Multidimensional approach for measuring female-based urban poverty in recently urbanizing societies: Sehore City of Madhya Pradesh, India as case study

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Abstract

The present study deals with selected aspect of measuring the prevalence of female-based multidimensional poverty in upcoming township of Sehore Municipal Council (Sehore M.C.) with limited economic opportunities reflected in economic poverty as such. The female-based urban poverty is also reflected even in households which are not below poverty line (BPL) and households with higher female work participation, suggesting that not only economic factors are at play when discussing the high rates of female-based socio-economic deprivation in the study area.

The parameters selected for this research were considered to be relevant for the evaluation of female-based multidimensional poverty given the local conditions. The study is based on the methodology of multidimensional poverty index (MPI) given by UNDP (2010) in which six domains including housing poverty, economic poverty, educational poverty, health poverty, lack of time for relaxation and lack of empowerment and decision-making power, are selected to evaluate female-based MPI. In order to bring out spatial variation in concentration of female-based MPI, seventeen congested and crowded localities across four wards with varying percentage population of females and female workers were surveyed. The results show that fifteen localities (88%) scores as multidimensionally poor on female-based MPI; one locality is severely poor; and one is vulnerable to multidimensional poverty. Out of the six analysed domains, the contribution of lack of empowerment and decision-making power domain are contributing the most to the female-based MPI (nearly 24%). The study concludes with the justification for selecting the indicators in evaluating the female-based MPI in new-urbanizing society in India along with area specific suggestions to tackle with existing problem of female-based urban poverty in Sehore M.C.

Keywords: *Sehore M.C.; female-based urban poverty; Multidimensional Poverty Index; spatial mapping; new-urbanizing society*

Rezumat. Abordare multidimensională pentru măsurarea sărăciei femeilor din mediul urban în societățile recent urbanizate: orașul Sehore din Madhya Pradesh, India, ca studiu de caz

Prezentul studiu tratează un aspect al măsurării răspândirii sărăciei multidimensionale a femeilor în viitoarea localitate a Consiliului Municipal Sehore (Sehore M.C.), cu oportunități economice limitate reflectate în sărăcia economică ca atare. Sărăcia femeilor din mediul urban se reflectă chiar și în gospodăriile care nu se află sub pragul sărăciei și în gospodăriile cu o participare mai mare a femeilor la muncă, ceea ce sugerează că alți factori decât cei economici sunt în joc atunci când se discută ratele ridicate ale deprivării socio-economice a femeilor din zona de studiu.

Parametrii selectați pentru această cercetare au fost considerați relevanți pentru evaluarea sărăciei multidimensionale a femeilor, având în vedere condițiile locale. Studiul se bazează pe metodologia indicelui sărăciei multidimensionale (IPM) calculat de de UNDP (2010) în care șase domenii incluzând sărăcia locativă, sărăcia economică, sărăcia educațională, sărăcia în sănătate, lipsa timpului pentru relaxare și lipsa de împuternicire și putere de decizie, sunt selectate pentru a evalua MPI-ul femeilor. Pentru a scoate la iveală variația spațială a MPI-ului femeilor, sunt chestionate șaptesprezece localități congestionate și aglomerate din patru districte, cu un procent diferit de populație feminină și de femei lucrătoare. Rezultatele arată că cincisprezece localități (88%) au fost înregistrate ca fiind sărace din punct de vedere multidimensional pe baza MPI-ului femeilor; o localitate este extrem de săracă; iar una este vulnerabilă la sărăcia multidimensională. Dintre cele șase domenii, contribuția lipsei de împuternicire și a puterii de decizie contribuie cel mai mult la MPI-ul femeilor (aproape 24%). Studiul se încheie cu justificarea selectării indicatorilor în evaluarea MPI a femeilori în societatea nou urbanizată din India, împreună cu sugestii specifice zonei pentru a aborda problema existentă a sărăciei femeilor din mediul urban în Sehore M.C.

Cuvinte-cheie: *Sehore M.C.; sărăcia femeilor din mediul urban; indicele sărăciei multidimensionale; cartografiere spațială; societate nou urbanizată*

Introduction

Although the concept of 'feminization of poverty' (Cagatay, 1998) which infers that the proportion of female is higher than that of males within the poor is often debated, it is no surprise to see women as most deprived in terms of overall wellbeing and not only in terms of prevalence of income poverty. The increasing gender bias has emerged as the major cause of female poverty and prompts to bring up the issue of women development again at the forefront, especially in the urban context.

There are various dimensions of urban poverty across which females are deprived including social empowerment, time for relaxation, lack of decision-making power, control over assets as well as income (UNIFEM, 2008). As suggested by Masika, De Haan and Baden (1997), men and women experience

poverty differently. Since the responses and experiences of poverty are dissimilar for men and women, it is important to look into the ways females experience poverty. Also, since poverty has an urban face, female poverty needs to be relooked at from the urban point of view and its geographical spread (Rustagi, 2007; Chant, 2013) in order to frame proper policies for tackling the menace of disempowerment and deprivation amongst the female population especially in case of urban areas. This becomes more pertinent in the light of United Nations Sustainable Development Goals which plan to reduce poverty in all its form everywhere by the year 2030 with the help of pro-poor and gender sensitive development strategies (UNSDGs, 2015).

