigarh	9 (25.71%)
Institute of Microbial Technology, Sector-39, Chandigarh	4 (11.43%)
Punjab State Council for Science & Technology, Sector- 26, Chandigarh	1 (2.86%)
Goswami Ganesh Dutta Sanatan Dharma College, Sector -32, Chandigarh	1 (2.86%)
p-value	36.29**

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

Table 4.26 (b) presents the number of projects sanctioned to different host institutes in Chandigarh. The analysis of the data revealed that out of all the institutions in Chandigarh maximum projects were granted to Panjab University, Chandigarh (57.14%), followed by PGIMER (25.71%) and IMTECH (11.43%). The Chi-square analysis depicted a significant differences (36.29**) in number of projects sanctioned to the various institutions in Chandigarh.

The analysis of number of projects sanctioned in Jammu & Kashmir with respect to the host institutes is illustrated in table 4.26 (c). It is perceptible from the table that 61.76% of the total research projects were sanctioned to University of Kashmir, Srinagar, followed by 11.76% to Indian Institute of Integrative Medicine, Jammu. Institutes such as Central University of Kashmir, Indian Institute of Integrative Medicine (IIIM), Srinagar and Islamic University of Science and Technology, Awantipora exhibited a very few number of research projects i.e. 2.94% each.

Table 4.26 c): Number of projects sanctioned in Jammu & Kashmir with respect to the various institutes

Name of the Institutions	Number of projects
Indian Institute of Integrative Medicine, Jammu	4(11.76%)
Indian Institute of Integrative Medicine, Srinagar	1(2.94%)
University of Kashmir, Srinagar	21(61.76%)
University of Jammu, Jammu	2(5.88%)
Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu, Jammu	2(5.88%)
Shri Mata Vaishno Devi University, Katra	2(5.88%)
Central University of Kashmir, Ganderbal	1(2.94%)
Islamic University of Science and Technology, Awantipora	1(2.94%)
p-value	77.06**

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

An analysis of accreditation status of the affiliated institutes of Punjab, Chandigarh and Jammu & Kashmir is illustrated in Table 4.27. It is clearly evident from the table that most of the institutes had their accreditation status with recognized accreditation body both in Punjab (86.57%) and Jammu & Kashmir (76.47%). The table also demonstrated that in Chandigarh accreditation status was not applicable to 40% of institutes and 60% institutes had their accreditation status.

Table 4.27: Accreditation status of the host institution in Punjab, Chandigarh and Jammu & Kashmir

Accreditation status of the host institution	Punjab	Chandigarh	Jammu & Kashmir
Yes	58 (86.57%)	21 (60%)	26 (76.47%)
Not Applicable	09(13.43%)	14 (40%)	08 (23.53%)
p-value	35.84**	1.40	9.53*

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

Figure 4.23: Accreditation status of the host institution in Punjab, Chandigarh and Jammu & Kashmir.

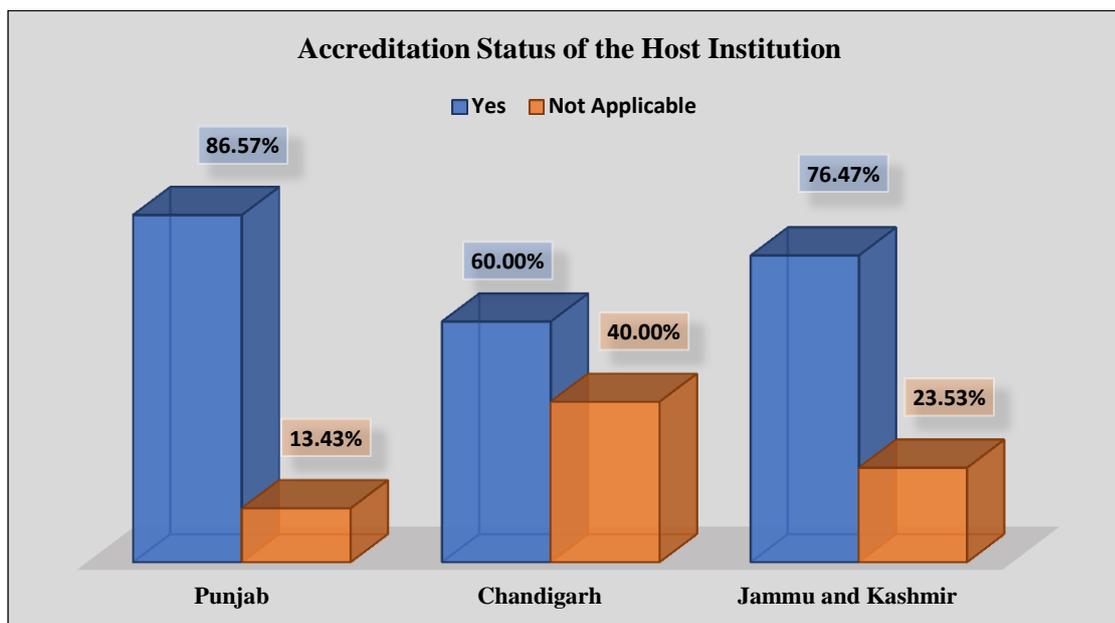


Table 4.28 demonstrate the number of conferences/seminars attended and the number of paper presented in national and international seminar/conferences by women scientists of Punjab, Chandigarh and Jammu & Kashmir. The analysis of data presented that in Punjab 41.79% and 38.81% of women scientists have attended 1- 2 national and international conferences respectively. While only 34.33% and 37.31% of women researchers have presented their original research papers in the conferences. In Chandigarh region majority (57.14%) of women scientists have attended national conferences, while 57.13% of the total respondents have presented paper in international conferences. Similarly, in Jammu & Kashmir 58.83% women respondents documented that they have attended and 73.53% had presented their research work at national seminar/ conferences.

Table 4.28: Number of conferences/seminars attended and the number of paper presented in National and International seminar by women scientists of Punjab, Chandigarh and Jammu & Kashmir

		Punjab		Chandigarh		Jammu & Kashmir	
		National	International	National	International	National	International
Number of conference/ Seminar attended	0	26 (38.81%)	27 (40.30%)	15 (42.86%)	18 (51.43%)	14 (41.18%)	21 (61.67%)
	1-2	28 (41.79%)	26 (38.81%)	16 (45.71%)	11 (31.43%)	13 (38.24%)	10 (29.41%)
	3-4	08 (11.94%)	10 (14.93%)	03 (8.57%)	04 (11.43%)	05 (14.71%)	01 (2.94%)
	5 or more	05 (7.46%)	04(5.97%)	01 (2.86%)	02 (5.71%)	02 (5.88%)	02 (2.94%)
Number of papers presented in conference/ seminar	0	29 (43.28%)	32(47.76%)	17 (48.57%)	15 (42.86%)	09 (26.47%)	22 (64.71%)
	1-2	23 (34.33%)	25 (37.31%)	12 (34.29%)	13 (37.14%)	17 (50.00%)	10 (29.41%)
	3-4	05 (7.46%)	07 (10.45%)	01 (2.86%)	03 (8.57%)	05 (14.71%)	01 (2.94%)
	5 or more	10 (14.93%)	03 (4.48%)	05 (14.29%)	04 (11.42%)	03 (8.82%)	01 (2.94%)

Figure 4.24 a): Number of conferences/seminars attended by women scientists of Punjab, Chandigarh and Jammu & Kashmir

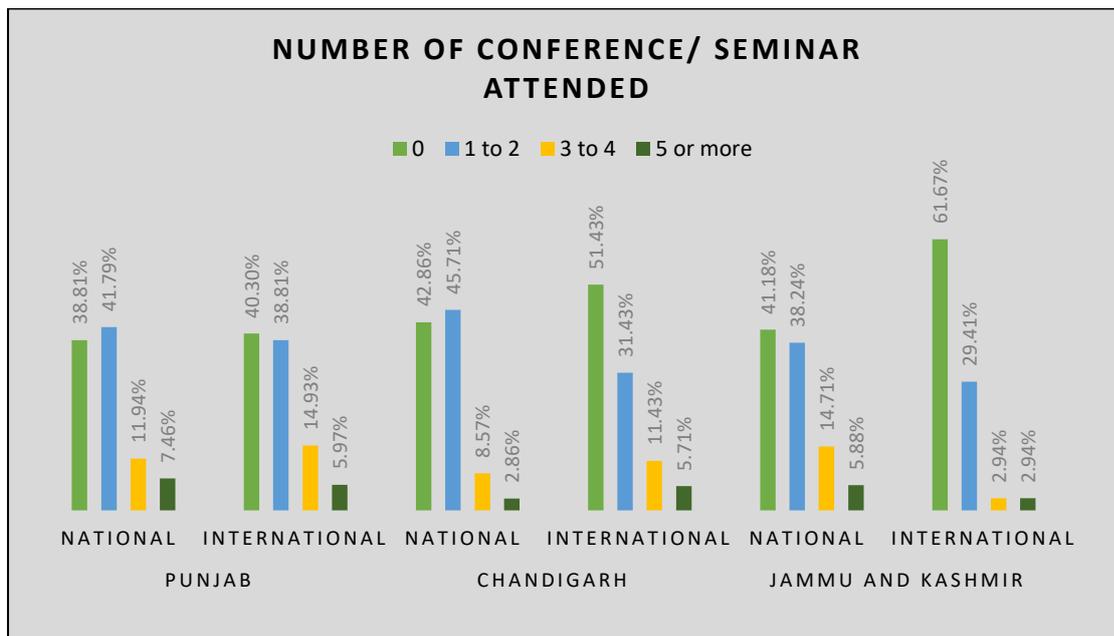


Figure 4.24 b) Number of papers presented in National and International seminars by women scientists of Punjab, Chandigarh and Jammu & Kashmir

