



THE NEED TO BETTER DEFINE AND DELIMIT AREA OF INFLUENCE FOR INFRASTRUCTURE PROJECTS

RECOMMENDATIONS

- The proposals pending before the Chamber of Deputies and the Federal Senate (PL 3729/2004 and PLS 168/2018, respectively) should restore the mandatory requirement to delimit the area of indirect influence and separate the concept of area of influence from its respective delimitation.
- The definition of the concept of the project's area of indirect influence should consider the area affected by changes in economic, social and environmental dynamics induced by the implementation of the infrastructure project.
- Environmental parameters should be preliminarily incorporated into the delimitation of the area of influence within the scope of EVTEA and, subsequently, the EIA should delve into the socioeconomic and environmental impacts to refine, deepen and consolidate the delimitation process.
- The reasoning behind the methodology used to delimit the area of direct (and, especially, indirect) influence should be transparent so that it may be checked by the competent entities, thus preventing discretionary decisions by those in charge of the EVTEA and the EIA.

The selection and structuring of quality infrastructure projects fundamentally depend on proper assessments of their environmental and socioeconomic impacts. The area where such impacts occur is typically called the area of influence. Defining this area can be a challenge, as there is no consensus about the appropriate criteria, methodologies, and scales to use.¹ Indeed, at the moment, there is no clear definition for the concept of area of influence, which often gets confused with the parameters used for its delimitation. In practical terms, the area of influence indicates where and to what extent those in charge of the project's implementation should focus their efforts on analyzing, mitigating and compensating for the direct and indirect impacts of the project. At the same time, the area of influence informs the authorities where and how they must operate. Due to its critical importance in identifying and managing socio-economic and environmental risks and in guiding policy integration efforts to uphold the rights of populations affected both directly and indirectly, adequately delimiting the area of influence is essential to improve the decision-making process related to infrastructure projects.

In this technical note, researchers from Climate Policy Initiative/Pontifical Catholic University of Rio de Janeiro (CPI/PUC-Rio) (i) analyze how areas of influence are currently defined by government bodies and in the Terms of Reference (TRs) for EVTEA and EIAs for land transportation infrastructure projects; (ii) present a set of recommendations for the adoption of clearer criteria

¹ SANTOS, R.F. (2004). Planejamento Ambiental: teoria e prática. São Paulo: Oficina de Textos. In: Menin, F., Reis, F. A., Giordano, L., Amaral, A. M., Gabelini, B., & Cerri, R. (2017). Critérios de delimitação de áreas de influência em Estudos de Impacto Ambiental de rodovias: abordagem de processos de dinâmica superficial. Geologia USP. Série Científica, 17(3), 209-224. <https://bit.ly/3hrxvY6>.

for the definition and demarcation of areas of influence for new projects, from a perspective that explicitly incorporates where the direct and indirect effects of this type of undertaking will occur; and (iii) propose a dialogue between the EVTEA and the EIA.

In Brazil, the area of influence of infrastructure projects is currently delimited in two moments: in the Feasibility Studies (*Estudo de Viabilidade Técnica, Econômico e Ambiental* - EVTEA), which aims to assess the economic feasibility of the project, and the Environmental Impact Assessment (*Estudo de Impacto Ambiental* - EIA), meant to evaluate the project's environmental feasibility. There is a difference in the objective and scope between these two instruments which, in itself, may lead to different delimitations of projects' areas of influence. On the other hand, both instruments, in theory, apply to the same project, which means that it is reasonable to expect that their areas of influence should somehow be related.

Within the scope of the EIA, changes to determine area of influence are currently under discussion by Brazil's National Congress. General Environmental Licensing Bill (Legislative Bill PL 3,729/2004) and Senate Bill PLS 168/2018, both aimed at changing environmental licensing rules, restrict the concept of area of influence, proposing that it applies only to Areas of Direct Influence (*Área de Influência Direta* - AID), where only the direct impacts of projects are considered. In current practice, however, terms of reference for EIAs usually mandate the establishment of both an AID and an Area of Indirect Influence (*Área de Influência Indireta* - AII) as parameter of study. Such proposals to restrict the concept of area of influence would, therefore, preclude the need to assess the indirect effects of building and operating the projects. As a logical consequence, they also exclude these indirect effects from future socio-environmental mitigation and compensation programs.

