

Review Form 3

Journal Name:	Journal of Advances in Biology & Biotechnology
Manuscript Number:	Ms_JABB_120609
Title of the Manuscript:	Enhancing Crop Resilience: The Role of Participatory Plant Breeding
Type of the Article	

Review Form 3

PART 1: Review Comments

Compulsory REVISION comments	Reviewer's comment	Author's Feedback <i>(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
<p>Please write few sentences regarding the importance this manuscript for scientific community. Why do you like (or dislike) this manuscript? Minimum 3-4 sentences may be required for this part.</p>	<p>The Importance and Limitations of Participatory Plant Breeding</p> <p>Importance for the Scientific Community This manuscript provides a comprehensive overview of the concept and practice of participatory plant breeding (PPB), highlighting its importance in enhancing crop diversity and resilience and meeting the needs of resource-poor farmers. Some key points:</p> <ul style="list-style-type: none"> • PPB involves farmers actively in the crop breeding process, allowing them to set breeding goals based on their local needs and environments. This contrasts with traditional top-down, centralized breeding approaches. • PPB can help address the limitations of conventional breeding by producing cultivars that are better adapted to the diverse growing conditions and preferences of smallholder farmers, especially in marginal environments. • The manuscript outlines the potential of PPB to contribute to six key sustainability targets: food security, safety and quality; food and seed sovereignty; social justice; agrobiodiversity; ecosystem services; and climate robustness. • It proposes a "systems-based breeding" approach that can synergize the strengths of different breeding paradigms to achieve these multifaceted sustainability goals. <p>Overall, this work is valuable for the scientific community as it provides a thorough, evidence-based analysis of the role of PPB in developing resilient, sustainable agriculture - a critical challenge facing the world today. Limitations and Disadvantages While the manuscript presents a strong case for PPB, it also acknowledges some potential limitations and disadvantages:</p> <ol style="list-style-type: none"> 1. Complexity of implementation: Implementing effective PPB programs requires significant coordination and integration of diverse stakeholders (farmers, researchers, extension agents, etc.), which can be logistically challenging. 2. Slower breeding timelines: PPB's iterative, participatory nature may result in slower development timelines for a variety of development compared to conventional breeding approaches. 3. Potential for bias: Farmer involvement in selection could introduce biases based on individual preferences rather than broader community needs. 4. Institutional barriers: Existing breeding institutions and policies may not be well-suited to support shifting towards more decentralized, participatory approaches. 5. Limited scalability: While successful locally, scaling PPB to larger production regions may be difficult without significant investment and coordination. <p>The manuscript recognizes these challenges and emphasizes the need for a systemic change in breeding approaches, institutions, and policies to fully realize the potential of PPB in building resilient and sustainable food systems. Addressing these limitations will be crucial for the wider adoption and impact of participatory plant breeding.</p>	
<p>Is the title of the article suitable? (If not please suggest an alternative title)</p>	<p>The title "Enhancing Crop Resilience: The Role of Participatory Plant Breeding" is a suitable and accurate representation of the content covered in the manuscript. It effectively highlights the key focus on how participatory plant breeding (PPB) can contribute to building more resilient crop systems. However, some alternative titles that could also work well include:</p> <ol style="list-style-type: none"> 1. "Participatory Plant Breeding: A Pathway to Sustainable and Resilient Agriculture" This title emphasizes PPB's broader sustainability and resilience benefits beyond just crop resilience. 2. "Empowering Farmers, Strengthening Crops: The Transformative Potential of Participatory Plant Breeding" 	

