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## Ethical Analysis for Evaluating Sustainable Business Decisions: The Case of Environmental Impact Evaluation in the Inambari Hydropower Project

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**Abstract:** We propose an ethical analysis as a method to reflect on how companies' decisions promote sustainable development. The method proceeds by first identifying the choice according to financial business interests, and by then scrutinizing this choice according to consequentialist and deontological ethics. The paper applies the method to the choice of an Environmental Impact Assessment (EIA) that a consortium of Brazilian companies (EGASUR) delivered as part of their project proposal for the realization of the Inambari hydropower dam in the Peruvian Amazon. We show that if an EIA is chosen based on the attempt to maximize the financial bottom line, it raises ethical issues both from a consequentialist perspective by involving negative consequences for various stakeholder groups, and from a deontological perspective by not complying with relevant rules, guidelines, and principles. The two ethical perspectives hence reveal where the consortium faces impediments to a genuine commitment to sustainability. Building on stakeholder interviews, observations of the project developments, and the executive summary of the actual EIA, we provide indications that EGASUR has indeed made a choice that resembles a decision based on financial interests.

**Keywords:** sustainable development; ethical analysis; business decisions; environmental impacts; Environmental Impact Assessment (EIA); hydropower

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## 1. Introduction

Companies frequently state their intention to integrate sustainability into their business strategy. For instance, Eletrobrás, a consortium member of the main business actor in the Inambari hydro energy project in the Peruvian Amazon, declares on its webpage that “reassuring its focus on society’s interests and the best practices of corporate management, Eletrobrás makes a commitment to sustainable development” [1]. Many people have doubts about such claims by business actors, however, and scholars point out cautiously, that the notion of “sustainable development” can be interpreted in many ways [2,3] and, more critically, that corporate sustainability strategies do not necessarily reflect a commitment to any values beyond profit [4].

In this paper, we propose an ethical analysis as a method for better understanding the extent to which business decisions reflect a genuine commitment to sustainable development. Our approach assumes that business decisions on sustainability issues will typically involve trade-offs between profit and the common good, and that a company’s true commitment to sustainability will therefore require the company to think and act beyond the financial bottom line [5,6]. An ethical analysis of the purely profit-driven choice can reveal where the company may face ethical issues and potential shortcomings in terms of compatibility with sustainability. We apply the method to a decision made by the company that has been granted the preliminary concession to prepare the feasibility studies for a large-scale hydropower project in the Peruvian Amazon, including the Environmental Impact Assessment (EIA). In most jurisdictions, the EIA is the key regulatory tool “to ensure that development options under consideration are environmentally and socially sound and sustainable” [7]. In this specific setting in Peru, the type and scope of the EIA is at the discretion of the project proponent, who chooses, monitors, and also pays the consultants to conduct the study. The nature of an EIA with its predictive character and inherent uncertainties, data gaps, subjective components, and implicit and explicit assumptions renders the study sensitive to potential biases in evaluation [8,9]. Hence, given the current regulatory environment in Peru, a corporate project proponent is free to choose an EIA with more or less commitment to sustainable development.

The method of an ethical analysis can be useful for companies to internally scrutinize their decisions as well as for external parties who wish to better understand the extent to which corporate decisions are committed to sustainable development. When used internally, an anticipatory ethical analysis can help managers to make decisions in an ethically reflexive way [10]. Even business decision-makers with genuine intentions for sustainability have to overcome the psychological temptation to hide from trade-offs and unethical aspects of a decision. When self-interest conflicts with other aspects, people tend to evaluate the situation with a “self-serving bias” [11,12] and to disregard or reinterpret unpleasant knowledge, arguments, or types of reasoning [13–15]. By distinguishing financial business interests from other ethical values, the method explicitly highlights potential conflicts between profit generation and sustainable development and the extent to which a responsibility toward organizational values such as profit-making, efficiency, and performance may contradict any convictions the decision-makers hold as

individuals. This facilitates the overcoming of psychological barriers, widens the ethical horizon and the understanding of trade-offs, and, given this information, can help companies to make decisions in line with their sustainability strategies. For external parties interested in sustainable development (including academic scholars), on the other hand, the method can be useful for evaluating the extent to which companies live up to their claims regarding sustainable development. This can happen before the actual decision is made—*ex ante*—in order to foresee the company's temptations to act unsustainably and to potentially influence corporate decision-making from the outside. It can also happen *ex post* to expose gaps between a company's stated intentions and its actual behavior. For the Inambari case presented in this paper, the ethical analysis was conducted *ex post* from an external perspective, after the type and scope of the EIA had already been decided on and the assessment had taken place. Interestingly, the preparatory activities for the Inambari project were discontinued in 2011 due to the local opposition against the project, raising doubts about whether the company had chosen a good approach.

The paper proceeds as follows: Section 2 introduces ethical analysis as a method for evaluating the sustainability of business decisions. Section 3 applies the method to the case of the Inambari hydropower project in Peru, focusing in particular on the corporate project proponent's choice of the EIA. In Section 4, the paper evaluates empirically whether the actual choice of this particular EIA was aimed primarily at maximizing financial business interests. Section 5 concludes the paper.

## 2. Methodology: Ethical Analysis of Business Decisions

We propose ethical analysis as a method to evaluate the extent to which a particular business decision is aligned with sustainable development. The proceeding consists of four consecutive steps: clarifying the scope of the analysis, determining the choice based on financial business interests, the actual ethical analysis, and the ethical reflection on the decision.

