Above and Beyond IA: Benefits for the Territory Development

Abstract

Undertaking actions that just respond to impacts has shown to limit project´s social acceptance, especially in complex socio-environmental contexts. Promoters and investors need to ensure wide and positive outcomes that surpass project boundaries and have an effect on its neighboring territory and its sustainability. A flexible, integrated and multidisciplinary IA methodology has been developed from applied experiences in multiple Colombian major investment projects over the last 40 years. Through the knowledge of the local territory and its socio-environmental trends, the qualitative and quantitative methodology uses IA under project and no-project scenarios to determine a Significance Index (SI) that considers modern concepts enabling promoters for better decision making and clever high-return investment. This paper will show results and conclusions of case studies where the methodology has been applied, demonstrating that an open mind and modern approach to IA can become a suitable tool for project and territory sustainable development

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Background

Since its origins, Impact Assessment (IA) process and methodologies have been adequate for decision makers (promoters, agencies and authorities), however as social awareness towards infrastructure and development projects has increased stakeholder expectations and involvement in the decision making process has also increased. Nowadays communities whose territory is directly affected by projects are actively involved in the Environmental and Social Impact Assessment (ESIA) processes and even further are key in the outcome of the decision making process.

Territory and community expectations increase as the early project study and design phase advance, usually resulting in local leadership expressing concerns about impacts, effects and how the immediate socio-environmental conditions will change. Underlying these concerns there is usually a legitimate claim for actions from promoters that result in benefits and welfare for the territory.

Over decades of experience in IA in Colombia and throughout its geography a team of specialists of the consultancy (INGETEC) have applied concepts and specific actions that result in an effective IA methodology that not only identifies, quantifies and qualifies project impacts but also identifies opportunities to implement additional activities that create value and welfare for the territory. It has become evident that project sustainability can only be achieved when the project not only becomes an integrated part of the territory but also

becomes an engine for territory welfare. In other words, a project has an obligation to manage, control and compensate for its impacts but in order to reach sustainability it should implement specific additional actions that result in benefits and welfare for the territory – managing impacts is not enough.

While implementing actions geared toward providing welfare (benefit to society) might seem straightforward, measuring change in welfare due to implementation of specific actions is not easy, as it requires a considerable amount of baseline data and requires short, mid and long term measurements and monitoring of key indicators in order to confirm effectiveness. IA and ESIA need to propose specific goals and key indicators to measure such changes in welfare once the management plans are implemented. It is proposed by the authors and consultancy the use of Economic Environmental Evaluation (EEE) as a valid method to estimate the real effect of proposed actions. EEE of impacts and benefits should be included as part of the ESIA.

Methodology and Application

While IA results in a comprehensive management plan, actions in such a plan are limited to impact management and seldom do they incorporate actions that result in clear and specific welfare and benefits, also called “additionalities”.

An analytical, holistic and integrated methodology has been developed and implemented by the authors and other specialists of the consultancy during the development of ESIA studies over the last decades. Originally adapted from Arboleda[(1)] and considering definitions from Conesa[(2)], the methodology has been far from static, on the contrary dynamic. Being perfected and adjusted as experience grows, regulation develops and novel and modern IA concepts appear. INGETEC´s state of the art IA process is based on the following concept.

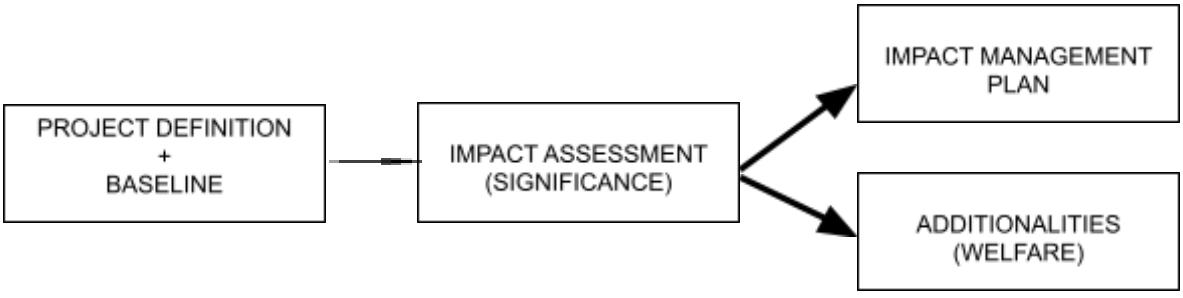

Figure 1. INGETEC´s IA for impact management and welfare creation

Parting from a project definition and characterization of the area of influence (baseline), impact assessment is developed using an analytical and holistic methodology. Impacts are ranked according to their Significance Index (SG) and finally specific actions are proposed for managing and controlling impacts, as well as creating additionality (territory welfare) [(3)].

INGETEC´s methodology for impact assessment considers a mathematical formula that when applied provides a SG. Impacts are evaluated under two scenarios. The first, with the project and the second without the project. While the project scenario provides specifics as to the impacts the project activities have on the territory (specifically the area of influence) the second scenario provides an analysis of trends in the socio-environmental components and territory (past, present and future).

While the second scenario initially was conceived as a means to compare with the other scenario it has become evident that a rigorous analysis of such scenario provides important and relevant information on the territory. It provides a valuable insight into the territory's basic necessities, as such a vast opportunity for investment and welfare creation. It should be noted and highlighted that these actions are not related to impact management and compensation, if such would be the case the validity of considering actions as an additionality would be diminished.

A mathematical formula has been created for each of the two scenarios and implemented for each analyzed impact. The formulas (one for each scenario) include parameters and corresponding weighting factors.

