

CHAPTER IV

CONCEPTUAL FRAMEWORK, DESIGN OF THE STUDY AND METHODOLOGY

4.1 Meaning of Livelihood

A livelihood is a means of making a living. It represents people's capabilities, assets, income and activities required to secure the necessities of life. A livelihood is sustainable when it enables people to cope with and recover from all kinds of shocks and stresses (such as natural disasters and economic or social upheavals) and enhance their well-being and that of future generations without undermining the natural environment or resource base. Therefore, livelihood is a means of securing the necessities of life. It is a means of support and subsistence. Person's livelihood refers to their "means of securing the basic necessities -food, water, shelter and clothing- of life" (Wikipedia). Livelihood is defined as a set of activities which involves securing water, food, fodder, medicine, shelter, clothing and the capacity to acquire above necessities working either individually or as a group by using resources (both human and material) for meeting the requirements of the self and his/her household on a sustainable basis with dignity (Wikipedia). The sustainable livelihood concept offers a more coherent and integrated approach to poverty. The sustainable livelihood idea was first introduced by the Brundtland Commission on Environment and Development, and the 1992 United Nations Conference on Environment and Development expanded the concept, advocating for the achievement of sustainable livelihoods as a broad goal for poverty eradication (Wikipedia).

According to the DFID (Department for International Development) framework:

A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base (Chambers and Conway, 1992).

Livelihood generally refers to the capabilities of people and their means of living which include food, income and assets. Assets include both tangible assets and intangible assets. Tangible assets refer to resources and stores and intangible assets refer to claims and access. A livelihood is said to be environmentally sustainable when it maintains and increases the local and global assets on which livelihood depends. It also has net beneficial effect on other livelihood patterns. Livelihood is a socially sustainable process because it can cope with and recover people and also provide for future generation. Therefore, capabilities, equity and sustainability together combine in the concept of sustainable livelihood. (Chambers and Conway, 1992)

IFRC (International Federation of Red Cross and Red Crescent Societies) defines livelihood as a means of making a living. It encompasses people's capabilities, assets, income and activities required to secure the necessities of life.

From the above discussion it can be said that livelihood is a process by which one can maintain the basic necessities of life such as food, shelter, clothes, education of children,

health care, water etc. It can also be said that livelihood refers to the way of maintaining the subsistence of daily life.

Women and livelihood is one of the least sought topics. Generally, the right to livelihood of women is the key to the overall development of women. Women are important actors for both economic and social development at the local and national levels. Women can play an important role in carrying out a wide range of economic activities in addition to domestic responsibilities. Women can be a powerful source of knowledge and skills.

UN-Women and the 56th session of the Commission on the Status of Women (CSW) in 2012 focused on “the empowerment of rural women and their role in poverty and hunger eradication, development and current challenges” as the priority theme.

The right to livelihood is crucial to women and men around the world. It is a right that is fought for and defended by farmers, workers, peasants and the urban poor. Conceptually, it is much more than the right to work, rather right to pursue a dignified life. Women are always considered as an important source of learning, creating empowerment at community level (Editorial, 2012).

Various new schemes on livelihood issues have also started emphasizing role of women in various livelihood generating activities. For example, Mahila Kisan Sashaktikaran Pariyojana (MKSP) is a component of National Rural Livelihoods Mission (NRLM). Ministry of Rural Development also recognizes women as farmers and mobilizes them into collectives at the village level. MKSP visualizes improving the status of rural women in agriculture or

agriculture based livelihood and enhancing their opportunities to empower themselves through their own institutions on self-help culture (Editorial, 2012).

4.1.1 Valued and Undervalued or Unvalued Work of Women

It is important to note that works of women can be categorized into valued work and unvalued work. Valued works of women represent those works in return of which they receive payments in terms of money. For example- wages, salary etc.

But historically it is seen that there is large discrimination in case of payment of wages between men and women. Women are paid lower wages than men regardless of the fact that both perform the same duties. In our society men's work contribution is fully valued without knowing their performance in the workplace. But women's work contribution is partly valued or sometimes their works are even unvalued. This is because the compensation for a particular job is generally closely related to the sex of the workers performing the job rather than other factors like education, experience etc. which suggest lower wages for female workers. This creates undervaluation of female works. Moreover, some particular types of work such as child care, care for the family members, cooking, cleaning which are very important, still considered as low- skilled. Therefore they are unvalued in our society. Thus, undervaluing or 'unvaluing' the works performed by women is one of the most important factors which causes gender pay gap, occupational segregation, low status of women and wage discrimination in the society.

4.2 The Concept of Empowerment

In the Oxford Dictionary the meaning of the word ‘empower’ means to give (someone) the authority or power to do something i.e. to make (someone) stronger and confident, especially in controlling their lives and claiming their rights. The noun form of the word empower is ‘empowerment’. The concept of empowerment has occupied a central place in work of many development policies of the nation. Empowerment is the process of enabling individual to think, to take action and control work in an autonomous way. It is the process by which one can gain control over own resources and the circumstances of their lives. So empowerment can be viewed as a way of creating social environment in which one can make decision of one’s own life and can make choices individually. Empowerment refers to increasing spiritual, economic, political, social, educational, and gender strength of individuals and communities. The concept of empowerment is multidimensional. Empowerment can be viewed as economic empowerment, social empowerment, political empowerment, educational empowerment, community empowerment etc.