### 2.1. Clarifying the Scope of the Analysis: The Context, the Business Actor, and the Decision

Prior to the ethical analysis, it is useful to clarify the context in which the decision is made, to identify the business actor actually making the decision, and to specify exactly which decision shall be analyzed. Typically it will be useful to survey the business actor at the hierarchical level at which strategic goals and intentions are formulated. Operational decisions may be taken at lower levels (e.g., business units), yet the responsibility for ensuring the alignment of a certain decision with strategic goals to promote sustainable development can be assumed to be at a high level of corporate governance. In case of project consortia, such as in our case study analyzed below, it can be important to identify the main strategic actor within the consortium who formulated strategic sustainable development. As for the specific decision to be analyzed, it needs to be substantiated why the decision chosen is highly relevant for sustainable development.

### 2.2. Identifying the Choice Based on Financial Business Interests

The choice based on financial business interests is used as an auxiliary construction: it identifies the choice which would have been made if only financial business interests had been taken into account, analyses it, and then compares it with the decision actually proposed or already made. This needs to be explained in more detail: our approach assumes that business decisions on sustainability issues will

typically involve trade-offs between profit and the common good, and that a company's commitment to sustainability will therefore oblige it to think and act beyond the financial bottom line [5,6]. An ethical analysis of the purely profit-driven choice can reveal where the company may be confronted with ethical issues and potential shortcomings in terms of its contribution to sustainability. We therefore start the analysis by defining, as a point of reference, the choice in line with maximizing expected financial performance, which we label financial business interests. According to the standard business paradigm in free market economies, a company's core interest should be to maximize profit for shareholders [16]. We only use the approach based on profit maximization as a hypothetical scenario, but in many cases there can indeed be pressures and temptations for companies to take this route.

### 2.3. Ethical Analysis

How is the actual ethical analysis conducted? Ethical analysis can scrutinize a particular decision or course of action—here, the choice according to financial business interests—with respect to its alignment with the normativity of particular ethical theories. Given multiple ethical theories worthy of consideration [17], we focus on the perspectives of the two most prominent ethical approaches of western moral philosophy: consequentialism and deontology. The ethical analysis hence clarifies the extent to which a decision that maximizes business interests raises ethical issues according to these two ethical perspectives. We note that both consequentialism and deontology are broad categories of ethical thinking, containing a variety of more specific theories [17]. Our analysis intends to capture the essence of the general approaches and to operationalize them for our application.

#### 2.3.1. Consequentialist Analysis

Consequentialist ethics determines the appropriateness of an action according to the positive and negative value of its consequences [18]. Our operationalization first identifies relevant stakeholder groups, *i.e.*, who is affected. Subsequently, it evaluates the consequences in terms of expected benefits or harm that each of the stakeholder groups accrues due to a decision based on financial business interests.

#### 2.3.2. Deontological Analysis

According to deontological ethics, what makes a choice right is its conformity with a moral norm, rule, or principle [19]. The first step of this part of the ethical analysis is to specify the rules, guidelines, and general principles which are of high relevance for the sustainability of the decision. It then assesses the extent to which a decision based on financial business interests complies with each of them.

### 2.4. Reflection on Planned or Actual Behavior

As mentioned, an ethical analysis may be useful internally for the business actors themselves or externally for third parties who wish to judge whether corporate decisions promote sustainable development.

A business actor would ideally conduct the analysis prior to the actual decision. In this case, the company can use it to reflect on existing plans or attitudes toward different possible courses of action, and to better understand potential trade-offs between a profit-maximizing approach and sustainability.

For such a reflection, an open view on different perspectives and the willingness to accept trade-offs between financial interests and sustainability goals is indispensable.

From a different perspective, a third party may conduct the analysis in order to foresee a company's temptations to act unsustainably. The goal of such an *ex ante* analysis may be to influence corporate decision-making from the outside. A second reason for an external analysis, this time as an *ex post* observation, may be to expose gaps between a company's stated intentions and its actual behavior. An external analysis will typically be more complicated due to the fact that the third party does not have direct access to all the data needed to characterize the course of action based on financial business interests. In addition, a judgment on whether the actual decision seems to be driven purely by profit maximization or includes genuine concerns for sustainable development will need to rely on indications. With the Inambari case presented below, a set of possible indicators will be introduced.

### 3. Applying Ethical Analysis to the Inambari Hydropower Project

#### 3.1. Scope of the Analysis: Context, Business Actor, Decision

##### 3.1.1. The Context: South-American Energy Integration and the Impacts of Hydropower in the Amazon

In order to satisfy the energy demand of its rapidly growing economy, Brazil is searching for energy generation capacity, the most promising potential source being hydro energy [20]. Due to the more favorable geographic conditions in the neighboring countries, Brazil already promoted large hydro energy plants in border regions (e.g., Itaipu in Paraguay and Madeira in Bolivia) and more recently pursued its interests in Peru. In Peru, the water flowing down from the Andean heights possesses a technical potential for hydro energy estimated at 60,000 MW p.a. [21]. Peru's current consumption amounts to only 4200 MW p.a., with an estimated annual growth of 6% [22]. In 2010, the Peruvian president Garcia Perez and his Brazilian counterpart Lula da Silva signed a bilateral agreement on energy cooperation and on the development of hydro energy projects with a capacity of up to 7200 MW p.a., 80% of which, for a start, would be exported to Brazil [20,23]. Five project sites for large dams in the southeastern Peruvian Amazon were selected, the realization of which implies total investments of 15 billion dollars US. The Inambari site, the largest of the five, with an estimated potential of 2200 annual MW and the site closest to the Brazilian border, was the first to be taken into consideration by the Brazilian corporate sector.

