

Environmental justice in road transport infrastructure in Global South: A critical review

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Abstract:

Environmental Justice (EJ) is argued to be undermined in road infrastructure development in Global South, although Environmental Impact Assessment (EIA) and environmental clearance have been made. So, using the context of the Global South, the study explored how and why EJ is relevant, what strategic and policy interventions have been suggested or implemented, and how it can be improved in road infrastructure development. The study was conducted through a critical review of the literature and discourse analyses. Findings suggested that all the three types of EJ (distributional, procedural and interactional) have been largely undermined in road infrastructure development in Global South. Strategic and policy measures are limited to the conduct of EIA and environmental clearance. In the local contexts, people's participation and recognition have been undermined. The paper argued that a holistic approach with more objective and clear legal provisions, expansion of the purview of EIA by the inclusion of local contexts and reinforcing the participation of people and consideration for context-specific socio-political aspects that include recognising people's needs, preferences and values are likely to improve EJ in road infrastructure development in Global South.

Keywords:

Construction, environmental justice, EIA, Global South, road transport infrastructure

1 Introduction

The increase in population and enhancement in socioeconomic activities have created demands for improved and efficient road transportation, specifically in different countries of the Global South. Hence, many countries and cities have invested in reinforcing road transportation systems including creating new road infrastructure, upgrading existing infrastructure, improving the traffic management and freight system, public transportation system, and so on (Wang *et al.*, 2018). In this process, one of the most important aspects that have been emphasised is either the creation of new highways or the up-gradation of existing highways. However, the creation of new or up-gradation of existing highways incurs significant financial, human, land and material resources and time. Furthermore, it also affects the environment significantly. Consequently, the development of road infrastructure both new creation and up-gradation of existing infrastructure), requires effective transportation planning, project management (such as initiation, planning, design, execution, and project

closing) and environmental impact assessment (EIA). While the success and completion of the project depend on effective transportation planning and project management, the prevention of the impact of the construction and operation of road infrastructure on the environment depends on the EIA. All these processes for road infrastructure development seem to be technical exercises. However, arguments have been made that the transportation planning, project management and EIA process are not any more apolitical. They need stakeholders' engagement and participation and should be based on socioeconomic demands and priorities. Furthermore, although EIA is emphasised and environmental clearance is sought and to facilitate the processes, Environmental Acts have been enacted in different countries. The environmental justice (EJ) aspect has been undermined (Katz, 2015; Schweitzer & Valenzuela, 2004).

In recent years, in addition to the increase in the economic disparity that has been witnessed in many countries of the Global South, disparities in the sharing of environmental loads by different sections of the society have been witnessed (Kubanza *et al.*, 2017). Consequently, environmental justice challenges in many aspects, for example, solid waste management, creation of public infrastructure, and green space development have been experienced, and many scholarly studies have been conducted (Das, 2022; Kubanza, *et al.*, 2017; Leonard & Pelling, 2010; Schlosberg & Carruthers, 2010).

However, not many significant scholarly studies have been found, specifically related to road infrastructure. EJ is a critical issue linked to legislation, distribution, equity, and recognition of people in the development process (Das, 2022; Jennings, Gaither & Gragg, 2012; Kronenberg *et al.*, 2020). Therefore, this study's objective was to explore how and why EJ is relevant, what strategic and policy interventions have been suggested or implemented and how it can be improved in road infrastructure development in the context of Global South.

2 The Approach of the Study

A qualitative study primarily premised upon literature review and discourse analyses was used for this study. A critical review of the established literature, including peer-reviewed journal and conference proceedings articles, books and book chapters, published and unpublished reports, web and newspaper articles, etc., was conducted. For this purpose, several databases were searched, including Science Direct, Wiley Online, Routledge, Sage, Taylor and Francis, EbscoHost, Google Scholar, Research Gate, Academia.edu, etc., to find relevant related articles to EJ and EJ in road transport infrastructure. More than 100 articles were reviewed from which 36 articles are found relevant to the study. The relevant articles reviewed included 28 peer-reviewed journal articles, 1 conference proceedings article, 3 Books, & Book chapters, 3 reports, and 1 thesis and were critically reviewed. Based on the findings of the critical review of the articles, discourse analyses were conducted by using various themes linked to EJ in road transportation infrastructure in Global South. The various themes considered in discourse analyses included (1) the impact of road transport infrastructure on the environment, (2) environmental protection laws and regulations for infrastructure development and linkage with EJ, (3) transport infrastructure and EJ: pitfalls and inadequacies in current processes, and (4) strategic approaches to improve EJ in road transport infrastructure. Moreover, the subthemes considered under theme 3 were EIA and EJ for road

transport infrastructure, project management and EJ, and construction and operation of road transport infrastructure and EJ.

