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Article

Enabling Risk Management and Adaptation to Climate Change through a Network of Peruvian Universities

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Abstract: In recent decades, Latin America (LA) has been frequently and severely affected by floods and landslides. There is an urgency for adopting Comprehensive Disaster and Climate Risk Management (CRM). In 2016, a group of Peruvian universities established a network (Gestión Integral del Riesgo de Desastres y Adaptación al Cambio Climático (GIRD-ACC)) committed to the principles of CRM. This article compiles and evaluates the network results/plans and actions. A qualitative study and a methodological strategy are reported featuring: a bibliographic/network documentary review; an account of the events that led to the start and development of the network; and a case study of a three-university network. Results show that the network can help in deepening knowledge and forging a culture of risk prevention. This is by incorporating risk management and climate change awareness in professional training and intensive activity to meet the UN Sustainable Development Goals (SDGs -11, 13, and 17). Results indicate the importance of gaining consensus (a notoriously difficult task in LA) between the authorities and the operational departments; the role of universities' social responsibilities; incorporating sustainability and risk management themes in the mainstream curricula; and developing a network by learning from similar groupings across LA to improve CRM within universities.

Keywords: climate change; ecological resilience; comprehensive disaster and climate risk management (CRM); risk management; SDGs; Latin America

1. Introduction

Existing climate crisis alarms suggest widespread environmental disequilibrium and disorder that is plunging humanity into a global emergency. The education sector, in particular, HE (higher education), has a role to play in the dawn of this 'Anthropocene' era. The latter describes a new geological era in which our planet's physical deterioration directly correlates with poor human choices. In response, higher education could enable individual and institutional participation toward change. This would help to mitigate against, adapt to, and reduce negative climate impacts [1]. Therefore, it follows that universities and colleges would join with other sector groupings to address disastrous climate threats. This view presupposes a contemporary approach to education as a conduit for stimulating regional and national growth. It requires imaginative organization and innovation, yet with the potential to boost national economic prosperity.

Arguably, HE institutions have been pursuing this open-ended mission. In the case of Asian countries such as; Bangladesh, Sri Lanka, and Thailand, HE contributions to regional

initiatives would help to improve the much-needed science-policy interface with disaster risk management (DRM). There is also opportunity to advance the objectives of the Sendai framework for disaster risk reduction (SFDRR) [2]. Furthermore, any Universities with international linkages would be poised to help advance the innovation agenda in these three Asian nations.

When it comes to enabling efficiency and capacity for disaster mitigation, education might also play a fundamental role through its communication function. According to this progressive view, education may be used to communicate hope for social transformation. This is despite the coexisting realities of any risks and sustainability aims [3]. One critical assumption behind this ideal is that successful students are normally well-informed citizens. Thus, access to vital information and instruction about how to use it qualifies them to become enablers of social resilience.

Where natural disasters are a constant and inescapable threat, one way of dealing with this challenge is by formalizing agreed goals and commitments from multiple institutions. For example, in recent decades, Latin America has been frequently and severely affected by floods and landslides [4,5]. This has helped to trigger an HE collaborative strategy, based on common ground because of shared threats. That strategy entailed forming diverse alliances and networks to deal with the risks attributed to climate change. In this respect, cooperation has also become a seedbed for multidisciplinary and transdisciplinary approaches. This is because it constitutes a future base for mobilizing shared knowledge, technology, and financial resources, toward achieving the United Nations Sustainable Development Goals (UNSDGs) [1].

These interconnected HE settings also help to articulate a systemic approach in that they allow agents to fully participate and to exchange experiences. Hence, there is greater potential for the uptake of risk awareness practices that may lead to more comprehensive disaster plans and programs. In this particular Latin American Study, information dissemination has been vibrant because of the commitment of the network's participating universities. This has been both at a strategic level (e.g., Rectors and University Authorities) and through the resolute efforts of staff responsible for implementing agreed agendas.

Purpose of This Study

This research will help to fill country-specific gaps pertaining to the topic. It describes the process of creating and animating a Peruvian (and Latin American) network for risk management and adaptation to climate change. The objective of this article is therefore to compile and to evaluate the results of the plans and actions of this Peruvian Network of Universities committed to the 'Comprehensive Management of Disaster Risk and Adaptation to Climate Change' (CRM). (In this article, as well as using 'Comprehensive Disaster and Climate Risk Management (CRM)' we used the Spanish adaptation of CRM principles to our project: 'Gestión Integral del Riesgo de Desastres y Adaptación al Cambio Climático (GIRD-ACC).) We discuss the outcome of the different actions taken by this CRM. The activities of the Network and Disaster Management and adaptation to climate change were catalysts for sensitizing and raising awareness about risks, among the different university stakeholders. In particular, we discuss how relevant material was incorporated into university programs to help graduates to understand the complexity regarding climate change in vulnerable communities.

