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Rea, A., Tripier, M. (2008). *Sociologie de l'immigration*. Paris: La Decouverte

Koh, H. K. (2010). A 2020 vision for healthy people. *New England Journal of Medicine*, 362(18), 1653–1656

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THE FINE LINK BETWEEN MIGRATION AND DOMESTIC VIOLENCE: A SHORT GLIMPSE OF VICTIMS' PERCEPTIONS AND EXPERIENCES

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Abstract: *This study is important in order to identify the fine link between migration and domestic violence. Through qualitative research, the study is based on three face-to-face semi-structured interviews, conducted via Zoom, between June 2021 and January 2022. The interviewed subjects are women, victims of domestic violence in their family of origin, aged between 22 and 37 years old, who migrated to Romania. The short fragments of their testimonies provide a unique perspective about victims' perceptions and experiences on the subject, revealing factors of domestic violence and the main risks and problems faced by migrant women who were abused in their family of origin. Secondary data analysis and specialized literature review are being pursued in order to create a comprehensive overview of the subject. The main two limitations consist in the lack of multiple perspectives offered by the specialized literature and analyses based exclusively on the link between migration and domestic violence, but also the limited number of interviews. The findings confirm the fact that women are more vulnerable to the risk of becoming victims of domestic violence, being abusive parenting practices, while migration becomes the right solution to escape the terror at home. The factors emerging from the study show that the excessive consumption of alcohol, financial problems and marginalization, often lead to domestic violence in the intimate family space.*

Keywords: *migration, woman, domestic violence, abuse, vulnerability*

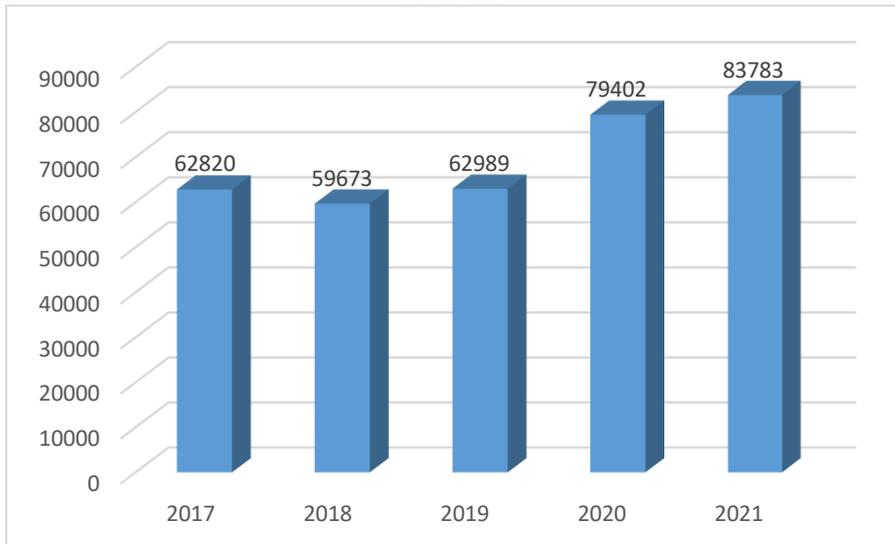
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Introduction

Between January and August 2021, approximately 97.000 refugees and migrants arrived in Europe, a 95 per cent increase compared to the same period of the previous year (UNICEF, 2022). Such international developments were also recognizable in Romania, which, although mainly a country of emigration (with an estimated of 4 million Romanians living abroad as of 2022), saw a steady increase in the number of incoming migrants since the early 2010's onwards, especially third-country nationals (TCNs) looking for work. According to Eurostat, Romania has the lowest share of non-nationals of all EU member states; still, the number of TCNs has gradually increased, as can be seen in Figure 1, with some 84,000 of them living in Romania in 2021, next to approximately 60,000 EU citizens (European Commission, n.d.).

Figure 1: **The Evolution of the number of Third Country Nationals living in Romania**



Source: own representation based on Eurostat data on Population and social conditions; database identifier: MIGR_POP1CTZ

Table 1 shows the number of TCNs living in Romania and their gender distribution. With the exception of 2018, the number of TCNs has increased year for year. 2021 saw 33 per cent more TCNs living in Romania than in 2017. Most of them are male, with a roughly 60-65 per cent distribution, to 35-40 per cent women.

Table 1: Number of TCNs living in Romania and their gender distribution

| Year | TCNs | Males | Females | %Males | %Females |
|------|-------|-------|---------|--------|----------|
| 2017 | 62820 | 38065 | 24755 | 61% | 39% |
| 2018 | 59673 | 36378 | 23295 | 61% | 39% |
| 2019 | 62989 | 38447 | 24542 | 61% | 39% |
| 2020 | 79402 | 50766 | 28636 | 64% | 36% |
| 2021 | 83783 | 54202 | 29581 | 65% | 35% |

Source: own representation based on Eurostat data on Population and social conditions; database identifier: MIGR_POP1CTZ

Migration is a complex phenomenon, and migrants face a series of problems such as the difficulty of finding a job according to their training, health problems, problems in adapting to the new environment, discrimination based on gender and ethnicity etc. (Carballo et al., 1996: 158). In addition to the trauma of the abuse suffered in the family of origin and the abandonment of the country of birth, migrants are subjected to stress factors and adaptation to the new life context (Liem et al., 2021). Thereby, intra-family relations and migration are characterized by a dynamic influenced by customs, culture, religion, education, the structure and composition of the family, intergenerational and intrafamilial relations between family members etc. (Enachescu and Rosca, 2014; Hugo, 2002: 14).

In general, migrants can be subjected to various forms of violence and abuse during their migration process or once they arrive in their destination countries. Thus, the main forms of violence and abuse that migrants may be subjected to include: physical violence, torture; sexual abuse in which migrant women present a higher risk than men; economic exploitation, where migrants may be forced to work in squalid conditions and receive irregular or below-minimum wages; psychological abuse, which may include threats, humiliation, discrimination or social isolation, having a serious impact on the mental health of migrants; different abuses at the border; discrimination and racism; repeated abuses in various refugee camps or in detention centers etc. (Infante et al., 2012; Adanu and Johnson, 2009).

At the same time, migrant women face a series of specific vulnerabilities during their migration process, in transit and destination countries. These vulnerabilities can start from gender-based violence, where migrant women are at increased risk of gender-based violence, including domestic violence, sexual harassment, sexual exploitation and human trafficking, gender-based discrimination (Calderón-Jaramillo et al., 2020). Migrant women show increased vulnerability to human trafficking, especially young and unaccompanied women are more likely to become victims of human trafficking, including trafficking for the purposes of sexual exploitation or forced labor (Alvarez and Alessi, 2012). Migrant women may also be more vulnerable to economic exploitation, including poor work conditions, underpayment and long working hours (Hennebry, 2017). Furthermore, migrant women may experience difficulties in accessing health and education services in destination countries. Language and cultural barriers, stigma and discrimination can make these services inaccessible or avoided for fear of reprisal or

deportation (Stewart et al., 2006). In some cases, migrant women are separated from their families, and this can lead to social isolation, increasing the risk of abuse and exploitation. When it comes to reproductive health, migrant women may experience difficulties in accessing reproductive health and family planning services, which may expose them to health risks for themselves and their children (Allotey et al., 2004). Last but not least, migrant women may have difficulties in obtaining legal assistance for the protection of their rights, either due to a lack of knowledge about the laws and procedures in the countries of destination, or due to a lack of financial resources (Kawar, 2004).

Migrants in general, but women in particular, are vulnerable to domestic violence, and addressing this issue is crucial for the respect of human rights, for the safety of women and children, for the health of society as a whole, as well as for the social and economic well-being of society as a whole. Thus, by studying the link between migration and domestic violence, we can identify the risk factors that contribute to the increased likelihood of migrant victimization.

The current study is located at the border between migration and domestic violence against women, emphasizing the fine link between the two elements. In order to escape the violence at home, some women choose to migrate (Alcalde, 2006; Erez, 2002), facing a multitude of socio-cultural and economic problems, but also with various dangers, as it is a question of an increased degree of their vulnerability from all points of view. Thus, the study is built around three face-to-face semi-structured interviews with female victims of domestic violence in their family of origin, who chose to emigrate in order to build a better life and to save themselves from abuse. So, exposing short fragments of their life stories, migrant women, victims of domestic violence, make their voices heard.

General Views on Migration

An attempt to define migration can prove to be a difficult undertaking, given the complexity of the phenomenon. As Castles (2000) observes, there are multiple definitions of migration, of different origins (social, economic, political etc.). Yet, in general, migration is understood as a movement of individuals over a certain geographical distance, involving crossing the border of a predefined spatial unit, in order to change residence, to ensure a better and safer life (Kok, 1999, 19). The spatial unit can be internal or international, meaning migration can occur within the boundaries of a state or it can take an international form (Bernard and Perales, 2022; Shamsuddin et al., 2022). Over recent years, globalization has drawn increasing attention towards international migration (Khaje Nouri and Sharifi, 2022). Nevertheless, the mere geographical movement is not enough to fully understand migration. Next to space, time is also an important dimension of migration. Migration can be temporary or permanent (Clibborn and Wright, 2022; Tazreiter and BurrIDGE, 2022). Temporary migrants intend to return to their country of origin after a shorter or longer stay abroad, while permanent migrants do not have such intention whatsoever (Dustmann, 1999; Khoo et al., 2008). Migration, therefore, is defined by its temporal and spatial-geographic dimensions, but without ignoring other important characteristics (Axelsson, 2022; Nedomysl and Fransson, 2014).

So, migration is the process of population movement from one place of origin to another place, either within a country or between different countries. This movement can have many causes, such as seeking better economic opportunities, fleeing political conflict or persecution, family reunification, or other personal reasons. However, migration brings with it a number of challenges and vulnerabilities for those involved, including the stress of adapting to a new cultural and social environment, as well as greater exposure to discrimination and social exclusion (Sinha, 2005).

Migration is a complex phenomenon that raises a number of problems and challenges at global level, and the main issues of migration include: discrimination and xenophobia, where migrants can be victims of discrimination at work, in education and in other aspects of everyday life; security and dangers of the migration routes, where migrants can be exposed to significant risks during their journey and these risks can include human trafficking, violence, sexual exploitation, separation from family and even death during travel, especially for those trying to cross borders illegally or reach conflict zones; family disintegration; integration and assimilation in the destination countries; legal status issues with uncertain migratory status that can lead to vulnerability and difficulty in accessing health services, education and other rights; poor living conditions especially for those working in precarious or illegal sectors; the impact on countries of origin with job losses, family separation and other social and economic effects; contribution of migrants to the development of host countries by contributing to economic growth and the development of various industries and sectors; economic opportunities in finding better paying jobs and a better life in countries with more developed economies; cultural diversity and cultural exchange; challenges related to integration and assimilation (Harzig and Hoerder, 2013; Boghean, 2016). So, we have to take into account the fact that the perspective on migration is very varied and can be influenced by many factors, including the social, political and economic context specific to a country or region.

Migration raises a series of questions regarding national security, cultural identity and social cohesion in many countries, but the cooperation of states at the international level is guaranteed by international agreements, such as the Global Compact for Safe, Orderly and Regular Migration adopted in 2018 by the Organization United Nations, are important for the management of migration at the global level. It cannot be ignored that migration plays an essential role in the economies of many countries, providing labor for sectors such as agriculture, construction and health care. At the same time, migration brings economic and cultural benefits to destination countries, but it can also create challenges in terms of integration and acceptance of diversity (Munck, 2013; Castles, 2002).

Theoretical dimensions: discussion about domestic violence

Domestic violence is not only a social problem, but also a public health problem (Tetikcok et al., 2016; Winett, 1998). In general terms, domestic violence involves several key elements related to the family domestic space: abusive and violent behavior, as well as the aggressor's desire to subjugate his victim. In other words, "domestic violence is

defined as the threat or infliction of physical, psychological and/or emotional violence; that is, any type of force against another person with intent to cause harm or to exercise power and control over them" (Flury et al., 2010: 2). Therefore, domestic violence does not only involve the physical manifestation with beatings and blows of all kinds, but each individual case can carry a varied series of abuses and aggressions of different intensity and duration (Hegarty and Roberts, 1998: 49).

There are two major forms of manifestation of the intensity of domestic violence, according to Johnson (2017), each having a different impact on the victim and, implicitly, on the family. The first form is occasional domestic violence between family members caused against the background of conflicts and tensions that can lead to various verbal manifestations and/or aggressive behavior, followed by reconciliation. The second form is characterized by violence and systematic abuses exercised, most of the time, by men, being defined as "patriarchal terrorism". In these cases, isolation and marginalization can become decisive factors in maintaining violence in the family. Also, "structural violence" takes place in a systematic way, indirectly by those who belong to a certain society, cultures that maintain and promote these types of conduct, strengthened by praise or attributions of blame to individuals depending on the role played by them (Farmer, 1996).

The explanation according to which the vast majority of victims of domestic violence are among women, lies in their increased vulnerability (Both et al., 2019; Kapoor, 2000; Alhabib et al., 2010). Also, women are more exposed to the risk of becoming victims of gender-based violence, whether at work, in the circle of acquaintances or in the public space (Krahé, 2016; Bonea, 2020). Migrant women are vulnerable and gender-based violence amplifies even more this vulnerability of becoming victims of domestic violence (Erez, 2002).

By creating various domestic scenarios in which the victim is deprived of power and help, the aggressor wants to tilt the balance of power in his favor through fear and manipulation (Bonea et al., 2022). It is a complex and complicated situation, in which the aggressor has the necessary privacy in the domestic space, in order to gain control over the victim (Hegarty et al., 2000; Bonea, 2020). Precisely this aspect of the inaccessibility from the outside of the family environment becomes one of the most relevant factors of domestic violence, in combination with a multitude of other factors of social, cultural and economic nature.

The factors favoring domestic violence are very complex, so that the explanatory theories offer a comprehensive but partially incomplete picture. Each theory focuses on certain factors that it carefully analyzes, which is why a series of theories must be included in order to capture the dynamics of the overall picture. Thus, the favoring factors of domestic violence are framed in a certain context of life and culture, and can vary from marginalization and strict socialization according to gender, up to the culture of violence that promotes certain deviant behaviors and the intergenerational transmission of violent behavior etc. (Berrios and Grady, 1991; Obi and Ozumba, 2007). So, here follows a brief exposition of the main theories in the field of domestic violence that can have an impact on the phenomenon of migration.

The first theory we discuss is related to excessive alcohol consumption, that facilitates the appearance of aggressive and violent behavior, especially in the private, restricted family environment, where access from outside is limited. Alcohol leads to disinhibition and may lead to engaging in abusive behavior towards the other members of his family (Galvani, 2006; Leonard, 2001; Kaysen, 2007).

Further, the culture of violence shows that through the culture, the norms generally accepted within society, but especially the increase in the degree of tolerance for deviant behavior, domestic violence is the form of manifestation that establishes the hierarchy in the family and tilts the balance of power in favor of the aggressor (Perilla et al., 1994; Fischer et al., 1992).

Also, socialization according to gender reflects the values that promote the secondary role of women, always subordinate to men. This type of socialization provides fixed gender roles and facilitates the abuse of women in the social and family environment (Kim et al., 2019; Fulton, 2017).

The social-psychological model, highlights the influence of external environmental factors on the manifestation of domestic violence. In other words, the various interactions between family members are seen as precursors to the occurrence of violence between family members. It is an intergenerational transmission of abuse and violence as a form of manifestation and conduct, considered to be appropriate in certain life situations (Gelles, 1979, 1980).

Marginalization and financial problems can be a major factor that must be taken into account. Besides many other factors, such as inequality and financial problems, marginalization remains an important aspect in the emergence and maintenance of violence between family members. Male dominance in the family and isolation, together with certain traditional practices that encourage a series of gender-based discrimination forms, can be triggering factors of domestic violence. Social policies focused on equal access to family resources, as well as combating gender violence, play an essential role in preventing marginalization (Kuskoff et al., 2022; Sokoloff and Dupont, 2005).

And last but not least, the patriarchal vision shows that male family members have a number of privileges and powers over female members. The submission of women to men in the family is one of the main rules that must be respected, according to the patriarchal vision. The man has the advantage of power and superiority over the woman, which inevitably makes her vulnerable to his abuse and aggression. At the same time, although the woman complements the man in the family, the norms that a woman must respect are established by men, and their non-compliance leads to abuse and violence. And finally, according to the patriarchy, women are worth less than men, which is the first reason why they must be obedient (Johnson, 2017; Bettman, 2009).

The main elements regarding the connection between migration and domestic violence

For the victim of domestic violence, the family environment is no longer a safe place, where she can feel protected, but becomes a permanent danger to her physical and mental integrity, with serious consequences in the short and long term (Kofman and Garfin, 2020; Nason-Clark, 2020). In this way, the victim, in the desire to defend herself from the abuses received from one or more family members, but also to ensure a better future, can choose to migrate. It is a radical decision that implies determination and courage for the female victim of domestic violence, involving a series of unknown situations and problems that may arise along the way. The vulnerabilities of migrant women can start from actually traveling the road to the desired country, until finding a job and a home. Also, the process of integration into the respective society can be fraught with difficulties in adapting to the new language, culture, customs etc.

Depending on the complexity of the causal factors, migrant women have unique needs and problems, while the abuses suffered by them in the past, in their families of origin, can be the link that determines the migration of the victim to another country (Guruge et al., 2010). Women are more vulnerable than men in the context of migration, being exposed, to a greater or lesser extent, to all forms of abuse (Kawar, 2004). Added to all this are the various obstacles and barriers in seeking help and at the same time, there is a reduced availability of women to defend themselves against abuse (Colucci and Montesinos, 2013). Men's violence against women and children within the family has an impact on migration, in that the victim decides to leave the country of origin in order to put an end to the abuses and to build a new life, far away from the terrorism inside home (Alcalde, 2006).

In general, migrants can become more vulnerable to domestic violence due to difficulties in accessing support and protection services, as well as fears about their legal status. The link between domestic violence and migration is complex and multifaceted. Migration can influence how domestic violence is experienced, perpetuated and addressed. In other words, migrants may be more vulnerable to domestic violence due to factors such as social isolation, financial dependence by their partner or family, difficulty accessing support and protection services, and fear of deportation or loss of their migratory status (Satyen et al., 2018). Also, migrants may experience difficulties in communicating with authorities and service providers due to language and cultural barriers. This can make reporting domestic violence and seeking help difficult (Ngo-Metzger et al., 2003). The migration process brings with it a number of stresses, such as adapting to a new culture and language, loss of social support networks, and lack of economic security. These stresses can intensify family tensions and lead to the escalation of domestic violence (Coll and Magnuson, 1997).

Domestic violence can affect the phenomenon of migration in several ways, influencing both the decision to migrate and the experience of migrants. Thus, migration can be seen by the victims as a form of escape in order to escape from an abusive relationship or from an abusive family. At the same time, domestic violence can lead to social isolation of women, making them less accessible to the support network. Victims of domestic

violence may face stigma and social judgment from their community, which may make it more difficult for them to integrate even into the host society after emigration. Domestic violence can leave deep traumas and affect women's mental health, making it difficult to adapt to a new country or culture after emigration (Binder and Tošić, 2005; Parkins, 2010). Therefore, for some individuals, domestic violence can be a trigger that leads them to try to escape the abusive situation by migrating. In other words, people who are victims of domestic violence may see migration as a way to escape abuse and seek a better or safer life elsewhere (Bowstead, 2015). Also, migrants who have survived domestic violence in their country of origin may carry the trauma and psychological effects of that experience with them during migration. These traumas can influence adaptation to the new environment and have an impact on migrants' mental health (Kirmayer et al., 2011). The individual circumstances are very varied and each case has its own particularities.

Methodology

This study is based on the short statements of three migrant women who were victims of domestic violence in their families of origin. Through semi-structured, face-to-face individual interviews, three women, between 22 and 37 years of age, were interviewed, respecting the rigors of ethics and with the consent of the subjects. The three interviews were part of a research project based on oral history interviews with third country nationals who migrated to Romania, conducted between June 2021 and January 2022. The three interviews were chosen for this article based on the domestic violence accounts provided by the respondents. Contact to the three women was intermediated by the representative of an NGO which provides integration services for immigrants. Because the data collection was conducted in the midst of the Covid-19 pandemic, with social distancing regulations in place, that confined people to their homes, the interviews were carried out remotely, online, per Zoom, in either Romanian (Milena and Valeria) or English language (Stephanie), as preferred by the respondents. The interviews were recorded on computer (video and audio) and then transcribed. Notes were also made during the interviews.

Brief participant biographies

The interviewed subjects come from different countries, with different backgrounds, presented in the following short biographies (the real names have been replaced with fictive ones):

Milena (36 at the moment of the interview) is Byelorussian. She holds a BA degree in Philology, specialization English-German studies, obtained in her native country. She first found employment as a language professor in Byelorussia, then found a job in the travel/tourism industry, where she met her husband. She moved to Romania in 2013 for family unification purposes. Mother of a boy.

Stephanie (37) is Filipino. She graduated in Business Administration, then worked in the real estate sector in her native country, before moving to Romania in 2019 to marry her partner whom she met on the internet. Was in pregnancy at the moment of the interview.

Valeria (22) is Moldovan. She left her native country to pursue educational opportunities in Romania. She graduated high school in Romania, then started her university studies in Medicine here, which she was industriously and passionately pursuing at the moment of the interview.

Several similarities can be identified between the three migrants. At the moment of being interviewed, all of them resided in the county of Brasov, two of them moving to Romania for family reunification purposes (thus confirming research findings of Jayaweera (2018) that female migrants are most likely to be spousal migrants) and the other one for studies. All have been subject to some form of domestic violence before emigration and all of them have siblings. Milena has one elder brother and one elder sister, Stephanie has two brothers and one sister, while Valeria has two brothers and six sisters. For all of them, the domestic abuse was caused by the father, while in one case, the mother was also reported to have caused troubles.

Oral history

The oral history was used as a research method in response to the suggestion made by Willans and Stewart-Brown (2021) that the qualitative research on migration should capture the personal narratives of the migrants, so that a clear understanding of the migration rationale and background can be obtained. In such a case, oral history is a suitable research instrument, as it has the ability to capture a vast number of personal stories from the migrants. Oral history was used to create that sort of space that Miller (1998) is talking about, in which women should feel the necessary comfort to voice out their personal stories. This was the case with Milena, Stephanie and Valeria, who opened up and shared stories of their past, not exactly the most pleasant. The oral history interviews were semi-structured: while they followed a certain set of questions, the interviewer also adapted to the flow of discussion and allowed participants to share their own ideas about their lives. As a matter of fact, there were no questions on domestic violence per se, but the questions aimed at the family life or the childhood back home. The questions about family or childhood were, thus, an aide-mémoire paving the way for the accounts of domestic violence: it was the participants who opened up and shared the stories about domestic violence when it came to discussing about their families, with the interviewer letting the participants set the pace of the domestic violence accounts being shared. By simply listening to the personal narratives and laying accounts of them, domestic violence became a point in the research process (Miller, 1998). The personal narratives helped in the better understanding of that aspect of the migrants' lives related to domestic violence.

Mission and limitations

The mission of the current study is to show the fine link between migration and domestic violence, where the victims are female. This leads the study to enter the area of feminist

research, in which the use of oral history to collect the life histories of migrants is aligned to Geiger's (1986) idea of bringing to light the social experiences of 'silenced women', who might not have opened up if other research methods had been employed. Indeed, qualitative methods seem popular in feminist research, as they ensure that in-depth needed for women to open up (Letherby, 2003). Nonetheless, neither Milena, nor Stephanie or Valeria did not voice over too many of the traumatic experiences from childhood, but, rather, fugaciously mentioned them. The lack of more insights is one of the major limitations of this research paper. Still, the stories were useful for a better understanding of the participants' lives and their migration contexts, especially since various other dots were connected during the interviews by the participants themselves. As Letherby (2003) observes, one advantage of oral history research is that listening to a life narrative offers the lived experience in full (in our case, before and after migration), without fracturing it. As such, employing this kind of participatory research methods, in which respondents are directly involved by providing fine details of their lives, in their own words, helps in a better evaluation of the present and past alike. In migration studies, knowing more about the past of women migrants can help explain social aspects post-migration, especially since other information channels, such as mass-media, in general, tend to fracture their reporting on migration to some disparate episodes, without capturing the whole life of the migrant and the roots that might explain some of her behaviour during or after the migration.

Another possible limitation of the research is that, as believed by Livne and Bejarano (2021), online interviews cannot create that intimate atmosphere which encourages respondents to feel comfortable enough in order to open up more and recall and share even more memories of their lives. Yet, such limitations are debatable, since other methodologists claim the opposite, namely that Zoom interviews offer convenience and user-friendliness (Serhan, 2020). As perceived in the own data collection for this research, the fact that Zoom allowed migrants to stay at their own homes, without having to travel for the interviews, provided the necessary simplicity and convenience to create a good rapport between interviewer and interviewee, not to mention that, during the interview, all three women migrants presented here moved their laptop video-camera around their homes in order to show several artefacts brought to Romania from their native country, which helped them maintain an emotional connection to back home. Moreover, it genuinely seemed that showing those artefacts and discussing about their roles and meanings helped the participants open up even more to share their life stories. Also, using Zoom offered more flexibility in scheduling, allowing the interviews to be set whenever it was most appropriate for the participants (with some of them even being carried out late in the evening, less likely to happen with face-to-face interviewing), as well as more flexibility in not setting a time limit for the interviews (Gray et al., 2020): the three interviews selected for this paper lasted for 60, 65 and 100 minutes.

Other limitations of the research were the limited number of interviews and the insufficiency of available studies strictly on the identification of the link between migration and domestic violence, which raised a series of difficulties at the theoretical level.

Research Findings

Of the eleven men and nine women interviewed in the research project, only the three women dealt with in this research paper have reported cases of domestic violence, thus confirming the view in the academic literature that women are more exposed and vulnerable to domestic violence than men (Bonea, 2020; Hegarty and Roberts, 1998). Box 1 displays the narratives of the three interviewed women on the various forms of domestic violence experienced before their emigration to Romania.

Box 1: Answers of interviewees concerning important events in their lives

Milena (Belarus), 36 years old

"[There was] a strong impact in adolescence. My father and my mother... My father was an alcoholic, he drank a lot. Then my mother started too. I think that's when it started to have an impact on me because I grew up in a lot of quarrels and unpleasant things".

Stephanie (The Philippines), 37 years old

"I didn't have a good childhood in the Philippines. My father used to have a lot of vices, you know, drinking, smoking, we've experienced physical abuse from our alcoholic father".

Valeria (Republic of Moldova), 22 years old

"We couldn't stay there any longer for various reasons and they had to place us [the children] in another orphanage, a kind of social assistance, not really an orphanage, where we stayed for another year. After that, my mother bought our house; father has not been with us since he went to Moscow. He stopped contributing, they decided not to be together anymore.

When we went to the orphanage, my mother initially went with him to work so she could help us with the house. He decided not to be with us anymore. I mean, he didn't really contribute. For example, when I came to Romania, I had to... My mother was not legally married to my father. I mean, not legally, they lived without having... so, as it is done in some cases in the Republic of Moldova. And, what can I say, he didn't even want to come and sign a document allowing my mother to take me to Romania, because I was 16 years old, I was a minor. As a result of this, my mother took the decision to remove him from the birth certificate, as they were not married so she had the right to decide. So, we have nothing to do with him, unfortunately, and, no..."

Source: Transcripts of the Zoom interviews

Researches show that parental domestic violence, since it is a so-called 'pre-migration stressor' (Velezmoro, 2014), can be a factor in motivations to migrate. In a context of domestic violence, migration can be an exit strategy for survival (Conrad, 2013; Cook Heffron, 2019). Neither of the interviewed women did not mention parental abuse as a reason in migration decision-making: Milena and Stephanie migrated to unite with their husbands in Romania, Valeria migrated for studies. Parental violence did not seem to play a role, at least not at declarative level. Yet it can be assumed that, to a given extent, domestic violence during childhood might have had an impact on the migration patterns pursued later in life.

Studies also reveal that being a woman migrant leaves one in a precarious position, especially when women migrate for reasons other than occupational or economic ones, which forces them to try and make a living for themselves in the new country (Lagon,

2008; Schneider, 2020). Milena and Stephanie are spousal immigrants who came to Romania for family reunification and, in spite of full support from their husbands, still had various societal problems after migration. Valeria, at her turn, didn't have it much easier either, although it has to be mentioned that she had the advantage of being native in Romanian language.

The findings also seem to confirm another view held in the scientific literature, namely that, in most cases, men are the aggressors and women the victims (Asper et al., 2003; Flury et al., 2010). All three women in this study share in common experiences of fathers deserting from their responsibilities (desertion by father). In Valeria's case, it was a pure, physical desertion, a father abandonment, with the father leaving the family behind and moving away to Moscow („*He decided not to be with us anymore. I mean, he didn't really contribute?*”), while for the other two it was an emotional abuse, with the fathers indulging in alcohol, in Stephanie's case even combined with physical abuse. The voices of the three women reveal the complexity of domestic violence: Milena and Stephanie had to deal with excessive alcohol consumption, while Valeria, due to the desertion of the father, had to deal with financial problems. Moreover, in the case of Stephanie, alcohol consumption soon transformed into a culture of violence („*we've experienced physical abuse from our alcoholic father?*”).

Parental abuse and psychological repression are both identified in the literature as factors of sorrow (Lyu and Lu, 2021; Madigan, 2011). Sorrow can be a factor of imbalance in the years after emigration, as evidenced by Maglizza (1985: 35-36), who offers a case study of a migrant woman victim of domestic violence before migration. Maglizza believes that a sense of sorrow or grief suffered in the family, in the country of origin, can leave deep psycho-social scars even years after emigration. The author adds that a crisis or, in this sense, abuse at home can make emigration and inclusion in the new society harder than normal. For Maglizza, as well as for many other authors, women often migrate for family purposes, either because the husband decides to move abroad and they follow, or because they migrate in order to reunite with a spouse from that country (as with Milena and Stephanie, who both met Romanian partners and then married in Romania). The woman will need many years to adapt to the new country, Maglizza thinks, and what could help her in making the whole process smoother is support from the family. Luckily enough, both Milena and Stephanie receive unconditional support from their husbands, which they are happy and grateful for, yet both mentioned that this is not enough to ensure proper social inclusion in the host society. Maglizza states that an important pillar of social inclusion is the reference of identity, understood by Yatsyna (2020: 177) as „a way of self-expression of one's personality in interpersonal relationships”. Milena and Stephanie claim the absence of this reference of identity from their post-emigration lives, in that they could not relate or communicate to their in-laws in Romania. At the same time, life after emigration can be made harder by a lack of reference of identity from the family of origin back home, which should provide support during life. Domestic violence and a sense of grief in the family of origin can leave scars even after the emigration of a member, especially for women, Maglizza points, who have few things which they can relate to in the destination country. Especially in the first years after emigration, the family – either of origin or of procreation – has the role to provide that identity that the migrant woman can relate to. Yet, for Milena and Stephanie, apart from their husbands, their

extended families of procreation do not provide much support, while the connections to the families of origin are wired through episodes of domestic violence:

„It's also challenging for me to communicate with my in-laws because my in-laws don't to speak English [and] I don't know how to speak Romanian” (Stephanie)

„It's just my husband and myself and I have no one else” (Milena)

Moreover, Milena has undergone acculturative stress after the traumatic event of her parents passing away within two months, shortly after her wedding, leaving her, as she states, with just her husband and herself. Studies have demonstrated that the loss of loved ones increases migrant's sensitivity to stress (Smid et al., 2018), since physical and emotional distance, plus having to cope in a society different to the native one, are added to the sorrow of losing the loved ones. This also confirms the idea of Aspinall and Watters (2010) that migrants who have experienced stressors before migration were more likely to undergo stressful situations after migration as well.