Typically, large hydropower projects in the Amazon as well as in other regions of the world have large social and environmental impacts [24]. With regard to social aspects, decision-makers face difficult trade-offs between prospects for direct and indirect regional and national development (including employment, health services, educational systems, infrastructure, *etc.*) and detrimental effects, such as the relocation of communities, and the destruction of cultural heritage and social structures. The environmental impacts of hydropower projects in Amazonia are mainly consequences of the flooding of large areas of forest ecosystems, of its biodiversity in the reservoir, and of the disruption of the natural flow of the rivers [25,26]. Impacts include harm to the fish population, particularly the migratory fish that cannot pass the dam, the alteration of the natural flow of sediments (including their fertilization effect for downstream ecosystems), as well as the contamination and physical and chemical changes of the water. Flooding primary forest involves the loss of biodiversity and of the ecosystem services it would otherwise generate for society [27,28]. For instance, the decomposition of flooded biomass causes

significant emissions of methane [29,30] and the disruption of previously unregulated rivers involves risks of extreme flooding and the spreading of diseases caused by increased mosquito populations [29]. Additional harm is done by constructing the transmission lines necessary for transporting the electricity, as they cause deforestation directly and indirectly and also lead to the accessibility of untouched areas [31].

The reservoir for the Inambari project would involve the flooding of a territory of approximately 410 km<sup>2</sup> situated in three Peruvian regions (Puno, Cuzco, Madre de Dios). The land to be flooded consists mainly of primary forest, including part of the “buffer zone” for the Bahuaja Sonene National Park. Several villages with currently around 8000 inhabitants would also be flooded, which would affect educational institutions and economic activities such as agriculture, fishing, gold mining, and trade [20]. Moreover, over 100 km of the Interoceanica Sur highway would fall victim to the reservoir [32].

### 3.1.2 The Main Business Actor: EGASUR and Its Consortium Member Eletrobrás

In early 2008, Eletrobrás (Centrais Elétricas Brasileiras S.A.), Furnas Centrais Eletricas S.A. (an energy company that is part of the Eletrobrás umbrella organization), and the construction company OAS, as the initial step, set up a Brazilian company called INAMBARI Geracao de Energia, and subsequently registered the Empresa de Generación Electrica Amazonas Sur S.A.C. (EGASUR) in Peru. In 2011, the Spanish construction company Obrascón Huarte Lain (OHL) took over 41% of the OAS shares. The EGASUR board consisted of one representative from each of the consortium members. In the same year, the Peruvian Ministry for Energy and Mining (MINEM) granted EGASUR a two-year temporal concession preceding the final decision on the actual building of the dam for developing the necessary preparatory studies. EGASUR had an office in Lima and a small local office close to the Inambari site. Although EGASUR is the actor for the operational decisions of the Inambari project, we see Eletrobrás as the main strategic actor. Eletrobrás is the Brazilian market leader in electric power generation and transmission areas. Being over 50% state-owned, it is a key actor in the implementation of national energy policy. Also, the company’s first “integrated strategic actions program” [33] builds extensively on the energy integration between Brazil and Peru, thus forestalling future decisions. Moreover, the quote in the introduction illustrates that Eletrobrás commits itself to a strategic promotion of sustainable development.

### 3.1.3 The Decision: Choosing the Environmental Impact Assessment (EIA)

We identify the choice of EIA as a key corporate decision with large sustainability implications. The EIA serves policy makers to determine whether a project is altogether viable for the development process of the country. In case the project is rated as viable, negative impacts should be met with mitigation efforts or be compensated. However, as institutional and procedural aspects of EIAs vary across jurisdictions, so does their effectiveness for incorporating environmental protection in development decisions [9,34]. Crucial aspects for their effectiveness in this respect are, for instance, the general status of environmental concern as compared to other (economic) development objectives, the independence and authority of the reviewer, and whether the actor responsible for conducting the EIA has a vested interest in project approval [7,34]. In accordance with Peruvian legislation, EGASUR as the project proponent subcontracted a consultancy for conducting the EIA. The contracted consultancy needs to be registered with the ministry, but the type and scope of the EIA is at the discretion of EGASUR.

### 3.2. Identifying the Choice Based on Financial Business Interests

Given various possible specifications of the EIA, the ethical analysis starts by looking for the choice based on financial business interests, *i.e.*, an EIA that maximizes the expected profitability of the project. A first determinant for profitability is the cost of an EIA, which will depend to a large extent on the scope of the study and the resources that the consultants dedicate to it. In addition, larger and more renowned consulting companies tend to be more expensive than smaller ones. Moreover, the duration of the study is of importance for profitability. Since any delay in the overall process is costly, EGASUR has an interest in assuring that the final concession can be given as early as possible. Finally, the results of the study will determine the expected profitability of the Inambari project. The EIA identifies and evaluates direct and indirect impacts caused by the project, which affect expected profitability in two ways. The severity of the impacts will influence the decision of the Peruvian government on whether or not the project is viable and should be implemented. If only few impacts are expected and the identified impacts are evaluated as causing fairly little harm, this increases the probability that the final license is granted. If it is actually granted, the identified impacts determine the impact mitigation and compensation measures, for instance, for relocation of the affected population, for the destruction of forest areas, for environmental management programs, *etc.* Hence, fewer impacts and lower evaluation of the expected harm reduce the anticipated costs for mitigation and compensation measures. At any rate, in order to ensure that the final concession can be granted, the process and content of the study need to comply with the legal requirement of current Peruvian legislation.

One more point has to be kept in mind: intangible factors such as reputation and consumer trust are crucial for the firm's market valuation [35]. For the EGASUR consortium members, Inambari is only one among many projects. For instance, Eletrobrás is already involved in studies on other Peruvian projects, and the company is building a reputation of acting in a socially and environmentally responsible manner. Thus, EGASUR has to avoid strong negative sentiments within society directed against consortium members, and it unconditionally will avoid that civil society at large regards the EIA as unacceptable or scandalous, *e.g.*, due to non-compliance with the law or grave misrepresentations of the impacts. In order to improve public perception of the project, EGASUR may even decide to conduct a public relations campaign.

To sum it up, the EIA choice according to the financial business interests is a study that is cheap and quick, identifies only few negative impacts, and attributes low monetary values to them, while complying with current Peruvian law and avoiding a scandal. We label such a study “minimalist EIA”.