Comprehensive Management of Disaster Risk and Adaptation to Climate Change plans are integrated into development policies and provide national agencies with the means of reversing the trend of increasing impacts of natural catastrophes. According to the analysis carried out by the United Nations Regional Planning Observatory (Observatorio Regional de Planificación para el Desarrollo-La planificación para el desarrollo y la gestión del riesgo de desastres <https://observatorioplanificacion.cepal.org/es/nota/la-planificacion-para-el-desarrollo-y-la-gestion-del-riesgo-de-desastres> (accessed on 5 November 2022)) of the 33 countries in Latin America and the Caribbean, 14 have national disaster risk reduction plans or strategies. Most of these plans have specific objectives on disaster risk

reduction; however, those that do not have planning instruments consider disaster risk management as a guiding and relevant element in all their processes.

The article is therefore organized as follows: After this introduction, in Section 2 we outline the conceptual framework of the problem to be tackled, and the methodological stages of the study. In Section 3, reports on phase 1 and phase 2 of the methodology, discussing the events on the early developments and networking. In Section 4, a full discussion on phase 3 of the study. Interviews with representatives from key institutions in the network, namely: the National University Jorge Basadre Grohmann of Tacna (UNJBG); the National University of the Altiplano Puno (UNAP); and the National University San Marcos (UNMSM) are presented as a case study. Section 5 outlines a summary of conclusions and recommendations together with some final remarks, limitations, and further research directions.

2. Conceptual Framework and Methodological Strategy

The conceptual framework that underpins our theoretical platform is based on the interrelation of the three primary questions behind all research: (1) What is the problem(s) to be studied? (2) How do you plan to study it (methodology)? and (3) Why is the problem important (or what are the contributions to knowledge and practice)? Figure 1 shows the interrelated elements of the conceptual framework used as a platform to answer the RQs.

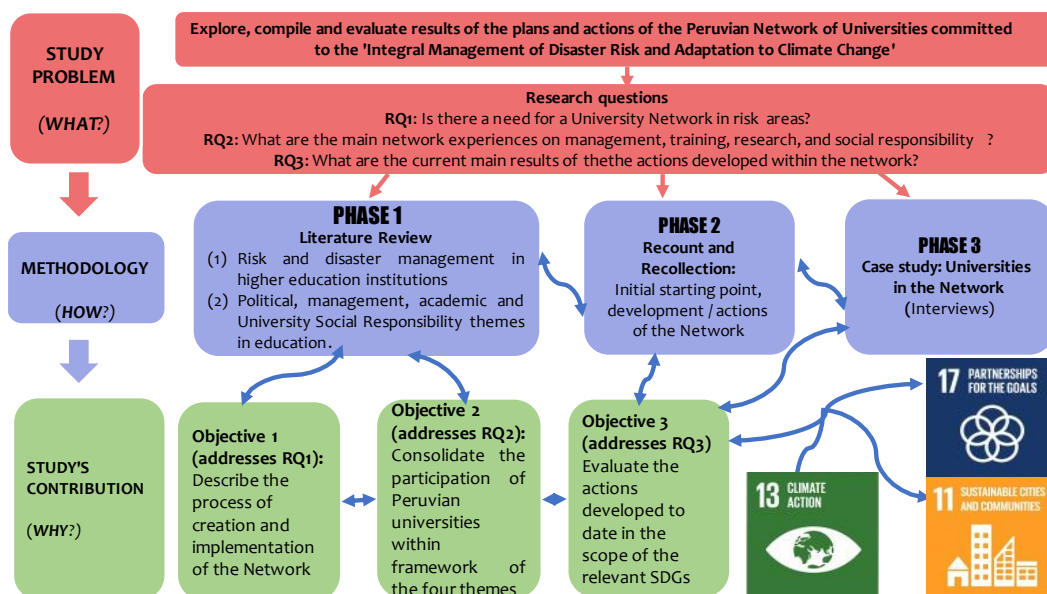


Figure 1. Conceptual framework of the problem to be tackled and methodological strategy.

As Figure 1 shows, the main thrust of this study is to explore, compile, and to evaluate the results of the plans and actions of the Peruvian Network of Universities committed to the 'Integral Management of Disaster Risk and Adaptation to Climate Change'. We reformulated this broad objective as 3 important research questions (RQs):

- RQ1: How and when did the need arise to create/establish networks among universities in risk areas, to implement actions, and to mitigate damage and disasters?
- RQ2: What experiences have developed in relation to the management, training, research, and social responsibility (RSU) themes in the Peruvian network (such as comprehensive disaster risk management, and adaptation to climate change in promoting universities in Peru, e.g., UNJBG, UNMSM, and UNAP)?
- RQ3: What are the current main results of the evaluation of the actions developed by promoting universities within the network (e.g., UNJBG, UNMSM, and UNAP), using the Political, Management, Academic, and RSU themes in relation to relevant UNSDGs?