3 Perspectives of Environmental Justice

EJ conceptually pertains to the variance in the exposure of different socioeconomic groups to environmental burdens and access to environmental goods (Schlosberg, 2007). However, several scholars have argued that it is broader and more complex (Jennings *et al.*, 2012; Kronenberg *et al.*, 2020). EJ entails environmental burdens such as landfills, toxic-emitting facilities, pollution and other environmental hazards that are disproportionately located near socially disadvantaged groups (Jennings *et al.*, 2012). It has also expanded from its focus on inequity to various issues ranging from the generally unequal nature of environmental protection to the distribution of an array of environmental ‘goods’ as well as ‘bads’. Also, health, safety, and the role of people’s participation and engagement in the planning, and decision-making form a part of the discourse (Kubanza *et al.*, 2017; Mebane, 2013; Seymour, 2012; Schlosberg, 2007).

EJ's challenges emanate from inequity in the distribution of environmental ‘bads’ in society (Schlosberg and Carruthers, 2010). In other words, they are another form of social injustice where some communities receive more environmental risks than others. Some scholars believe those environmental bads were another example of social injustice (Dominelli, 2014; Mebane, 2013; Seymour, 2012). Therefore, EJ solicits for the fair treatment and meaningful involvement of all people regardless of race, colour, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies.

Environmental justice encompasses three types of justice. They are distributive (distributional approach), procedural (participatory) and interactional (recognition) justices (Jennings *et al.*, 2012; Kronenberg *et al.*, 2020). Distributive justice is most prevalent and related to the equal distribution and equity of environmental burden and access to resources, benefits and services (Das, 2022). It emphasises the fair allocation of or access to benefits for all social groups. Procedural justice is linked to the decision-making process and therefore argues for the fair integration of all affected groups into decision-making processes. On the other hand, interactional or recognition justice entails recognition and respect for the stakeholders. It recognises all stakeholders' needs, values, and preferences in a safe, fair, and non-discriminatory environment (Kronenberg *et al.*, 2020; Mahmoud & Gan, 2018). However, it was observed that both procedural and interactional justices have been undermined in the Global South and largely distributive justice was emphasised in the development process (Das, 2022).

4 Environmental Justice in Road Transport Projects

4.1 Impact of road transport infrastructure on the environment

The development of transport infrastructure, including road infrastructure, is a very complex exercise. It has significant social, economic and environmental implications (Zubala, 2022). The most important benefits of road infrastructure construction are the enhancement of

accessibility, mobility and bringing in structural changes in spatial patterns and land uses. It also engenders economic opportunities, employment generation, social connectivity, etc. (Asturias, Garcia-Santana & Ramos, 2019; Walia, Aggarwal & Bhardwaj, 2017). However, the development of road infrastructure whether or creation of new infrastructure or upgradation of existing infrastructure, may lead to significant environmental ailments if the environmental challenges are not properly addressed (Walia, Aggarwal & Bhardwaj, 2017). The environmental impacts could include the destruction and removal of existing ecosystems and the reconfiguration of local landforms. It also causes diverse ecological effects on both terrestrial and aquatic ecosystems. More importantly, the development of road infrastructure because of construction and operation becomes a major source of air, water and noise pollution, which leads to the degradation of natural resources and causes health ailments (Aslam, Khan & Khan, 2011; Kumar, Mulheron & Claudia, 2012; Qian *et al.*, 2011; Walia, Aggarwal & Bhardwaj, 2017). These are likely to negatively impact the different communities of the society, specifically those located close to the construction sites or near the road transport infrastructure (Das, 2021). Furthermore, it was contended that those who are poor or live in minority neighbourhoods are likely to have higher levels of environmental challenges from transportation, such as accidents and pollution, than the affluent community (Brainard *et al.*, 2002; Gwynn & Thurston, 2001; Morello-Frosch, Pastor & Sadd, 2001). Thus, road transport infrastructure has a differential adverse environmental impact on different strata of the society, engendering EJ challenges.

4.2 Environmental protection laws and regulations for infrastructure development and linkage with EJ

Laws and regulations in several countries have been enacted for environmental protection. These laws are also found to be applicable concerning the development of road infrastructure as relevant. Specifically, EIA is done and environmental clearance is sought before the development of the transport projects (ARBITA, no date; European Transport Agency, 2020; Handa, Aggarwal & Bhardwaj, 2019). In Western developing countries such as the USA, all transportation projects must undergo an environmental review and approval process before any construction is permitted. The relevant acts are the Clean Air Act (CAA), the Clean Water Act (CWA), the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA) and climate change (ARBITA, no date). Similarly, in Europe, similar acts have also been enacted (European Transport Agency, 2020).