The evolution of urban poverty as a multidimensional concept holds more importance for females, as more often, women are income-deprived and face gender discrimination because of existing socio-cultural disparities between men and women. As gender equality and poverty are intrinsically linked (Nieuwenhuis et.al., 2019), even in urban areas which offer a number of opportunities for promoting women empowerment, discrimination against women on the lines of gender and class are widespread (Chant, 2017) resulting in the widely acknowledged concept of 'feminization of poverty' in urban areas. The positive impact of urbanization is troubled by the burden of poverty faced by women (Banerjee and Guha, 2009; Sridhar, 2016).

It is against this background that the Multidimensional Poverty Index (MPI) given by UNDP (Alkire and Santos, 2010) becomes an excellent tool to assess the multiple deprivation aspects of poverty, narrowing down the gap disparities in socio-economic development on regional and sectoral levels. Since 2010, MPI for global comparison across countries is provided yearly by the Human Development Report based on three key dimensions regarding health, education and standard of living, comprising ten indicators. Therefore, the methodology to assess female-based multidimensional poverty is based on MPI given by UNDP (2010).

The significance of MPI for the present study lies in the fact that it belies the general tendency to give primacy to monetary status as the measurement of poverty which fails to provide a holistic picture. Thus, as per the evidence, the issue of female poverty is a multidimensional one and hence it needs to be measured from a multidimensional perspective. It is often the case that women within the households receive smaller portions of food or have less investment in their education and health as compared to their male counterpart (Paramo and Boudet, 2018). Thus, it is pertinent to study the issue of female poverty in terms of multidimensional approach.

The selected area belongs to Madhya Pradesh which in 2011 recorded 27.63% urban population (national average 31.1%) and is placed at the lowest category on the female empowerment index as given by the McKinsey Global Institute (Woetzel et.al., 2015). Under this scenario, Sehore Municipal Council (Sehore M.C.) lying within the urban economic sphere of influence of two metropolitan cities of Bhopal and Indore is showing signs of an upcoming urbanizing society despite a tradition bound society, lack of economic opportunities especially for women and lack of gender sensitive infrastructure. Sehore M.C. recording an overall urban female work participation rate of 12.8%, is showing wide variation in both female work participation rates with contrasting picture of posh localities not sending females to job market. Therefore, the issue of female poverty in Sehore M.C. is assessed through a multidimensional approach tailoring indicators relevant to the local setting (Peterman and Seymour, 2018), for an in-depth analysis of the spatial pattern of female deprivation as an example to assess the effect of socio-cultural aspects in future socio-economic development of Sehore M.C., an urbanizing city of Madhya Pradesh.

In this context, the aim of the study is to observe the prevalence of female-based multidimensional poverty in the surveyed localities of Sehore M.C. which has been achieved through the following objectives: (i) to select relevant indicators and to identify the determinants of female-based multidimensional poverty; (ii) to measure the female-based multidimensional poverty index (MPI) in terms of deprivation scores and identify spatial pattern; (iii) to test the research hypotheses framed through multiple linear regression analysis; (iv) to give problem specific and area relevant suggestions to alleviate urban female poverty in critically identified female-based multidimensional poverty areas of Sehore M.C. Consequently, the study aims to assess whether multidimensional poverty index has reflected the prevalence of urban female poverty in terms of selected indicators specific to the given socio-economic conditions of females in the study area. The study also tries to assess what role the economic indicators play in predicting the female multidimensional poverty in the study area.

Literature Review

The existing gender bias in the society has made female deprivation more blatant (CEPAL, 2004). The large gender inequalities exist not only in terms of economic indicators, but also regarding women well-being, such as survival and education, their mobility for recreation as well as for work, the double burden of paid work and unpaid care work (Klasen, 2007). Thus, gender inequality and female-based poverty

are intrinsically linked to each other (Nieuwenhuis et al., 2019).

The multidimensional poverty aspect has gained momentum through Human Development Report (UNDP, 2010). The economic parameters have remained a primary indicator of poverty, yet there are various dimensions over which deprivation is based. Deprivations affect women in particular as the existing gender inequalities in the society have posed a worrying picture for women, especially in developing countries like India.

Against this background, the concept of 'feminization of poverty', first floated by Diana Pearce (1978) needs to be taken into account. The concept has come to mean three things with the subsequent evolution: women compared to men have a higher incidence of poverty; women's poverty is more severe than men's; over time, the incidence of poverty among women is increasing compared to men (Pierce, 1978; Cagatay, 1998). The United Nations Development Fund for Women (UNIFEM, 2005), primarily responsible for women development, encourages the mainstreaming of gender issues while asserting that 'feminization of poverty' is the biggest concern women face in today's world and describes it as the burden of poverty borne by women, especially in developing countries, ascribing the cause to the lack of capacity building of women internationally. The UNDP (2005) defines 'feminization of poverty' as a condition wherein the change in poverty levels is biased against households headed by female. But with the recent widening of understanding on the subject, it has been observed that limited focus on households headed by females does not offer an authentic display of female deprivation which is wider spread and needs to be assessed irrespective of the headship (Tinker, 1990; Chant, 2003).

