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Finding the Links between Risk Management and Project Success: Evidence from International Development Projects in Colombia

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Abstract: The aim of this research is to help improve the effectiveness of international development projects (IDPs) with a focus on enhancing their success. For this purpose, this work seeks to identify links between the management of risks among five projects executed in Cauca (Colombia) and the success of these projects in terms of project management and impacts on the beneficiary communities. An analysis of these projects reveals the most critical risks encountered and the relationships between the management of those risks and the success of the projects. The use of fuzzy logic through the fuzzy-set qualitative comparative analysis (fsQCA) program is key to performing this difficult task. The results of a qualitative study reveal that the most important risks correspond to economic, cultural, and political factors. A quantitative analysis by fsQCA shows a direct relationship between the management of cultural differences and the positive impacts of IDPs on the beneficiary communities.

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1. Introduction

With investments in official development aid estimated by the Organization for Economic Cooperation and Development (OECD) [1] at $143.22 billion in 2018 and with levels of hunger across the globe continuing to rise for the third consecutive year, affecting more than 820 million people (one in nine) [2], the effective management of international development projects (IDPs) is not only a commitment marked by the Paris Declaration [3] or a means to achieve goals set by the United Nations' 2030 Agenda [4] but also the responsibility of those who participate, in one way or another, in these projects.

The World Bank's Results and Performance report [5] records that approximately one in four IDPs financed by the World Bank does not achieve even moderate success. Those achieving highly satisfactory success are a small minority at 3%, representing approximately 21 of 713 World Bank projects analyzed in the 2014–2016 period.

Among the possible causes of such low levels of success, the World Bank notes in previous reports the residual risks of projects. In turn, the World Bank's Results and Performance report [5] provides the first analysis relating levels of project risk to project success. The report finds a significant correlation between high residual risk rates and low project success.

Despite this finding, little research has been performed on IDP risk management, which is striking given that for other types of projects, risk management is considered a prominent area of project management (PM). Some exceptions include Couillard et al. [6] and Ika and Lytvynov [7],

who incorporated a column on risk into the Logical Framework Matrix. In continuing this work, Rodríguez-Rivero et al. [8] pointed to the integration of risk management as the most valued improvement to the Logical Framework Approach. Hekala [9] also found risks inherent to IDPs to limit their impact, noting that while these risks are inevitable, they could be better controlled with better project planning and by developing project managers' skills.

Project success can be understood in two ways: success in project management and success in project impact. These two interpretations of success can occur independently. Traditionally, in the literature related to project management, successful PM is linked to efficiency mainly in terms of the well-known golden triangle (scope, cost, and time) and to effectiveness based on customer satisfaction [10].

While successful PM is also essential for IDPs, successful impacts on the beneficiary community also play an indispensable role, as the fundamental objective of these projects is to improve people's quality of life.

The present work explores the relationship between risk management and the success of projects in reference to various IDPs applied in Cauca (Colombia), as part of a Doctoral Thesis research [11]. The aim is to contribute to the success, in its double aspect, of future projects developed in Cauca. Only by knowing which risks are more important will it be possible to act on them; knowing which risks have more influence on success will also allow for the prioritization of strategies. Through the use of a fuzzy-set qualitative comparative analysis (fsQCA), this study seeks to evidence the causal links between managing risks and IDP success. Thus, in studying five IDPs in Cauca, and under the hypothesis that the success of IDP in Cauca depends on the proper management of its risks, this work aims to respond to two questions:

Research Question 1 (RQ1): What are the most critical risks that affect IDPs executed in Cauca?
Research Question 2 (RQ2): What is the relationship between managing such risks and the success of such projects?

In answering these questions, this work is organized as follows. A literature review first describes the main challenges facing IDPs today and describes the setting in Cauca, where the studied projects were executed. A methodological section then presents the projects considered along with qualitative methodologies used for risk assessment and quantitative methods used employing fuzzy techniques. Finally, the main results obtained are presented and discussed and conclusions are drawn.

*1.1. Challenges Facing International Development Projects*

Project ineffectiveness [12,13] and dependent relations between developed and developing countries [14,15] have been identified as challenges to IDPs. This latter more critical vision is posed by theories of the postdevelopment field, which have gained prominence since the publication of Wolfgang Sachs's bestseller The development dictionary [16]. This movement understands that dominant notions of development linked to the economic growth of markets, productivity, and the satisfaction of insatiable desires for material goods respond to a Western economic model that disregards other possible dimensions of economic activity, such as the relationship to Mother Earth, which plays a significant role in agriculture, or concepts of sufficiency, solidarity, or community [17].

The concept of sustainability, which has grown more mainstream not only in the international community but in society itself, responds to a demand to meet needs while respecting the environment [18]. In introducing this environmental component, the multi-directionality of development emerges and with it some indigenous concepts such as *Buen Vivir*, which promotes productive and sustainable community development and which offers valuable lessons for international debate around the idea of sustainable development [19].

The classic work Development projects observed [20] placed IDPs at the core of development activities, and with them these projects have evolved from their origins to the present, as Figure 1 shows.

Through the challenge of evolving towards more effective projects, many works have focused on identifying factors that influence the achievement of successful IDP impact [21–25].