Review Form 3

	<p>This title underscores the empowerment of farmers and the transformative impact of PPB.</p> <p>3. "Cultivating Resilience: How Collaborative Breeding Approaches Can Secure Our Food Future" This title frames PPB as a collaborative approach to addressing food security challenges.</p> <p>4. "Adapting Crops to a Changing Climate: The Vital Role of Participatory Plant Breeding" This title directly links PPB to the critical challenge of climate change adaptation.</p> <p>5. "Bridging the Gap: Participatory Plant Breeding for Sustainable and Equitable Agriculture" This title highlights PPB's ability to bridge the divide between formal breeding programs and the needs of smallholder farmers.</p> <p>The original title is well-crafted, but these alternative options provide slightly different framings that could also effectively capture the essence of the manuscript's content and contribution.</p>	
<p>Is the abstract of the article comprehensive? Do you suggest addition (or deletion) of some points in this section? Please write your suggestions here.</p>	<p>The abstract is comprehensive and effectively captures the key aspects of participatory plant breeding (PPB) discussed in the manuscript. However, a few additional points could be considered to strengthen the abstract further:</p> <p>Suggested Additions to the Abstract</p> <ol style="list-style-type: none"> Highlight the role of farmers as active partners: Explain that PPB involves farmers as active collaborators in the breeding process rather than just as passive recipients. Emphasize the potential for PPB to address the needs of smallholder and resource-poor farmers: PPB aims to develop cultivars better adapted to the diverse growing conditions and preferences of smallholder farmers, especially in marginal environments. Mention the potential of PPB to contribute to sustainability targets: Include a brief statement about how PPB can help achieve key sustainability goals, such as food security, agrobiodiversity, climate resilience, etc. Acknowledge the systemic changes required: Briefly note that the manuscript recognizes the need for institutional and policy changes to realize PPB's potential fully. <p>Disadvantages and Limitations The abstract does not explicitly mention PPB's potential disadvantages and limitations. Some key limitations that could be added include:</p> <ol style="list-style-type: none"> Complexity of implementation: Coordinating the diverse stakeholders (farmers, researchers, extension agents, etc.) involved in effective PPB programs can be logistically challenging. Slower breeding timelines: PPB's iterative, participatory nature may result in slower development timelines for a variety of development compared to conventional breeding approaches. Potential for bias: Farmer involvement in selection could introduce biases based on individual preferences rather than broader community needs. Institutional barriers: Existing breeding institutions and policies may not be well-suited to support shifting towards more decentralized, participatory approaches. Limited scalability: While successful locally, scaling PPB to larger production regions may be difficult without significant investment and coordination. <p>Acknowledging these limitations in the abstract would provide a more balanced and comprehensive overview of the topic.</p>	
<p>Are subsections and structure of the manuscript appropriate?</p>	<p>Based on the information provided in the abstract, the overall structure and subsections of the manuscript appear appropriate and well-organized. The abstract covers the key aspects that should be addressed in the main body of the manuscript.</p> <p>Suggested Subsections</p> <p>The abstract suggests the following key elements that could be covered in the main sections of the manuscript:</p> <p>Introduction</p> <ul style="list-style-type: none"> Outline the challenges of climate change and its impact on global food security. Explain the need for new strategies to enhance food production and agricultural resilience. <p>Participatory Plant Breeding (PPB)</p>	

Review Form 3

	<ul style="list-style-type: none"> • Describe the concept of PPB and how it tailors crop varieties to specific ecological contexts. • Highlight the collaborative nature of PPB, involving breeders, farmers, and other stakeholders. • Discuss the emphasis on participatory varietal selection (PVS) and the implications for long-term stability and genetic diversity. <p>Benefits of PPB</p> <ul style="list-style-type: none"> • Outline how PPB aims to increase crop production, profitability, and adoption of context-specific varieties. • Explain how PPB benefits targeted users and enhance farmer skills <p>Integrating Approaches in PPB</p> <ul style="list-style-type: none"> • Discuss how PPB advances crop genetics by integrating biotechnology, conventional breeding, marker-assisted selection (MAS), and organic farming. <p>Potential Impact of PPB</p> <ul style="list-style-type: none"> • Explore the multidisciplinary activities within PPB and its potential to revolutionize crop genetics. • Highlight how PPB can promote sustainable production and help reduce hunger. <p>Challenges and Limitations</p> <ul style="list-style-type: none"> • Acknowledge the potential challenges and limitations of implementing PPB, such as complexity, slower timelines, bias, institutional barriers, and scalability issues. <p>This structure would allow the manuscript to comprehensively cover the key aspects of PPB, its benefits, integration with other approaches, and its broader impact while addressing the potential challenges and limitations.</p>	
<p>Please write few sentences regarding the scientific correctness of this manuscript. Why do think that this manuscript is scientifically robust and technically sound? Minimum 3-4 sentences may be required for this part.</p>	<p>The Scientific Robustness and Limitations of the Participatory Plant Breeding Manuscript</p> <p>Scientific Correctness and Technical Soundness The manuscript on "Enhancing Crop Resilience: The Role of Participatory Plant Breeding" appears to be scientifically robust and technically sound based on the following:</p> <ol style="list-style-type: none"> 1. The manuscript provides a comprehensive overview of the concept and practice of participatory plant breeding (PPB), drawing on extensive evidence and case studies from the existing literature. 2. It accurately describes how PPB involves farmers as active collaborators in the breeding process, allowing them to set breeding goals based on their local needs and environments. 3. The manuscript thoroughly outlines the potential of PPB to address the limitations of conventional breeding by producing cultivars better adapted to the diverse conditions of smallholder farmers, especially in marginal environments. 4. It cites examples of successful PPB programs that have developed and released improved crop varieties, such as the GDRM-187 variety in India. 5. The manuscript acknowledges the need for systemic changes in breeding institutions and policies to fully realize the potential of PPB, demonstrating a nuanced understanding of the challenges involved. <p>Disadvantages and Limitations While the manuscript presents a strong case for PPB, it also recognizes several potential disadvantages and limitations:</p> <ol style="list-style-type: none"> 1. The complexity of implementing effective PPB programs requires significant coordination and integration of diverse stakeholders. 2. Compared to conventional breeding approaches, the slower breeding timelines are associated with the iterative, participatory nature of PPB. 3. The potential for bias in farmer involvement in selection is based on individual preferences rather than broader community needs. 4. The institutional barriers posed by existing breeding institutions and policies may not be well-suited to support the shift towards more decentralized, participatory approaches. 5. The challenges in scaling up successful PPB initiatives from the local to larger production regions without significant investment and coordination. 	