### 3.3. Ethical Analysis

Now the notional decision to conduct a minimalist EIA is scrutinized with the means of an ethical analysis. As pointed out above, we have chosen two prominent ethical approaches to do so. We remind the reader that at this point of the analysis we do not assume that EGASUR has indeed chosen a “minimalist” EIA (Section 4 will evaluate whether this seems to be the case)—we only survey it as a standard of comparison. The ethical analysis discloses to which extent a decision based on financial business interests raises ethical issues in order to reveal potential shortcomings regarding sustainability.

As mentioned in the methodology of Section 2, the company could have performed an ethical analysis *ex ante*, that is, before actually choosing the EIA, in order to obtain a more holistic view of its decision.

### 3.3.1. Consequentialist Analysis

Table 1 summarizes the results of the first part of our analysis, including a list of relevant stakeholders that are affected by the choice of a minimalist EIA and the consequences in terms of their expected benefits or of the harm they would endure. As already outlined above, EGASUR expects the highest profit from a minimalist EIA. Assuming that financial success is the sole relevant consequence for the company, it benefits from a minimalist EIA. A minimalist EIA will understate the negative impacts for the affected population as compared to a less biased and more exhaustive study. As this increases the likelihood that the project is accepted, it concurrently makes it more likely that the negative consequences for the affected population will actually occur. A minimalist EIA also leads to an undervaluation of mitigation and compensation efforts. This harms the interests of the affected population. For Peru as a country, a minimalist EIA fails to internalize all externalities that will come along with the decision to grant the final concession (e.g., the full social costs, the risks involved, the losses in natural resources and ecosystem services). This implies a higher likelihood that the project will be executed with a net welfare loss for Peru. The economic and energy-related interests of Brazil are more likely to be met with a minimalist EIA, due to the higher probability that a concession is actually granted. This is a benefit for Brazil. Humanity on a global level is affected by biodiversity loss, forest degradation, and emissions of CO<sub>2</sub> or methane. For instance, the Copenhagen Accord [36] has declared halting deforestation and forest degradation as an important pillar for fighting global climate change. A minimalist EIA harms the global community by neglecting negative external effects, which within a more comprehensive study could have been identified and potentially mitigated. Finally, the Inambari project involves substantial harm for nature, including killing animals and plants in the flooded area. A minimalist EIA study will tend to omit or understate non-anthropocentric values, hence, nature will be harmed.

**Table 1.** Consequences of a minimalist EIA for different stakeholders.

Stakeholder	Benefits	Is Harmed	Description
EGASUR	x		Higher expected profit
Affected population		x	Higher likelihood that negative impacts will actually occur Lower mitigation efforts and compensations
Peru		x	Welfare loss due to incomplete internalization of externalities
Brazil	x		Higher likelihood to meet energy demands
Global community		x	Welfare loss due to neglect of global externalities
Nature		x	Ignoring or low valuation of nature

### 3.3.2. Deontological Analysis

The deontological analysis first specifies the rules, guidelines, and general principles relevant for the choice of an EIA and then assesses the extent to which a minimalist EIA would comply with each of them (see summary Table 2). For the sake of clarity, we group the different rules and principles as legal



rules, standards of financing institutions, international good practice guidelines, voluntary corporate principles, and general principles.

**Table 2.** Compliance of a “minimalist” EIA with relevant rules and principles.

Rule or Principle	Compliance	Unclear	Non-Compliance
Legal rules			
Present Peruvian law	x		
Future Peruvian law			x
Brazilian legal standards			x
Standards of financing institutions			
Brazilian National Bank for Economic and Social Development (BNDES)	x		
Equator Principles			x
International guidelines for good practice			
UNEP Dams and Development Project (DDP)			x
UN Convention on Biological Diversity (CBD)			x
Academic state-of-the-art tools			x
Voluntary corporate principles of Eletrobrás		x	
General principles			
Precautionary Principle			x
Polluter Pays and Full Cost Recovery			x
Universality			x

*Legal rules:* Peruvian legislation since 1990 requires an EIA in order to obtain a concession for large infrastructure projects. The company that is granted the temporal concession is responsible for choosing a registered environmental consulting company and for monitoring its work. The EIA shall “identify and evaluate direct and indirect environmental impacts (physical, biological, socio-economic, and cultural) of the different alternatives and for the different stages of the project” [37]. Moreover, it shall specify how to avoid, minimize, and/or compensate negative impacts, as well as lay out a contingency plan for potential risks. Since 2004, civil society and the local population have to be informed in a series of informational meetings [38]. The minimalist EIA will meet these legal requirements as they are necessary for receiving the final concession.

In May 2008, an environmental ministry (MINAM) was created and, in recent years, the Peruvian government has approved general legal guidelines for an integrative environmental legislation: The National System for Evaluation of Environmental Impacts (SEIA). Although MINAM’s influence remains limited to consultations during the process and commenting on the study results, future EIAs have to meet a number of additional requirements, for instance, the economic valuation of environmental impacts and a plan for environmental monitoring [39]. A minimalist EIA will not meet more advanced standards which were not yet legally required at the time when the EIA was conducted.

The actions of Brazilian companies could also be evaluated according to the legal standards in their home country. Legislation in Brazil already incorporated the EIA in 1982 [34] and has evolved toward

requirements that are considerably stricter than the ones currently applied in Peru. For instance, the EIA in Brazil is evaluated by an entity that is independent from the energy sector (Brazilian Institute of Environment and Renewable Natural Resources, IBAMA), an environmental compensation fund was created, and three different licenses have to be obtained at different stages of the project. Moreover, the technological and location-related alternatives have to be considered, including a non-implementation (“No-Go”) hypothesis, and compensation costs for biodiversity conservation have to be at least 0.5% of the total investment [40]. A minimalist EIA will not meet Brazilian standards if they imply additional costs.

