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REVIEWER'S REPORT

Manuscript No.: IJAR-59699

Title: Recurring Annual Flood in Bhagalpur District of Bihar: A Case Study of Agricultural, Livestock, Socio-Economic and Public Health Impact.

Recommendation:
Accept with Minor Revisions……

Rating	Excel.	Good	Fair	Poor
Originality		✓		
Techn. Quality		✔		
Clarity			✓	
Significance		✓		

Reviewer Name: Faheem Abdul Muneeb

Reviewer's Comment

The manuscript examines the recurring effects of flooding in Bhagalpur district, Bihar, with particular attention to agricultural livelihoods, livestock, drinking-water availability, sanitation, public health and the displacement of affected households. The subject is important, particularly given the vulnerability of communities living in the floodplains of the Ganga and the continuing consequences of seasonal inundation. One of the strengths of the study is its field-based approach. The authors report visits to 12 villages in Nathnagar Block and collect information from flood-affected residents concerning their living conditions, health, access to basic services, livestock losses and immediate rehabilitation needs. The photographs on pages 2, 3 and 5 also provide useful visual documentation of inundated settlements, damaged houses, temporary shelters and the difficulties experienced by residents. The article's attempt to examine flooding as not merely an agricultural or infrastructural problem but also a public-health and livelihood challenge is particularly relevant. A few clarifications concerning the geographical scope, survey methodology, statistical presentation and interpretation of findings would strengthen the manuscript considerably.

The first point concerns the relationship between the title and the geographical scope of the fieldwork. The title refers to Bhagalpur district, while the actual survey was conducted in 12 villages, all located

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within Nathnagar Block. The introduction also discusses the wider geographical conditions of Bhagalpur, including the influence of the Ganga and Kosi rivers, but the primary empirical findings come from this particular block. The authors should clarify this distinction in the introduction and methodology. They may retain the present title, but the abstract and conclusion should make it clear that the field observations are based on selected villages in Nathnagar rather than a district-wide survey. This would accurately communicate the scope of the research while preserving the wider relevance of its findings.

The introduction provides a useful account of the geographical conditions contributing to recurrent flooding, including low-lying terrain, sediment deposition, riverbank erosion, shifting river channels and inadequate drainage. The discussion of prolonged waterlogging and its consequences for agricultural production is also relevant. However, several numerical claims in the introduction and abstract require clearer attribution. For example, the manuscript refers to 85.86% of agricultural land being affected, 60% economic loss, 84% of people suffering from health problems, 80% damage to agriculture and 40% damage to infrastructure. The source and geographical reference for these figures should be provided. It would be particularly useful to distinguish between figures drawn from previous studies or official reports and those obtained through the authors' own field survey. This distinction would help readers understand which claims represent the wider flood situation in Bihar and which relate specifically to the villages examined in this research.

The methodology section would benefit from a more complete description of the field survey. The authors identify 12 villages and state that 225 people of different age groups were included in the study. However, the manuscript does not explain how these participants were selected, how many households were covered, or whether the questionnaire was administered to individuals or to household representatives. Since several questions concern household-level conditions, such as access to drinking water, livestock ownership, food availability, illness and economic loss, it is important to clarify the unit of observation. The authors could briefly provide the number of households surveyed, the approximate distribution of participants across the 12 villages, and the criteria used for selecting respondents. It would also be helpful to indicate when the survey was conducted and whether the respondents were interviewed during active flooding or after the immediate flood conditions had subsided. These details would make the research process more transparent.

The questionnaire described on page 3 covers a useful range of issues, including evacuation, drinking-water sources, sanitation, hygiene, illness, livestock losses, agricultural occupation, economic damage, menstrual hygiene, maternal health and relief requirements. This breadth is one of the study's strengths.

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However, the questionnaire itself is not sufficiently visible or reproduced in the manuscript. The authors may consider adding the principal questions as a short appendix or presenting a compact table showing the main survey themes and the corresponding information collected. This would help readers understand how the findings were generated. The document icon and caption referring to the survey questionnaire on page 3 should also be checked to ensure that the questionnaire file is properly embedded or accessible in the final manuscript.