The aforementioned legislative bills also draw on the concept of area of influence to determine the right to participate in the decision-making process, both by limiting public hearings exclusively to people located in the areas directly influenced by the project and by restricting the intervention of bodies and entities from outside the AIDs.²

DIFFERENT DEFINITIONS USED BY ANTT, VALEC AND CONAMA

According to the Brazilian Land Transportation Regulatory Agency (*Agência Nacional de Transportes Terrestres* - ANTT), an area of influence is "the part of a territory where the effects of the existence of a transport offering can be perceived". Under this definition, ANTT subdivides the area of influence into two parts: (i) direct or nearby, i.e., an area occupied by habitual users of transport facilities, and (ii) remote, where the indirect effects of a transport offering take place.³

VALEC also classifies areas of influence as direct or indirect, but adopts a more comprehensive definition than that of ANTT. According to VALEC, an area of direct influence is composed of geographical units that constitute potential hubs for the loading or passing of railroads, whereas an area of indirect influence is composed of geographical units that will be impacted by new railroad either by potentially attracting new loads or by diverting the load flow. According to the

² The intervening bodies are: FUNAI (National Indigenous Foundation), Palmares Cultural Foundation, IPHAN (National Historic and Artistic Heritage Institute), the Ministry of Health, ICMBio (Chico Mendes Institute for Biodiversity Conservation) and INCRA (National Institute for Colonization and Agrarian Reform).

³ ANTT Resolution No. 3,054 of 03/05/2009.

VALEC's manual, the delimitation of areas of direct and indirect influence must be justified to show, unequivocally, the interactions between the railroad and the geographical area.

These agencies use the definition of areas of direct and indirect influence interchangeably with the concept of area delimitation. They also believe that different criteria should be taken into account in the delimitation process, which may cause some confusion, as these are two autonomous agencies and yet both deal with land transportation. The definitions also use certain terms as parameters that are only related with the economic feasibility of the project. However, the EVTEA also has an environmental component, allowing for the possible existence of environmental parameters when delimiting areas of influence.

The National Environment Council (*Conselho Nacional do Meio Ambiente* - CONAMA), in turn, provides a general definition stating that the area of influence of a project is the "geographical area to be directly or indirectly affected by the impacts".⁴ In practice, the terms of reference (TRs) for preparing the EIA go further and state that the area of influence of a given project corresponds to the delimitation of the geographical area that will be directly affected by the project and to the areas under its indirect influence. In this case, it should be noted that the definition of the area of influence uses the actual delimitation of the area.

It is understandable that the definition is linked to delimitation - after all, it is a geographical area that must be identified based on certain criteria so that the socio-economic and environmental impacts of a project can be mapped. However, separating the two concepts - "definition" and "delimitation" - can make everything clearer - both when formulating the terms of reference for the EVTEA and the EIA, to indicate which criteria or methodology should guide the delimitation of the area of influence, and when determining who will design the studies.

DELIMITATION OF AREAS OF INFLUENCE IN THE EVTEA AND EIA TERMS OF REFERENCE

The area of influence is delimited in two moments within the life cycle of a project: in the EVTEA and the EIA - i.e., in the phase when land transportation infrastructure projects undergo feasibility assessments.

Due to the nature of these studies, it would make sense for the EVTEA to preliminarily delimit the area of influence and then the EIA would delve into the socioeconomic and environmental impacts, thus consolidating the delimitation process. This is not necessarily what happens, not least because there is no legal obligation for the EVTEA to be carried out prior to the EIA.

Despite the differences between the criteria employed by ANTT and VALEC, both consider areas of both direct and indirect influence in their respective definitions. In practice, however, the scope of EVTEA is limited to the area of direct influence of land transportation projects.⁵ It should also be noted that the studies do not justify the delimitation of the area of influence and, in the case of railroad projects, contain no indication as to whether the information and data provided in the VALEC's manual for EVTEA preparation manual were, in fact, heeded.⁶

⁴ CONAMA Resolution No. 01, of January 23, 1986.

⁵ The EVTEA for the following projects were analyzed: Ferrogrão, Ferronorte (Cuiabá-Santarém), FICO (Porto Velho - Vilhena), Norte-Sul (Açailândia-Palmas), BR-364 (Rondonópolis / MT-Jataí / GO) and BR-163 (Sinop / MT-Miritituba / PA)

⁶ Ibid.

In terms of environmental licensing, the EIA terms of reference deal with areas of direct and indirect influence according to their peculiarities (e.g., if it is an area with indigenous land present)⁷ and the impacts to which they will be subjected (e.g., population growth, increased service offerings, etc.). As such, the following parameters must be used: the watershed where the project will be undertaken, the dynamics of land use and occupation, as well as social indicators, predominant ecosystems, and indicators relevant to biodiversity conservation in the region (watersheds, vegetation cover, etc.). It should be noted that not all parameters are objective by nature, thus making it important for the methodology used in delimiting the area of influence to be explicitly stated in the EIA.