In several countries in Global South, such acts and rules and regulations are available in some form or other. For example, in India, a series of environmental legislations between 1980 and 2005 have been enacted to control or reduce the adverse impacts of transportation infrastructure on the environment (Handa, Aggarwal and Bhardwaj, 2019; Walia, Aggarwal & Bhardwaj, 2017). Similar laws include National Environmental Management Act 1998 and National Environmental Management: Biodiversity Act No. 10 of 2004 (NEM: BA). National Environmental Management: Protected Areas Act No. 57 of 2003 (NEM: PAA), and the Environmental Conservation Act have been enacted in South Africa. The Acts have provided established detailed procedures for assessing the environmental impacts of the proposed projects and how clearances for the projects should be given.

However, the challenge with most of these acts and consequent rules and regulations is that although they offer processes to protect the environment at the macro level, they do not offer processes for and emphasise EJ in road transport infrastructure. Furthermore, it has been argued that environmental regulations have been differential enforcement (Lavelle & Coyle, 1992; Ringquist, 1998).

4.3 Transport infrastructure and EJ: Pitfalls and inadequacies in current processes

4.3.1 EIA and EJ for road transport infrastructure

EIA is one of the most important processes that is conducted before the project is undertaken and implemented. It is done to explore the adverse impact the transport infrastructure that can be experienced during the construction and operation of the infrastructure. This is largely a mandatory process in many countries including that of the Global South, however, is usually undertaken at a macro or regional scale. Since many projects were stalled or taken long because of lack of environmental clearance on account of adverse impact on the land use, spatial pattern, wildlife, agriculture, and so on, some countries in the Global South, for example, India have created regulations to restrict the requirement of environmental clearance and EIA for certain kind of road transportation projects. For instance, road development projects other than State Highways and National Highways, State Highway widening projects located below an altitude of 1000 m MSL, State Highway widening projects not located in an ecologically sensitive area, National Highway widening projects of up to 100 km length, National Highway widening projects of more than 100 km length involving the additional right of way or land acquisition up to 40 m (at any place) on existing alignment and 60 m (at any place) on re-alignments or bypasses IRC (2017) and so on do not need EIA and environmental clearance. Although these restrictions have been brought in to facilitate and expedite the development of transport projects, they undermined the local environmental challenges. Consequently, the areas around such transportation project areas undermined the adverse environmental and ecological impacts of the project on the areas around these projects and local communities. Moreover, concerns have been raised that low-income and minority communities receive less environmental mitigation during the implementation of transport projects. In addition to this, low-income and minority communities have less access to, less influence in, and are given less respect in collective decision-making than other communities (Denmark, 1998; Khisty, 2000; Lee, 1997). Consequently, the local communities bear the environmental burden of the developments causing distributional EJ challenges.

It was also found that gaps in the EIA process exist which include a lack of consideration of local contexts, non-participation or lack of little engagement with the stakeholders including the local communities despite theoretically being emphasised in the EIA processes (Das, 2021). In other words, EIA has become too bureaucratic, technical and apolitical exercise without the involvement of affected communities and stakeholders. Such non-engagement and lack of participation in the decision-making and undermining of the aspiration and values of people, cause both procedural and recognition EJ challenges.

4.3.2 Project management and EJ

Project management entails the life cycle of a project starting from project initiation to project closing. It also included important phases such as Planning, Execution, Monitoring and Control (PMBOK Guide, 2021). This process is undertaken to complete a project within a

scheduled time and cost and attain the objectives of the project. This process is no different from the development of road transport infrastructure. However, project management phases are largely attuned to successful project delivery and attaining time and economic efficiency (PMBOK Guide, 2021). However, EJ is not a part of this process. However, an argument can be made that project management is undertaken after commissioning of the project on receiving environmental clearance, therefore consideration for EJ or environmental aspects is not warranted. However, project management includes various aspects such as material management, equipment management, waste disposal, etc., (PMBOK Guide, 2021), which create an environmental burden by creating adverse environmental impact and health challenges at the local scale. To reduce such burdens, involvement and participation of the local communities are warranted, specifically at the planning stage to explore environmental impact mitigation measures (Schweitzer & Valenzuela, 2004). However, since project management is purely a technical exercise, lack of involvement of local and affected stakeholders and consideration for the environment cause all three types of EJ challenges, especially at the local level.