The UNIFEM (2005) identifies seven main causes of this problem out of which absolute poverty, society's attitudes and immobility of women independently for work are most relevant keeping under view the study area of Sehore M.C. The burden of unpaid care work, migration of women in search of employment, higher proportion of females in informal employment, lack of support from family, lack of education especially beyond secondary in urban areas, as identified by Verick (2014) and unequal treatment of women almost in all spheres, are the important drivers of female-based multidimensional poverty. Following the contention of Bradshaw (2002) that female poverty is multidimensional and multi-sectoral, there is a need to recognize the various dimensions of female poverty that particularly emerge in an urban area (Chant, 2013), making thus clear that poverty faced by women in urban areas has a multidimensional nature.

Against this background, the present study deals with the issue of female poverty based on the Multidimensional Poverty Index (MPI) given by the UNDP (2010) which is flexible to decompose and use for various groups such as males and females, rural and urban etc. It is also noted that the recognition of poverty as being multidimensional has led to a better understanding of the concept holistically (Altamirano Montoya and Teixeira 2017). The multidimensional approach and decomposition of data has further led to broadening of the concept by allowing for cross comparisons within sub-groups and regions (Alkire and Santos, 2011).

The list of indicators comprised in the methodology of MPI is area-specific, a choice based on relevant dimensions proposed by standard international and national agencies such as UNIFEM (2008), UNDP (2010), Socio-Economic Caste Census (2011), NFHS-4 (IIPS, 2016), UN-HABITAT (2017) etc. The modified indicators as proposed by Aguilar (2015) are applied in consonance with the suitability for the study area in Sehore M.C.

There have been a number of studies based on measuring multidimensional poverty amongst females over various regions including Sub-Saharan Africa (Batana, 2013); Ethiopia (Aguilar, 2015). Multidimensional poverty amongst females has also been assessed based on NFHS data in India (Dehury and Mohanty, 2017) but there is definitely a dearth of studies on female-based multidimensional poverty particularly focusing on upcoming urban areas in India or newly upcoming urban areas like Sehore M.C. The present study attempts to address the issue of multidimensional poverty amongst females from the perspective of a small upcoming urban area such as that of Sehore M.C.

The study is thus focused on finding the relevant indicators for the assessment of female-based multidimensional poverty index in Sehore M.C. Although situated near two metros of Bhopal and Indore, Sehore M.C. is suffering from lack of work opportunities for both males and females. But due to the fact that females are multiply burdened by the lack of empowerment and decision-making power, time poverty, lack of recreation and time for themselves, considering the dual responsibility of paid and unpaid care work (Lawson, 2008), which leads to health crisis amongst women, calls for attention towards the multidimensional deprivation faced by women in the upcoming Sehore M.C. in terms of urban development.

Data and Methods

The study is based on primary data collected through a self-structured questionnaire based on the selected indicators of female-based urban poverty measures. The survey was conducted during 2017 and 2018 in which 17 localities across four wards with

a varying female population and female workers are selected from Sehore M.C. The adopted indicators reflect on urban female poverty issues. There has been no change in the administrative set-up of the region since the time of survey. The socio-economic fabric of the study area also remains the same.

The questionnaire collected six-stage data at area; locality; building; house; household and female-based levels. Since the study is female-based, the female-based level of the questionnaire is the most elaborate and intensive inquiring about various aspects including work-related aspect, health and nutritional status, social status, their management skills, awareness and decision-making power amongst females. The respondents belonged to the financially weaker class with the exception of a few households living in congested localities in insalubrious conditions with a higher degree of female working population mostly belonging to low literacy and educational level.

For the purpose of building the female-based multidimensional poverty index we used the selected indicators from the data collected through the primary data and classified them into six-domains

(Table 1). Although the standard Multidimensional Poverty Index (UNDP) measures deprivations across three basic dimensions of health, education and living standard, a large amount of literature on gender- and female-specific indices generation indicate that certain parameters are alo crucial and therefore need to be a part of the study, such as the time constraints as well as management practices and awareness amongst women.

Selection of indicators: The standard indicators are adopted from various international and national agencies for developing a female-based multidimensional poverty index. The indicators are divided into 6 domains including housing poverty, economic poverty, educational poverty; health poverty; lack of time for relaxation; and lack of empowerment and decision-making power. The adopted indicators particularly reflect on female-based urban poverty issues such as health poverty, time poverty (lack of time for relaxation) and lack of empowerment. The indicators are selected so that they can relate to the prevailing deprivation conditions in the Sehore M.C. area and more specifically to the surveyed area as follows:

Table 1 The list of indicators for Female-based Multidimensional Poverty Index

Indices for female-based multidimensional approach to urban poverty					
1. Housing Poverty	**2. Economic Poverty**	**3. Educational Poverty**	**4. Health Poverty**	**5. Lack of Time for Relaxation**	**6. Lack of Empowerment and Decision Making Power**
•1. % of householdshared/rented housing •2. % of semi-pucca and kuchcha housing •3. % of households with no LPG connection •4. % of households with exclusive kitchen • 5. % of households with no toilet/bathroom within home * 6. % of BPL HH * 7. % of workers in unorganized sector	•1% of non-working females •2. % of females working in unroganzied sector •3. % of females working under compulsion	•1. % of Illiteracy Females •2. % of females not having Education till Graduation •3. % of women not having Technical/Vocational Training	•1. % of females Not haivng normal Body Mass Index (BMI) •2. % of females never Consuming Milk; Pulses/Beans; Green Vegetables; •3. % of females having no access to Health services; •4. % of females haivng no access to Anganwadi •5. % of females having no awareness about common ailments	•1. % of females spending more than 4 hours on unpaid domestic chores •2. % of females working more than average working hours for women. •3. % of women whose work is not shared by other females of the huosehold	•1. % of females having no Freedom to visit Market place alone •2. % of females having no Freedom to visit Health facility alone •3. % of females having no Control over of personal income •4. % of females having no Exposure to Media% of females with decision deficit on Major Household Purchasing Decision •5. % of females with decision deficit on Education/Expense of Children •6. % of females having no decision on Purchasing Medical treatment •7.% of females having no decision on Purchasing daily food items