In response to these RQs, the study features a methodological strategy delivered through three interrelated phases. We believe this triadic approach is also inherently systemic as it matches the root elements of the case and our basic objectives.

2.1. Research Design and Methodological Stages

The research takes a qualitative study format in evaluating the development and scope of the linkages, formed by the Disaster Management and Adaptation to Climate Change Network in Peru. As shown in Figure 1, the methodological strategy of the research is based on the three phases. These comprised (1) a bibliographic and documentary review; (2) a recount and compilation of the events leading to the start and development of the network; and (3) the defined case study incorporating the three public, accredited universities (e.g., UNJBG, UNMSM, and UNAP), within the network. The research was carried out between the months of January and March 2022.

2.1.1. Phase 1: Bibliographic and Documentary Review

This entailed the collection, organization, and analysis of information in keeping with the study's objectives. It was conducted between January and February 2022. This phase included the following activities:

We conducted an information search of various online databases and there was a review of published research on CRM in Higher Education Institutions. In order to implement the search, we used the following keywords: Network and Disaster Management and adaptation to climate change (Ries GIRD (to expand our search, as well as using 'Comprehensive Disaster and Climate Risk Management (CRM)' we used the Spanish translation of CRM: 'Gestión Integral del Riesgo de Desastres y Adaptación al Cambio Climático (GIRD-ACC)') and Higher Education Institution (IES). Further search activity entailed using combined keywords: Ries GIRD and alliances; Ries GIRD and LAC; Ries GIRD and IES; Ries GIRD and Universities Peru; and Implementation of Ries GIRD and University.

2.1.2. Phase 2: Compilation of Network Activities: Birth and Development of the 'Gestión Integral del Riesgo de Desastres y Adaptación al Cambio Climático (GIRD-ACC)' Network

During this stage, documents about the initial steps that resulted in the formation of the Network were searched, read, and analyzed. This was achieved by collecting information via reports and university web pages. Specifically, we studied documents describing the initial events in the creation of the networks. For example, reports from four inter-university fora (developed as strategies for the creation of the networks under study) were reviewed and analyzed. Likewise, documents describing processes and activities concerning risk management and adaptation to climate change were examined. These allowed us to better understand the implementation policies, plans, and collaborative activities of Comprehensive Disaster and Climate Risk Management (CRM), in the universities under study. Note that from now in the rest of the paper, we refer interchangeably to the CRM with the acronym coined for the Peruvian HIEs network: 'Gestión Integral del Riesgo de Desastres y Adaptación al Cambio Climático (GIRD-ACC)'.

2.1.3. Phase 3: Case Study: Universities in the Network—Discussion of Results

We assembled information for each university and described their involvement in the network's development, as a case study. We followed the premises of a descriptive study, based on the research by Cavalcanti-Bandos et al. [6]. In this phase, we assembled opinions, impressions, and judgments from the interviews with the team of internal and external university staff who were/are involved in promoting the network. We used open-ended interviews in order to capture the respondents' perceptions and knowledge about the network's plans, its current development, and its future. We also used a timeline that depicted the start and progression of the network and visually recorded the most important events. Finally, using these four themes: management, training, research, and University

Social Responsibility (USR), the results of the interviews with the university respondents were analyzed and discussed.

3. Discussion of Results (Phase 1 and Phase 2)

3.1. Literature Review (Phase 1): Risk and Disaster Management in Higher Education Institutions (HEIs)

In this section, we report on the literature review and the state of the art in the field of HEIs' alliances and risk management networks. We all witness natural disasters around the world as constant threats, along with their catastrophic socio-economic impacts. In the period 2005 to 2014, a total of 3809 natural disasters (with considerable human losses) were registered [7] (for full details, see Appendix A: Table A1. Number of reported disasters and total number of people killed (2005–2014)). The complex, endemic nature of many of these challenges emphasizes the need for proactive responses, based on a systematic approach to risk management. In the section below, we present a brief overview of the literature on the development of risk management in recent decades. We then review the role of higher education institutions with respect to sustainable development and we also comment on the measure of UNSDG implementation.

3.1.1. Global and Regional Alliances in Defining Risk Management and Shaping a Role for Education

The need for an integrated analytical approach suggests there is acute complexity in implementing risk management [8,9]. Furthermore, disaster risk management (DRM) becomes more clearly outlined as a process when it is implemented as a coordinated effort. In that case, it could be defined as: '... a systematic process of using administrative directives, organizations, skills and operational capacities to implement strategies, policies, and improve coping capacities to reduce the adverse impacts of hazards and the possibility of disaster' [10] (p. 10).

This important detail about 'process' may be seen in the 2005 Hyogo Framework for Action (HFA) (of the World Conference on Disaster Reduction, Japan), which was developed as an instrument for implementing disaster risk reduction. As a global network at the highest level, that Framework brought together 168 member countries of the United Nations. The objective was to increase national resilience to disasters—achieving by 2015, a decrease in impacts on social, economic, and environmental goods [3].