The EIA's terms of reference provide for three types of areas of influence delimitation: Directly Affected Areas (*Área Diretamente Afetada - ADA*), Areas of Direct Influence (*Área de Influência Direta - AID*) and Areas of Indirect Influence (*Área de Influência Indireta - All*):

- ADA: Areas that will undergo direct interventions due to activities inherent to the project (areas affected by construction, vegetation removal, access routes, stations and yards, support structures, works of art, loaned areas, deposits, dumps, etc.).
- AID: Areas actually or potentially threatened by the direct impacts of the project's implementation and operation, as well as associated and resulting activities. In addition to these minimum guidelines, other areas to be incorporated or added to the Area of Direct Influence may need to be delimited as well, depending on physical, biological, social and economic characteristics and the specificities of the project in question.
- All: The region that will be affected by the indirect impacts of the construction project, considering the physical, biotic and, mainly, socioeconomic environments, as related to changes in the dynamics of land use and occupation, in the dynamics of urban centers and in the flow and transport dynamics at the regional level. For the socioeconomic environment criterion, the All must cover, at the very least, the territories of the municipalities that cross the project.

Within the scope of the federal environmental licensing, although the delimitation of areas of influence is standardized in the terms of reference of the EIAs, in practice different studies use different criteria and fail to include the rationale behind the delimitation process.

As an example at the federal level, an EIA carried out for the Midwest Integration Railroad (*Ferrovia de Integração do Centro-Oeste - FICO*, or simply EF 354) determined that the area of direct influence for the biotic environment would encompass a radius of 5 km on either side of the railroad. For the physical environment, it was 2.5 km on either side, and for the socioeconomic environment, it was the total area of the municipalities directly sectioned by the railroad layout. It also considered a 10km-radius for each area for archeology purposes and 50 km for anthropology. When delimiting the area of indirect influence, the EIA pooled the physical and biotic aspects together and delimited a 50 km-radius, with 25 km on each side. From a

⁷ The Interministerial Ordinance 060/2015 regulates the participation of governmental bodies in the environmental licensing procedure. In its annex 1, it establishes a radius in the project's surrounding in which it assumes interference in certain areas, such as indigenous land and/or *quilombola* communities, and requires the participation of the governmental bodies responsible for managing these areas in the licensing procedure. This radius may be used, in a practical sense, as a parameter to delimit the AID. However, the ordinance only regulates the participation of governmental bodies for this purpose. Additionally, the radius only establishes a minimum distance for which the participation of governmental bodies in the environmental licensing procedure, however depending on the EIA or other evidence gathered in the environmental licensing procedure participation could be required within a longer distance. See: TRF-1. Agravo de Instrumento. Ag nº0005755-44.2017.4.01.0000. Rel: Des. Federal Daniel Paes Ribeiro. e-DJF1 16/02/2017 PAG 706. Available at: <https://bit.ly/32QXIL0>. Accessed on July 17, 2020.

socioeconomic perspective, it encompassed the total area of the municipalities located within 10 km of the project's layout.

The Ferronorte (EF 364) project, on the other hand, used different criteria to delimit the area of direct influence. One of the EIAs conducted for the project concluded that the AID should be the same for the biotic and physical environment and considered as a parameter the micro basins that would be crossed by the project, as well as the landscape - especially forest fragments located near the planned route. As for the socioeconomic environment, the EIA considered the two municipalities that would be most affected by the construction of the railroad. When calculating the area of indirect influence for the physical and biotic environment, the EIA considered a radius of 10 km on either side of the railroad and, for the socioeconomic environment, concluded that all municipalities surrounding the railroad would suffer indirect effects from the project.

It should be noted that the same type of project in two locations had ADAs, AIDs, and AIIIs delimited using different criteria, and both studies failed to transparently explain how these delimitations had been determined. Granted, differences can be expected given that the projects are located in different regions, each with its own peculiarities and sensibilities. However, technical rationale is needed to justify the delimitation, as the methodological decisions made should be publicly available.

AREA OF INFLUENCE AND THE MARKET ACCESS APPROACH

Researchers from CPI/PUC-Rio have developed a "market access" methodology that serves as the first step in delimiting the area of influence of transportation infrastructure projects and computing the socio-environmental impacts of their operation. Using operational research algorithms to estimate transport costs for all pairs of municipalities in the country (and between each municipality and its nearest port), the researchers assist decision makers to predict which municipalities will be impacted by a given investment in transport infrastructure and measure the size of such impact on an accessibility measure entitled "market access".