Pre-migration trauma is linked with mental health issues (Buchmüller et al., 2018) and posttraumatic stress disorder (Torres, 2019). Traumas experienced in the family of origin are believed to lead to adaptation problems even later in life (Maglizza, 1985; Poraj, 2014). To overcome such negative developmental outcomes, Jang et al. (2022) claim that migrants have to enhance their networks of friends, yet this also proved difficult for the three migrant women interviewed, who claimed that it was difficult for them to make friends in Romania.

One of the effects that parental alcoholism had on Milena was the rejection of alcohol:

„Here [in Romania], I also told my husband, in so many years, I only saw one single drunk man on the streets. It had a positive impact upon me that I didn't see [drunk people on the streets]. You know, [in Romania] people know how to drink, when to stop”.

The fact that Milena talks about moderation in alcohol consumption, about knowing when to stop when drinking, can be related to emotional trauma in childhood. Gorsuch and Arno (1979) demonstrated that children tend to reject acts considered to be deviant when they internalize values related to abuse; precisely, being exposed to abuse, once children become adults, they tend to develop negative attitudes towards that kind of abuse, leading to acts of rejection later on in life. In Milena's case, the rejection contributed to the development of an angle of regarding the host society after emigration. Had Milena not had to live the experience of an alcoholic father, she might well not have been able to perceive the cultural dimension of alcohol consumption in different societies, which would not have allowed her to observe that people in Romania tend to be more moderate in alcohol consumption than in her native country.

Conclusions

In this article we have exposed the unique experiences and perceptions of migrant women victims of domestic violence, indicating the fine link between migration and domestic violence. With this study we try to draw attention to the fact that both migration and domestic violence are two big and extremely complex subjects, but which are closely related to each other, in certain life contexts.

The fine interaction between domestic violence and migration, highlighted two big favouring factors: excessive consumption of alcohol and marginalization. Also, society can indirectly contribute to the perpetuation of violent behavior in the family, through the increased degree of tolerance and even indifference to the suffering of the victims.

In the case of migrant women, the family history in which domestic violence is found, is a factor of physical vulnerability with the appearance of various health problems and also a psychological increased susceptibility.

Gender dynamics in the context of the migration of women who were abused in their families of origin are very complex and can be understood through culture, customs, gender roles and the norms of conduct in the family and society (Abdi, 2014: 479). The migrant women who witnessed and/or were victims of domestic violence, suffer various traumas along the way. Also, these women have in their cultural and educational background, the customs and behaviour norms received in their families of origin. Gender norms in the patriarchal cultural context, see family as a forbidden space for the public, like an isolated fortress, where only members have access (Akpınar, 2003: 438). Thus, the isolation of female family members can increase the risk of abuse and violence in the private space.

Besides the desire to have a better life, women also migrate to be able to put an end to family abuse. Isolation, marginalization, poor material situation, the culture of violence, the excessive consumption of alcoholic beverages, all of these are among the main factors of the emergence and maintenance of domestic violence.

First, a victim of domestic violence, then a migrant, women face a multitude of risks and difficulties in the process of integration into society, in finding a job according to their qualifications, identifying a home they can afford, adapting to the new social rules, culture, language etc. (Alcalde, 2006). Also, in the context of migration, once they arrive in the desired country, women are most exposed to the danger of becoming victims of domestic violence and gender-based violence (Raj and Silverman, 2002; Menjívar and Salcido, 2002).

If we pay attention to the effects of the culture of violence, where the patriarchal vision places the man in a privileged position of power over the wife and children, we will find that abusive and violent behavior is transmitted intergenerationally and encouraged in certain circumstances. Thus, society's perception of domestic violence is distorted, offering advantages to the aggressor and endangering the victims. The marginalization of the family and the isolation of the victim make the domestic space a true cage from which the victim can hardly leave to put an end to the abuse.

Authorship

Materials and methods, V.I.R.; formal analysis, V.I.R., G.V.B.; investigation, V.I.R., G.V.B.; review and theoretical conceptualization, V.I.R., G.V.B.; data collection, V.I.R. Both authors have read and agreed to the published version of the manuscript.

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SAVE THE COMMUNITY FROM THE FLOOD HAZARD: THE PERSPECTIVE OF COMMUNITIES SURROUNDING THE LAKE

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Abstract: *The community has a strategy facing floods. This research aims to analyze (1) the community's mitigation, (2) the community's action during the flood, (3) the community's post-flood action, (4) the community's effort to avoid flood's effect. This research's approach is explanatory-sequential design. Data collection used questionnaires, in-depth interviews, observations, literature studies. Quantitative data analysis used descriptive statistics and qualitative data analysis used a 3-step technique. The results are (1) community mitigation: cleaning the lake and the river from waste, preparing the boat, preparing the empty land for the animal, and making higher the house. (2) community actions during flooding: picking up things to the place under the roof, building the higher place into the home, building the bamboo bridge, saving the vehicle in other families, saving the animal in the safety place (3) actions after flooding: cleaning mud post-flood, improving the broken part of the home, putting back things post-flood, broken the bamboo bridge. (4) efforts to avoid impact of flooding, having housing provided by the government and utilizing bridges. The conclusion that all community actions to deal with floods are collectivity for the community.*

Keywords: *mitigation, flood disaster, preparedness, social action*

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1. Introduction

Sociologically saving the community from the threat of flooding can be understood as a social action of the community facing a flood disaster (Daddoust et al., 2018). These social actions include disaster management steps including the mitigation stage, the preparedness stage, and the post disaster recovery stage (Karana & Supriharjo, 2013; Robbani et al., 2020). The countermeasures stage in this context is called non-structural countermeasures. Mitigation is structural if it involves the government as the person in charge of the policies in it (Taryana et al., 2022).

Disaster management measures around the world are uniform in stages (mitigation stage, preparedness stage, and post disaster recovery stage) which are inferred from years of experience in disaster management programs including local knowledge around the world (Desportes et al., 2016). The stages of countermeasures can be applied to all types of disasters that have ever existed, such as hydro-meteorological disasters, natural disasters, and so on. Mitigation of flood disasters, for example, in Europe, America, Asia, with the characteristics of each flood complements the experience of coping with the community along the Brahmaputra river adapting to floods, flash floods and other disasters. Communities along the Brahmaputra river have gone through various types of disasters and they have experience surviving these disasters (Das et al., 2009).

Flood management in Indonesia, both structural and non-structural, has been extensively researched and documented. Non-structural countermeasures such as the local wisdom of the Bringin drainage sub-system community in dealing with flooding (Waskitaningsih, 2012), Local wisdom about disaster mitigation in the Baduy community (Permana et al., 2011). Structural countermeasures such as the concept of handling flood disasters at Housing Manggala Makassar City (Arifin et al., 2021), study of the implementation of flood control strategies in the Jeneberang Hilir sub-watershed (Case Study of Flood Control in Makassar City) (Nandini, 2010), etc. Thus, the flood disaster mitigation policy is reviewed from 3 aspects, namely (1) land characteristics, (2) flash flood hazard level, and (3) social vulnerability (Putri, 2018; Rachmat & Pamungkas, 2014). Areas with such conditions require both structural and non-structural mitigation (Dinia Putri & Syafei, 2022). However, research on flood disaster management in communities around the lake has not been widely carried out, especially in Indonesia.

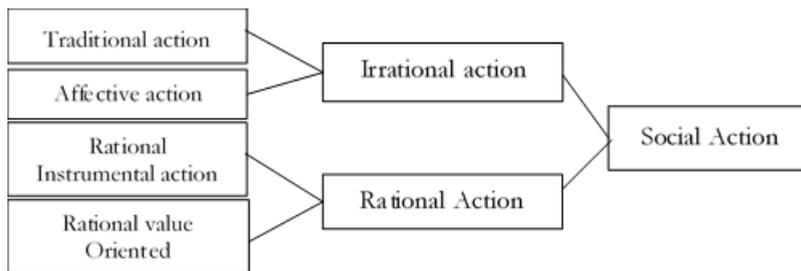
The urgency of this research is (i) the community in the lakeside area needs to improve their quality of life so that they need to solve the problem of flooding, (ii) regional development can be resolved if the community contributes to flood control, (iii) Tempe Lake is a tourist destination so that it requires the involvement of the local community to maintain and protect it. Thus this research will answer the following research questions: (1) to analyze the mitigation strategy of the community before the flood, (2) to analyze the social action of the community during the flood, (3) to analyze the social action of the community after the flood, (4) to analyze the efforts made by the community to avoid the effects of flood.

2. Conceptual Framework

Social Action

According to Max Weber, social action is an action that is clearly directed at other people, it can also be an action that is inner or subjective in nature that may occur due to the positive influence of a particular situation or is a deliberate repetitive action as a result of the influence of a similar situation, or in the form of an agreement. positively in certain situations (Ritzer & Stepnisky, 2021). Furthermore, Weber's social actions are classified as follows: traditional actions and affective actions are a form of irrational action in humans, while value-oriented rational actions and instrumental rational actions are manifestations of rational action in humans (Nutani, 2016; Setiadi & Kolip, 2011; Soekanto, 2019). Each type of rational action is in the following figure.

Figure 1: Weber's Social Action



Source: Kamanto, 2004

Mitigation

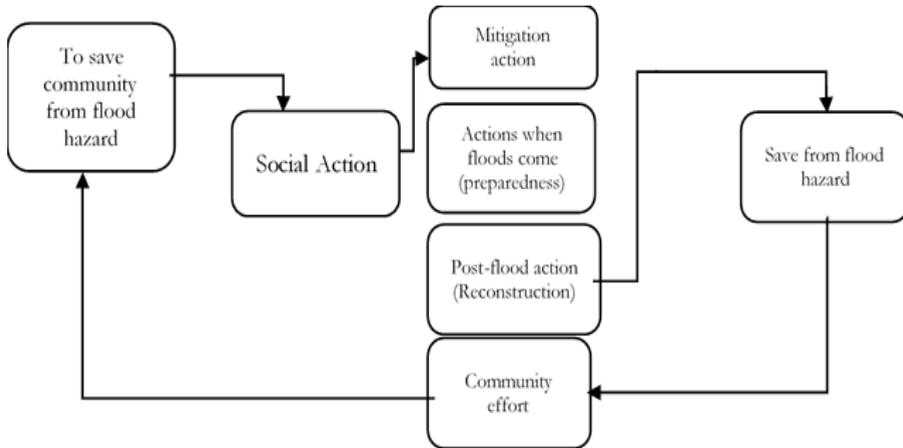
Mitigation is understood as the series of efforts to reduce disaster risk, both through physical development and awareness and capacity building in dealing with disasters (Halim & Zainuddin, 2017). to reduce losses caused by disasters, it is necessary to create disaster mitigation plans, plan evacuation routes, and increase capacity in emergency response management and guide the community in steps to reduce losses due to disasters. In disaster mitigation there are four important things, namely: (1) Availability of information and maps of disaster-prone areas for each type of disaster (2) Existence of outreach to increase public understanding and awareness in dealing with a disaster (3) Knowing how to save oneself, what needs to be done carried out and avoided during a disaster (4) There are arrangements and arrangements for disaster-prone areas to reduce threats (McEntire, 2011).

Preparedness

Preparedness is thus defined as actions taken in advance of a flood disaster to ensure adequate response to its impacts and relief and recovery from its consequences (Paton, 2003). This preparedness is closely related to community resilience which means the

capacity of the community and its members to recover from the effects of hazard exposure to disasters (Klein et al., 2003). Yield losses and risk losses are 2 things that can be reduced with resilience (Chan & Liao, 2022). These two things are also a disaster risk reduction strategy including the environment (Alexander, 2013; Weichselgartner & Obersteiner, 2002).

Figure 2: Conceptual framework



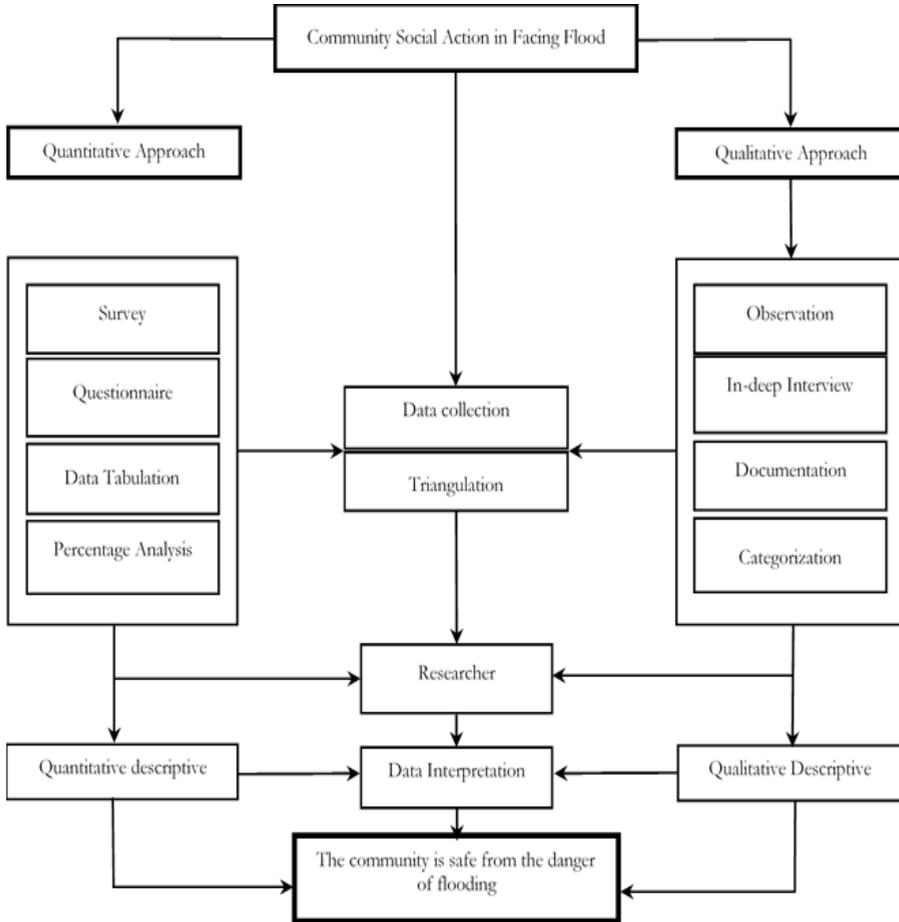
Source: author's elaboration, 2023

3. Method

Research Design

This study uses a mixed method approach, namely quantitative-qualitative with an explanatory-consequential design (Creswell, 2013). Data were obtained through observation, in-depth interviews, surveys, and documentation (Bungin, 2015; Emzir, 2010; Oetomo, 2015). Quantitative data in this study is used to explain social action in mitigation, social action when flood coming, social action post flood while qualitative data is used to describe community effort to avoid the negative effect of flood. Triangulation in this study is used by researchers to check and validate data by combining the results of data acquisition through observation, in-depth interviews, and documentation. Furthermore, the case study was chosen with consideration: (1) case characteristics are complex in the sense that data examination is carried out in depth, detail, and detail; (2) case studies are used to explain developing situations based on facts found in the field; and (3) case studies are used to explore in-depth information related to the phenomenon of community social action in facing flood. The quantitative-qualitative approach in this study is presented in Figure 3 below.

Figure 3: Combined sequential quantitative-qualitative approach

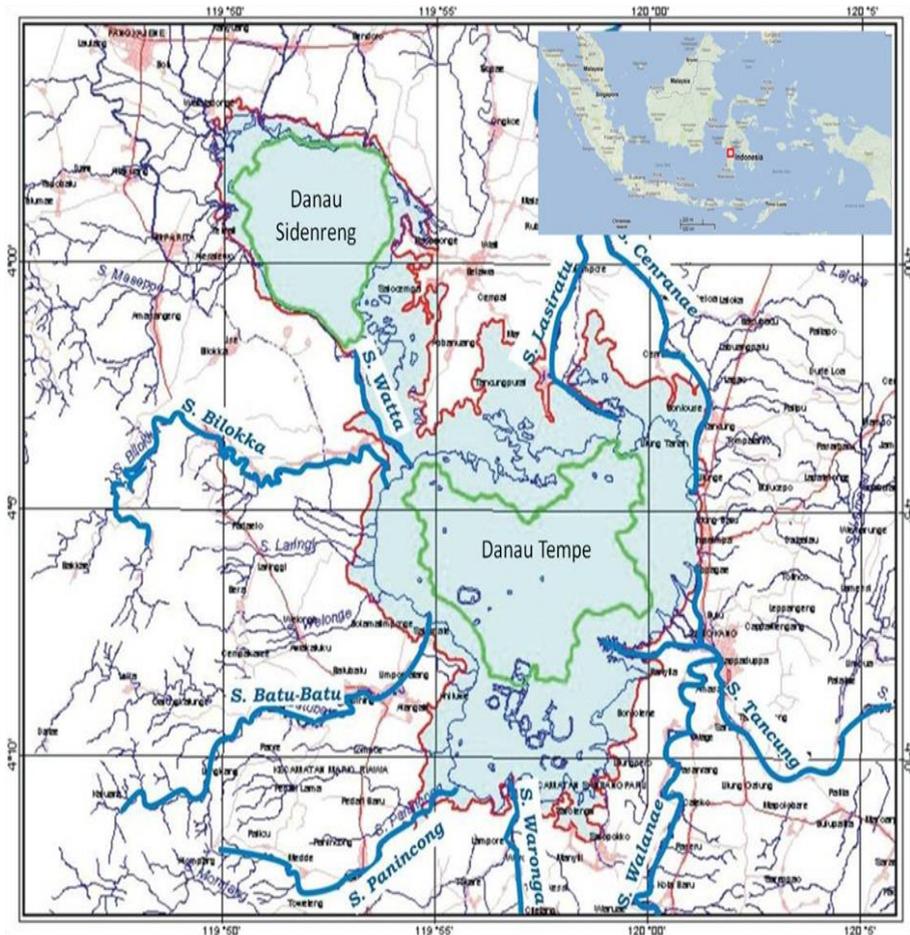


Source: author's elaboration

Study Area

This research was conducted in the area around Tempe Lake from July 2021 to December 2021 in Wajo District, South Sulawesi province. The research area around the lake namely (i) Bakke Orai hamlet, (ii) Baru Orai hamlet, (iii) Baru Alau hamlet, (iv) Bakke Alau hamlet, and (v) Padduppa hamlet. The research location is presented in Figure 3 below.

Figure 4: Map of Tempe lake and Province of South Sulawesi, Indonesia, 2023



Source: Mansor and Omrizal, 2013

Data Collection Method

Observation

Observation in this study was used in data collection, namely: community social action in mitigation, when flood coming, and social action post flood. The instruments used in collecting data through observation are (i) field notes, (ii) periodic notes, and (iii) checklists. Furthermore, the results of observations obtained by researchers are used to describe the situation or events that are taking place in relation to research variables such

as mitigation, social action when flood coming, and social action post flood, (ii) community efforts to avoid the effects of flooding.

In-depth Interview

In-depth interviews were used to collect data on (i) social action in mitigation, social action when flood coming, and social action post flood, (ii) community efforts to avoid the effects of flooding. Furthermore, the tools used in the in-depth interviews were tape recorders, pictures, and interview guidelines with loose notes, checklists, and rating scales. Thus, the functions of in-depth interviews in this study are (i) description, in this case to describe the situation and conditions of the community, (ii) exploration, in this case exploring the field for the purpose of obtaining information related to community social action in mitigation, social action when flood coming, and social action post flood, and solution for the community. Both of these are used by researchers to emphasize the situation and conditions of the field based on the results of the observations that have been carried out.

Documentation

This study used several documents, including: (i) Bakke Orai hamlet, (ii) Baru Orai hamlet, (iii) Baru Alau hamlet, (iv) Bakke Alau hamlet, (v) Padduppa hamlet, (vi) Tempe lake picture and (vii) community activity when flood coming.

Questionnaire

A questionnaire instrument was used for data collection, including: (1) community social action in mitigation; (2) community social action when flood coming or preparedness; (3) community social action post flood, (4) community efforts to avoid the effects of flooding. Furthermore, the questionnaire in this study is used for two purposes, namely (i) descriptive, in this case describing the situation and condition of the object of research based on the facts found in the field, and (ii) ordinal scale is used in measurement based on the grouping of data obtained in the field. The value scale set is distinguished by five categories, namely (i) value 5 for the category strongly agree, (ii) value 4 for the category agree, (iii) value 3 for the ordinary category, (iv) value 2 for the category disagree, (v) value 1 for the category strongly disagree.

Questionnaires were distributed to the community around the Tempe lake. The completion of the questionnaire was guided by the researcher and the enumerator. Enumerators were selected with the following considerations: (1) Having the ability to collect data; and (2) Understanding the characteristics, social reality, and behavior of the community. Furthermore, the research sample was determined using the stratified sampling technique (Sugiyono, 2010; Suyanto, 2015) as follows.

Table 1: Population and research sample

| No. | Name of hamlet | Population | Sample |
|-----|--------------------------|------------|--------|
| 1. | <i>Bakke Orai</i> hamlet | 240 | 72 |
| 2. | <i>Baru Orai</i> hamlet | 200 | 60 |
| 3. | <i>Baru Alau</i> hamlet | 190 | 57 |
| 4. | <i>Bakke Alau</i> hamlet | 170 | 51 |
| 5. | <i>Padduppa</i> hamlet | 200 | 60 |
| | Total | 1000 | 300 |

Source: Tempe village community documentation, 2023

Table 1 shows that there are 5 hamlets included around the Tempe lake which always gets flooded in Wajo District area. The total population of 5 hamlets are 1000 people. There is 30% each of the population taken as a sample (Sugiyono, 2019), so the research respondents are 300 people.

Furthermore, the general characteristics of respondents based on age, number of family member, vehicle ownerships, boat ownership, and livestock ownership are presented to illustrate the circumstances that contribute to their social action in facing flood. These are presented as follows.

Table 2: Characteristics of research respondents

| No. | Demography | f | % |
|-----|--|---|---|
| 1. | Age a) 41-45 years b) 46-50 years c) 51-55 years d) 56-60 years e) 61> years Number of family members a) 1-2 person b) 3-4 person c) 5-6 person d) 7-8 person e) 8> person Vehicle ownership a) Motorcycle b) Car Boat ownership a) Nothing b) 1 boat c) 1> boat Livestock ownership a) Chicken, duck, duck, goose b) Cattle, horse, goat | | |

Source: Results of questionnaire processing, 2023

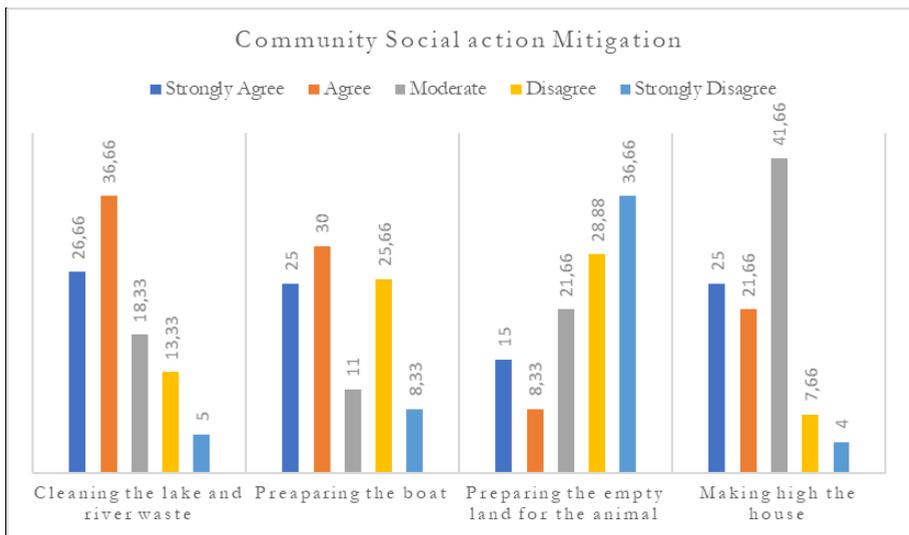
Data Analysis Method

Quantitative analysis in this study uses the descriptive Statistics analysis method. Descriptive statistical analysis is used to describe the indicators of each variable used. Qualitative analysis in this study refers to the results of data obtained through observation, in-depth interviews, and documentation. Data analysis was conducted through three categories, namely data reduction, data display, and conclusion. The three processes were carried out by separating information into categories based on informants' views and facts found in the field. Furthermore, the stages of qualitative analysis include: (i) domain analysis, in this case based on the social situation that takes place including place, actor, and activity, (ii) taxonomy analysis, in this case the domain that is determined is then described in detail. This means that mitigation before flood coming) variables, preparedness (when flood coming) variables, post flood variables, involvement in government program variable are described in detail, (iii) componential analysis is carried out by contrasting situations and field conditions that show differences in conditions between lakeside community characteristics and other community characteristics that are often exposed to flooding, and (iv) cultural theme analysis is carried out by integrating across domains found in the field. The aim is to explain the variables in this study in relation to other variables.

4. Findings

Community social action in mitigation

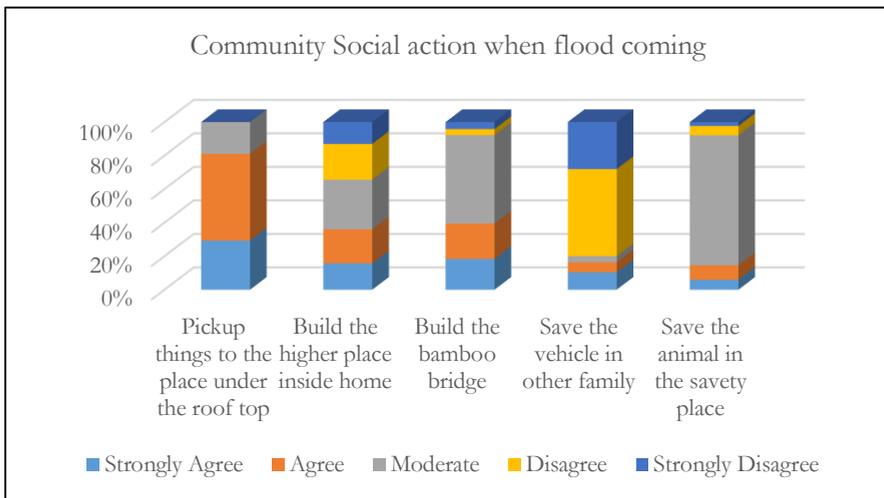
Figure 5: Community social action in mitigation



This strategy is carried out before a flood occurs in preparation for reducing the risks it poses. These actions include (1) Cleaning up lake and river rubbish is the main cause of flooding in addition to the silting up of lakes and rivers. However, it is not the community's authority to dredge lakes and rivers but the authority of the government and the private sector. The community can participate in alleviating flooding by cleaning up the large amount of rubbish in the lake in the form of logs, grass and weeds, household waste, and so on carried by the flow of water from outside the lake. People who actively do this activity (63.32% strongly agree and agree) outnumber those who moderate and do not (18.33%). (2) In addition to cleaning up lake and river rubbish, a common thing that people do is to raise the pillars of their houses and all residents have houses on stilts. This activity is mostly done by 46.66% of residents, 41.66% of moderate residents and 11.66% who do not do it at all. This type of house is suitable for lakeside conditions that are often flooded. Even though people can raise their houses by about 1 metre, they are still likely to be flooded in the event of lake overflow. (3) Preparing a boat is the most likely action for boat owners because not all people own a boat. Residents who own boats use them for river transport and some keep them in reserve in case of flooding, which they can use and lend out. In this regard, 55% of residents prepare boats, 33.99% do not prepare at all and 11% are moderate. (4) For people with pets, they will look for and clear vacant land to prepare a place to save their pets. Most of them utilize vacant land around the lake and are free from flooding. They will bring their pets such as cows, goats, chickens, ducks or horses, etc. to the land. There are 65.54% of residents who do not have livestock or pets so they do not need to prepare vacant land, 21.66% who are moderate, and only 23.33% who are quite dependent on their pets and prepare land.

Community social action when a flood occurs (Preparedness)

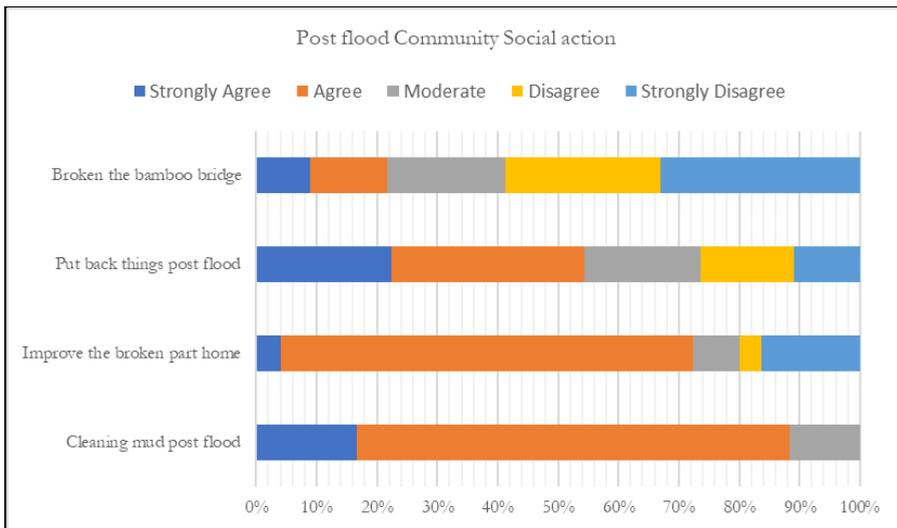
Figure 6: Community social action when a flood occurs



When the floods come, people no longer panic because they have prepared everything in anticipation of a greater impact. Social actions taken include (1) Moving goods to the attic. As many as 25.5% of respondents strongly agreed and 50% agreed, and 18.33 were moderate. (2) Creating a higher storage area in the house that is not reached by floods. In this regard, 15.66% strongly agreed, 20.22 agreed, 29.66% moderated, 21.33 disagreed, and 13% strongly disagreed. (3) Build bamboo walkways to walk above the water, 22% strongly agreed, 25.33% agreed, 63.33% moderated, 4.33% disagreed, and 5% strongly disagreed. This walkway connects houses within the village to the main road or a flood-free location. This bamboo walkway is made by men working together while women prepare food and drink. (4) Leaving vehicles with families whose houses or locations do not experience flooding. 8.66% strongly agree, 5% agree, 3% moderate, 43.33% disagree, and 23.33% strongly disagree. Those who agree and strongly agree to leave their vehicles are those whose houses are safe from flooding, while those who agree to leave them are those whose locations are not safe from flooding. (5) Saving livestock in a safe place. In relation to this, 6% strongly agree, 8.66% agree, 78% moderate, 51.51 disagree, and 2.33% strongly disagree. Those who strongly agree and agree are those whose livestock are in danger of being carried away while disagreeing means it is safe. A moderate answer means that livestock can be threatened with death or not depending on the size of the flood. If a large flood occurs, it means that livestock are threatened, if a small flood occurs, it means that it is safe.