Sources:

Indicators of Urban Poor Communities and their Accessibility, UN Habitat (1)

Multidimensional Poverty Index, Human Development Report, United Nations Development Programme (UNDP) (2)

Urban Indicators, Socio - Economic Caste Census, 2011(1, 2)

National Family Health Survey-4 (4, 6)

Political Component, African Gender Status Index (6)

UNMP/TFEGE (2005) (3, 5)

UNDP (2005) En Route to Equality: A Gender Review of National MDG Reports 2005 (New York: UNDP) (4, 5)

(Anganwadi- Healthcare Centres; Semi-pucca and Kuchcha houses refer to houses which are not solid and permanent. Most often they are made of mud, reed, grass, straw, thatch etc.).

Sampling frame: As the study focuses on the analyses of female-based multidimensional poverty, which is mainly influenced by the economic condition of the household, localities with varying percentage of female population and female workers have been selected randomly. Within these four selected wards, 17 congested and crowded localities (localities with high population density) are selected with both having female workers and non-workers with their basic household information affecting overall poverty

of females on selected demographic and socio-economic parameters as follows:

1. Selection of wards with varying percentage of female workers and female population.

2. From the selected wards, localities which are congested and crowded are selected.

3. From the localities, households with both working women as well as households without working women are selected for the survey for the present study.

The sampling framework for the area and population under study is presented in Table 2:

Table 2 The sampling frame of the study

Selected Ward	Total Number of Households within ward	Size of Households for Survey (15% of the total households in ward)	Locality Selected within wards	Sample size of Households within Locality	% of Female Population in locality
Ward 27	427	64	Gadi Adda	20	54.44
			Chandrashekhar Marg	22	54.81
			Lohar Gali	22	52.81
Ward 31	743	110	Deewan Bagh	22	49.67
			Firdous Nagar	22	57.14
			Jamshed Nagar	22	50.00
			Peter's Compound	22	50.57
			Dulha Badshah	22	57.52
Ward 32	651	98	Jhuniabadi	20	55.79
			Banspura	20	53.61
			Sipahipura	20	51.00
			Qazipura	20	51.96
			Talayya Mohalla	18	58.88
Ward 33	527	80	Bhopali Phatak	20	58.62
			Jalali Mohalla	20	55.56
			Jamanpura	20	51.82
			Gohapura	20	59.09

Computation of Female-based Multidimensional Poverty Index: The methodology for the calculation of female MPI is based on the Multidimensional Poverty Index (MPI) given by the UNDP (Santos and Alkire, 2011). As per the methodology for the assessment of MPI, the following formulae have been used:

Weighting of dimensions and indicators

In the Female-based MPI the six dimensions are equally weighted, so that each of them receives a 1/6 weight. Thus, the indicators within each dimension are equally weighted:

$$\sum_{i=1}^{n} w_i = 1$$

$$H = \frac{q}{n}$$

Poverty cut-off point

For the Female-based MPI, a locality is identified as poor if it has a deprivation score (c_i) higher than or equal to 1/3 or 0.33, where (c_i) is given as-

$$c_i = w_1 I_1 + w_2 I_2 + \ldots + w_n I_n$$

Where $I_1 = 1$ if the person is deprived on the indicator I_1.

For those whose deprivation score is below the poverty cut-off of 0.33, it is censored to "0" to calculate the censored deprivation score $(c_i(k))$.

Computing the final MPI score

The multidimensional headcount ratio *(H)* for the deprived population is calculated as:

Here *q* is the number of females who are multidimensional poor (if censored deprivation score ≥ 0.33) and *n* is the total females.

The second component is called the intensity (or breadth) of poverty (A). It is the average deprivation score of the multidimensional poor females and can be expressed as:

$$A = \frac{\sum_{i=1}^{n} c_i(k)}{q}$$

Where $c_i(k)$ the censored deprivation score of the ith individual and q is the number of females who are multidimensionally poor.

The final score of MPI is given as:

$$\mathbf{MPI} = H \times A$$

The MPI score reflects the proportion of weighted deprivations that the poor experience in a society out of all the total potential deprivations that the society could experience.

The deprivation scores ($c_i(k)$)for the localities are mapped in GIS Environment to spatially depict the level of female-based multidimensional poverty in the study area.