Economic empowerment is the process by which one can obtain access to formal sector employment, self-employment, income, financial independence, establish good saving habits, and improve future prospects for participation in economic activities. It represents the ability of a person to make economic decision independently regarding production, consumption, transfer etc.

Social empowerment is the process of accessing opportunities and resources in order to make personal choices (e.g. choosing what to eat, what to wear, what neighborhood to live in etc.) and

have some control over the environment. Therefore, social empowerment is understood as the process of developing a sense of autonomy and self-confidence. It enables people to act individually and collectively to change social relationship and the institutions and helps in reducing poverty in the society.

Political empowerment is the only way to empower people through legislation for ensuring participation in the political decision making. It is the real empowerment which enables a person to take part in making decision that affects their political life. It means people have the freedom in access to basic legal and human rights, to control their land and other resources, in employment and earnings and in social and political participation.

Educational empowerment is the process to empower the marginalized people in the society who are living below poverty line through literacy and education.

Community empowerment is the process of enabling communities to increase control over the factors and decisions that impact on their lives.

Thus, empowered people have the freedom of choices and actions which enable them to better influence the course of their lives and decisions. The World Bank's 2002 Empowerment Sourcebook identified empowerment as the expansion of assets and capabilities of the poor to participate in, negotiate with, influence, control and hold accountable institutions that affect their lives.

The term 'empowerment' has its widespread usage in different fields and therefore there is a variety of meaning of the term empowerment. There are various debates among different authors in using the term empowerment. Empowerment is viewed as a process and sometimes it

is also used as an outcome. Empowerment as a process focuses on the organizational capacity building or an increase in participation of previously excluded group in the design, management and evaluation of development activities (Luttrell et al, 2009). Besides this, empowerment is a process because many development agencies and organizations work as processes to achieve empowerment (Oxaal & Baden, 1997). Empowerment as an outcome focuses on economic enhancement and increasing access to economic resources (Luttrell et al, 2009). Therefore the term empowerment is both process and outcome. Whenever it is necessary it acts as a process or as an outcome.

The concept of empowerment can also be interpreted on the basis of the concept and operation of power. It means empowerment can be measured in terms of power relations such as power over, power to, power with and power within (Luttrell et al, 2009). Since empowerment is measured in terms of the concept and operation of these power relations, therefore, the idea of power is at the root of the term empowerment (Oxaal & Baden, 1997). Empowerment can be defined in terms of power to represent people's possibilities and options, and to act on them, the power within that enables people to have the courage to do things they never thought themselves to be capable of and the power that comes from working alongside others to claim what is rightfully theirs (Eyben & Kabeer, 2008).

Empowerment is a poverty eradication process. Because through empowerment people and groups who are partially or fully excluded can claim their full participation in the society in which they are living (Eyben & Kabeer, 2008). Thus, empowerment is the way for the most disadvantaged group, marginalized group and socially excluded group to come out from poverty.

To measure the meaning of empowerment McLean and Andersson (2009) divide the concept of empowerment into three categories such as:

- i. De jure empowerment which means the power that is manifested in opportunities and rights provided through law, contract or other official records.
- ii. De facto empowerment which means actual control or influence over an outcome or a decision.
- iii. Subjective empowerment which means the feelings of being able to influence or control or affect a situation.

Thus, empowerment is multi-dimensional, social and a process. It is multi-dimensional because it deals with sociological, psychological, economic and other dimensions. It is social because it occurs at various levels i.e. individual, group and community. Besides these, empowerment is a social process because it occurs in relationship to others (Page & Czuba, 1999).

4.3 The Concept of Women Empowerment

Women constitute half of the world's population. Despite having such a large size, in most of the developing countries women fail to achieve the basic amenities of life to live like a human being. In a developing nation like India, women are treated as one of the most excluded, disadvantaged and marginalized sections in the society. Women are generally discriminated and marginalized in India at every level of the society. They are discriminated against in social participation, political participation, economic participation, access to education, and also reproductive healthcare. Women are found to be economically very poor all over India. So, they need economic power to stand on their own feet at par with men. Though the government has introduced many

development programmes, women are still much more likely to be poor and illiterate than men. Women usually have less access to medical care, credit, property ownership, training and employment. They are also far less likely than men to be politically active, and more likely to be the victims of domestic violence in the society. Therefore, it is very important to bring gender equality and women empowerment. Gender equality implies a society in which both men and women equally enjoy the same rights, opportunities, outcomes and obligations in all spheres of life. Gender equality exists when both male and female are able to share equally in the distribution of power and influence; have equal opportunities for financial independence through engagement in labour force activities and enjoy equal access to education and the opportunities to develop personal ambitions. A critical approach of promoting gender equality in the society is the empowerment of women which focuses on identifying and redressing the imbalances of power and gives women more autonomy and courage to manage their own lives. Empowerment of women is the key to achieve sustainable development and realization of human rights for all. Therefore, it is essential to implement policies and programmes along with their proper evaluation so that women empowerment can be achieved.