The statistical presentation requires some clarification. The authors explain that the collected information was converted into percentages and that mean or average calculations were used. However, the formulas on page 4 are not consistently clear about their denominators. For example, the formula for affected pregnant women uses the total number of people as its denominator, whereas a household-level or eligible-population denominator may be more appropriate depending on what was actually surveyed. Similarly, the formulas for illness, drinking-water sources and livestock losses refer to different units of measurement. The authors should ensure that each percentage is calculated using the correct denominator and identify whether the unit is an individual, household, water source, animal or agricultural holding. A short explanation beneath the formulas would be sufficient. The formula for the average age-group calculation should also be reviewed, as the current expression does not clearly explain how the average was obtained.

The findings presented in the discussion are important, but some figures need to be reconciled across the manuscript. For example, the abstract refers to 84% of people suffering from health issues, while the discussion reports that 16.88% of people suffered from different medical problems and that 76% of houses were affected by illness. These figures may refer to different indicators, but the distinction is not explained. Similarly, the discussion states that 60% of households suffered from fever and 4% from diarrhoea. The authors should clarify whether these percentages refer to households reporting at least one case, individuals experiencing symptoms, or the distribution of reported illnesses. The same care should be applied to the figures concerning drinking-water use, sanitation and livestock mortality. For instance, the reported 84% use of untreated water and 4% use of boiled water should be clearly distinguished from the percentage of households whose drinking-water sources were directly affected by flooding. A consistent presentation of these indicators would make the findings much easier to interpret.

The description of housing damage on page 4 also deserves a small clarification. The manuscript reports that 99% of houses were trapped by floodwater, that 60% had water levels of 1–2 metres, and that 4% experienced water depths of 0–5 metres. The authors should verify the depth categories and explain

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whether they refer to water inside houses or the surrounding inundated area. In particular, the range of 0–5 metres is very broad and overlaps with the preceding category. A more precise classification would improve the reliability of this important finding. If the reported percentages represent different depth ranges, the categories should be presented in a consistent and non-overlapping form.

The discussion of agricultural and livestock impacts is relevant to the title and central objectives of the study. The manuscript explains how prolonged inundation damages paddy, maize, sugarcane and seasonal vegetables, delays subsequent Rabi cultivation and increases the financial vulnerability of marginal farmers. It also identifies livestock mortality, illness and fodder shortages as important consequences. The reported finding that 40% of livestock died and 32% became ill is particularly significant. However, the manuscript would benefit from clarifying how these figures were obtained and the total number of animals covered by the survey. It would also be useful to distinguish between direct livestock losses, such as mortality, and indirect effects, such as illness, reduced productivity and fodder shortages. Similarly, the agricultural discussion could be strengthened by indicating which crops were most frequently affected in the surveyed villages and whether the reported losses were based on farmers' estimates or independent measurements. These additions would give greater empirical support to the agricultural and livestock dimensions of the article.

The discussion of drinking water, sanitation and public health is one of the most important parts of the manuscript. The findings concerning untreated drinking water, open defecation, damaged toilets and the reported prevalence of fever and diarrhoea demonstrate the serious difficulties faced by households during flooding. The photographs on page 3, particularly those showing the conditions of women and young children in temporary shelters, provide useful context for the discussion of maternal and child health. The authors could develop this section slightly by distinguishing between illnesses reported by respondents and illnesses medically diagnosed by healthcare providers. The manuscript also refers to respiratory problems, skin infections, mosquito-related illness and diarrhoeal disease. It would be useful to indicate which of these were directly reported during the survey and which are discussed as recognised public-health risks associated with flooding. This distinction would prevent the interpretation from extending beyond the evidence collected while preserving the importance of the public-health argument.

