

Environmental Justice Concerns in Rural Planning and Regional Biosolids Management



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Abstract

Planning for biosolids has become a complex issue that is causing researchers and practitioners to reevaluate the concepts of environmental justice and sustainability. This study reviewed over 100 scholarly articles related to biosolids management, rural planning, regional planning, urban planning, environmental justice, and sustainability. Given the relatively limited research on biosolids planning, we find that a more holistic approach to management is needed. One that considers not only the environmental impacts but also long-term social and human health impacts across regions. From a planning perspective, the literature indicates that regional planning processes between urban and rural sectors need to be more inclusive and conscious of rural realities.

Introduction

Biosolids, another term for human waste that is treated and returned to the environment for beneficial purposes (mainly agricultural), are considered a sustainable resource due to their high nutrient content which contributes to soil health and plant growth. Several cases, however, have described negative environmental and social impacts resulting from the improper treatment of contaminants that are released into the environment and make their way back into the food chain. These studies have also identified environmental justice concerns in rural communities associated with a lack of participation in regional planning and an inequitable distribution of pollution and public nuisances. To address these concerns, this research reviews trends in the literature on sustainability and regional planning between urban and rural areas. The results of this research contributes to a more holistic understanding of sustainability and regional planning that considers broader interactions and more long-term implications of waste management in a world that continues to grow and is increasingly interconnected.

Methodology

- Reviewed multiple academic databases, including Google Scholar and FSU Libraries OneSearch.
- Collected peer-reviewed journal articles, books, reports, and policy documents published since 1993 (The year biosolids regulations were established).
- Searched online for key terms including: Biosolids Sustainability, Sustainable Development, Environmental Justice/Equity, Urban Planning, Rural Planning, and Regional Planning.
 - Journals were particularly focused on the U.S. context considering the U.S. is one of the main producers of biosolids globally. Regulations and management practices also apply to the U.S. context.
- Annotated scholarly literature and organized sources within the scope of biosolids research.
 - Sample size = Approximately 100 to 150 articles.
 - Articles were reviewed based on previously discussed criteria.
- Synthesized and summarized research findings to identify main themes, trends, and gaps.
 - After identifying limitations, the sample size was reduced to about 50 to 100 articles.

Results



- Nutrients**
- Circular Economies (Urban & Rural)**
- Treatment**
- Reduced Landfill Waste & Synthetic Fertilizers**
- Repeated & Heavy Applications**
- CECs & PFAS**
- Eutrophication**
- Bioaccumulation**
- Soil Health & Productivity**
- Odors, Property Values & Quality of Life**
- Lack of Public Notification & Difficulties Reporting**
- "Right to Farm" Laws**
- Regional Power Dynamics**
- Fairness & Influence**