A woman is said to be empowered when she is able to enjoy economic empowerment, social empowerment, political empowerment, educational empowerment and all the human rights which should be enjoyed by a citizen of a nation. Therefore, women empowerment is the process of enhancing the capacity of a woman to make choices and transform those choices into desired action and outcomes.

The issue of women empowerment has gained importance since 1990's. In all the development policies and five year planning programmes of the nation the issue women empowerment has

been occupying a central place. The Government of India declared the year 2001 as the ‘Women Empowerment Year’ which focuses on a vision where women are equal partners of men (Deshpande & Sethi, 2010).

The World Bank suggested in the third Millennium Development Goal (MDG3), for promoting gender equality and empower women by 2015. In September 2000 the world’s leaders adopted the United Nations Millennium Declaration, and committed their nations to stronger global efforts to reduce poverty, improve health and promote peace, human rights and environmental sustainability. The Millennium Development Goals (MDGs) that emerged from the Declaration are specific, measurable targets, including the one for reducing the extreme poverty by 2015 that still grips more than 1 billion of the world’s population. These Goals, and the commitments of rich and poor countries to achieve them, were affirmed in the Monterrey Consensus that emerged from the March 2002 United Nations Financing for Development conference, the September 2002 World Summit on Sustainable Development and the launch of the Doha Round on international trade. Therefore, Millennium Development Goals (MDGs) are the eight international development goals that were established following the Millennium Summit of the United Nations in 2000, following the adoption of the United Nations Millennium Declaration. All 189 United Nations member-states at the time and at least 23 international organizations, committed to help achieve the following Millennium Development Goals by 2015:

- To eradicate extreme poverty and hunger.
- To achieve universal primary education.
- To promote gender equality and empower women.

- To reduce child mortality.
- To improve maternal health.
- To combat HIV/AIDS, malaria, and other diseases.
- To ensure environmental sustainability.
- To develop a global partnership for development.

World leaders from countries of rich and poor described the Monterrey conference as marking a compact between them in support of shared development goals. That commitment forms the basis for the Millennium Development Compact through which the world community can work together to help poor countries achieve the Millennium Development Goals. This Compact calls on all stakeholders to orient their efforts towards ensuring the success of the Millennium Development Goals in a system of shared responsibilities. Poor countries can insist on increased donor assistance and better market access from rich countries. Poor people can hold their politicians accountable for achieving the poverty reduction targets within the specified timetable. And donors can insist on better governance in poor countries and greater accountability in the use of donor assistance (HDR, 2003)

Since women empowerment is a complex process, the following subsection contains some important definitions of women empowerment given by different authors.

Puttaraja and Heggade (2012) define women empowerment as a way to enabling the weaker section of the society like poor women to acquire and possess power and resources so that they can take decision of their own lives.

Devi (2013) defines economic empowerment of women as one of the basic tools for social empowerment. According to the author, literally empowerment means 'to invest with power' and the power is ability through which one can influence the behavior of other with and without restraint. Women empowerment provides women the 'ability to gain control over resources, develop physical and psychological capacity to challenge the prevailing gender customs'.

Vasanthakumari (2012) defines empowerment of women as the process of making women economically independent, self-reliant, confident and positive in attitude. It encourages women to participate in various economic, political, social, cultural and development activities of the nation.

Reddy (2011) defines gender budgeting as an important tool for empowering women. Budget through allocation of budgetary fund for development policies and programmes for women can promote women empowerment. It also creates general awareness and understanding in all the top policies regarding the problem of women empowerment.

Revenge and Shelly (2012) represent the importance of gender equality to achieve women empowerment. Empowerment of women through gender equality brings about reduction of excess mortality among girls and women, eliminating gender disadvantages in education, increasing the women's access to economic resources and opportunities, providing women an equal voice in both households and societies and limiting the transmission of gender inequalities across generations.

Panda (2000) defines women empowerment in terms of certain key elements such as power, autonomy, self-reliance, entitlement, participation and the process of capacity building and awareness.

Suja (2012) defines women empowerment as the process in which women become active both individually and collectively. Women become more knowledgeable and their empowerment goal refers to a strategy to achieve gender equality as well as to the inherent capacity building processes and various other factors.

Sultana and Hasan (2010) define women's empowerment as the process of transforming gender relations through groups or individuals by developing awareness of women's subordination and building the capacity to challenge it. So it is a process of changing the power potential within an individual first and consequently a change of relationship at different groups and social level.

Deshpande and Sethi (2010) define that empowerment of women is achieved when women become educated, better informed, can make rational decisions, and physically healthy so that they can make challenges for equality.

Hazarika (2011) defines empowerment of women as the way of equipping women to be economically independent, self-reliant, have positive esteem to enable them to face any difficult situation. They should be able to participate in development activities, and also in the process of decision making.

Meenu et al. (2011) define women empowerment as women's hold over use of own resources and participation in decision making leading to improvement in their socio-economic status.

Gupta (2006) attempts to study the empowerment of women by using four indices. They are-

- i. Household autonomy index which measures the extent to which women alone or jointly with their husbands or with other household members can participate in household or personal decision making.
- ii. Freedom of mobility index which measures whether women have the freedom of movement or not.
- iii. Gender preference index which measures women's acceptance of unequal gender role by capturing their attitudes about the education of male and female children and their preferences for son over daughter.
- iv. Attitude towards domestic violence index which measures attitude of women toward various kinds of domestic violence suffered by them.