While Denizer et al.'s [26] work based on data on 6000 World Bank projects concludes that in obtaining better results, variables related to a project itself such as its duration, budget, or control have a stronger influence than other variables related to the context of the country in which a project is implemented, many authors attach particular importance to the latter and to the influence of local contexts on IDP impacts [22,24,27–30]. In following this focus on local contexts, the present work analyzes Cauca in depth to identify risks most often encountered when executing an IDP.
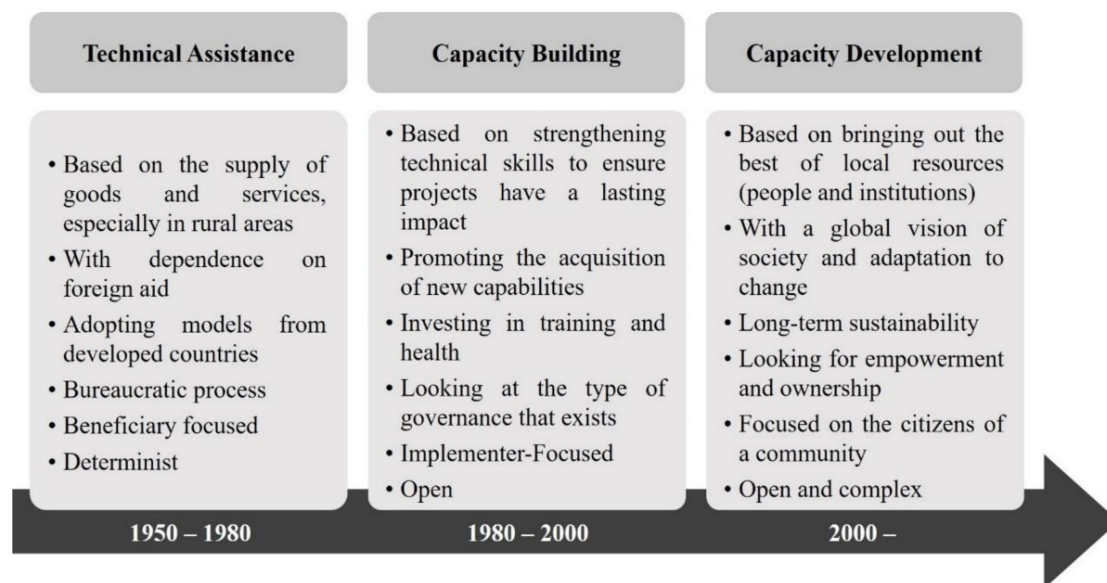
Figure 1. Evolution of international development projects. Based on the work of Ika [29], Ika and Hodgson [30], Boni [31], LenCD [32], and McEvoy et al. [33].

1.2. The Context in Cauca (Colombia)

Colombia has been studied as a special case characterized by rapid improvements in its population's quality of life and economic growth. For instance, mortality rates were reduced from 23.4 deaths per thousand inhabitants in 1905 to 5.5 in 2000 [34]. Economic growth has mainly been based on coffee exports and the extractive industry. Colombia is Latin America's fourth largest oil producer and the world's fourth largest coal producer [35]. Colombia is also the world's second largest producer of Arabica coffee, and its harvest in 2019/20 is forecasted to reach 14.1 million bags, 1.7% higher than that in 2018/19 [36]. Its human development index (HDI) is 0.761, placing it at 79 of 189, tied with Brazil [37]. Despite this development, neither its minerals or coffee nor its HDI currently gives Colombia as much global prominence as the end of its 50-year conflict, which officially ended in November 2016 and created the world's largest internally displaced population [38].

Many works published in recent years have focused on postconflict Colombia, highlighting among other factors issues related to sustainable development (e.g., Franco et al. [39], González-Salazar et al. [40], Nail [41]). Academics and politicians agree that progress in Colombia must be in line with the UN's Sustainable Development Goals (SDG) listed in its 2030 Agenda [4].

The department of Cauca with the capital of Popayán is in southwestern Colombia and includes 42 municipalities. Cauca is one of the departments hardest hit by the armed conflict in Colombia and is suffering the reconfiguration of an increase in armed groups in their eagerness to occupy territories left by the FARC-EP [42]. The department is also one of the areas with the highest extreme poverty rates in the country with 22.9% of the affected population, while this figure drops to 7.2% for the rest of Colombia [43]. Cauca is also distinct in its large indigenous (42.7%) and rural populations (59.9%) [44]. Levels of higher education are also lower here than in the rest of the country [45].

The United Nations Office for the Coordination of Humanitarian Affairs (OCHA) considers Cauca a priority area for action, defining most of its municipalities as of very high need since armed groups dispute over territorial and population control to manage illegal economies, which has triggered risks and a need for humanitarian and protection care. For example, between 2016 and 2018, 89 social leaders were assassinated in the area [42].

The critical situation in this department is recognized by the international community with numerous IDPs developing in the area.

1.3. Project Management in International Development Projects

Project life cycle management has been the principal methodology used for decades by donor countries and Non-Governmental Development Organizations (NGDO) for the management and assessment of IDPs [33,46]. While various tools have been developed under this methodology, the best known is the Logical Framework Approach (LFA). The evolution of development cooperation and associated projects has meant that international agencies and organizations have been adapting both the life cycles of their projects and the LFA [46].

Along with such methodologies, project teams have proved central in obtaining better IDP results [5,23]. While few studies have focused on the competencies of IDP project managers, Cobo [47] and Ortiz-Marcos et al. [48], in reference to development engineering projects, found that the most critical factors shaping successful project execution are related to the skills of project managers and team members and to their abilities to face changes, risks, and opportunities that may arise during project implementation (that is, their adaptability).

International projects and IDPs fail more often than projects at the national level due to a lack of training in intercultural skills among team members [49].

Working with different cultures implies a need to train in a series of competencies, including teams' and project managers' capacities to adapt to the environment in which a project is executed [50]. This adaptability is also highlighted by Ika and Donnelly [22] in studying 20 cooperating professionals of four IDPs.

Risk management, according to Kerzner [51], involves proactively and positively facing the risks of a project to enhance the likelihood of its success. Thus, risk management is increasingly understood as a process of increasing the probability of project success [52].

Zwikael and Ahn's [53] study of 700 project managers shows a negative correlation between risks and project success and that the effective application of risk management moderates the negative effects of risk. Other authors have also tried to relate risk management to project success in different types of projects as Research and Development (R&D), construction, or Information and Technologies (IT), among others [54–60].

The present research seeks to link risk management to project success in the context of development cooperation based on a case study of Cauca (Colombia).

