FEMALE-BASED URBAN POVERTY IN PARTS OF SEHORE CITY, INDIA

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Abstract: Female-based urban poverty has been a widely researched topic fitting into the pursuit of gender equality since the Beijing 1995 Conference for Women. However, the criteria for measuring female-based urban poverty assume a direct role in reducing various urban poverty manifestations amongst females. Nevertheless, standard domains such as economic and educational statuses show some noticeable characteristics in smaller townships located in the low-urbanised states of India. The city under concern—Sehore Municipal Council (M.C. hereafter)—furnishes an example of an emerging urban area in a low-urbanised state of Madhya Pradesh (27.6% of the urban population compared to the national average of 31.16%) where domain-wise spatial manifestations of female-based urban poverty are noticeable. In addition to the financial aspect of urban poverty, the study attempts to identify local area determinants related to the socio-economic and the cultural environment of Sehore M.C., using standard variables and indicators for the spatial manifestation of female-based urban poverty through a GIS-based multi-criteria decision-making technique of the analytical hierarchy process (AHP). Female-based urban poverty in Sehore M.C., lying within the urban sphere of influence of two metro cities of Bhopal and Indore, is analysed across six domains of economic, educational, social, health, lack of decision-making and time poverty, for 17 selected localities across four wards. Out of the six selected domains, the economic poverty domain turns out to be the strongest, while time poverty is the least dominant. The present model of female-based urban poverty may apply to similar newly urbanising areas falling within the ambit of metro cities in India.

Keywords: urban poverty, female-based urban poverty, urban poverty modelling, Sehore city, analytical hierarchy process

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Introduction

The notion of female-based poverty has gained attention since the 1970s, culminating in the Beijing Conference on Women (1995) with the ultimate aim of attaining gender equality as a component of the gender and development approach. The deprivation amongst females is more tangible in urban areas, even though they enjoy higher female educational attainment and freedom (Bradshaw et al. 2017). The problem of declining female work participation is also adding to the already ailing situation of female-based urban poverty as low levels of female labour force participation can have negative economic effects (Kapsos et al. 2014). In this scenario,

newly urbanising areas that fall within the ambit of metro cities show potential for overall development as well as for the enhancement of gender equality.

The United Nations Development Programme (UNDP) has also focused on removing poverty amongst women for attaining the goal of an equal society (Cagatay 1998). Although the fact that 70% of the world's poor are women remains highly contested and debated, but it rightly points out that women suffer from chronic and structural poverty due to the existing gendered norms in the society (Chant 2016). Even though there have been anti-poverty programmes which target mainly female-based poverty, there is evidence of the cycle of defeminisation to re-feminisation of poverty (Bradshaw et al. 2019). The lack of standard indices for measuring women's poverty highlighted by Alkire et al. (2020) has also given the direction to generate individual-level Multidimensional Poverty Indices (MPIs). There is also a proposal to change the number of indicators to make the MPI more focused on the gendered aspect of poverty, instead of being gender blind (*ibid.*).

Against this background of increasing modification in the assessment of female poverty through revising the MPI, the present study uses set of indicators that are more relevant in the regional context and thus suit the study area selected more.

Regardless of women's increasing contribution to income within the household along with increased access to education, their involvement in unpaid care work within the household leads them to time poverty, which in turn leads to power deficit within the households. Power poverty is addressed not only through capabilities and components of resources but also through decision-making strength in households including decisions along with leadership deficit and lack of participation. In a male-dominated society like India, there is a manifestation of 'power poverty', which together with 'time poverty' is becoming more prominent than income poverty alone (Bradshaw et al. 2017). The overstress given to female-headed households associated with feminisation of poverty is debated as it is generally the interplay of time and power poverty amongst females, which happens to be higher in male-headed households, forming the major

determinants of female-based poverty amongst even male-headed households (*ibid.*). Poor health is also one of the aspects of poverty amongst females, which is why there is a need to take up the issue of health poverty amongst women. It is also important to add the income as part of the economic domain, given the economic profile of India and the unequal distribution of wealth.

Thus overall, poverty takes various forms, including lack of income and productive resources, hunger and malnutrition, ill health, homelessness and inadequate housing, unsafe environments, social discrimination and exclusion. It is also characterised by lack of participation in decision-making and in civil, social and cultural lives (Gordon 2005). These aspects of female poverty are in line with the multi-criteria concept of poverty that deals with its various dimensions and not only with a financial situation (UNDP 2010).

The present study furnishes the example of Sehore Municipal Council (M.C. hereafter), an emerging urban area in the low-urbanised state of Madhya Pradesh in India, considering the various aspects of female-based poverty that are at play in spatial terms in the evaluation of female-based urban poverty through a multi-criteria decision-making approach. The aim of this paper is to find out the level of female-based urban poverty in the selected study area of Sehore M.C. and to identify the major domains impacting female-based urban poverty by selecting the pertinent variables and indicators related to the local area manifesting urban poverty amongst females in Sehore M.C. The study aims to bring out the spatial characteristics of female-based urban poverty in selected localities of Sehore M.C. and to propose area- and problem-specific recommendations. The research makes an attempt to answer the questions whether the medium-sized cities lying within the set-up of low-urbanised area in a developing country like India exhibit female-based urban poverty in various dimensions and whether there is a noticeable impact of the urban sphere of influence on a tradition-bound newly urbanising medium-sized city of India (Sehore M.C. in this case).

The study is organised as follows: A brief *Introduction* highlights the significance and need of a female-based approach in urban poverty studies and the rationale for adopting a multi-criteria approach towards tackling the urban

poverty menace in emerging urban areas like Sehore M.C., along with the primary aim of the study. *Literature review* traces the introduction and evolution of female-based notions to urban poverty studies from a multi-criteria perspective with evidence from several national and international organisations that have dealt with the issue in question from a similar point of view. Against this background, the *problem is defined* with the special reference to the area of interest in Sehore M.C. Out of many paradoxes, the study tries to provide reasons for a high gender gap and low female workforce participation in the city of Sehore M.C. The *Database and methodology* section covers the details of primary data obtained through a field survey and focuses on methodology for the application of the analytical hierarchy process (AHP) assessing female-based urban poverty. The next part, *Results and discussion*, deals with poverty experienced by females in each of the six domains selected, followed by the presentation of the overall female-based urban poverty in Sehore M.C. The *Conclusion and suggestions* section summarises the results of the study along with recommendations for localities experiencing a higher poverty rate. The *Limitations of the study* ends the article.

Literature review

The concept of female-based urban poverty has originated from the very basic notion of female poverty that implies that women compared to men have a higher incidence of poverty; women's poverty is more severe than men's; and that over time, the incidence of poverty amongst women is increasing compared to men (Pearce 1978; Cagatay 1998). The UNDP has attributed female poverty to the headship of the household wherein the change in poverty levels is biased against women or female-headed households.

The UNIFED (United Nations Development Fund for Women) has identified major dimensions of female-based poverty of which overall poverty, society's attitudes and inability of women to work independently are the main ones given emerging urban areas in India. Unpaid care work, migration of women in search of employment, informal employment and lack of support from family, lack of education especially beyond the secondary level in urban areas, and unequal treatment of women almost in all spheres are other reasons which are the important drivers of female-based urban poverty.

India's economic growth has not been accompanied by a corresponding increase in female labour force participation, despite declining fertility rates and rising levels of education and income amongst women (Chaudhary, Verick 2014). The decline in female employment rates is due to both supply- and demand-side factors, with changes in the sectoral structure of employment responsible for much of the decline (Klasen, Pieters 2015). The service sector, which drives India's growth, requires high-level skills that many women do not possess (Lahoti, Swaminathan 2016). Women's participation rates in labour force are the highest amongst the least educated, while women with higher levels of education tend to leave farm work but face limited job opportunities in other sectors (Chatterjee et al. 2018). The increasing education of men also benefits households through higher income (Marois et al. 2022). Owing to such a paradoxical situation, it becomes pertinent to study the condition of females from a multidimensional perspective.