The formulas for impact evaluation for the two scenarios are as follow[4]:

$$SG = \{(DU*wa)+(EX*wb)+(MR*wc)+(INC*wd)+(NV*we)+ (AC*wf)+(SI*wg)\} \quad \text{(project scenario)}$$

$$SG = \{(DU*wa)+ (EX*wb)+(MR*wc)+(INC*wd)+(NV*we)+ (TE*wf)+(SI*wg)\} \quad \text{(no-project scenario)}$$

Where the Significance (SG) for each impact equals the sum of each Parameter multiplied by a weighting factor (w). Weighing factors have been established by a panel of senior specialists at the consultancy using the AHP (Analytic Hierarchy Process) and principles of pair comparison matrices[5]. These have been regularly reevaluated and confined according to specific situations and conditions (novel concepts and definitions for example).

It should be noted that each formula incorporates specific parameters and weighting factors, as such direct numerical comparison between results (SG) is NOT valid and should be avoided. A mathematical subtraction or addition between SG results from the two scenarios has no validity.

While several definitions can be provided for each Parameter, extensive research has been made to establish a unified definition as applicable to the methodology. The following table shows a summarized definition.

Table 1. Parameter definition [4]

Parameter	Name	Definition
CL	Class	Positive of Negative
DU	Duration	Length of time in which impact or its effects persist
EX	Extension	Area in which impact or its effect are present
MR	Relative Magnitude	Ratio between affected or impacted elements vs existing elements within study area
INC	Uncertainty	Uncertainty (probable error) as to duration, extension or relative magnitude
NV	Vulnerability	Refers to the level of sensibility or fragility of the impacted element and its capacity to recover from impact
AC	Cumulative	Cumulative effect of other actions, activities already present in the territory
SI	Synergy	Compound effect between two or more project impacts
SG	Significance	Index used to determine how significant an impact can be. Significant impacts are those that due to their effect should be considered as important to territory and society and should have a corresponding and specific action

Table 2. Impact ranking according to SG results [6]

SG Result and Range	Impact Ranking
4 ≤ SG ≤ 5	High Significance
3 ≤ SG < 4	Significant
2 ≤ SG < 3	Moderate Significance
SG < 2	Low Significance

Ranking impacts according to their significance is valuable as it provides an opportunity to compare among impacts and disciplines and validate overall results. Impacts ranked under Significant and High Significance deserve special interest as they should be used to determine the limits of the overall project area of influence and are key in determining

where most attention and resources should be invested during proposal and implementation of the management plan. Such impacts and actions should be evaluated under EEE to determine and ensure that project implementation provides a net positive outcome (under a BCA or Benefit-Cost- Analysis). If such a condition is not achieved the project should be deemed not feasible and modifications to the design and or impact management measures should be implemented either to reduce impacts or to improve corresponding management.

The previous methodology has been used for over three decades (adapted and improved on several occasions, 2023 the latest version) and has proven applicable and valid for diverse types of projects, different sectors and for public and private promoters. More than 100 ESIA have been subject to evaluation, most of which have resulted in environmental licensing and project implementation. However during the last 5 years, as EEE has become a primary method for determining the BCA, the numerical methodology for impact assessment has become a key instrument to EEE.

Difficult socio-political context in territories where infrastructure and development projects are to be implemented has forced IA one step further. Specifically geared towards implementing specific additional actions to impact management and creating welfare for territory and society. While the methodology explains and analysis effects of project activities it also provides visibility of conditions and situations that explain where the territory and its communities could benefit from investment from the project promoter.

The use of EEE to effectively measure the net positive contribution of such additional actions needs to be implemented during preparation of the ESIA and during implementation of the project. Measuring the real benefit to society is a favorable tool for project promoters when it comes to disclosing the real benefit of their investment, also a valuable tool to determine if the investment is offering value and welfare.

Conclusions

In today´s complex socio-political territories where even basic needs are not satisfied, project development becomes a real opportunity for territory development and sustainability. As promoters and projects focus resources and investment on specific territory needs and create welfare for its communities it has a higher chance of becoming part of the landscape and being considered by locals as an asset.

Over the last decades an IA methodology has been perfected through its vast application in diverse industry sectors, promoters and locations across Colombia. Based on a project definition and a solid socio-environmental characterization of the territory (baseline) an integrated and analytical approach and process has been implemented. The process includes a mathematical analysis of parameters to obtain a significance rating for each impact. The process analyzes scenarios with and without the project.

Application of the methodology and process has resulted in successful project licensing and foremost adequate prediction of impacts, enabling implementation of effective impact management measures. Over the last decade an additional effort and analysis has been set to identify instances where territories can benefit from additional promoter investment. Such investment or “additionality” is conceived for the purpose of generating benefit and welfare for territory and local communities.

Coupled with EEE, the methodology provides sufficient insight and is a valuable tool to set up the stage for welfare and social benefit measurement. IA and ESIA are key instruments in which actions can be proposed and their real benefit can be measured (ESIA sets target indicators and goals for short, mid and long term measurement that monitor investment effectiveness).

Shifting from IA traditional mindset is by itself a challenge for specialists, however if IA is understood as a tool to provide net positive benefit and welfare for society while maintaining project and promoter sustainability in the territories motivation should be guaranteed. Successful outcomes from implementation of INGETEC´s methodology has been demonstrated even though it has had to overcome setbacks amongst them the lack of detailed public information and data and need to detailed additional studies, promoter resistance and community buy-in.

The current paper falls short of explaining details and presenting the detailed IA methodology and process, both authors will be available for consultations and further details on implementation.

References

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