IAIA 2012 - Porto

Health Session: Health baseline data within different impact assessments

Before the Beginning: *'intelligent'* baselines

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Abstract:

Current impact assessment (IA) operating principles begin with a Screening phase made to coincide with the Project's Conceptual phase. What if screening were not to constitute the first phase of the IA process? What if the first alignment with oil & gas projects took place before project alternatives' conceptualisation?

Business investment studies are generally based on economic, engineering and logistic considerations. Business Intelligence Studies (BIS) foresee the execution and mapping of an area assessment before any engineering concept is conceived, allowing to identify and factor into earliest investment decisions a number of potential social, health and environmental criticalities, alongside customary financial and logistic evaluations. Moreover, mapping these "*new*" criticalities allows for quick visual assimilation of findings.

Two case studies, situated in Sub-Saharan Africa and with a particular focus placed on the health component, will be put to comparison. The one outlining a *baseline* data analysis and the relative obstacles therein encountered, initiated, as per standard IA procedures, in-line with project conceptualisation, the other illustrating "*base*" data collection for a Business Intelligence study and the potential its results represent in guiding and aiding future phases of both IA and Project design. An example: identification of key relevant indicators as of IA's earlier stages.

All too often, baseline analyses and IAs find themselves following a project on the side lines. BIS acting as an *input* to Concept Design, means that IA need not risk running in parallel to a project but rather forge the initial section of the project's rail tracks.

'Fuel' for thought

When it comes to assessing project impacts why shouldn't the Impact Assessment (IA) practitioner look the gift horse straight in the mouth? We rarely have the power to influence our engineering consorts and their choice of project design and site-selection. But what if we could? In this paper we shall attempt to illustrate how the input of Business Intelligence (BI) studies, which incorporate baseline data collection and contextual criticalities identification into earliest stages of project planning, could influence project conceptualization and hence obviate many of the future obstacles to IA and its relative effectiveness.

Two Oil&Gas sector case studies, situated in Sub-Saharan Africa will be put to comparison. The one outlining a *baseline* data analysis and all the relative obstacles therein encountered, initiated, as per standard IA procedures, in-line with project conceptualisation, the other illustrating "*base*" data collection for a Business Intelligence study and the potential its results represent in guiding and aiding future phases of both IA and Project design.

Business Intelligence

BI mainly refers to computer-based techniques and analysis methodologies used in identifying, extracting and analysing data, in view of generating information and hence supporting knowledge-based decision-making (Vercellis, 2009). A decision is the choice selected among multiple alternatives. Criteria are the measure of each alternative's effectiveness. Economic, technical and logistic criteria most commonly influence companies' business investment choices, and in more recent years they are being joined by legal, ethical and political considerations.

Meanwhile, Environmental, Social and Health Impact Assessments (ESHIAs) have come to be internationally recognised primary decision-making tools for maintaining and enhancing ESH quality while carrying out economic development. Fig.1 illustrates a Best Practice example, within the Oil&Gas industry, of aligning the ESHIA and Project Development (PD) processes. Yet, unlike the economic and technical business evaluations, ESHIA outcomes cannot actually feed into the initial Project Concept Phase. In practice, the ESHIA procedure begins once project design is complete; data-choice for impact evaluation requires knowledge of the project. Even preliminary ESHIAs foresee project alternatives' assessment and hence follow basic project design. At this point in the timeline, any project modifications in response to ESHIA outcomes generate both time delays and economic losses, without even mentioning the hypothesis of a whole new project design. The ‘natural’ result is recourse to impact mitigation and compensation, leaving little or no room for project alteration options.