*Standards of financing institutions:* For large investment projects, companies typically need financing from big national or international institutions. Many of these institutions require compliance with social and environmental standards, which may be stricter than the requirements of national legislation. In the Inambari case, the Brazilian National Bank for Economic and Social Development (BNDES) will provide a credit of 2.5 billion dollars US. BNDES requirements evoke a set of environmental principles and guidelines, including compliance with national environmental law, the use of clean technologies, and appropriate preventive actions. In order to obtain the BNDES credit, a minimalist EIA will meet these requirements.

The Equator Principles are a prominent benchmark for the financial industry. Equator Principles Financial Institutions (EPFIs) have adopted these principles in order to ensure that the projects they finance are developed in a manner that is socially responsible and reflects sound environmental management practices. For Category A “projects with potential significant adverse social or environmental impacts that are diverse, irreversible or unprecedented”, Principle 7 demands an independent review by a “social or environmental expert not directly associated with the borrower” in order to assess Equator Principle compliance [41]. BNDES has currently not adopted the Equator Principles [42]. Since this may involve higher costs and since an independent reviewer may object to potential undervaluation, a minimalist EIA will not follow the Equator Principles.

*International guidelines for good practice:* The Dams and Development Project (DDP) of the United Nations Environmental Program (UNEP) provides a “Compendium of Relevant Practices for Improved Decision-Making on Dams and their Alternatives” [43], with a set of tools for improving the decision-making, planning, and management of dams. In particular, the DDP calls for stakeholder engagement early on and throughout the project, and for a comprehensive options assessment on all scales and aspects of the project, including on alternative sources of energy or project sites.

The UN Convention for Biological Diversity (CBD) provides guidelines for including the biodiversity dimension into environmental impact assessments. These guidelines define a sequence of procedural steps characterizing good practice in EIAs and include screening and scoping, as well as review processes that assure stakeholder participation [44]. One important aspect of these guidelines is an assessment of possible alternatives and their impacts compared to the proposed project plan.

The international academic community is providing state-of-the-art methodologies and tools, e.g., for the calculation of greenhouse gas emissions or for the economic valuation of ecosystem services. The calculation of greenhouse gas emissions from hydropower in the Amazon is discussed in a series of papers [29,30] and freely accessible emission calculators can be found on the Internet [45]. A general framework for the economic valuation of ecosystem services is presented in The Economics of Ecosystems and Biodiversity (TEEB) reports [28,46]; online sources provide an overview of more specific methods and tools [47].

Incorporating international good practice principles, guidelines, and methodologies involves additional effort and generates extra costs, and by potentially revealing higher impacts could decrease the chances that the project is accepted as viable. A minimalist EIA will therefore not abide by these principles.

*Voluntary corporate principles:* Eletrobrás declares high ambitions with respect to sustainability [1] and the environment [48]. The company states as a voluntary corporate principle to “continuously act seeking the best social-environmental performance” and declares that “in partnerships with universities, research centers and experts, Eletrobrás fosters and participates in studies on critical issues: relocation of populations, strategic environmental planning methodologies, emissions of greenhouse gases in hydroelectric reservoirs, reduction of emissions provided from thermal generation” [48]. Since 2012, the company has been listed in the Dow Jones Sustainability Index (DJSI) [49]. Unless the environmental performance of EGASUR will be sufficiently criticized and publicly related to Eletrobrás so as to threaten the company’s reputation, a minimalist EIA is unlikely to comply with these voluntary principles.

*General principles:* A prominent version of the Precautionary Principle, as formulated at the Rio Convention 1992, demands that “when there are threats of serious or irreversible damage, lack of full scientific uncertainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation” [50,51]. Uncertainty is inherent to the predictive approach of EIA; hence, there is scope for the application of the principle [9]. The Inambari project may imply uncertain large-scale risks for people and the environment (the spread of diseases, uncontrolled floods, *etc.*). The EIA would need to perform a comprehensive risk analysis and incorporate uncertain large-scale risks. Since the existence of such impacts may threaten the viability of the project, however, a minimalist EIA is likely to omit or understate such risks.

The “Polluter Pays Principle” and the “Full Cost Recovery Principle” are economic principles for environmental regulation with the objective to internalize external costs and to bring private incentives in line with the interest of society at large. The applicability of these principles relies on the identification of all impacts and a correct evaluation of the costs (e.g., of pollution). The EIA is meant to provide this information, and the fact that the company has to pay for the study and for the compensation measures reflects this principle. A crucial question is whether costs are also covered *ex post, i.e.*, when unexpected or low-probability events such as environmental disasters occur. In some countries, compensation funds have been established for these cases [40]. A minimalist EIA will not capture the complete range of impacts and understate the costs, thereby preventing the proper application of the principles, and it will not insure low-probability events as long as the actor is not held responsible in case they happen.

A prominent ethical principle is universality, as reflected in Kant’s categorical imperative [52]. This principle holds that an act is right only if its maxim is desirable as a universal rule to be applied in all cases at all times. For the present project, this amounts to asking if it is desirable to perform a minimalist EIA for all investment projects on the planet. We conjecture that an EIA that disregards and undervalues impacts is certainly not desirable as a universal rule (and not in line with the spirit and intention of EIAs as regulatory tools). Hence, a minimalist EIA does not comply with the principle of universality.

To summarize, the ethical analysis has shown that the decision to perform a minimalist EIA raises ethical issues on several levels and in various dimensions, in particular by harming the local population and other stakeholder groups, and by not complying with a series of relevant rules, guidelines, and principles.