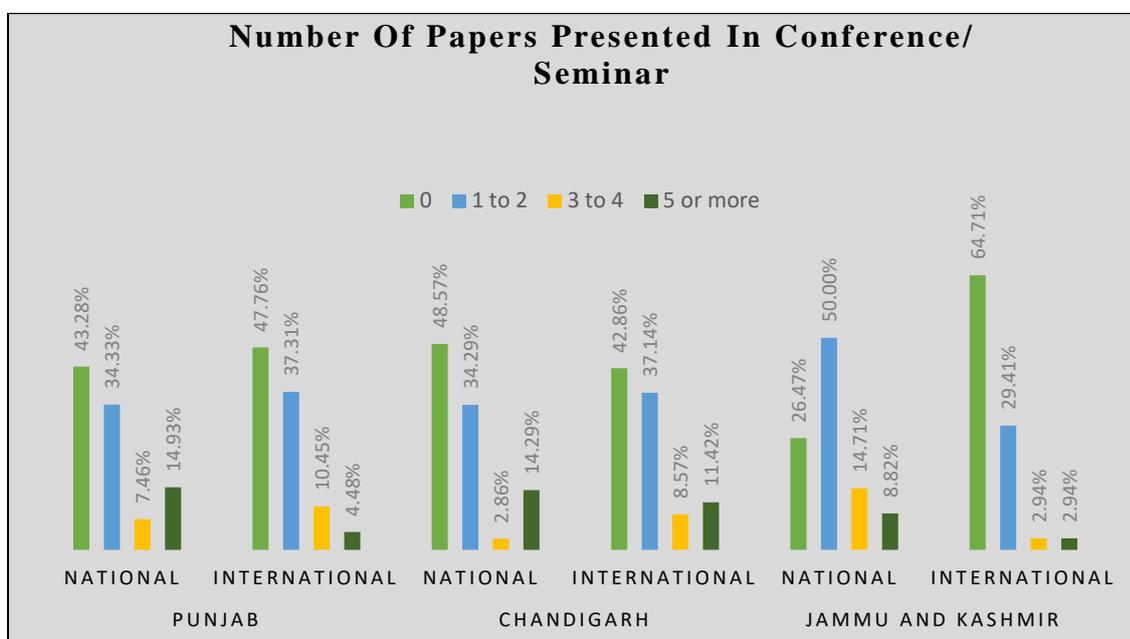


Table 4.29: Number of workshops attended and number of papers presented in National and International workshop by women scientists from Punjab, Chandigarh and Jammu & Kashmir

		Punjab		Chandigarh		Jammu & Kashmir	
		National	International	National	International	National	International
Number of workshop attended	0	42 (62.69%)	57 (85.07%)	20 (57.14%)	26 (74.29%)	18 (52.94%)	32 (94.12%)
	1-2	18 (26.87%)	10 (14.93%)	12 (34.29%)	07 (20%)	11 (32.35%)	02 (5.88%)
	3-4	06 (8.96%)	--	01 (2.86%)	01 (2.86%)	02 (5.88%)	--
	5 or more	01 (1.49%)	--	02 (5.71%)	01 (2.86%)	03 (8.82%)	--
Number of papers presented in workshop	0	57 (85.07%)	63 (94.03%)	28 (80%)	30 (85.71%)	27 (79.41%)	32 (94.12%)
	1-2	06 (8.96%)	03 (4.48%)	07 (20%)	05 (14.29%)	05 (14.71%)	02 (5.88%)
	3-4	03 (4.48%)	--	--	--	01 (2.94%)	--
	5 or more	01 (1.49%)	01 (1.49%)	--	--	01 (2.94%)	--

Figure 4.25 a): Number of workshops attended by women scientists at National and International level by women scientists from Punjab, Chandigarh and Jammu and Kashmir

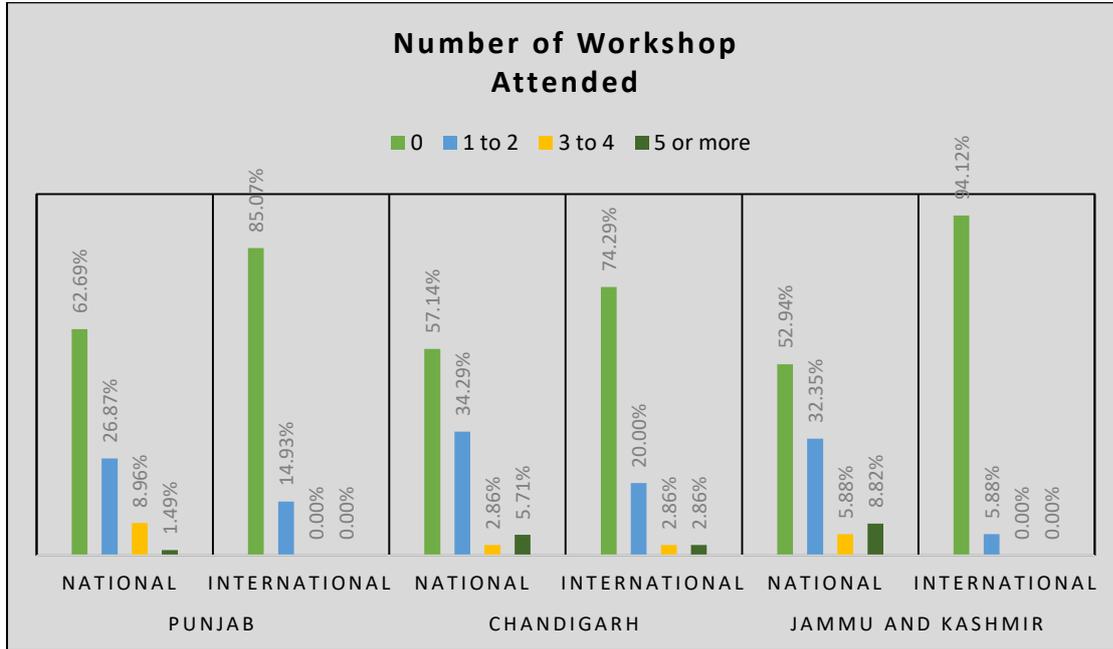
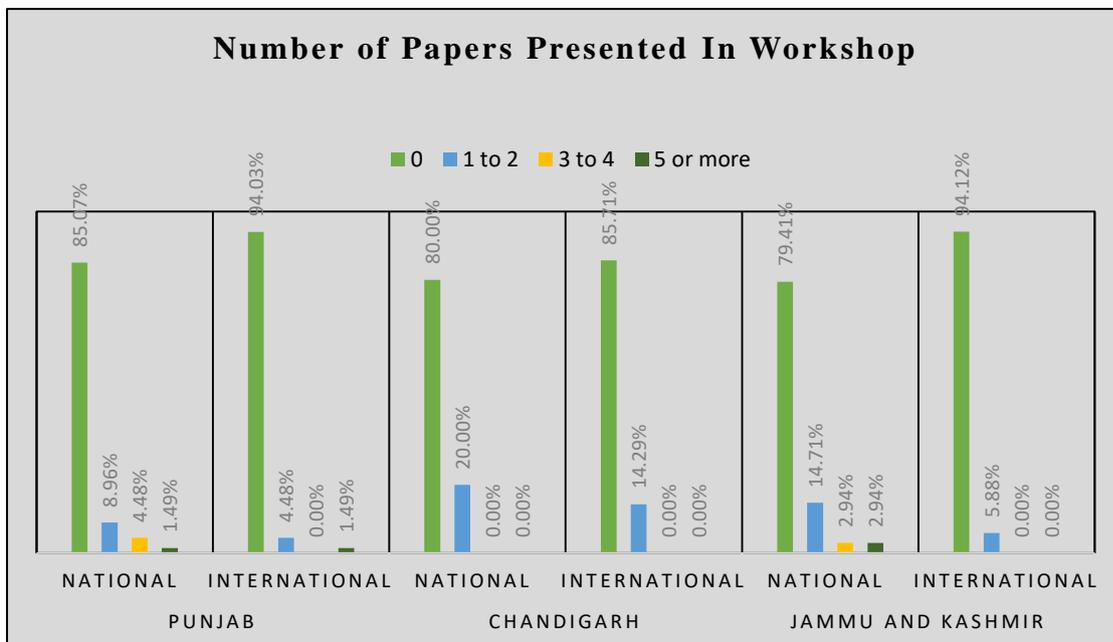


Figure 4.25 b): Number of papers presented at National and International level by women scientists from Punjab, Chandigarh and Jammu and Kashmir



Number of workshop attended by women scientists from Punjab, Chandigarh and Jammu & Kashmir is illustrated in table 4.29. It can be seen from the table that in Punjab 62.69% and 85.07% of women scientists did not attend any workshop at national and international level respectively and 26.87% of principal investigators attended one or two workshops at national level followed by 14.93% who attended workshops at international level. There was only one women scientist who had attended five workshops during the tenure of her project. In Chandigarh, majority of the women scientists did not attend any workshop at national (57.14%) and international (74.29%) level. In Jammu & Kashmir national workshops were attended by most of the women scientists (47.05%) as compare to international workshops (5.88%). Further analysis showed that in all the three states more than 79% of women did not present any paper in national as well as international workshops. It is also clear from the table that women scientists presented their paper in national workshops (Punjab: 14.93%; Chandigarh: 20%; Jammu and Kashmir: 20.59%) rather than in international level (Punjab: 5.97%; Chandigarh: 14.29%, Jammu and Kashmir: 5.88%).