The Sendai Framework noted earlier was consistent with this Hyogo Framework and after an instrument for Disaster Risk Reduction (2015–2030) was created, disaster management would henceforth be seen as disaster risk management [11]. Thus, the focus became strategizing to minimize threats and to strengthen resilience. The idea was that by understanding risk (in all its aspects and stages), this would help to instruct the national response at various levels [11]. In 2004, the Inter-American Conference on Disaster Risk Reduction defined risk as a growing factor in danger and variability. It stressed the need to face threats and possible hazards in a responsible way. Following this logic, the need to know the dimensions of a problem, to educate in a common language, and to train societies about how to reduce peril [12] seems appropriate.

It was along these lines that educators and researchers volunteered to consolidate efforts of the Office of US Disaster Assistance for Latin America and the Caribbean (OFDA/LAC). They provided critical advice and promoted risk management-related content in higher education [13]. The United Nations Educational, Scientific, and Cultural Organization (UNESCO) and the International Strategy for Disaster Reduction [10] (under the Hyogo and Sendai Frameworks) also delineated a central place for education in this scheme. Generally, despite this sector's relatively low resource investments, it still has the necessary stretch for addressing all stages of disaster mitigation. Educational activities might also be aimed toward achieving sustainability, despite continuous co-existence with risk [3]. This is promising for society as it could contribute to the social transformation cause.

Thus, education may be a mechanism of strategic support and a basis for adopting relevant risk management in society. Furthermore, Shaw et al. [14] argue that this may favorably reduce the vulnerability of communities. According to this perspective, risk management delivered through universities' curricula becomes a vital component of education for sustainable development (ESD). In terms of a pedagogical method, this would also mean that teaching and learning are delivered as an integrated process. There would be an opportunity to draft and implement study plans, evaluations, and multidisciplinary activities in a comprehensive way. Educational programs would therefore become mechanisms for preparing and for strengthening values that promote social alertness and responsible citizenship [15].

The USAID-OFDA supports this ideal that higher education (HE) should prepare professionals for interdisciplinary work as leaders and agents. This is in the common interest of a sustainable future. Through appropriate education sectoral planning, educators could help to manage the institutionalization of disaster risk reduction (DRR). One important aim would be to design creative spaces for open innovation and knowledge exchange—both within and among universities. This would help to consolidate foundations (already laid by other actors) toward increased resilience and development of nations [16].

The urgency around climate change also suggests that forging international linkages is imperative for social transformation and for sustainable development [17]. Alliances bring with them an aptitude for imagination, interconnections, and a practical capacity to mobilize resources. The thinking here is that such linkages may contribute to achieving the UNSDGs [18], as functional collaboration. It is worth noting that the potential for transformation could also play out at the local, regional, and global levels [17]. Put succinctly, alliances may be powerful devices for influencing cross-sector change. Universities and related institutions should be poised to contribute to this cause as part of their civic mission.

Academia is already using organizational and other networking as a commitment to developing sustainable and resilient societies [19]. We should especially note here that HE has the capacity for theorizing, training, and other endeavors that may contribute to transforming communities. This factor actually positions the HE sub-sector for entertaining more discussion and critical arguments surrounding climate change [20]. In other words, seminars, workshops, and similar fora may become conduits for multidisciplinary teams to act in the face of these challenges.

Cavalcanti-Bandos et al. [6] further support the argument that university life (as a whole) can be closely aligned with several of the UNSDGs. When the university plays this leadership role in society, there is an opportunity to address each SDG. We specify the institutional functions of teaching and learning, research inquiry, helping to craft or to support governance frameworks, working through university management and extension policies, consultancy provision, and general HE/community engagement.

3.1.2. Education and Implementing the UNSDGs: The Latin American Regions and Peru The Latin American Region

Based on the above discussion, we maintain that higher education institutions (HEIs) could be key players in animating the UNSDGs [11]. Stakeholder and cross-sector alliances are fundamental in order to achieve these goals. At the same time, stakeholders in such multiparty contexts (e.g., community associations and other NGOs) may also influence HEIs [21]. One example of this effect would be HEIs pursuing solution strategies to the global challenges outlined in the UNSDGs. Abedin and Shaw [8] define the exchange as a type of catalytic agency. This is because of the potential to increase knowledge that could help to counteract socio-economic and other losses, in the aftermath of natural disasters. Agency is most evident when there is rallying cooperation and inputs because of any resonance and synergy shared by participants [22].

Co-learning (or collaborative learning) is therefore inextricably linked with networking in education [23] and lively interconnections help to shape networks [24]. This is explicit in the tenor of SDG-17 [11] and the repercussions for organizational change [21]. In the case

of CRM, alliances have also demonstrated this social mission of HE. The results across the network have been rewarding.