Mishra and Tripathi (2011) use the term empowerment, agency and autonomy interchangeably which include the ability to make authentic choice and to have resources to exercise these choices and finally to get the desired goal. Though empowerment, agency and autonomy substantially diverge from each other, and one cannot reflect the other, they are very positively related to each other so that an empowered woman can exercise a higher degree of autonomy and agency.

Pankaj and Tankha (2010) define women empowerment both as a process and as an outcome that alters the position of women both inside and outside their households. With this altered position women are able to realize better social and individual life.

Narang (2012) defines women empowerment as the process to increase the strength of women as spiritual, political, social or economic beings. According to the author, the most common explanation of “Women’s Empowerment” is the ability to exercise full control over one’s actions. Thus, in real sense, empowerment occurs when women achieve increased control and participation in decision making that leads to their better access to resources, and it often involves the empowered developing confidence in their own capacities.

Violence against women and girls is one of the most widespread human right violations. The UN Trust Fund to End Violence against women is the leading global fund introduced to eliminate violence against women and girls. Working with partners across the world, the UN Trust Fund supports concrete action to help thousands of women and girls attain justice, and to build long-term solutions for a world free of violence.

The United Nations Development Fund for Women (UNIFEM) also works to help in improving the living standards of women in developing countries and to address their concerns. UNIFEM provides financial and technical assistance to innovative approaches aimed at fostering women’s empowerment and gender equality. The Fund has activities in more than 100 countries. UNIFEM focuses its activities on four strategic areas: (i) reducing feminized poverty; (ii) ending violence against women; (iii) reversing the spread of HIV/AIDS among women and girls; and (iv) achieving gender equality in democratic governance in times of peace as well as war.

In July 2010, the United Nations General Assembly created UN Women, the United Nations Entity for Gender Equality and the Empowerment of Women. In doing so, UN member states

took an historic step in accelerating the Organization's goals on gender equality and the empowerment of women.

From the above discussion it can be concluded that empowerment process is multidimensional. The meaning of empowerment cannot be understood by a single word. There are various variables that define and indentify women empowerment. They are-

1. Household decision making
2. Attaining economic security
3. Access to resources
4. Control over resources
5. Educational status
6. Self-reliance and confidence
7. Freedom of movement
8. Political power
9. Gender equality
10. Process of capacity building and awareness
11. Physical and psychological capacity

4.4 Design of the Study

Research design is a blue print or structure within which research is conducted. It constitutes the blue print for the collection, measurement and analysis of data. According to Gay and Airasian (2000), “A design is general strategy for conducting a research study. The nature of the hypothesis, the variables involved, and the constraints of the “real world”- all contribute to the selection of design.” Kothari (1988) says, “Decisions regarding WHAT?, WHERE?, WHEN?, HOW MUCH?, by WHAT? concerning an inquiry or a research study together constitute research design. Thus, it can be said that research design is an outline of what the researcher will do from writing the objectives, hypotheses and their operational implications vis-a-vis analysis of data.

The present study is conducted with the major objective to study the livelihood pattern of women of Nagaon district of Assam and their present status of empowerment in the society. It is observed that a good number of research works have already been conducted on empowerment of women, but no such research had been conducted on livelihood pattern of women and their level of empowerment in Nagaon district. Therefore, the present study is a humble pioneering attempt in this regard.

In this subsection of the chapter the design, method and technique adopted for carrying out the research work are discussed in details.

4.4.1 Description of the Data

The study is based on primary data. All the data are collected from the target group population. Personal interview method through field schedule is used for collection of data.

A methodological diagram of the study is given below-

Objectives of the study	Description of tool used	Sources of data	Nature of data
To study and examine the livelihood pattern of women and their valued and unvalued works.	Interview through field schedule	Primary sources	Quantitative
To assess and examine the women's own interpretations of , priorities for, and abilities for their livelihoods	Interview through field schedule	Primary sources	Qualitative
To estimate and examine the level of empowerment of women by constructing a suitable empowerment index	Interview through field schedule	Primary sources	Quantitative
To find out the empowerment differentials among women having different livelihood patterns and options	Interview through field schedule	Primary sources	Quantitative
To assess the impact of livelihood patterns of women on their level of empowerment amidst different personal background characteristics	Researcher's Observation	Researcher's Views	Both Qualitative & Quantitative

4.5 Methodology

Methodology of research refers to the plan of action to examine the research problem from various possible angles, so that the objective of the study could be accomplished. The meaning of methodology is the set of methods used in a particular area of activity. It may be understood as a science of studying how the research is undertaken, based on logically derived empirical evidence from the environment. The prime necessity of the research is not only to follow all the steps of research methods or techniques, but also to consider its methodology carefully. Thus, the research methodology includes research design, and statistical design. The logic behind these designs used by the researcher must be relevant to his or her study.

In the present research study the descriptive survey method is used to meet the objectives of the study. Descriptive research collects information or data to answer questions about the current status of the topic or subject of the study. Therefore, here, survey method is used to collect the primary data to meet the objectives of the study.