4.3.3 Construction and operation of road transport infrastructure and EJ

While the new construction and up-gradation of the roads are expected to bring positive transformations in the socioeconomic and mobility scenarios, they create significant environmental ailments in and around the road construction sites. Several environmental and health ailments are experienced during and after the road construction, specifically where large-scale construction activities are undertaken for a considerable period and during the operation of the road infrastructure (Handa, Aggarwal & Bhardwaj, 2019; Solanki, Ahamed, Gupta & Nongkynrih, 2016; Walia, Aggarwal & Bhardwaj, 2017). The major adverse environmental ailments include air pollution, noise pollution, and water pollution and land severance. Also, road construction causes landslide and soil erosion, loss of flora and fauna and adversely impacts the wild animals to a certain extent. These impacts the local socio-ecological balances and upset the local economic activities such as agriculture, horticulture, aquaculture, etc. Similarly, on account of the construction and operation of road infrastructure, health ailments such as respiratory diseases due to dust particles, smoke and other gases generated from the construction site followed by sleep disorders, waterborne diseases and deafness occur (Das, 2021). However, since road infrastructure construction is considered a temporal process, such impacts are largely undermined, despite their adverse impacts. Further, the adverse impacts of the operation of such road transport infrastructure have also been undermined. However, an argument may be made that Traffic Impact Assessment (TIA) is done as a part of the EIA is done to observe the adverse impact of traffic operations on the roads. However, the implication of the TIA is found to be limited in the face of long-term health and environmental implications of the operation of the road transport infrastructure. Although the scope of involvement and the role of local communities in the construction and operation of transport infrastructure are marginal, they bear the environmental burden without any scope for remedial measures. Therefore, it is argued that the EJ aspect should be considered and integrated with the construction and operation of transport infrastructure to reduce the environmental burden on the local affected communities.

4.4 Strategic approaches to improve EJ in road transport infrastructure

Not much evidence from practice and literature on the strategic measures to attain EJ in road transportation infrastructure is found. However, it has been argued that the people's public health, specifically the affected communities, and disadvantaged sections should be linked to road transportation infrastructure. Also, a community-based assessment of the impact of environmental pollution such as air and noise pollution should be made before road infrastructure development (Schweitzer & Valenzuela, 2004). In other words, the scope of the EIA should be expanded to include the linkage of public health and risk assessment of environmental pollution in the local context and disadvantaged section of the society. Moreover, communities must be involved in the decision-making and implementation of road transport projects (Schweitzer & Valenzuela, 2004). The aspirations, values, needs and demands of the people are needed to be considered, perhaps by encompassing these in the EIA process. In other words, the stakeholders/ public participation process and engagement in the EIA process and project management process should be reinforced and made mandatory. Further, arguments have emerged that the development of road transport infrastructure is made visible in the environmental law (Bogojević & Zou, 2020). More importantly, the scope of environmental laws and acts should be more inclusive by incorporating road infrastructure development into its purview. The combined effect could enhance EJ in road infrastructure development. However, objective empirical studies are needed to explore more objective strategies to improve EJ in road transportation infrastructure in the Global South.

5 Conclusions

EJ is an underemphasised aspect of road transport infrastructure development. Therefore, it is essential to explore EJ in road transport infrastructure, specifically in the Global South to bridge the knowledge gap. The findings of this study suggested that EJ has not been considered in various aspects such as in the EIA process, Project Management, construction and operation of road infrastructure. However, people, specifically communities that include disadvantaged sections of the society face significant adverse impacts of environmental pollution and health ailments. More importantly in some countries in Global South, EIA excludes the local contexts in order to expedite the development of the transport infrastructure. Consequently, distributional EJ challenges are observed. Moreover, although peoples/communities' participation and engagement in decision making as well as in the EIA process, it is largely undermined and mostly conducted at the macro scale excluding the local contexts, which essentially causes procedural EJ. Also, the values, aspirations and views of people for example views and experiences of people to explore solutions to mitigate the adverse impacts of environmental pollution and prevent health ailments are given due respect and recognition. As a result, the interactional or recognition EJ is also experienced.

However, EJ in road transport infrastructure is essential to prevent adverse health and environmental challenges specifically in the local context. Therefore, exploring strategic measures to enhance EJ in road transport infrastructure should be emphasised. This study contends that expansion and strengthening of environmental laws should be done by the inclusion of EJ in the context of road transport infrastructure. Also, the people's participation and involvement in the EIA process and project management are needed to be reinforced and be made mandatory. Further assessment of environmental impact and health risks in local

contexts in the EIA process would likely improve EJ in road transportation. Also, solutions to mitigate adverse environmental impact and health risks in the local context may be explored by using local knowledge and valuing people's experiences and good practices. Overall, it is advocated based on this study that there is a need for a holistic approach with an objective and clear legal provisions, expanding the purview of EIA by the inclusion of local contexts and reinforcing the participation of people and consideration for context-specific socio-political aspects. These may include recognition of people's needs, preferences and values for a safe, fair and non-discriminatory environment to improve EJ in road infrastructure development in Global South.

However, since this is a qualitative study based on a literature review, empirical studies are needed to confirm these findings related to different issues of EJ and strategic measures to improve EJ in road transport infrastructure.

6 References

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