Universities also exhibit a proactive management approach to DRR through the knowledge that they impart to students and other stakeholders. When universities encourage the exchange of experiences, such knowledge helps to improve the decision making of policy actors and practitioners [8]. For example, associations such as the University Network of the Americas and the Caribbean for Disaster Risk Reduction (REDULAC) foster the development of more sustainable and resilient universities in Latin America and the Caribbean. There is deliberation about regional policies and strategies pertaining to risk management.

Likewise, the University Program for Disaster Risk Reduction and Adaptation to Climate Change (PRIDCA) was developed by the Central American Higher University Council between 2013 and 2018. The aim was to integrate approaches within a coherent framework of Central American policies on the Interlinking Disaster Risk Management (IDRM) UN program. The regional higher education plan also incorporates adaptation to climate change (ACC). As spelled out in the earlier section, there is attention to study plans, research, university extension, minimizing institutional vulnerability on campus, and activities affecting the university [25].

The Peruvian Case

Peru is highly susceptible to disasters and the effects of climate change. This is because of its uniquely diverse climate. Additionally, Peru's geomorphology, geodynamic activity, informal use of land, deforestation, and soil degradation are among other reasons [9]. Since natural disasters often disrupt the psychological and socio-economic stability of nationals, this underlines vulnerability and resilience as key concepts in determining the process of recovery [26].

It is worth noting that Peru has made considerable progress in its IDRM policies over the past decade. Since 2010, there has been determined attention to this field. This may be seen through the following measures: inclusion of State Policy 32 "Disaster Risk Management"; the creation of the National Disaster Risk Management System (SINAGERD); approval of the National Disaster Risk Management Policy (PNGRD); and the gradual implementation of the National Disaster Risk Management Plan, 2014–2021 [27]. This information collectively represents the Government's intention to enhance the PNGRD strategy, in moving toward 2050. These plans are also consistent with international commitments and agreements such as the Sendai Framework for Disaster Risk Reduction (2015–2030) and the Agenda 2030 for the DS [27].

The Peruvian Government is establishing policies that address relevant social issues in a range of areas. These are being aligned with the PNGRD and with awareness of the importance of Sustainable Development. For example, the University Law 30,220 emerged from this thrust to facilitate continuous improvement of HEI delivery. This legislation was seen as fundamental to comprehensive national development [28]. This regulation specifies vital areas of management such as teaching and learning, research, and university social responsibility (RSU).

In the midst of these developments, management is being portrayed as an institutional activity for achieving procedural efficiency and for achieving effective outcomes. In this context, HE teaching/learning is important because of its contribution to continuing education as an aspect of human development. Similarly, while research is an essential mandate of universities, this means that their endorsing the UNSDGs, in the interest of society, is one expression of social responsibility.

Finally, based on some university experiences, such as that of PRIDCA in Central America, we can conclude that education for sustainable development makes it possible to expand knowledge about IDRM and ACC. This is primarily through networks and, in the case of Peru, these have been game-changing. In the following sections, the review of these experiences (both in Peru and across the region) provides an informative backdrop. We

trace the development of actual networks of Peruvian and Latin American universities that are committed to risk management and adapting to climate change (CRM).

3.2. Creation, Development, and Actions of the Gestión Integral del Riesgo de Desastres y Adaptación al Cambio Climático (GIRD-ACC) (Phase 2)

In September 2016, the Universidad Nacional Mayor de San Marcos (UNMSM) promoted the first Inter-university conference entitled: ‘The role of the university in comprehensive disaster risk management and adaptation to climate change’. The objectives of the conference were to strengthen the capacities of the members of the universities involved; to encourage the development of a systemic and comprehensive vision of the problems in Disaster Risk Management and adaptation to climate change; learn about projects for the institutionalization of CRM across national universities; and to provide oversight for institutions in CRM, so that they align to the network objectives.

The first forum generated (among the attending rectors) interest and commitment to promoting CRM across the university network. The second forum was international in nature. It was organized by the Jorge Basadre Grohmann National University of Tacna (UNJBG) with the support of USAID/OFDA. This event was held in 2017 and labeled as the ‘II International Interuniversity Forum: The university and its commitment to Management Comprehensive disaster risk and adaptation to climate change’. The conference agenda was based on four thematic matrices. These outlined the relationship between the fundamental objectives of the academy and the CRM. The focal areas are related to management, teaching and learning, research, and university social responsibility.

Around that time, an assembly of 19 rectors of national universities was convened. This gathering was called: ‘Articulating the National Risk Management System with Higher Education Institutions for National Development’. This was aimed at deepening the participation of their institutions in the CRM-ACC. Participants signed a declaration based on the following four essential points: (1) promoting and institutionalizing Inter-university Fora; (2) creating an Inter-university Network; (3) implementing institutional policies within national universities; and (4) establishing General Offices for Disaster Risk Management and Climate Change Conditioning (with a specific mandate to develop actions in institutional management, academic training, university social responsibility, and research).