### 3.4. Reflection on the Actual Decision

If EGASUR had conducted an ethical analysis prior to making the actual decision on the type and scope of the EIA, it could, at that stage, have used the results to reflect on the trade-offs to balance its financial business interests with sustainability considerations. We conducted the analysis as external observers and *ex post*, after the EIA had been chosen. Our intention was to evaluate the extent to which EGASUR's choice promotes sustainable development and whether Eletrobrás operationalizes its sustainability strategy in line with its stated intentions. We approach this evaluation by assessing whether and how the actual study resembles or departs from a minimalist EIA. Since we have no internal knowledge of the actual decision-making process or the specific financial and non-financial information that EGASUR used for choosing the type and scope of EIA, we rely on indicators from field and desk research. The following section presents the approach and our conjectures about the type of EIA the company has chosen.

## 4. Evaluating EGASUR's Choice of EIA

Our evaluation of the actual choice of the EIA is based on observations of the project developments between 2009 and 2010, a set of survey data collected in October 2009, and from the interpretation of the publicly available EIA executive summary.

### 4.1. Indications from Observations and Survey Results

We conducted field research in October 2009 and subsequently updated our information on the project developments via Internet sources (media sources, technical reports) and consultations with Peruvian contacts from academia and non-governmental organizations. Field research in Peru included 17 interviews with five members of civil society organizations (Derecho, Ambiente y Recursos Naturales—DAR, Pronaturaleza, Asociación para la Investigación y el Desarrollo Integral), three government representatives (National Ministry of Transport, National Ministry of Environment, Regional Government of Madre de Dios), three company representatives (EGASUR, ECSA Ingenieros, Cesel), two researchers from the University Pacifico in Lima, and four members of the local population in the affected Cuzco and Puno regions. Ten interviews closely followed a questionnaire. Due to time constraints and the particular situation of the remaining encounters, seven interviews were shorter and semi-structured along the same lines. Table 3 describes the content of the questionnaire and how we used the responses to support our analysis. Responses on the expected positive and negative consequences of the dam project for stakeholder groups and of relevant rules and principles served as qualitative support for the ethical analysis in Section 3.3. We defined four indicators to evaluate whether the process and content of the EIA resembled a “minimalist EIA” (see below). The evaluation is based on the content of survey responses regarding emotions, attitudes toward the project, opinions on the EIA process, and expectations on project developments, in combination with information from other sources (e.g., media, reports).

**Table 3.** Content of the survey and use of responses.

<b>Content of Empirical Survey</b>	<b>Analysis and Use of Data</b>
<p>Elicitation of affected stakeholder groups and types and severity of consequences</p> <ul style="list-style-type: none"> <li>• Which stakeholders will benefit from the project? Please rate the benefits between 0 (none) and 5 (very high).</li> <li>• Which stakeholders will be harmed? Please rate the harm between 0 (none) and 5 (very high).</li> </ul>	<p>Qualitative supporting data to the consequentialist part of the ethical analysis (list of affected stakeholder groups—Section 3.3.1).</p>
<p>Identification of relevant rules and principles, and whether the EIA process is in compliance with them</p> <ul style="list-style-type: none"> <li>• Which principles, rules, codes, or laws are applicable with respect to the social and environmental impacts of the project?</li> <li>• Do you see them applied in the EIA process?</li> </ul>	<p>Qualitative supporting data to the deontological part of the ethical analysis (list of relevant rules and principles—Section 3.3.2).</p>
<p>Emotions</p> <ul style="list-style-type: none"> <li>• How would you rate your feelings toward the project on a scale from –5 (very negative) to +5 (very positive)?</li> <li>• Please describe your feelings.</li> </ul>	<p>Data used qualitatively for the indicator “emotions” on whether EIA is minimalist (see Section 4.1.4).</p>
<p>Attitude and expectations towards the dam project</p> <ul style="list-style-type: none"> <li>• In your opinion, should the Inambari dam be constructed? Why?</li> <li>• Do you think the Inambari dam will be constructed? Explain.</li> </ul>	<p>Qualitative supporting data for indicators on whether EIA is minimalist (Section 4.1)</p>
<p>General questions on how respondents perceive the project development and the process of the EIA.</p>	<p>Qualitative supporting data for indicators on whether EIA is minimalist (Section 4.1)</p>

#### 4.1.1. Stakeholders’ Attitudes and Expectations Regarding the Quality of the EIA

Several interviewees (in particular from NGOs and regional governments) expressed their concern about the choice of consultancy for the EIA (ECSA Ingenieros) and their distrust regarding the intentions of EGASUR to provide an objective study: When referring to ECSA’s efforts, interviewed parties judged the company as “not good” and “biased”, and stated that there was “no trust”, and that the current impact study was “a joke”. Long before any results of the EIA were presented, the environmental NGO Pronaturaleza applied for a grant from an international foundation to conduct an alternative impact study, and eventually produced a report documenting the need for national discussion of the project [20]. Distrust was frequently related to ECSA’s performance in a recent study on impacts of the Interoceanica Sur highway, where it was said to have neglected crucial impacts of settlements along the road. Moreover, there was agreement that ECSA had little previous experience with hydro energy projects, but was chosen mainly because of its “good relations with the Brazilian companies”. According to ECSA’s general manager, the “experience in the region through the Interoceanica project” had been decisive. Several interviewees criticized the current Peruvian legislation as insufficient for taking social and environmental impacts properly into account. According to a source from the corporate sector, even companies in Peru agree that “the state does not demand anything from us”. It was anticipated by different interviewees that ECSA would neither have a mandate nor the incentives to perform an

objective, independent study that incorporates and evaluates all potential impacts in the best interest of the affected population and the environment.