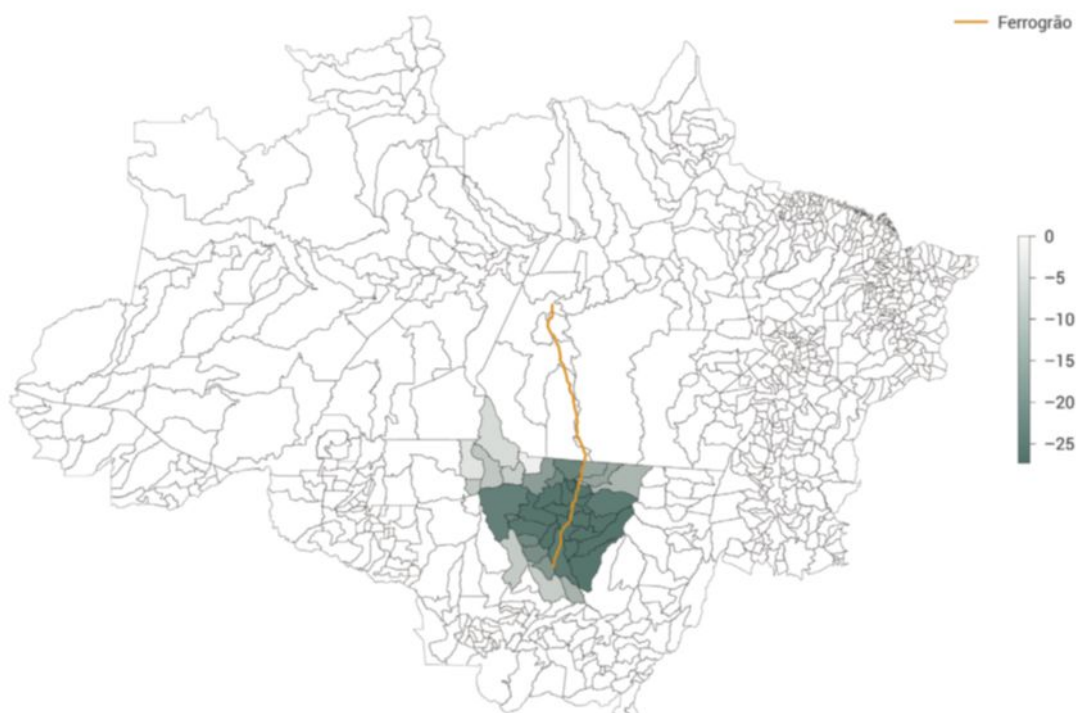
This approach illustrates just how problematic it is to define an area of influence based solely on a radius around the project or on a fixed range of kilometers along highways or railroads. To illustrate, consider the definition of a road's area of indirect influence. The implementation of such a project would affect the economic dynamics not only of the project's surrounding areas, but also for all the producers whose businesses will use the project to sell and/or transport their products. Where exactly these entrepreneurs are located, in turn, varies between projects, as it depends on multiple factors such as the goods produced in each region and pre-existing transport networks.

Using CPI's market access approach to delimit the EF-170's (Ferrogrão's) area of influence illustrates the limitations of the criteria commonly used to define areas of influence in land infrastructure projects. Figure 1 shows the municipalities impacted by changes in the cost of transporting agricultural goods to the port in a scenario where the railroad is operational. Due to the lack of stations for long stretches of the route, many municipalities it crosses do not show accessibility improvements. The opposite occurs with several municipalities outside the railroad's trajectory that show substantial gains in accessibility derived from the reduced costs of transporting grains to the Miritituba terminal in the state of Pará (PA). The municipalities affected by the construction are those outlined in the construction plan, usually with simpler

and more direct identification. These results show how the geography of the economic impacts resulting from the construction of EF-170 (Ferrogrão) is quite different from the geography of the project itself. **This means that delimiting an area of influence simply by applying the ‘distance from the project’ criterion is unlikely to adequately cover the indirect impacts from the change in economic dynamics brought about by the project.** In fact, the use of criteria exclusively based on distance from the project might overburden mitigation and compensation actions in the vicinity of the project, while disregarding these types of actions in areas farther away from the project but for which economic dynamics are nonetheless greatly affected by it.

This underscores the need to establish clearer criteria for defining areas of influence. The concept of area of influence must be extricated from its delimitation to enable a more reliable characterization of the area of influence for transport infrastructure projects. Especially in the area of indirect influence, it is also important to incorporate the influence of criteria related to the extent of the project’s economic impact into the delimitation process.