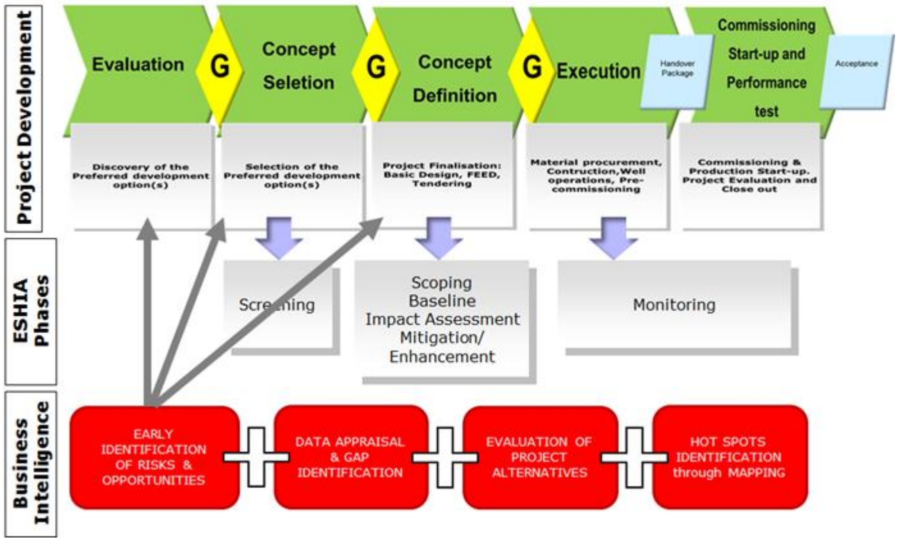


Fig. 1 - Basic ESHIA phases aligned with Project Development phases

Saipem (an Oil&Gas services company operating worldwide) proposes enriching with environmental, social and health criteria, current business decision-making for PD in the Oil&Gas sector. BI studies have the objective of collecting and mapping high level environmental, social and health data on a specific potential project area, when a project is as yet undefined and alternatives unidentified. The results allow to factor into earliest investment decisions and the Concept Phase a number of potential ESH criticalities, enriching customary business investment studies’ financial and technical evaluations (see Fig. 2). Moreover, mapping these “*new*” criticalities allows for quick visual assimilation of findings.
BI’s anticipation of ESH issues’ influence on project development is also what makes it a valuable instrument of response to certain IA challenges, challenges typically manifest in the baseline phase. With a particular focus on the health component, two Oil&Gas projects put to comparison in the following section shall illustrate how BI can contribute to the efficacy of a baseline analysis, in turn propaedeutic to a successful IA.

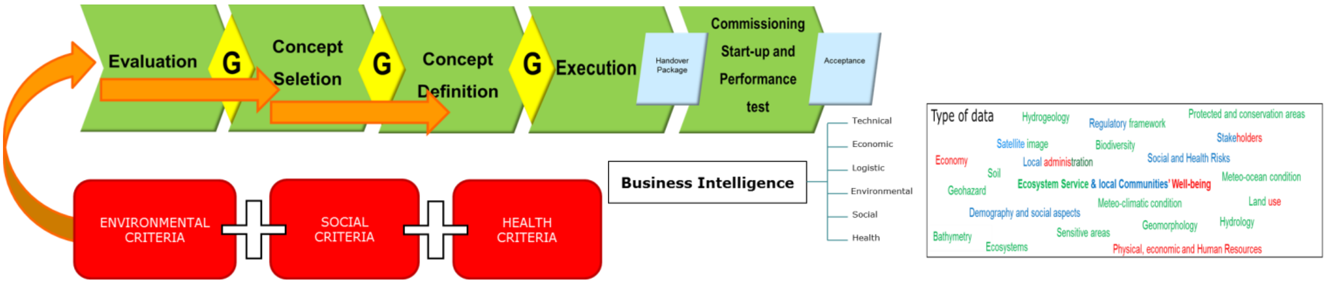


Fig. 2 – Factoring into earliest investment decisions and the Concept Phase a number of potential ESH criticalities through Business Intelligence

Let us now examine in practice how Business Intelligence can contribute to overcoming typical obstacles in baseline execution, focussing our examples on health.

‘Intelligent’ Baselines

The two case studies[1], were chosen for similarity in geographical location (sub-Saharan Africa) and the likely technical specifications of their respective projects. The CaseA project had already entered the Concept Phase. Hence, as per standard IA procedure, Screening and Scoping[2] were carried out, to be shortly followed by on-site baseline data collection. The project under CaseB was as yet inexistent, merely the concession to explore had been granted. Here the IA team began a BI study that would feed into the Concept Phase. BI suggests aligning and inputting into the Concept phase knowledge of receptor communities’ ESH conditions, anticipating part of the Baseline phase which foresees data appraisal, evaluation and gap identification.

[1] The specific projects’ names, descriptions and locations cannot be provided in respect of Client privacy rights.
[2] Screening and Scoping according to Oil&Gas Industry ESHIA Standards foresee rapid appraisals of possible risk factors through an examination of mainly high (national/regional) level data and general project criteria/description.

Case A provides many an example of typical challenges to an effective IA Baseline. Indeed, what we noticed is how one challenge often led to one or more in a sort of domino effect. Health status baselines, whether used to measure potential project impacts on well-being or to monitor changes in the health environment once the project is in place, require the identification of relevant indicators to be effective. Case B approach could in time prove a possible response to such challenges.