#### 4.1.2. Style and the Content of Communication by EGASUR

The media criticized that EGASUR's communication was characterized by secrecy and lack of transparency. For almost a year, the viability study had gone unnoticed by the NGO community, by the local population, and to a large extent even by the regional governments of the affected regions, and eventually Peruvian media started spreading information that plans for a large hydro energy plant in the Inambari were underway. During the first obligatory informational events in 2009, EGASUR was criticized for not explaining its plans openly and in a manner that the people understand, and for not addressing the crucial social and environmental issues. Inappropriate communication was confirmed by statements from several interviewees: "bad communication", "the company came only once to talk to us", "my frustration is mostly about the behavior and communication", and "there is a lack of information and consultations". In presentations to the regional governments or to the media (held, for instance, at the College of Engineering), representatives of EGASUR provided an invariably positive interpretation of the consequences of the project ("opportunities for regional development", "halting illegal mining and drug trafficking activities", the reservoir as "an additional buffer for the National Park"), depreciated the impacts ("loss of forest without commercially valuable species"), and neglected any potentially unethical aspects. Moreover, no responsibility for critical questions was taken, either by referring to the contracted environmental consulting firm, or to the Peruvian government responsible for granting the final concession [53].

#### 4.1.3. Stakeholders' General Attitude and Degree of Acceptance of the Project Proposal

Opposition against the project can indicate a controversy on the desirability and sustainability of the project. Indeed, we observed increasing opposition from the local population, civil society organizations, and academics. The affected population on the Puno side mentioned "strike" and "war" as means to defend their rights. Tensions eventually reached such high levels that EGASUR and ECSA employees were afraid of entering the affected zone for further studies or consultation. Subsequently, serious violent conflicts were reported in which the local police stopped protests against the Inambari project [54]. The College of Engineering declared its concern about the viability of the project for Peruvian development interest in several public declarations and by organizing events and debates on the issue. Representatives of leading Peruvian civil society organizations and academic institutions signed a joint letter to the Peruvian ministries, expressing their doubts on whether the current process takes the social and environmental consequences sufficiently into account and demanding a more transparent and participative decision process [55]. At the same time, the principal indigenous federation of the Madre de Dios region declared its opposition to the project [56]. National and international organizations and academics were showing increasing preoccupation with the local and global impacts of the big hydro projects and with the appropriateness of the decision processes [57,58].

#### 4.1.4. Stakeholders' Emotions toward the Project Proposal and the EIA

Although difficult to measure scientifically, emotions of the people involved can help detect controversial ethical issues. The principle that virtuous decisions raise positive emotions and, conversely, that negative emotions are a signal of a lack of virtue can be traced back to Aristotle (350 B.C.). Moreover, classical utilitarian calculus [59] relies on an emotional measure of pleasure vs. pain for relevant stakeholders. In this sense, emotions at the present stage may already be counted as consequences of the project, but they may also be useful indicators of the future utility that stakeholders expect to derive from the project. For instance, local inhabitants' sadness may reflect the anticipation of pain that they expect from leaving their homes; their anger may reflect their judgment that the situation or the prospects are morally wrong. On the other hand, the happy anticipation of construction workers may reflect their future gain from income, e.g., to improve their families' lives. In our interviews, eight out of 10 respondents stated that they have negative feelings about the project. The most frequent descriptions were in terms of "preoccupation", "frustration", or "anger" with the process of the project. These emotions were said to stem from the uncertainty and lack of transparency in the process, the lack of communication from the company and the national government, the lack of public participation, and the apparent ignorance and disorganization of the regional governments. With respect to the potential effects of the project, two interviews with members of the population revealed "fear" of losing the basic provisions for living and of moving to unknown situations, and one stated "compassion" for animals and plants. Positive emotions we encountered among the affected population were two expressions of "hope" for work and income through the project. Outside the affected region, a more distant kind of "concern" for people and nature was prevalent, typically accompanying a discourse on the need to balance economic development and environmental protection in Peru. Overall, negative emotions were dominant and much of the emotional distress was related to the process and general conduct of the company and the government rather than the actual effects of the project. Psychological and economic research recognizes the importance of procedural justice or fairness for the acceptance of public and organizational decision-making [60,61]. The provision of a forum for discourse and an opportunity for participation and consensus-building is also an integral part of EIA processes [8,10]. Obviously, they were not sufficiently integrated into the EIA in question.

#### 4.2. Interpretation of the EIA Executive Summary

We analyzed the 61 pages of the publicly available executive summary of the EIA [62] for indications of whether or not the study resembles a "minimalist EIA". Indicators were the size of compensation costs estimated by the study, the extent to which the study considers the full range of impacts and presents their severity in an unbiased manner, and the degree of compliance with rules and principles identified in the deontological analysis.

##### 4.2.1. Estimated Size of Compensation Costs

The EIA determines roughly 80 million dollars US for environmental compensation costs (2% of total investment, covering mostly environmental and biodiversity management plans) and 150 million dollars US for costs for community relocations (3.8%). These figures are significantly higher than those

previously estimated by the company, in which environmental and social costs summed up to only 2.3% of total investment costs [20], and they appear higher than “minimal” costs for environmental and social compensation.

#### 4.2.2. Compliance with Rules and Principles

The EIA describes the requirements of current Peruvian legislation and clarifies how they are met. Additional requirements of the integrated environmental legislation that was under development at the time are not mentioned, nor is any reference made to the requirements of Brazilian law. The executive summary refers to international agreements on the UN’s Millennium Development Goals and the Equator Principles, but the relation to the study is not specified. The EIA study does not reveal any efforts to incorporate international good practice or guidelines; in particular, it does not follow the recommendation to assess options of alternative hydro sites or energy sources and to include indirect impacts such as those caused by transition lines or the necessity to reconstruct the highway. The executive summary does not reveal whether a risk analysis has been carried out. An independent review, as demanded by Brazilian law and by the Equator Principles, is not mentioned. Calculations of greenhouse gas emissions and the economic valuation of ecosystem services are included in the study as “elaborated by the consultant”, so we do not know whether state-of-the-art tools and methods were applied.