Following the contention of Bradshaw (2002) that female poverty is multidimensional and multi-sectoral, there is a need to recognise the various dimensions of female poverty that emerge out of an urban area (Chant 2013). The presence of women in urban areas therefore commands attention to study the issue of women's poverty in a multidimensional and multi-spatial way (Lemanski et al. 2015).

As it is clear that poverty faced by women has a multidimensional nature, the present study deals with the issue of female poverty based on a multi-criteria approach. The concept of overall poverty has been thoroughly investigated by the UN which states that it includes income poverty, health poverty, housing poverty, social disempowerment and lack of decision-making poverty (Gordon 2005).

The multi-criteria decision-making method is applied while the list of indicators is area-specific based on certain dimensions given by standard international and national agencies such as the UNDP (2010), UNIFEM (2005), USAID (2023), CGIAR Gender Platform (2021), Global Poverty Research Group (Lawson 2008), NFHS-5 (IIPS et al. 2021) and Aguilar (2015). Given the various

dimensions, the indicators are selected for the assessment of female-based urban poverty for the present study. Although little is known about how differently poverty is experienced by women and men and that we are still far from having a set of tools able to adequately measure and monitor female-based poverty (Sen, Grown 2013), the present study makes an attempt to assess female poverty from all perspectives.

The multi-criteria aspect of poverty has been considered by a number of studies since the work of Townsend (1979) who proposed a set of 60 indicators for the assessment of poverty levels in the United Kingdom. A new multidimensional and fuzzy measures of poverty were put forward by Betti et al. (2009). The AHP has also been tried when the data were more heterogeneous based on the membership function derived from Fuzzy-AHP (Kumar, Pathinathan 2015). The multi-criteria approach to assess the urban poverty has been investigated, as there are many features of poverty that makes it different from rural poverty (Baker 2004; Sulaiman et al. 2014). It gives an example of the application of a Multidimensional Urban Deprivation Index (MUDI) for any region. The poverty assessment has been done using GIS (Geographical Information Systems) and a multi-criteria decision-making model (MCDM) in rural dryland of Monte Desert, Argentina (Rubio et al. 2018). Similarly, poverty has been assessed using MCDMs in a number of studies involving a multidimensional aspect of poverty.

Given the above, it is thus important to note that the recognition of poverty as being a multi-criteria phenomenon has led to a better understanding of the concept from a holistic perspective (Montoya, Teixeira 2017). Therefore, the present study takes into consideration this widely recognised concept of multi-criteria poverty amongst females for the selected wards of Sehore M.C., an emerging town in Madhya Pradesh adjacent (40 km) to the region's capital city Bhopal, where socio-economic and cultural factors operate in addition to the financial factor. Their impact is being observed in the study area using specific local area indicators representing urbanisation. A medium-sized Class I city (with more than 100,000 population), suffering from urban poverty in general, has shown specific local area characteristics of female-based urban poverty over the selected domains of economic poverty,

educational poverty, social poverty, health poverty, lack of decision-making and time poverty, which taken together have contributed to the overall female poverty in the surveyed localities of Sehore M.C. The originality of the work lies in the fact that a female-based analysis has not been earlier focused on newly emerging urban areas in the case of India, which this study has addressed in a nuanced and comprehensive manner. Therefore, the research may be considered as a bridge between the assessment of women's situation and studies on newly urbanising areas.

Identification of the problem in the study area

Sehore M.C. is a newly urbanising area with a population of 108,909 (Census 2011). According to Urban and Regional Development Plans Formulation and Implementation (URDPFI 2014) guidelines, the city is classified as a medium-sized town. Sehore M.C. geographically forms part of the Malwa Plateau region which is rich in fertile soil suitable for the cultivation of wheat, soyabean and sugarcane with the Seevan River (tributary of the Parbati River) serving as the lifeline of the city. The city falls within the ambit of two metropolitan cities of the state of Madhya Pradesh, Bhopal and Indore; therefore, the economic transformation is perceptible along the major transport route, especially along SH-18 connecting Bhopal and Indore, and also along the marginal areas of the city.

The urban economy of Sehore M.C. is fairly dependent upon agriculture and trade of agricultural products. The city has mainly agro-based industries like the flour mill, the *Dalda* factory and the paper mill. However, many of these traditional raw material-based industries are suffering from lack of access to basic services for manufacturing and marketing units, while a few of them, such as the sugar mill and the soybean solvent plant have been permanently shut down for more than two decades. The mechanisation of the *Mandi* (market) industrial complex, which used to employ females from the northern outskirts of Sehore M.C., has predominantly affected women living in the city. Work participation in the informal sector of the economy is more dominant. The total work participation rate is low, while the female work participation rate (12.8%) is still lower (Fig. 1).
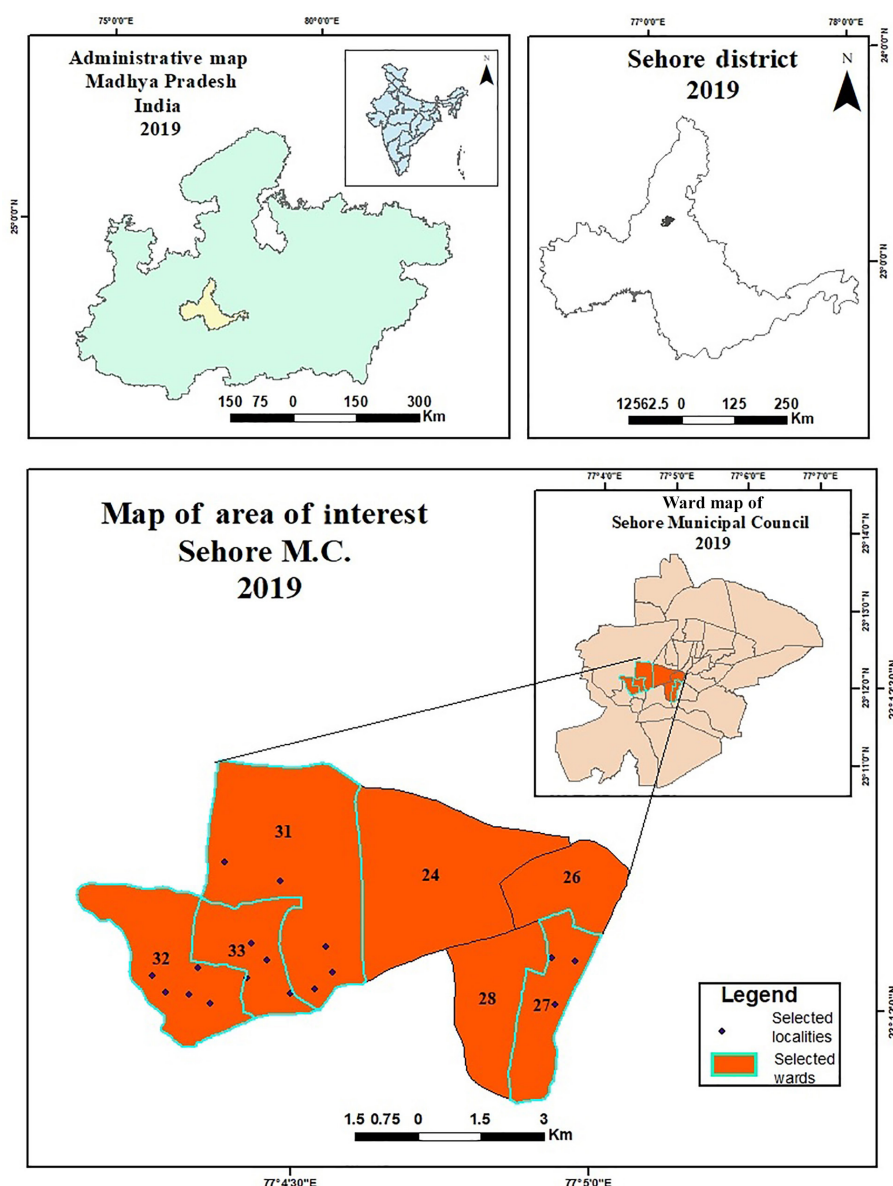
Fig. 1. Location map of the study area, Sehore M.C., Madhya Pradesh.
Source: own compilation.