Decomposing the MPI score by domains

For the purpose of decomposing the MPI scores by domains, censored headcount ratio (CH) is calculated as the number of persons who are MPI poor and deprived in the domain divided by the total population.

$$\textit{Censored Headcount Ratio } (CH_i) =$$

$$\frac{\textit{Number of MPI Poor and deprived on indicator}}{\textit{Total population}}$$

The contribution of each domain to the MPI is given by-

Contribution of domain i to

$$MPI =$$

$$\frac{\textit{Weight of domain i X Censored Headcount Ratio of domain i}}{MPI} \text{ X}$$

$$100$$

Identification of the Problem in the Study Area

Sehore M.C. belongs to Malwa Plateau region which is well known for the cultivation of wheat (Fig.1). The Seevan river, a tributary of the Parbati, passes through the middle of the city thus serving as its lifeline. According to 2011 Census, Sehore M.C. is reclassified as Class I city with 108,909 inhabitants.
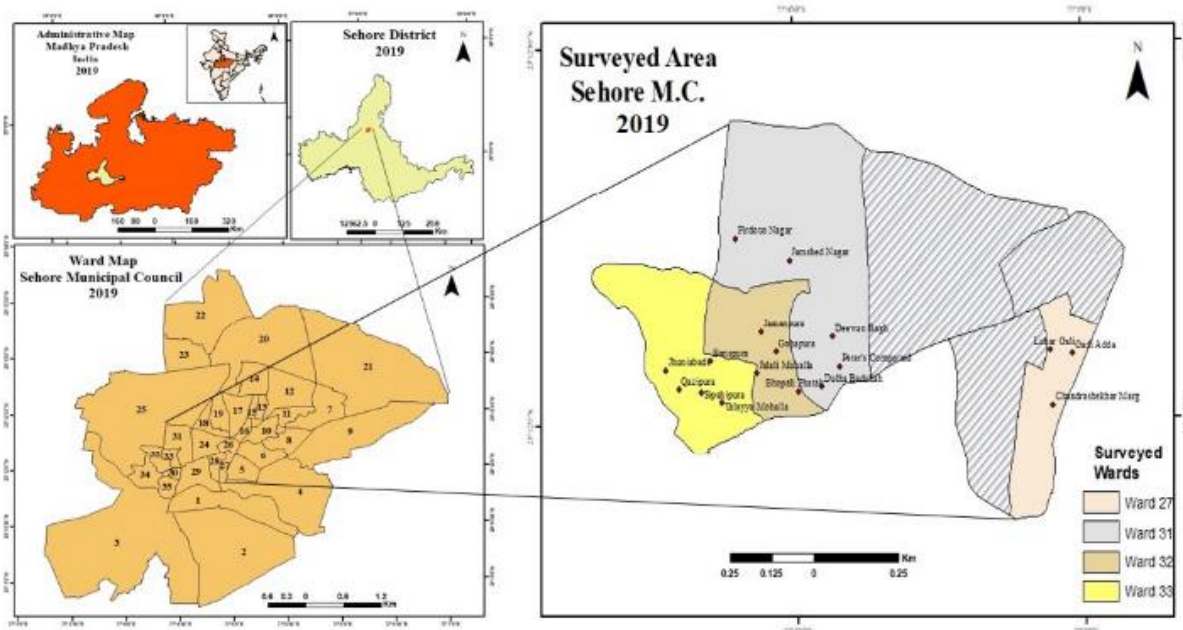
Figure 1: The location of the study area, Sehore M.C., Madhya Pradesh

The urban economy of the Sehore M.C. is mainly dependent upon agriculture and trade of agri-products. Nearly 92% of the workforce belongs to 'other work' according to Industrial Classification of workers in 2011 Census, which testifies for the predominant tertiary sector in Sehore M.C. with an annual urban growth rate of 17.94% (state, 20.30% and national 31.80%); the fact that Sehore M.C. lies in the vicinity of two metros of Bhopal and Indore offers valuable potential in terms of development.

At this note, it is important to highlight that Madhya Pradesh is one of the bottom five states on McKinsey's Femdex (the Indian Female Empowerment Index). Also, as per the country briefings of MPI, 53.71% of the country's population is MPI poor, out of which nearly two-thirds are concentrated in eight states including Madhya

Pradesh. As per the annual report of RBI (2012), the share of population living below the poverty line (BPL) in Madhya Pradesh is 21% in urban areas (national average 13.7%), amounting to more than half of the population in Sehore M.C. according to the City Development Plan for Sehore (2011).

More than half (58%) of the population in the surveyed area belongs to BPL, of which 12% benefit from Antyodaya Anna Yojana (AAY, scheme for providing subsidized food for the Poorest of the Poor), which is evident from the fact that nearly as much as 84% of the surveyed population belongs to less than Rs 10,000 income category. Within the study area, it has been found that nearly 24% females are working whereas 76% are non-working, with a high dependency ratio of 52%. Yet, although the females are employed, they are working in low-paying petty works, mostly based out of home, which do not amount to any significant change in their lifestyles. The females are clearly working for the mere sustenance of the family and to support their non-working or meagre-earning spouses in running the family.

It has been also found that there are certain areas over the city landscape which amount to a larger proportion of female workers while in other areas their work participation is very low. Most of the area where a high female work participation was registered belongs to the city centre through which the road connecting Bhopal and Indore passes and it thus can be considered the urban-economic lifeline of the city. This is borne out of the fact that poverty carries a multidimensional character and hence it cannot only be judged in terms of economic and working profile of the surveyed population. Several other relevant dimensions are therefore required to be taken into account, such as lack of educational attainment mainly due to the weak economic status and patriarchal mentality, decision-making power which is more evident in a male-dominated upcoming urban society such as Sehore M.C., time constraint due to duality of work which brings about a 'zero-sum game' for women (UN, 1990). All these factors play a significant role in reshaping the health status of women which is again an interplay of the above stated factors.