Table 4.30: Involvement of women scientists in organizing extension activities in Punjab, Chandigarh and Jammu & Kashmir

Involvement or Organizing Extension Activities	Punjab	Chandigarh	Jammu & Kashmir
Organizing awareness programme	01 (1.49%)	03 (8.57%)	02 (5.88%)
Organizing skill development programme	03 (4.48%)	01 (2.86%)	--
Organizing workshop	07(10.45%)	01 (2.86%)	01 (2.94%)
Delivered Talks	26 (38.81%)	10 (28.57%)	21 (61.76%)
Organizing Public Lectures	04 (5.97%)	03 (8.57%)	--
Others	26 (38.81%)	17 (48.57%)	10 (29.41%)
p-value	60.79**	35.11**	30.24**

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

Figure 4.26: Involvement of women scientists in organizing extension activities in Punjab, Chandigarh and Jammu & Kashmir

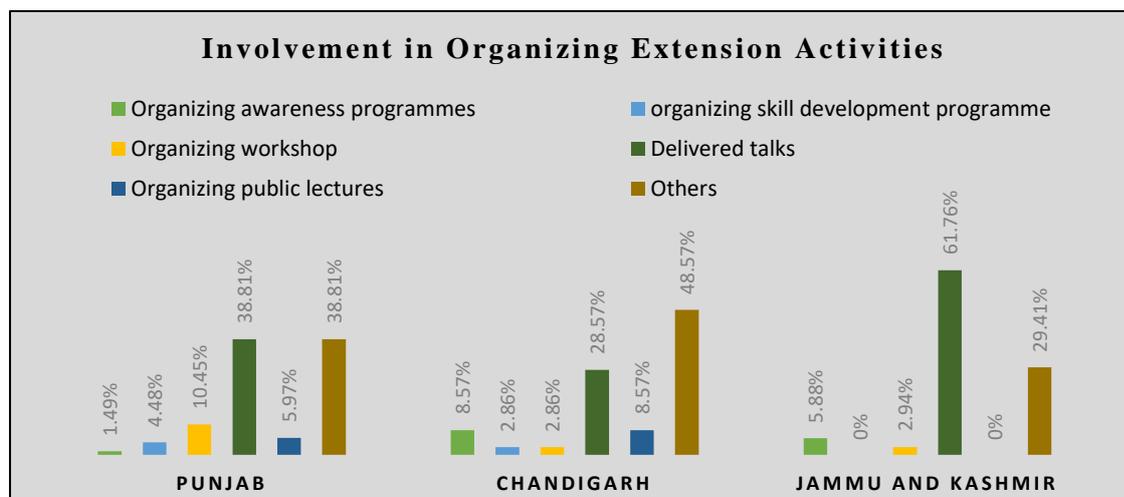


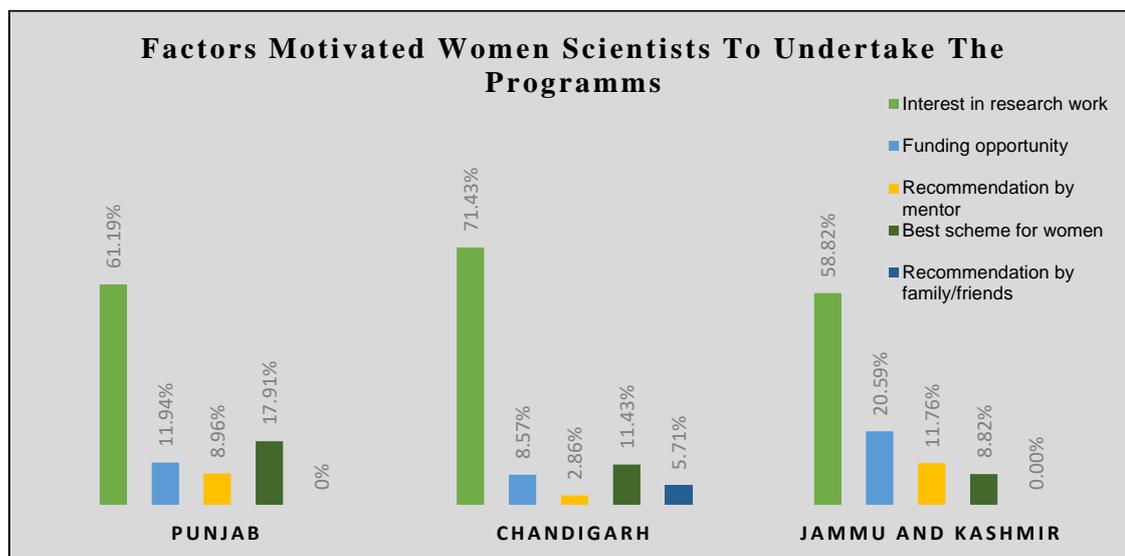
Table 4.30 presents the involvement of women scientist in organising extension activities. It is clearly perceptible from the table that majority (38.81%) of women researchers in Punjab were involved in delivering talks followed by organizing workshops (10.45%) and least i.e. 1.49% were associated with organizing awareness programs. In Chandigarh region 48.57% of women beneficiaries did not mention any extension activities, whereas 28.57% of them reported delivering talks as their extension activity. The analysis of data also presented that out of the total respondents of Jammu & Kashmir 61.76%, 5.88% and 2.94% of women scientist were associated with delivering talks, organizing awareness programs and organizing workshop respectively.

Table 4.31: Factors motivated women scientists to undertake the programs in Punjab, Chandigarh and Jammu & Kashmir

Factors motivated women scientists to undertake the programs	Punjab	Chandigarh	Jammu & Kashmir
Interest in Research Work	41 (61.19%)	25 (71.43%)	20 (58.82%)
Funding Opportunity	08 (11.94%)	03 (8.57%)	07 (20.59%)
Recommended by Mentor	06 (8.96%)	01 (2.86%)	04 (11.76%)
Best Scheme for women	12 (17.91%)	04 (11.43%)	03 (8.82%)
Recommended by friends/relative	--	02 (5.71%)	--
p-value	47.93**	58.57**	21.77**

Level of significance: $p < 0.05^*$, $p < 0.01^{**}$

Figure 4.27: Factors motivated women scientists to undertake the programs in Punjab, Chandigarh and Jammu & Kashmir



The analysis of factors that motivated women scientist to undertake the programme are demonstrated in table 4.31. It is noticeable from the table that interest in research was the most evident reason for undertaking independent research project in all the regions i.e. Punjab (61.19%), Chandigarh (71.43%) and Jammu & Kashmir (58.82%). In Punjab interest in research followed by best scheme (17.91%) and financial assistance (11.94%) were documented as the major motivating factors. Similarly, in Chandigarh region 11.43% and 8.57% of women researchers described best scheme and financial need respectively as the factors responsible for inspiring women scientist (figure 4.27). Whereas in Jammu & Kashmir recommendations by mentor (11.76%) and best scheme (8.82%) were the least contributing factors.

4.3 Inference from statistical analysis

Statistical analysis of present study revealed an increase in number of projects sanctioned to women scientist from 2003 to 2018 in Punjab, Chandigarh and Jammu & Kashmir. In consistent with the findings of present study Gupta (2009) also observed a remarkable enhancement in the number of women enrolled in higher education i.e. from 32.3% to 47.9% in various institutes from 1990 to 2017. Most of the women beneficiaries had break in their career and family responsibility was the major reason for this break in all the three regions under consideration. A considerable proportion of

women scientists were satisfied from their mentor's, host institutes and family support. Women scientist from Punjab, Chandigarh and Jammu & Kashmir revealed little mobility for transferring projects from one state to another. In Punjab and Jammu & Kashmir, a significant proportion of women scientist had enhanced their educational qualification from postgraduate to doctorate during their research project.

In the present study maximum number of women scientists belonged to life sciences. Very few women scientist from Punjab represented chemical sciences (4.48%), engineering (5.97%), mathematical sciences (2.99%) and Engineering and technology development (2.99%) field of specialization. No woman scientist from Chandigarh and Jammu & Kashmir received any project in engineering and mathematical sciences. Similarly, health food and nutrition as well as earth science were not very popular among women scientist. Findings of Goel (2007) highlighted the status of women in engineering, and also discussed the underlying determinants responsible for lack of interest among women towards engineering. After analyzing the MHRD data (1950-2001), he revealed that number of women enrolling in sciences has improved much more as compared to engineering.

Analysis of research publication part of women scientists is not very encouraging. It is clearly noticeable from the analysis that out of the total respondents a considerable percentage of the women scientist (35.82%) in Punjab, Chandigarh (42.86%) and Jammu & Kashmir (20.59%) have not published even a single research paper from the projects awarded to them. A substantial proportion of women beneficiaries published one to two research papers only. This may be due to majority of women scientist have not developed any skill or attended any seminar or conference/ workshop to update their knowledge with emerging and advanced techniques as well as methods of their subject in all the three regions under study.

It was observed from the analysis that in Punjab State highest number of projects were sanctioned to Punjab Agricultural University, Ludhiana (20.90%), followed by Thapar University, Patiala (19.40%), Guru Nanak Dev University, Amritsar (16.42%) and Punjabi University, Patiala (14.92%). Other Institutes such as IIT Ropar, Central University of Punjab, Shaheed Bhagat Singh State Technical Campus Ferozepur, and

GSSDGS Khalsa College, Patiala received only minimal i.e. 1.49% out of the total research projects granted in Punjab state. Districts like Gurdaspur, Tarntaran, Fazilka, Sri Muktsar Sahib, Kapurthala, Barnala, Pathankot and Mansa have not received even a single project. It is evident from the table that most of the projects were sanctioned to the host institute located in the regions with higher literacy rates. This may be attributed to either little awareness to the people in less developed areas or more facilities of research are available at urban areas. In Jammu & Kashmir region it is perceptible from the table that 61.76% of the total research projects were sanctioned to University of Kashmir, Srinagar, followed by 11.76% to Indian Institute of Integrative Medicine, Jammu. Institutes such as Central University of Kashmir, Indian Institute of Integrative Medicine (IIIM), Srinagar and Islamic University of Science and Technology, Awantipora exhibited a very few number of research projects i.e. 2.94% each. It is surprising to see that most of the districts with lower literacy rate have no representation in these initiatives of Government of India to bring women in mainstream. There is no women beneficiary from Kupwara and Ladhak areas.

Analysis of data presented that most of the women beneficiaries from Punjab and Chandigarh were from general category. In Jammu & Kashmir all the women scientists were from general category. Women from OBC and SC/ST categories had little representation.