The third conference was called: ‘Disaster risk management and adaptation to climate change’. It was organized in 2018 by the National University of Trujillo. Some critical outcomes from this event included: promoting the institutionalization of CRM in the universities, (with the solid commitment of their administration). A collaboration agreement was also signed by the participating universities. This was for building CRM action frameworks. It encompassed both implementation of the network’s activities, as well as the creation of their respective CRM Offices.

Finally, in September 2019, the fourth forum took place in the city of Puno. It was organized by the National University of the Altiplano (UNAP). At this conference, an alliance of universities was consolidated for setting up the CRM network. It was agreed that a constitution would be drafted for the Peruvian Network and, also, for the Latin American and Caribbean Network of universities committed to the CRM. The Rector of the UNMSM was elected as President of the Latin American Network of Universities committed to the CRM and of the Peruvian Network of Universities committed to the CRM. A Technical Secretariat was assigned to support the President with duties.

After these four conferences, the Network of Higher Education Institutions of Latin America and the Caribbean (Ries GIRD–LAC) and the Peruvian Network of Universities were officially established. This collective movement supported the CRM (Ries GIRD–Peru) and was committed to its goals. One immediate task was to draft a formal constitution for both networks. This was a major institutional foundation for more comprehensive disaster risk management.

4. Case Study: Discussion of Interviews Results (Phase 3)

In this section, we summarize and discuss the responses to the interviews that were conducted. The work was carried out during the 2016–2020 academic phase of the participating universities and in accordance with the ethical protocols of the National University Jorge Basadre Grohmann of Tacna (UNJBG). As explained in the methodology section, four questions were addressed to the Rectors and those individuals with responsibility for IDRM and ACC. These questions were structured along the lines of the management, training, research, and the RSU axis, and along the guidelines of the University Law Art. 07 [28]. All the questions were framed in Spanish and the interviews and recordings were also conducted in Spanish.

In keeping with the rationale behind the first research question, the inquiry focused on the process leading up to the formation of the Ries GIRD. The second question about how Ries GIRD and ACC were being implemented responded to the themes of this framework. Information was collected from the GIRD archives, the organizers of various fora, and from the websites of participating universities. The data that were analyzed also correspond with the wrap-up conclusions of the four conferences, and other information from a range of documents, and reports. In this section, the third RQ is addressed: What are the current main results of the evaluation of the actions developed by promoting universities within the network? To address this question, a survey was conducted to interview key staff from the universities involved. The results are reported in the next sections, arranged under the four themes highlighting the conceptual framework, that is: (1) Risk management to address climate Change; (2) Teaching and Learning to raise risk awareness; (3) Research about risk management and Climate change; and (4) University social Responsibility. The richness of these results and their full analysis are the main contributions of this paper. A complete record of interviewee responses is available upon request, from the authors. These have been developed within the framework of the UNSDGs towards Agenda 2030, MAH 2015–2030, of the United Nations, and of the policies and national systems of GIRD-ACC.

4.1. Risk Management to Address Climate Change

In terms of Management, there are two categories of factors that impact the move toward addressing climate change. These may be summarized as external influences affecting the universities and institutions (internal features). Both categories are necessary for any adjustments to be made. In the case of the former category, these exogenous factors relate to support received from institutions with more experience about the issue. In this case, these institutions collaborate and share knowledge about matters such as implementing institutional policies for their inclusion in Risk Management. This was described by one university as ‘In the same way, the advances of the UNMSM in this theme, such as the incorporation of the CRM in the institutional policy, as well as in the Institutional Strategic Plan and one of the objectives’.

Likewise, they identify USAID-OFDA as playing the part of an external consultant to the university. This facility is seen as a major source of information and resources about implementing Risk Management in universities.

Recognizing the key actors within the institution and bringing them on board is another helpful approach for incorporating risk management. One of these stakeholders even describes it as “... very conducive due to the level of commitment and responsibility of the representatives of the universities”. When considering that the leadership in the institution incorporates not only the decision making but also the supervision and implementation of policies, it is not surprising that they would be committed to the full process.

4.2. Teaching and Learning to Raise Awareness of Risk and Climate Change

Therefore, since these Universities recognize the significant role that they have to play in educating students, their measure of commitment to this topic can only be ascertained by solid institutional effort. For example, in the first university studied, the Rector of the previous academic period (2016–2019) reflected ‘... the networks have facilitated an agenda

and a common commitment that materializes in various actions within the framework of the CRM, (...) in professional and continuous training'. The operational unit confirms that the network has made it possible to 'Socialize the training experiences (...) of the universities, which is why we set out to make a baseline of the progress of the CRM ... '. Another action refers to 'Mainstreaming the GIRD in the educational/pedagogical Model and the incorporation of the GIRD as a subject in general studies'.