2. Materials and Methods

2.1. Projects in Cauca

The representativeness of the five selected IDPs executed in Cauca was determined over several stages. First, professionals from international organizations working in the field were consulted. Second, a thorough study of financing granted by international institutions to projects in Cauca was conducted. Finally, the Head of Cooperation of the Government of Cauca was consulted.

Information on the studied projects is presented in Table 1. Information provided by coordinators of the five IDPs was first compiled and analyzed. Then, workshops were held in the field with the team members of each project with a focus on the identification and assessment of risks and on perceptions of project success. Interviews based on open-ended questions were also conducted with project managers to contrast results obtained from the workshops and to identify any risk management

activities executed during a project. Finally, additional validation of the results was conducted in consultation with the Head of Cooperation of the Government of Cauca.

Table 1. Descriptions of the studied projects.

Id. Project	Project	Donor	Duration	Direct Beneficiaries	Budget (USA $)
P1	Access to higher education institution among rural youth	Colombian Government	Three years	1035 rural youth	1,094,232
P2	Cultural industries as a source of development	Inter-American Development Bank (IADB)	Three years	51 companies (200 direct jobs)	1,201,519
P3	Microenterprises for integrating displaced populations	International Organization of Migration (IOM)	One year	19 micro-enterprises (248 people)	180,445
P4	Economic and social empowerment of rural women	EuropeAid	Two years	400 women from five municipalities	812,692
P5	Productive processes for allowing ETCR	Swedish Government	Nine months	120 ex-combatants	11,433

The consulted project managers had more than 13 years of experience in international development and more than nine years of project management experience with the exception of the project manager of P1 who had five and four years of each form of experience, respectively. Project teams led varied from 30 people for P1 to four people for P5. The number of people who attended the workshops also varied for each project: 7 people for P1, 4 people for P2, 3 people for P3, 13 people for P4, and 4 people for P5. The number of people who attended the workshop for project 4 is remarkable and it is convenient to emphasize that it was the only one that was in execution at that time, which facilitated the attendance.

The workshops were held at each team's headquarters in sessions lasting three hours on average. Sessions started by introducing the concept of risk management and the two main perspectives on project success: community impact and the fulfillment of objectives (project management). The participants then individually defined the concept of project success with each person allowed to provide up to three definitions, which were written on Post-it notes to encourage everyone's participation. The definitions were then grouped by the participants by consensus into a maximum of three factors. The session continued with the identification of risks. After being given examples and upon agreeing to work with the proposed Risk Breakdown Structure (RBS) presented in Figure 2, the participants jointly identified risks affecting or that could affect a project and listed these under the corresponding category. Assessments of the risks and different views of success identified were carried out individually based on a paper questionnaire with the format presented in Appendix A.
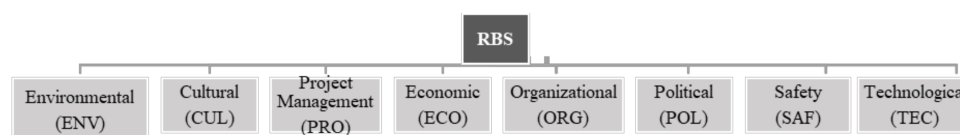
Figure 2. Risk Breakdown Structure used in the focus groups.

The results obtained were contrasted days later with the five project managers of each project, who had also taken part in the workshops, in an open-ended interview. The project managers were asked if they agreed with the results and if there was anything that surprised them. They were also asked to identify their projects' priorities (scope, cost, scheduling, or safety), which helped give weight to and define the risk importance formula used for each project.

Finally, the results of the workshops were first analyzed qualitatively and second analyzed using the fuzzy methodology.

To verify the RQ2 mentioned in the previous section and evaluate the link between risk management and project success (in its double dimension) in the context of international development, the following propositions are posed:

Proposition 1 (P1). *The effect of risks relative to the external environment of the project (environmental, cultural, political, and safety categories) causes an impact on the success of the project.*

Proposition 2 (P2). *The effect of risks relative to the internal environment of the project (project management, economic, organizational, and technological categories) causes an impact on the success of the project.*

2.2. Fuzzy Logic

Initially, fuzzy logic was applied exclusively in the field of formal sciences (e.g., mathematics, statistics, or logic). With the first works known to apply this technique carried out by Zadeh [61], fuzzy logic was considered a mathematical theory used under multipurpose logic. In more recent years, the approach has been applied to several areas such as for the identification of stakeholders [62], transportation [63,64], and energy [65]. It has also been applied in the area of sustainability in examining the effects of climate change [66] and capacity factors and their influence on project results in developing countries [67]. In recent years, its use has also spread in the field of international development, establishing as a very useful methodology for measuring the use of project management tools in NGDOs [68]. Its application in this field of international development fits in with the fact that is particularly appropriate for uncertain environments [61,63,66,68], since when classifying membership in a category, an all or nothing approach is not used, as diffuse logic recognizes the possibility of belonging to more than one, allowing for the development of gradual scales in regard to perceptions, as in this case for risks that affect a project and its success.

In the present research, fuzzy logic is used, employing fsQCA 3.0 software (fuzzy set Qualitative Comparative Analysis). This program uses combinatorial logic, fuzzy logic set theory, and Boolean minimization to determine which combinations of features may be necessary or sufficient to give a certain result [69]. FsQCA identifies necessary conditions and their effects when obtaining a result or output variable. The method also allows for the identification of sufficient conditions (a combination of conditions) from which to achieve a result [70].

To introduce the data into fsQCA, it is necessary to define the variables, which in our case are risk categories (input variables or conditions) and levels of project success in impact and PM (output variables or outcomes). These conditions and outcomes are studied across 31 people or cases representing the total number of participants in the five workshops.