The study also makes an important observation concerning the particular difficulties experienced by pregnant women, lactating mothers, newborn children and women requiring menstrual-hygiene products. These issues deserve attention because relief arrangements frequently focus on food, shelter and drinking water while overlooking the specific requirements of women and young children. The authors could

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make the findings more informative by clarifying the number of households or respondents from whom these observations were obtained. The caption accompanying Figure 4 on page 3 refers to the unavailability of food and medicines for pregnant women and their children in relief camps. A brief explanation of the nature of the reported difficulties, such as access to medicines, nutritional support, sanitation or privacy, would make this observation more useful for public-health and disaster-management planning.

The discussion of evacuation and immediate livelihood needs is another valuable feature of the article. The finding that 52% of respondents faced difficulties with transportation, while 12% reported difficulties in shifting livestock, illustrates the practical challenges of evacuation in flood-affected settlements. Similarly, the reported demands for employment, plastic sheets, education and housing reconstruction provide useful information about the priorities of affected households. The authors should clarify whether these percentages represent the most frequently reported response among respondents or the proportion of all households expressing each particular need. The distinction is important because households may have identified more than one urgent requirement. A short table presenting the principal difficulties and assistance needs, together with the number and percentage of respondents reporting each, would improve the presentation of the findings.

The visual material is a useful feature of this manuscript. The photographs on page 2 show inundated roads, settlements and houses, while those on page 5 illustrate temporary shelters, people living in difficult conditions and livestock in flooded surroundings. These images help readers understand the conditions described in the text. However, the captions and location information should be made more consistent. Some photographs contain embedded location and date information, while others do not. The authors should provide a uniform caption identifying the village or location, approximate date of photography and the particular condition being illustrated, wherever this information is available. It would also be useful to ensure that the photographs are clearly connected to the 12 villages identified in the methodology. This would strengthen their value as field documentation rather than merely illustrative images.

The conclusion appropriately emphasises the interconnected nature of flood impacts, including damage to crops, livestock, drinking-water systems, sanitation, infrastructure and household livelihoods. It also highlights the importance of community awareness and adaptation to recurrent flood risk. The authors could make the conclusion more directly responsive to the objectives stated on page 2 by adding a few specific recommendations arising from the survey. For example, the findings could support

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recommendations concerning safe drinking-water provision, temporary sanitation facilities, accessible medical services, protection of livestock, emergency fodder arrangements, evacuation routes and livelihood assistance for marginal farmers. The manuscript already discusses these needs, particularly the demand for employment, shelter materials and basic services. Bringing them together in a short concluding paragraph would improve the practical contribution of the study.

Finally, the manuscript requires a careful editorial and bibliographic review. The title and abstract should be checked for grammatical accuracy and consistency. Expressions such as "annual flood problems," "flood survivors," "affected households" and "flood-affected villages" should be used consistently. There are several grammatical and typographical issues throughout the text, including "pre dominantly," "water born disease," "people faces," "food availability" and missing spaces between sentences. The phrase concerning the availability of food on page 4 appears to contain a typographical error where "flood" is used instead of "food"; this should be verified against the original survey findings. The reference list is relatively short for a study covering hydrology, agriculture, livestock and public health. The authors should ensure that the main claims concerning flood frequency, river dynamics, agricultural losses and flood-related diseases are supported by appropriate sources. The bibliographic details of the listed publications should also be standardised, including journal names, volume and issue numbers, page ranges and publication years.

Overall, the manuscript addresses an important regional problem and offers useful field observations from flood-affected villages in Nathnagar Block, Bhagalpur. Its main contribution lies in bringing together agricultural damage, livestock losses, drinking-water insecurity, sanitation, public health and the immediate needs of displaced households within a single case study. The photographs and survey-based observations give the article practical relevance. The suggested revisions are primarily intended to improve the transparency of the fieldwork, clarify the statistical calculations, reconcile a few numerical inconsistencies and strengthen the connection between the findings and the concluding recommendations. These changes can be incorporated without altering the study's basic design or central purpose.

Final Recommendation

Decision: Accept with minor revisions.