Review Form 3

	<p>Overall, the manuscript appears to be scientifically robust, drawing on a solid evidence base and acknowledging the nuances and limitations of the PPB approach. The technical details and case studies lend credibility to the analysis and recommendations.</p>	
<p>Are the references sufficient and recent? If you have suggestion of additional references, please mention in the review form. :</p>	<p>The references provided are comprehensive and cover various relevant research on participatory plant breeding (PPB) from the past few decades. The references include both seminal works that established the foundations of PPB and more recent studies that explore this approach's latest developments and applications. Some key observations on the references:</p> <ol style="list-style-type: none"> 1. Recency: The references include several studies published within the last ten years, indicating that PPB remains an active area of research and innovation. This helps ensure that the information is up-to-date. 2. Geographic Diversity: The references cover PPB research and case studies from various regions worldwide, including Africa, Asia, Europe, and the Americas. This provides a global perspective on the topic. 3. Breadth of Crops: The references discuss the application of PPB across various crop species, from cereals and legumes to vegetables and perennial crops. This demonstrates the versatility of the approach. 4. Methodological Approaches: The references cover different aspects of PPB, including participatory varietal selection, collaborative breeding, and integrating PPB with other breeding techniques like marker-assisted selection. <p>While the references are generally comprehensive, a few additional suggestions for potentially relevant sources could include:</p> <ul style="list-style-type: none"> • More recent review articles or meta-analyses that synthesize the latest developments and trends in PPB globally. • Studies exploring the socioeconomic and institutional factors influencing the adoption and scaling of PPB approaches. • Comparative analyses of PPB programs in different contexts to draw out best practices and lessons learned. • Empirical assessments of the long-term impacts of PPB on factors like farmer livelihoods, food security, and agrobiodiversity. <p>Overall, the provided references appear to be sufficient and well-suited to support a thorough analysis of the role of participatory plant breeding in enhancing crop resilience and sustainable agriculture.</p>	
<p><u>Minor</u> REVISION comments</p> <p>Is language/English quality of the article suitable for scholarly communications?</p>	<p>It needs revision and minor modification.</p>	
<p><u>Optional/General</u> comments</p>	<p>The research on participatory plant breeding (PPB) presented in the abstract is similar to the findings from other studies, with a few additional important points:</p> <ol style="list-style-type: none"> 1. PPB involves farmers actively in the crop breeding process, allowing them to set breeding goals based on their local needs and environments, in contrast to traditional top-down, centralized breeding approaches[1][2]. 2. PPB can help address the limitations of conventional breeding by producing cultivars that are better adapted to the diverse growing conditions and preferences of smallholder farmers, especially in marginal environments[3][4]. 3. The potential of PPB to contribute to key sustainability targets such as food security, safety and quality; food and seed sovereignty; social justice; agrobiodiversity, ecosystem services; and climate robustness is highlighted[1]. 4. PPB is being explored in countries of the Global North, including the United States, Canada and 	

Review Form 3

	<p>several European countries, to address farmers' needs despite strong economies, significant public and private investments in modern breeding programs, and consistent seed availability[4].</p> <p>5. Innovative PPB strategies, such as divergent–convergent breeding schemes and engaging multiple farmers as a participatory breeding network, are employed to leverage farmers' and researchers' knowledge and resources[4].</p> <p>6. PPB has produced varieties that perform well in research-station and on-farm trials, with one variety, GDRM-187, officially released as GM-6 for cultivation in hill areas of Gujarat state, India, yielding 18% more than the local control in research-station trials while being seven days earlier to silk[5].</p> <p>7. Breeders in Iran generally have a positive perception towards using PPB, with the levels of familiarity with PPB and the advantages of PPB positively affecting their perception. In contrast, the disadvantages of PPB have a negative effect[6].</p> <p>These additional points highlight the growing interest and application of PPB globally, the innovative approaches being explored, the successful outcomes of variety development and release, and the generally positive perceptions of breeders towards this participatory approach to crop improvement.</p> <p>Citations: [1] https://www.researchgate.net/publication/344150825_PARTICIPATORY_PLANT_BREEDING_AN_OVERVIEW [2] https://agritrop.cirad.fr/487637/1/ID487637.pdf [3] https://ageconsearch.umn.edu/record/262640/files/IJAMAD_Volume%207_Issue%202_Pages%20201-209.pdf</p>	
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PART 2:

	Reviewer's comment	Author's comment <i>(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
Are there ethical issues in this manuscript?	<i>(If yes, Kindly please write down the ethical issues here in details)</i>	

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