Community social action during post flood

Figure 7: Post-flood community social action



The receding floods have left behind dirt, rubbish and mud. In view of these conditions, people still have to work hard, namely: (1) Cleaning up dirt, rubbish, and mud at home brought by the flood. 16.66% strongly agreed, 71.66% agreed, and 11.66% were moderate. This means that all houses are dirty because none of the residents disagree. (2) Returning items that had moved to their original places. There were 22.33 respondents strongly agreeing, 32% agreeing, 19.33% moderating, 15.33% disagreeing, and 11% strongly disagreeing, (3) Repairing parts of the house damaged by flooding such as the walls of rooms or walls of houses that leaked due to flooding. In this regard, 4% of respondents strongly agreed, 68.33% agreed, 7.66% were moderate, 3.66% disagreed, and 16.33% strongly disagreed. (4) Dismantling bamboo walkways connecting houses or roads and returning the bamboo and tools. There were 9% strongly agree, 12.66% agree, 19.66 moderate, 25.66% disagree, and 33% strongly disagree.

Community efforts to avoid the flood effect

Lake Tempe is the largest lake in South Sulawesi. In the past 2 decades this lake has experienced siltation and narrowing. The siltation was caused by the large amount of material that was carried into Lake Tempe by small rivers connected to the sea in the bay of Bone. The Wajo district government has been dredging rivers and lakes little by little but the results are not optimal since 5 years ago. The dredging also stopped the program, the government diverted it to other programs such as the construction of residential areas.

Meanwhile the government is building public facilities. One of the facilities built is a bridge. This bridge serves to connect all research locations with roads. Previously, people had to cross by boat if they wanted to go to the main road or for community activities such as shopping, going to school and working. Therefore, the government built a connecting bridge between the highway and the area so that the mobility of the population is smooth.

As a result of the construction of the bridge, traffic in and out of the area became heavy with high frequency. Eventually, many people owned and built houses elsewhere that were safe from flooding. When the flood came, they evacuated to other houses. However, they stayed in the first house that was flooded because the land was fertile and used for farming. The location is also not far from the fishing location that is their livelihood.

5. Discussion

Community social action in mitigation

Mitigation is an action taken by the community before the flood occurs. Mitigation is intended as a precautionary measure or greater risk reduction in the event of a flood. Actions taken by the community at the research location such as raising the house (Halim & Zainuddin, 2017), or raise the pillars of the house (Halim, 2016) is the result of research that has the same characteristics, namely the banks of the river with the possibility of a

flood disaster. Mitigation is also always unique and different because of the different physical environment and even so, mitigation always aims to reduce the risk of more severe losses and harm people's lives.

At this mitigation stage, the role of the government and other institutions is very urgent. Their role is closely built through the strength of social capital, especially in empowering community resources aimed at handling floods (Bodin & Crona, 2008; Brown & Ashman, 1996).

Community social action when a flood occurs

Likewise, when a flood occurs, there are special actions that are more urgent and urgent to take, namely preparedness. This preparedness issue requires community knowledge specifically for disaster. The results of this study are in line with the results of other studies that the community needs knowledge related to something new to be said to be prepared (Mas'Ula et al., 2019). In addition to community preparedness, it is also necessary to have a certain level of government preparedness as the person in charge (Erlia et al., 2017; Rahma & Yulianti, 2020). In a society with an agrarian character, social capital is thick with togetherness, mutual cooperation and social solidarity. When the flood occurred, all the actions were sudden, in an atmosphere of urgency, wanting to save each other what they could.

Community social action during post-flood

Post-flood is the final phase of handling residual floods. There are various things that are caused during a flood and require serious attention and handling. The most common thing that happens is that floods bring silt into the house and it can settle on the floor of the house for days if it is not anticipated. In addition to mud, floods also bring garbage. Overcoming garbage and silt, women play a very important role in cleaning it up (Ha et al., 2022). Sometimes the local government, such as the village head, involves non-formal institutions (Dinh et al., 2021) such as volunteer groups for cleaning and handling all damage caused by floods such as damaged houses and so on.

Community effort from the effects of flooding

Population growth has consequences for area expansion and this requires new land to build housing (Haslinda B. Anriani et al., 2019). There are lots of housing built by the government to respond and this is a solution for people who are often affected by floods. There are several types of facilities provided for those affected by flooding to have a place to live in a residential area. Consideration of the ease of service is carried out by taking into account the socio-cultural conditions of the flood-affected community such as they are flood victims, their livelihoods are disrupted, their income is small and not fixed. The impact of such a policy is that many residents in flood locations have alternative housing or affordable housing so that they have alternative housing in the event of a flood.

6. Conclusion

Actions taken by the community to save the community from floods are collective actions carried out by all members of the community at the research location. These actions were carried out in mutual cooperation, full of togetherness, good cooperation and based on common interests, both affected by the flood and both safe from the flood.

These collective actions include pre-flood mitigation social actions, social actions when floods occur, and social actions during post-flood events. There is an acceleration of social action for the involvement of the government and private institutions to help ease the burden on society.

The efforts made by the community to reduce the impact of flooding on them are to find alternative places to live when a flood occurs. There is a lot of housing provided by the local government at affordable prices and other conveniences and the places around the lake are still inhabited when there is no flood so they can grow crops again.

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Declaration of conflicting interests

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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EVALUATION OF THE SOCIOECONOMIC IMPACT OF COVID-19 IN BANGLADESH: AN ANALYSIS FROM A GENDER PERSPECTIVE

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Abstract: *The COVID-19 pandemic, since its emergence in late 2019, has exerted profound socioeconomic repercussions globally. This study explores the multifaceted socioeconomic impact of the pandemic on Bangladesh, with a specific focus on gender disparities. This study examines the gender-specific effects of COVID-19 on the economic well-being, healthcare access, and social roles of individuals in Bangladesh, using data from secondary sources. The findings of this study indicate that COVID-19 has exacerbated preexisting gender disparities in Bangladesh. Loss of income and employment opportunities caused disproportionate economic hardships for women, particularly those in low-income households. The pandemic disrupted women's access to healthcare services, raising concerns regarding their reproductive health. The study underscores how traditional gender roles were reinforced during the pandemic, with women bearing the brunt of increased caregiving responsibilities. It resulted in decreased participation of women in the formal labor force, potentially hindering their long-term economic empowerment. Policy recommendations are put forth to address these disparities, emphasizing the need for gender-responsive measures in pandemic recovery strategies. These include targeted economic relief programs, improved healthcare access, and initiatives to promote gender-equitable social norms. The research highlights the urgency of integrating a gender perspective into public health and economic policy to build a more resilient and inclusive society post-pandemic.*

Keywords: COVID-19, Pandemic, Economy and Society, Gender, Bangladesh

1. Introduction

The purpose of this study is to analyze the impact that COVID-19 has on Bangladesh's economic sector and society from the gender perspective point of view, including current references and examples from Bangladesh. The pandemic caused by COVID-19 is not just a public health crisis; it is also having profound significant consequences on the

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fundamental aspects of society and economy (Bonea and Rosca, 2022; Cimpoeru et al., 2023). Even though the impacts of the pandemic will vary from country to country, it is quite likely that poverty and inequality will increase all over the world. As a result, it will be even more extremely crucial to achieve the Sustainable Development Goals (SDGs) (UNDP, 2020). The Novel Corona Virus Disease, also known as COVID-19, was detected for the first time in Wuhan Province on December 31, 2019, which is located in China. After several time elapsed, on March 11, 2020, the World Health Organization announced that the corona virus had reached "pandemic" dimension. The virus has rapidly spread around the world, reaching 185 countries, including both underdeveloped and developed nations. Everything around people's lives all across the world has been disrupted as a result of the pandemic. It has had a significant impact on the family lives of people, as well as the economy, society, and other aspects of life. The United Nations says that the world hasn't changed this much in the last 75 years. The COVID-19 pandemic has caused a significant amount of damage to the economy around the world. The International Monetary Fund (IMF) considered situation a "new recession" and evaluated by comparing it with the European financial crisis during 2009. Along with damaging the global economy, the pandemic has negatively affected development, security, health care, food, and political sectors. Because to the widespread transmission of the COVID-19 epidemic, the whole planet is currently going through the most challenging time of the history. Its effects on society and the economy are so terrible that the strongest economies in the world are still fighting to get over it. Even after a lot of effort, the US, the UK, and most of the countries of Europe are still trying to deal with this pandemic. From this point of view, Bangladesh is not an exception; rather, it is comparable to other countries. The epidemic has severely affected poor countries economically, socially, and politically. Poor countries are likely to lose the battle against Corona due to a lack of supply of necessary equipment for Corona treatment and a lack of test kits. A research paper published by Travel Bank has shown that in developing Asian countries, the production of the domestic trade sector has decreased drastically. The economy suffered a loss ranged from \$77 billion to \$347 billion as a consequence of the epidemic, which approximately to 0.1% to 0.4% of the global Gross Domestic Product (GDP). A total of \$22 billion have been lost throughout Asia as a result of the pandemic (ADB, 2020). Projections indicate that major economic and social changes will take place worldwide in the future due to this pandemic.

2. Objectives and Methodology

The main purpose of this research paper is to provide a concise overview, in as few words as possible, of how the COVID-19 epidemic has had an effect on the economy of Bangladesh., affected the population and social surroundings of Bangladesh, and analyzed this transformation from a gender perspective. This article contains two sections. The initial section analyzes the effects of COVID-19 on the Bangladesh's economy, the Ready-Made Garment (RMG) industry, and remittances. The second section analyzes, from a gender perspective, how the pandemic has affected women in the labor market as well as at home.

This article was mostly written by compiling information and data from secondary sources. This article was prepared after considering the findings and points of view presented in a variety of other publications, including newspapers, social and mass media, research papers, essays, novels, and accounts of earlier epidemics. All the data has been verified multiple times and collected. After analyzing the data, the results and conclusions are written. The article analyzes the socio-economic changes of the corona virus from a gender perspective and recommends the necessary next steps.

3. Economic Impact of Covid-19

Bangladesh is one of the countries that has a massive population and is among the most populous nations in the world. Because of the spread of COVID-19, Bangladesh is currently dealing with a significant obstacle. Bangladesh has experienced a crisis in health, economics, society, religion, and politics as a result of the Corona virus pandemic. In reality, COVID-19 has made massive impact to the total impact in the country's economy. There are three primary ways in which COVID-19 has had an impact on the economy of Bangladesh. Initially, Bangladesh announced a lockdown on March 26, 2020, which was later rescinded. On April 5, 2021, the country went into lockdown for the second time. As a result of the lockdown, the country's domestic productions as well as its international trade have suffered. The second factor is a decrease in exports to the ready-made garment sector (RMG), and the third factor is a decrease in remittances sent by Bangladeshis working outside of the country (IMF, 2020).

Agriculture, industry, and the service sector make up 18%, 29%, and 53%, respectively, of Bangladesh's gross domestic product. The pandemic has had an adverse effect on the economic condition of Bangladesh (Begum et al., 2020). Because of the inability to sell milk during the lock-down, dairy producers have requested urgent government aid. Around 12 to 15 million liters of milk were halted throughout the country, resulting in marginal dairy farmers losing Tk 5 million each day (Begum et al., 2020). The lock-down has lowered demand for chicken and eggs, threatening the viability of Bangladesh's poultry industry. The Bangladesh Poultry Industries Central Council (BPICC) estimates that the losses in the poultry business fluctuated between 1.150 billion and 1.160 billion Bangladeshi Taka (Begum et al., 2020).

In May 2020, the Bangladesh Institute of Development Studies (BIDS) conducted a study which revealed that around 16.4 million individuals have dropped below the poverty level as a result of COVID-19. About half of these individuals had a decreased income, and more than twenty percent had a monthly income below Tk 15,000. 57% of respondents to the BIDS survey reported not receiving a salary throughout the pandemic, 32% witnessed a decline in earnings, and just 11% maintained a constant income (Jamal, 2020).

The Power and Participation Research Centre (PPRC) and the BRAC Institute of Governance and Development (BIGD) have jointly done a research and found that the rural population's daily income decreased by 79% between February and April of 2020. The percentage is 82% among the urban poor. The food budget of the urban poor has declined by 47%, and among the rural poor, this rate is 32%. A report published by

BRAC showed that about 36% of the city's residents had deteriorated economic conditions, and 3% did not receive any salary. In another study done by BRAC, found that 95% of household incomes have gone down and 62% of salaried workers have been fired (Miah et al., 2020).

A survey by the Bangladesh Bureau of Statistics (BBS) in September 2020 found that, due to the coronavirus pandemic, the income of each family in the country has decreased by an average of 4 thousand takas only. As incomes dropped during the pandemic, food intake has dropped by 52% of households (IBS, 2020). The impact of Corona has hit the lower working class people deeply as the upper class of society has stopped hiring maids or maids to maintain social distance. According to a report published by the Bangladesh Bureau of Statistics (BBS), more than 50 million people are employed in the informal sector, which is about 85.1% of the total workforce. About 80% of day laborers have lost their jobs and become unemployed due to the epidemic (Jamal, 2020).

Some recent data bears relatively positive results. According to the World Bank (2021) report, the agriculture industry and services sector contributed 12.7%, 29.6%, and 52.8% to GDP in 2020, respectively, and these sectors provide employment to 38%, 22%, and 41% of the total workforce (lloydsbanktrade, 2021). The strategies adopted by Bangladesh to minimize the negative impact on its economy after the lockdown have worked positively. According to a report published in *The Financial Express* in February 2021, Bangladesh and Vietnam will be the fastest growing economies in the world among the six frontier markets in Asia (Mujeri, 2021). The Washington-based International Institute of Finance (IIF) noted that Bangladesh provided more than Tk 1.0 trillion in stimulus to boost the domestic economy (Mujeri, 2021). According to this report, this has been positive for Bangladesh as the risk of a debt crisis is low.

China is providing short-term financial and technical assistance to a wide variety of the flagship development projects in Bangladesh. These projects include the Padma Bridge, the Padma Rail Link, the Karnaphuli Road Tunnel, and the Greater Dhaka Sustainable Urban Transport Project. The epidemic has caused significant delays and setbacks for many of these initiatives. However, Bangladesh succeeded in completing the 6.15 km long Padma multi-purpose bridge on June 25, 2022 (Daily Star, 2022).

Impact of Covid-19 on the Ready-Made Garment (RMG) Sector

In Bangladesh, the Ready-Made Garment (RMG) sector is capable of generating 80 percent of the country's total exports. Each year, Bangladesh's garment sector makes up for the export of over \$32 billion worth of clothing. Following China as the world's highest exporter of clothes, Bangladesh is the second largest exporter in the world. There are over 4,000 factories in Bangladesh, which together employ 4 million people; the vast majority of these workers are women (Thomasson and Paul, 2018).

The crisis caused by the corona virus has had a significant impact on Bangladesh's garment sector, which saw a reduction of 89 percent in exports in the first week of April. A total of \$2.3 billion worth of orders placed in the garment industry were canceled during the first half of the month of April 2020. Major UK companies cancelled orders

worth 25 billion dollars in clothing (Nazir, 2020). In addition to Primark, most UK clothing retailers, including Fraser Group, Walmart-owned Asda, Debenhams, New Look, and Philip Day's Picks, have cancelled their clothing orders from Bangladeshi suppliers. Many garment workers lost their jobs due to the cancellation of garment orders. Many garment factories fired their workers without any prior warning. More than one million garment workers in Bangladesh have lost their employment as a result of order cancellations, as stated in a study that was published by the Global Workers' Rights and Workers' Rights Consortium (WRC) at Penn State University. The government of Bangladesh announced a \$588 million development package. The country's trade minister was cited as claiming that orders totaling more than \$2.6 billion had been canceled in Bangladesh's garment industry, and more cancellations are forthcoming (Begum et al., 2020). The Bangladesh Garments Manufacturers and Exporters Association (BGMEA) reported that around \$2.67 billion worth of production, or 828 million garment orders, were cancelled. Many factories have closed, affecting the lives of about 1.96 million people (Begum et al., 2020).

According to a survey published by the Centre for Policy Dialogue (CPD) in October 2020, ready-made garment (RMG) factories closed their doors between March and October and reduced 8% of their manpower. And among the garment workers who lost their jobs, the number of women is 61%. Prior to the beginning of the COVID-19 outbreak, the total percentage of women working in garment manufacturers was 62%. It is now down to 57% (Ahmed, 2021). The Bangladesh government's main strategy for the garment industry was to temporarily shut down garment factories to prevent the spread of the virus. Later, the government decided to open factories in an attempt to protect the garment industry. Businessmen, workers, and factory owners applauded the decision, but human rights activists criticized it. They urged the government to ensure more protection for factory workers. Covid-19 hit the garment industry first with cancelled orders and delayed payments. Government initiatives for this industry include extending wage support loans and stimulus packages; facilitating export development funds and holding foreign exchange in a single pool to pay back-to-back imports; a moratorium on export earnings; and debt classification. The first wave of the corona hit the garment industry hard, but these government programs helped the industry keep going. Garment sector exports decreased by 7.78% in October 2020. Last year, the annual export volume decreased about 16.94% (Huq, 2021). Currently, export prices have fallen and order placements have slowed down. This industry needs to be protected as it is already suffering from the first wave of attacks. Restructuring of this sector will ensure a stable life for millions of workers.

Impact of Covid-19 on migrant workers and remittances

Bangladesh plunged into further uncertainty after the garment industry lost \$6 billion in export earnings (Rashid, 2020). Apart from the garment industry, the second shock to the economy came from the disruption in remittance flows. Many families living in rural areas of Bangladesh dependent on remittances as their primary source of income. It is regarded to be the second highest source of foreign exchange earnings in Bangladesh, behind the garment sector, which provides for around 40 percent of total foreign

exchange earnings. Remittances contribute around 8.8 percent of a country's GDP, making them a significant impact in the nation's overall economy, fiscal health, and ability to reduce levels of poverty (Rashid, 2020). The Refugee and Migrant Movement Research Unit (RAMRU) has named migrant workers as the "Golden Man" for their tremendous contribution to the economy. There is a clear downward trend when comparing data from March 2019 and 2020 provided by Bangladesh Bank. About 11.38% of migrant workers in different countries are losing their job, which is expected to increase in the coming months. The longer the pandemic lasts, the longer the waiting time to go abroad. According to the Bangladesh Association of International Recruiting Agencies (BAIRA), about one and a half to two million workers completed the immigration process in the last three months and left from the country (Rashid, 2020).

Due to the COVID crisis, developed countries have created some restrictions in their job markets. As a result, many migrant workers lost their jobs and returned home. According to a report by the World Bank, Bangladesh will have to accept an increasing number of repatriated labor migrants, which may again increase the unemployment rate in the country. According to Bangladesh Bank's data, remittances of \$1.78 billion came into the country in February 2021, which was 9.2% less than the previous month. The flow of remittances decreased from February to April but increased from May onwards. The country's foreign exchange reserves reached \$444.03 billion as of February 25, 2021, with increasing inflows of remittances (Mavis, 2022).

4. Gender Significance of Covid-19

During the corona period, the social and economic crisis of Bangladesh was observed from the perspective of gender, and the current situation is observed to be more complicated. The Corona crisis has a massive impact on the everyday lives of Bangladeshi women and has pushed to a shift in gender roles in the workplace as well as the household. These changes have been brought about by the crisis. Women face an uncertain future as most legal institutions remain closed amid the state of emergency. As the lockdown began, it affected the women of the poor working class, especially pregnant women and children. Pregnant women and children suffer from food and nutrition shortages, which increase maternal and child mortality rates (Suraiya and Saltmarsh, 2020).

Women's Participation in the Labor Market

Women have been disproportionately impacted by the worldwide coronavirus epidemic, with many losing their jobs and others experiencing fatigue trying to care for sick family members and aging parents. Oxfam International states that in 2020, women around the world lost more than 64 million jobs, which is 5% of all the jobs they held. Last year, only 3.9% of jobs for men were lost. Oxfam International says that the loss of jobs caused by the Covid-19 crisis cost women around the world at least \$800 billion. This is more than the GDP of 98 countries put together (Connley, 2021). The lockdown in Bangladesh

has adversely affected the lower working class population. In general, the participation rate of women in the labor market of Bangladesh is low. In 2020, male participation in the labor market was 84%, while female participation was only 36.4% (Mujeri, 2021). Due to the lockdown during the Corona period, the participation rate of women in the labor market has further decreased. Many female workers have lost their jobs due to the cancellation of a large number of garment orders in the ready-made garment sector. According to the World Trade Organization (WTO), women have been affected more than men in the commercial sector by the COVID-19 pandemic. A significant number of women are employed in industries or organizations that are disproportionately impacted by the pandemic. Such examples of these include the textiles, clothes, and footwear industries, as well as the telecommunications industry. Women earn less than men, resulting in increasing poverty among women (WTO, 2020).

According to the survey results of UNFPA, UN Women and British Medical Journal, due to the impact of Corona, the employment opportunities of women in the formal sector in Bangladesh have decreased by 81%. For men, this rate is 14%. Even in the informal sector, 24% of women have lost the opportunity to work. About 37% of women are at risk as employment declines in the productive sector, compared to 26% of men. As a whole, 10% of women in countries with low and moderate incomes are at risk from trade marriages in the service industry, whereas only 6% of men (Ahmed, 2021).

In service sectors, such as tourism and the travel service industry, women are more represented than men, and travel restrictions during the corona virus pandemic have cut off their sources of income. School closures and temporary closures of child care facilities have had a significant impact on reducing women's income opportunities. For all these reasons, women have to change their work schedule as well as reduce their working hours. Besides, their household and service work has increased. Due to the low level of financial resources and limited access to government funds, the rate of risk in such businesses has increased. The government of Bangladesh has launched an incentive package of Tk 200 billion for cottage, micro, small, and medium enterprises (CMSMEs), of which only 5% would be dedicated to women. During the period of April through December of 2020, the SME Foundation distributed loans totaling TK 220 million. However, just five out of the total of 282 borrowers were female (Ahmed, 2021).

According to a separate research report that was published by BRAC in October of the previous year, only 1% of female business owners and employees were unaware of the incentive package that the government was offering, and while 44% of them attempted to take loans under the package, the remaining 59% did not do so out of fear of being harassed (Ahmed, 2021).

The COVID-19 pandemic has also put rural women entrepreneurs in a major crisis, with 80% of them having no income during the pandemic. Without any income, small business entrepreneurs spend most of their savings in a bid to survive and get caught in the web of debt. If the situation worsens, many of the entrepreneurs may have to go back to their previous housewife roles. This will hamper the economic development of rural women.

The Dropout Rate of Girls and increase of Child Marriage

All educational institutions, including schools and colleges, have been closed since March after the epidemic spread across the country, increasing the dropout rate of girls and child marriage. It is expected that the dropout rate among school-going children will increase and it is likely that more of them will be girls. Due to lack of income and rising poverty rate, many families will not be able to afford the education of girl children which is likely to increase the number of child marriages as a result. According to a UNICEF Bangladesh report, nearly 1 crore girls are at risk of child marriage due to Covid-19 (UNICEF, 2021). This means that Bangladesh faces the danger of losing its previous progress in reducing the prevalence of child marriage.

Impact on Female Headed Households

Although every household is facing financial loss due to Corona, female headed households are facing more uncertainty than male headed households. A BRAC study revealed that 80% of households headed by women saw a decline in income, whereas 75% of households headed by men did so (Miah et al., 2020). 57% of female-headed households saw their incomes drop to almost zero, compared to 49% of male-headed households. About 90% of women-headed households require food or financial and humanitarian assistance. 21% of female-headed households compared to 18% of male-headed households said their ability to meet living expenses would not exceed one week. 25% of male-headed households and 30% of female-headed households are uncertain about the future. That is, on the basis of all these data, it can be said that, where all families are facing crisis, the level of income-related crisis of women-headed families is direr.

The Burden of Domestic, Service and Unpaid Work

The world's economy and people's livelihoods often depend on women's unpaid work. Before the pandemic, women performed two-thirds of the unpaid domestic work worldwide (UN Women, 2020). In the context of Bangladesh, lockdowns, social distancing measures and school closures have placed additional pressure on women. As of March 2020, nearly 42 million students who have closed schools and colleges are staying at home. This has put additional pressure on women for household work and child care (UNICEF, 2020). According to a survey conducted by BRAC, 91% of women's unpaid work increased during the pandemic. About 89% of women do not get any free time. Due to the closure of schools, the amount of unpaid work for girls who have younger siblings has also increased (Suraiya and Saltmarsh, 2020).

A UN Women study titled "COVID-19 Bangladesh Rapid Response Analysis" claims that the lockdown period increased existing tough conditions for women at home, caused more women to suffer, and intensified existing gender inequalities. The report also stated that before the pandemic, women worked 3.43 times more than men at home. As schools are now closed and all family members are at home, women's unpaid work has increased

since the pandemic. Lockdown has brought different results for men and women. Many men have come forward to share the housework, but most of the housework is done by women during the lockdown.

Men used the opportunity to stay at home to focus on creative and hobby activities, such as writing poetry and short stories and joining Facebook Live. On the other hand, women hardly have time to spend on any hobby. During the pandemic, there is a shortage of domestic assistance, so working women are required to do all of the home duties on their own. These tasks include cooking, cleaning, and taking care of children and the elderly. The additional burden of unpaid work on working women often leads to marital discord and domestic violence.

Violence Against Women

According to the UNFPA, domestic violence has increased by 20% worldwide during this period. In the first week of the lockdown in South Africa, more than 90,000 complaints were filed against gender-based violence (Prothom Alo, 2020). Domestic violence has increased by 32% in France. 13 women have died in the UK in the first four weeks of lockdown. According to a report published by the Guardian, the rate of requests for help online has increased by 120% worldwide (Sarker, 2022). Harassment of women has also increased on social media, with tweets against women increasing by 93% between October 2019 and October 2020 (Ahmed, 2021).

Gender-based violence has increased at an alarming rate during the epidemic in Bangladesh. A case study of 7,000 rural families conducted by STEPS showed that a total of 4,500 women were victims of violence (Sifat, 2020). Due to lack of employment, loss of income, closure of business, lack of food and increase in family debt, family violence is increasing in the country. Another survey conducted by BRAC to examine the status of women in the 11 districts of our country and found that 32% of the participants felt that domestic violence had increased due to the loss of jobs and income in their families. Although there are only 90 victim centers in the country, all have been closed due to the pandemic. As a result, women victims are more likely to be victims of violence as they stay at home. Manusher Jonno Foundation (MJF) conducted two telephone surveys to find trends in violence during the lockdown. According to the preliminary findings of the survey conducted in May 2020, there were 4,249 women victims and 456 children victims of violence in the month of April. Out of them, 1,672 women and 424 children have never been victims of any kind of violence throughout their whole lives. After thereafter, a second telephone survey was carried out on 53,340 women and children, and it revealed that a total of 13,944 episodes of violence had taken place in 53 locations over the course of 31 days in the month of May (MJF, 2020).

A comparison of the May and June reports shows that there has been an increase in incidents of violence from May to June. The survey also noted that the rate of violence against women and children has increased by 31%. Around 19 girls were raped, 18 girls were attempted to be raped, 19 girls were abducted and 13 girls and 6 boys were kidnapped in May. About 97.4% of the total 11,025 women were victims of domestic

violence. The telephone survey also shows that 45% of women are victims of emotional violence, 33% of women are victims of economic violence, 19% of women are victims of physical violence and the remaining 4% are victims of sexual violence (Suraiya and Saltmarsh, 2020). According to the January online report of *The Financial Express*, Bangladesh Mahila Parishad revealed that 4,622 women and girls were victims of violence in 2019, according to the data of 14 domestic newspapers (Mujeri, 2021).

A total of 197 cases of violence were registered in the Chief Metropolitan Magistrate's Court between March 26 and June 3 after the start of the Corona situation. Among the cases, there are 56 cases of rape, 14 cases of attempted rape, 51 cases of dowry-related violence, 36 cases of kidnapping, 18 cases of sexual harassment and 7 cases of physical violence (Suraiya and Saltmarsh, 2020).

During the pandemic in Bangladesh, gender-based violence has escalated at an alarming rate due to child marriage. An analysis of the reports from May and June, as conducted by the Manusher Jonno Foundation (MJF), reveals a discernible surge in violent incidents during that period. Additionally, the rate of violence in child marriage has risen by 31%, according to the survey (Sarker, 2023). As the police primarily focused on controlling the situation outside of the epidemic, they paid less attention to cases related to violence against women. Courts were also closed for months after the epidemic broke out. These incidents have worsened the situation of women. So, it is clear that the rate of violence against women has increased in the country during the lockdown period.

5. Results and Analysis

The society and economy of Bangladesh have been severely affected by Covid-19 in the past two years and ongoing in the following year. However, the hope is that the economy of Bangladesh has suffered less damage during the epidemic compared to the economy of other countries in the world. The supply of foreign exchange or remittances has increased relatively in the last few months which have provided financial security to various households. Recently, the United Nations has approved Bangladesh to transition from the list of least developed countries by 2026. Various organizations, including the World Bank, have predicted that this year's economic growth will not exceed 2-3%. If so, then evil will be good. In that case, it can be said that the condition of the rich or middle class may not be so bad. But it is true that it will not affect all classes of people equally. There are numerous small professional groups in the country, which are undoubtedly in financial distress. Women workers can be specially mentioned in this regard. We have to wait for a few more days to understand the effect of Corona on the overall economy of the country, how much people of various classes and professions will be affected.