Figure 1: Change in the cost of transport to the port as a result of constructing EF-170 (Ferrogrão)



Source: Climate Policy Initiative

A concern with using these criteria is that projects could become even more complex. However, economic impact estimates are a key input for estimating the demand for these projects and, as such, are an inherent part of a project’s design and feasibility studies. An example would be a road designed for a geographical area widely used by producers, who would experience a reduction in sourcing and marketing costs. This means that it is possible to use the same criteria used to identify the users of the project to also determine the locations where its socio-environmental impacts are likely to occur and which may warrant actions by the project manager and the government to mitigate.

The EF-170 (Ferrogrão) case is a good example of the relevance of the proposed criteria when assessing these projects from a cost-benefit standpoint. The EVTEA for this project estimates

that most of the demand for the railroad will be from producers in the mid-north region of the state of Mato Grosso, many of whom are located hundreds of kilometers away from the railroad. This means that the implementation of this project will have indirect socio-environmental impacts on this region, which, due to the definition and criteria proposed in this technical note, should be included in its area of influence from the very beginning. The EVTEA also includes several parameters about the project itself - such as the location of construction sites, construction time, etc. - that can be used to delimit the area of direct influence from the outset. The final shape of the area of influence must benefit from refinements to the contour through the addition of other criteria to be determined by law - for example, about lands belonging to traditional communities or other sensitive areas.

RECOMMENDATIONS FOR DEFINING AND DELIMITING THE AREA OF INFLUENCE

The use of more consistent and clear criteria for delimiting areas of influence is key to improving the delimitation process. Currently, the conceptualization of the area of influence is often mixed with its delimitation. To assuage this confusion, the **first recommendation** of this technical note is that the concept and definition of area of influence be revisited and separated from its delimitation.

A clear definition of the concept of area of influence, facilitates the determination of the most suitable criteria for delimiting the area in question. In this sense, the **second recommendation** of this technical note is that one of the criteria used to define a project's area of influence includes any area affected by changes to its economic, social and environmental dynamics caused by the implementation of an infrastructure project. This will avoid the use of purely geographical parameters as mentioned earlier. It is important to note that this technical note does not propose that this be the only criterion used in delimiting areas of influence, but rather that it be used as one of several criteria when defining this area.

Once the concept and criteria for delimiting the area of influence of land transportation infrastructure projects have been determined, one must decide when in the project cycle the area will begin to be delimited and studied. As such, the **third recommendation** of this technical note is that environmental impacts be incorporated into the definition of the area of influence as early as in the EVTEA. This makes conceptual sense, as these impacts affect the social costs and benefits of the project and thus influence its economic feasibility. It also makes practical sense, as it allows the EIA to refine and add further detail to an environmental analysis conducted beforehand.

Finally, transparency is essential. Previous sections have shown how the differences in the criteria used in the definition and delimitation of areas of influence by different agencies and at different stages in the infrastructure project cycle causes significant confusion and insecurity. Therefore, the **fourth recommendation** of this technical note is that the preparation of studies (EVTEA and/or EIA) be based on clear and transparent methodologies that can be checked by competent bodies so as to eliminate the discretion project leaders enjoy in the current model.

CONCLUSION

Adequately delimiting the area of influence is essential to the decision-making process related to infrastructure projects, due to its critical importance in identifying and managing socio-economic and environmental risks and in guiding policy integration efforts to uphold the rights of populations affected directly and indirectly by the project.

CPI/PUC-Rio's analysis reveals that at the moment, there is no clear definition for the concept of area of influence, which often gets confused with the parameters used for its delimitation. Additionally, the project studies fail to provide any justification for the way the areas are delimited, highlighting the need for greater transparency in the methodology and in the decision-making process itself. EVTEA and EIAs for the same project may feature completely different areas of influence; the synergy between these studies could be improved.

AUTHORS

JOANA CHIAVARI

Associate Director, Climate Law and Governance
Climate Policy Initiative/Pontifical Catholic University
of Rio de Janeiro (CPI/PUC-Rio)
joana.chiavari@cpiglobal.org

ARTHUR BRAGANÇA

*Head of Policy Evaluation, Sustainable Agriculture and
Infrastructure*
Climate Policy Initiative/Pontifical Catholic University
of Rio de Janeiro (CPI/PUC-Rio)
arthur.braganca@cpiglobal.org

ANA CRISTINA BARROS

Senior Advisor
Climate Policy Initiative/Pontifical Catholic University
of Rio de Janeiro (CPI/PUC-Rio)
acbarros040@gmail.com

LUIZA ANTONACCIO

Legal Analyst, Climate Law and Governance
Climate Policy Initiative/Pontifical Catholic University
of Rio de Janeiro (CPI/PUC-Rio)
luiza.antonaccio@cpiglobal.org

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