#### 4.2.3. Inclusion and Unbiased View of Impacts

The conclusions and recommendations of the executive summary communicate a biased perspective of the severity of impacts, in particular by underrating harm to the local population and nature. While acknowledging “significant changes” of the local conditions, the environmental effects, the loss of habitat for species, and the flooding of the Interoceanica Sur highway, the conclusions suggest that the impacts could be easily compensated via relocation programs, health campaigns, a biodiversity management plan, and relocation of migratory fish. Moreover, the study emphasizes the negative aspects of the current situation with respect to local living conditions, informal economic activity, pollution, biodiversity change, and health conditions. The EIA predicts a net benefit from the project for people through improved living, working, and farming conditions, and for the environment through biodiversity and ecosystem management and higher carbon sequestration of “young” forests in reforested areas compared to current forests. The study disregards indirect effects from transition lines and the reconstruction of the Interoceanica highway. In its recommendations, the EIA argues that the project is needed to ensure Peruvian energy demand and recommends to move ahead quickly with the implementation of the project.

### 4.3. Evaluation

Observations and interviews show that stakeholder relations are characterized by distrust, concern, active opposition, and the prevalence of negative emotions. The lack of transparency and the company’s style of communication further point in the direction that EGASUR has chosen a minimalist EIA approach. This conjecture is partially confirmed by the executive summary of the EIA. Even though the estimated social and environmental costs are significantly higher than what one would expect from a



minimalist study, it clearly presents a biased perspective of the impacts and does not comply with most rules and principles that characterize international good practice.

## 5. Conclusions

Many companies nowadays emphasize their intention to take into account environmental and social aspects in their business strategies and to take an active role in promoting sustainable development [63]. In the face of the dominant motive to maximize profit and a lack of conceptual and practical clarity on what it actually means to act sustainably, such declarations of intent pose challenges to corporate decision-makers and to external parties who wish to judge the sustainability of business decisions. This paper proposes an ethical analysis as a method to evaluate the extent to which a particular business decision is aligned with sustainable development. Rather than prescribing a certain action, an ethical analysis can help decision-makers to be more reflective and aware of the different dimensions and potential trade-offs of the choice alternatives [3]. Moreover, an anticipatory ethical analysis for important decisions can help businesses to act in line with the aspired sustainability strategy [4] and allows business decision-makers to critically examine whether the strategic and operational directions of their organization contradict any convictions they hold as individuals.

We applied the method to the Inambari hydropower project in the Peruvian Amazon, focusing on the decision of the Brazilian consortium EGASUR on which type of Environmental Impact Assessment (EIA) to deliver to the Peruvian Ministry for Energy and Mining. As in most countries, the EIA in Peru is the key regulatory tool to incorporate environmental aspects into development decisions, and a high-quality EIA, in terms of process and content, is a precondition for an unbiased and comprehensive evaluation of the project. Since the preparation of the EIA is the responsibility of the corporate project proponent, the EIA can reflect the company's conviction regarding sustainable development practices.

Our analysis first identified that dominant financial business interests might be tempting the company to perform a "minimalist EIA", *i.e.*, to maximize expected profitability by reporting few impacts as well as relatively low values of the reported impacts. The subsequent ethical analysis revealed that such a minimalist EIA raises several ethical issues that may be unfavorable for sustainable development, in particular by harming various stakeholder groups and by not complying with a series of relevant rules, guidelines, and principles. Building on stakeholder interviews, research on the project process between 2009 and 2010, and an analysis of the executive summary of the EIA, we conclude that EGASUR's impact assessment is not fully in line with but nevertheless closely resembles a "minimalist EIA", and that it reveals serious shortcomings with respect to a true concern for sustainable development. The analysis hence led us to the conclusion that the company does not regard sustainability concerns as necessary and appropriate reasons to act, but merely as an obligation that should be met with minimum effort. We regard this result as particularly interesting in light of the publicly stated commitment to sustainability from the consortium member Eletrobrás.

In the Inambari case study, we conducted the analysis from an outside perspective and *ex post*, in order to evaluate the extent to which EGASUR, and Eletrobrás as the main strategic business actor, are promoting sustainable development. Ideally, the ethical analysis would have been performed by the company itself in an anticipatory manner in order to reveal trade-offs, broaden the perspective, and allow the company to evaluate appropriate conduct in the Inambari project and make a reflective decision in

line with its sustainability strategy. Paradoxically, it turns out that even from the perspective of financial business interests, the latest developments raise doubts on whether the choice of EIA, in terms of content and process, was indeed optimal for the company. Due to the increasing local opposition against the project, EGASUR first had to solicit a prolongation of the temporal concession in order to settle the social and environmental issues. It subsequently stopped its operations and, in the course of 2011, lost the authorization for project-related activities. By May 2015, the project is still mentioned as part of the strategic agenda of Eletrobras [64], but it is unclear whether and how it will be continued. We conjecture that more awareness of unethical aspects and trade-offs between financial business interests and sustainable development could have led the company to a different approach and might have directed the course of the project into a more sustainable direction, leading to a better situation for the companies and other stakeholders alike.

Finally, our paper touches on a general aspect of environmental regulation, namely that companies with the mandate to conduct an EIA may face a conflict of interest between economic profit and good practice environmental impact valuation. The case study shows that in Peru the current legal framework does not effectively prevent economic actors from delivering an EIA that neglects aspects relevant to sustainable development and understates the environmental impacts. There seems to be neither an economic incentive nor an ethical culture inducing corporate project proponents to palliate the lack of legal obligation. This does not necessarily reflect an intentional desire to harm local populations and their environment, but is a consequence of the general orientation of business actors towards values such as efficiency, profit-making, and market performance, which often contradict the values held by individuals inside the company. Environmental regulators should be aware of the effects of conflicts of interest and develop appropriate regulatory procedures to ensure an effective and objective assessment of the environmental consequences of infrastructure projects.

### Author Contributions

All authors participated in the research design. The first author performed the research and analyzed the data. The paper was written by the first and the second author. All authors read and approved the final manuscript.

### Conflicts of Interest

The authors declare no conflict of interest.

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