CHAPTER-5 RESULT AND DISCUSSION

5.1 Introduction

The Department of Science and Technology plays a pivotal role in promoting new realms of Science & Technology and as the nodal agency for organizing, coordinating and promoting S&T activities in the country. Although, the Department has made every effort to bring highly educated women to the mainstream but social, economic and infrastructure factors are the potential hindrance for bringing more women in Science. According to UNESCO Institute for Statistics (UIS) fact sheet (2017) only 30% women researchers are present across the globe. Despite great efforts by governmental agencies to fill this gap still the scenario is not very encouraging, so the analysis of present study is an attempt to assess the impact of Government of India's gender mainstreaming programme for women in science with respect to Punjab, Chandigarh, Jammu & Kashmir regions of North India.

The results of the present study presented higher participation of women from Life sciences (i.e. 55.22% in Punjab; 74.29% in Chandigarh; 64.71% in Jammu and Kashmir), followed by Chemical sciences in Chandigarh (14.29%) and Jammu and Kashmir (14.71%) and Physical sciences (17.91%) in Punjab. In accordance with the results of present report, Gupta et al., (1996) revealed that out of the total 987 R&D projects, 38% of financial support was received by biological sciences followed by Chemical sciences (29%). They also observed that majority of projects were sanctioned to academic institutions (83%), whereas 10% were granted to Institutes of National importance and remaining 7% to National laboratories and others. Another research conducted by Gupta et al., (1998) also analyzed the impact of extramural R&D projects funded by major central government S&T Departments/ agencies during 1990-1995 in terms of pattern of funding by types of institutions and by subject areas. They documented that biological sciences, engineering, medical sciences and agricultural sciences received 70% of the total sanctioned projects.

Similarly, after analyzing the MHRD data (1950-2001), Goel (2007) also revealed that number of women enrolling in sciences has improved much more as compared to engineering. They mentioned that factors like male dominance, lack of inspiring role

models, women getting little societal and institutional support for higher education and negative professional images in the society were accountable for lower number of women in engineering. But most of the women scientist of the present study received support from their mentors, host institutes as well as their families. So it has emerged from the study that although perceptions of the society for girl education is changing with time, but their social responsibilities are the main hindrance in their educational as well as professional journey.

After analyzing the interviews of women scientist, Subhramanian (2007) also concluded that there is lack of recognition and nurturing among women competence as compared to that received by men. The structure and organisations of science institutions must be transparent and democratic in their approach for letting the women scientist equal opportunities in their scientific endeavour. Whereas both Gupta and Sharma (2002) and Gupta et al., (2005) reported that male dominance at work place, isolated feeling among women scientist and dual burden of family and academic workload as the major significant problems experienced by women in various academic sectors.

In the current study, a considerable percentage of the women scientist (35.82%) in Punjab and Chandigarh (42.86%) has not published even a single research paper from the projects awarded to them. While 32.84% womenscientists published one to two research papers in Punjab region, 34.29% in Chandigarh region and 55.88% in Jammu and Kashmir region. Gupta et al., (1996) noted that 459 Ph.D's and 220 M.Phil's were supported by these 693 R&D projects. From 1985-1990, a total-number of 2283 research papers were published in various National and International Journals from 693 projects (Gupta et al., 1996).

5.2 Specific Issues raised in the analysis as a part of Suggestions

SWOT analysis was performed collectively for all the regions under consideration to know the strengths, weaknesses, opportunities and threats of the topic.

Strength:

Present study has both direct (academic impact, research impact, professional impact, and capacity building impact) as well as indirect impacts (societal status upliftment of

the women in science) on the women beneficiaries. This study provided a holistic perspective of impact of women empowering projects on the women in science.

These Gender Mainstreaming programs helped women scientist to enhance their research skills. The success stories of women scientist will encourage other women scholars and researchers to pursue their career in science.

Weaknesses:

Following are certain weaknesses at the data collection level, institutional level, scheme level and on the part of women beneficiaries, which were encountered while analyzing the topic;

During data collection we were unable to track some of the beneficiaries of the schemes, as year wise projects awarded to the women scientist in the respective schemes are missing. In some cases information regarding PI's name, contact information and research topic was not available. Only mentor's name was provided in the data received from DST. We tried to contact them through their mentors also, but most of them were not supportive.

1. Complete data of women beneficiaries before 2006 from WOS-B scheme was not available.
2. Most of the information about the beneficiaries of WOS- C scheme is not available. So we were unable to reach them as their details regarding institution names, phone numbers, e-mail id, and department are missing or incorrect in the available data sets.
3. It is difficult to reach the beneficiaries once they change in their locations. Some of the women scientists were settled abroad, so it was difficult to contact them.
4. The arrogant attitude of some women beneficiaries towards providing the information or filling the form was also a hindrance.
5. We faced obstacles in getting project related information from the host institute of the women scientist because the host institute also did not have any information about them once they complete their projects.
6. When we tried to contact one of the women scientists from Punjab region, we were informed by her family that unfortunately she was no more.

Opportunities

These women centric schemes initiated by Department of Science and Technology are an attempt to dismantle gender imbalance in science and bring women scientist in the mainstream.

Gathering program-specific information about problems faced by beneficiaries or their requirement and impact on their professional development in academia, research and professional settings was a challenging yet vital requirement for successful assessment of these schemes.

Threats:

There were some practical problems which are being faced by the women scientist;

The major problem faced by most of the women scientist is a disparity in terms of rules and regulations between the university and the funding institutions. The guidelines and rules and regulations issued by DST were not acceptable by the auditing wing of the concerned university. To resolve this procedural anomaly takes a long time and once the disparity was cleared two three months were lost. In the absence these clearance it was not possible to buy requisite chemicals and other provisions for the ongoing projects and by the time money arrived the project period was already over. Hence many of them requested for extension for the project.

1. Few women scientist have not received funds for the second year of the project. Hence they did not provide us required information.
2. Some of the women scientists were not satisfied with the tenure of their sanctioned project. Because crucial time of their research period was wasted in taking ethical clearances and taking permission to purchase their equipments.
3. Even when women scientists get projects there are several operational hindrances that they have to encounter. When these projects are perused in university system and are funded by DST, the university is not willing to certify researcher's contribution in that project. What is further troubling is funding agency fail to certify the research contribution of the principal investigator. In the absence of any written recognition of researcher in various projects the concerned researcher is not able to draw benefit that can recruit her.
4. Some women scientist also informed that it is mandatory by DST to publish project research in reputed journals, but it is a time-consuming process, as the journals take time for the review process.

Limitations:

1. Inaccessibility of database from the offices due to COVID-19 lockdown was one of the major limitations. Women scientist who did not respond to our e-mail, project team visited their host institutes before lockdown to establish rapport with them or to get information about the beneficiaries who have completed the project. But after lockdown personal contact with them was not possible.
2. Incomplete projects due to the unavailability of project funds from the funding agency.
3. Mentor transferred/ retired / absence of the mentor, from mid of the project was a hindrance in getting information about women beneficiaries.
4. The non-cooperative attitude of the women beneficiaries despite the regular calls and follow-ups was also a limitation.

Concluding Remarks

UN Secretary-General António Guterres addressed on the International Day of Women and Girls in Science “To rise to the challenges of the 21st century, we need to harness our full potential. That requires dismantling gender stereotypes, let’s pledge to end the gender imbalance in science. Hence it is not enough to initiate women centric schemes to bring women in mainstream but carefully evaluation of these polices to assess their long-term impact on the academic excellence of the women scientist are also need of the hour.

CHAPTER-6 FINDINGS/SUMMARY AND RECOMMENDATIONS

6.1 SUMMARY

The present study was a multicentric project supported by the National Science and Technology Management Information System (NSTMIS) of Department of Science and Technology, Government of India. The general objective of the study was to evaluate the impact of women centric programmes sponsored by the government to reduce the gender gap in science, technology, engineering and mathematics (STEM) domains, because till date there was no clear data on the same. This will also facilitate the policy makers to improve the women centric programmes and to identify the gap, if any.

To achieve objective of the study, Panjab, Chandigarh and Jammu and Kashmir regions of north India were assigned to regional principle investigator and her team. For this purpose a well designed elaborate questionnaire was prepared by all the regional principal investigators. Thereafter pilot study followed by field work through personal visits in universities, e-mails, and telephonically was performed to get information about the women beneficiaries. Although during this phase of the study, many hindrances were faced by the regional principal investigator and her team. Incomplete data provided by the DST, reluctance of some women beneficiaries to give information, abrogation of article 370 in Jammu and Kashmir and lockdown due to Covid 19 pandemic were the major obstacles in gathering information of the women beneficiaries.

Data thus collected was subjected to data analysis employing SPSS version 16. To illustrate the graphs in present study, Microsoft chart wizard was used and text and tables have been made in Microsoft word and Microsoft excel. Analysis of data highlighted an increment in the number of projects sanctioned to women scientists from year 2003 to 2019. It is found that in Punjab, total 113 research projects were sanctioned under different schemes and 67 women scientist filled the online forms. Out of the total 41 research projects, 35 online forms were received from women scientists in Chandigarh region, whereas in Jammu & Kashmir filled online forms were received from 34 women scientists. Analysis of the status of the projects showed that the percentage of completed research projects in Punjab, Chandigarh and Jammu and

Kashmir were 62.69%, 65.71% and 64.71% respectively. About 70.15% women scientists in Punjab, 74.29% in Chandigarh and 61.76% in Jammu & Kashmir revealed that they had break in their career and family responsibility was the major reason for this break.