Nearly 6% of the workforce is employed as agricultural labourers and cultivators, 2.3% as household industry workers, whereas more than 90% are employed as 'other workers', which is indicative of the largest share of the tertiary sector of the economy in Sehore M.C. mainly in the informal sector. The female work participation is low (12.8%), and the gender gap in the workforce is higher. Although the female work participation increased from 1981 to 2011, the male work participation declined after 1981–2001 only to attain its peak of 50.8% in 2011. The gender gap in workforce understood as a difference between male and female work participation is calculated,

and although it declined after the period of 1981–2001, the gap peaked in 2011 to 37.96%, which was the highest gender gap recorded for 1981–2011.

The present study thus is about the socio-economic characteristics of an old settled inner area of Sehore M.C. dominated by tradition-bound society with only a limited culture of female-based work participation in economic activity. The prevalence of urban poverty in general and the opening up of new job opportunities and avenues because of an urban sphere of influence of two adjacent cities of Indore and Bhopal are perceived in terms of increasing work participation,

though mainly in the informal sector. Therefore, an insight into the determinants and dynamics of female-based urban poverty in Sehore M.C. in spatial terms is required to define strategies to alleviate the female-based urban poverty and to promote overall socio-economic development in Sehore M.C. in the state of Madhya Pradesh. The high gender gap in workforce participation with a low female participation in the labour force prompts to model the peculiarities of female-based urban poverty in Sehore M.C.

Database and methodology

Database

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 in 2017 when 17 localities across four wards with a higher density and a higher degree of female workers were selected from Sehore M.C.

Methodology

Selection of indicators

The standard indicators for the study of urban poverty are adopted for measuring female-based urban poverty index (Table 1). The indicators are selected in such a way that they relate to prevailing deprivation conditions in the Sehore M.C. area, and more specifically to the surveyed area as follows:

Economic poverty domain (females of 18–65 years of age)

Based on UN Women, a number of factors can be defined as the determinants of female-based poverty. The factors that relate to the economic status include an employment type, inequalities in wages, lack of opportunities for work and engagement of women in unpaid domestic work, leading to women's lack of time for paid work and their own recreation.

Although a number of indicators are required to assess the level of poverty, the economic dimension of poverty assessment cannot be ignored and still remains the most relevant factor for the assessment of poverty. The poverty lines across the globe are based on per capita income. From the literature on female poverty, a number of relevant indicators for the present study have been charted. The indicators selected are essentially affecting women's welfare; their job satisfaction and work acceptance are also taken into consideration.

Educational poverty domain (women of >7 years of age)

At the global level, there are regions where school education of girls is not compulsory, which becomes a huge obstacle to women's emancipation and to their having an opportunity to be upgraded to skilled jobs. Moreover, as women's educational status has been proven to be linked to economic development, there is a need for more than just basic education for women but also, as Verick (2014) argues, for an educational status beyond the secondary level, especially at least in the case of newly urbanising regions.

Education forms the backbone of the society, and its implications on the overall wellbeing of the family members depends, to a large extent, on women's educational status. There is also a proven relationship between the economic development of a region and the educational status of women (U-shaped hypothesis); it is pertinent to give education an important place in assessment of female-based poverty.

Social poverty: Lack of women's empowerment domain (women of >18 years of age)

Although female poverty is a social problem, for the purpose of the study, as we define the determinants of female-based urban poverty, it is important to discuss the social aspects of poverty that intrinsically affect women. Amongst the social causes of poverty, social marginalisation is the major one, which is often due to lack of freedom and awareness. Empowering women has been conceived as an aim to reduce poverty amongst them (Louis-Weinstein 2019). Women empowerment has been termed as an essential element for sustainable development (UNFPA 1994), the ultimate aim of poverty reduction programmes. Angemi (2011) proves that poverty and vulnerability are positively related to each other. A socially marginalised household is the one with limited access to resources including poor social networking (Zahra, Zafar 2015).

Table 1. List of indicators for the female-based Urban Poverty Index.

No.	Domain	Indicator
1	Economic poverty	1. % of non-working females
		2. % of females earning less than average income of females
		3. % of female workers in unorganised sector[1]
		4. % of females as unpaid family workers
		5. % of female workers as non-regular earners
		6. % of females in hazardous jobs
		7. % of females with work-related ailments
		8. % of females working under compassion
		9. % of females with no job security
		10. % of females with no or low job satisfaction
		11. % of females with no or conditional social acceptance
2	Educational poverty	1. % of illiterate women
		2. % of females having education below graduation
		3. % of females without technical/vocational training
3	Social poverty	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 personal income
		4. % of females having no exposure to media
4	Health poverty	1. % of females not having normal BMI[2]
		2. % of females never consuming milk, pulses/beans and green vegetables
		3. % of females having no access to Anganwadi[3]
		4. % of females having no access to health services
		5. % of females having no awareness of common ailments
5	Lack of decision making power at household level	1. % of females with decision deficit on major household purchasing
		2. % of females with decision deficit on education/expense of children
		3. % of females having no decision on purchasing medical treatment
		4. % of females having no decision on purchasing daily food items
6	Lack of time for relaxation	1. % of females spending more than four hours on unpaid domestic chores
		2. % of female workers working more than average working hours for women
		3. % of females whose work is not shared by others within the household

[1] Unorganised sector refers to the unregulated informal sector of the economy in India and lacks organisational structure. A vast majority of workers work in the unorganised sector.
[2] BMI – body mass index.
[3] 'Anganwadi' refers to child care centres under the Integrated Child Development Programme (ICDP), developed to address the need of children (0–6 years), pregnant and lactating mothers, and adolescent girls (14–18 years).
Source: own study.

As social empowerment forms the basis of any developing society, it is pertinent to take it into account for female-based poverty, especially in the case of urban areas. It is important for females to be able to have control over their actions as well as movements within the society. If the liberty of moving at one's own will is restricted or compromised, then the society is disempowered up to a large extent. What is more, social empowerment also translates into educational and economic strength of women, which is manifested in their day-to-day activities such as environmental awareness or awareness regarding governmental schemes.

Health poverty domain (women of 15–49 years of age)

Although health is itself an effect of the economic and educational status of women, as often observed, women in economically poor households sacrifice their health and nutrition in favour of other family members. Similarly, studies show a strong link between the educational status of women and health indicators (Oxaal, Cook 1998; Davidson et al. 2011).

Various aspects concerning health issues such as access to healthcare facilities, awareness and consumption have been taken into account amongst females in the reproductive age group as per NFHS-4 (IIPS, 2017). Health awareness

and health maintenance are important elements of overall wellbeing of the household.