During the COVID-19 pandemic, women are at a disadvantage socially and economically. Women entrepreneurs can be specially mentioned here. The government incentive package calls for payment based on bank-client relationships. But any advice on what to do for small women entrepreneurs who have no record of taking loans in the past. So if the incentive package is not specifically for women, then it can be feared that

it will not reach women. Many women have lost their jobs during the Corona period. In this case, only the clothing sector comes up in the newspapers, but there is not much discussion about the large number of women who have lost their jobs in the vast informal sector. A large number of women also work in agriculture. Corona has also had an adverse effect on them. It can be said that a special kind of fragility has been created for women in the working world. Women, who may have been able to join a job after hundreds of attempts, have lost it during the corona virus. Those women don't know if they can ever go back to their old jobs. It can be assumed that, due to lack of adequate facilities, many women have to return to domestic activities only. During the corona period, not only the household and service work of women has increased, but women have to do a lot of work. From service work to domestic work, women have to perform. Even after the lifting of the lockdown, many women are unable to return to work as other facilities such as child day care centers are closed. Boredom and depression are coming in women's life. Social distance, quarantine management is useful at this time, but its effect is falling on people's psyche. Depression, fear, panic, resentment, anger, isolation, loneliness, neglect, degradation and futility emerge from social distancing and dehumanizing behavior in people. These are one of the main causes of violence against women. Violence against women has increased exponentially during COVID-19.

Analyzing the data from the year before and after the epidemic, it can be seen that the number of rape victims in 2019 was 1,080, which increased to 1,538 in 2020. In 2020, only from January to September, a total of 919 women and children were raped. Worryingly, children are almost twice as likely to be raped as adult women. In 2019, the number of women and children who were raped during this period was 834 (Sifat, 2020). There is an economic reason behind the increase in violence against women during the Corona period. The male breadwinner in many households has lost his job during the lockdown. Frustration, anger and resentment are born from lack of money. In patriarchal societies, women are affected. In addition, since spouses and children spend more time at home, women's domestic labor has grown on the one hand, while family conflicts, violence, and dowry abuse have increased on the other.

Corona pandemic has further weakened the position of women at home and outside. But here it is not necessary to blame only Corona. Even before the advent of COVID-19, there was violence against women. So, along with Corona, we need to shed light on the prevailing views and thoughts of the society, which has further accentuated the negative impact of Corona on women.

The gender-specific impacts of COVID-19 in Bangladesh have serious implications for the country's social and economic fabric. Addressing these implications is not just a matter of gender equality but also essential for achieving sustainable development goals and ensuring overall societal resilience. Some Policy Recommendations to address and minimize these issues are following:

- **Gender-Responsive Economic Relief:** Policymakers should design and implement targeted economic relief measures that address the specific needs of women, including cash transfers, job creation programs, and support for women entrepreneurs. These measures should aim to bridge the income gap created or exacerbated by the pandemic.

- **Enhanced Healthcare Access:** Ensuring equitable access to healthcare services, especially for maternal and reproductive health, should be a priority. Investments in healthcare infrastructure and awareness campaigns that emphasize women's health and well-being are essential.
- **Promotion of Gender-Equal Norms:** Initiatives to challenge and transform traditional gender roles are imperative. Education and awareness campaigns can be used to challenge stereotypes and promote the equal sharing of caregiving responsibilities within households.
- **Data Collection and Research:** Continued research is vital to understand the evolving dynamics of the pandemic's impact on gender disparities in Bangladesh. Data collection should be gender-disaggregated, allowing for a more precise understanding of the situation and informed policymaking.
- **Capacity Building and Empowerment:** Empowering women through skill development, education, and vocational training can enhance their resilience and ability to adapt to changing economic conditions.

6. Conclusion

In 2019, Bangladesh's position was 135 in United Nations Human Development Index (UNHDI). In 2022, Bangladesh climbed six steps and got the 129th position in just three years. Bangladesh was ranked 50 in the Global Gender Gap Report-2020. Among the 7 countries of South Asia, only Bangladesh has achieved the honor of being among the first 100 countries. After the pandemic, Bangladesh's position in the Global Gender Gap Report-2023 has dropped to 59. So it can be feared that the COVID-19 may overshadow many of Bangladesh's achievements. The COVID-19 pandemic has had a profound impact on the socio-cultural structure of Bangladesh, resulting in a paradigm shift in how people live and tragically claiming numerous lives. The current situation has further amplified pre-existing gender inequities within the labor market and heightened women's workload in domestic settings. Concerns have arisen over the potential dampening effect on women's rights movements within society as the prevalence of gender-based violence and pre-existing gender disparities escalate amidst the pandemic. The escalation of violence against women during the lockdown period is a significant concern, necessitating the implementation of imperative measures to address and mitigate this issue effectively. Hence, it is imperative to address not just the economic aspects but also to develop a comprehensive strategy that incorporates a gender perspective in order to combat the COVID-19 pandemic. This approach should be central to societal rehabilitation and economic recovery efforts. In the forthcoming period, Bangladesh will face significant difficulty bolstering its economy, augmenting individuals' income, and ensuring a seamless standard of life. On the contrary, to address the issue of violence against women, it is imperative to implement current legislation rigorously. This is because the safety and advancement of half of the population within a society are essential prerequisites for achieving comprehensive and enduring societal progress. As the world navigates the complexities of a post-pandemic era, further research is needed to monitor the long-term

effects of COVID-19 on gender disparities in Bangladesh. Future studies should focus on evaluating the effectiveness of gender-responsive policies, tracking changes in gender norms, and examining the broader social and economic consequences.

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ETHICAL CHALLENGES AND TRANSFORMATIVE POTENTIAL: EXAMINING THE IMPACT OF ARTIFICIAL INTELLIGENCE ON PATIENT CARE, DATA SECURITY, AND THE HEALTHCARE WORKFORCE IN ROMANIA

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Abstract: *The integration of artificial intelligence (AI) into healthcare holds immense potential for transforming diagnostic, prognostic, and therapeutic approaches, particularly in addressing challenges faced by Romania's strained medical system. This study conducts an in-depth literature review to explore the opportunities and risks associated with implementing AI technologies in Romanian healthcare. Relevant research has evaluated the impact of AI on patient quality of life, highlighting both positive outcomes, such as improved disease management and personalized treatment, as well as potential concerns, including algorithmic bias, data privacy issues, and workforce displacement. This review underscores the need for a balanced approach that maximizes the benefits of AI while mitigating associated risks through robust governance frameworks, ethical guidelines, and stakeholder collaboration. Ultimately, the responsible integration of AI could revolutionize healthcare delivery in Romania, enhancing access, efficiency, and overall patient well-being. However, a comprehensive assessment of socioeconomic and ethical implications is crucial to ensure a smooth and equitable transition toward AI-driven healthcare.*

Keywords: *Artificial Intelligence, Romanian Healthcare, Patient Quality of Life, Ethical Implications, Data Privacy, Workforce Transformation*

Introduction

Artificial intelligence (AI) is a surprise for many fields without being able to know its real limits; if it exists, it has a vast range of applications in various sectors, including the

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medical field (Topol, 2019). Within the difficult and very well-known situation in the Romanian healthcare system, AI can be perceived as a promising alternative to improve the processes of diagnosis, prognosis, and therapeutic approach to treating diseases but also in terms of the long string of Romanian bureaucratic processes. Using AI in healthcare would have positive consequences, at least as we suspect from many other studies, such as improving the quality of patients' lives (T'symbal et al., 2018). Application of artificial intelligence methods for imaging of spinal metastasis. *Cancers*, 14(16), 4025) but also negative ones, e.g., discrimination (Char et al., 2018), technical errors (Wang et al., 2021), hacking or more or less voluntary cracking of IT systems (Dittrich & Himma, 2006), overtechnologists (Meskó et al., 2018), lack of training of technical staff (Longhurst et al., 2019), replacement of medical staff (Jiang et al., 2017), etc.

AI technologies have the undeniable potential to radically change the medical field because they can process enormous volumes of data from the BigData universe and medical information and deliver results at a light speed (Bean, 2021). As emphasized by Ahmed et al., using AI in 2023 has the potential to revolutionize healthcare, as it can rapidly process vast amounts of data. For the reasons listed above, I believe that introducing AI in human medicine is currently a controversial topic from several perspectives, especially because of concerns about safety and efficacy (Ahuja, 2019), as well as job loss in the medical sector (Igou, Power, Brosnan, & Heavin, 2023). According to a recent survey, over 50% of Romanian doctors believe that AI will lead to massive layoffs in the healthcare system in the coming years (Association for the Development of Artificial Intelligence in Romania, 2019). Briciu et al. also emphasized that integrating AI and COVID-19 effects is reshaping the labor market, leading to automation in various sectors and causing upskilling of the workforce (Briciu et al., 2020). These fears are justified, given the ability of AI to perform some medical tasks better and more efficiently than humans, such as interpreting medical images or making diagnoses (Dimoglo, 2023). It is therefore important that the adoption of AI in medicine is gradual, with the active involvement of medical staff and, in a way that enhances, not replaces, their work. Although there is a wealth of research and applications showing the potential of AI to improve patient diagnosis, treatment and monitoring, these topics have not yet been sufficiently evaluated through rigorous clinical trials (Ahmer et al., 2023; AlZaabi et al., 2023; Alexandru & Coardos, 2016; Bisdas et al., 2021; Dijmarescu, 2021;rescu &rescu, 2018; Fotea et al., 2019; Krittanawong & Kaplin, 2021; Micu et al., 2021; Pană et al., 2021; Qurashi et al., 2021; Săniuță & Filip, 2021; Sit et al., 2020; Sunarti et al., 2021). There is a welcome optimism of AI in our lives, and this optimism must be treated with the realism of a skeptical researcher, asking: to what extent should we rejoice and to what extent should we worry about this unexpected and fulminating development? Therefore, can we get a full picture? It is essential to consider the ethical issues associated with the application of AI in medicine, such as protecting patient data and the implications for medical practice. There is a need to ensure that the technology is used in a responsible and respectful way so as not to compromise the quality of patients' lives or the integrity of the already precarious medical system in Romania. Therefore, in this article, I will review the literature selected for this purpose, the potential of AI in medicine, and the impact, challenges and concerns that need to be addressed to ensure the responsible use of this technology in the development of new methods of patient care.

Background and review of the literature on the impact of artificial intelligence (AI) on patients' quality of life is crucial to deepen our understanding of this issue and to develop viable solutions. According to the literature, AI can diagnose conditions faster and more accurately than traditional methods (Ojha, 2022). For example, some researchers have shown that advanced machine learning (ML) algorithms can identify certain heart diseases with significantly greater accuracy than can expert cardiologists (Shameer et al., 2017). In parallel, AI can help accurately predict disease progression and therapeutic outcomes based on the complex integration of a patient's multiple medical parameters, improving personalized care planning (Dautenhahn, 2007). However, there are potential issues related to the use of AI in healthcare; therefore, a rigorous evaluation of the medium- and long-term effects is needed to determine the impact of AI on patients' quality of life, considering these issues and solutions.

In principle, the chapter focuses on a detailed exploration of how AI influences patients' quality of life in the Romanian medical context, a sector with distinctive characteristics. From this perspective, there is a distinction between the contributions of AI in medicine globally and its particularities in Romania, highlighting specific opportunities and risks. A literature review allows not only an understanding of the impact of AI on the diagnosis and treatment of diseases but also an assessment of the uncertainties and challenges brought about by its implementation in a medical system with multiple difficulties.

The implementation of AI in Romanian medicine is a potential catalyst for improving diagnostic and treatment processes, given the ability of AI to process large volumes of data quickly and efficiently. Significant benefits are foreseen, such as optimizing disease management by personalizing treatments and improving diagnostic accuracy. AI can provide solutions to the systemic problems of health bureaucracy. However, optimism must be balanced with realism and a keen awareness of negative repercussions, such as discrimination, technical errors, and vulnerabilities to cyber attacks. Implementing AI can lead to ethical and professional dilemmas, including the marginalization of healthcare professionals. While AI promises to bring significant transformations to Romanian medicine, a sociological perspective is important for understanding the complexity of this evolution. Therefore, a thorough assessment and monitoring of the impact of AI on patients' quality of life is needed to maximize the benefits and minimize the associated risks. The contribution of this chapter is therefore to provide a comprehensive and contextualized picture of the potential and limitations of AI in healthcare in Romania, with a vision toward a future where technology and humanity can complement each other to improve patients' health and quality of life.

Method

To meet these goals, I vetted academic resources that discuss the influence of artificial intelligence (AI) on the welfare of patients in Romania from October 2023 to December 2023. The research process included exploring digital databases (PubMed, Scopus and Web of Science) to identify relevant publications from the last decade. In the analysis, I incorporated studies that were closely aligned with the topic, published within a specific

time period, and possessed unique publication-related attributes. The selected studies were analyzed using a qualitative approach involving synthesis and critical evaluation of the findings from each study. The analysis focused on identifying opportunities and challenges associated with implementing AI-led technologies in the Romanian healthcare system.

Search Strategy and Databases

The search terms included ("artificial intelligence" OR "machine learning" OR "deep learning") AND ("health" OR "medicine" OR "medical") AND "Romania*"). As the Romanian scientific community primarily uses English databases, the search terms were constructed in English only.

Inclusion and Exclusion Criteria

Inclusion criteria: a. Studies that focused on implementing AI in the Romanian healthcare system. b. Studies that have explored the potential benefits and challenges of AI in healthcare. c. Articles that focus on AI in medicine and are written by Romanian experts/authors. d. Articles published in English or Romanian.

Exclusion criteria: a. Studies that did not specifically address the Romanian health care system, e.g., studies focused on AI applications in health care outside Romania and not referring to Romania or Romanians. b. Editorials, opinion pieces and conference abstracts.

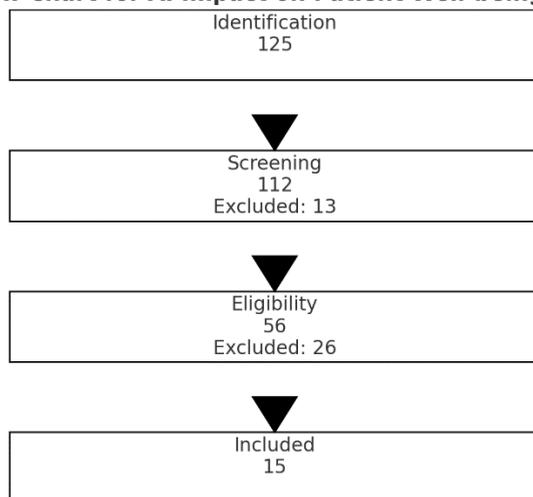
The three selected scientific databases were filtered using the MESH system to make an initial selection of relevant articles. By using the specified search terms, I found 125 articles that applied to the research topic. To narrow this number, a three-step selection process was adopted, focusing on keyword relevance, publication date, study type, methodological rigour, data quality, and full-text accessibility. For example, for the PubMed database, the search string "(((Artificial Intelligence*) AND (Health)) AND (Perception*)) AND (Student*)" resulted in 26 articles. The remaining articles, up to 125, were selected from three other databases: Scopus, Web of Science and Google Scholar.

Step 1: Initial screening

Out of the original 125 articles, I eliminated duplicates, leaving 112 records for screening. After applying the inclusion and exclusion criteria, 56 articles remained for further evaluation.

Fig. 1. Number of publications for each reason at each level

PRISMA Flow Chart for AI Impact on Patient Well-being in Romania



Note. Flow Chart according to PRISMA (Moher et al., 2009)

Step 2: Relevance and Methodological Rigour

At this level, the articles were assessed for relevance and methodological rigor. Following this evaluation, 30 articles were retained for the final selection stage.

Stage 3: Quality Assessment and Final Selection

In the final stage, a detailed evaluation of the remaining articles focused on data quality and full-text accessibility. Fifteen articles were ultimately selected for the literature review. This rigorous selection process ensured a comprehensive and high-quality presentation of the impact of AI on health. I critically examined these articles, identifying common themes, trends, and areas where the literature is lacking. The findings helped us infer the ramifications of AI for patients' quality of life in Romania, including the opportunities and risks associated with implementing AI in the healthcare system. Recommendations were made to improve AI usage in medicine, aiming to enhance the Romanian healthcare system and patient well-being.

Data extraction and synthesis

Data were extracted from the included studies using a standardized form, which captured the study design, sample size, main findings, and implications for the Romanian health

system. A narrative synthesis was conducted, grouping the results into relevant themes and categories (see Appendix 1 for details).

Analyzing and interpreting the data

To understand how AI influences the quality of life of patients in Romania, I examined data from 15 articles and identified common themes, emerging trends, and gaps in the literature. The thematic analysis method was used to organize the findings into distinct categories and subcategories. The following specific areas of qualitative analysis were included:

- a. An overview of AI's status in the Romanian healthcare system.
- b. Perceived pros and cons of incorporating AI into Romanian healthcare.
- c. Obstacles and potential risks of integrating AI in the Romanian healthcare system.
- d. Suggestions and approaches to maximize AI use in health care while managing potential negative effects.

During my discussion, I focused on the primary findings of the selected articles, shedding light on the prospects and difficulties linked to AI in the Romanian healthcare system while considering the credibility of the evidence.

The ethical and social considerations outlined in the selected qualitative articles apply to integrate AI in the Romanian healthcare system. Data protection issues, patient independence and potential biases in AI algorithms are crucial factors to consider for the conscious integration of AI in healthcare in Romania. For example, the possibility of unequal treatment resulting from bias in AI algorithms is an issue that could influence patient care in Romania. Therefore, it is vital to address these considerations during the design and implementation of AI in the Romanian healthcare system to ensure that patient care is not adversely affected.

The selected literature also examined the impact of AI on the health workforce in Romania. Some studies have highlighted the potential of AI to streamline workflows and reduce the burden on healthcare professionals by up to 20% (Ahmer et al., 2023; Qurashi et al., 2021), while others have raised concerns about the displacement of healthcare workers due to increased automation (Fotea et al., 2019). These diverse findings highlight the need for further exploration and discussion of the impact of AI on healthcare professionals, as well as the formulation of tactics to mitigate potential negative consequences. The quality assessment revealed a moderate risk of bias in these studies, warranting further research to clarify the impact of AI on the health workforce.

Interpretation of results and comparison with literature

A review of the relevant literature suggests that integrating AI into medical practices could potentially benefit the Romanian healthcare system. These findings are consistent with the literature, which highlights that AI can foster innovation, optimize resource

allocation, and improve healthcare services (AlZaabi et al., 2023; Pană et al., 2021). The involvement of multiple parties, such as technology developers, public health officials, commercial enterprises, and academic bodies, was not explored comprehensively in the analysis of this study. However, their collaboration could be critical in cultivating the growth and introduction of innovative solutions designed to simplify administrative work, refine approaches in healthcare, and improve diagnostic and treatment procedures. A literature review revealed that AI has considerable potential for improving the quality of life of patients in Romania. AI technologies can be applied in healthcare, with many examples of collaborations between technology companies and healthcare institutions. These technologies are useful in diagnosis, treatment protocol development, personalized medicine and patient monitoring. Ethical and safety considerations related to the use of AI in medicine, such as protecting patient data and implications for medical practice, need to be addressed.

Implications of the findings: The digitization process in the Romanian health sector plays a vital role in ensuring that reliable information reaches citizens while also improving the level of interaction between those providing and those seeking health services. It is essential to understand that, although different from AI, E-health still holds importance—it uses communication technologies to enable seamless transfer, documentation and protection of health data. It is necessary for Romania to cultivate the development and application of such digital innovations, ensuring that they are tailored to meet the unique requirements of its health infrastructure and patient population.

Upon examining the chosen publications, I observed several areas where the research field could be strengthened. These include the necessity for a more rigorous methodological framework, a greater focus on the application of AI in the medical field, and an increased number of studies exploring the long-term effects of AI on patients' quality of life in Romania. Moreover, I recognize the limitations of this study, which include focusing only on articles published in English or Romania, considering a specific time frame for the selected publications, and the potential for overlooking relevant studies due to the constraints of the search strategy. To address these gaps and limitations, I suggest future research directions: to carry out several empirical studies to assess the real impact of AI on patients' quality of life in Romania; investigating the ethical, legal and social implications of the use of AI in health; exploring the potential of AI in addressing health disparities and improving access to health in Romania; examining the role of AI in workforce development and health education.

In conclusion, this review of selected literature provided valuable insights into the impact of AI on the quality of life of patients in Romania. My research focused on evaluating the opportunities, risks, and challenges involved in integrating AI into the healthcare system in Romania. As a result, I suggested recommendations to optimize the use of AI in medicine, with the goal of enhancing patients' quality of life and mitigating any adverse consequences.

The impact of AI in Romanian and international medical environments

Artificial intelligence (AI) and deep learning (DL) are sophisticated technologies in the medical context that explore connections between prevention, treatment, and patient testing. They are used in diagnostics, therapeutic protocol development, drug creation, personalized medicine, and patient surveillance (Dobrescu & Dobrescu, 2018). Butaru et al. highlighted a unique challenge in medical AI, where datasets often display class imbalances, especially in rare diseases, challenging the typical deep learning assumption of class equality. Nasser and Yusof (2023) provided an extensive review of deep learning techniques for breast cancer detection, highlighting their effectiveness in early diagnosis and increased survival chances. They noted that deep learning, compared to traditional machine learning, requires less human intervention for feature extraction, making it a more efficient tool in medical diagnostics. In Romania and other countries, technology companies collaborate with medical and academic institutions to tailor DL technologies to healthcare. Examples include Google Deep Mind's collaboration with the NHS in the UK for cancer detection through medical image analysis and Microsoft's Hanover Project with the Oregon Health & Science University Cancer Institute for cancer treatment estimation. Other initiatives involve evaluating medical images of tumor progression and creating programmable cells (Dobrescu & Dobrescu, 2018).

Artificial intelligence has become a key element in healthcare worldwide, including in Romania, with a significant impact on the quality of services and the efficiency of resources, especially in regions with restricted access to medical resources. Technologies such as healthcare robots and unmanned aerial vehicles can be integrated with computer vision techniques to enable a wide range of innovations in healthcare. An example would be the use of computer vision for remote diagnosis of parasitic infections or tuberculosis, after which delivery of needed medicines can be made using unmanned aerial vehicles (Krittanawong & Kaplin, 2021). This app includes Romania in addition to Swahili to support people in Romania and East Africa who have restricted access to medical resources. Introducing Romania into the app facilitates access and usefulness for the Romanian population, providing them with a digital tool for assessing health status and making informed healthcare decisions. This highlights the ability of artificial intelligence to improve healthcare in resource-constrained countries, such as Romania.

In Pană and collaborators' 2021 research, the authors explored the possibility of developing a noninvasive system capable of predicting worsening heart failure in Romania by voice analysis. The central aim of the study was to analyze patients' vocal characteristics and use the identified variations as input for a machine learning-based method using artificial intelligence (AI) technologies. Sixteen patients, 9 men and 7 women aged 65 to 91 years who were hospitalized for acute cardiogenic pulmonary edema, participated in the present study. Patients' voice recordings were made twice a day using the same smartphone device, Lenovo P780, from admission to discharge, when their clinical condition stabilized. These voice recordings were subsequently used in the machine learning algorithm. Different machine learning techniques have been applied for classification, such as artificial neural networks (ANNs), support vector machines (SVMs) and K-nearest neighbors (KNNs), to determine which best fit the dataset and can serve

as a starting point for future developments. After integrating information from 15 patients, the algorithm correctly classified the 16th patient into NYHA (New York Heart Association Functional Classification) stage three on admission and NYHA stage two on discharge, based solely on voice recording. The KNN algorithm achieved the highest classification accuracy, with a value of 0.945. As Varela et al. (2023) highlighted, integrating AI in medical applications, particularly in areas requiring rapid and accurate diagnosis, is becoming increasingly vital. Their study emphasized the potential of AI to revolutionize traditional diagnostic methods, offering new avenues for early detection and treatment strategies. Preliminary research has shown that voice could be an accessible and simple means of monitoring the health status of heart failure patients. The algorithm used for voice analysis provided highly accurate results. The authors' goal is to obtain larger datasets and develop more sophisticated voice analysis algorithms to validate the results. In terms of the practical applicability of the study, the researchers plan to develop a smartphone app in the future that works in the background by performing voice analysis of heart failure patients. If the app identifies signs of heart failure decompensation, patients will be referred to medical services. This could prevent severe acute heart failure requiring hospitalization and emergency treatment. This study provides a new perspective on the applicability of artificial intelligence in medicine and proposes a noninvasive approach for monitoring and preventing worsening heart failure.

The theme of digitization in the Romanian health system addresses a major problem, examining the lack of digitization and its effects on public health. These difficulties include high morbidity and mortality rates for cardiovascular diseases and malignancies and a low birth rate (Dijmarescu, 2021). Implementing digitization in the healthcare system is crucial both to provide accurate information to the population and to simplify the interaction between doctors and patients, facilitating the achievement of medicine's primary goal—protecting health. The concept of e-health encompasses all these aspects and refers to the use of communication technologies to support the transmission, recording and storage of medical information (Dijmarescu, 2021). Certainly, a national database would provide important benefits in Romania, improving and facilitating health services and providing a complete medical history. The applications of e-health are varied and are attracting increasing attention from doctors and patients, who are providing services such as telemedicine, e-health education, information storage through electronic health records and various useful tools in the medical field. The COVID-19 pandemic has highlighted the importance of digitization in healthcare and telemedicine in maintaining social distance. In addition, telemedicine facilitates the remote monitoring of patients through smart home technologies and devices, thus contributing to increased quality of life for some patients.

Health organisations need to optimize their use of health data and distribute it to other institutions to increase the quality and efficiency of the services provided and to stimulate learning opportunities (Alexander & Coardos, 2016). Big Data can centralize patient information, making it easier to analyze and predict outcomes. This paper describes the concept and characteristics of Big Data, the data in healthcare, and the major challenges of Big Data and Big Data Analytics in Romania.

Some applications of Big Data in Romania include the following:

- ✓ The Integrated Electronic Health Record System (SIUI) is a computer system of the National Health Insurance House (CNAS) that integrates county health insurance houses (CJASs) and medical service providers under the coordination of the CNAS. The SIUI has been fully operational since 2008;
- ✓ The electronic prescription information system (SIPE) aims to provide an essential component of the Romanian Health Insurance Information Platform and became operational on 1 July 2012;
- ✓ Armonia®sanita—a hospital IT system successfully adopted by some of the largest healthcare providers in Romania and available in the Cloud. This system helps to improve the efficiency and quality of healthcare services (Alexandru & Coardos, 2016);
- ✓ An Integrated Emergency Services System coordinates emergency services at the national level and supports the response activities of operational units. It handles approximately 1.4 million victims every month and, due to the technologies implemented, has reduced the time needed to locate victims on the map and increased the response capacity of search teams throughout Romania;
- ✓ The National Registry of Rheumatoid Arthritis Patients - Romanian Rheumatic Diseases Registry Association and Ymens Cloud have developed and implemented a cloud-based solution for the Romanian public health sector. The system focuses on automating the flow of rheumatoid arthritis patient records and received the EuroCloud Romania award in 2014;
- ✓ StarVaulte-Health is a platform that allows physicians and medical centers to interact with patients in a secure and user-friendly environment, facilitating the constant exchange of medical information between health systems, patients, and physicians. It also received the EuroCloud Romania award in 2015 (Alexandru & Coardos, 2016).

All these examples illustrate the potential of Big Data to revolutionize healthcare in Romania by integrating and centralizing information, thus facilitating access to data and improving the healthcare services offered. It is important to consider the challenges related to data security and confidentiality of information, as well as the need to develop technological solutions and infrastructures adapted to the specific Romanian healthcare system. Big Data refers to data collected throughout the entire diagnostic and treatment process and has the potential to transform medical practices, guiding specialists in the delivery of efficient and high-quality healthcare services (Murdoch & Detsky, 2013). The benefits of Big Data include prevention of some conditions (Bates et al., 2014), minimization of errors in the medical process (Groves et al., 2013), ensuring access to the right treatment at the right time (Wang et al., 2021) and improving therapeutic outcomes (Raghupathi & Raghupathi, 2014). In healthcare, specific Big Data challenges include managing and analyzing unstructured data (Wang et al., 2021), real-time data processing (Andreu-Perez et al., 2015), maintaining confidentiality and protecting patient information (Baro et al., 2015).

Big Data Analytics opens new opportunities for combining health knowledge with data analytics, providing valuable insights into decision making and health system

transformation (Murdoch & Detsky, 2013). The use of big data analytics in population health monitoring (Bates et al., 2014) and healthcare quality assessment (Wang et al., 2021) is experiencing rapid growth. By using Hadoop technology, efficient patient care management can be achieved by providing data-driven services and meeting patient needs (Gupta et al., 2014).

In Romania, the adoption of big data technologies and approaches in the health and medical sector has had a positive impact on the quality of healthcare services, optimized processes and improved patient access to high-quality treatment and care. By implementing these innovative solutions, the Romanian healthcare system aligns with international trends and ensures better adaptation to patient and community needs (Alexandru & Coardos, 2016).

Artificial intelligence (AI) is being integrated into many aspects of life. In the age of technology, companies are turning to AI to increase productivity, better understand consumer behavior or provide services through robots. Successful businesses exist through the development of European and Romanian AI startups and the factors that determine their success, such as product development team expertise, core team commitment and business strategy (Săniuță, A., & Filip, S. O., 2021). Recent research has also explored clinical research on AI in the treatment of cancer and underlined its integration challenges and opportunities in the European Union (EU) health sector (Popescu, Geantă, & Brand, 2022).

At present, there are few studies documenting the relationship between AI and business in Romania. For example, Micu et al. (2021) investigated AI algorithms in e-commerce, noting significant interest at the management level in implementing AI in online stores, although the actual adoption of AI is still low. Enhancing the cybersecurity measures of new-age startups is facilitated by artificial intelligence, which offers advanced solutions for detecting threats and assessing vulnerabilities (Dasawat & Sharma, 2023). In short, in Romania, there is an interest in AI and a wide recognition of its potential, but the development of AI remains rather slow compared to that of other European countries in different fields, including business (Săniuță & Filip, 2021). As a result, there has been a noticeable increase in the adoption of AI-based educational solutions across different countries, including less-developed areas, as evidenced by the increased use of intelligent platforms (Pantelimon, Bologa, Toma, & Posedaru, 2021).