1. Prepping for baselines consists in the critical overall *appraisal of available data*. Existing sources of information must be collected, collated and evaluated for accuracy and relevance, verifying their capability to provide adequate baseline data before actually carrying out the baseline. Yet time and resources allocated to ESHIAs are mostly very slim, largely undermining baseline preparatory activities. So it was with CaseA, and local-level scoping coincided with the field survey. Considering preliminary ESHIA data of the screening phase sufficient proved erroneous; indeed such data which usually provides national, at best regional level information, could not compensate. Moreover, even where medical data was found, the statistical aggregations were not necessarily useful to ESHIA considerations. A simple example, the non-distinction between new health problems and repeat visits for the same health condition.
   CaseB identified a similar challenge during data appraisal but given its collocation in the project timeline, the IA team could recommend the search for alternative sources such as NGOs or other associations active in the specific area.
2. Preparation also includes ascertaining *stakeholders' availability* (as in presence at the time of the field survey) and despondency to participate. CaseA, due to unacquired knowledge of certain political issues, cultural practices in the area and stakeholders' customary routines (e.g. water-collection hours), experienced a decided compromise in the variety of stakeholder groups' interviewed. And time restrictions meant that interview locators could not be activated nor a reference or proxy population found within the deadline.
3. *Change in expected interlocutors rendered obsolete certain data collection tools*; such as the planned Focus Group Discussion with women on health issues. While in reality it is important to use *data collection tools that have been tailored* to communities' characteristics. In this regard, it is important to bear in mind that the general approaches to ranking potential health impacts are derived from three disciplines: sociology, epidemiology and toxicology. Indeed, does not an indigenous HIA process require health indicators which make use of the knowledge of the communities affected? Is this not at the basis of the debate on health determinants' importance? Different socio-economic and cultural groups experience different sensitivity in exposure to health problems, yet all too oft we are merely requested to adopt a set of indicators taken from a general-purpose baseline check-list.
4. Change in expected interlocutors also generated a *selection bias in baseline sampling*. Practically only community representatives, local administrators and a few other participants, who simply had the influence to select themselves, were involved in the data collection. Such a sample-type in a way facilitates survey implementation but, in concomitance with limited statistical data, later makes it difficult to truly tell on the basis of baseline data collected, whether observed deviations from existing health conditions are to be strictly considered the result of project implementation or of the specific characteristics of the receptor communities.
5. Ultimately, incomplete *contextualisation/characterisation of the receptor communities* constitutes a challenge to baseline efficacy, in particular in its usefulness to the later phases of monitoring and follow-up. For example, it is not always immediately evident what the background or baseline incidence of certain diseases in a given population may be. In such cases, it is useful to examine in further depth whether disease incidence rates in the target area significantly exceed those of neighbouring areas. In fact, had identification of CaseA particular phenomena (not necessarily attributable to the project's implementation) occurred at an earlier stage, there might have been more room left for further investigations within the ESHIA development.

This dominoes sequence of obstacles left CaseA IA team with a predominance of qualitative, high-level data and few health indicators useful and pertinent for subsequent ESHIA phases. The non-execution of a relevant baseline can cripple core ESHIA sections; potential impacts assessment and monitoring and follow-up. Moreover, a strong data and indicator mechanism could serve to provide a more accurate depiction for future assessments of a similar nature and allow us to strengthen our knowledge of cumulative effects.

The BI approach adopted in CaseB showed positive implications from the start, allowing to identify potential ESH criticalities that could interfere with normal project development and IA efficacy. Early suggestions on which criticalities require further study reduce future survey costs and time. Similarly,

early identification of technical incompatibilities with existing physical and anthropic ecosystems reduces project alteration costs and time, reduces recourse to mitigation and compensation.
The approach adopted in Case B can be broken down into a few main phases and outcomes:

- Data Gathering
- Data appraisal and gap identification
- Site characterisation on the basis of data available, interpretation of cartography and consequential hotspots identification
- Sites analysis on the basis of risks and opportunities identified

Data gathering: With reference to the specific study area, BI began with useful data, relevant stakeholders and local researchers' competencies appraisal. Sources of information generally include secondary data collected on-site and remotely through health reports, health surveys, as well as, local health policies and programmes; a few key stakeholders may be consulted (see Fig. 3).