4.5.1 The Study Area

Since women empowerment is a prerequisite for economic development, this study aims at analyzing the level of women empowerment in an economically backward district of Assam. The geographical area selected for the study is Nagaon district of Assam. The district is selected for the following reasons. It is one of the most backward districts of Assam and is thickly populated (density of population is more than 700 per square km as per 2011 Census which is the highest in the state). As per HDR of Assam- 2003, the position of Nagaon in HDI ranking is 14 out of 23 districts of the state and its GDI rank is 22 which points towards the prevalence of high gender

disparity in the society. Moreover, the female work participation rate is only 12.24% in 2001 which is the third lowest in Assam. The female literacy rate is 68.07% as per census 2011. Keeping all these points in view, a pioneering attempt is made here to study the livelihood pattern of women and their level of women empowerment in Nagaon district of Assam.

4.5.2 The Target Group Population

The target group population for the study comprises of adult women belonging to the age group of 18-60 years of rural and urban areas of Nagaon district. Identification of this group is in the line of the study that focuses on empowerment and workforce participation of women. As per the Population Census 2011, the female population of the district was 1,385,699. In urban areas the size of female population was 181,407 and in rural areas it was 1,203,249. But, Census Data on the exact size of male and female population of 18-60 years age group is not available.

4.5.3 Sample of the Study

Sampling is the process of selecting a sample from the target group population. It is the process through which one may draw valid inferences on the basis of careful observation of variables within a relatively small proportion of the population. Multistage sampling technique is followed for the selection of the sample of study. A sample of women of 18-60 years age groups from rural and urban areas of district is drawn for the study. For the rural subsample, 5 CD blocks out of the 18 in the district are selected at random in the first stage. In the second stage, 20 villages from 5 selected blocks taking 4 villages from each block are selected purposively. In the third stage, from each village, thus selected, 15 target group women belonging to 18-60 years age group from 15 households are selected purposively and interviewed for collection of rural data.

For the urban subsample, the Nagaon Municipality Board area is surveyed and a subsample of 100 target group women from 100 households are selected and interviewed for collection of data.

4.5.4 Collection of Data

The present study focuses on livelihood pattern of women and their level of empowerment in Nagaon district of Assam. For the study five development blocks out of eighteen development blocks of Nagaon district are selected at random. The names of these five development blocks which are selected for the study are Khagorijan development block, Raha development block, Pakhimoriya development block, Dolongghat development block and Barhampur development block. And from each of these five development blocks four villages are selected purposively and from each village fifteen target group women belonging to age group of 18-60 years from fifteen households are selected purposively and interviewed for collection of rural data. The names of the four villages selected from each of the five development blocks are mentioned below-

1. Khagorijan Development Block

- i. Khutikatia Village
- ii. Sensuwa Village
- iii. Komargaon Village
- iv. Biroh Bebejia Village

2. Raha Development Block

- i. Ghahi Village
- ii. Gormur Village
- iii. Jagial Village

iv. Petboha Village

3. Pakhimoriya Development Block

i. Morongial Village

ii. Hatipara Village

iii. Deodhar Village

iv. Rantholi Village

4. Dolongghat Development Block

i. Nij Hatisung Village

ii. Samuagaon Village

iii. Kujidah Namati Village

iv. Jamuguri Village

5. Barhampur Development Block

i. Birohigaon Village

ii. Sutargaon 1 Village

iii. Sutargaon 2 Village

iv. Komar gaon Village

For urban subsample, Nagaon Municipality Board area is surveyed and subsample of hundred target group women in the age group of 18-60 years from hundred households are interviewed for collection of urban data.

Here data have been collected through direct personal interview method with the help of a pre-tested structured schedule which contains information about the livelihood pattern of women respondents who are engaged in formal and informal sector and household sector. It provides an

idea about the employment of women in various sectors. Here an attempt is made to study how livelihood differentials impact on the empowerment differentials among women respondents. On the basis of data received from both employed and unemployed women respondents, the empowerment of women is measured by using the following constituents –

Decision making within the Family: The decision making ability of women within the family is judged by using the following variables or attributes-

1. Family health care
2. Larger household purchase
3. Routine household purchase
4. Family size
5. Family planning
6. Job of women
7. Going outside home of any member
8. Family day- to- day expenditure
9. Spending personal income

All the above variables are quantified as

- Entirely by the respondent-1
- Partially by the respondent- 0.5
- Entirely by others- 0

Freedom of movement outside home: Freedom of women is judged by using the following variables or attributes-

1. Local market for purchase

2. Local health centre/clinic
3. Neighborhood for gossip
4. Visiting home of relatives/friends
5. Visiting other city or village
6. Cinema hall, club, festival or village fair etc.
7. Visiting parental home
8. Participating in cultural programmes of village/town
9. Participating in religious programmes of village /town
10. Participating in the meeting of women organizations
11. Doing job/work outside home for self earnings

All the above variables are quantified as

- Entirely by the respondent-1
- Partially by the respondent- 0.5
- Entirely by others- 0

Political Participation of Respondent Women: Following variables or attributes define the constituent part of political participation of women empowerment.