Radiography of AI development in the Romanian medical environment

In Romania, AI technologies are being applied in the healthcare system for various purposes, such as diagnosing conditions, managing patient cases and optimizing the quality of healthcare. Thus, AI has become an essential tool for identifying diseases. For example, a team of researchers at the University of Medicine and Pharmacy "Carol Davila" in Bucharest has developed an AI algorithm that facilitates the diagnosis of brain tumors and is capable of accurately identifying even the smallest tumors (Univ. Professor Gheorghe Iana, 2021). These results have led to notable improvements in the accuracy

and efficiency of diagnosis of this condition, contributing to saving lives and reducing medical costs. AI is also proving to be of great use in patient care in Romania. These technologies can monitor patients in real time, especially those with chronic diseases such as diabetes or chronic obstructive pulmonary disease (Ionescu, 2020). An example of this is the patient monitoring system successfully developed by a team of researchers at the University of Medicine and Pharmacy "Grigore T. Popa" in Iasi (Ionescu, 2020). The system continuously tracks patients' vital parameters using sensors and monitoring technology, alerting doctors in real time if problems occur. Each example shows the potential of AI in improving the healthcare system in Romania, contributing to early diagnosis of conditions, personalized patient care and overall optimization of healthcare quality. As new technologies continue to develop and integrate into healthcare, it is expected that these applications will become increasingly widespread and bring significant benefits to both patients and healthcare professionals. However, it is essential to pay particular attention to protecting patient data and privacy, as well as addressing ethical and legal issues related to the use of AI in medicine. In the long term, the adoption and integration of AI in the Romanian healthcare system could lead to better efficiency and optimal distribution of resources, contributing to increased accessibility and quality of healthcare services offered to the population. Similarly, investment in AI research and the development or training of specialists and medical staff in using these technologies could have a significant impact on the health and well-being of the Romanian population.

AI can also improve the quality of patient care. A team of researchers at the "Iuliu Hațieganu" University of Medicine and Pharmacy in Cluj-Napoca has developed an AI-based medical data analysis system that can help doctors make better decisions regarding the diagnosis and treatment of patients (Faculty of Dental Medicine UMF Cluj, n.d.). The system uses advanced machine learning algorithms to identify patterns in medical data and provide personalized suggestions and recommendations for individual patients. Similarly, Tătaru (2022) highlights that the use of AI in pharmacies has great potential to improve pharmaceutical processes, but it is crucial to carefully address legal aspects, including data security and liability. However, with great care, the use of AI in medical and patient care should always be supervised by qualified professionals to ensure that it is used in an ethical and responsible way. Data security and privacy concerns also need to be considered when implementing AI-based systems.

Medical imaging has developed greatly in Romania. In this respect, there are various examples of the use of AI in radiology, computed tomography, and magnetic resonance imaging. For example, the Romanian Society of Radiologists and Medical Imaging is developing AI software that can analyze medical images and help detect tumors and lesions quickly and accurately (SRIMR, 2023). Syncro Soft in Cluj-Napoca has also created an artificial intelligence platform that can analyze medical images and help diagnose respiratory diseases such as pneumonia or tuberculosis (Sync.ro, n.d.). Another example of the use of AI in Romanian medicine is in the treatment of cancer patients. A team of researchers at the Bucharest Oncology Institute has developed an AI system that can analyze patients' medical data and help choose the most effective treatment for each individual patient (Dr. Minea, 2023). This system is now helping to improve treatment and increase the survival rate of cancer patients. In addition, AI is also used in patient and medical data management. For example, SoftNet Consulting in Bucharest has

developed an AI platform that can help manage patients' medical data and increase efficiency in managing complex medical cases (Tomescu, 2023). The platform can help improve communication between doctors and provide more efficient and accurate treatment for patients. Gradually and surely, AI has been increasingly used in the Romanian medical field, having a significant impact on the diagnosis and treatment of diseases, as well as on the management of patients and medical data.

Risks and opportunities in implementing AI in medicine.

There are obviously several risks that come with the benefits, requiring a careful assessment of what is already happening but also an inference of what might follow. In academia, we are seeing an increasing number of students who seem familiar with AI technology as regular users of social networks with a high level of knowledge of information technology. We need to evaluate whether this level of technological expertise is sufficient to adequately prepare these young individuals for employment. A study by Kuleto et al. (2022) showed that Serbian K-12 teachers recognize the benefits of AI in education, viewing it as a tool for improving teaching and learning processes. According to the authors' research, professionals are becoming more optimistic about how AI can contribute to their professional aspirations, and they primarily rely on the media and the internet for information. Although AI is perceived positively in personal interactions, respondents show distrust in using AI in education, especially in the process of teaching in front of a class. Therefore, it is essential that the educational process helps students gain knowledge of AI without becoming experts but rather to take advantage of the opportunities arising from this technological revolution (Fotea, S., Fotea, I., & Țundrea, E., 2019).

There are also several international studies on the same subject that show, on a broad scale, what students' attitudes and perceptions are about this phenomenon. Tănculescu et al. (2023) reported that Romanian dental students are positive about AI in dentistry, particularly valuing AI-based virtual simulations for skill enhancement. They also highlighted concerns about the limited role of online learning in practical fields such as dentistry and the challenges of keeping students engaged in such settings. Students perceive AI as a partner rather than a competitor and believe that AI will revolutionize medicine and dentistry. Most students believe that AI development will make medicine and dentistry more interesting, and that AI should be part of medical training. In Romania, medical and dental students have positive attitudes toward AI and are eager to integrate it into their future practice. However, the study identified the need to include AI in the curricula of medical and dental schools, as only one-third of respondents reported university education as a source of information about AI. This suggests that students are currently seeking information about AI on the internet to satisfy this demand. Another important aspect to consider is the impact of AI on human interactions in medicine and dentistry. Most students (61.86%) expressed concerns that as the role of AI increases in these fields, human interaction with patients may decrease. It is essential that the foundation of medicine and dentistry, based on communication, empathy, and a close relationship with patients, is maintained as AI is integrated into medical practice.

In Romania, introducing AI into healthcare can offer obvious opportunities to develop and improve healthcare services. However, it is important that students and health professionals be properly trained to understand and use such power effectively and responsibly for the benefit of patients.

Regarding the risks, one of the major concerns is that AI will replace many jobs in healthcare, such as radiology. We do not yet have dedicated studies on this topic in Romania, but we have some relevant studies internationally. In a study by Qurashi et al. (2021), researchers investigated the perceptions of radiology staff in Saudi Arabia on implementing artificial intelligence (AI) in their field. Most respondents (70%) agreed or strongly agreed with the usefulness of AI in clinical decision-making, setting scanning protocols, improving patient care, and saving time. Although AI is a relatively new technology in radiology, most participants had a good basic understanding of it. However, radiologists' level of confidence in machine learning's ability to analyze data for decision-making purposes was quite limited. The literature suggests that AI should not play the ultimate role in image interpretation but should facilitate real-time workflow management and prioritization of urgent examinations. An important issue related to implementing AI in radiology is the impact on workplaces. In the present study, only one-third of participants thought that AI would replace their jobs in the future. However, almost half of the participating students felt threatened by AI applications. In a UK study (Sit et al., 2020), it was found that students were less likely to consider a career in radiology because of AI. Despite these concerns, approximately 95% of participants showed interest in AI education. This highlights the importance of introducing AI education into future study programmes. The study also revealed that most respondents will implement AI technology in clinical practice.

AI can transform healthcare by enhancing diagnosis, prevention, and treatment while also increasing cost effectiveness and promoting equal access to healthcare services. Despite the potential benefits, several challenges and risks must be addressed when implementing AI in healthcare. The benefits of integrating AI into healthcare include better patient management, reduced referrals, cost savings, and time efficiency. AI can also contribute to a fairer overall healthcare system by supporting health facilities in rural and deprived areas. Despite these benefits, there are several barriers to the adoption of AI in healthcare. These challenges include the need for early adoption and sustainable implementation in the healthcare system, consideration of the user perspective, and optimization of the use of technology in the public health sector (Sunarti et al., 2021). Ethical concerns arise as AI is increasingly integrated into clinical practice. Concerns include the risk of bias in AI algorithms, lack of transparency, privacy issues related to the data used to train AI models, security vulnerabilities, and accountability for implementing AI in clinical settings (Sunarti et al., 2021). To address these challenges, a robust governance framework must ensure fairness, transparency, trust, and accountability in AI applications. Such a project should involve multiple stakeholders, including software developers, government officials, healthcare providers, physicians, and patient advocacy groups. Some specific issues that need to be addressed include data bias¹, privacy², ethical double effects³ and ethical principles related to research and biomedical medicine⁴. Ensuring that artificial intelligence models are trained on representative and unbiased data is crucial to avoid misleading predictions, adverse events

and discrimination. Confidentiality is another significant concern, as healthcare data are highly sensitive and must be protected to respect patient autonomy and privacy. Finally, AI applications in healthcare should respect biomedical ethical principles such as autonomy, beneficence, nonmaleficence and justice (Sunarti et al., 2021). As in other countries, implementing AI in medicine and healthcare in Romania comes not only with benefits but also with several risks that need to be assessed with caution. In an academic context, it is imperative to assess whether the level of technological competence of young people is adequate to adapt to the demands of the changing labor market. According to the literature review, the following risks and challenges may arise in implementing AI in the Romanian healthcare system:

Job displacement: AI could displace certain jobs in healthcare, such as radiology, which could lead to increased unemployment among healthcare professionals (Qurashi et al., 2021).

Insufficient training of health professionals: Studies have shown that the level of knowledge of AI among young Romanians is low to medium (Fotea, S., Fotea, I., & Țundrea, E., 2019). Thus, it is essential that the educational process adapts to provide AI knowledge without imposing expertise but rather to take advantage of the opportunities arising from this technological revolution.

The need to include AI in medical and dental school curricula: International studies reveal the need to include AI in curricula to prepare future health professionals for the use and understanding of AI (Bisdas et al., 2021).

Reduced human interaction: The integration of AI into the medical and dental fields could lead to a decrease in human interaction with patients, thus affecting the basis of medicine, which is based on communication, empathy, and close relationships with patients.

Ethical and privacy issues: There are concerns about bias in AI algorithms, lack of transparency, privacy issues related to the data used to train AI models and security vulnerabilities.

Need for educational adaptation: Educational programmes need to adapt to include AI training and prepare future health professionals to take advantage of the opportunities this technology offers.

Create a robust governance framework: To address the challenges and risks associated with implementing AI in healthcare, it is necessary to establish a governance framework that ensures fairness, transparency, trust, and accountability in AI applications. This framework should involve multiple stakeholders, including software developers, government officials, healthcare providers, physicians, and patient advocacy groups.

Ensuring correct training of AI models: It is essential that AI models are trained on representative and unbiased data to avoid misleading predictions, adverse events, and discrimination.

Implementing artificial intelligence in healthcare in Romania remains a dilemma, bringing opportunities for progress but also significant risks that can affect the human relationship

between patients and healthcare professionals. It is crucial to adapt education and strengthen the governance framework to assimilate this technology responsibly and equitably without compromising ethics and confidentiality but cultivating the skills needed to navigate the wave of transformation in 21st century medicine.

Discussions

The Romanian health system faces challenges such as insufficient funding and discrepancies between the number of insured people and the beneficiaries of health services. Using artificial intelligence (AI) can improve the quality of this system by stimulating innovation, streamlining resource allocation, and improving healthcare services. Collaboration between AI developers, the Ministry of Health, business, and academia is essential for the development and implementation of intelligent applications to reduce bureaucracy, boost marketing strategies and optimize the diagnosis and treatment process.

A literature review revealed that AI has significant potential to improve the quality of life of patients in Romania. AI technologies are applied in healthcare, with many examples of collaboration between technology companies and medical institutions. These technologies can be used in diagnostics, treatment protocol development, personalized medicine, and patient monitoring. However, ethical and safety issues related to the use of AI in medicine, such as protecting patient data and the implications for medical practice, need to be considered.

Digitization of the Romanian healthcare system is important for providing reliable information to the population and simplifying interactions between doctors and patients. The concept of e-health is defined as the use of communication technologies to support the transmission, recording and storage of medical information. In Romania, there is a need to develop and implement technologies adapted to the specificities of the healthcare system and the needs of patients.

There are examples of successfully implemented information systems and technologies in Romania, such as the Electronic Prescription Information System (SIPE), Armonia@sanita, a hospital information system, the Integrated Emergency Services System, and the National Registry of Rheumatoid Arthritis Patients. All these systems have shown significant benefits in improving the quality of life and the efficiency of the healthcare system.

Using AI as a marketing tool in the Romanian healthcare system implies responsibility and respect for patients and the healthcare system. The development and implementation of AI technologies must be adapted to the specifics of the Romanian healthcare system and to the needs of patients, considering privacy issues and protecting patient data. The use of speech analytics to predict heart failure exacerbation (Pană et al., 2021) is an example of the use of AI in medicine, which can significantly improve patients' quality of life. In this context, it is essential to address issues of privacy and protection of patient data and the responsible and respectful use of technology so as not to affect the quality of patients' lives or the integrity of the healthcare system.

Conclusions

In this chapter, we analyzed the use of artificial intelligence in healthcare and assessed the effects of risks and challenges for patients and healthcare staff in Romania. Considering the current crisis in the Romanian healthcare system, AI could be considered a promising solution for improving the diagnosis, prognosis, and treatment of diseases. Implementing this technology in the healthcare system can generate both positive and negative consequences. AI can process large volumes of medical data, ranging from medical images and laboratory analyses to patient medical histories. Using AI can facilitate the identification of patterns and trends relevant for early diagnosis and prediction of disease progression. Rapid and accurate results can save more lives and improve therapeutic approaches. AI can also increase the efficiency of medical staff by reducing the time needed to check and update patient information, process medical images, and interpret laboratory analyses.

In terms of the impact on patients in Romania, artificial intelligence in healthcare can bring several benefits, including improved quality of life. Early diagnosis and accurate prognosis facilitate prompt treatment of conditions, preventing or reducing complications and reducing the length of hospitalization. In addition, AI can help tailor treatments to patients' individual medical data. However, there are risks. Discrimination can occur if learning algorithms use datasets affected by bias and human error. Another risk is the overreliance of doctors and patients to make coparticipatory decisions with AI, which can lead to the neglect of atypical signs and symptoms or the underestimation of risks. Additionally, where AI generates errors, establishing the causes can be difficult. Another relevant issue concerns the security and protection of patient data. Medical data, sensitive being, require adequate safeguards against unauthorized access or theft. Implementing artificial intelligence may amplify the risk of data compromise, especially with security vulnerabilities in systems using this technology. As a result, the use of artificial intelligence in medicine carries great benefits as well as potentially substantial risks for the future, and it is essential to address these issues to develop technologies and practices that minimize potential dangers and maximize benefits for patients and healthcare professionals. Thus, artificial intelligence represents an innovative and promising tool in the transformation of the Romanian medical system, with the potential to revolutionize diagnostic, prognostic, and therapeutic approaches. Under these circumstances, a balanced, responsible approach and long-term preparation of legislation and citizens before implementing the technology are imperative, considering both the benefits and the associated risks.

Following all these analyses, I believe that in the long term, collaboration between the different actors involved in the health system and the development of AI technologies can lead to a better quality of life for the population and an increase in life expectancy in Romania. AI technologies and digitization support the transmission, recording, and storage of health information. The creation of a national database can facilitate access to health information, monitoring of patients and rapid identification of needs and opportunities for health system improvement.

List of abbreviations

AI - Artificial intelligence

DL - Deep learning

ML - Machine Learning

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Appendix 1: Topics covered in the 15 selected articles.

| Article | Subject | Study sample and results |
|-------------------------|--|---|
| (Briciu & Briciu, 2021) | Influence and Future Perspectives of Artificial Intelligence on the Labor Market | The authors analyze the impact of COVID-19 and AI on the labor market. The study sample includes a range of industries affected by AI, focusing on how job roles are developing. Key results show a shift toward automation, with AI replacing certain jobs while creating new opportunities in others. The study emphasizes the need for reskilling and upskilling in the workforce to adapt to these changes. It also highlights the growing importance of AI literacy and interdisciplinary skills in the future job market. The article concludes with a discussion of the socioeconomic implications of these trends. |
| (Butaru et al., 2022) | COVID-19 Influence and Future Perspectives of Artificial Intelligence on the Labor Market. BRAIN. Broad Research in Artificial Intelligence and Neuroscience | Artificial Neural Networks (ANNs) was used to analyze data from Hepatitis C screenings. The ANNs were trained to identify high-risk individuals for Hepatitis C from the screening data. Two ANN models were developed and tested for their effectiveness. These models aimed to enhance the efficiency of identifying individuals at higher risk for Hepatitis C, improving resource management in screening programs. The results showed varying degrees of success in using AI for predictive analysis in public health screening. |
| Tătaru (2022) | Inteligența Artificială și industria farmaceutică: duet pentru inovație | This study examines the integration of AI in Romania's pharmaceutical sector, focusing on enhancing processes like research, clinical testing, production, and drug promotion. It underscores AI's benefits in streamlining these activities but also highlights legal risks, such as data misuse, confidentiality breaches, and product liability. The article delves into the implications of AI in pharmaceuticals, addressing personal data processing risks and the need for responsible AI application to mitigate potential legal issues. This exploration is crucial for understanding AI's role in advancing pharmaceutical practices while ensuring legal compliance. |

| Article | Subject | Study sample and results |
|----------------------------|--|---|
| Tănculescu et al. (2023) | Perception of Remote Learning by Fixed Prosthodontic Students at a Romanian Faculty of Dentistry | The article presents the findings of a study conducted in Romania, focusing on the perceptions of dental medicine students regarding the quality and effectiveness of clinical training using AI during the COVID-19 pandemic. The study sample included 259 clinical year students, and the results showed that most students preferred a learning sequence involving teaching, individual study, and discussions. Clear and understandable content was identified as a key factor in improving the quality of clinical training in online settings. |
| Dijmarescu (2021) | Entrepreneurship in medicine and digitization of the medical system in Romania | The article examines the increasingly close relationship between entrepreneurship and medicine, particularly through the use of technology, including AI and digitization in healthcare. It highlights the potential benefits of digitization, such as information systems, robotics, automation, and AI, with a special emphasis on the role of telemedicine and collaborative platforms, as stressed by the COVID-19 pandemic. However, it also notes the existing gaps in Romania's healthcare digital infrastructure and its implications for public health. The article includes a comprehensive list of 18 references to e-health, covering various aspects like service delivery impact, opportunities, challenges, and efficiency in enhancing treatment adherence. Overall, it suggests that technology and digitization could significantly improve healthcare and ease strains on the health system. |
| Dobrescu & Dobrescu (2018) | Artificial intelligence (Ai)-the technology that shapes the world. Global economic observer | The article summarizes trends, analyses, and perceptions regarding artificial intelligence (AI) and its integration across various socioeconomic aspects of life. It discusses AI's positive societal impact and its potential to address societal challenges. Concerns about AI's risks, such as mass unemployment and global destabilization, are also noted. The article highlights AI's application in health, military, and economic sectors, and mentions regulatory approaches by the European Commission and the UN, China's rise as a key global AI player, and Romania's |

| Article | Subject | Study sample and results |
|----------------------|---|---|
| | | prioritization of AI in its national research, development, and innovation program for 2016-2020. |
| Kuleto et al. (2019) | The Attitudes of K-12 Schools' Teachers in Serbia toward the Potential of Artificial Intelligence | Kuleto et al. conducted a study in the provided document. focuses on the perspectives and attitudes of K-12 school teachers in Serbia toward integrating Artificial Intelligence (AI) in education. The sample comprised 109 teachers who expressed their opinions on AI's utility in various educational processes. Key findings reveal a general positive attitude toward AI in teaching, with teachers acknowledging AI's potential to automate and enhance certain educational tasks. The study also discusses the teachers' readiness to implement AI in their schools, reflecting on the opportunities and challenges AI presents in the educational sector. |
| Varela et al. (2023) | Artificial intelligence in retinal disease: clinical application, challenges, and future directions | This research addresses retinal diseases, a leading cause of blindness in developed countries. It emphasizes the need for specialized clinicians to interpret multimodal retinal imaging and discusses the potential delays in diagnosis and intervention. The study reviews the development of artificial intelligence (AI) software to facilitate rapid data processing in this field. It focuses on decision support for the diagnosis, classification, monitoring, and treatment of retinal diseases using AI, particularly diabetic retinopathy, age-related macular degeneration, inherited retinal disease, and retinopathy of prematurity. The review expresses cautious optimism about integrating these AI algorithms into routine clinical practice, which could improve access to treatments, enhance healthcare system efficiency, and assist clinicians in managing the increasing volume of multimodal data. |
| Ahmed et al. (2023) | A Systematic Review of the Barriers to the Implementation of Artificial | In this literature review explores the challenges hindering the integration of artificial intelligence (AI) into the field of medicine. It delves into how AI holds the promise of improving medical practices through its capacity to enable early disease |

| Article | Subject | Study sample and results |
|-------------------------|---|---|
| | Intelligence in Healthcare | detection, streamline administrative tasks, facilitate drug development, personalize medical and cancer treatments, and continuously monitor individual health metrics. Despite the long-standing recognition of AI's potential in healthcare, the review highlights the slow and uneven adoption of AI technologies in the medical sector. It identifies obstacles across six critical domains: ethical considerations, technological constraints, liability and regulatory concerns, workforce readiness, societal factors, and patient safety issues. Grasping the nuances of these impediments is essential for healthcare professionals and leaders as they strive to surmount these challenges and seamlessly incorporate AI solutions to the advantage of both patients and medical practitioners. |
| Dasawat & Sharma (2023) | Cyber Security Integration with Smart New Age Sustainable Startup Business, Risk Management, Automation and Scaling System for Entrepreneurs: An Artificial Intelligence Approach | This article examines the impact of Artificial Intelligence (AI) and cybersecurity on the growth and sustainability of modern startup enterprises. It highlights the capabilities of AI in identifying and thwarting cyber threats, as well as in uncovering potential security weaknesses. The paper delves into the potential risks linked to the use of AI and cybersecurity, including the likelihood of data breaches and ethical dilemmas. It proposes robust security protocols to mitigate these risks. |
| Pană et al. (2021) | Reducing the heart failure burden in Romania by predicting congestive heart failure using artificial intelligence: Proof of concept | The study sample comprised 16 patients with heart failure. It used vocal recordings containing specific keywords linked to the New York Heart Association's functional classification to categorize the heart failure stages of the patients. The algorithm accurately identified the 16th patient as being in the third NYHA stage based solely on the vocal recording. The study concluded that voice is a cost-effective and simple method for monitoring a patient's health status. However, for a larger dataset, a more computationally efficient algorithm might be necessary. This study was presented at the ESC Congress 2021 - The Digital Experience. |

| Article | Subject | Study sample and results |
|---|--|---|
| Nasser & Yusof (2023) | Deep Learning Based Methods for Breast Cancer Diagnosis: A Systematic Review and Future Direction | In their study, Nasser and Yusof (2023) thoroughly review the application of deep learning methods in the detection of breast cancer, emphasizing the significant advancements these techniques bring to the field. They highlight the superior accuracy of Convolutional Neural Networks (CNNs) in identifying breast cancer, outperforming traditional machine learning models. The review emphasizes the efficiency of breast cancer diagnostics by highlighting the minimal need for human intervention in feature extraction when deep learning is employed. Various datasets used for breast cancer detection are explored in the study, and different metrics for performance assessment are evaluated. The authors conclude by discussing the challenges in the field and suggesting future research directions, positioning deep learning as a pivotal tool in improving breast cancer diagnosis and patient outcomes. |
| Săniuță & Filip (2021) | Overview of the European and Romanian startup landscape for AI and factors determining their success | Aiming to identify critical success factors for AI startups across various industries, the study analyzed a sample of 10 European artificial intelligence startups from Romania. According to the key findings of the pilot research, pivotal factors influencing business success in the AI industry were identified as the core team's expertise, commitment, product development, and business strategy. The study also revealed that internal factors appeared more crucial for a business's success than external ones. The research identified areas where AI is still underdeveloped, such as education, transportation, entertainment, and human resources, suggesting these as potential avenues for further business development in the AI sector. |
| Pantelimon, Bologa, Toma, & Posedaru (2021) | The evolution of AI-driven educational systems during the COVID-19 pandemic. Sustainability | This study discusses the significant impact of COVID-19 on education, particularly emphasizing the shift toward digital, remote learning methods. The transition from traditional resources like paperback books to digital formats, and from in-person classes to |

| Article | Subject | Study sample and results |
|--------------------------------|--|---|
| | | <p>online platforms, has been notable. This shift has been accompanied by the adoption of artificial intelligence (AI)-driven systems that use adaptive learning techniques by both educators and students. The paper presents a statistical analysis of the use of an adaptive learning system in Romania, both before and during the pandemic, based on data collected during a pilot project. This data includes the number of students enrolled in a course, the percentage of successful completions, and demographic information, such as age, location, and primary interest areas. The study concludes that the use of AI in education has escalated during the pandemic, and the data supports the growing popularity and effectiveness of AI-driven tools in the educational process.</p> |
| Popescu, Geantă & Brand (2022) | Mapping of clinical research on artificial intelligence in the treatment of cancer and the challenges and opportunities underpinning its integration in the European Union health sector | <p>This study conducts a systematic review to map clinical research on artificial intelligence (AI) in cancer treatment and explores integration challenges and opportunities in the European Union (EU) healthcare sector. It encompasses 44 clinical trials between 2010 and 2020, focusing on three research areas: AI with medical imaging, robotic surgery, and clinical decision-making. While 21 studies were interventional and nine observational, 14 did not specify the study type, exhibiting significant heterogeneity. Interestingly, only a small fraction of studies occurred in the EU, likely influenced by socioeconomic, political, and technological factors. Addressing these challenges causes tailored strategies to leverage AI in EU healthcare fully.</p> |



UNDERSTANDING CULTURAL AND SOCIAL INFLUENCES ON FEMALE ENTREPRENEURSHIP IN MANDAN VILLAGE, CHINA

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Abstract: *This qualitative study delves into the intricate interplay of cultural norms, social networks, and unique challenges impacting female entrepreneurship in Mandan Village, Yunnan Province, China. Amidst evolving economic realities and entrenched traditional values, this research aims to unravel how these factors shape women's entrepreneurial endeavors in a rural context. The study's objectives are threefold: (1) to explore the influence of cultural norms on female entrepreneurship, (2) to investigate the role of social networks in supporting or challenging female entrepreneurs, and (3) to identify the unique challenges and opportunities faced by female entrepreneurs in Mandan Village. Employing semi-structured interviews, field observations, and analysis of government documents, the study captures diverse perspectives from 3 village committee members, 6 local residents, 3 NGO representatives, and 3 female entrepreneurs, totaling 15 individuals. Results uncover that conventional social standards altogether impact ladies' choices to become entrepreneurs and the kinds of organizations they lay out. Social networks are found to assume an essential part, offering fluctuating levels of assistance and assets. Female entrepreneurs face difficulties like adjusting business and family obligations, restricted admittance to resources, and exploring the digital gap. These experiences add to a nuanced comprehension of the variables influencing rural female entrepreneurship, offering important ramifications for policymakers, educators, and local area leaders. This research enriches the academic discourse on gender, culture, and entrepreneurship and underscores the importance of considering local contexts in fostering female economic empowerment and entrepreneurial choices in rural settings.*

Keywords: *female entrepreneurship, cultural norms, rural China, social networks, Mandan Village, gender and culture, rural business development*

Introduction

In the dynamic sphere of global entrepreneurship, the distinct experiences of rural women are garnering increasing scholarly and socio-economic attention. Mandan Village in Yunnan Province, China, with its rich cultural diversity, offers a unique lens to study these phenomena. This research focuses on understanding the cultural and social

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influences shaping female entrepreneurship in this locale, a subject vital in the broader context of gender studies and entrepreneurial research. Recent findings indicate personal traits, societal elements, and economic factors significantly impact female entrepreneurial decisions (Cavada et al., 2017). In China, while many women entrepreneurs are driven by necessity, such as family income improvement, a growing number are opportunity-driven, buoyed by enhanced educational access (Franzke et al., 2022). This trend aligns with He et al. (2022) findings on the influence of family cultural values on entrepreneurship, based on the China Family Tracking Survey. The importance of local, neighborhood, and family networks in shaping female social enterprise is immense, as entrepreneurship intertwines with place-based social, economic, and cultural patterns (Halberstadt & Spiegler, 2018). Furthermore, the significance of village entrepreneurs in combatting rural poverty is emphasized by Huang et al. (2017) and Naminse and Zhuang (2018), thereby emphasizing the intricate relationship between entrepreneurship and socio-economic advancement.

Social approval and support are crucial for female entrepreneurial intention, as observed in Gul et al. (2021) study, where a significant majority of Chinese women achieved success in socially supportive environments. Education also emerges as a key factor, with Gawel (2021) emphasizing its role in promoting entrepreneurship. Chen et al. (2018) further investigates this by dissecting the effect of social networks and business on territorial financial development in China.

Cultural factors are equally influential. Dai (2021) examines how culture shapes entrepreneurial behavior in China, while Lin and Kloet (2019) discuss the state's use of digital technology and entrepreneurship as solutions to socio-economic challenges. Xiao et al. (2020) investigates the convergence of traditional principles and digital business ventures, offering valuable insights into the cultural and institutional framework of China. On the contrary, Wang et al. (2023) and Yeh (2021) delve into the analysis of family dynamics in entrepreneurship and the cultural dynamics of Tibetan entrepreneurship, respectively, thereby presenting a more comprehensive view of the entrepreneurial landscape in China.

Hence, this investigation situates itself at the crossroads of cultural anthropology, gender studies, and entrepreneurship research, presenting a distinctive vantage point on the dynamics of female entrepreneurship in rural China, particularly in Mandan Village. Its primary objective is to contribute to our comprehension of how local circumstances shape women's economic empowerment and their decisions related to entrepreneurship.

Literature Review

Female Entrepreneurship in Global and Chinese Contexts

In China, the phenomenon of female entrepreneurship has seen a continual increase over the past 30 years, with a significant role in rural areas Dewitt et al. (2022). The relevance of education in encouraging entrepreneurial activity is highlighted by the favourable correlation between female entrepreneurship and educational attainment (Gawel, 2021). The influence of gender equality on bridging or buffering the entrepreneurship gender

gap has been investigated, indicating variations in the influence of female economic and political participation on female entrepreneurship across different countries (Vracheva & Stoyneva, 2020). Furthermore, the ingenuity and experience of female business people have been found to emphatically affect their wellbeing, showing the perplexing interchange among business and prosperity (Jia et al., 2021). Furthermore, the study on improving the entrepreneurial competence of college social entrepreneurs in China highlights the positive influence of digital government building and entrepreneurship education on female social entrepreneurs (Xiang et al., 2022). While the quantity of female business visionaries in China has been on the ascent, this pattern doesn't seem, by all accounts, to be converting into higher wages for ladies, which asks the issue of how economical their organizations are (Hernández et al., 2012). At long last, reflections on female business venture through its set of experiences, improvement, and orientation division have been introduced, revealing insight into the addition of ladies in the business area in various territorial, social, monetary, and social environments (Santos et al., 2019). These examinations all in all give an exhaustive comprehension of female entrepreneurship in China and its worldwide circumstance, enveloping elements like family dynamics, training, gender equality, wellbeing suggestions, entrepreneurial competence, and the difficulties and possibilities related with female entrepreneurship.

