

## How to calculate and integrate a Cumulative Social Impact Index in Engineering Projects for more Sustainable Outcomes

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### ABSTRACT

The decision-making process concerning with designing and implementing a planned intervention or project relies often times on economic and technical arguments, expressed as data, indicators, models. This paper argues that projects could benefit out of taking into consideration, aside from this economic and technical dimensions, also aspects regarding the social impact of that respective intervention or project. For the past over 40 years, with applicability especially in engineering domains, Social Impact Assessment (SIA) has been developing tools, methodology, and distinctions to support this idea. SIA implies identifying and managing social impacts generated by planned interventions.

This paper is aiming to propose a model that allows integrating all positive and negative social impacts into a single cumulative social impact index. In order to do this, the process requires identifying the social impacts expressed as variables. The challenge in the attempt to use social data is the fact that these variables, which describe the main dimensions of the social context and/or express social processes of change (for example), differ in nature. There could be qualitative or quantitative data, variable with different measurement units and different weights. The model proposes ways to solve these and other challenges, resulting in a general methodology that (following provided guiding principles) could be used by any planned intervention that has a social impact. In addition to this, the model implies the use of participative tools, involving stakeholders into this process.

While the process of obtaining all the data integrated into this index is complex, the outcome is a

dichotomous variable that is easy to read. Taking into considerations social impacts contributes to increasing the project's sustainability and reducing possible risks that could emerge if these aspects are disregarded

### INTRODUCTION

This paper presents a conceptual model designed to facilitate integrating social impacts within the decision making processes of planned interventions or projects [1]. The decisions processes we make reference to could be concerned with the development, designing, features, implementing, and resources allocation for any planned intervention, project and public policy. This model was proposed as part of the doctoral research undertaken by the author [2-9].

The vast majority of projects that make use of Social Impact Assessment (SIA) methodologies are projects that produce a change within the physical environment and as a result propose a different use of the natural resources in that area or SIA is defined as "the process of analysing (predicting, evaluating and reflecting) and managing the intended and unintended consequences on the human environment of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions so as to bring about a more sustainable and equitable biophysical and human environment" [10-17]. SIA has been used in projects concerned with: mining exploitations, building roads, bridges, dams, etc. In the same time, the theoretical distinctions regarding SIA do not limit the applications of these tools and methodologies only to the above-mentioned domains. One could infer that there could be other domains that could benefit from SIA. As a result, the proposed model that integrates

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social impacts identified and measured as proposed by SIA can be used in a wide range of domains, planned interventions, projects, public policies, etc.

## WHAT ARE SOCIAL IMPACTS?

SIA aims to measure and manage the social impacts generated by a planned intervention. Social impact refers to “the consequences to human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organize to meet their needs and generally cope as members of society”. The term also includes cultural impacts involving changes to the norms, values, and beliefs that guide and rationalize their cognition of themselves and their society[3].

## Calculating a Cumulative Social Impact Index-A Conceptual Model

SIA process aims to assess or anticipate the social consequences of a planned intervention[10]. “Social Impact Assessment (SIA) can be defined in terms of efforts to assess or estimate, in advance, the social consequences that are likely to follow specific policy actions (including programs/ projects and the adoption of new policies), and specific government actions. It is a process that provides a framework for prioritizing, gathering, analyzing, and incorporating social information and participation in the design and delivery of developmental interventions. The SIA ensures that the development interventions: (i) are informed and take into account the key relevant social issues; and (ii) incorporate a participation strategy for involving a wide range of stakeholders. Social Assessment (SA), on the other hand, is a process that provides a framework for prioritizing, gathering, analyzing and incorporating social information and participation in the design and delivery of development operations”

## CONCLUSION

This paper presents a model aiming to support projects, planned interventions to better consider social impact on their decisions regarding development for more sustainable outcomes. The process of calculating the cumulative social impact index integrates elements of social research and participative tools and the result is a dichotomous variable easier to be integrated into the decision about designing and implementing a project [19-21]. The model makes the presumption that all concerns regarding social research methodology and participative methodology are taken into consideration when collecting data to calculate the social impact index. Each project requires a tailor-made approach in mapping stakeholders, identify the social impact variables, measuring them and establishing their weight. The problems this project is aiming to solve are:

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