Lack of the decision-making power domain (women of >18 years of age)

As discussed so far, women are poor because of several factors, one of which is power dynamics between men and women that aggravates the already grim situation of females. The governments of the signatory countries of the 1996 United Nations Conference on Human Settlements (Habitat II) pledged the commitment to developing a framework that would ensure women's participation in planning as well as decision-making. The First World Assemblies of Cities and local authorities alike had committed itself to full participation of women in the decision-making process. Structural barriers and social norms serve as impediments in women's decision-making power and participation. As decision-making stems from the economic and educational status of women, many studies find a correlation between working status and decision-making amongst females. With an increase in educational and material resource access (O'Neil, Domingo 2015), there is an increasing participation of women in the decision-making process. Nevertheless, given the patriarchal set-up of society with male domination, a male is actually a head of the family. It has been observed that women lack the power of decision-making in urbanising society like Sehore M.C., the decision-making power still rests with males within the households. The decision-making power at the community level is practically absent. Hence for the present study, only household-level decision-making has been considered.

The decision-making power deficit amounts to 'power poverty' within the household, which is aggravated within a male-dominated society. As women in the surveyed area have been rarely found to be commanding any authority with regard to decisions at the community level, only decision-making at the household level is considered for the present study, including all women above 18 years old.

Lack of time for the relaxation domain (women of >15 years of age)

The lack of time for relaxation, more loosely termed as 'time poverty', is a more recent concept in the study of female-based poverty as females bear the dual burden of paid work and unpaid care work (Hyde et al. 2020). More often women are without any support from any male members as far as daily chores within the household are concerned, which is mainly due to the gendered norms that deter men from sharing household tasks with their female family members. It is often considered unmanly if men perform duties in the kitchen as a sharing hand. As gendered norms prompt girls from a very young age to share domestic work, females over the age of 15 are taken into account.

Sampling frame

The study area consists of 17 localities from four selected wards in which a total of 950 females were surveyed (15% of the female population from the selected wards). The data were collected at the individual level and collated at the locality level. The selection was made based on a higher female working population along with manifestations of urban poverty including congested localities with a more observable lack of sanitation. The target population of the study is both working and non-working females at the household level from selected localities. For different domains, the group of females between 7 and 65 years of age is taken into consideration.

Application of AHP for GIS-based modelling of female-based urban poverty

The AHP multi-criteria decision-making method focuses on the relative importance of evaluation criteria. The results obtained show the best balance of performance for criteria from different domains such as lack of economic, educational, social empowerment and health, decision-making aspects and time poverty amongst females in the surveyed area. Generally, income criteria and economic dimensions are associated with poverty issues, but there are criteria other than economic poverty such as educational poverty, lack of decision-making and time poverty which affect the overall status of females within the society and are causing variation in the overall poverty levels of an economically deprived society. AHP thus has made the decision-making between the criteria of various domains of female-based poverty in Sehore M.C. more efficient, flexible and realistic based upon the available criteria and alternatives. The domain weights

have been calculated using the AHP method. The following steps are involved:

Step 1: Defining the criteria based on the problem. The criteria are defined to assess the results. The present study takes five criteria, namely economic poverty, education poverty, social poverty – lack of women empowerment, health poverty, lack of decision-making and lack of time for relaxation or time poverty.

Step 2: Each criterion is compared with other criteria and a comparison matrix is thus formed. The comparison matrix for the present study is given in Table 3. The equation for the pairwise comparison matrix is given as follows:

$$a_{ij} = w_i / w_j, \ i,j = 1,2,3,\ldots,n$$

where w_i is the weight of the ith criterion, w_j is the jth criterion and a_{ij} is the value for the ith criterion as against the jth criterion. The stronger the relation, the lower the integer. The following is the comparison matrix for the present study.

Table 2. Ratio index.

n	1	2	3	4	5	6	7	8	9	10
RI	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.46	1.49

n = order of matrix.
Random inconsistency indices for *n* = 10 (Saaty 1980).
Source (Tables 2, 3, 4): own study.

Step 3: Normalisation. Each entry in the column is then divided by the column sum to yield its normalised score. The sum of each column is 1.

Table 3. Normalised matrix.

$$\begin{bmatrix} 0.40 & 0.59 & 0.35 & 0.34 & 0.27 & 0.18 \\ 0.13 & 0.20 & 0.35 & 0.34 & 0.38 & 0.24 \\ 0.13 & 0.07 & 0.12 & 0.11 & 0.16 & 0.18 \\ 0.13 & 0.07 & 0.12 & 0.11 & 0.11 & 0.18 \\ 0.08 & 0.03 & 0.04 & 0.06 & 0.05 & 0.18 \\ 0.13 & 0.05 & 0.04 & 0.04 & 0.02 & 0.06 \end{bmatrix}$$

First, we must recognise the value of the eigenvector which is the weighted value of the criterion. To calculate the eigenvector, we use the following equation:

$$w_i = a_i / n, \forall_i$$

where w_i is the eigenvector and a_i is the sum of the matrix normalisation values and is divided by the number of the criterion (*n*). The largest eigenvalue is the number of times multiplying the number of columns with the main eigenvector (see Table 4), which can be obtained by the following equation:

$$\lambda_{max} = (\textstyle\sum GM11 - n_1 \times X_1) + \ldots + (\textstyle\sum GM1n - n \times X_n)$$

Step 4: Approximation of consistency index (*CI*). This involves the calculation of the consistency index for the calculation of the consistency ratio (*CR*). The consistency index is calculated as follows:

$$CI = \lambda_{max} - n / n - 1$$

The consistency ratio is calculated as follows:

$$CR = CI / RI,$$

where RI is the ratio index.

The RI value used is in accordance with the order *n* matrix. If the *CR* of a smaller matrix is 10% (0.1), this means that the inconsistency of each opinion is considered acceptable.

The consistency ratio is tested for a 10% acceptance level for smaller matrices. The RI for *n* = 6 is 1.32. Since for the present study *CI* is 0.108. Therefore,

$$CR = 0.108 / 1.32 = 0.08$$

which is smaller than 0.1; thus, the consistency is accepted for the present study.

The weights thus obtained using the AHP process are used in the percentage data for the

Table 4. Eigen vector showing the strength of the domains.

Variable	Eigen vector	Rank
Economic poverty (18–65 years of age)	0.354	1
Educational poverty (all females >7 years of age)	0.272	2
Social poverty – lack of women empowerment (>18 years of age)	0.128	3
Health poverty (15–49 years of age)	0.119	4
Lack of decision-making power at HH level (>18 years of age)	0.072	5
Lack of time for relaxation (>15 years of age)	0.056	6

indicators within the domains. The final scores for each domain as well as overall female-based urban poverty were mapped in ArcGIS 10.3 using the inverse weighted distance (IDW) interpolation technique.

Results and discussion

Spatial pattern of female-based urban poverty through the AHP

The spatial pattern of female-based urban poverty is discussed separately for each domain,

followed by overall weighted female-based scores as follows:

Economic poverty domain

The economic poverty domain contains indicators that relate to economic depravity amongst women. For the economic domain, three distinct pockets of better-performing localities and one continuous patch of poor-performing localities are observed (Fig. 2).