Further analysis demonstrated that maximum number of women scientists belonged to life sciences. Very few women scientist from Punjab represented chemical sciences (4.48%), engineering (5.97), mathematical sciences (2.99%) and engineering and technology development (2.99%) as their field of specialization. No woman scientist from Chandigarh and Jammu & Kashmir received any project in engineering and mathematical sciences. Similarly, health food and nutrition as well as earth science were not very popular among women scientist. Results also showed that a substantial proportion of women scientists were satisfied from their mentor's, host institutes and family support. Women scientist from Punjab, Chandigarh and Jammu & Kashmir revealed a little mobility for transferring projects from one state to another. A significant proportion of women scientists had enhanced their educational qualification from postgraduate to doctorate during their research project. It is clearly noticeable from the analysis that out of the total respondents a considerable percentage of the women scientist (35.82%) in Punjab and Chandigarh (42.86%), Jammu & Kashmir (20.59%) has not published even a single research paper from the projects awarded to them. A substantial proportion of women beneficiaries published one to two research papers only. It is evident that most of the projects were sanctioned to the host institute located in the regions with higher literacy rates. An attempt had also made to analyze the request for extension of the project and found that out of the 14 principal investigators from Punjab, extension was granted to 12 women scientists and 8 from Chandigarh submitted the request for extension and 5 of them got the approval of the extension. Most of the women scientists revealed that the major reason of the request for extension was that they need more time to complete their research. Majority of the women scientist from three states under consideration rated women centric schemes extremely good.

Hence the present study from Punjab, Chandigarh and Jammu and Kashmir regions of north India recommended Policy makers should encourage women scientist from all backgrounds to explore scholarly and scientific careers, thereby contributing to mainstream research. Duration of the projects should be increased for better outcome of

the projects. There is a disparity in terms of rules and regulations between the university and the funding institutions, so the projects should be governed by the rules and regulations of DST to avoid any hindrance in the governance of the projects. To empower women and as a matter of human rights, promoting women in Science is an overarching priority of government of India. Findings of the present study confirmed the blooming results of the efforts of government of India in term of women centric schemes.

6.2 RECOMMENDATIONS

6.2.1 Discussion on the Strategy which can be adopted for successful Implementation by the stakeholders – Government, Beneficiaries.

Given the focus of the present government on promotion of girl and women education in the New Education Policy, we need concerted efforts to promote intellectual capacities of women in general and women scientist in particular. These are some recommendations for effective implementation and rewarding results of effort made to bring women scientist in mainstream

1. Projects funded under Department of Science and Technology schemes should not be governed by the rules and regulations of host institute, rather DST should have a calendar pertaining rules for governing the DST sponsored research projects, which all of the host institutes should follow. There is a disparity in terms of rules and regulations between the university and the funding institutions.
2. Most of the women scientist from Punjab and Chandigarh are from general category. In Jammu and Kashmir all the women scientists were from general category. Women from OBC and SC/ST categories had little representation. Policy makers should encourage women scientist from all backgrounds to explore scholarly and scientific careers, thereby contributing to their research excellence.
3. These projects are perused in university system and are funded by Department of Science and Technology, the university is not willing to certify researcher's contribution in that project. In the absence of any written recognition of researcher in various projects the concerned researcher is not able to draw benefit that can recruit her. It is imperative that this fundamental anomaly in certifying research contribution to the project should resolved immediately.

4. Most research projects are sanctioned for a stipulated period of three years. Once the project is completed and report submitted these young brilliant women researchers feel incapacitated because their research experience neither entitled them regular employment either within university system, central scientific laboratories or institutions. The period spent in perusing the research project should be counted in the promotion wherever or whenever they get employment.
5. It should be mandatory for the host institute to give at least five hours per week teaching load to the women scientist, so they can get teaching as well as research experience for this period. This will enhance their possibility to get permanent job once the project is over.
6. It is not enough to launch women centric projects, but for their perpetuation in the scientific world special attention on the skill development is required. Because the findings of present study for north India demonstrated limited skill development among women beneficiaries.
7. There should be workshops on the latest techniques for women scientist to update/improve their knowledge or develop concepts, theories, models, techniques instrumentation.

MODEL RESEARCH SUMMARY

Assessment of Government of India's Gender Mainstreaming Programs for Women in Science by Dr. Maninder Kaur, Panjab University, Chandigarh. 2021

The present multicentric project was sponsored by the National Science and Technology Management Information System (NSTMIS) of Department of Science and Technology, Government of India. The major purpose of the study was to evaluate the impact and effectiveness of women empowering schemes initiated by the government to support highly educated, unemployed women with demonstrable research experience. This will also facilitate the policy makers to improve the women centric programmes and to bridge the gap, if any.

A carefully designed questionnaire was prepared by all the regional principal investigators. Thereafter exhaustive and extensive field work through personal visits in universities, e-mails, and telephonically was conducted to get information about the women beneficiaries from Punjab, Chandigarh and Jammu & Kashmir. Most of the women beneficiaries had break in their career and family responsibility was the major reason for this break and a substantial proportion of women scientists were satisfied from their mentor's, host institutes and family support. In this study maximum number of women scientists belonged to life sciences.

Very few women scientist from Punjab represented chemical sciences (4.48%), engineering (5.97), mathematical sciences (2.99%) and engineering and technology development (2.99%) as their field of specialization. No woman scientist from Chandigarh and Jammu & Kashmir received any project in engineering and mathematical sciences and out of the total respondents a considerable percentage of the women scientist (35.82%) in Punjab and Chandigarh (42.86%), Jammu & Kashmir (20.59%) have not published even a single research paper from the projects awarded to them. It is also found that most of the projects were sanctioned to the host institute located in the regions with higher literacy rates. Findings of the study highlighted that women centric schemes have significantly contributed to promote intellectual capacities of women in general and women scientist in particular.

REFERENCES

- Goel, S. (2007). Women in Engineering in India. *International Journal of Interdisciplinary Social Sciences*, 1(6), 45-56.
- Gupta, N. (2019). Analysing gender gap in science: Government of India initiatives. *Current Science*, 11, 1797-1804.
- Gupta, N. Choudhary, S.K. & Rajeswari, A.R. (1996). Sponsored research and development projects approved by Council of Scientific & Industrial Research- A brief analysis. *Journal of Scientific & Industrial Research*, 55,1-5.
- Gupta, N., Choudhary, S. K., & Murthy, A. N. N. (1998). An overview of extramural research and development funding in India. *Current Science*, 75(3), 190-195.
- Gupta, N., Kemelgor, C., Fuchs, S., &Etzkowitz, H. (2005). Triple burden on women in science: A cross-cultural analysis. *Current science*, 1382-1386.
- Gupta, N., & Sharma, A. K. (2002). Women academic scientists in India. *Social studies of science*, 32(5-6), 901-915.
- Rajaram, K. (2005). *Science and Technology in India*, Spectrum Books (P) Ltd, New Delhi.
- Rashid, R., &Maharashi, S. K. (2015). Status of Female Education in Jammu and Kashmir Since 1950. *American Journal of Educational Research*, 3(6), 731-735.
- Sharma, P., &Nagaich, S. (2014). Women's Literacy Rate, Sex Ratio, and Women Work Participation in Punjab: A Granger Causality Analysis. *Arthshastra : Indian Journal of Economics & Research*, 3(2), 37. doi: 10.17010/aijer/2014/v3i2/55977
- Subramanian, J. (2007). Perceiving and producing merit: gender and doing science in India. *Indian Journal of Gender Studies*, 14(2), 259-284.
- Srivastava, V. K. (2004). *Methodology and fieldwork*. New Delhi: Oxford University Press.

Internet Sources

- <https://punjab.gov.in/>
- <http://chandigarh.gov.in/>
- <https://www.jk.gov.in/jammukashmir/>
- <https://www.mapsofindia.com/>
- <https://www.census2011.co.in/>
- <https://dst.gov.in/>

Appendix-I

List of Women Scientist from Punjab

S.No	Name	State	Marital status	Category	Institution (at present)	Area of specialisation
1	Geeta Devi Leishangthem	Punjab	Married	General	Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana	Life Sciences
2	Jyoti	Punjab	Married	General	Guru Angad Dev Veterinary & Animal Sciences University, Ludhiana	Life Sciences
3	Meenakshi Malhotra	Punjab	Married	General	Punjabi University, Patiala	Life Sciences
4	Monica Singh	Punjab	Married	General	Punjabi University, Patiala	Life Sciences
5	Ajaybeer kaur Saini	Punjab	Married	OBC	Punjabi University, Patiala	Engineering Sciences
6	Rishu Arora	Punjab	Married	General	Thapar institute of engineering & technology, Patiala	Mathematical Sciences
7	Neetu Bansal	Punjab	Married	General	Thapar Institute of Engineering & Technology, Patiala	Physical Sciences
8	Shveta Kaushal	Punjab	Married	General	Sri Guru Granth Sahib World University, Fatehgarh Sahib	Life Sciences
9	Nipin Kohli	Punjab	Un Married	General	Guru Nanak Dev University	Physical Sciences
10	Nidhi Rani Gupta	Punjab	Married	General	Multani Mal Modi College, Patiala	Chemical Sciences
11	Ritu Mahajan	Punjab	Married	General	Institute of Nanoscience & Technology, Mohali	Chemical Sciences
12	Seema Eruch Satin	Punjab	Other (Specify)	General	Indian Institute for Science Education and Research, Mohali	Physical Sciences
13	Kulwinder Kaur	Punjab	Married	General	Guru Nanak Dev University, Amritsar	Life Sciences
14	Ravneet Kaur	Punjab	Married	General	Thapar Institute of Engineering and Technology, Patiala	Engineering and Technology Development
15	Amandeep Cheema	Punjab	Married	General	Thapar Institute of Engineering and	Health, Food and Nutrition