While there has been an increase in female entrepreneurship in China, especially in provincial districts, there has been no relating expansion in ladies' income, as per the exploration (Dewitt et al., 2022; Hernández et al., 2012). Education has been found to well affect entrepreneurial exercises, as per review (Gawel, 2021). Vracheva and Stoyneva (2020) found a complicated link between gender equality and entrepreneurship in different nations. However, the implications of these trends for long-term sustainability and wellbeing (Jia et al., 2021; Xiang et al., 2022) remain underexplored, particularly in rural Chinese contexts.

Cultural and Family Influences on Entrepreneurship

Both the objectives and the results of an entrepreneur are heavily impacted by cultural and familial factors. Research has shown that family dynamics and early exposure to entrepreneurship within the family can influence an individual's entrepreneurial intent Carr and Sequeira (2007). Additionally, family resources have been found to impact the long-term outcomes of entrepreneurship, such as exit from entrepreneurship, highlighting the enduring influence of family on entrepreneurial endeavors (Bird & Wennberg, 2016). Family culture, and Confucianism in China in particular, is a potential driver or brake on entrepreneurial spirit (He et al., 2022). The impacts of family history on students' plans to establish their own firms have been studied (Georgescu & Herman, 2020), and one finding is that an entrepreneurial family background may limit a student's entrepreneurial aspirations. Cultural factors, in addition to those inherited from one's family, play a significant influence in molding entrepreneurial behavior, according to research. For instance, the cultural roots of entrepreneurship have been explored, suggesting that durable, portable, and intergenerationally transmitted cultural imprints influence the likelihood of individuals becoming entrepreneurs, particularly among second-generation immigrants (Kleinhempel et al., 2020). In addition, it has been brought

to light that national culture has a part in shaping entrepreneurship. This highlights the importance of looking at subcultural variances within a culture to fully grasp how it affects entrepreneurship (Valliere, 2019). Furthermore, scholarly investigations that have prioritized the examination of situating entrepreneurship within its appropriate cultural framework have provided insights into the fundamental contextual elements and consequences that promote entrepreneurial activities in nations such as China (Huang et al., 2019). The influence of family environment on entrepreneurial interest has been a subject of study, with findings indicating that family support and positive influence significantly contribute to inspiring and supporting individuals' decisions to pursue entrepreneurship (Arfah et al., 2023). The amount of familial support has been demonstrated to exert an impact on students' inclination towards entrepreneurship (Suharto et al., 2022). Furthermore, scholarly investigations examining the impact of entrepreneurship on development, interpersonal dynamics, and familial life have revealed that entrepreneurs have significant repercussions in their personal lives, with a special emphasis on their familial relationships (Gholami & Tahoo, 2021). In sum, research shows that cultural and familial aspects, including family dynamics, cultural origins, national culture, and the impact of the home environment on entrepreneurial goals and achievements, have a major bearing on the entrepreneurial process.

Research highlights the significant impact of family dynamics and culture on entrepreneurial intent and outcomes (Bird & Wennberg, 2016; Carr & Sequeira, 2007; He et al., 2022). While family background can inspire entrepreneurial aspirations, it may also impose limitations (Georgescu & Herman, 2020). National and subcultural differences within China play a crucial role in shaping entrepreneurial behaviors (Huang et al., 2019; Valliere, 2019), but the specific influence of these factors in rural settings like Mandan Village needs more examination.

Social Networks and Community Support

Social networks and community support play crucial roles in shaping entrepreneurial activities and outcomes. Research has shown that the scale of social support networks and the activities of individual and group members within the network are positively correlated with the level of users participating in online health tasks, highlighting the significance of social support networks in influencing user participation Lin and Li (2021). Furthermore, the impact of social networks and online communities on research and communication platforms has been emphasized, underscoring the need to consider the social desirability tendency of community members in these settings (Massara et al., 2012). Additionally, the linkage between social support and social networks and health education programs has been explored, emphasizing the implications for natural helper and community-level interventions (Israel, 1985). Likewise, earlier examinations have shown that social capital, which is gathered through social networks and trust, connects with local area personal satisfaction (Singh, 2022). This underscores the significance of communal involvement and social networks in facilitating community adaptation. In addition to social networks, family environment and support have been identified as influential factors in determining entrepreneurial career decisions and students' interest in entrepreneurship (Arfah et al., 2023; Hidayat & Veronica, 2022). The influence of the

social environment, particularly the support of the family environment, especially the elderly, has been highlighted as important for determining entrepreneurial career decisions (Hidayat & Veronica, 2022). Furthermore, the impact of family resources within the family and ethnic community on immigrant entrepreneurs' exit from entrepreneurship has been studied, emphasizing the enduring influence of family resources on entrepreneurial endeavours (Bird & Wennberg, 2016). Furthermore, academic examinations have dove into the meaning of family dynamics and connections with regards to female business venture. These studies have shed light on the transformative shifts in family dynamics that foster female entrepreneurship. Simultaneously, they have acknowledged the obstacles and inequitable expectations imposed on women who opt for entrepreneurship as a profession (Dewitt et al., 2022).

Social networks and community support are pivotal in shaping entrepreneurship (Israel, 1985; Lin & Li, 2021; Massara et al., 2012). The literature underscores the role of social capital and community quality of life (Singh, 2022), but there's a gap in understanding how these dynamics specifically affect rural women entrepreneurs in China.

Education and Entrepreneurship

Rural women's entrepreneurship can contribute to economic growth in developing countries, representing an untapped potential Kabagerayo et al. (2022). Nonetheless, the level of education assumes a critical part in deciding the degree to which rustic ladies can take part in entrepreneurial exercises. Studies have indicated that women with low education can pursue rural entrepreneurship if they are supported through training and access to networks (Semkunde et al., 2021). Furthermore, access to competitive markets and entrepreneurial education, supported by adequate funding, is fundamental for achieving economic empowerment through resilient rural women's livelihoods (Jaka & Shava, 2018). The influence of education on rural women's economic empowerment has been a subject of study, with findings indicating that low educational status has limited rural women in attaining equitable livelihood opportunities and decision-making capabilities (Obayelu & Chime, 2020). Moreover, the improvement of women's entrepreneurial competence in rural tourism has been linked to the need for action learning, particularly as rural women typically have less access to formal education and extensive social networks (Yong et al., 2021). Additionally, functional literacy has been identified as an effort to develop home businesses for rural women, recognizing the pivotal role of women in supporting family economies (Arbarini et al., 2020). With regards to provincial regions, education has been viewed as a mediator among strengthening and conceptive health care, with suggestions for rural women's dynamic power in family matters, including medical problems (Alishah et al., 2019; Aly, 2021). Furthermore, the determinants of economic empowerment of rural women through agricultural activities have been analysed, highlighting the significance of education in enhancing their economic empowerment (Didana, 2019). Furthermore, the section of rustic ladies into advanced education has been considered to grasp its commitment to the change and defeating of man centric social relations, revealing insight into the possible effect of education on social change and empowerment (Falciro & Farias, 2017).

While rural women's entrepreneurship is recognized as a driver of economic growth, education is a critical determinant of their participation in entrepreneurial activities (Jaka & Shava, 2018; Kabagerayo et al., 2022; Semkunde et al., 2021). However, the specific educational needs and challenges of rural women entrepreneurs in China, and their impact on economic empowerment, are not adequately addressed in current literature.

Rural Entrepreneurship and Its Unique Challenges

The obstacles encountered by female entrepreneurs in rural areas are deeply influenced by the intricate dynamics of economic and social elements. The problems faced by women entrepreneurs in rural regions have been recognized as access to investment capital, availability of resources, and state financial support (Ghouse et al., 2021). Additionally, limited access to farmlands and profitable markets, lack of business networks, limited time, poverty, and insufficient financial resources constrain women's engagement in entrepreneurship (Semkunde et al., 2021). Furthermore, rural women entrepreneurs face primarily social and cultural, financial, and skill-related challenges, which impact their ability to survive in family entrepreneurship (Rahman et al., 2022). The challenges are exacerbated by gender-specific barriers, as rural entrepreneurship can be more challenging for women due to societal norms and expectations (Elkafrawi & Refai, 2022). Likewise, the barriers experienced by female entrepreneurs in rural areas are shaped by the wider social and economic circumstances. Entrepreneurs who conduct commercial activities in geographically isolated rural regions have unique challenges that might hinder the growth and sustainability of their enterprises. These challenges include limited access to resources and constrained market opportunities (Besser & Miller, 2013). Additionally, women entrepreneurs in rural areas encounter difficulties in taking financial risks, mitigating organizational risk, and empowering themselves as a social collective, reflecting the multifaceted nature of the challenges they face (Kumar, 2013). Rural women entrepreneurs have additional difficulties due to the absence of adequate support systems and limited prospects. Women entrepreneurs in rural areas often encounter obstacles in accessing financial services and entrepreneurship opportunities, which can hinder their economic empowerment and poverty reduction efforts (Koomson et al., 2022). Furthermore, the entrepreneurship model of rural women's cooperatives has been identified to have problematic areas, indicating the need for comprehensive support and interventions to address these challenges (Lassithiotaki & Roubakou, 2014).

Rural female entrepreneurship faces unique challenges, including access to capital, resources, and support (Elkafrawi & Refai, 2022; Ghouse et al., 2021; Rahman et al., 2022; Semkunde et al., 2021). While these challenges are acknowledged, there is a lack of in-depth exploration of how these barriers specifically manifest and are navigated in rural Chinese contexts.

Digital Technology and Entrepreneurship

Digital technology can enhance rural women's entrepreneurship by providing access to information, markets, and financial services, thereby enabling them to identify new

opportunities and innovate (Fahmi & Savira, 2021). The development of digital technology can help entrepreneurs by facilitating faster and easier information acquisition, which is particularly beneficial for rural communities (Fahmi & Savira, 2021). Besides, computerized innovation can act as a way to strengthening and more noteworthy monetary interest for under-resourced and socially minimized rural women (Dy et al., 2018). It can support women in various ways, such as saving time and labor, shaping their abilities, and improving the infrastructure of their work (Sharma, 2022). However, the digitalization of entrepreneurship also presents challenges, including the potential to increase inequality and disrupt sustainable development goals (Prasetyo & Setyadharma, 2022). The transformation of entrepreneurship through digital technology has the potential to increase inequality, particularly in rural areas, and disrupt sustainable development goals (Prasetyo & Setyadharma, 2022). Additionally, the digitalization of entrepreneurship can lead to increased inequality, posing challenges for sustainable development (Prasetyo & Setyadharma, 2022). Moreover, the role of digital technology in provincial ladies' entrepreneurship is firmly connected to monetary consideration and admittance to digital financial services. With the help of digital inclusive finance, rural families, particularly women, are showing unprecedented entrepreneurial enthusiasm, which can contribute to poverty reduction and economic empowerment (Chen et al., 2022). Financial digitalization, banking proximity, financial inclusion, financial care services, and government support systems can enhance rural women's entrepreneurial productivity and reduce poverty levels (Nso, 2022).

While some research suggests that digital technology might help rural women start their own businesses (Dy et al., 2018; Fahmi & Savira, 2021; Sharma, 2022), others are worried that it would worsen issues of inequality and sustainable development (Chen et al., 2022; Prasetyo & Setyadharma, 2022). The literature suggests a need for more nuanced understanding of digital technology's impact on rural female entrepreneurship in China.

The present research covers most facets of Chinese female entrepreneurship. Significant knowledge and insights into rural places like Mandan Village are lacking. Current study focuses on general trends or metropolitan contexts, limiting its investigation of rural female entrepreneurs' unique challenges and opportunities. Further research is needed to understand the intricate connection between cultural, educational, and technical factors that foster rural Chinese women's entrepreneurship. This study is essential for creating effective policies and support systems.

Methodology

Thorough, semi-structured interviews were significant in social occasion information for this qualitative examination. Qualitative research methodology encompasses a range of approaches and traditions that aim to provide a deep understanding of social phenomena through systematic, self-conscious research design, data collection, interpretation, and communication (Mays & Pope, 2000). It is exploratory in nature, aiming to explain the "how" and "why" of a certain social phenomena or program's operation in a given setting, and it is defined by the collecting of data directly from respondents in the field (Alam, 2008). Interviews are the backbone of qualitative research, which seeks to describe and

illustrate the use of qualitative interview methods in many contexts. It is a research method that effectively supports a qualitative, quantitative, or mixed methodology and is based on Lewin's action-research principles, including planning, action, observation, and reflection (Britten, 1995; García-Sampedro, 2018). This approach is chosen for its effectiveness in exploring the complex, nuanced, and context-specific experiences of individuals, particularly in a culturally rich setting like Mandan Village.

Data Collection

Each participant will have semi-structured interviews. This format allows for flexibility in exploring topics deeply while ensuring that all relevant areas are covered. The study will involve 15 participants, 3 village committee members, 3 small business owners, 3 NGOs, and 6 residents (Table 1). They will be divided into four distinct groups to capture a range of perspectives. Deliberate testing, otherwise called purposeful examining, is a non-likelihood inspecting strategy oftentimes utilized in qualitative examination. This method is effective in gathering data from knowledgeable experts and ensures the quality of the information collected (Tongco, 2007). In qualitative exploration, two separate examining procedures are utilized: convenience examining and intentional testing. While convenience sampling entails picking individuals who are easily available to the researcher, purposive sampling follows a deliberate and purposeful approach to choose participants (Guarte & Barrios, 2006). Each interview session is expected to have a duration of around 60 minutes and will take place in a conducive and confidential environment, aimed at fostering candid and transparent conversation. The interview guide will include open-ended questions tailored to each group of participants, focusing on their experiences, perceptions, and opinions related to female entrepreneurship in Mandan Village.

The selection criteria for participants and the composition of the interview question sample:

Village Committee Members (3 Participants)

- **Criteria:** These individuals play a crucial role as key informants in providing insights into the administrative and policy viewpoints pertaining to entrepreneurship within the village.
- **Sample Question 1:** " Could you at any point portray the ongoing scene of entrepreneurship in Mandan Village, particularly corresponding to female entrepreneurs? What changes have you seen throughout recent years?"
- **Purpose:** This question expects to accumulate bits of knowledge into the more extensive entrepreneurial climate in the village from a strategy and managerial point of view.
- **Sample Question 2:** " What difficulties and opportunities do you suppose ladies face while beginning and running organizations locally?"

- Purpose: This question tries to comprehend the committee members impression of the impediments and benefits that female entrepreneurs encounter in Mandan Village.

Small Business Owners (3 Participants)

- **Criteria:** Female entrepreneurs in Mandan Village are engaged in the ownership and operation of various companies, including restaurants, homestays, and beauty salons. The perspectives they offer will be crucial in comprehending the pragmatic obstacles and prospects associated with operating a business inside this rural environment.
- **Sample Question 1:** "What roused you to go into business, and how did your cultural and social foundation impact this choice?"
- Purpose: This question is intended to investigate the individual inspirations driving their entrepreneurial ventures and the impact of their cultural and social circumstance.
- **Sample Question 2:** "Might you at any point share a huge test you've looked at in your business and how you figured out how to overcome it?"
- Purpose: This tries to comprehend the functional difficulties experienced and the methodologies utilized to address them, giving bits of knowledge into flexibility and development in a rural business context.

NGOs (3 Participants)

- **Criteria:** The forementioned individuals will contribute an external viewpoint about the support mechanisms accessible to rural businesses, as well as the wider socio-economic framework. The user's text does not provide any information to rewrite in an academic manner.
- **Sample Question 1:** "From your experience, how do NGOs uphold female entrepreneurship in rural regions like Mandan Village? Are there explicit projects or initiative you can share?"
- Purpose: This question means to assemble data on the role of NGOs in cultivating female business venture and the viability of their projects.
- **Sample Question 2:** "As you would like to think, what are the most basic requirements of female entrepreneurship in Mandan Village that are as of now neglected?"
- Purpose: This question looks for bits of knowledge into expected holes in help and assets that NGOs or different partners could address.

Local Residents (6 Participants)

- **Criteria:** This collective will provide a communal viewpoint, encompassing the societal and cultural context in which female entrepreneurship is situated.
- **Sample Question 1:** "How would you see the effect of female-possessed organizations on our local area in Mandan Village?"

- Purpose: This question expects to comprehend local area view of female business venture and its socio-cultural and financial effects.
- **Sample Question 2:** " Could you at any point share any accounts or encounters you have had with nearby female business visionaries and what they have meant for your perspective on women in business?"
- Purpose: This looks to accumulate individual narratives and encounters that reflect the cultural mentalities and convictions about female entrepreneurship in the village.

Table 1: Stakeholders with Their Information

| Code | Employment | Interview Duration |
|------|---------------------------|--------------------|
| S1 | Village Committee Members | 57mins |
| S2 | Village Committee Members | 50mins |
| S3 | Village Committee Members | 51mins |
| S4 | Restaurant Owner | 61mins |
| S5 | Homestay Owner | 60mins |
| S6 | Beauty Salon Owner | 58mins |
| S7 | NGOs | 52mins |
| S8 | NGOs | 51mins |
| S9 | NGOs | 50mins |
| S10 | Local Resident | 62mins |
| S11 | Local Resident | 59mins |
| S12 | Local Resident | 56mins |
| S13 | Local Resident | 55mins |
| S14 | Local Resident | 59mins |
| S15 | Local Resident | 60mins |

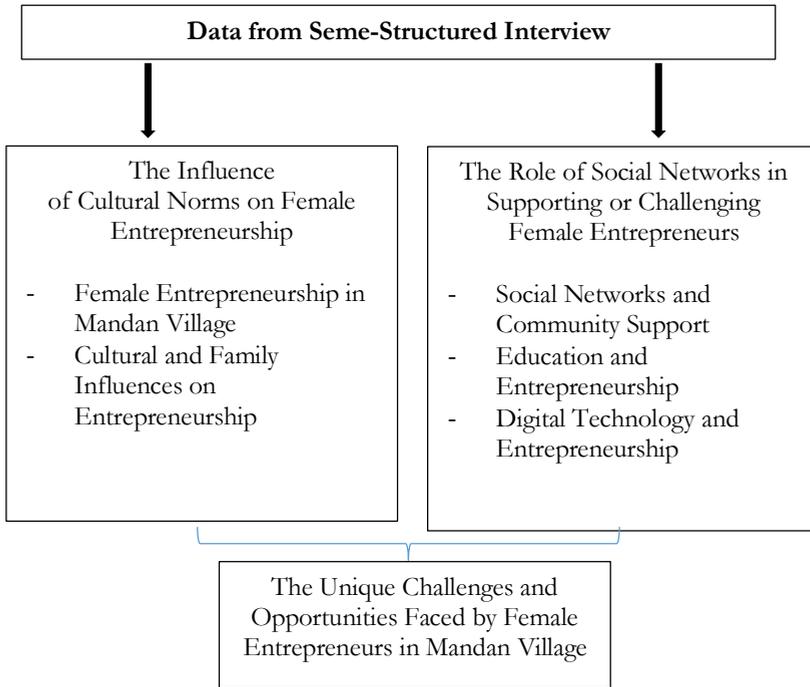
Source: Developed by Author

Data Analysis

Thematic analysis is a versatile and extensively employed approach that centers on the identification of patterns and themes within qualitative data. The forementioned approach provides a comprehensive comprehension of practical concerns and may be effectively employed to address diverse research inquiries and datasets. Unlike other approaches, thematic analysis allows for theoretical freedom and rich, detailed yet complex analytical accounts (Lochmiller, 2021; Majumdar, 2022; Saunders et al., 2023). The interviews will be documented by recording, transcribing, and subsequently subjected to theme analysis. Finding and recording recurring ideas or patterns in the data collection is the methodological approach taken in this investigation. The analysis will be an iterative process, moving back and forth between the data and emerging themes to ensure a comprehensive understanding of the narratives.

According to the data from the semi-structured interview, a conceptual research framework was generated for this study. (Figure 1)

Figure 1. The Conceptual Research Framework



Source: Developed by Author

In order to bolster the credibility and dependability of the study, various methodologies will be implemented. These methodologies encompass triangulation, which involves the comparison and cross-verification of findings across diverse participant groups, member checking, which entails sharing the findings with participants to validate their accuracy, and the meticulous maintenance of an exhaustive audit trail documenting the research process. The vital moral consent will be looked for from the fitting institutional survey board. All participants will be mentioned to give informed assent, which will guarantee that they have information in regard to the objective of the review, the deliberate idea of their association, and their qualification to pull out from the review at some random point. The review system will stick to severe conventions to guarantee the conservation of secrecy and obscurity. The restricted generalizability of the discoveries is credited to the qualitative nature of this review and the use of a little, purposive example.

The present study utilized empirical data collected during interviews conducted during two site visits that spanned two months (late-January to late-March 2023). The interviews were carried out at Mandan Village. Situated along the China-Laos border, it is a

constituent of Yunnan Province, China. The village currently has 86 farming households, with a rural population of 458 people, including 236 males and 222 females. The entire population is involved in agriculture, with a workforce of 250 people. The village is predominantly Dai ethnic group, consisting of 456 Dai people and 2 Han people. The village's primary school students attend Mandan Primary School, while middle school students go to Mengla Town Middle School. The separation from the town to the elementary school is 1.5 kilometers, and to the middle school it is 15 kilometers. There are 47 students in the village receiving compulsory education, including 34 primary school students and 13 middle school students.

Mandan Village was visited in January 2023 for the first time, with the purpose of setting up informal meetings with certain members of the Village Committee and several local women business owners. The researchers were also given an hour-long tour of Mandan by two members of the Village Committee, who gave them an overview of the town's history and ecology. The tour included stops at Mandan Village's historical archives, infrastructure, a hall showcasing traditional culture, guesthouses, restaurants, and a beauty salon. Also, when the Village Committee members were at the home of a woman who showed a strong interest in business, the researchers tagged along. A cross-section of local women was interviewed informally, including some who operate small businesses and others who live in the area. At the local level, ladies' support in business was the primary subject of conversation.

The subsequent excursion occurred toward the end of March, explicitly between the 29th and the 31st. Throughout the three days, a progression of semi-organized interviews was done, yielding a sum of 15 significant gathering records.

The research questions of the study guided the interviews.

- RQ1: How do cultural norms and values in Mandan Village influence women's decisions to become entrepreneurs, and in what ways do they shape the types of businesses women choose to start?
- RQ2: In what ways do social networks within Mandan Village support or impede women in their entrepreneurial endeavors, and how do these networks influence business success?
- RQ3: What are the specific challenges faced by women entrepreneurs in Mandan Village, and how do they navigate these challenges in the context of their cultural and social environment?

Results and Discussion

RQ1: How do cultural norms and values in Mandan Village influence women's decisions to become entrepreneurs, and in what ways do they shape the types of businesses women choose to start?

Answering the above research question requires two approaches: Female Entrepreneurship in Mandan Village, Cultural and Family Influences on Entrepreneurship.

– Female Entrepreneurship in Mandan Village

The interviews with village committee members and local residents revealed the strong influence of traditional cultural norms on women's entrepreneurship. The majority of participants expressed that, “despite the growing recognition of women in the corporate realm, conventional gender roles and societal expectations continue to provide substantial challenges” (S1, S3, S10, S12, S14, S15). For example, all the interviewed local women mentioned that “we actually had the idea of starting a business a long time ago, but the traditional concept in the village is very strong. The older generation believes that women's responsibilities are to care for the next generation, farming, cooking, and washing clothes. As for entrepreneurship and other things, it is not something that rural women should consider” (S10, S11, S12, S13, S14, S15).

The findings from Mandan Village resonate with broader trends observed in China, where traditional cultural norms continue to exert a strong influence on women's entrepreneurial decisions (Dewitt et al., 2022; He et al., 2022). The persistence of conventional gender roles, as highlighted by the local women and committee members, aligns with the literature noting the enduring impact of such norms on female entrepreneurship (Carr & Sequeira, 2007; Georgescu & Herman, 2020). However, this study also uncovers the nuanced complexity within these norms, particularly in rural contexts. The resistance faced by women in Mandan Village, despite the growing recognition of their roles in business, points to a critical gap between societal progress and entrenched cultural attitudes. This gap mirrors the discoveries of Hernández et al. (2012), where expanded entrepreneurial action has not converted into relative monetary additions for women.

– Cultural and Family Influences on Entrepreneurship

Some interviewed small business owners shared stories about balancing business activities with expected family roles, highlighting the dual challenges faced by women. For example, “I run a homestay. Indeed, my proposition to begin a commercial venture is characterized by its simplicity, namely, the sole objective is to augment the financial resources of my household. In rural areas, except in busy farming season, I am still very busy many times, and I have been thinking about how to use the vacant rooms in my home. Finally, I chose to run a homestay. My family is very opposed to it. Although it increases my family's income by running a homestay, I need a lot of money. Take time to manage homestays. My family all believe that I did not fulfill my responsibilities as a woman” (S5).

The dual challenges of managing business and familial responsibilities, as expressed by the participants, underscore the dual role many women must navigate. This reflects findings by Bird & Wennberg (2016), who note the significant influence of family resources and dynamics on entrepreneurial outcomes. Nevertheless, the research emphasizes a distinctive facet of rural entrepreneurship: the need to reconcile

entrepreneurial ambitions with the pressure to conform to conventional family responsibilities. This discovery holds significant pertinence when considering the impact of Confucianism in rural China, a factor that can simultaneously stimulate and impede the entrepreneurial ambitions of women (He et al., 2022).

RQ2: In what ways do social networks within Mandan Village support or impede women in their entrepreneurial endeavors, and how do these networks influence business success?

To answer the forementioned research query, three methods are necessary: Social Networks and Community Support, Education and Entrepreneurship, Digital Technology and Entrepreneurship.

– Social Networks and Community Support

Social networks and community support Interviews with representatives of non-governmental organizations (NGOs) and residents indicate that social networks play a crucial role in supporting women's entrepreneurship. For example, as a vocational skills training institution, we are commissioned by local governments to provide skills training to local people in remote areas such as Mandan Village. Especially for female students, we prepare courses such as pastry, Chinese cuisine cooking, hair salon, etc. We really hope that rural women can step out of the mountains and start their own businesses after mastering the skills (S7, S8, S9). However, the experiences of small business owners are mixed. While certain individuals experience advantages from robust community affiliations, others may perceive a sense of isolation stemming from inadequate access to pertinent networks or support structures. For example, "I run a small restaurant, but on the one hand, I don't have enough variety of dishes, and on the other hand, I lack experience in business management. In addition, I don't have any fixed large customers, so my business has not been very stable" (S4).

The findings from Mandan Village regarding the role of social networks in supporting female entrepreneurship echo broader research emphasizing the significance of social support networks (Lin & Li, 2021; Massara et al., 2012). The vocational training initiatives mentioned by NGO representatives highlight how skill development can be a critical driver for rural women's entrepreneurship, aligning with Semkunde et al. (2021) findings on the importance of training and network access. However, the mixed experiences of business owners, with some benefiting from robust community ties and others feeling isolated, point to an inconsistency in the effectiveness of these networks. This variation suggests that while social networks can be a powerful asset, their benefits are not uniformly accessible or leveraged in rural entrepreneurial settings.

– Education and Entrepreneurship

Education and Entrepreneurship The interviewed village committee members and residents stated that education is very important in the process of entrepreneurship. For example, "Our village committee hopes that more education and training institutions can teach our local residents to enhance their skills and provide them with more employment

opportunities" (S1, S2, S3). Some female villagers mentioned that "our entrepreneurial idea originated from the teacher who came here to train us. We see that she is also a woman who can master skills and knowledge and lead the society independently. We are very eager to become independent women like her" (S13, S14, S15)

The impact of education on fostering female entrepreneurship, as noted by village committee members and residents, supports existing literature on the positive correlation between education and entrepreneurial activity (Jaka & Shava, 2018; Kabagerayo et al., 2022). The inspiration drawn from educated role models underscores the potential of education not only in skill-building but also in changing societal perceptions about women's roles in entrepreneurship. Be that as it may, the discoveries likewise uncover a gap in the writing regarding the educational necessities of rustic women entrepreneurs in China and how these requirements convert into monetary.

– Digital Technology and Entrepreneurship

Digital Technology and Entrepreneurs The interviewed small business owners and residents unanimously believe that digital technology is a key factor in today's social development. For example, "I ran a small beauty salon, and the business was not very good at the beginning, so I asked my cousin who worked in the city. She taught me how to use short video tools such as Tiktok. Almost overnight, I feel that everyone knows the existence of my shop. Now many customers come to me, of course, they will also make an appointment with me through WeChat and will also pay me through Alipay or WeChat. Thank you very much "The changes that technology has brought to my life" (S6). The interviewed villagers also mentioned that "almost everyone in our village now has smartphones, which greatly improves the efficiency of communication. We can also learn and learn more knowledge and information through some large websites and platforms" (S11, S12).

The positive impact of digital technology on rural women's businesses, as seen in the case of the beauty salon owner, aligns with research highlighting digital technology as a catalyst for entrepreneurship (Dy et al., 2018; Fahmi & Savira, 2021). This finding illustrates the transformative potential of digital tools in enhancing business visibility and customer engagement. Even so, the issue of digital technology worsening inequality (Chen et al., 2022; Prasetyo & Setyadharma, 2022) raises worries over its equitable accessibility, which might potentially result in a digital gap among entrepreneurs.

RQ3: What are the specific challenges faced by women entrepreneurs in Mandan Village, and how do they navigate these challenges in the context of their cultural and social environment?

Collaboration between RQ1 and RQ2 is necessary to address the research inquiry specified before.

Results for RQ3

(1) Specific Challenges Faced by Women Entrepreneurs: Women business owners in Mandan Village confront a complex set of obstacles, according to the study's results, which have their origins in the local culture and economy. These challenges include:

- Limited Access to Resources and Capital: Ghouse et al. (2021) and Semkunde et al. (2021) both point out that women business owners have a hard time getting the funding and resources they need. This includes limitations in accessing farmlands, markets, and investment capital.
- Balancing Entrepreneurial and Domestic Responsibilities: Participants noted the dual burden of managing business and familial roles, a challenge that resonates with the broader research findings of Elkafrawi and Refai (2022) and Rahman et al. (2022). This balance is particularly challenging in the context of Mandan's traditional cultural norms.
- Lack of Business Networks and Support Systems: Some women reported feeling isolated due to inadequate access to relevant business networks, echoing the findings of Besser and Miller (2013) and Kumar (2013).