The core of poor-performing localities in terms of economic poverty is located in the central portion of ward 33 which stretches to ward 31, covering the northern part of the study area.
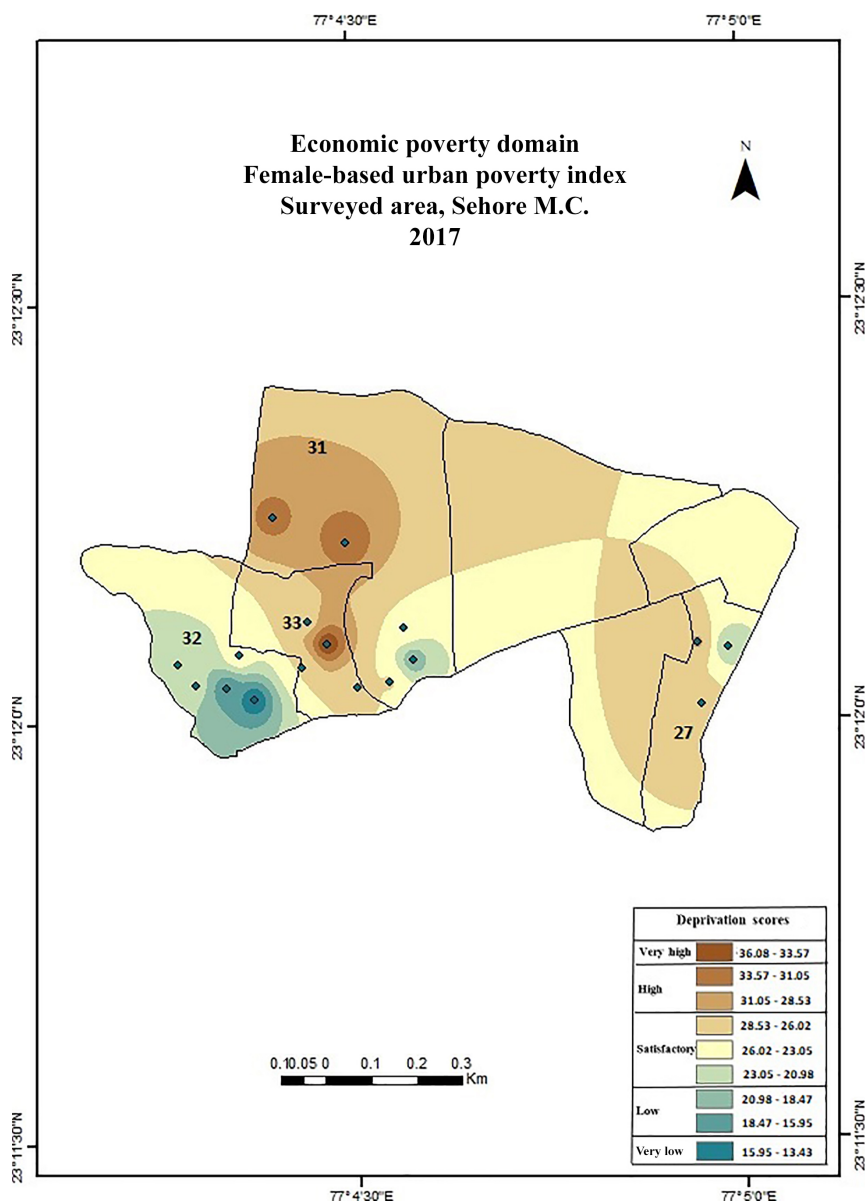

Fig. 2. Economic poverty domain.
Source: own compilation.

The area of better-performing localities is located around the southern periphery of ward 32 extending to moderately-performing near the western margin of the study area.

Another pocket of medium-performing localities lies around the southern periphery in the central region stretching along the northern parts of ward 31.

Educational poverty domain

Two distinct pockets of high- and poor-performing localities in the educational poverty domain are observed in Figure 3, the latter stretching to most of the western portions of the study area covering wards 32 and 33 and the north of ward 31 that form the core of the poor-performing pocket of localities. Another poor-performing region lies near the eastern periphery, which is mainly composed of the market area accounting for low scores in terms of educational poverty indicators.

The core of better-performing localities is located near the eastern margin of the study area in ward 27 where the education poverty is at its lowest. Another patch of the better-performing region on the educational poverty domain lies near the southern margin of ward 31. These two areas have a considerable graduate degree and diploma holders amongst the female population.
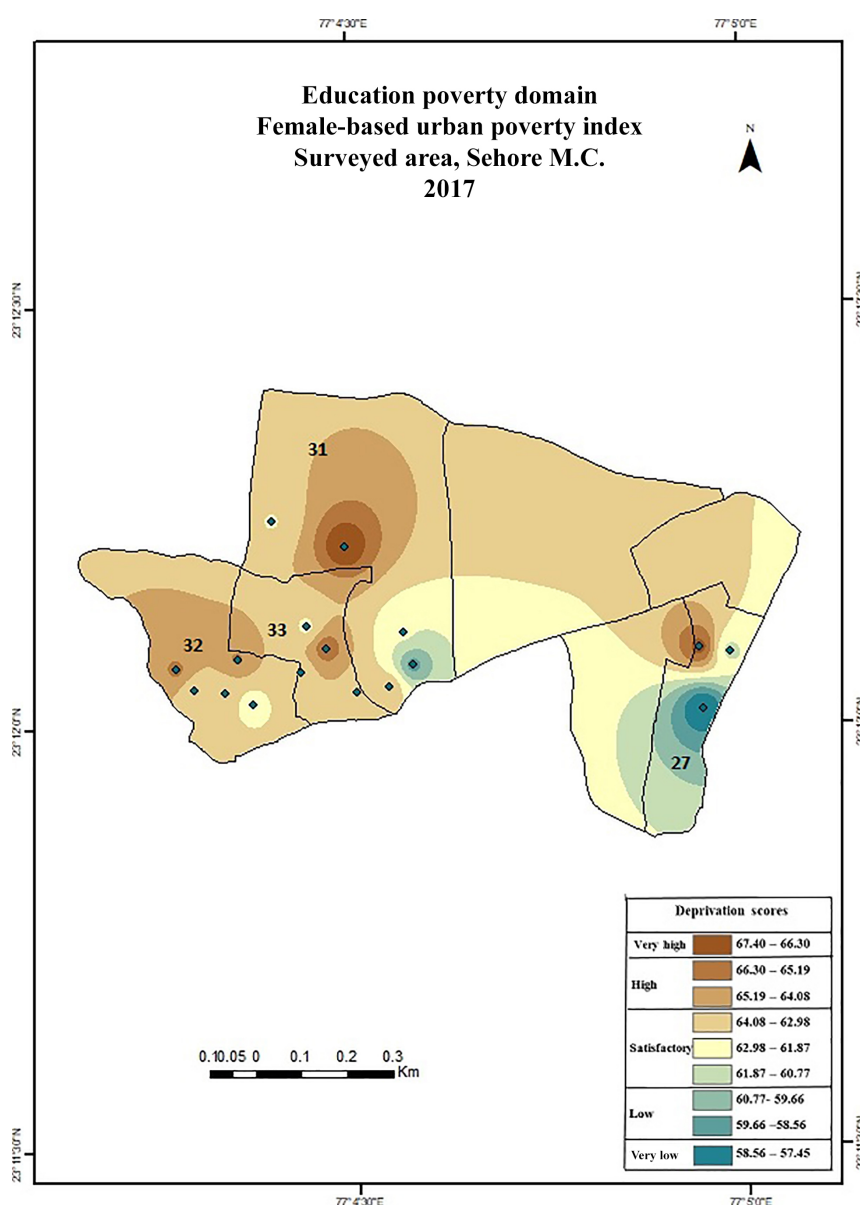

Fig. 3. Education poverty domain.
Source: own compilation.

Lack of women empowerment and the social poverty domain

The social poverty domain takes into account the empowerment of women parameters including awareness of government schemes, exposure to media and environmental awareness. With respect to the social poverty domain, two distinct pockets of high- and low-performing localities are observed. The low-performing localities are situated along the west covering the whole of ward 32 along the western margin of the study

area. The core lies at the southern margin of ward 31 where exposure to media and control over income are minimal, causing lack of women empowerment in the area under study (Fig. 4).