The input variables (conditions) are obtained from the total values given by each person (case) for each category. That is, each person's overall score for each category is the sum of all scores obtained on the importance of each form of risk within a given category. The importance of each form of risk is determined by the product of the probability of a risk's manifestation and its impact. As impact was previously divided into corresponding impacts on scheduling, costs, scope, and safety (see Appendix A), final impact values were obtained from weights estimated by the project manager of each project.

As for each project, a different number of risks was identified, and the value obtained for each category of risk varies not only by scores given (perceptions of risk) but also by the number of risks identified. This variation was addressed through data calibration, and the importance of eight types of risk corresponding to the 31 participants from the five projects was measured, forming our conditions. Each participant also scored levels of project success in terms of impacts on the beneficiary population and project management on a scale of 1 to 10 as outcomes. An outline of our cases, conditions, and outcomes are given in Figure 3.
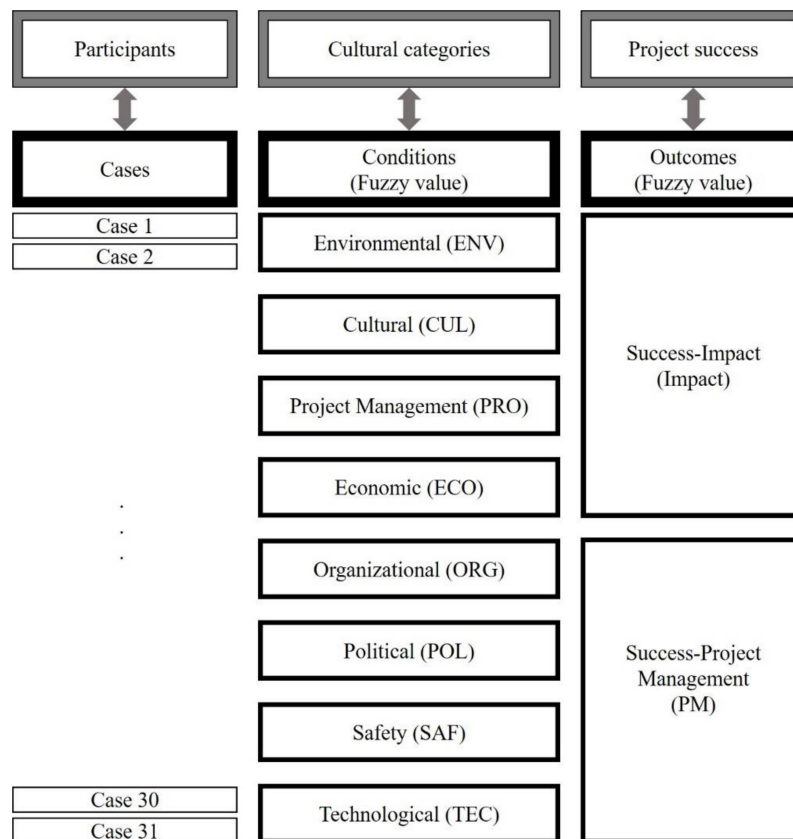
Figure 3. Cases, conditions, and results used for the study.

The data used in the fsQCA analysis are shown in Table 2.

Table 2. Workshop data used for the analysis.

Cases	Categories								Results	
	ENV	CUL	PRO	ECO	ORG	POL	SAF	TEC	Impact	PM
Par1	6	49.4	5.6	36	119.2	27.8	19	21.6	8.5	9
Par2	7.2	64.4	10.2	30.8	79.6	24.2	16.8	33	7.5	8
Par3	1.8	40	14.6	29.4	87.2	32.4	8.8	9.8	9.5	9
Par4	1.2	62.4	16.6	32.4	135.4	28.8	10.8	12.2	7.5	10
Par5	1.4	52.4	17.6	30	116.8	32.4	7.8	13.2	8.5	10
Par6	11.2	62	24.8	42	115.6	30.6	0	15	9.5	9
Par7	6.6	70.4	42.4	41.2	181	21.6	28.6	32.6	8.5	9
Par8	4	41.8	77.4	68.4	25.8	69.8	13.6	13.2	6	6
Par9	12	47.2	59	96.8	42	88.8	41.4	39.2	6.5	8
Par10	4.8	51.8	41.6	46.2	21.4	47.4	20.4	14.8	7.5	8
Par11	9	52.2	85.8	88.2	74.6	47.6	24.4	43.4	7.5	7
Par12	12.4	59.4	28	20	68.2	43.6	9	16.4	6	5
Par13	6.4	27.2	12	22.6	33	26.4	14.4	12.2	6.7	5
Par14	41.8	77.2	51	4.8	69.8	48.6	16	26	10	10
Par15	52.4	159.2	97.6	122.4	150.4	40.2	51.6	58.8	5.5	6
Par16	17.6	86.6	33.4	86.4	71.8	45.2	60	25.2	6.5	6
Par17	28.4	113.4	35.2	51.4	84	52.6	28.8	35.4	5	5
Par18	32	116	56.8	103.4	118.4	54.4	32	31.2	7.5	6
Par19	23	181.2	57.2	155	70.3	66	8	24	5.5	7
Par20	26	128.8	36.6	83.4	71.2	14.4	35.2	52.4	7	8

Table 2. *Cont.*

Cases	Categories								Results	
	ENV	**CUL**	**PRO**	**ECO**	**ORG**	**POL**	**SAF**	**TEC**	**Impact**	**PM**
Par21	32.4	151.4	35.6	53.6	81.6	54	27.6	28.2	7	7
Par22	57.2	119.2	96	93.6	80	61	34.4	55	6	6
Par23	6.2	62.8	21.8	41.6	47	7.6	5.2	7	6.3	6.5
Par24	15.8	78	19	31.6	24.8	19.4	3	6	6	7
Par25	30	59.4	9.2	43.2	57	35	4.8	10	6.5	6
Par26	30.8	128	75.6	92	130.6	61.8	61	19.6	6.5	6
Par27	23.8	131.8	26	73.4	77.2	49.4	12.4	17.6	6.5	9
Par28	12	26.8	6.8	56.6	62.55	26.8	8.6	6.8	8	9
Par29	2.3	104.8	42.4	50	99.5	19.2	48.5	42	6	8
Par30	2.2	101	41.3	51	96.75	19	47.5	43	7.5	9
Par31	10.8	75.6	37.5	51.8	85.5	58.5	22	23.4	7.5	6

3. Results

3.1. Qualitative Analysis to Identify and Assess Risks and Success

The five most important project risks identified from the focus groups are described in Table 3.