Urban

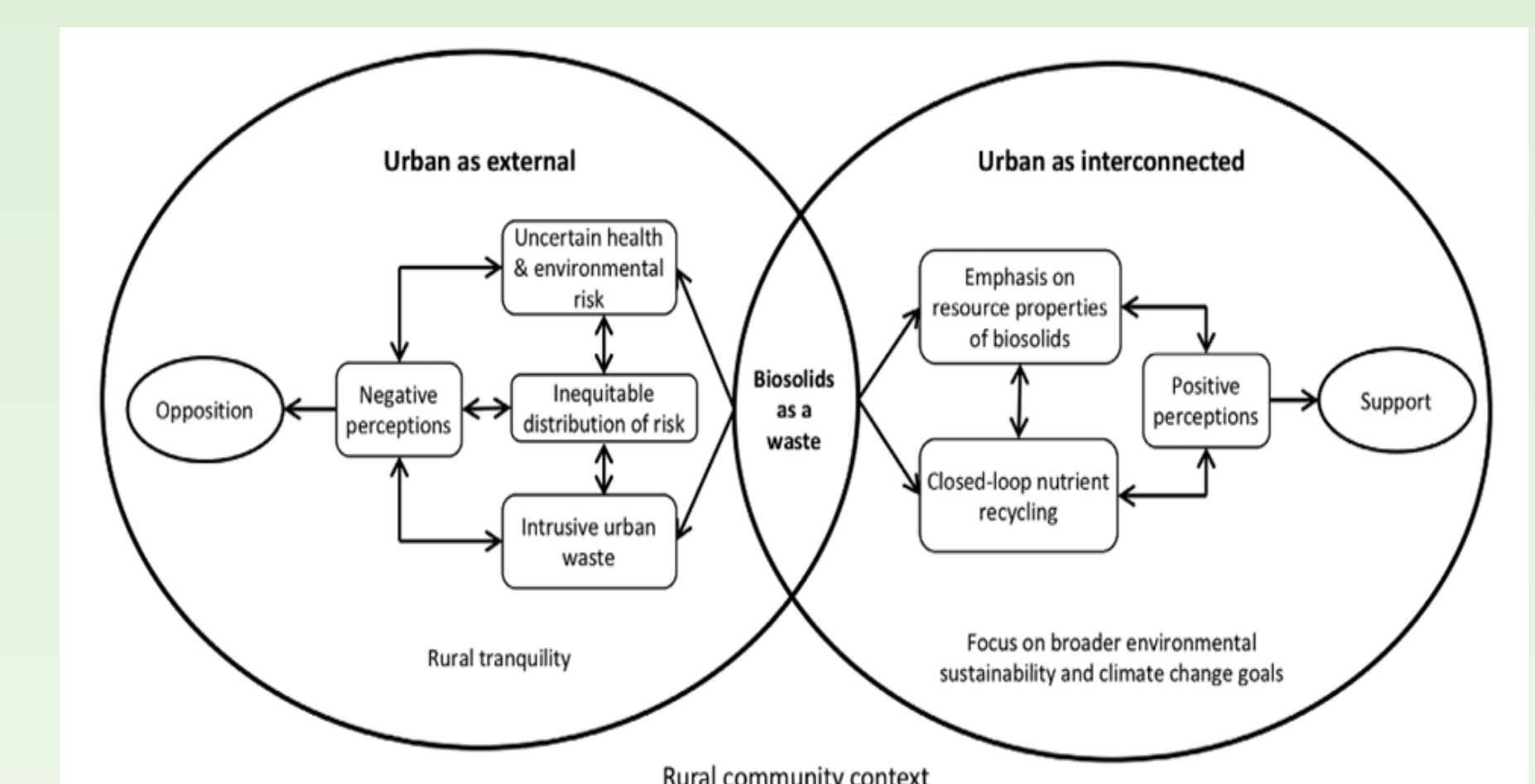
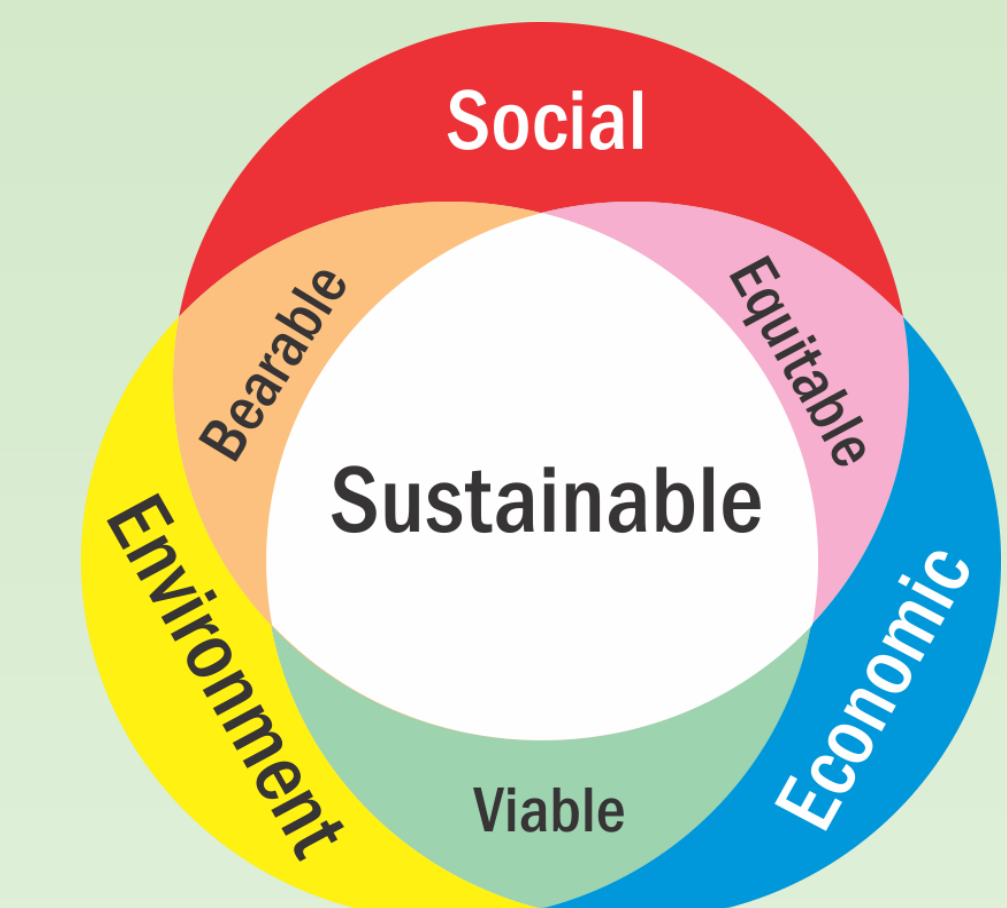
- Sanitary reform movement in town site consciousness
- Population issues (more waste)
- Limited landfill space + disposal costs
- Investment costs

Rural & Regional

- Lack of institutional resources
 - Finances, personnel, skills, etc.
- Urban centers of power & organized commodity groups
- "Right to Farm" laws
- Disconnected from rural realities
- More intense farming
- Difficulty organizing members
- Lack of voting power

Conclusion & Recommendations

- Neo-sustainability**
 - Interconnectedness of social, economic, and environmental systems
 - Current systems need to be improved for future generations
 - Social sustainability is often ignored
 - Need more holistic & long-term thinking
- Environmental justice**
 - Largely focused on low-income, minority populations
 - Various socioeconomic & political explanations
 - Affordability & Coming to the Nuisance
 - Most progress is in cities
 - Need to expand on rural identities, cultures, needs, and experiences
 - Distributive, Procedural, & Recognition Justice



Acknowledgements & References



WASTEWATER TREATMENT PROCESS - HOW BIOSOLIDS ARE MADE