Thus, keeping under view the small urban size of Sehore M.C. (more than 100,000 population) and the ongoing urban development in the city, along with wide spatial variations in terms of female work participation has prompted to take up the issue of assessment of female-based urban poverty in the city. Therefore, an insight into the determinants and dynamics of female-based urban poverty of Sehore M.C. in spatial perspectives is required to define strategies to close down the gender gap and to promote overall socio-economic development in Sehore M.C. as well as other urbanizing smaller cities

in the state of Madhya Pradesh, so that the method of assessment of urban female poverty is applied to similar smaller urban towns in the ambit of larger cities.

Results and Discussion

Female-based Multidimensional Poverty Index in Sehore Municipal Council: Survey Results

The female-based multidimensional poverty index is based on the methodology of Multidimensional Poverty Index given by UNDP (2010). The weighting of indicators for the female-based multidimensional index is done as per the methodology given by the UNDP while each domain has equal weight. The results of the female-based multidimensional poverty index are as follows:

The headcount ratio (H), which is the basic measure of poverty, has recorded a value of 0.96 amongst the surveyed female population, thereby indicating that poverty is wide-spread, covering 96% of the respondents. Concerning the intensity of poverty in terms of weighted indicators selected for the study, 40% of the females are lying within deprivation indices of various dimensions of multidimensional poverty. The final score for measuring MPI is showing a value of 0.39 indicating a severity of female-based MPI amongst 39% of the surveyed female population (Fig. 2).
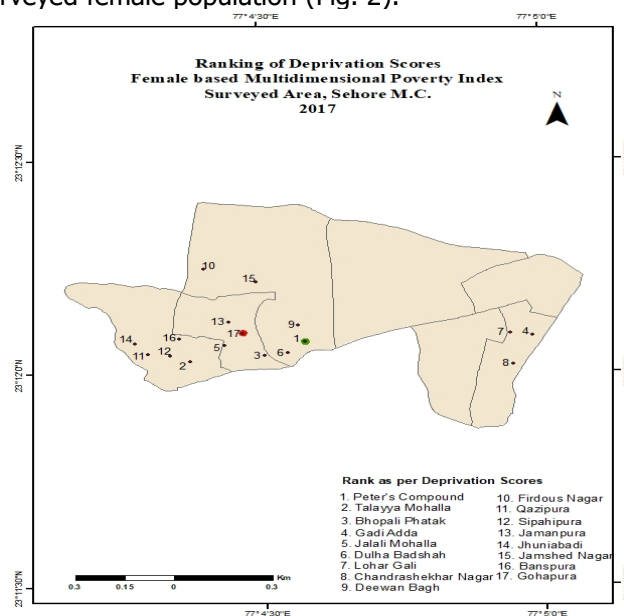
Figure 2: Ranking of Deprivation Scores, Female-based Multidimensional Poverty Index, Surveyed Area, Sehore M.C., 2017

Regarding the deprivation scores, it was observed that localities recording a higher incidence, intensity

and severity of poverty are concentrated towards the western part of the surveyed area (14 localities where both highest and lowest deprivation occur in ward 33 and 31, respectively). The lowest score on female-based MPI is found to be 32% in Peter's Compound thus placing it in a vulnerable category (c(k)<33%), while Gohapura locality scores 51% on the deprivation score, thus belonging to severely poor category (c(k)>50%) of MPI. Thus, 16 localities (96%) of the total localities are suffering from multidimensional poverty. The average score of deprivation of the multidimensional poor (the intensity of the poverty) is 40%. The overall multidimensional score of the female population is 0.39, meaning that the localities are deprived in nearly 39% of the total potential deprivations they experience overall.
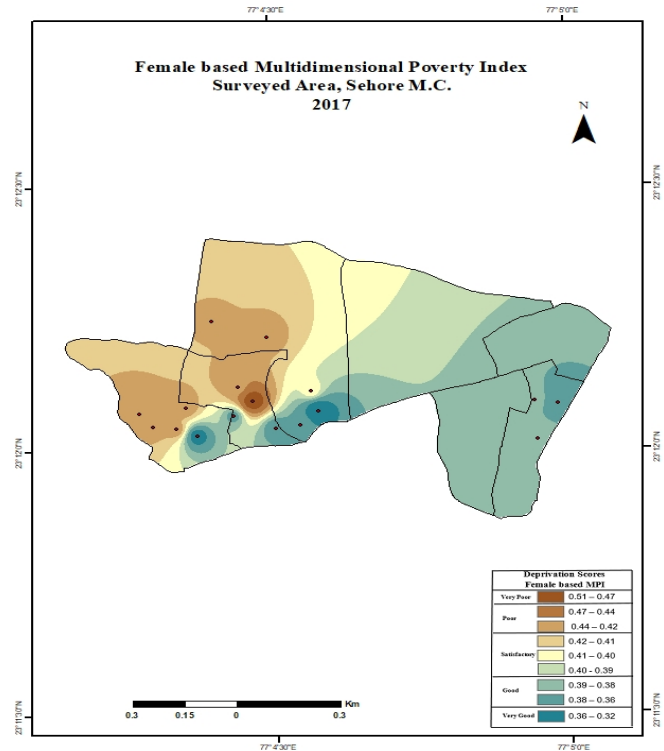
Spatial pattern of Female-based Multidimensional Poverty Index for surveyed areas

As per the location map (Fig. 3), certain concentration of deprivation scores dominating localities can be observed. Therefore, spatial interpolation technique through GIS was applied to find out the patterns of concentration or dispersion of female-based urban poverty in terms of deprivation scores as observed below.