Table 3. Description of the five most important risks facing each project.

Id. Project	Id. Risk	Risk Description
P1	P1.ECO.1	Inability to cope with transportation costs to attend training
	P1.POL.1	Removal of project support due to a change of government
	P1.ECO.2	Delays in financing from the donor
	P1.CUL.1	Difficulties asking questions of beneficiaries
	P1.CUL.2	Greater participation in sports activities (opportunity)
P2	P2.ECO.2	Budget delays
	P2.ECO.6	Lack of interest among investors to co-finance business plans of entrepreneurs
	P2.POL.5	Lack of interest among local governments to measure impacts of cultural industries
	P2.POL.2	Lack of collaboration from public institutions in facilitating cultural heritage
	P2.CUL.4	Communication difficulties between beneficiaries and the project team
P3	P3.CUL.1	Fears of facing new production challenges
	P3.POL.1	Lack of interest from local governments to access economic impacts
	P3.POL.2	Lack of local government support
	P3.PRO.2	Inexperience of the project manager across similar projects
	P3.SAF.2	Displacement through conflict zones to carry out training
P4	P4.ECO.1	Sale price fluctuations
	P4.CUL.1	Communication difficulties between female beneficiaries
	P4.POL.1	Existence of political interests when selecting productive activities
	P4.CUL.2	Resistance to collaborative associative work
	P4.CUL.3	Dependence on permission from husbands or parents to participate
P5	P5.ECO.1	Difficulties with administrative purchasing management
	P5.CUL.1	Difficulties from the project team with communicating with beneficiaries
	P5.POL.1	Lack of collaboration with public institutions
	P5.CUL.2	Lack of participation from beneficiaries without orders from superiors
	P5.CUL.3	Dependence on the leadership of specific people

Table 4 presents the most relevant values derived from the qualitative analysis. Values in this table were obtained from Appendix A and by translating the qualitative scale for probability and impact into a scale of 1 to 5. Risk importance is measured as the product of probability and impact and weighted accordingly.

Table 4. Summary of the qualitative analysis.

Id. Project	P1		P2		P3		P4		P5	
Participants (focus group)	7		4		3		13		4	
Nº Risks	33		35		28		45		51	
	Id. Risk	Imp.	Id. Risk	Imp.	Id. Risk	Imp.	Id. Risk	Imp.	Id. Risk	Imp.
	P1.ECO.1	18.2	P2.ECO.2	16.6	P3.CUL.1	24	P4.ECO.1	13.6	P5.ECO.1	15
Top 5 Risks and their Importance	P1.POL.1	15.8	P2.ECO.6	14.9	P3.POL.1	14.7	P4.CUL.1	13.5	P5.CUL.1	14.4
	P1.ECO.2	15.8	P2.POL.5	13.5	P3.POL.2	13.1	P4.POL.1	13.4	P5.POL.1	14.2
	P1.CUL.1	15.6	P2.POL.2	13.1	P3.PRO.2	12	P4.CUL.2	12.8	P5.CUL.2	14.1
	P1.CUL.2	14.8	P2.CUL.4	12.8	P3.SAF.2	12	P4.CUL.3	12.6	P5.CUL.3	13.6
Priority	Scope		Scope		Scope		Scope		Schedule	
Success	Impact	PM	Impact	PM	Impact	PM	Impact	PM	Impact	PM
	8.5	9.1	6.8	7.3	7.6	6.7	6.3	6.6	7.3	8

Table 4 shows that among the most important risks common to all projects, those associated with the economic (ECO), cultural (CUL), and political (POL) categories stand out. These common and significant risks include a lack of support and/or interest from local governments, financing delays, and communication difficulties between the beneficiary community and project team. It should be noted that problems with communication are not in most cases related to language barriers but to cultural patterns linked to hierarchical structures whereby conversation only flows between people of the same hierarchy, which is important to consider in relation to the participatory methodologies used in these types of projects.

Risks related to technologies, from the results obtained, are not a priority for any of the projects. It is more difficult to manage relationships between people and institutions than those with equipment and technology. Similarly, while the Department of Cauca is located in a mountainous area subject to heavy rains and landslides, risks related to environmental phenomena are not those that most affect the projects despite many of them being related to agricultural production. Additionally, despite insecurity present in Cauca, safety risks are hardly seen as crucial among local teams.

While in the workshops the participants were asked to identify positive risks (opportunities), only the higher education project (P1) identified such risks as shown in Table 3, and they appear among the five most important. The methodology of strategic foresight applied to this project surely contributed to the search for opportunities in this project on which an in-depth investigation has been completed [71].

In terms of priorities, meeting the project scope is paramount to almost all of the projects, which involves a desire to deliver all planned activities and to reach as many people as possible.

Finally, regarding levels of success achieved, while the teams prioritize success in impact, success in project management shows higher scores, though not for the entrepreneurial project for displaced populations (P3), which also shows the greatest variations between measures of success. The highest success scores both for impact and PM are reached by the higher education project (P1), despite this project being run by a newer team.

3.2. Quantitative Analysis to Identify Links between Risk Management and Success Levels

The relationship between IDP success in Cauca and the management of risks faced is studied using fuzzy logic for several reasons. First, given the small sample size, fuzzy logic can serve as a very interesting alternative to traditional statistical methods. Second, the use of this methodology is highly recommended when one can intuit possible causal structures and their complexities and different options, which requires having excellent knowledge of the cases studied [69]. Finally, we study 31 cases corresponding to assessments of success and risk made by 31 people working on the projects analyzed. According to Kent and Olsen [69], the ideal number of cases for fsQCA 3.0 fuzzy logic analysis is

roughly 30, meaning that both the method and program used are considered adequate for this analysis, as other social science research studies with small samples have already shown [72].