The core of better-performing localities lies on the border of wards 32 and 33 stretching towards east, covering the southern margin of ward 33. Further, three distinct pockets of better-performing localities are observed comprising one locality near the eastern margin and two near the northern and southern regions of ward 31.
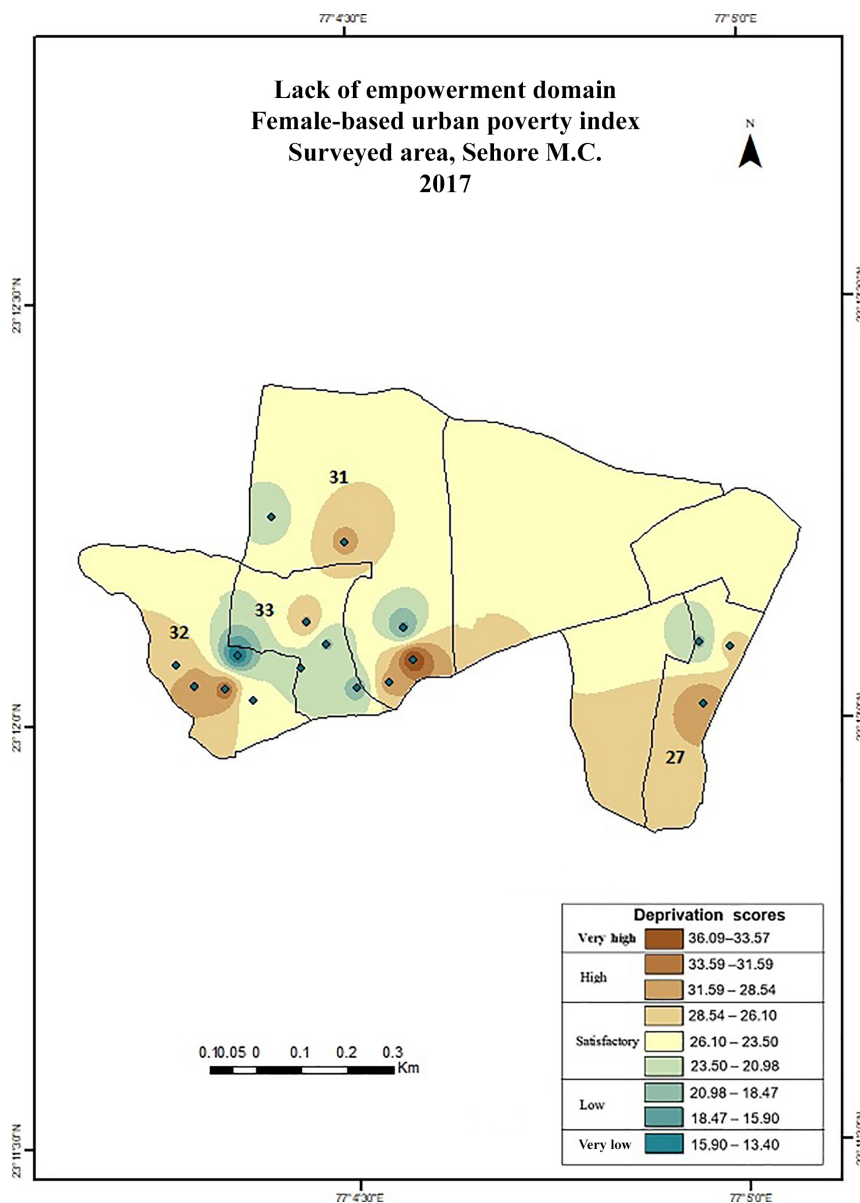

Fig. 4. Lack of the empowerment domain.
Source: own compilation.

Health poverty domain

Most of the study area is performing fairly well on the health poverty domain, except for the central region covering mainly ward 31 with the core in the eastern margin of ward 33. Two patches of poor-performing regions are observed in the western and eastern margins of the study area (Fig. 5).

Access to Anganwadi and health services with a considerable female population having a normal body mass index (BMI) accounts for a positive image of the study area in the health domain.

Lack of the decision-making poverty domain

The decision-making forms an important part considering the urban set-up of the study area. The decision-making amongst females is indicative of female empowerment within the society (Fig. 6).

With respect to the domain of decision-making power deficit amongst females, the pocket of poor-performing localities is observed along the western margin of the study area covering the whole of ward 32 and the northern periphery of wards 33 and 31. One isolated patch can be found near the southern margin of ward 31.
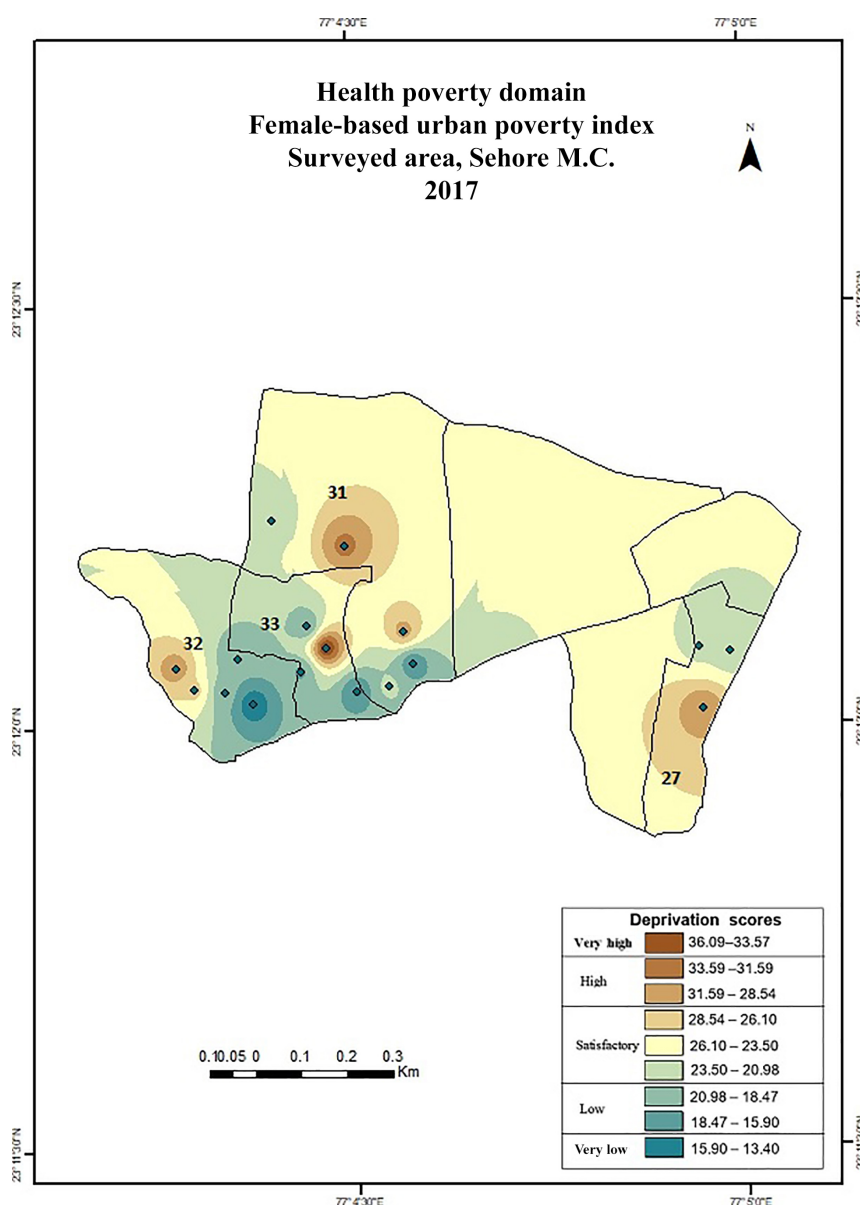

Fig. 5. Health poverty domain.
Source: own compilation.

On the other hand, the eastern half of the study area accounts for better performance on the decision-making power deficit domain with its core near the southern margin of ward 33.

Time poverty domain

The time poverty domain is an important aspect of poverty considering the time spent on housework, duration of work and management of housework. Given the time poverty domain, two distinct pockets of high- and low-performing wards, each located in the east and west of area of interest, can be observed (Fig. 7).