1. Ability to cast vote in election
2. Vote to a candidate of her choice
3. Attend the speeches of the election candidates
4. Update herself about the political system
5. Talk to political leaders/representatives in need

All the above variables are quantified as-

- Entirely by the respondent-1
- Partially by the respondent- 0.5
- Entirely by others- 0

Respondent Women's Control over Economic Resources: Following variables or attributes

are used to measure the women's ability to have control over economic resources-

1. Routine household spending
2. Purchasing jewelry/ bonds/shares
3. Purchasing gifts for relatives
4. Control the savings for use
5. Purchasing clothes and make-up articles
6. Own and control household variables
7. Sale/ purchase or exchange land/ house/ livestock
8. Education/expense on children
9. Purchasing daily foods
10. To open bank account/ insurance policy by her name

All the above variables are quantified as-

- Entirely by the respondent-1
- Partially by the respondent- 0.5
- Entirely by others- 0

Freedom of the Respondent Women to Enjoy Exposure to Media: This constituent of

empowerment is measured by using the following variables or attributes-

1. Read daily news paper of her choice

2. To watch TV programme of her choice
3. To read books/ journals/ magazines of her choice
4. To go to cinema house/theatre to see movies
5. To use mobile phone/ internet

All the above variables are quantified as-

- Entirely by the respondent-1
- Partially by the respondent- 0.5
- Entirely by others- 0

4.6 Tools Applied For Data Analysis

The data collected through field survey cover a wide range of information pertaining to respondent's current income, total household's current income, household's educational qualification, economic status, caste, respondent's age, number of assets owned, attributes of women empowerment etc, priorities of women for their livelihood etc. To analyze the data collected from field survey, various mathematical and statistical tools such as fuzzy set technique and linear regression model by applying OLS method are used to find out level of empowerment of women in Nagaon district. Factor analysis approach is also used to measure the level of empowerment of women on the basis of various empowerment attributes. Several statistical tables and diagrams are constructed to represent the level of empowerment of women. The objectives of the research work are examined on the basis of these.

4.6.1 Fuzzy Set Technique

The notion of Fuzzy set technique was first introduced by Zadeh in 1965. Fuzzy set is best used to represent or manipulate data and information which are non-statistical uncertainties. Fuzzy logic is a many-valued logic which deals with approximate, rather than fixed and exact values. Comparing to binary logic where variables may take true or false values, fuzzy logic variables may take a truth value that ranges in degree between 0 and 1. Fuzzy sets therefore allow elements to be partially in a set. In fuzzy logic each element is given a degree of membership in a set. A membership function in fuzzy logic is the relationship between the values of the element and its degree of membership. This membership value can range between the values from 0 to 1. Let X be the collection of objects denoted by x . Then a fuzzy set A in X is the set of ordered pairs:

$$A = \{(x, \mu_A(x)) \mid x \in X\}$$

$\mu_A(x)$ is called the membership function or grade of membership of x in A and

$$\mu_A : X \rightarrow [0,1]$$

The theory of fuzzy logic provides a mathematical strength to capture the uncertainties associated with human cognitive processes, such as thinking and reasoning etc.

The fuzzy set theory has been applied in different frameworks. This theory has been applied to measurement of poverty (Cerioli, Zani, (1990); (Lemmi, Betti, (2006)); well-being (Chiappero, Martinetti, (2000)); Balamoune-Lutz, (2004)), quality of life (Lazim, Osman, (2009)), domestic violence (Devadoss, Sudha, (2013)); customer satisfaction for a service (Zani,

Milioli, Morlini, (2012)), or satisfaction of graduates with the suitability of university education for working purposes (Crocetta, Del Vecchio, (2007)) etc.

In this research work the fuzzy set approach is applied to analyze the empowerment of women in Nagaon district. Women empowerment is a multidimensional concept. This multidimensional concept of empowerment can be measured with fuzzy set technique. Fuzzy technique can distinguish between different degrees of empowerment by assigning some membership values to the different constituents of empowerment. The mathematical framework of the same is presented below.

Let X be a set of all population and E is the fuzzy subset which represents the set of empowered women. The degree of membership to the fuzzy set E of the i -th individual ($i = 1, \dots, n$) with respect to the j -th constituents ($j = 1, \dots, m$) is defined as

$$\mu_E \left(X_j (a_i) \right) = x_{ij} \quad 0 \leq x_{ij} \leq 1$$

Where

- i. $x_{ij} = 1$ if the i -th individual is fully empowered with respect to the j -th constituents;
- ii. $x_{ij} = 0$ if the i -th individual is not empowered with respect to the j -th constituents
- iii. $0 \leq x_{ij} \leq 1$ if the i -th individual is partially empowered with respect to the j -th constituents with an intensity belonging to the open interval $(0,1)$.

The empowerment index of the i -th individual $\mu_E (a_i)$ i.e. the degree of membership of i -th individual to the fuzzy set E is defined as the weighted average of x_{ij} ,

$$\mu_E(a_i) = \frac{\sum_{j=1}^m x_{ij} w_j}{\sum_{j=1}^m w_j}$$

where w_j is the weight attached to the j -th constituents. The empowerment index $\mu_E(a_i)$ measures the degree of empowerment of i -th individual as a weighting function of the m constituents. Hence, it measures the intensity to empowerment of the i -th individual subject to decision making, freedom of movement, political participation, women's control over economic resources and freedom of women to enjoy the exposure to media.