WHAT	HOW
Social & Health Risks Data - National/regional health policies & programmes - Disease Burden - Communicable Diseases - Food security & malnutrition - Watsan - Welfare: Education & Poverty - Health services coverage - Natural disasters susceptibility - Geopolitical & cultural issues - as well as appraisal of local research resources and capacity **Ecosystem Services** - Arable/agricultural lands - Fishing zones - Tourism areas - Timber forests (fuel/firewood)	**Publicly available sources** - Institutional (UN, WB, WHO ....) - Resources centers (Universities, national providers....) - Government and regional database - Publications - Maps **Project database** - Past Project data - Private providers (IHS, Eastview cartographic....) **Satellite images, aerial photos & cartography** - Public sources (Landsat, Google, Microsoft.....) - Project acquisitions - Archive (already available) - New acquisitions (to be scheduled)

Fig. 3 – Business intelligence data collection and relative sources

Alignment of project conceptualization with existing health policies and programmes is key to long-term sustainable planning. Project and local context affinity are better consolidated, often also leading to expedited project approvals in the future. Meanwhile, discovering tardily the competency of local researchers, who effectively carry out the baseline surveys, can too result in higher costs, missed deadlines, poorer work quality and again questionable results.

Data appraisal and gap identification: Data collected is classified first into relevant or irrelevant to given project topics or other topics (HSE and Sustainability). Second classification consists in whether the level of detail of data classified as relevant is sufficient or requires further analysis. Thirdly, among those requiring further analysis a further discrimination is made; data possesses sufficient accuracy and reliability to act as a starting point for analysis or absolutely requires much further detail? Fig. 4 illustrates these three classifications of data components.

	Project topics				Other topics		
Components & Geographic Information	Logistics	Engineering – Civil	Engineering – Process	Production/ Operation	Exploration	SUST	HSE
Policies and programmes	1	0	0	0	0	2	2
Regulatory framework	1	1	1	2	1	2	2
Populated Areas	1	2	2	1	1	1	1
Land-use	2	2	2	2	1	2	1
Fishing zones	2	2	2	2	1	2	1
Protected Areas	2	2	2	2	2	1	1
Infrastructure	2	1	2	1	1	2	2
Education & skills	0	0	0	2	2	1	1
Industries	1	1	2	*	1	1	2
Welfare (education & poverty)	0	0	0	0	0	1	1
Food security & malnutrition	0	0	0	0	0	1	1
Natural disaster susceptibility	*	*	1	1	1	2	2
Geopolitics	2	1	1	1	1	2	2
Watsan	1	0	0	*	1	1	1
Disease Burden	0	0	0	0	0	1	1
Communicable diseases	0	0	0	0	0	1	1
Health Coverage	1	0	0	0	0	*	*
Health C&D projects	0	0	0	0	0	2	2

0	Dataset not relevant to project
1	Dataset relevant to the project and shall be regarded as a starting point for more detailed data gathering
2	Dataset relevant and sufficiently detailed for project topics
*	Dataset relevant to project topics but far higher data accuracy required; further data gathering to be executed

Fig. 4 – Data appraisal and gap identification matrix

Site characterisation, interpretation of cartography & hot spots identification: Next mapping and spatial analysis are also carried out and help to interpret, in the case of health, the linkages between population health and environmental factors, among other determinants. Moreover, the communities/areas can be characterized into zones of relatively high, moderate, and low exposures to health risks, through the overlay of health sensitivities, health determinants and hypothetical project sites, allowing to quickly identify which areas should be concentrated on during the full baseline analysis and which health conditions will likely be linked to project development[3].

Sites analysis on the basis of **risks and opportunities** identified: Collected and validated data were used to identify contextualised ESH criticalities and inputted into the project concept phase in the form of a written report and geodatabase. Risks and opportunities are intended as on the one part those TOWARDS the project, on the other those FROM the Project TO the receptor communities. A third view is the risks to the project deriving from affecting any prior existing sensitive ESH issues.