On the other hand, the second university stated that ' ... the process of incorporating the GIRD in curricular plans maybe seen in the reformulation of courses in some committed schools, such as architecture, communications and veterinary'. An Advanced Management course is one of the outputs from these developments. IRMRM competencies were also incorporated into the curriculum and this delivery area received technical sponsorship from USAID/OFDA. However, some respondents told us that the emergence of research, training, and knowledge management course streams has not developed in a comprehensive and articulate way.

In the third university under study, the CRM Office was established in 2019. It eventually expanded to different faculties, and this led to a number of initiatives pertaining to disaster risk management. According to the Rector, during his presiding office (2016–2020): ' ... they took on commitments to incorporate the CRM in academic training' and ' ... propose its integration within the undergraduate and postgraduate curricula'. However, despite some work achieved through the Office, this progress has been stymied by the recent pandemic.

Following on from discussions at the IV conference, the participating universities all committed to integrating CRM into their professional training units. Additionally, it is clear that there is now a drive to integrate IDRM subjects in undergraduate and postgraduate programs and, also, to engage the academic community with the topic. Updates about the progress of these initiatives are also shared in other university settings [29].

The complexity of challenges facing future professionals demands that they acquire transferrable skills, competencies, and ways of thinking [30], which address problem solving in disaster and climate change scenarios. This means that training would need to match certain educational standards. This alignment is important in order to meet the expectations of the three major policy frameworks (i.e., the Sendai Framework for Disaster Risk Reduction, the UN Sustainable Development Goals, and the Paris Agreement on Climate Change) [31].

4.3. Research about Risk Management and Climate Change

It is fair to say that overall, sustainable development efforts promote a culture of prevention. It makes sense too that this area would be closely linked to disaster risk mitigation. However, it should be noted that there is still a dearth of actual research about IDRM issues [32]. The first university admitted that the work undertaken so far has not been well documented and researched, but there is some intention to boost activity with this focus. According to the interviews and the administration of the second university that was studied, research is definitely still a pending field. In short, both universities confirmed this research gap and the need to expand knowledge in IDRM and ACC [33].

As it stands, this kind of research is open to cross-cutting themes and it is really at a formative stage. In reviewing the profiles of the universities that were studied, it was possible to identify some early work that referred to IDRM and ACC over the last 5 years. However, the majority of research was conducted by local specialist groups or other organizations. Palacios Serna [34] argues that because of this, it is critical that more is done about developing academic research capacity. Moreover, where two universities show pending research concerning GIRD-ACC, the Ries CRM, this means there is an opportunity to strengthen alliances and strategic partnerships for multidisciplinary and inter-institutional tasks [34]. Whatever the case, it is important to emphasize the role of scientific research in promoting national development and achieving deliveries associated with CRM. Palomino León [35] agrees that while efficiency correlates with advancing science, technology, and innovation, progress also bodes well for Peru's national development.

4.4. University Social Responsibility (USR)

According to Edgar Morín's gloomy thesis: "We are on a planetary Titanic". Apparently, humanity's ecological footprint deteriorates in the midst of social instability. In response to this, the UNSDGs (11, 13, and 17) offer a roadmap to guide educational policies, but higher education institutions are still far from including these 17 SDGs in their prospectuses and curricula [36]. University social responsibility may be defined as the ethical and effective management of impacts generated by the university in society, as a result of exercising its functions. It includes the management of the impact produced by the relationships involving the university community and other parties committed to the environmental cause [28]. In the study entitled "University Community and Sustainable Campus: USR in the Framework of the 2030 Agenda", one conclusion refers to the fact that the testimony of a sustainable campus could enrich USR and vice versa. According to this thinking, a 'sustainable campus' status would mean prioritizing academic and research activities, with attention to economic balance, and social and environmental causes and effects. Overall, it entails contributing to and favoring sustainable development and the welfare of society.

Therefore, when it comes to the specific question of the university's social responsibility, CRM implementation is in an inception phase. There is still no clear understanding of the social responsibility approach as this would really meet common activities of projection and of extension, which guide the university's agendas and delivery. For example, this might include the formation of university action brigades; concerted recognition of volunteer organizations; a visible university presence at local, regional, and international levels; and organizing international events.

During the interviews with the Rectors of the (2016–2019) academic period, at least recognition of disaster risk (due to global warming) was implicitly observed. However, this invites further reflection on the role of the university in contributing to the well-being of society. Essentially, it highlights the foundational social mission of the university. This might play in making the university community become sustainable in itself [28].

Given the problems at hand, there is a clear need to take action. This is shown by the administrations in the successive academic events (e.g., the national and international conferences referenced earlier), organized by their universities. This is laudable and at a macro level, it demonstrates growing commitment by the cohort of universities across Peru, Latin America, and the Caribbean. Once again, these initiatives respond to what was agreed upon in the Sendai Framework for Disaster Risk Reduction 2015–2030, [11]. The university focal points stated that when these obligations have been assumed, they could then evolve and be expressed in various ways within the CRM framework. This links back to the role of universities, in terms of their institutional policy and management, professional and continuous training, applied research, and knowledge management, as well as the extension and university projection with social responsibility. These actions are recognized as progressions that enable the risk management theme.