The poor-performing localities lie in the western part covering most of wards 32 and 33, except for two localities near the southwestern margin of the study area which is faring medium in the time poverty domain. Another pocket of high-/ poor-performing localities lies in the east covering ward 27.

The better-performing localities in terms of time poverty lie in ward 31 covering the northwestern margin and ward 27 covering the eastern margin, while the rest of the area lies in the medium category.
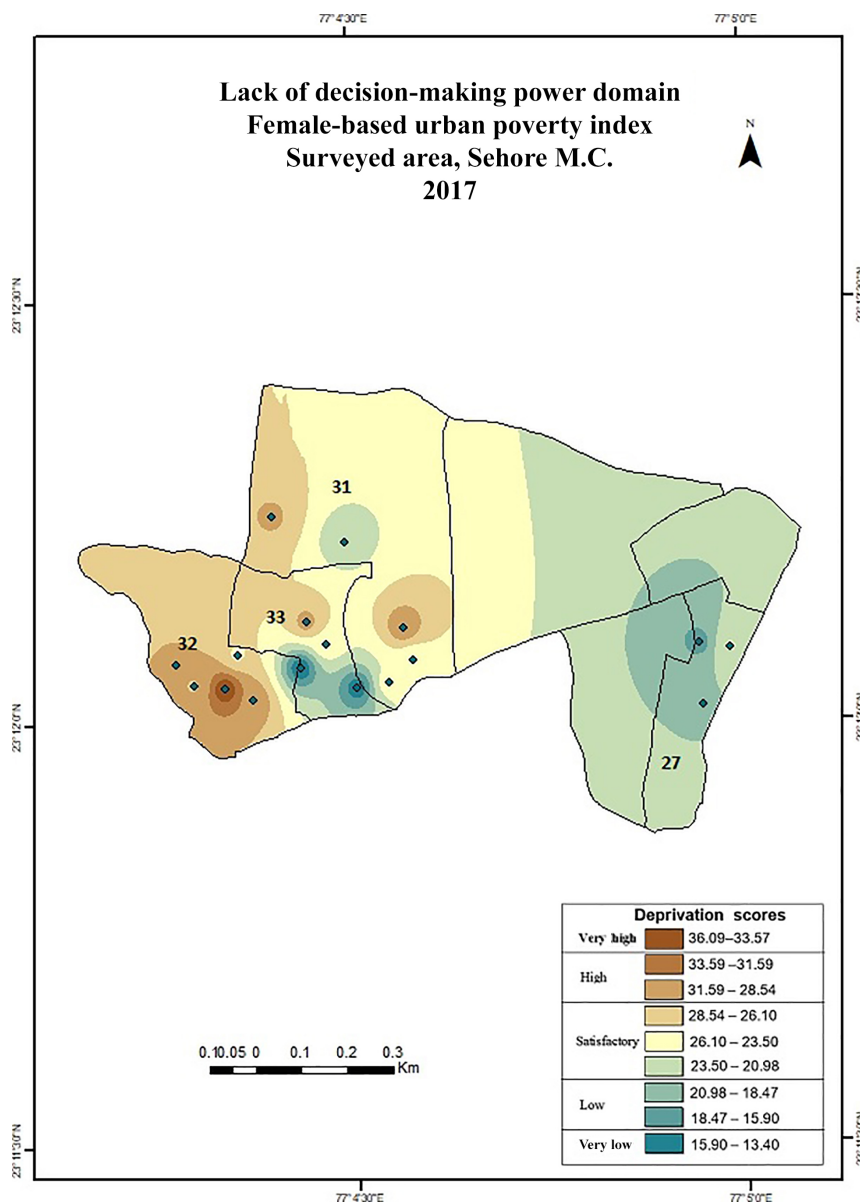

Fig. 6. Lack of decision-making power domain.
Source: own compilation.

Overall female-based urban poverty

As per the overall deprivation scores of the female-based urban poverty index for Sehore M.C., two clear-cut categories of high and low deprivation localities are observed. The high deprivation localities (24%) are covering the northwestern portion of the study area which lies in the vicinity of the rural areas towards western margins of Sehore M.C., including Gohapura and Jhuniabadi (ward 33) and Jamshed Nagar (ward 31). The core of the high deprivation localities lies in *Gohapura* in ward 33 spreading out towards the northern and western peripheries of the study area with

a lower deprivation score. The results obtained with the use of the effective and highly applied AHP model in the assessment of female-based urban poverty in localities show the highest deprivation of all localities compared, *Gohapura* (ward 33) with the highest weighted score of 52.08, is experiencing very poor performance on economic and health poverty (1st), time for relaxation (2nd) and educational poverty (3rd), mainly due to the involvement of a large female population in low-paid high-density polyethylene (HDPE) bag stitching work while neglecting their own health. On decision-making power, the locality is
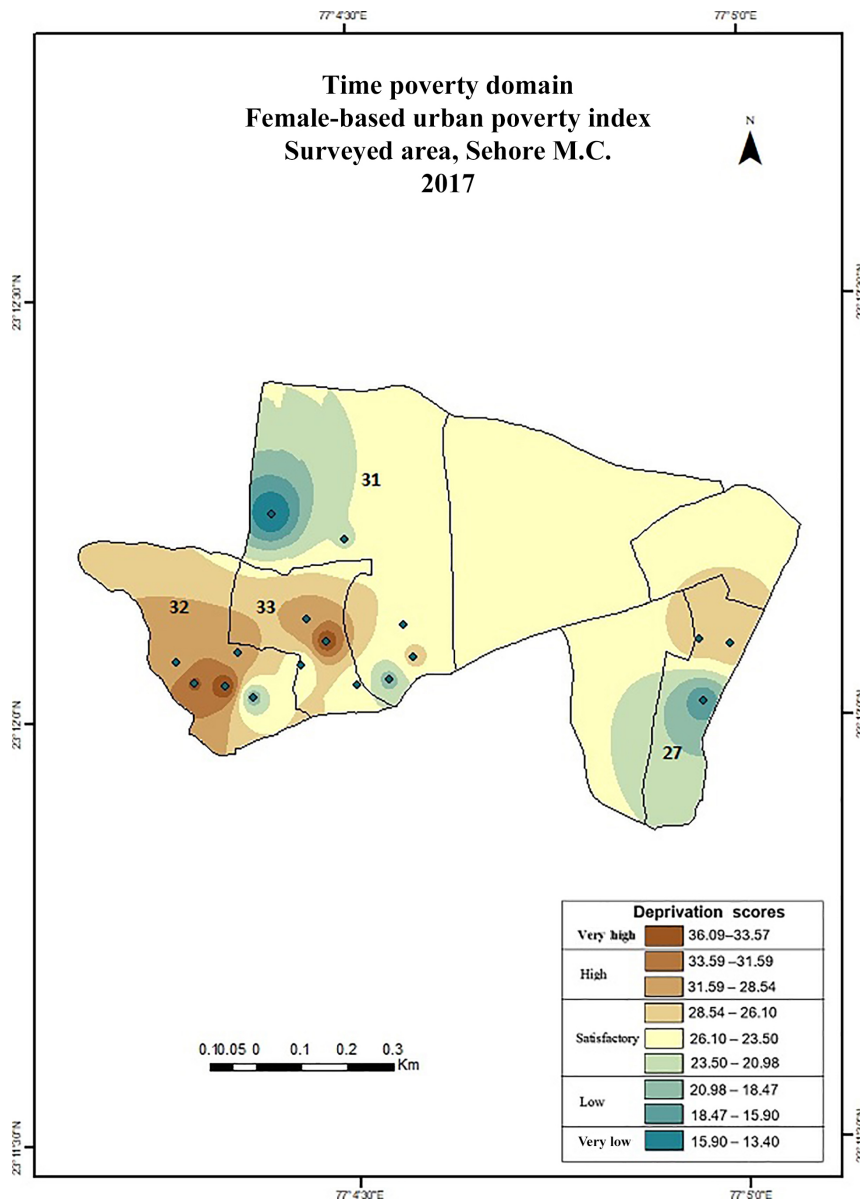

Fig. 7. Time poverty domain.
Source: own compilation.

performing relatively better (8th) as males are not in a strong enough position.