(2) Navigating the Challenges: Women entrepreneurs in Mandan Village adopt various strategies to navigate these challenges:

- Leveraging Digital Technology: Consistent with the findings of Fahmi and Savira (2021), women are increasingly using digital technology to access markets and improve business visibility, thereby partially overcoming the limitations of geographical isolation.
- Skill Development through Education and Training: Aligning with the emphasis on education by Jaka and Shava (2018) and Kabagerayo et al. (2022), women entrepreneurs are seeking skill development and education to enhance their business competencies.
- Community Support and Cooperatives: Some women are turning to community cooperatives and support networks to mitigate the lack of formal support systems, as suggested by Koomson et al. (2022) and Lassithiotaki and Roubakou (2014).

Discussion for RQ3

(1) Cultural and Socio-Economic Barriers: Cultural standards and financial limitations altogether frustrate female business venture in Mandan Village, as per the review. While the challenges align with broader trends in rural entrepreneurship, the specific context of Mandan Village - with its unique cultural and social environment - intensifies these challenges. The findings underscore the need for contextualized solutions that address both cultural norms and practical barriers. The research could benefit from a deeper exploration of how cultural norms specifically influence the types of businesses women choose to start. Understanding this could provide more targeted insights for policy interventions.

(2) **Strategies for Overcoming Challenges:** The adaptive strategies employed by women entrepreneurs in Mandan Village demonstrate resilience and innovation. The use of digital technology, for instance, highlights a modern approach to overcoming traditional barriers. By the by, not all women are furnished with equivalent admittance to these assets, and the progress of these actions varies. Further research should investigate the accessibility of digital tools and educational resources to all women entrepreneurs in the village. Understanding these disparities is crucial for developing inclusive support mechanisms.

(3) **Need for Holistic Support Systems:** The reliance on community support and cooperatives indicates a gap in formal support structures for female entrepreneurs in rural areas. This emphasizes the significance of comprehensive and multi-dimensional support systems that address the cultural and economic dimensions of entrepreneurship. The study points to the importance of community and cooperative structures but does not fully explore how these can be effectively integrated with formal support mechanisms. Creating integrated support models that merge community-based strategies with official entrepreneurship assistance should be the primary goal of future studies.

Conclusion

The motivation behind this exploration was to look at the elements of female entrepreneurship in Mandan Village, Yunnan Province, China, with a specific concentration on the means by which social networks, cultural standards, and individual obstructions assume a part. The results show that there is a complicated relationship between long-standing cultural standards and the new goals of female entrepreneurs. Despite the progressive recognition of women in business, entrenched societal expectations and gender roles continue to pose significant challenges. Social networks and community support, while crucial, offer mixed benefits due to variability in accessibility and effectiveness. Women entrepreneurs in Mandan Village are navigating these challenges through innovative strategies, including leveraging digital technology, and pursuing skill development through education.

Limitations of the Study

The study, while providing valuable insights, is not without limitations. The results may not apply to other rural areas in China or anywhere else due to the study's qualitative character and its limited, purposeful sample size. Additionally, the study primarily captures the experiences and perceptions of a specific group of women in Mandan Village, which may not fully represent the diversity of experiences among all rural women entrepreneurs.

Future Research Directions

Future research should aim to address the following areas:

- a) Quantitative Analysis: To complement the qualitative insights, a quantitative approach involving a larger and more diverse sample could validate and extend the findings of this study.
- b) Longitudinal Studies: Conducting longitudinal research would provide deeper insights into how the entrepreneurial journey of women in rural areas like Mandan Village evolves over time, especially in the face of changing cultural norms and technological advancements.
- c) Comparative Studies: To even more likely figure out the perplexing connection between culture, gender, and entrepreneurship, looking at the tales of female entrepreneurs from different rural areas of China or different nations could be educational.
- d) In-depth Exploration of Digital Divide: To fully understand how the digital gap affects rural women business owners, more studies are required. Understanding the barriers to digital access and literacy among rural women entrepreneurs could inform more effective strategies for digital inclusion.
- e) Policy-Oriented Research: Studies focusing on the effectiveness of specific policies and programs aimed at supporting rural women entrepreneurs would be valuable. An examination of how various forms of assistance may be modified to address the specific difficulties encountered by these women could be part of this process.

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ADDRESSING THE CHALLENGES OF LEARNER'S PERSISTENCE IN A FREE BASIC EDUCATION PROGRAM IN A DEVELOPING COUNTRY

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Abstract: *The basic education in a developing country struggle with parental disinterest and resource limitations, hindering education access. Despite offering free tuition and food, the school has witnessed a worrisome increase in dropouts over the past five years. Hence, the study was conducted to examine the challenges of learner's persistence. Key informants consisting of the teachers, parents, and three former students formed part of the research participants. The findings showed that challenges to learner's persistence include family problems, financial difficulties, absence of a security guard, school location, lack of parental cooperation, and inadequate learning materials. Finally, the study recommended specific strategies to address these challenges. The implementation of these strategies can greatly contribute to improving the learner's persistence and their overall learning experience in a free basic education program.*

Keywords: *challenges; free basic education; persistence; private school*

1. Introduction

The availability of high-quality education for everyone has significantly improved around the world. Technology has made great progress in advancing and raising the standard of education in many nations throughout the world. It is required under international human rights legislation that all children get a free basic education. This law is being written so that it will be mandatory and available to all children. Furthermore, secondary and higher education will gradually become free of charge. A free education is one that is paid for through charitable organization taxes rather than student fees. In many nations, primary school and other comprehensive or required education are free.

However, it is a reality that the majority of families in many developing nations struggle to make ends meet so that their children can attend school. As a result, millions of

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children in school are denied their fundamental right to a free education. As of June 2022, 58.4 million children, or 8% of the 787 million children enrolled in primary school, were unable to attend school, according to data from the UNESCO Institute for Statistics. In South Asia, 12.8 million kids do not attend school. In light of this, numerous researchers have made analyzing learner persistence a top subject of research for education since the 1960s (UNESCO, 2022). Persistence refers to an individual phenomenon—students or learners persist to a goal (Ortega-Dela Cruz, 2015- 2016).

Many Filipinos in the Philippines place a high value on education. All Filipino students will receive high-quality education, according to the Philippine government. In the political, economic, social, and cultural life of the Philippines, education is of utmost importance. It has always been held in high regard as a cornerstone of national development and a key pathway for social and economic mobility. The Article XIV, Sec. 5, paragraph 5 of the 1987 Philippine Constitution additionally protects the right to education of every Filipino. In accordance with its provisions, "The State shall protect and promote the right of all citizens to quality education at all levels and shall take appropriate steps to make education accessible to all" (Official Gazette of the Philippines, 2022).

Additionally, the Philippine National Education for All 2015 Plan of Action, which is based on the Dakar Framework of Action and the 1990 World Declaration on EFA as well as the 2000 World Conference on EFA, ensures that every child, young person, and adult will receive the fundamental educational needs that they have and that educational disadvantages won't start developing inequitably from an early age. It aims to enroll all kids who are six years old and older in school. The Enhanced Basic Education Act of 2013 was passed in 2013 to make kindergarten the required first year of a child's compulsory formal education. The government offers free education to all children from kindergarten through secondary school.

Although the nation has previously provided free basic and secondary education, going to school still involves indirect costs. These costs, which restrict children from low-income families from attending school, include school supplies, uniforms, and travel or transportation costs (International Bank for Reconstruction and Development, 2009). How to provide access to high-quality, reasonably priced education so that the nation can fully benefit from its demographic dividend is the biggest problem. The difficulty for the schools is how to continue operating and provide a high standard of instruction without receiving any financial rewards (Dayagbil et al., 2021). The implementation of or provision of free education in schools has also been made difficult by this circumstance.

Despite offering free education, a private school located in Laguna, Philippines struggles to provide the necessary resources for the children to attend school regularly. This includes transportation, uniforms, school supplies, books, and even food. Consequently, there has been a significant increase in the number of dropouts over the past five years. It is crucial, therefore, to gather adequate information on the challenges of learner's persistence. Information on these challenges can help provide valuable solutions to help address them and increase learner's persistence for free basic education programs.

Basically, this study aimed to provide answers to the question: How will the school leaders resolve the challenges related to learner's persistence for free basic education program? Specifically, this study examined the challenges related to learner's persistence in a free basic education program.

2. Materials and Methods

Research Design

Qualitative research design was used to examine the challenges related to learner's persistence in a free basic education program in a private school. Specifically, the study used key informant interviews.

Research Participants

The participants were composed of three former students, five parents, five teachers, and two school administrators. They were chosen purposefully for the study.

Instrumentation

Guide questions were prepared to obtain qualitative answers from key informants, including former students, parents, teachers, and school administrators. The challenges faced by the school administrators and parents were derived using the same interview schedule prepared by the researcher. Key informant interviews were conducted to gather more qualitative and in-depth information.

Data Analysis

Qualitative data from key informant regarding the challenges were analyzed using content analysis.

Ethical Considerations

The discussion regarding ethical considerations includes recruitment of participants, informed consent, confidentiality, and data storage procedures. For the recruitment of participants, the researcher wrote a formal letter to seek permission to conduct the study. The participants were informed that the researcher would only use the data they provided for the study. The collected data was stored in a digital drive with password protection and security, accessible only by the researcher.

3. Results and Discussions

Results of the Key Informant Interview show that among the challenges that have a significant impact on learner's persistence include family problems, such as separation of parents and financial challenges; weather-related concerns, such as poor classroom ventilation; health concerns, such as malnourishment of students, lack of motivation and absenteeism, the proximity of residence to the school, which can affect attendance, limited awareness among some parents about the importance of education, and insufficient school security that can compromise student safety and welfare.

Specifically, the first response highlights two main challenges: family problems and financial challenges. These issues can create emotional distress and financial burdens, leading to an increased likelihood of dropping out of school (Chang et al., 2021). The mention of some students being "lazy" is a potential contributing factor. However, it is worth noting that laziness may have underlying causes, such as lack of motivation or mental health issues. It is essential to address the root causes of any behavioral issues. Addressing family problems requires a holistic approach that recognizes the impact of these challenges on learners' persistence. School-based interventions may include counseling services for students to cope with emotional difficulties related to family problems (Chang et al., 2021). Several parents were interviewed to gather their perspectives on the challenges of availing free basic education and its effects on their children's persistence to study.

Parent #1 (mother) expressed satisfaction with the school, stating, "Ma'am, in my opinion, there are no issues with the children's experiences at the school because it is free, and snacks are provided". Our only expenses are for transportation to and from the school.)" Parent #5 (mother) and Parent #6 (mother) had positive experiences with the free education program, with Parent #5 (mother) stating, "So far, we have encountered no problems in accessing free education in this school...", and Parent #6 (mother) expressing, "Ma'am, there are no problems in accessing free basic education. My only minor concern is the requirement for a school uniform, as we need to incur expenses for a dressmaker".

Additionally, fostering strong communication and collaboration between schools and parents can support students by providing a stable and supportive environment (Ahmadi et al., 2020). Family counseling and parent education programs can equip parents with the necessary skills to navigate family issues effectively, reducing the negative impact on their child's education (Guo & Wang, 2021). To address financial challenges, it is crucial to implement targeted interventions and support mechanisms (Chang et al., 2021). Initiatives such as scholarships, financial aid programs, or sponsorship programs can help alleviate the financial burden on families, ensuring that students have access to the necessary resources they need. Parent #3 (mother) highlighted the challenges of limited learning materials and outdated books, stating, "Since education is free, there is a shortage of learning materials, handouts, and books. However, I do understand that not everything can be provided by the sponsors from Korea".

Collaboration with community organizations and government agencies can offer additional support through initiatives such as school feeding programs, which address

nutritional and financial needs (Wang & Fawzi, 2020). By reducing financial barriers, students are more likely to persist in their education without compromising their basic needs (Chang et al., 2021).

The second response focuses on a specific weather-related concern: the classroom's ventilation, which is particularly important in hot and humid climates. Poor ventilation can lead to discomfort and distractions for students. Therefore, schools must prioritize adequate ventilation and cooling systems to create a comfortable learning environment (Wyon et al., 2019). Addressing poor classroom ventilation requires attention to infrastructure and design considerations (Barrett et al., 2019). Implementing proper ventilation systems such as fans or air conditioning can help regulate temperature and improve air quality, thus creating a more conducive learning environment (Barrett et al., 2019). Additionally, incorporating natural ventilation strategies, such as windows or skylights, can enhance airflow and promote fresh air circulation. Investing in infrastructure improvements and adhering to regular maintenance routines are essential to ensure optimal classroom conditions (Barrett et al., 2019).

Moreover, it is crucial to raise awareness among educators, school administrators, and policymakers about the importance of adequate ventilation in promoting learners' persistence (Chakacha et al., 2014). Professional development programs for teachers can provide guidance on classroom management techniques that optimize ventilation and air quality, further enhancing the learning experience (Chakacha et al., 2014). Creating a comfortable and conducive physical space helps students remain focused, engaged, and motivated, contributing to their educational success.

It is important to note that weather-related concerns can extend beyond poor classroom ventilation. Other weather-related challenges, such as extreme weather events like hurricanes and floods, which can disrupt regular school operations, should also be taken into consideration. Developing emergency response plans and ensuring the safety and well-being of students during such events are vital to maintain continuity in education and supporting learners' persistence in the face of weather-related challenges (Moser et al., 2021).

The third response also mentions financial challenges as a critical issue and adds the additional factor of student health. Addressing malnourishment requires a multi-faceted approach involving both school-based and broader community initiatives. Implementing school feeding programs can ensure that students have access to nutritious meals during the school day, supporting their physical health and cognitive functioning (Wang & Fawzi, 2020). Collaboration with government agencies, NGOs, and community organizations can provide additional resources and support, such as nutritional education programs, access to affordable and nutritious food, and promoting awareness about the importance of a balanced diet (Ngeh, 2013). Moreover, considering the socio-economic factors contributing to malnourishment, such as poverty and food insecurity, is crucial. Addressing these underlying issues through poverty reduction programs, income support, and social safety nets can positively impact learner's persistence by alleviating the financial constraints that impede access to proper nutrition (Chang et al., 2021).

In addition to malnourishment, other health concerns, such as inadequate access to healthcare, prevalent diseases, and mental health issues, can also impact learner's persistence. Ensuring access to quality healthcare services, implementing preventive measures, and promoting mental health awareness and support within the education system are essential components of addressing health concerns comprehensively (Marais et al., 2019).

The fourth response highlights motivational factors and absenteeism as significant challenges that impact learner persistence. Students who lack motivation and regularly miss school are at a higher risk of disengagement and dropping out (Feldman et al., 2017). To address the lack of motivation, it is essential to implement strategies that foster intrinsic motivation and create a supportive and engaging learning environment (Herman, 2012). Teachers can incorporate student-centered approaches, such as project-based learning or experiential learning, that provide opportunities for autonomy, mastery, and purpose (Ortega-Dela Cruz, 2020). Providing constructive feedback, recognizing, and celebrating student achievements, and promoting a growth mindset can also enhance motivation and learner persistence (Feldman et al., 2017).

School should focus on providing teachers with professional development programs to equip them with the necessary skills to create a motivating classroom environment. Additionally, working with parents and guardians to create a supportive home environment that reinforces the value of education can greatly contribute to the motivation of learners (Feldman et al., 2017).

The fifth response discusses the distance between a student's residence and the school, which can significantly impact learner's persistence. When students live far away from their school, it can be difficult to attend regularly, leading to increased absenteeism (Balabanian, 2020). To address this problem, schools explore options such as providing transportation services, creating satellite learning centers in remote areas, or implementing flexible learning models that accommodate students' geographic limitations. By doing so, schools can create an environment that supports students and helps them stay motivated. It is essential to consider the specific needs of each community when addressing this issue (Balabanian, 2020). For example, rural areas may require different solutions than urban areas. To develop effective strategies, it is crucial to understand the local context and collaborate with relevant stakeholders deeply. Overall, providing transportation options, fostering community engagement, and maintaining clear communication channels between home and school are critical steps in overcoming distance-related barriers (Balabanian, 2020).

The sixth response includes limited awareness among some parents about the importance of education as a challenge that can hinder learner's persistence. Parents who do not fully understand the value of education may not prioritize their child's academic engagement (Elbaum et al., 2016). Schools need to actively involve parents by organizing workshops, information campaigns, and partnering with community organizations to overcome this challenge. Indeed, parental awareness and involvement play a crucial role in supporting learners' persistence. Schools should strive to improve parental awareness by organizing workshops, information campaigns, and partnering with community organizations to emphasize the importance of education and provide parents with the necessary resources

to support their children's learning (Elbaum et al., 2016). It is essential to recognize that limited parental awareness can be influenced by various factors, such as cultural beliefs, language barriers, and socioeconomic conditions (World Health Organization, 2019). Parent #2 (mother) highlighted the lack of from certain parents when it comes to contributing to school supplies, stating, "What I see as the problem is not coming from the school. The problem lies in the cooperation of other parents who could contribute according to their capabilities, specifically for water and bond papers needed by the children in school".

Tailoring outreach efforts and interventions to the specific needs and contexts of the community is crucial for effectively addressing this challenge and promoting learner's persistence. Engaging parents and guardians in discussions about school security can help raise awareness and build a collective commitment to ensuring the safety of students. Encouraging parents to participate in safety committees or volunteer programs can also contribute to implementing and monitoring security measures (World Health Organization, 2019).

The seventh concern is insufficient school security, which is crucial for promoting effective learning and academic persistence. Inadequate security measures can have a negative impact on students, underscoring the importance of prioritizing student welfare (Wang et al., 2020). "Parent #4 (mother) expressed concerns about the school's security, stating, "There is no problem in availing free education at the school. My only concern is the security of the children since there is no security guard. The school is located along the road, and I worry that the children might wander off or someone unauthorized might enter the premises". Collaborating with local law enforcement, community organizations, and government bodies can provide additional support and expertise in addressing school security challenges. Sharing best practices, conducting risk assessments, and implementing comprehensive security measures can create a secure and conducive environment that enhances learners' ability to focus on their studies (Wang et al., 2020).

Involving parents and guardians in discussions about school security can help raise awareness and build a collective commitment to ensuring student safety (Kutsyuruba et al., 2015). Encouraging their participation in safety committees or volunteer programs can also contribute to monitoring and implementing security measures. To address insufficient school security, educational institutions should prioritize student safety, implement comprehensive security measures, and foster a positive school climate (Kutsyuruba et al., 2015). It is crucial to tailor security measures to the specific needs and context of the school community while considering local regulations and guidelines. Regular evaluation and adjustments to security protocols are also essential to adapt to evolving safety concerns and ensure a continuously secure learning environment (Wang et al., 2020).

4. Conclusions

This study highlights the need for a multidimensional approach to address the challenges faced by learners in a free basic education program. The challenges identified, including

distance and accessibility, family responsibilities, lack of motivation, insufficient support and guidance, and poor classroom ventilation, require a comprehensive intervention strategy that involves the collaboration of various stakeholders, including the government, school authorities, parents, and the community. The involvement of these stakeholders is necessary to provide a holistic and sustainable solution to address the challenges and support learners in their academic pursuits.

Overall, this study emphasizes the significance of understanding learners' needs and challenges in a free basic education program, and the importance of collaborative efforts to address those challenges for the benefit of learners' academic success and development.

Based on the results of the study, the following recommendations were proposed for the school, and for further academic research.

For the private school, the following recommendations were proposed:

Hiring and retaining high-quality teachers. The school should prioritize hiring and retaining high-quality teachers who are supportive and committed to helping students succeed. This can be achieved through competitive compensation and benefits packages, professional development opportunities, and a positive work environment.

Creating a welcoming learning environment. The school should strive to create a welcoming and inclusive learning environment that promotes student engagement, motivation, and academic success. This can be achieved through the implementation of positive discipline practices, the promotion of student voice and agency, and the establishment of a supportive and respectful school culture.

Addressing the challenges faced by learners. The school should develop a comprehensive intervention strategy to address the challenges faced by learners, including distance and accessibility, family responsibilities, lack of motivation, insufficient support and guidance, and poor classroom ventilation. This strategy should involve the collaboration of various stakeholders, including the government, school authorities, parents, and the community.

Future research may consider the experiences of learners in different regions and contexts to develop a more comprehensive understanding of the challenges and opportunities associated with free basic education programs.

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Declaration of conflicting interests

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WETLANDS IN BIHAR: A COMPREHENSIVE ANALYSIS OF EXTENT SOCIO-ECONOMIC SIGNIFICANCE, ECOLOGICAL BENEFITS, AND ASSOCIATED RISKS

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Abstract: Bihar, situated in the eastern part of India, possesses a repository of 21,998 wetlands, covering an extensive area of 403,209 hectares. These wetlands, known for their ecological richness, have a crucial role in offering a wide range of ecological services. Their diverse functions, which include hydrological processes like recharging and discharging groundwater, controlling floods, and regulating water flow, highlight their importance. However, there has been a lack of comprehensive research on wetlands of Bihar, State. This paper provides a thorough analysis of Bihar's wetlands. It also explores the social and environmental benefits that they provide, highlighting their pivotal role in maintaining the ecological equilibrium and local economies of the region. Furthermore, this paper dissects the various threats faced by these wetlands, stemming from human activities and environmental changes. In addition to the ecological perspective, this study investigates the socio-economic conditions of communities living near these invaluable wetlands. It critically assesses their reliance on wetland resources and the consequences of wetland degradation on their well-being. This research also offers policy recommendations to promote the sustainability of wetlands.

Keywords: Bihar, Wetland, Extent, Socioeconomic and Ecological Benefits.

Introduction

Wetlands, often referred to as the Earth's kidneys, are vital ecosystems with global significance, providing ecological, economic, and social benefits (Mitsch et al., 2015; Verma et al. 2001). They serve as biodiversity hubs, freshwater sources, and regulators of floods and carbon sequestration³. The hydrological structure, including water supply

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³ The Ramsar Convention defines wetlands, highlighting their diverse nature.

dynamics, is fundamental to wetland nature. Prolonged water presence is pivotal for their development. Despite their crucial role, wetlands face serious concerns due to extensive degradation and diminishing size, prompting questions about their preservation. The comprehensive classification system categorizes wetlands based on various characteristics (Cowardin et al. in 1979; Bassi et al., 2014) and this multifaceted analysis underscores the importance of wetlands and emphasizes the urgent need for effective conservation strategies to preserve these ecosystems (Alikhani et al., 2021). Several countries, including India, have also taken steps to protect wetlands. But, the Supreme Court of India has played a pivotal role in shaping policies for wetland conservation, leading to the enactment of The Wetlands (Conservation and Management) Rules in 2017 in India. However, concrete policies for wetlands have not been uniformly implemented across Indian states, with states like Bihar lacking attention.

Situated in the Gangetic plains, Bihar is home to diverse wetland ecosystems, including rivers, lakes, ponds, marshes, and floodplains. These wetlands hold economic significance, supporting traditional livelihoods such as fishing, agriculture, and the collection of non-timber forest products (Das et al., 2015; Rai & Kumar, 2018; Jha et al., 1991). Despite having a substantial number of wetlands, Bihar has only one designated Ramsar site, indicating a gap in recognizing and preserving these valuable ecosystems. On the other hand, in Bihar, wetlands are rapidly diminishing and facing contamination due to concurrent issues of reduction and pollution. The transformation of wetlands into agricultural, urban, and various other land uses has significant ecological consequences, particularly on a local scale (Mishra, 2020; Srinivasan, 2010). Major threats include changes in water inflow and outflow, pollution, encroachment, and the spread of invasive species. Given this background, the objective of this paper is to review the status of wetlands in Bihar, considering their geographic distribution, ecosystem services, stressors, socio-economic conditions, and legal and policy approaches for conservation and management. This comprehensive review underscores the importance of wetlands in Bihar and emphasizes the urgent need for effective conservation strategies. The multifaceted analysis provides valuable insights for policymakers, researchers, and practitioners to develop sustainable management practices and policies for the preservation of wetlands in Bihar.

Distribution and Extent of Wetlands in Bihar

The National Wetlands Atlas: Bihar (2010) provides a comprehensive overview of the state's wetlands, revealing that Bihar is home to 21,998 wetlands spanning 403,209 hectares (see Table 1). Notably, 92% of these wetlands are natural, while 3.5% are man-made (see Figure 1). Wetlands smaller than 2.5 hectares constitute 4.36% of the total wetland area. Analysing the distribution of wetland types (see Figure 2), it's intriguing to observe the dominance of the "River/Stream" category, constituting only 1.08% of wetlands but covering a substantial 74.01% of the total wetland area. This is attributed to the linear nature of rivers and streams, influencing large areas along their course, including floodplains and riparian zones. "Wetlands (<2.25ha)" constitute a larger percentage of wetlands (79.93%), covering a relatively smaller area (4.36%) (Figure 1). Lakes/Ponds (Natural), with a low number (2.34%), cover a moderate area (5.03%). Ox-

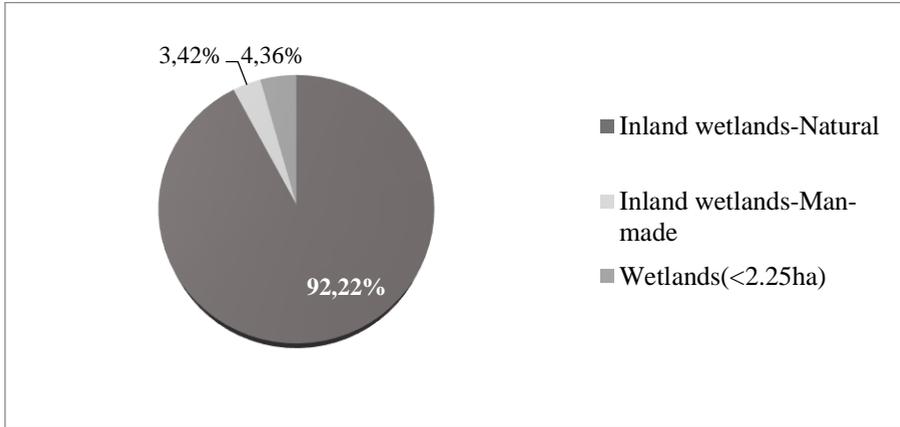
bow lakes, resulting from river changes, show a relatively higher number, possibly due to river meandering. Riverine wetlands, associated with river systems, have both a low number (0.91%) and low area coverage (0.53%) due to limited space along riverbanks. Comparison between "waterlogged (Natural)" and "waterlogged (Man-made)" reveals their low percentages in both numbers and coverage. However, "waterlogged (Natural)" covers a significantly larger area (8.65%) compared to "waterlogged (Man-made)" (0.08%) (see Figure 4). Natural waterlogged areas may occur in low-lying regions with water accumulation, explaining their larger coverage. Reservoirs/barrages and tanks/ponds, human-made structures, cover larger areas due to their construction. Tanks/ponds, created for various purposes, show a relatively higher number, reflecting their widespread usage. The atlas reports the post-monsoon water-covered area of inland wetlands at 2,24,655 hectares and 1,48,382 hectares during the pre-monsoon period. Across all wetland types, water-covered areas notably decrease from post-monsoon to pre-monsoon seasons, indicating shifts in use and changes. "Natural" wetlands generally exhibit larger water-covered areas compared to "Man-Made" wetlands in both periods. The reduction in water-covered area from post-monsoon to pre-monsoon is more significant for "Natural" wetlands (34%) compared to "Man-Made" wetlands (28.5%), suggesting greater responsiveness to seasonal changes. Understanding these variations is crucial for managing and conserving wetlands, ensuring their ecological health and the diverse services they provide to the environment and society.

Table 1: Wetland Landscape: A Comprehensive Overview of Area Estimates in Bihar (in hectare)

| Wetland category | Number of wetlands | Total wetland area | % of wetland area | Open water | |
|---------------------------------|--------------------|--------------------|-------------------|-------------------|------------------|
| | | | | Post-monsoon area | Pre-monsoon area |
| Inland wetland-Natural | | | | | |
| Lake /Pond | 514 | 20281 | 5.03 | 11506 | 6345 |
| Ox-bow lakes/Cut-off meanders | 989 | 16172 | 4.01 | 10130 | 5264 |
| Riverine wetlands | 200 | 2118 | 0.53 | 1664 | 777 |
| Waterlogged | 1300 | 34878 | 8.65 | 21185 | 9507 |
| River/stream | 238 | 298408 | 74.01 | 168984 | 118481 |
| Inland wetlands-Man-made | | | | | |
| Reservoirs/Barrages | 90 | 8612 | 2.14 | 7587 | 6005 |
| Tanks/Ponds | 1067 | 4822 | 1.2 | 3363 | 1870 |
| Waterlogged | 18 | 336 | 0.08 | 236 | 133 |
| Sub -Total | 4416 | 385627 | 95.64 | 224655 | 148382 |
| Wetlands(<2.25ha) | 17582 | 17582 | 4.36 | | |
| Total | 21998 | 403209 | 100 | 224655 | 148382 |

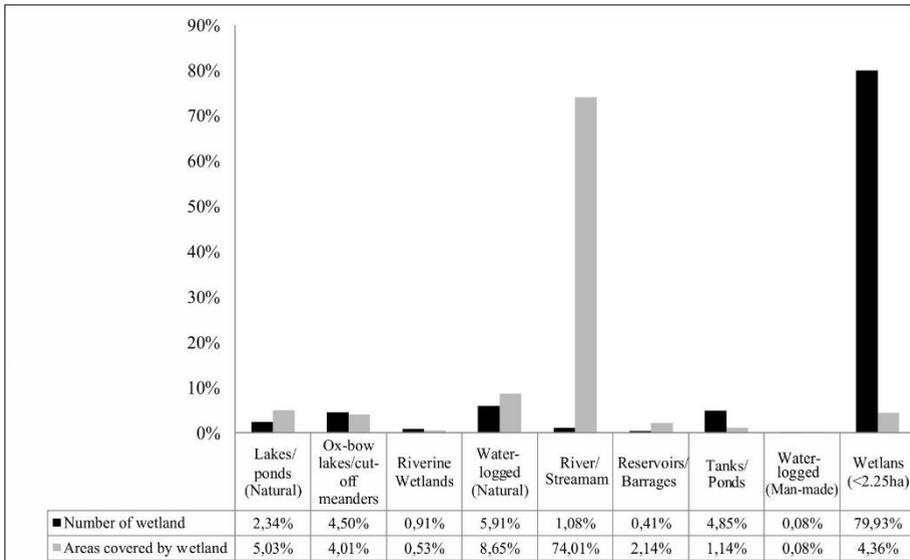
Source: National Wetlands Atlas: Bihar 2010

**Figure 1: Bihar's Wetland Landscape:
A Comprehensive Distribution Analysis**



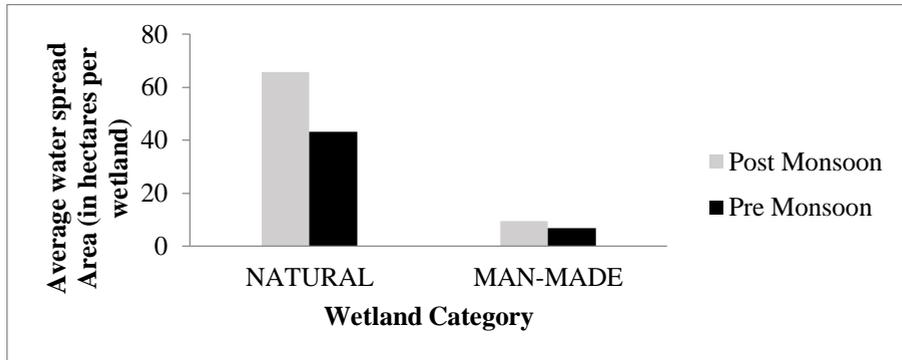
Source: National Wetlands Atlas:Bihar, 2010

**Figure 2: Wetland Diversity in Bihar:
Analysing the Proportion of Various Types**



Source: National Wetlands Atlas:Bihar, 2010

Figure 3: Analysing Average Water Spread Area in Various Wetland Types across Bihar



Source: Author's analysis using data from NATIONAL WETLAND ATLAS: Bihar (2010).