S.No	Name	State	Marital status	Category	Institution (at present)	Area of specialisation
					Technology, Patiala	
16	Shivani Punj	Punjab	Married	General	Thapar Institute of Engineering and Technology, Patiala	Physical Sciences
17	Pooja Thakur	Punjab	Unmarried	General	DAV University, Jalandhar	Physical Sciences
18	Jaspreet Kaur	Punjab	Unmarried	General	Panjab University, Chandigarh	Life Sciences
19	Monika Bansal	Punjab	Married	General	Punjab Agricultural University, Ludhiana	Life Sciences
20	Pratima Pandey	Punjab	Married	General	Indian Institute for Science Education and Research, Mohali	Life Sciences
21	Sreekala Mohandas	Punjab	Married	General	Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana	Life Sciences
22	Poonam Sharma	Punjab	Married	General	Not Applicable	Life Sciences
23	Vandana Kumari	Punjab	Married	ST	Punjabi University Patiala	Life Sciences
24	Manpreet Kaur	Punjab	Married	General	Punjab Agricultural University, Ludhiana	Agriculture and Allied Sciences
25	Gagan preet	Punjab	Married	OBC	Indian Institute of Science Education and Research, Mohali	Physical Sciences
26	Yogyata Pathania	Punjab	Married	General	Indian Institute of Science Education and Research Mohali	Physical Sciences
27	Rupinder Kaur	Punjab	Married	General	Thapar University, Patiala	Chemical Sciences
28	Manisha Dubey	Punjab	Married	General	Punjab Agricultural university, Ludhiana	Agriculture and Allied Sciences
29	Hardeep Kaur	Punjab	Married	General	None	Earth Sciences
30	Shweta Sareen	Punjab	Married	General	Panjab University, Chandigarh	Chemical Sciences
31	Seema Madhumal Thayil	Punjab	Married	General	VaHN Biotech Pvt Ltd, Kannur	Life Sciences
32	VarinderJit Kaur	Punjab	Married	General	GSSDGS Khalsa College, Patiala	Physical Sciences
33	Reema Goyal	Punjab	Married	General	Thapar Institute of Engineering and Technology, Patiala	Engineering Sciences

S.No	Name	State	Marital status	Category	Institution (at present)	Area of specialisation
34	Jayeeta Bhaumik	Punjab	Married	General	Center of Innovative and Applied Bioprocessing Knowledge City, Mohali	Life Sciences
35	Sukhpreet Kaur Sidhu	Punjab	Married	General	Punjab Agricultural University, Ludhiana	Life Sciences
36	Nina Jain	Punjab	Unmarried	General	Punjabi University, Patiala	Life Sciences
37	Rajni Mittal	Punjab	Married	General	Patel Memorial National College, Rajpura	Physical Sciences
38	Rachna Hora	Punjab	Married	General	Guru Nanak Dev University, Amritsar	Life Sciences
39	Komal Saini	Punjab	Married	General	Punjabi university, Patiala	Life Sciences
40	Harleen Kaur	Punjab	Married	General	Dr. Bhasin Path labs, Amritsar	Life Sciences
41	Anu Kalia	Punjab	Married	General	Punjab Agricultural University, Ludhiana	Agriculture and Allied Sciences
42	Deepika Sharma	Punjab	Married	General	CSIR-Institute of Microbial Technology, Chandigarh	Life Sciences
43	Gurinder Walia	Punjab	Married	General	Department of Zoology, Punjabi University, Patiala	Life Sciences
44	Nutan Sharma	Punjab	Married	OBC	Hurcourt Butler technological institute	Pl. Specify
45	Amandeep kaur	Punjab	Married	General	Guru Nanak Dev University, Amritsar	Life Sciences
46	Kawaljeet kaur Chauhan	Punjab	Married	General	Guru Nanak Dev University, Amritsar	Life Sciences
47	Saranjeet Kaur Sekhon	Punjab	Married	General	National Institute of Pharmaceutical Education and Research, Mohali	Life Sciences
48	Jaskiran Kaur	Punjab	Married	General	Guru Nanak Dev University Amritsar	Physical Sciences
49	Navjot Sidhu	Punjab	Married	General	Shaheed Bhagat Singh State Technical Campus, Ferozepur	Engineering Sciences
50	Gagandeep Gahlay	Punjab	Married	General	Guru Nanak Dev University, Amritsar	Life Sciences
51	Richu Singla	Punjab	Married	General	Punjab Agricultural University, Regional Station, Faridkot	Life Sciences
52	Nitika Sandhu	Punjab	Married	General	Punjab Agricultural	Agriculture and

S.No	Name	State	Marital status	Category	Institution (at present)	Area of specialisation
					University, Ludhiana	Allied Sciences
53	Ravneet Kaur	Punjab	Unmarried	General	Punjab Agricultural University, Ludhiana	Life Sciences
54	Keshani Bhushan	Punjab	Unmarried	General	Punjab Agricultural University, Ludhiana	Life Sciences
55	Ramandeep kaur	Punjab	Married	General	Regional Research Station, Ludhiana	Life Sciences
56	Mily Bhattacharya	Punjab	Married	General	Thapar University, Patiala	Life Sciences
57	Neelam Kumari	Punjab	Married	General	Punjab Agricultural University, Ludhiana	Agriculture and Allied Sciences
58	Himshikha Gupta	Punjab	Married	General	Presidium Rajnagar School, Gaziabad	Life Sciences
59	Manjeet Kaur Sangha	Punjab	Married	General	Punjab Agricultural University, Ludhiana	Life Sciences
60	Gajala Sumana	Punjab	Married	General	National Physical Laboratory, New Delhi	Physical Sciences
61	Ranjit Kaur Gill	Punjab	Married	General	Punjab Agricultural University, Ludhiana	Life Sciences
62	Puja Srivastava	Punjab	Married	General	Punjab Agricultural University, Ludhiana	Life Sciences
63	Simarjit Kaur	Punjab	Married	General	Punjab Agricultural University, Ludhiana	Life Sciences
64	Jiban Jyoti Panda	Punjab	Married	General	Institute of Nanotechnology, Mohali	Physical Sciences
65	Shayla Bindra	Punjab	Married	General	Punjab Agricultural University, Ludhiana	Life Sciences
66	Anamika Chhabra	Punjab	Married	General	Indian Institute of Technology, Ropar	Engineering and Technology Development
67	Jeevanjot Kaur	Punjab	Married	General	Thapar University, Patiala	Mathematical Sciences

Appendix-II

List of Women Scientist from Chandigarh

S.No	Name	State	Marital Status	Category	Institution (at present)	Area of Specialisation
1.	Reetinder Kaur	Chandigarh	Married	General	Panjab University, Sector-14	Life Sciences
2.	Indu Sharma	Chandigarh	Married	General	Panjab University, Sector-14	Life Sciences
3.	Madhuri Tanaji Patil	Chandigarh	Married	General	MCM DAV College for women, Sector 36	Chemical Sciences
4.	Kavleen Sikand	Chandigarh	Unmarried	General	Punjab University, Sector-14	Life Sciences
5.	Gurpreet Kaur	Chandigarh	Married	General	Punjab University, Sector-14	Chemical Sciences
6.	Monika Sharma	Chandigarh	Married	General	Punjab University, Sector-14	Life Sciences
7.	Sarabjeet Kaur	Chandigarh	Unmarried	Scheduled Caste	Punjab University, Sector-14	Chemical Sciences
8.	Sahila Chopra	Chandigarh	Married	General	Punjab University, Sector-14	Physical Sciences
9.	Chaaya Iyengar	Chandigarh	Married	General	National Institute of Pharmaceutical Education and Research, Mohali	Life Sciences
10.	Maryada Sharma	Chandigarh	Unmarried	General	Postgraduate Institute of Medical Education and Research, Sector 12	Life Sciences
11.	Gunjan Didwal	Chandigarh	Unmarried	General	Postgraduate Institute of Medical Education and Research, Sector 12	Life Sciences
12.	Neha Arora Chugh	Chandigarh	Married	General	Punjab University, Sector-14	Life Sciences
13.	Mandeep	Chandigarh	Unmarried	General	Postgraduate Institute of Medical Education and Research, Sector 12	Life Sciences
14.	Ravneet Kaur	Chandigarh	Married	General	Panajb University, Sector-14	Life Sciences
15.	Neetu Saini	Chandigarh	Married	General	Punjab University, Sector-14	Life Sciences

S.No	Name	State	Marital Status	Category	Institution (at present)	Area of Specialisation
16.	Rachana Srivastava	Chandigarh	Married	General	Postgraduate Institute of Medical Education and Research, Sector 12	Health, Food and Nutrition
17.	Srirupa Mukhopadhyay	Chandigarh	Married	General	Not applicable	Life Sciences
18.	Rama Aggarwal	Chandigarh	Married	General	Punjab University, Sector-14	Life Sciences
19.	Divya Kaushik	Chandigarh	Married	General	Punjab State Council for Science & Technology, MGSIPA Complex, Sector 26	Life Sciences
20.	Reshu Mandal	Chandigarh	Others	OBC	Punjab University, Sector-14	Life Sciences
21.	Simmi Aggarwal	Chandigarh	Married	General	Punjab University, Sector-14	Life Sciences
22.	Disha Handa	Chandigarh	Married	General	Punjab University, Sector-14	Engineering and Technology Development
23.	Alka Khera	Chandigarh	Married	General	Postgraduate Institute of Medical Education and Research, Sector 12	Life Sciences
24.	Babita Garg	Chandigarh	Married	General	Panacea Biotech Limited Lalru, Punjab	Life Sciences
25.	Rajni Sharma	Chandigarh	Married	General	Not Applicable	Life Sciences
26.	Geetanjali Manchanda	Chandigarh	Married	General	DAV University, Jalandhar	Life Sciences
27.	Deepti Malik	Chandigarh	Married	General	Postgraduate Institute of Medical Education and Research, Sector 12	Life Sciences
28.	Swati Gupta	Chandigarh	Married	General	Not Applicable	Life Sciences
29.	Ruchika Mittal	Chandigarh	Married	General	IQVIA, Gurgaon	Life Sciences
30.	Astha Kuhad	Chandigarh	Married	General	Punjab University, Sector-14	Chemical Sciences
31.	Swati Haldar	Chandigarh	Married	General	Indian Institute of Technology, Roorkee	Life Sciences
32.	Renu Garg	Chandigarh	Married	General	Institute of Microbial Technology, Sector	Life Sciences