The low deprivation localities (41%) lie mainly along the southern periphery of the study area which also covers the main road (SH-18) which connects Indore–Bhopal and along the eastern margin covering the market. The core of low deprivation localities is at Peter's Compound locality in ward 31 radiating outwards towards east in ward 27 and west in wards 33 and 32 with comparatively higher deprivation localities (Fig. 8).

While the lowest overall poverty observed in Peter's Compound (ward 31) ranks very low on educational poverty (16th), economic and health poverty (15th), in terms of lack of decision-making power and lack of time for relaxation, the locality is performing poorer ranking 10th and 8th, respectively, mainly because of educated and working male spouses who earn better incomes and take decisions on their own.

Thus, the spatial mapping of the localities recognises that although 40% of the surveyed females are experiencing low poverty levels, the critical level of female-based urban poverty is reported in nearly 60% of the households in the surveyed area mainly because of the compound effect of various aspects of female-based poverty.
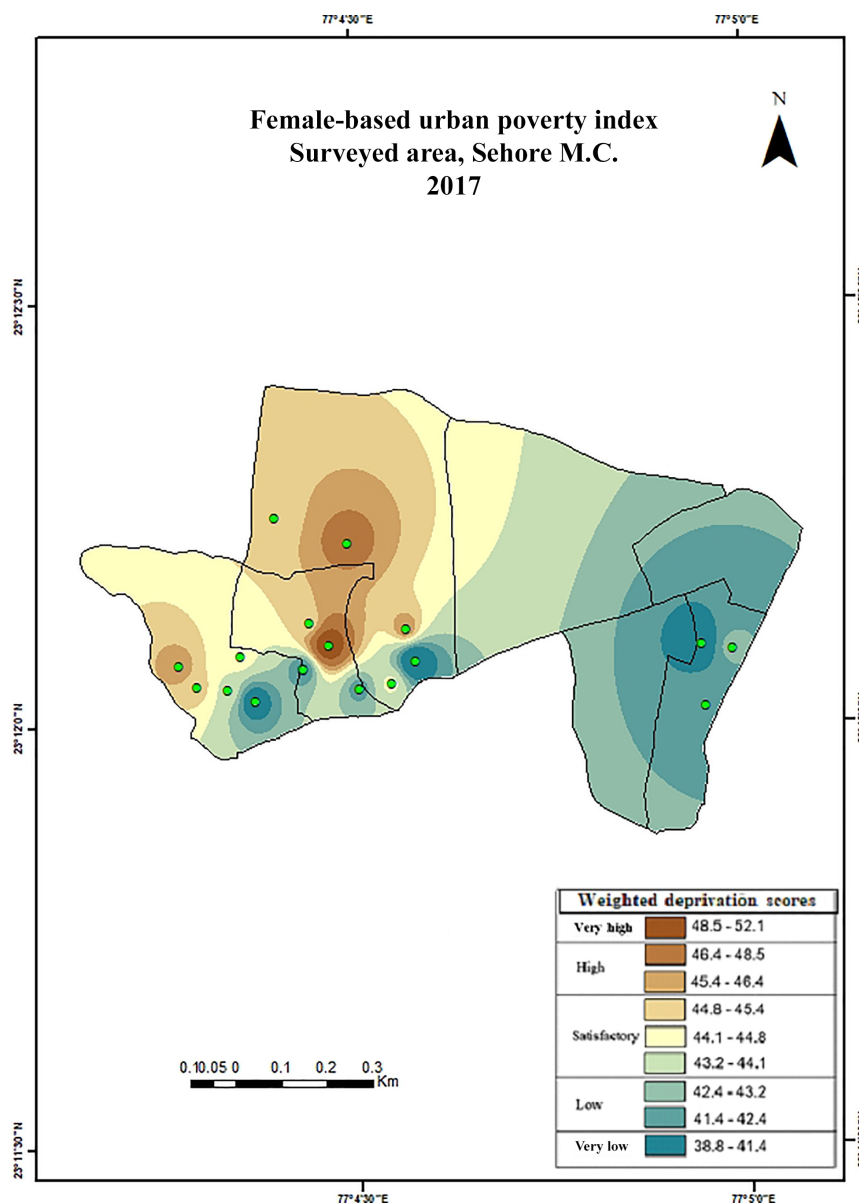

Fig. 8. Overall weighted deprivation scores, female-based urban poverty index, Sehore M.C.
Source: own compilation.

Conclusion and suggestions

The AHP technique applied for spatially weighted maps for the analysis of female-based urban poverty depicts an overall high deprivation score on the western margin of the study area mainly due to the nearness to the rural hinterland. The lower deprivation scores recorded for the eastern margin and the southern margin of the study can be mainly attributed to the more urbanised eastern portion and the Bhopal–Sehore road that runs along the southern margin of the study area mainly along the SH-18 connecting the state capital Bhopal with the so-called financial capital of the state Indore.

One important finding of the study is that even though some localities fare better in the economic domain, this does not translate into better figures in the social poverty domain; in contrast, some localities which score low in the economic poverty domain rank higher in the social poverty domain. Similarly, a few localities which perform poorly in economic and educational poverty domains are better regarding the decision-making power domain. Thus, it is clear that the overall score for the localities after AHP is obtained after considering a number of factors which contribute to the overall female-based urban poverty in the study area.

As the present study attempts to assess the deprivation of females on various dimensions, it has been found that the surveyed area suffers from various aspects of urban poverty amongst females. Using the AHP technique, the various aspects are ranked according to the weights, the highest being in the economic poverty domain (35%), followed by educational poverty (27%), social poverty (13%), health poverty (12%), lack of decision-making power (7%) and time poverty (6%).

With regard to the impact of an urban sphere of influence in a tradition-bound newly urbanising Sehore M.C., it can be concluded that even though the surveyed area registers a low poverty level across the transport routes connecting the two metros of Bhopal and Indore, the effect of an urban sphere of influence is not noticed over the entire surveyed area equally. The marginal areas still do not fall within the ambit of major cities in the state of Madhya Pradesh. Thus, there is a need to extend the urban amenities and services even to the marginal areas in Sehore city.

Given the major findings of the study, it is suggested that the major problem area should be introduced with all the urban services that are otherwise available in the urban city centre of Sehore M.C. The highest deprivation is observed in the educational poverty domain because of the lack of education attainment beyond the secondary level and also vocational and skilled training, except only in ward 27 and Peter's Compound (ward 31). The focus should be on promoting education beyond the secondary level so that females may get jobs that are more suited for an emerging city like Sehore M.C., which is also proposed to become an education hub for the state of Madhya Pradesh.

The spatial variation observed in the previous study conducted on Sehore M.C. (Parveen, Siddiqui 2019) has pointed towards the irregular distribution of the female workforce, which is also highlighted in the present study with a female higher workforce in the marginal surveyed areas. The marginal areas thus should be provided with new and better work opportunities such as namkeen and snacks making, soy sauce making with the help of the Centre for Entrepreneurship Development Madhya Pradesh (CEDMAP).

Limitations

The study deals with the finding of female-based urban poverty, wherein a number of factors have been taken into account, but spatially it is limited to only some select localities within the four selected wards in Sehore M.C. Thus, the study does not produce a citywide picture of female-based urban poverty. Moreover, owing to the limitation of the resources, only the sampled female population has been surveyed. The data on domestic violence and abuse amongst females could not be recorded because of the patriarchal and male-dominated nature of Sehore society.

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