Overall, two regions of high and low performing localities are clearly observable as per the interpolation results. The better performing localities lying below the mean deprivation score (<0.40) cover mostly market areas (ward 27), old core areas (ward 31 and 33) in the east of Sehore M.C., while the western portion of the study area lying above the mean deprivation score (> 0.40) is an indicative of poor performing localities covering mostly the city fringe margins merging into the rural hinterland.

The core of the low scoring (better performing) localities is at Peter's Compound, located in the southern portion of ward 31, stretching into ward 32 and 33 in the west and ward 27 towards the east. The core of the high (poor) performing localities lies in Gohapura in ward 33 stretching further west in ward 32.

The worst performing locality (very poor category, 0.51-0.47) of Gohapura (17th, ward 33) is scoring the highest on the female MPI (0.51). The time poverty is significantly prevalent in the locality due to large family size and long work hours involving High Density Polyethylene (HDPE) bag stitching work. The absence of women with education beyond secondary level and lack of exposure to media and awareness, all compound for the worst performance of the locality on female-based MPI.

Figure 3: Spatial pattern of Female-based Multidimensional Poverty Index, Sehore M.C., 2017

The poor performing localities (0.47 to 0.42) cover nearly 41% wards of the study area and the behavioural as well as social norms of the households located in the region are being influenced by the proximity to the rural hinterland. Jhuniabadi (16th), Banspura (15th) and Sipahipura (14th) in ward 32 are some of the most economically deprived areas of Sehore M.C., the male domination being visible in nearly all parameters. Though the females are performing fairly on economic domain, due to lack of exposure to media, awareness level and decision-making power, the social status of females is weak within these localities. Jamanpura (12th, ward 33) and Qazipura (11th, ward 32) perform poorly on economic domain due to involvement in low-paying HDPE work while many women suffer from time poverty due to its tedious nature. Firdous Nagar (10th, ward 31) houses most of the neglected migrant population while the high score (poor) on health poverty domain of the female-based MPI is reflected in the lack of access of Anganwadi workers (primary healthcare workers) owing to the interior location of the houses and their nearness to filthy sites.

Satisfactory conditions (0.42-0.39) prevail over Deewan Bagh (9th) in ward 31 which is considered as a posh locality both educationally and economically. Here, women are faring better, but because of the male dominance and the cultural norms which are biased against female work, women mostly work from home or near home, due to restricted mobility.

The better performing localities (good category, 0.39-0.36) are covering mostly the southern part of ward 33 and 31 and are stretching into the eastern most part of the study area, i.e. ward 27. The vicinity to the market area of Chandrashekhar Nagar (8th), Lohar Gali (7th) and Gadi Adda (4th) of ward 27 provides better access to work opportunities to females as well as social empowerment due to higher degree of awareness and accessibility of educational institutes including Government Colleges. For others, it is the accessibility to basic services and better economic conditions of people such as Dulha Badshah (6th, ward 31), Jalali Mohalla (5th) and Bhopali Phatak (3rd) in ward 33, that females are performing better on female-based MPI.

The best performing localities (very good category, 0.36 to 0.32) are Peter's Compound (1st, ward 31) and Talayya Mohalla (2nd, ward 32) according to the interpolated map results. Peter's Compound is ranking the lowest on the female-based multidimensional poverty index houses, due to better-off economic and educated strata of the society with a better accessibility to both educational and health institutes as well as active Anganwadi workers. Talayya Mohalla is performing better (low poverty) on the female-based multidimensional urban poverty index due to better access to the basic services such as Anganwadis (primary health care centres) and government schools and also due to working females in organized sector.

Decomposition of Female-based Multidimensional Poverty scores by domains

The decomposition of female-based multidimensional poverty scores by domains helps in grasping the meaning of female-based multidimensional poverty in a better and more nuanced way. Through the decomposition, the contribution of each domain has been assessed (Table 3).

Table 3: Domain-wise censored headcount ratio, weight and contribution

Domain	Censored Headcount Ratio (CH)	Weight (w)	Contribution (%)
Housing Poverty	0.53	0.167	23
Health Poverty (15-49 years females)	0.20	0.167	9
Educational Poverty (all females above 7 years)	0.52	0.167	22
Economic Poverty (18-65 years females)	0.29	0.167	13
Lack of Time for Relaxation (all females above 15 years)	0.19	0.167	8
Lack of Women Empowerment and Decision-Making (all females above 18 years)	0.56	0.167	24

The percentage contribution is the highest for lack of women empowerment and decision-making power (24% contribution to female-based MPI) mainly due to the highest censored headcount ratio in the concerned domain supported by the lack of female participation in government (2.8%), closely followed by decision-making deficit amongst females in terms of medical treatment (2.6%). The lack of households having access to smartphones and laptops with internet is causing a high deprivation in terms of housing domain (23% contribution to female MPI).