S.No	Name	State	Marital Status	Category	Institution (at present)	Area of Specialisation
					39	
33.	Sonal Datta	Chandigarh	Married	General	Institute of Microbial Technology, Sector 39	Life Sciences
34.	Jasamrit Kaur	Chandigarh	Married	General	GGDSD College, Sector- 32C	Chemical Sciences
35.	Garima Gupta	Chandigarh	Married	General	Chandigarh University	Agriculture and Allied Sciences

Appendix-III

List of Women Scientist from Jammu and Kashmir

S.No	Name	State	Marital Status	Category	Institution (at present)	Area of Specialisation
1.	Bisma Mohi-ud-din Teli	Jammu and Kashmir	Unmarried	General	Indian Institute of Integrative Medicine Jammu	Chemical Sciences
2.	Bisma Malik	Jammu and Kashmir	Unmarried	General	University of Kashmir, Srinagar	Life Sciences
3.	Saba Niaz Lone	Jammu and Kashmir	Unmarried	General	University of Kashmir, Srinagar	Chemical Sciences
4.	Madhavi Suresh Agarwal	Jammu and Kashmir	Unmarried	General	Indian Institute of Integrative Medicine, Jammu	Chemical Sciences
5.	Sheetal Ambardar	Jammu and Kashmir	Married	General	Tata Institute of Fundamental Research Bellary Road, Bangalore	Life Sciences
6.	Farrah Gul Khan	Jammu and Kashmir	Married	General	Not Applicable	Life Sciences
7.	Ruchi Shah	Jammu and Kashmir	Married	General	Shri Mata Vaishno Devi University, Katra	Life Sciences
8.	Raveeza Din	Jammu and Kashmir	Married	General	University of Kashmir, Srinagar	Engineering and Technology Development
9.	Puja Rattan	Jammu and Kashmir	Married	General	DAV University, Jalandhar	Agriculture and Allied Sciences
10.	Nelofer Jan	Jammu and Kashmir	Married	General	University of Kashmir, Srinagar	Life Sciences
11.	Rabia Hamid	Jammu and Kashmir	Married	General	University of Kashmir, Srinagar	Life Sciences
12.	Deepa Singh	Jammu and Kashmir	Married	General	Not Applicable	Physical Sciences
13.	Syed Douhath Yousuf	Jammu and Kashmir	Unmarried	General	Sher-i-Kashmir Institute of Medical Sciences, Soura	Life Sciences
14.	Rumaisa Rafiq Sheikh	Jammu and Kashmir	Married	General	Not Applicable	Life Sciences
15.	Insha Zahoor	Jammu and Kashmir	Unmarried	General	Not Applicable	Life Sciences
16.	Humeera Nisa	Jammu and Kashmir	Married	General	Not Applicable	Physical Sciences
17.	Sana Shafi	Jammu and Kashmir	Unmarried	General	Cluster University, Srinagar	Life Sciences

S.No	Name	State	Marital Status	Category	Institution (at present)	Area of Specialisation
18.	Iqra Hameed	Jammu and Kashmir	Married	General	Government Degree college (Boys), Pulwama	Life Sciences
19.	Aasima Rafiq	Jammu and Kashmir	Married	General	Sher-e- Kashmir University of Agricultural Sciences & Technology, Kashmir	Agriculture and Allied Sciences
20.	Nusrat Nabi Khan	Jammu and Kashmir	Unmarried	General	Sher-e- Kashmir University of Agricultural Sciences & Technology, Kashmir	Life Sciences
21.	Preeti Sharma	Jammu and Kashmir	Married	General	Shri Mata Vaishno Devi University, Katra	Life Sciences
22.	Sumira Jan	Jammu and Kashmir	Married	General	University of Kashmir, Srinagar	Life Sciences
23.	Sonali Bharati	Jammu and Kashmir	Married	General	Indian Institute of Integrative Medicine, Jammu	Chemical Sciences
24.	Iram Ali	Jammu and Kashmir	Married	General	Not Applicable	Earth Sciences
25.	Veenu Sharma	Jammu and Kashmir	Married	General	Indian Institute of Integrative Medicine, Jammu	Chemical Sciences
26.	Tabasum Yaseen	Jammu and Kashmir	Married	General	Not Applicable	Life Sciences
27.	Nowsheen Hamid Bhat	Jammu and Kashmir	Married	General	Central University of Kashmir	Life Sciences
28.	Syed Sana Mehraj	Jammu and Kashmir	Married	General	Not Applicable	Life Sciences
29.	Falak Qazi	Jammu and Kashmir	Married	General	Not Applicable	Life Sciences
30.	Qulsum Akhtar	Jammu and Kashmir	Married	General	Not Applicable	Life Sciences
31.	Tanzeela Khan	Jammu and Kashmir	Married	General	Not Applicable	Life Sciences
32.	Rubiya Samad	Jammu and Kashmir	Married	General	Central University of Kashmir	Physical Sciences
33.	Shagoon Tabin Khan	Jammu and Kashmir	Married	General	University of Kashmir, Srinagar	Life Sciences
34.	Sabeena Ali	Jammu and Kashmir	Married	General	Indian Institute of Integrative Medicine, Microbial Biotechnology Division	Life Sciences

Appendix-IV

ASSESSMENT OF GOVERNMENT OF INDIA'S GENDER MAINSTREAMING PROGRAMMS FOR WOMEN IN SCIENCE

(Department of Science and Technology, Government of India Sponsored Research Project)

ASSESSMENT OF GOVERNMENT OF INDIA'S GENDER MAINSTREAMING PROGRAMMS FOR WOMEN IN SCIENCE

(Department of Science and Technology, Government of India Sponsored Research Project)

Dear Woman Scientist,

Having administered large number of funding schemes and programs time-to-time, it is impossible for the Government of India to measure and trace the impact merely based on the data submitted by the individual Women Scientists or respective organisations at the end of the completion of the project and consecutive funding support. Since, the nature of support is targeted toward overall professional development, the resulting impact can only be determined by tracking individual's progress over period of time. Therefore, in order to evaluate impact of these schemes and programmes of the Government of India is conducting a survey and adjudge the core aim of the government is accomplished.

You are requested to participate in this questionnaire survey and fill the Form. The Survey Forms are prepared hard copy as well as on-line. You may spare your time and provide correct information. Please fill the form and give complete information.

We assure you that the information provided by you will be kept with DST, Government of India and will remain confidential.

Anticipating your kind co-operation.

Thanking you,

PROJECT TEAM

**ASSESSMENT OF GOVERNMENT OF INDIA'S GENDER MAINSTREAMING
PROGRAMMS FOR WOMEN IN SCIENCE**

(Department of Science and Technology, Government of India Sponsored Research Project)

INSTRUCTIONS to Fill the Form (on-Line/ hard Copy):

1. Before starting to fill the form, you may have a through look to the entire questionnaire.
2. You may keep all the details/documents of the projects you have undertaken, or is currently on-going.
3. Please select the suitable check-box for answering the questions.
4. Certain questions are descriptive. You may answer in the space provided. Please share your own views.
5. Where ever Codes are assigned, you may select an appropriate Code and write in proper space given. For hard copy Survey Form the codes are available Annexures -1, Annexures -2, and Annexures 3. Wherein, in on-line Form you may have to select from the pull-down menu.
6. You are requested to fill the information for all projects you have undertaken from these schemes.
7. Please do not submit the incomplete form. You may go through the filled form once again before submitting.
8. The correct information and your positive support will bring accurate meaning to the project objectives.
9. On submission of complete information and correct information, the DST will give you a Certificate of 'Women Scientist Volunteer'.

Hoping to have your positive support.

Thanking you in anticipation.

PROJECT TEAM

Annexure -1: Accreditation Institute's

Code	Accreditation Institute's
001AICTE	All India Council for Technical Education)
002AIMA	All India Management Association)
003AIU	Association of India Universities)
004AKADOEACC	Department of Electronics and accreditation of Computer Courses)
005BCI	Bar Council of India)
006DCI	Dental Council of India)
007DEC	Distance Education Council)
008FTII	National and Television Institute of India)
009ICAI	Institute of Chartered Accountants of India)
010ICSI	Institute of company Secretaries of India)
011INC	Indian Nursing Council)
012MCI	Medical Council of India)
013NAAC	National Assessment and Accreditation Council)
014NBA	National Board of Accreditation)
015NCHRH	National Council for Human Resource in Health)
016NCTE	National Council for Teacher Education)
017NIELIT	National Institute of Electronics & Information Technology)
018NIRF	National Institutional Ranking Framework)
019PCI	Pharmacy Council of India)
020UGC	University Grants Commission)
021VCI	Veterinary Council of India)

Annexure -2: On Schemes

Code	Schemes
001BC	Bio-Care
002CU	CURIE
003MO	Mobility
00STW	S&T Women
005UGCPDF	UGC Post-Doctoral Fellow
006WSTEM	Women In STEM
007WOSA	WOS (A)
008WOSB	WOS (B)
009WOSC	WOS (C)
010WTP	WTP

Annexure -3: Field of Specialisation

Code	Field of Specialisation
001AAS	Agriculture and Allied Sciences (AAS)
002AS	Atmospheric Sciences
003CS	Chemical Sciences
004ES	Earth Sciences
005ETD	Engineering and Technology Development (ETD)
006ES	Engineering Sciences
007HFN	Health, Food and Nutrition (HFN)
008LS	Life Sciences
009MS	Mathematical Sciences
010PS	Physical Sciences
011OT	Other

Appendix-V

**Assessment of Government of India's Gender Mainstreaming Programs for Women in Science
(Department of Science and Technology, Government of India Sponsored
Research Project)**

QUESTIONNAIRE SURVEY

INSTRUCTIONS to Fill the Form (on-Line/ hard Copy):

1. Before starting to fill the form, you may have a through look to the entire questionnaire.
2. You may keep all the details/documents of the projects you have undertaken, or is currently on-going.
3. Please select the suitable check-box for answering the questions.
4. Certain questions are descriptive. You may answer in the space provided. Please share your own views.
5. Where ever Codes are assigned, you may select an appropriate Code and write in proper space given. For hard copy Survey Form the codes are available Annexures -1, Annexures -2, and Annexures 3. Wherein, in on-line Form you may have to select from the pull-down menu.
6. You are requested to fill the information for all projects you have undertaken from these schemes.
7. Please do not submit the incomplete form. You may go through the filled form once again before submitting.
8. The correct information and your positive support will bring accurate meaning to the project objectives.
9. On submission of complete information and correct information, the DST will give you a Certificate of 'Women Scientist Volunteer'.