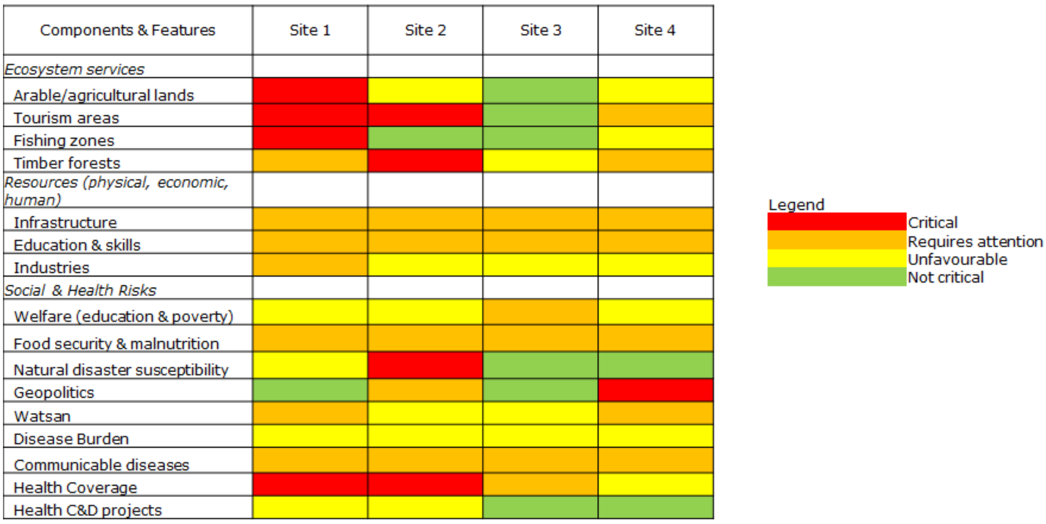


Fig. 5 – Site selection through data analysis, cartography interpretation and hotspots identification

In the case of site selection between X potential project sites, it is possible to elaborate a multi-criteria analysis on the basis of data collected, influencing project localisation in terms of ESH considerations (see Fig. 4).

Ultimately the main potentialities & advantages of taking action "Before the Beginning" consist in helping to avoid classical IA challenges through the following:

- Two-fold data input to Project Design; (1) base data to Project development process and (2) base data to ESHIA
- 3-way identification of risks: (1) to the project,(2) to the communities, (3) how project effects on sensitive ESH issues can undermine the project itself
- Early identification of critical data gaps
- Early identification of relevant and available stakeholders, in turn allowing for appropriate sampling and reliable data
- Alignment of project conceptualization with existing health policies and programmes is key to long-term sustainable planning. Project and local context affinity are better consolidated
- Given its potential to act on the design phase BI contributes to favouring the concept of AVOIDANCE at the source/root, rather than mitigation or compensation.
- An ESH integrated approach which does not only encourage communication, between project and IA, but also strengthens collaboration between environment, social and health experts of the IA team, increasing awareness on how closely interrelated their examinations are and allowing for an integrated awareness and contextualisation of receptor communities' sensitivities.

With regards to this last point, it would indeed be naïve and inaccurate to assume, as some do, that health is automatically protected if the project's environmental mitigation and protection measures are adequate. A project's impact on the biophysical environment is only one of a number of impacts which indirectly and cumulatively affects the overall health of an individual or a community. Health impacts

[3] On a more prospective basis (e.g. monitoring purposes) mortality, cancer incidence, and morbidity patterns identified could continue to be mapped over time in relation to environmental exposure.

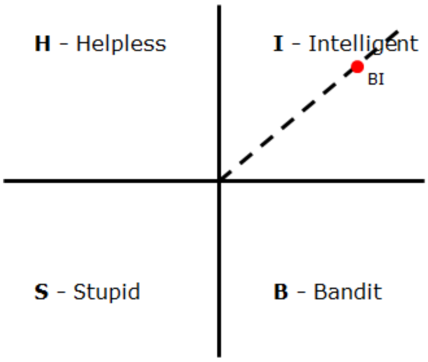
from project development can be associated to socio-economic aspects such as job-creation/increase; unemployment and underemployment have been widely associated with poorer health. The physical health of humans (e.g. bioaccumulation) or the social, community and psychological aspects of health and well-being must also be taken into account. It is only through an integrated awareness and contextualisation of receptor communities' sensitivities that relevant health indicators can be extracted and built upon.

Conclusions

Information is transformed into knowledge when it is used to make decisions and develop the corresponding actions. Design for Environment foresees that product design factors into its earliest development phases ways of minimising/avoiding impacts to the environment, steering product concepts toward the most environmentally friendly option. In a similar manner projects could be designed with the more social and health-friendly options or at least located where they might generate the lesser impact.

BI provides the project team with the necessary integrated ESH knowledge to develop sustainable[4] concepts and IA practitioners with the necessary preparatory knowledge to plan for an effective baseline. Thus, though time and resources are yes all too often an issue, by taking action earlier we are able to "fill the unforgiving minute with sixty seconds' worth of distance run". Baseline analyses and IAs need no longer risk running in parallel to a project, following it from the side lines but rather, through BI acting as an input to Concept Design, forge the initial section of the project's rail tracks.

The economist C. Cipolla devised a graph of Gain & Loss, used to determine levels of intelligence. BI actually leads to a win-win solution, and therefore 'naturally' lies in the 'I' (Intelligent) quadrant. Conclusion: acting earlier such as through Business Intelligence can help build a path to 'intelligent' baselines.



Cipolla's Graph of Gain & Loss to determine levels of intelligence

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[4] Sustainable on all fronts: financial, technical, logistic, environmental, social and health.