Once the cases are defined (sample of 31 people), conditions (risk categories), outcomes (levels of project success in impact and PM), and the variables (conditions and outcomes) were calibrated. Calibration involves transforming conventional variables into diffuse variables as conditions (input variables) and outcomes (output variables). This calibration determines the degree to which cases belong to each set with scores of 0 to 1. Among the calibrations proposed by Ragin [73], three values (0.3; 0.6; 0.9) were chosen. Table 5 shows the meaning of these calibrations. Table 6 shows the data after calibration to be analyzed by fsQCA.

Table 5. Calibration with four sets [60].

Value of the Calibrated Case	Interpretation
<0.3	The case has a minimum membership to the condition
0.3–0.6	The case has a medium-low membership to the condition
0.6–0.9	The case has an upper-middle belonging to the condition
>0.9	The case has a maximum belonging to the condition

Table 6. Calibrated data for analysis.

Cases	Conditions								Outcomes	
	ENV	CUL	PRO	ECO	ORG	POL	SAF	TEC	Impact	PM
Par1	0.3	0.3	0.3	03	0.9	0.6	0.6	0.6	0.9	0.9
Par2	0.3	0.6	0.3	0.3	0.6	0.3	0.6	0.9	0.6	0.6
Par3	0.3	0.3	0.3	0.3	0.6	0.6	0.3	0.3	0.9	0.9
Par4	0.3	0.6	0.3	0.3	0.9	0.6	0.6	0.3	0.6	0.9
Par5	0.3	0.6	0.3	0.3	0.9	0.6	0.3	0.3	0.9	0.9
Par6	0.6	0.6	0.6	0.6	0.9	0.6	0.3	0.6	0.9	0.9
Par7	0.3	0.6	0.6	0.6	0.9	0.3	0.6	0.9	0.9	0.9
Par8	0.3	0.3	0.9	0.6	0.3	0.9	0.6	0.3	0.3	0.3
Par9	0.6	0.3	0.9	0.9	0.3	0.9	0.9	0.9	0.3	0.6
Par10	0.3	0.6	0.6	0.6	0.3	0.6	0.6	0.3	0.6	0.6
Par11	0.3	0.6	0.9	0.9	0.6	0.6	0.6	0.9	0.6	0.6
Par12	0.6	0.6	0.6	0.3	0.6	0.6	0.3	0.6	0.3	0.3
Par13	0.3	0.3	0.3	0.3	0.3	0.6	0.6	0.3	0.3	0.3
Par14	0.9	0.6	0.9	0.3	0.6	0.6	0.6	0.6	0.9	0.9
Par15	0.9	0.9	0.9	0.9	0.9	0.6	0.9	0.9	0.3	0.3
Par16	0.6	0.6	0.6	0.9	0.6	0.6	0.9	0.6	0.3	0.3
Par17	0.6	0.9	0.6	0.6	0.6	0.9	0.6	0.9	0.3	0.3
Par18	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.6	0.3
Par19	0.6	0.9	0.9	0.9	0.6	0.9	0.3	0.6	0.3	0.6
Par20	0.6	0.9	0.6	0.9	0.6	0.3	0.9	0.9	0.6	0.6
Par21	0.9	0.9	0.6	0.6	0.6	0.9	0.6	0.6	0.6	0.6
Par22	0.9	0.9	0.9	0.9	0.6	0.9	0.9	0.9	0.3	0.3
Par23	0.3	0.6	0.6	0.6	0.3	0.3	0.3	0.3	0.3	0.3
Par24	0.6	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6
Par25	0.9	0.6	0.3	0.6	0.6	0.6	0.3	0.3	0.3	0.3
Par26	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.6	0.3	0.3
Par27	0.6	0.9	0.6	0.6	0.6	0.6	0.6	0.6	0.3	0.9
Par28	0.6	0.3	0.3	0.6	0.6	0.6	0.3	0.3	0.9	0.9
Par29	0.3	0.9	0.6	0.6	0.6	0.3	0.9	0.9	0.3	0.6
Par30	0.3	0.9	0.6	0.6	0.6	0.3	0.9	0.9	0.6	0.9
Par31	0,6	0.6	0.6	0.6	0.6	0.9	0.6	0.6	0.6	0.3

A truth table with fuzzy scores of variables was used to conduct an analysis of necessary and sufficient conditions using fsQCA.

Necessary conditions were first analyzed. The need for a condition is demonstrated by a result forming a subset of a condition (i.e., the degree of relevance to an outcome must be less than or equal to that of the condition), [64,70]. For this purpose, values obtained for each outcome (Impact, PM) and each absence version (~Impact, ~DP) are analyzed together with the presence of conditions (ENV, CUL, PRO, ECO, ORG, POL, SAF, and TEC) and their absence (~ENV, ~CUL, ~PRO, ~ECO, ~ORG, ~POL, ~SAF, and ~TEC).

According to Ragin [66], a condition is necessary when it has a consistency index of greater than 0.9. Table 7 shows the values obtained with fsQCA. Attending to these numbers, the values of consistency with greater relevance are taken (in bold), although in some cases they are not superior to the indicative value of 0.9.

Table 7. Necessary conditions.