Educational poverty is significantly prevalent in the study area (22% contribution to female-based MPI), which is evident from the highest deprivation on indicator involving lack of females in technical/vocational education (7%).

Identification of Determinants of Female-based MPI in Sehore M.C.

In order to determine whether the three selected economic indicators (share of BPL households, share of workers in unorganized sector and share of female non-workers) could predict the female MPI, a multiple linear regression analysis was performed.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.669[a]	.447	.319	.036148

a: Predictors: % BPL HH, % of workers in unorganized sector, % of female non-workers

b. Dependent Variable: Female-based MPI

The result shows that there is strong relationship between the three selected independent variables and female MPI and (R=0.669), thus the model is a good predictor of the female MPI.

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	.014	3	.005	3.504	.047[b]
Residual	.017	13	.001		
Total	.031	16			

b. Dependent Variable: Female-based MPI

a: Predictors: (Constant), % BPL HH, % of workers in unorganized sector, % of female non-workers

The result indicated that the model explained 44.7% of the variance ($R^2=0.447$) in the female MPI and that the model is significant predictor of female MPI, $F_{(3,13)}=3.504$, $p<0.05$.

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
1 (Constant)	.05519	.124		.445	.664
% of BPL Households	-.00036	.001	-.140	-.541	.59781
% of workers in unorganized sector	.00375	.002	.622	2.375	.03365
% of female non-workers	.00052	.000	.266	1.232	.23973

a. Dependent Variable: Female-based MPI

Thus, the predictors of female MPI is showing the importance of the share of workers in unorganized sectors (0.0037, p<0.05), though the percentage of BPL households is negatively and insignificantly related to female-based MPI (-0.00036, p>0.05); the share of female non-workers was found to be insignificantly related to the female-based MPI (p>0.05). Thus, the choice of mixed population, BPL as well as non-BPL households for the purpose of study is justified. Also, since the share of female non-workers is not significantly contributing as a predictor of female-based MPI, hence, the choice of multidimensional indicators other than only economic indicators is justified for the present prevailing conditions in the context of the study area.

Conclusion

With a recently urbanizing society having people with patriarchal mindset, the city landscape of Sehore M.C. presents an abysmal picture regarding female workforce participation as female work is mainly discouraged in the tradition bound society living in core of the city or even in parts of posh colonies coming up along Bhopal-Indore State Highway. Since the assessment of female-based urban poverty in Sehore M.C. could not be measured only in monetary terms, therefore, area-specific and socio-cultural dimension of the society is harnessed to assess multidimensional female-based urban poverty in non-monetary terms also, in the upcoming township of Sehore M.C., Madhya Pradesh (India), such as in MPI by UNDP and Women Empowerment Index (WEI) of IFPRI.

The present study has discussed the issue of the multidimensional poverty amongst females and its spatial extent in a recently urbanizing small city of Sehore M.C. which has not been discussed in the previous studies. A widespread female-based multidimensional poverty was observed in the study area and it was validated by a MPI score of 39% covering 96% of the surveyed localities. Except for one locality, the entire surveyed area is experiencing female-based multidimensional poverty, while one locality is facing severe multidimensional poverty in the city area. The western periphery of the study area is experiencing a higher female MPI mainly due

to the lack to basic services and relatively larger distance from the city centre. The study area is suffering from the lack of women empowerment and decision-power deficit amongst women since the contribution of the lack of women empowerment domain is the highest in the female MPI. The lack of women empowerment and decision-power deficit is prevalent in the study area and forms the primary contributor to the female-based multidimensional poverty in the study area.

The choice of some economic indicators has been validated through multiple linear regression analysis from which it is inferred that BPL population is not significantly contributing to the model with female-based MPI as the outcome. Hence, the choice of non-BPL households is justified; the female non-working population is also not significantly contributing, thus pointing towards the fact that female MPI is prevalent in areas with even female work participation, which justifies the choice of non-economic indicators for the study of female MPI.

In order to bring out the women from multidimensional poverty, the schemes that are being run by the government such as training programmes of Centre for Entrepreneurship Development of Madhya Pradesh (CEDMAP), need to be upgraded and applied robustly in the problem areas such as the western portion of the study area covering ward 32 and 33 which is poorer in terms of urban basic services availability as compared to the eastern and southern margin of the study area.

The study is mainly confined to localities with certain socio-economic characteristics like market area, old core city area, and newly urbanizing area and city fringes only in which females work participation is found to be considerable. Therefore, the results of the study highlight the socio-economic conditions of an upcoming township with high female to male gender-ratio but low female work participation rates, a phenomenon common to many developing countries undergoing rapid urbanization.

Therefore, the approach to measure MPI for female to urban poverty is based on both standard as well as area specific indicators derived from survey data of Sehore M.C. (Madhya Pradesh, India) the given selection of indicators can form a basis for addressing similar socio-economic conditions of small towns within the urban sphere of influence of metropolitan cities to assess the multidimensional aspect of female-based urban poverty through MPI in India. This will help in identifying aspects of urban poverty amongst females and promote their economic contribution in an urbanizing society for better economic planning and gender sensitive policy issues.

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