The weight w_j attached to the j -th constituents stand for the intensity of empowerment of X_j . More a constituent is accessed by the respondents, fewer numbers of respondents are deprived of and more important it becomes. Such a constituent should get greater weight among all the constituents.

A weight that fulfills the above property is proposed by Cerioli and Xani (1990) and can be represented in the following form-

$$w_j = \log \left[n / \sum_{i=1}^n x_{ij} \right] \geq 0$$

Finally, the empowerment index of the population μ_E is simply obtained as a weighted average of the empowerment index of the i -th individual $\mu_E(a_i)$

$$\mu_E = 1/n \sum_{i=1}^n \mu_E(a_i)$$

In addition to the multidimensional empowerment index of the i -th individual $\mu_E(a_i)$ and of the population μ_E , the fuzzy set theory also allows to obtain a unidimensional empowerment index for each of the j -th constituents considered.

While the multidimensional empowerment index for the i -th individual $\mu_E(a_i)$ is the weighted average of x_{ij} , with weight w_j , the unidimensional empowerment index for the j -th constituents is the average of x_{ij} :

$$\mu_E(X_j) = 1/n \sum_{i=1}^n x_{ij}$$

In this way it is possible to get the multidimensional empowerment index of the population μ_E as the weighted average of $\mu_E(X_j)$ with weight w_j :

$$\mu_E = 1/n \sum_{i=1}^n \mu_E(a_i) = \sum_{j=1}^m \mu_E(X_j) w_j / \sum_{j=1}^m w_j$$

In order to define the degree of membership x_{ij} to the set E of the i -th household,

$i = 1, 2, \dots, n$, with respect to the j -th constituents, $j = 1, 2, \dots, m$ it is possible to follow a three steps procedure-

First, for each constituent X_j it is necessary to build a table containing the possible simple or composite outcomes of X_j .

Second, to each outcome it is associated a value, in the closed unit interval $[0,1]$, which represents, for the j -th constituents, the degree of membership to E corresponding to the given outcome.

Third, for the i -th household, $i = 1, 2, \dots, n$, the outcome is observed with respect to the j -th constituents and it is assigned the corresponding degree of membership to E , which for the i -th household is x_{ij} .

In the present study Fuzzy Set Technique has been applied on 300 rural respondents and 100 urban respondents to assess the level of empowerment of women in Nagaon district.

4.6.2 Factor Analysis Approach

Factor analysis approach is applied to measure the status of women empowerment in Nagaon district. Factor analysis is applied on 400 respondents to assess the empowerment level of women. The women empowerment is measured here as a function of a set of constituents which are represented in the form of women's decision making within family, freedom of movement, political participation, control over economic resources and freedom of women to enjoy the exposure to media. The variables or attributes which are used in this study to measure women empowerment in its above mentioned five constituents of women empowerment are defined below.

Decision making within family: The decision making ability of women within the family is judged by using the following attributes or variables-

1. Family health care
2. Larger household purchase

3. Routine household purchase
4. Job of women
5. Going outside home of any member
6. Family day-to-day expenditure
7. Spending personal income

All the above variables/attributes are quantified as-

- Entirely by the respondent-1
- Partially by the respondent- 0.5
- Entirely by others- 0

Here two attributes, namely Family Size and Family Planning Services are dropped out from the analysis of data. The reason for this is that the respondents are married, unmarried and widowed women. An unmarried girl and widow cannot participate in family size and family planning services. But a married woman can participate in those activities. Since among all the respondents some can participate and some cannot participate, therefore, these two attributes are dropped out from the analysis of data.

Freedom of movement: The variables/attributes which represent freedom of movement of women are -

1. Local market for purchase
2. Local health centre/clinic
3. Neighborhood for gossip
4. Visiting home of relatives/friends
5. Visiting other city or village

6. Cinema hall, club, festival or village fair etc.
7. Visiting parental home
8. Participating in cultural programmes of village/town
9. Participating in religious programmes of village /town
10. Participating in the meeting of women organizations
11. Doing job/work outside home for self earnings-

All the above attributes are quantified as-

- Entirely by the respondent-1
- Partially by the respondent- 0.5
- Entirely by others- 0

Political participation- The following attributes or variables define the constituent part of Political Participation of women empowerment.

1. Ability to cast vote in election
2. Vote to a candidate of her choice
3. Attend the speeches of the election candidates
4. Update herself about the political system
5. Talk to political leaders/representatives in need

All the above variables are quantified as-

- Entirely by the respondent-1
- Partially by the respondent- 0.5
- Entirely by others- 0

Women's control over economic resources- The following variables or attributes are used to measure the women's ability to have control over economic resources-

1. Routine household spending
2. Purchasing jewelry/bonds/shares
3. Purchasing gifts for relatives
4. Control the savings for use
5. Purchasing clothes and make-up articles
6. Own and control household variables
7. Sale/ purchase or exchange land/ house/ livestock
8. Purchasing daily foods
9. To open bank account/ insurance policy by her name

All the above variables are quantified as-

- Entirely by the respondent-1
- Partially by the respondent- 0.5
- Entirely by others- 0

Here also one attribute namely Education/Expense on children is dropped out from the analysis of data because an unmarried respondent cannot participate in such activities.