Condition	Impact		~Impact		PM		~PM	
	Consistency	Coverage	Consistency	Coverage	Consistency	Coverage	Consistency	Coverage
ENV	0.722	0.696	0.811	0.714	0.683	0.732	0.846	0.655
~ENV	0.704	0.803	0.655	0.683	0.678	0.859	0.654	0.598
CUL	**0.815**	0.657	**0.885**	0.652	**0.800**	0.716	**0.892**	0.577
~CUL	0.568	0.844	0.534	0.725	0.528	0.871	0.561	0.670
PRO	0.778	0.677	**0.865**	0.688	0.733	0.709	**0.885**	0.618
~PRO	0.642	0.839	0.594	0.710	0.605	0.879	0.585	0.613
ECO	0.759	0.661	**0.865**	0.688	0.717	0.693	0.885	0.618
~ECO	0.642	0.839	0.574	0.685	0.606	0.879	0.561	0.589
ORG	**0.926**	0.781	0.804	0.619	**0.867**	0.812	0.838	0.568
~ORG	0.549	0.754	0.716	0.898	0.539	0.822	0.723	0.797
POL	0.796	0.672	0.858	0.661	0.733	0.687	**0.900**	0.609
~POL	0.599	0.822	0.574	0.720	0.583	0.890	0.538	0.593
SAF	0.796	0.693	0.838	0.667	0.750	0.726	0.861	0.602
~SAF	0.617	0.806	0.615	0.734	0.589	0.855	0.608	0.637
TEC	0.796	0.682	0.817	0.640	0.767	0.730	0.831	0.571
~TEC	0.580	0.777	0.594	0.727	0.550	0.818	0.608	0.653

The results of Table 7 show that having a high impact on a project requires the consideration of the organizational risks; it means that the project requires a good and supervised organization. It also highlights the importance given to cultural risks. Analyzing now the denied case, the absence of impact, it can be seen that a project has little impact on the beneficiaries, the condition that most influences is the culture. The fact that the risks associated with cultural differences appear both in the impact and non-impact results demonstrates the strong relationship between the risks in this category and the impact of the project on the beneficiaries.

Regarding the necessary conditions to consider that the project has been successful in the project management, there is a curious agreement on the conditions of organization and culture, although with less relevant values. When analyzing the lack of success in the PM the political condition dominates, although the culture, the economy, and the project management are also present.

After this study of necessary conditions, sufficient conditions were analyzed. Combinations of sufficient conditions are also called causal combinations. According to Schneider et al. [74], only models with a consistency level of greater than 0.75 are acceptable. While others such as Ragin [70] and Eng and Woodside [75] call for values of greater than 0.8, 0.75 is considered sufficient. Consistency refers to the level at which data subsets are present in an outcome. It is also important to highlight that from all combinations of possible conditions for any solution, the most representative is the one with greater coverage.

In the analysis of sufficient conditions, fsQCA 3.0 performs Boolean minimization that allows for three solutions: simplified, intermediate, and complex.

Based on the types of solutions in which they appear, causal conditions can be divided into core (appearing in the simplified and intermediate solutions) and contributing conditions (appearing in the intermediate solution).

Figure 4 presents the sufficient conditions for the results with higher values of coverage and consistency. The intermediate solution was employed for the combination of sufficient conditions following previous studies [64,70].

Configuration No.	Success (Impact)			Absence of success (Impact)	Success (PM)		Absence of success (PM)	
	9	7	8	2	3	4	5	1
ENV	○ (large)	●	○		○ (large)		●	○
CUL	● (large)	● (large)	● (large)	●	●	●	○	
PRO	●	●	●	●	●	●	●	●
ECO	●	○	●	● (large)	●	●	●	●
ORG	●	●	●	●	● (large)	● (large)	○ (large)	○ (large)
POL	● (large)	● (large)	○	● (large)		○	●	●
SAF	●	●	●	● (large)	●	●	●	●
TEC	●	●	●	●	●	●	●	○
Raw coverage	0.512	0.494	0.481	0.682	0.517	0.494	0.4461	0.423
Unique coverage	0.031	0.037	0.031	0.230	0.011	0.022	0.538	0.054
Consistency	0.965	0.976	0.963	0.802	0.969	0.978	0.879	0.859
Solution coverage	0.75			0.82	0.78		0.56	
Solution consistency	0.94			0.81	0.88		0.83	

Figure 4. Summary of conditions determined from fuzzy logic. Note: as per Fiss's [76] notation, grey circles indicate the presence of the condition, white circles indicate the absence of the condition, and large circles indicate a core condition and small circles indicate contributing conditions. Blank spaces mean that the condition is irrelevant.

All of the proposed models meet the consistency levels of greater than 0.75; thus, all of the configurations can be considered valid for the presence and absence of both outcomes.

The interpretation of Figure 4 will be done for each of the outcomes. First, for the impact of the project, it can be said that the careful management of risks associated with both culture and politics, along with avoiding all risks that may endanger the environment, greatly increases the probability of success in the impact of an IDP in the area of Cauca. Second, the presence of high risks, mainly political, economic, and safety, but without neglecting all the others (except for those related to the environment, which does not enter the equation) brings with the absence of the impact in the beneficiary community. Third, by minimizing mainly the risks related to the environment, and with proper management of all the other risks, especially the organizational ones, it would be possible to achieve success in the PM of an IDP in Cauca. Fourth and last, the presence of important risks of all categories, even with the absence of organizational and cultural risks, would result in the absence of success in the PM.

The strength of the union of necessary and sufficient conditions establishes as significant the following direct relationships: (i) there will be success in a project's impact if and only if cultural risks (CUL) are managed properly; (ii) there will be no success in a project's impact if and only if economic risks (ECO) are not managed properly; (iii) there will project management success if and only if organizational risks (ORG) are managed properly. These findings highlight the relevance of the following conditions for outcomes: cultural, economic, and organizational risks.

These relationships are perhaps the most valuable results of this research, establishing that it is possible for an IDP to achieve successful impacts on beneficiary communities in Cauca if and only if special attention is paid to risks associated with cultural differences and to identifying and controlling them from the beginning. In the same vein, an IDP in the studied area will have no impact on the beneficiary community if and only if economic risks are not adequately addressed. Regarding the impact of a project and its absence, as political risks are also very present, these must also be addressed.