Hoping to have your positive support.

Thanking you in anticipation.

Assessment of Government of India's Gender Mainstreaming Programms for Women in Science

(Department of Science and Technology, Government of India Sponsored Research Project)

QUESTIONNAIRE SURVEY

PERSONAL INFORMATION:

Last Name:	Name:	Middle Name:
Date of Birth:	DD/MM/YYYY:	
Residential Address:		
Email ID:		
Marital Status: (Tick Mark)	Married:	Unmarried:
	Other (Specify):	
Category: (Tick Mark)	General:	SC:
	ST:	OBC:
	Physically Handicapped:	Any Other, specify):
Education Qualification (At Present)		

INFORMATION ON CURRENTLY AFFILIATED INSTITUTION:

Name and Address of the Institute: (Currently Affiliated)			
	City:	Pin Code:	State:
Current Position:			
Accreditation Status of the Affiliated Institution:	Select from the List Given in an Annexure 1 and write appropriate Code No) in space below:	YES/ NO	Not Applicable
		Number	
Source of Information to access the Project and the Institution: (Multiple Ticks are permitted)	Friends/ Relatives:	University Web site:	
	Scientific Journal:	Awareness Programme:	
	News Paper:	DST Web site:	
	Any Other Sources:		

PRE-PROJECT CONDITION OF WOMEN SCIENTIST:

Break in Career: (Tick Mark)	Yes:	No:	Duration of Break:	
Reasons for the Break:				
Any Eligibility Test Cleared: (Tick Mark)	ICMR	ICAR	SLET	
	CSRI NET	UGC NET	Any Other (Specify):	
Family Support received for Research/ Professional Activities: (Tick Mark)	Motivational:	Moderate:	Not Satisfied:	
	Neutral:	Any Other (Specify):		

PROJECTS RELATED INFORMATION: (Write the details of all projects you have availed)

Number of Projects availed from the Government of India's Gender Mainstreaming Programme: (Tick Mark on Number):		1	2	3	4	5
Project Availed: (Chronological Order)	Scheme: (Select the Scheme from the List given in Annexure 2 and write appropriate Code No)	Field of Specialisation: (Select from the List given in Annexure 3 and write appropriate Code No):				
1						
2						
3						
4						
5						

PROJECT-WISE INFORMATION:

BASIC INFORMATION - PROJECT 1:

Project ID:			
Date of Sanction of the Project:			
Duration of the Projects as per Sanctioned Order (In Years):			
Date of Completion:			
Status of the Project (As on Date):		Completed: YES / NO	On-Going: YES / NO
Requested for the Extension: YES / NO		Extension Granted: YES / NO	Duration of the Extension (in Months):
Reasons for Extension Request: (Explain)	1		
	2		
	3		

INSTITUTIONAL INFORMATION (PROJECT 1):

Name and Address of the Institute: (Affiliated during Project 1)			
	City:	Pin Code:	State:
Accreditation Status of the Affiliated Institution:	Select from the list given in an Annexure 1 and write appropriate Code No in space below):	YES/ NO/	
		Not Applicable	

MENTOR'S INFORMATION:

Mentor's Name:	
Mentor's Designation at Host Institution:	

SUPPORT RECEIVED FROM:

Mentor's Support:	Extremely Satisfied	Very Satisfied	Moderately Satisfied
	Slightly Satisfied	Not Satisfied	
Institutional Support:	Extremely Satisfied	Very Satisfied	Moderately Satisfied
	Slightly Satisfied	Not Satisfied	

STATUS OF THE PROJECT 1 RELETED:

Whether the Project was transferred to another Institution?		YES	NO
Any Reason for the Transfer? (Specify)			
Name and Address of the Institution where the Project Transferred and Completed:			
In case of a change in the Mentor, (New) Mentor's Name:			
(New) Mentor's Designation at this Institution:			
Mentor's Support: (Tick Mark)	Extremely Satisfied	Very Satisfied	Moderately Satisfied
	Slightly Satisfied	Not Satisfied	
Institutional Support: (Tick Mark)	Extremely Satisfied	Very Satisfied	Moderately Satisfied
	Slightly Satisfied	Not Satisfied	

PROFESSIONAL DEVELOPMENT RELATED:

Educational Qualification (at the time of grant of the Project):					
Educational Qualification (at the completion of the project):					
Awards and Honours Received (During the Project Period): (Write the Details)	1				
	2				
	3				
Number of the Publications from the Project Awarded:					
Citation Index:					
H Index:					
Numbers of Seminars/ Conferences: (Write the Nos)					
National Level:	Attended:		Papers Presented:		
International Level:	Attended:		Papers Presented:		
Numbers of Workshops: (Write the Nos)					
National Level:	Attended:		Papers Presented:		
International Level:	Attended:		Papers Presented:		

Involvement/ Organising Extension Activities: (Tick Mark)	Organising Awareness Programmes	Organising Skill Development Programme
	Organising Workshop	Delivered Talks
	Organising Public Lectures	Delivered Public Talks
	Any Other (Specify):	
Special Contributions/ Achievements: (Give Details)	Achievements:	
	Innovations:	
	Patent:	
Societal Technology Benefits: (Give Details)		
Technology Dissemination: (Give Details)		
Transfer of Technology: (Give Details)		

SKILL DEVELOPMENT:

Any Skill Developed:	YES	NO
Particular Skill Developed: (Write in specific, if relevant)	1 2 3	

EMPLOYMENT STATUS PROJECT 1:

	Year	Details/ Position	Nature of Job
Before an Award of the Project:			
After the Completion of the Project:			
Current Job:			

Satisfaction Level with current job: (Tick Mark)	Excellent	Very Good	Good	Average	Not Satisfied
Reason for your choice of the Level:	1 2 3				

PROGRAMME LEVEL FEEDBACK: (Tick Mark)

Your Rating on the Programme/ Scheme:	Excellent	Very Good	Good	Average	Not Satisfied
Satisfaction Level of Programme/ Scheme:	Excellent	Very Good	Good	Average	Not Satisfied
Problems related to receiving Grants:	YES / NO	Specify:			
Problems faced in Spending grants:	YES / NO	Specify:			

COMMON QUESTION:

WHAT MOTIVATED YOU TO UNDERTAKE PROGRAMME/ PROJECT:

YOUR REMARKS/ OVERALL EXPERIENCE:

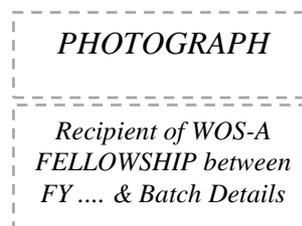
Appendix-VI

FORMAT

(To capture success stories from the beneficiaries)

Photograph With a brief highlighted bio-data (in their person) that should include

- **Current affiliation**
- **Brief academic profile**
- **Punch lines specific about the beneficiary**



Example: Dr. Parul Saxena has completed her Ph.D. in year 2000 in ... discipline. She is currently working on position in ... institution on ... designation. She is a proud mother & wife with 2 children.

How was the academic & professional life of the beneficiary before joining the scheme?

Example: Before being awarded with the project, I was staying at home after my second baby was born. Although, I had my Ph.D. degree, I was just taking care of my child and I had no professional carrier....

How did the beneficiary got to know about this scheme

Example: I heard about this scheme through internet/friend/social media....

How did you got passion to pursue career in STEM

How the scheme has helped the beneficiary to get back on the track after carrier break

When I applied for this scheme, I was not expecting that things will move in such a positive and forward manner for me after all these years of break... The interview was conducted in.... And the whole process was very smooth...

Rewards/Awards/achievements received during the scheme

During the scheme I have attended many Technology conferences which were so informative and inspiring... I have developed this project during the scheme.... I have published n number of papers in Conferences & journals...

Critical Skills developed during the scheme

Example: During WOS-A, I have developed Programming skills, software development, mathematical modelling etc.

Impact of Fellowship/Internship of the scheme on

- Professional life

Example: I am teaching in a reputed university and have also guided number of students for M.Tech./Ph.D. dissertations. I am also carrying out research in the emerging field of Climate Change science and wrote research papers in peer review National/International journals.

- Family front

Example: Earlier I was not able to support my family financially. Now not only I have sufficient economic standing, the love and passion for science is inspiring me to give my children the same education I got...

- Personal Front

I see myself as an eminent researcher and member of scientific community now...

Contribution of research/entrepreneurship to society

Example: The topic of my project under the scheme is green energy... which can be used to lower the Global pollution index & carbon footprint... My application is helping with assisted living for the elderly etc.

Message to other women in Science

Example: To the women in science & technology field I would like to say that don't lose hope when you get dragged by family responsibilities. There is still hope and real time opportunity ... Govt is taking initiatives in building a platform for comeback...

Feedback on scheme (how to improve further)

Example: More women are required to get aware about this scheme, so government should also put some effort in spreading awareness and should also increase the quantum of support under these schemes.

Majority of women scientist have exhibited less professional development in terms of skill enhancement or attending any seminar or conference/ workshop to update their knowledge with emerging and advanced techniques as well as methods of their subject in all the three regions under study.