Regional and District-wise variations in Extent and Type of Wetlands

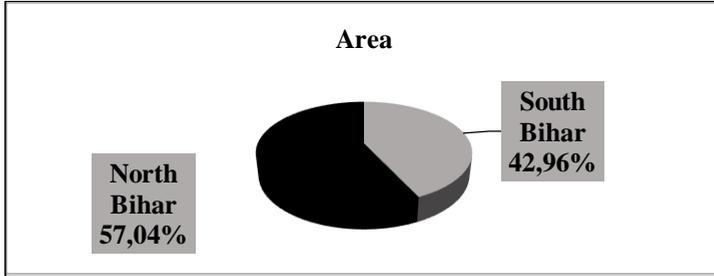
Bihar, with its expansive 94,163 square kilometres, unfolds a diverse canvas divided into two major regions. South Bihar, constituting 43% of the total state area, stands distinct in its topography and cultural heritage. On the flip side, North Bihar, occupying 57.04%, weaves an intricate tapestry of geography and history (Figure 4). The state's wetlands cover a significant 403,209 hectares, playing a vital role in sustaining diverse species and ecosystems. South Bihar contributes 36% of this total wetland area, emphasizing its crucial role in conserving aquatic habitats and biodiversity (Figure 5 & Figure 6). In contrast, North Bihar dominates with a 64% share, underlining its significance in preserving the state's wetland ecosystems and ecological balance. When assessing wetland proportions relative to the geographical area, Begusarai leads with 17.5%, showcasing its commitment to wetland conservation. In contrast, Kaimur and Sheikhpura allocate a mere 0.43% of their land to wetlands. Katihar emerges as the leader among districts, dedicating 22.8% of its area to wetlands, while Sheikhpura contributes minimally to the state's wetland expanse. The water-spread area of wetlands undergoes seasonal fluctuations. During the post-monsoon period, water covers about 55% of the total wetland area, revealing a substantial inundation. In the pre-monsoon period, this coverage decreases to 36%, indicating a seasonal ebb. Regions like East (Purba) Champaran, Muzaffarpur, Gopalganj, Siwan, Vaishali, Samastipur, Bhagalpur, and Buxar witness water spread constituting over 60% of the total wetland area during the post-monsoon period, emphasizing the dynamic nature of these ecosystems (Table 2 and Figure 7). This intricate interplay of geography, wetland distribution, and seasonal variations underscores Bihar's commitment to preserving its natural heritage. The disparities among districts highlight the need for tailored conservation strategies to ensure the sustained health of wetland ecosystems across the state.

Table 2: District – Wise Wetland Areas in Bihar

| District | District geographical area (sq.km) | Wetland area (ha) | % of total wetland area | % of district geographical area | Open water (ha) | |
|---------------------------|------------------------------------|-------------------|-------------------------|---------------------------------|-----------------|-------------|
| | | | | | Post-monsoon | Pre-monsoon |
| West (Pashchim) Champaran | 4250 | 21697 | 5.38 | 5.11 | 11924 | 10118 |
| East Champaran | 4155 | 12477 | 3.09 | 3 | 8915 | 5119 |
| Sheohar | 443 | 1476 | 0.37 | 3.33 | 845 | 782 |
| Sitamarhi | 2628 | 2601 | 0.65 | 0.99 | 906 | 588 |
| Madhubani | 3478 | 8958 | 2.22 | 2.58 | 2411 | 2280 |
| Supaul | 2985 | 19285 | 4.78 | 6.46 | 9004 | 9021 |
| Araria | 2797 | 4157 | 1.03 | 1.49 | 2245 | 1930 |
| Kishanganj | 1939 | 10954 | 2.72 | 5.65 | 5542 | 4886 |
| Purnia | 3203 | 12401 | 3.08 | 3.87 | 5279 | 3365 |
| Katihar | 3010 | 31011 | 7.69 | 10.3 | 17135 | 14574 |
| Madhepura | 1797 | 3539 | 0.88 | 1.97 | 1589 | 967 |
| Saharsa | 1196 | 12086 | 3 | 10.11 | 7202 | 4125 |
| Darbhanga | 2502 | 8709 | 2.16 | 3.48 | 5171 | 2467 |
| Muzaffarpur | 3123 | 10490 | 2.6 | 3.36 | 6984 | 4048 |
| Gopalganj | 2003 | 7122 | 1.77 | 3.56 | 5128 | 3783 |
| Siwan | 2213 | 7105 | 1.76 | 3.21 | 4295 | 2117 |
| Saran | 2624 | 21170 | 5.25 | 8.07 | 12118 | 7950 |
| Vaishali | 1995 | 17148 | 4.25 | 8.6 | 11405 | 5970 |
| Samatipur | 2579 | 15022 | 3.73 | 5.82 | 10867 | 7133 |
| Begusarai | 1889 | 20365 | 5.05 | 10.78 | 10628 | 7703 |
| Khagaria | 1486 | 11645 | 2.89 | 7.84 | 9060 | 5807 |
| Bhagalpur | 2502 | 24171 | 5.99 | 9.66 | 16237 | 10273 |
| Banka | 3020 | 9895 | 2.45 | 3.28 | 5151 | 3847 |
| Munger | 1419 | 11979 | 2.97 | 8.44 | 7001 | 5498 |
| Lakhisarai | 1229 | 4177 | 1.04 | 3.4 | 1759 | 1447 |
| Sheikhpura | 689 | 296 | 0.07 | 0.43 | 163 | 73 |
| Nalanda | 2362 | 1589 | 0.39 | 0.67 | 756 | 283 |
| Patna | 3130 | 20678 | 5.13 | 6.61 | 11943 | 7570 |
| Bhojpur | 2337 | 11154 | 2.77 | 4.77 | 5700 | 2435 |
| Buxar | 1634 | 3717 | 0.92 | 2.27 | 2449 | 1408 |
| Kaimur (Bhabua) | 1840 | 796 | 0.2 | 0.43 | 296 | 174 |
| Rohtas | 3838 | 18641 | 4.62 | 4.86 | 9259 | 4040 |
| Jehanabad | 1569 | 4345 | 1.08 | 2.77 | 1843 | 564 |
| Aurangabad | 3389 | 8116 | 2.01 | 2.39 | 3428 | 1436 |
| Gaya | 4941 | 11422 | 2.83 | 2.31 | 3979 | 626 |
| Nawada | 2498 | 5464 | 1.36 | 2.19 | 2445 | 1241 |
| Jamui | 2997 | 7351 | 1.82 | 2.45 | 3593 | 2734 |
| Total | 91689 | 403209 | 100 | 4.4 | 224655 | 148382 |

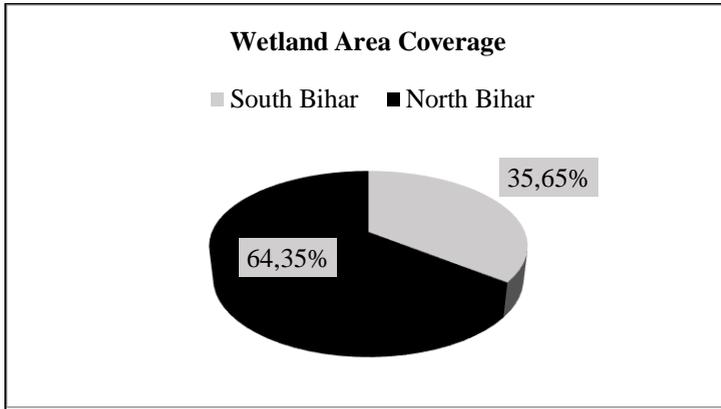
Source: National Wetlands Atlas: Bihar, 2010

Figure 4: Distribution of Bihar's Geographical Area



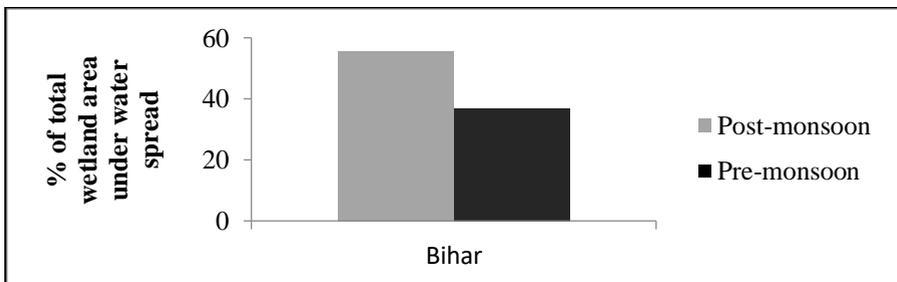
Source: Author's analysis using data from NATIONAL WETLAND ATLAS: Bihar (2010)

Figure 5: Regional Distribution of Wetland in Bihar



Source: Author's analysis using data from NATIONAL WETLAND ATLAS: Bihar (2010)

Figure 6: Proportion of Total Wetland¹ Area Under Water Spread in Different Seasons in Bihar



Source: Authors' analysis using data from National Wetlands Atlas: Bihar, 2010

¹ Wetlands exceeding a size of 2.5 hectares are the only ones included in this analysis.

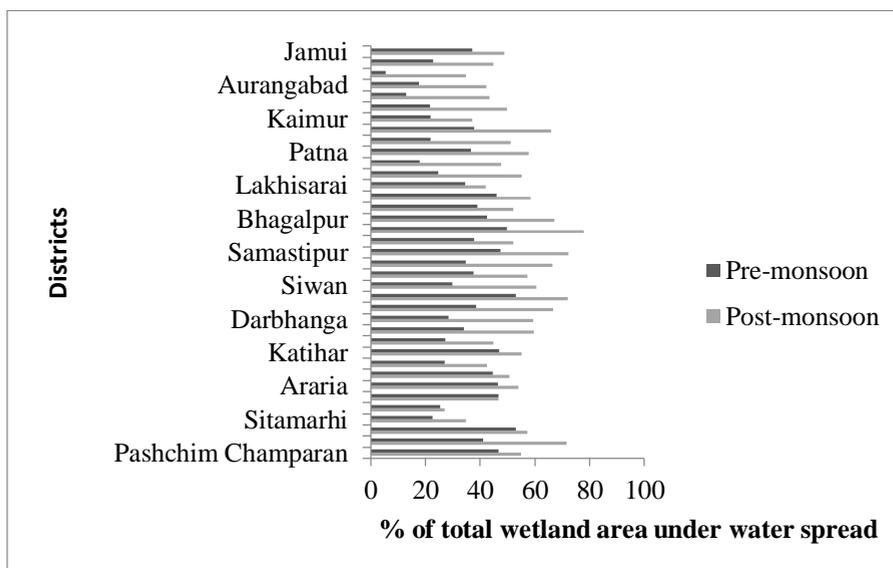
Ecosystem services Provided by Wetlands in Bihar

Based on the health status report of 28 wetlands of Bihar collected from Government’s Website and literature review, we have categorized the socio-economic and ecological services of wetlands in Bihar under seven main categories: domestic uses of water, income-generating activities, ecotourism, serving as biodiversity hotspots, holding environmental importance, aiding in flood control, and holding cultural and religious significance (Table 3).

Domestic Purpose

The assessment of ecosystem services from the 28 wetlands in Bihar reveals the diverse utility of wetland water for various domestic purposes. This includes its use for drinking water, bathing, and wallowing of domestic animals, highlighting the multifaceted importance of wetlands. The economic value of these services is underscored by a few studies in case of Bihar. For instance, in the case of Kabartal Wetland, a study (Ambastha and Badola, 2007) indicates that among the sampled population, a significant percentage (65.8%) owned livestock. Notably, 67% of these individuals relied on Kabartal as a vital source of fodder for their livestock. This showcases the wetland’s contribution to supporting local livelihoods through providing essential resources for agriculture and livestock maintenance.

Figure 5: Proportion of Total Wetland Area Under Water Spread In Districts of Bihar



Source: Authors’ analysis using data from National Wetlands Atlas: Bihar, 2010

¹ Wetlands exceeding a size of 2.5 hectares are the only ones included in this analysis.

Income generating activities.

Wetlands, encompassing tanks, ponds, lakes, and reservoirs, have been historically integral to various income-generating activities in Bihar, contributing to the economic sustenance of the region. Kabar Lake (Kabartal Wetland) stands out as a crucial economic asset, yielding approximately two tonnes of fish daily and serving as a vital water source for irrigation (Shah & Laha, 2022). The economic benefits of using wetlands for irrigation extend to cost savings, notably in terms of reduced fertilizer expenses (Mukherjee, 2008). Traditional tank systems in Bihar, as well as in states like Orissa, Uttar Pradesh, and West Bengal, play a significant role, contributing nearly 25% to the net tank-irrigated area (Pant & Verma, 2010). Beyond irrigation, these tanks play a pivotal role in fisheries, providing substantial value in terms of household income, nutrition, and health, particularly benefiting economically disadvantaged populations (Kumar et al., 2012). The fisheries sector, critical for food security, employment, and state revenue, supports a significant portion of the population's livelihoods.

The 2011 data reports a total fisher population of 2,658,163 in Bihar, with 68 percent of the income of wetland fishers derived from the fishery profession (Chandra & Das, 2019). Communities like the Mallahs and Godhis, economically disadvantaged and residing along wetlands like Kabartal, rely entirely on these ecosystems for their livelihoods, engaging in fishing and boatmen activities (Shah & Laha, 2022). Bihar's wetlands are rich repositories of various aquatic plants, including Water Chestnut (Singhara), Amaranth (Ramdana), Fox Nut (Makhana), and Water Lily (Kamal Kakri). The aquatic flora in these wetlands play a multifaceted role, meeting sustenance, medical, and financial needs of the local populations (Raut et al., 2020). For example, *Trapa natans* fruits and *Nelumbo nucifera* leaves are collected, with the latter specifically used in crafting plates made of leaves. Beyond Singhara, other notable edible plants include Ramdana, Makhana, and Kamal kakri, providing economic benefits to the local community and serving as a significant source of income. Additionally, individuals living near Kabartal wetland engage in the cultivation of deepwater rice locally known as Barobar (Ambastha et al., 2007). Bihar's contribution to more than 85 percent of the total makhana production in the country highlights the economic, cultural, and religious significance of this crop, particularly for communities like the Mallah fishing community in Darbhanga (Verma, 2019). Moreover, Makhana is recognized for its role in effective cardiac ailment treatment (Das et al., 2006). The intricate interplay between wetlands, economic activities, and community livelihoods underscores the profound importance of these ecosystems in Bihar's socio-economic fabric.

Ecotourism

Bihar holds considerable ecotourism potential within its wetlands, driven by diverse ecosystems, rich biodiversity, and unique cultural heritage. Notable sites like Kanwar Lake Bird Sanctuary (Kabartal/Kanwar Taal), Bhimbandh Wildlife Sanctuary, and Kusheshwar Asthan Bird Sanctuary attract birdwatchers and ornithologists, establishing them as birding tourism hotspots. These wetlands support various flora and fauna, providing opportunities for wildlife enthusiasts to observe species in their natural

habitats. Destinations like Kanwar Lake and Gandhi Ghat offer water-based activities, such as boating and fishing, contributing to the ecotourism experience. These areas provide serene environments for relaxation, with activities like picnicking, meditation, and nature walks. Wetlands also serve as outdoor classrooms for environmental education and research. The government and environmental agencies can boost wetland ecotourism through supportive policies, infrastructure development, and marketing campaigns, potentially increasing visitation and revenue.

Biodiversity

The wetlands of Bihar not only support a variety of noteworthy plant and animal species but also serve as significant congregation sites for migratory birds. Additionally, they play a crucial role in sustaining the life cycles of various fish and amphibian species. The endangered Greater Adjutant storks are found in Jagatpur Lake. Other vulnerable species of birds, such as Lesser Adjutant stork, Woolly-necked stork, and Black-necked storks, are also recorded in Jagatpur Lake. In a study conducted on Jagatpur wetland from August 2003 to July 2005, it was found that the wetland hosted a total of 34 bird species, and approximately 79% of these species were dependent on wetland ecosystems (Kumar & Choudhary, 2006). In a study conducted on Kanwar Tal, it was observed that there were a total of 61 tree species, which included two species of bamboo (Kumar & Pandey, 2021).

Flood Control

In 2010, floods in Bihar affected 0.72 million people, submerged 3.24 million hectares of cropland across 8 out of 32 districts, and damaged around four thousand houses (Bassi et al., 2014). The repetitive floods placed a fiscal burden on both the State and Central governments, with approximately INR 759.80 lakhs being allocated during 2021-22 solely for flood management initiatives in the Ganga River basin (ANNUAL REPORT 2021-22). But, wetlands serve as natural floodwater drainage points, effectively mitigating the impact of flood situations in the surrounding catchment areas. The area of influence of these wetlands extends into the Gangetic plain, which is frequently susceptible to flooding during the monsoon season. The presence of these wetlands, as significant water bodies, plays a crucial role in flood control.

Cultural and Religious Significance

Wetlands in Bihar carry cultural and religious significance deeply intertwined with the local way of life. One notable example is Kanwar Lake in Begusarai district, believed to be the spot where Lord Shiva consumed poison during the churning of the ocean in Hindu mythology. Consequently, the lake is considered sacred, attracting devotees during religious festivals. The region possesses historical and religious significance dating back to the post-Sunga period (185–73 BC), with a small temple island named Jaimanglagarh

in the southeastern corner of the wetland, officially designated as of state importance under the Bihar Ancient Monuments and Archaeological Sites, Remains and Art Treasure Act, 1976 (Ambastha et al., 2007).

Table 3: Socio-Economic Benefits of Wetlands in Bihar

| Purpose | Use | Details |
|--|--|--|
| Domestic Purpose | Drinking Water, Households Demand, Livestock | Water is withdrawn for drinking purposes. Cattle wallowing and bathing is done by village residents. |
| | Income Generating Activities | Irrigation |
| | Fisheries | |
| | aquatic food plants | A number of aquatic food is cultivated in the wetlands of Bihar. |
| | Medical Plants | |
| Ecotourism | Tourism | The wetlands of Bihar hold great potential for recreation and tourism. Proposals have been submitted to initiate eco-tourism ventures in the future. |
| | Boating | Boats are popular means of travel from one village to another . |
| Biodiversity | Support noteworthy plant species | |
| | Support noteworthy animal species | The endangered Greater Adjutant storks are found in Jagatpur Lake. Other vulnerable species of birds like Lesser Adjutant stork, Wolly necked stork, and Black necked storks are also recorded in Jagatpur lake. |
| | Site of high congregation of migratory water birds | During the migratory season, hundreds of migratory birds can be observed. Vikramshila Gangetic Dolphin Sanctuary is one of the largest congregation site of migratory birds in Bihar |
| | Support life cycle of fish or amphibians | The wetlands and adjoining marshes in this region are home to a diverse range of aquatic life, including numerous fish, amphibians, and insects. |
| Environmental Importance | Ground Water Recharge | The wetland of Bihar stores water all the year around and helps in recharging the surrounding water table |
| | Water Purification | |
| | Act as a sink of sediments | Wetland acts as sink for silt received during flood pulses from river. |
| Flood control | Flood Control | The wetlands act as natural floodwater drainage points, effectively reducing the impact of flood situations in the catchment area. |
| Cultural and Religious significance | Cultural and Religious Use | The local community utilizes this water body for religious purposes, particularly during the annual Chhat Puja festival. |
| Others | Grazing | Grazing is done by cattle owned by local residents. |

Source: Authors' Compilation.

Similarly, Gandhi Ghat in Patna, situated along the Ganges River, serves as a prominent religious site where people take holy dips and perform rituals, emphasizing the purifying

qualities of the river. The Chhath Puja festival, celebrated with great fervor in Bihar, further underscores the connection between wetlands and religious practices. This festival involves various rituals conducted in and around water bodies to express gratitude to the Sun God for its life-giving energy. Local myths and legends often link wetlands to gods, goddesses, and ancient heroes, contributing to their cultural significance. Traditional livelihoods such as fishing, agriculture, and plant collection from wetlands are also deeply rooted in local culture. The 'Kojagara' festival on Ashwin Poornima is marked by the tradition of gifting Makhana, and in weddings, it's customary for the bride's parents to present Makhana to the groom's family during the first year of marriage (Verma, 2019). Furthermore, the sacred nature of these wetlands can inspire conservation efforts, as communities and religious leaders actively engage in their protection and preservation, highlighting the unique blend of tradition and environmental awareness associated with Bihar's wetlands.

Table 4: Ecosystem Services Provided by Wetlands in Bihar

| Wetland | Ecosystem services | Wetland | Ecosystem services |
|-------------------------|--|-------------------------|---|
| Jagatpur | B, C, D, G, H, J, K, L, N, O, P, S | Berai Chaur | |
| Baraila Chaur (Siwan) | B, C, H, I, J, L, M, N, O, P, Q, R, S | Boaria Chaur | B, C, D, E, F, G, H, I, J, M, N, P, Q, R, S |
| Gamhoria Chaur (Saran) | G, H, P, Q, R | Dhane Chaur | B, C, D, E, FG, H, I, J, K, L |
| Bhatkesri Chaur | B, C, E, G, H, P, Q, R, S | Loma Chaur | |
| Mangolapur Chaur | B, C, G, H, J, P, Q, R, | Tal Berai | B, C, D, E, F, G, H, I, J, K, L, N, O, Q, S |
| Dhurde Tal / Chaur | B, C, E, G, H, I, J, N, P, Q, R, S | Sonbarsa Man (Motihari) | B, C, E, G, H, I, J, K, P, R, S |
| Prenaina Talab | A, B, C, G, H, J, N, O, P, Q, R. | Sohag Man | B, C, E, G, H, I, J, K, N, O, P, R, S |
| Samika Chaur | B, C, E, G, H, P, R, S | Sarotar Chaur | B, C, E, F, H, I, J, N, P, Q, R, S |
| Maken Wetland | B, C, D, H, I, J, M, N, O, P, Q, R, S | Matwalee Man | B, C, E, G, H, I, J, P, R, S |
| Batis Khumba (Vaishali) | B, C, D, E, F, G, H, I, J, K, M, N, P, Q, R, S | Dariyapur Lake | C, E, G, H, I, J, P, R, |
| Pahetia Chaur | B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S | Chorma Siraha Jalkar | B, C, D, E, G, H, I, J, K, L, M, O, P, R, S |
| Manorai Chaur | A, B, C, D, E, F, G, H, I, J, K, L, M, N, P, Q, R, S | Bhutaha Chaur | B, C, E, G, H, I, J, O, P, Q, R, |
| Lochan Chaur | B, C, D, E, F, G, H, I, J, K, M, N, P, Q, R, S | Bawlee Lake | A, B, C, E, G, H, I, J, P, Q, R, |
| Powra | B, C, E, F, G, H, I, J, K, M, N, P, Q, R, S | Balwa Man | B, C, E, G, H, I, J, O, P, R |

Source: Authors' Compilation using Health Cards of Wetland Downloaded from Government's Website.

In this context, A represents the source of drinking water for people living in and around the area, B signifies the source of water for agriculture, and C denotes its importance for fisheries. D stands for the cultivation of aquatic food plants, while E highlights its use

for buffalo wallowing and domesticated animals. F signifies the growth of medical plants, and G emphasizes its role in buffering communities from extreme events like floods and storms. H denotes its contribution to groundwater recharge, and I signify its role in water purification. J represents its function as a sink for sediments, and K underscores its significant cultural and religious values. L designates it as a site for recreation and tourism, and M indicates its support for noteworthy plant species. N represents its support for noteworthy animal species, and O highlights its role as a site of high congregation for migratory water birds. P emphasizes its contribution to the life cycle of fish or amphibians, and Q represents its role in agriculture or horticulture within the wetland. R signifies its use for grazing, while S indicates its suitability for playing boat.

Overall Ecosystem Services Provided by Wetlands in Bihar

Wetlands in Bihar serve as indispensable ecosystems with a myriad of functions crucial for both nature and human societies. They are a primary source of drinking water for local communities and provide essential water resources for agriculture, supporting the growth of crops. Wetlands foster fisheries, contributing to the livelihoods of many, and cultivate aquatic food plants, enriching local diets. These areas are utilized for diverse purposes, including buffalo wallowing, the care of domesticated animals, and the cultivation of medicinal plants. Acting as natural buffers, wetlands protect communities from extreme events like floods and storms. They play a pivotal role in groundwater recharge and water purification, ensuring environmental sustainability. Wetlands act as sinks for sediments, maintaining ecological balance. With significant cultural and religious values, wetlands are sites for recreation and tourism, supporting noteworthy plant and animal species. They attract high congregations of migratory water birds and contribute to the life cycles of fish and amphibians. Furthermore, wetlands facilitate agriculture, horticulture, grazing activities, and even serve as locations for recreational boating, highlighting their diverse and vital contributions to both ecosystems and human well-being.

Threats to Wetlands in Bihar

Table 5 provides a comprehensive assessment of both current and potential threats to various wetlands in Bihar. Each wetland is assigned specific threat codes represented by letters: T for changes in water inflow and outflow, U for pollution, V for unsustainable harvest of biological resources, W for mining, X for siltation, Y for encroachment, and Z for the spread of invasive species. As of now, wetlands like Lochan Chaur, Tal Berai, and Sarotar Chaur are actively experiencing multiple threats in Bihar. Looking ahead, future concerns may escalate for wetlands such as Manorai Chaur, Pahetia Chaur, and Powra. This information acts as a crucial reference for the assessment of environmental challenges faced by each wetland in Bihar. It plays a pivotal role in devising effective conservation and management strategies to mitigate these threats and ensure the sustainability of these vital ecosystems.

Table 5: Present and Potential Threats to wetland in Bihar

| Wetland | Threats | | Wetland | Threats | |
|-------------------------|------------------|---------------------|-------------------------|---------------------|---------------------|
| | Present | Potential | | Present | Potential |
| Jagatpur | T, U, V, X, Z | W, Y | Powra | | T, U, V, W, X, Y, Z |
| Baraila Chaur (Siwan) | T, U, V, W, X, Z | | Berai Chaur | | |
| Gamhoria Chaur (Saran) | T, W, | U, V, | Boaria Chaur | T, U, V, W, X | Y, Z |
| Bhatkesri Chaur | T, X, Z | U, V, Y | Dhane Chaur | | |
| Mangolapur Chaur | T, U, X, | V, Z | Loma Chaur | | |
| Dhurde Tal / Chaur | T, U, V, Z | X, Y, | Tal Berai | T, U, V, W, X, Y, Z | |
| Prenaina Talab | T, V, W, X, | U, Y, Z | Sonbarsa Man (Motihari) | U, X, Y, Z | T |
| Samika Chaur | T, U, X | V, Y, Z, | Sohag Man | T, U, X, Z, | |
| Maken Wetland | T, V, X, Z | U, | Sarotar Chaur | T, U, V, X, Y, Z | |
| Batis Khumba (Vaishali) | | T, U, V, W, X, Y, Z | Matwalee Man | U, X, Y, Z | T |
| Pahetia Chaur | | T, U, V, W, X, Y, Z | Dariyapur Lake | U, X, Z | T |
| Manorai Chaur | | T, U, V, W, X, Y, Z | Chorma Siraha Jalkar | U, X, Y, Z | T |
| Lochan Chaur | T, U, V, W, X, Y | Z | Bhutaha Chaur | T, U, X, Y, Z | |
| Bawlee Lake | T, U, X, Y, Z | | Balwa Man | T, U, X, Y, Z | |

Note: In this context, T represents changes in water inflow and outflow, U signifies pollution, V denotes unsustainable harvest of biological resources, W represents mining, X stands for siltation, Y indicates encroachment, and Z highlights the spread of invasive species.

Source: Authors' Compilation using Health Cards of Wetland Downloaded from Government's Website.

Conclusion and Policy Suggestion

In conclusion, Bihar's wetlands stand as vital ecosystems, providing ecological, economic, and social benefits. Despite their global significance, these wetlands face severe degradation and reduction, raising concerns about their preservation. The comprehensive review presented in this paper highlights the urgent need for effective conservation strategies in Bihar. The distribution and extent of wetlands in Bihar, as outlined in Section I, illustrate the rich diversity of these ecosystems, with rivers and streams dominating the landscape. However, the state faces challenges, with only one Ramsar site and a gap in recognizing and preserving these valuable ecosystems. Regional and district-wise variations in wetland extent, discussed in Section II, underscore the importance of tailored conservation strategies. While South Bihar contributes significantly to the total wetland area, disparities among districts highlight the need for a nuanced approach to ensure the sustained health of wetland ecosystems. Section III delves into the socio-economic benefits of wetlands, showcasing their contribution to domestic uses, income-generating activities, ecotourism, biodiversity, flood control, and cultural and religious

practices. Wetlands in Bihar serve as essential sources of water for various purposes, support income-generating activities like fishing and agriculture, and hold immense potential for ecotourism. However, these valuable ecosystems face threats, as outlined in Section V, including changes in water inflow and outflow, pollution, encroachment, and the spread of invasive species. These threats pose significant ecological consequences, urging the implementation of robust conservation measures. In essence, the multifaceted analysis provided in this article emphasizes the critical importance of wetlands in Bihar. The state needs comprehensive conservation strategies that consider geographic distribution, ecosystem services, socio-economic conditions, and legal and policy approaches. The disparities among districts highlight the need for tailored conservation strategies, recognizing the unique challenges faced by each region. This review serves as a valuable resource for policymakers, researchers, and practitioners, offering insights to develop sustainable management practices and policies for the preservation of wetlands in Bihar. The urgent need for effective conservation strategies cannot be overstated, considering the vital role wetlands play in sustaining biodiversity, supporting livelihoods, and providing a range of ecosystem services. The preservation of Bihar's wetlands is not just an environmental imperative but also a commitment to safeguarding the cultural, economic, and ecological heritage of the region.

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Declaration of conflicting interests

The authors declare no conflicting interests.

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