These initial results were presented to the Head of International Cooperation of the Government of Cauca for validation through an interview, from which the most relevant considerations are identified.

The interview first corroborated the finding of the importance of risks associated with cultural differences in having an impact on the community, confirming the importance of considering the ancestral culture and knowledge of an area, given that "The cultural aspect is essential. When a project does not fit with the culture, it does not work." In addition, "some indigenous communities are environmental authorities through the Indigenous Regional Council of Cauca (CRIC, by its Spanish initials) and, therefore, it's necessary to garner their support when developing any project."

Limited project impact and its relation to economic risks is especially critical "when the project is executed by several entities." Thus, "responsibilities and funds should be independent to avoid delays." Such funding delays can prevent activities from being carried out, impacting the scope of a project and potentially resulting in an IDP not having the impact initially planned in the community (lack of impact).

Likewise, the influence of political risks is highlighted because "if a project is not in the development plan, it is very difficult to articulate. Projects have to be articulated with regional development policies" and "risks associated with changes in government must be considered."

The third direct relationship identified establishes that an IDP in Cauca will succeed in its management if and only if organizational risks are identified and controlled throughout the project. The director of cooperation validated this finding and believes that "the risks that most affect an IDP are those that affect the project's own sustainability through poor organization and few alliances between the various executing organizations; these risks can be categorized as organizational."

A less significant relationship between a lack of success in project development and political, economic, and project management risks is also identified.

Finally, for a complementary validation of the summary table presented in Figure 4, the Head of Cooperation of the Cauca Government was asked why he believed that technical and security risks were not as representative and how he viewed environmental risks and conditions of their absence. He responded that "the technical part can be corrected, and the safety part is very important and can prevent many activities from developing; a project can have no impact, but this can be fixed in most cases by involving the army." Regarding the environment, he states "Nowadays it is considered universal to all projects as well as addressing gender because respect for the land is essential. Almost all IDPs in Cauca address this aspect already; maybe, even though it is very important, it is not identified as a necessary condition."

4. Discussion

The need to restructure international development cooperation towards a more effective model in social, economic, and environmental terms and including new actors while leaving none behind constitutes one of the most critical challenges facing society in this century.

An IDP is involved in processes of change, and any change implies uncertainty; therefore, risks are inevitable (but manageable). The best tool for combatting uncertainty is information and the best source of information is the beneficiary community.

The present work identifies a limited use of risk management among IDPs in Cauca, confirming what previous studies have already reported [71,77]. In building on other studies on the links between risk management and project success [55,60], this work establishes direct relationships between project success and the management of specific risks in international development, a sector in which

this relationship has until now only been studied in an exploratory manner by the World Bank [5]. This confirms the research hypothesis: the success of IDP in Cauca depends on the proper management of its risks.

Through the case study of Cauca, it is possible to address the first research question through qualitative analysis and find that the most important risks common to all of the projects studied correspond to economic, cultural, and political issues.

A subsequent analysis applying fuzzy logic identifies a relationship between risk management and projects success, addressing the second research question. The results highlight the importance of identifying and managing cultural differences at the start of a project as a necessary and sufficient condition to achieve project impact. Thus, within the first proposition, among all the categories of external risks, culture is the one that gains more importance over the success in the impact of the project and should be given more attention when what is sought is a greater effect on the beneficiary community, that could also be viewed as external. In this line, Kassem et al. [60] already demonstrated the influence of the local culture of the people on the success of oil and gas projects, mainly in developing countries.

The fuzzy logic analysis also finds a direct relationship between organizational risks and success in project management. Likewise, in the second proposal on the internal risks of the project, the organizational ones have the most influence and this corresponds directly to the project management, which could also be considered internal.

In addition, IDPs in Cauca have demonstrated how risks increase when working with vulnerable populations such as displaced persons, women, and ex-combatants, making the environment and circumstances decisive as some previous works also show (e.g., Ika and Donelly [22]). Additionally, an analysis of the studied projects shows that while risks can be seen as opportunities, as Kerzner [51] established, there is still much to be done in this regard. In the present work, only a few opportunities were identified for the studied education project.

The present study shows how the careful management of certain risks associated with the cultural environment can help improve project acceptance and ownership by the beneficiary community, facilitating the achievement of a project with real impacts.

In focusing on this case study of Cauca, the present research is limited to a specific context in which cultural diversity is a major factor. Therefore, some of the results obtained may not be generalizable to other contexts. In view of this limitation, future work may extend the present work to studies of other countries.

Appendix A

Table A1 shows the evaluation sheet used during the workshops.

Table A1. Sheet used for the risk assessment and project success evaluation

Risks by Categories			Probability					Impact																			
								Schedule					Cost					Scope					Safety				
Stage	1. 2. 3. 4.	Identification Planning Execution Closure	VH: often (>50%) H: once every 4 projects (>25%) M: once every 10 projects (>10%) L: once every 20 projects (>5%) VL: less than 1/20 projects (<5%)					VH: >3 months H: 2–3 months M: 1–2 months L: 2–4 weeks VL: <2 weeks					VH: >100,000 \$ H: 50,000–100,000 \$ M: 20,000–50,000 \$ L: 10,000–20,000 \$ VL: <10,000 \$					VH: >10% H: 5–10% M: 3–5% L: 1–3% VL: <1%					VH: Fatality H: Serious damage M: Medical treatment L: First aid VL: No damage				
			VH	H	M	L	VL	VH	H	M	L	VL	VH	H	M	L	VL	VH	H	M	L	VL	VH	H	M	L	VL
	ENVIRONMENTAL																										
	CULTURAL																										
	PROJECT MANAGEMENT																										
	ECONOMIC																										
	ORGANIZATIONAL																										
	POLITICAL																										
	SAFETY																										
	TECHNOLOGICAL																										
	Success factor 1: (Values from 1 to 10):										Success factor 2: (Values from 1 to 10)									Success factor 3: (Values from 1 to 10)								

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