Freedom of women to enjoy the exposure to media- This constituent of empowerment is measured by using the following variables or attributes-

1. Read daily news paper of her choice
2. To watch TV programme of her choice
3. To read books/ journals/ magazines of her choice

4. To go to cinema house/theatre to see movies
5. To use mobile phone/ internet

All the above variables are quantified as-

- Entirely by the respondent-1
- Partially by the respondent- 0.5
- Entirely by others- 0

To construct women the empowerment index, it is important to calculate the relative importance of the attributes. To derive the relative objective weights of selected attributes, some scientific techniques need to be applied. In the present study the statistical technique ‘Principal Component Analysis’ (PCA) of data reduction technique ‘Factor Analysis’ has been used to find out the empowerment variation in different attributes and to determine the relative weights of the selected aspects of empowerment for constructing composite index of empowerment. The Principal Component Analysis produces components (factors) in descending order of their importance and factor loading which explain the relative weights of different attributes in explaining variances in the phenomenon. In this study, all the components are taken into account to find out relative weights of selected attributes in order to reflect maximum possible variation in the constituents of empowerment of women. The method for determining the relative weights for the attributes is explained below-

$$W_i = F_{ik} \lambda_k$$

W_i = Weight of i -th attributes of women empowerment,

F_{ik} = Factor loading of i -th attributes and k -th factor which reflects the highest correlation between variable (X_j) and factor (F_k) and

λ_k = Variation explained by k -th factor.

The composite index of women empowerment is estimated by applying the following formula-

$$WEI = \sum Z_i W_i / \sum W_i \text{-----(1)}$$

where WEI is the composite index of women empowerment, Z_i is the i -th attributes of women empowerment and W_i is the weight of the i -th attributes derived from factor analysis.

In the present study factor analysis has been applied on 300 rural respondents and 100 urban respondents to assess the level of empowerment of women in Nagaon district.

4.7 Regression Analysis to Identify Socio-Economic Factors Affecting Women Empowerment

To identify the causal connection of various socio-economic factors with women empowerment two regression equations are constructed and estimated by applying OLS method.

The Regression Model-1

In the regression model-1, the women empowerment index (WEI) constructed by Factor Analysis is taken as dependent variable. Higher value of women empowerment index indicates higher level of empowerment among women of Nagaon district. Therefore, it is considered as a dependent variable in the regression model.

The following socio-economic factors, having literature support, are considered here as a set of explanatory variables which will explain the variation in women empowerment. These explanatory variables are-

1. Respondent's age (RA)
2. Caste
 - General-1
 - Otherwise-0
3. Respondent's educational qualification (REQ)
4. Household income excluding respondent's income (HIERI)
5. Respondent's income (RI)
6. Place of residence (PR)
 - Urban-1
 - Otherwise-0
7. Household's main occupation (HMO)
 - Head of the household is engaged in agriculture-1
 - Otherwise-0
8. Economic status (ES)
 - APL-1
 - Otherwise-0
9. Number of specified assets owned (NSAO)

The specified assets are Television, Bicycle, Mobile Phone, Refrigerator, Two Wheeler, Four Wheeler, Computer and Washing Machine.

10. Primary

- Respondent is engaged in primary sector-1
- Otherwise-0

11. Secondary

- Respondent is engaged in secondary sector-1
- Otherwise-0

12. Tertiary

- Respondent is engaged in tertiary sector-1
- Otherwise-0

Here the reference group comprises of women who are not in paid jobs.

The regression model-1 constructed with the above variables is as under

$$WEI_{FA} = \beta_0 + \beta_1 RA + \beta_2 CASTE + \beta_3 REQ + \beta_4 HIERI + \beta_5 RI + \beta_6 PR + \beta_7 HMO + \beta_8 ES + \beta_9 NSAO + \beta_{10} PRIMARY + \beta_{11} SECONDARY + \beta_{12} TERTIARY + \mu$$

Here β_0 is the constant term, β_j 's are the regression coefficients where $j=1,2,\dots,12$ and μ is the random disturbance term.

The Regression Model-2

In the regression model-2, the women empowerment index (WEI) constructed by Fuzzy Set Technique is taken as dependent variable. For the explanatory variables, the same set of explanatory variables as given in the regression model-1 is taken into account in the regression model-2. The regression model-2 is constructed as-

$$WEI_{FS} = \beta_0 + \beta_1 RA + \beta_2 CASTE + \beta_3 REQ + \beta_4 HIERI + \beta_5 RI + \beta_6 PR + \beta_7 HMO + \beta_8 ES + \beta_9 NSAO + \beta_{10} PRIMARY + \beta_{11} SECONDARY + \beta_{12} TERTIARY + \mu$$

Here β_0 is the constant term, β_j 's are the regression coefficients where $j=1,2,\dots,12$ and μ is the random disturbance term.

With the help of the results obtained from these two regression models, the impact of various socio- economic factors on women empowerment of Nagaon district can be examined.

4.8 Conclusion

The present chapter represents the theoretical and conceptual framework of the study, various concepts of empowerment, women empowerment, meaning of livelihood etc. To achieve more logical and appropriate result all the concepts and variables are explained systematically. The methodology part of the chapter explains the study areas of the district, sample design, method of data collection, survey schedule. Besides these, the mathematical and statistical tools and techniques which are used for the purpose of data analysis are also discussed in the chapter.