5. Conclusions, Limitations, and Further Research

Universities are recognizing the importance of their role in achieving the goals of the SDGs through risk management. In this Peruvian case, HE institutions have been joining efforts toward achieving SDGs 11, 13, and 17. This shows that coping with disaster risks and adaptation to climate change is not limited to mere technological advancement and proficiency. There are distinct human organizational factors at play and academia is not excluded. In order to achieve this change, avid recruitment, program alignment, and cooperation across HE institutions are important. HEI cross-sector engagement is also vital. This thrust toward risk management and climate change in institutional policies and strategies entails implementing strategic alliances across academia, and the public and private sectors. We define this as a networking strategy that is translatable at local, national, and international levels. Participation in such HE-related networks also enables

the empowerment of its membership. Two main contributions of this paper should be highlighted as a result of taking stock of the key events on the network journey.

First, the linkage between higher education and CRM in strengthening the culture of prevention is key. In this case, the higher education institution develops scientific research as a component in advancing national development and in harnessing and meeting the UNSDGs. These important achievements must be expressed through quality education, sustainable cities and communities, and meeting climate action.

Second, the main conduit for implementing commitments and driving CRM delivery (related to the UNSDGs) is through education for sustainable development. However, progress is still in an inception phase. This is also due to the nature of the administrative structure of the universities in question. Although the participating universities have not made significant progress in this regard, they recognize that more work is still needed for social action re: IDRM and CCA issues. Hence, the Ries CRM signifies an opportunity for partnership, and for honing alliances and other cooperation among higher education institutions.

5.1. Recommendations

The objective of this study has been to enhance the sustainable and resilient development of wider society by enabling Risk Management and Adaptation to Climate Change Through a Network of Peruvian Universities. One of the main recommendations of this study is to incorporate risk and disaster management (GIRS) in the curricula via the training of relevant sustainability and risk management literature together with the implementation of technology development in UG, graduate, and research programs. Initial results indicate the crucial importance of gaining consensus (a notoriously difficult task in LA) between the authorities and the operational departments. We also highlighted the importance of the role of universities' social responsibilities in perusing sustainability and SDGs in achieving the mission. Finally, we discussed the importance of developing and nurturing a network by learning from similar groupings across LA to improve CRM within universities

Furthermore, incorporating practical networking in professional training is a commitment already taking root in the universities, but the level of application varies from one campus to another. For example, whereas one campus may be in its initial phase, as a result of the determined work of a group of directors (or lecturers with an interest in the subject), these efforts may not necessarily be supported by institutional policy. Some non-formal training is available outside the classroom, and recruitment and participation are organized by the institutions. This activity directly relates to global environmental objectives (UNSDG 13). This particular SDG acknowledges that there are wide-ranging geo-physical fluctuations in the natural environment and adaptations to the impacts of climate change that have already taken place (e.g., episodes of high–low temperatures, droughts, increased storms, floods, etc.) are needed.

However, in some instances, there is an obvious lack of consensus between the governance and the operational departments of these institutions. This relates specifically to the University Social Responsibility approach, which emphasizes hard-line mainstreaming for more effective integration of IDRM and ACC processes. The University Social Responsibility concept has not been fully internalized by most of these bodies. It is best reflected in concrete actions toward implementing IDRM and ACC within the universities. Based on this definition, and on what has been noted earlier, the action areas most frequently mentioned by the former Rectors are still Management and Training.

In terms of LAC regional progress, there are currently three distinct fields and related institutional teams. Team 1, which works on constitutional matters and the governing statutes of the Ries GIRD–LAC and Ries GIRD–PERU, is being implemented by the Columbia University of Paraguay. Team 2 supervises the operational network and is under the charge of the Universidad Colegio Mayor de Antioquia, Colombia. Team 3 develops projects and innovation and it is led by the UNJBG. These parties distribute the operational work across the network. They benefit from technical cooperation with

the US Agency for International Development and its Office of Humanitarian Assistance (USAID/BHA—formerly USAID/OFDA).

5.2. Limitations of This Study

One of this study's constraints is that not all the universities that participated in creating the Red Ries GIRD were actually involved. This was because of the lack of access to some of their administrative representatives during the designated study period. It should also be noted that the interviewing was conducted with former university officials, some of whom are no longer in those positions. Therefore, it would not be prudent to generalize about headway across all of the university membership bodies. This is because the study only covers the experiences and best practices of the participating universities.

At the same time, we consider that these findings allow us some baseline data. This is simply a starting point in exploring inter-university linkages regarding the topic. Our findings strongly suggest that external relationships involving HEIs may develop into functional, successful partnerships. This would help academia to work more closely with the rest of society in a mutually functional way. For example, the perception of academics and students about the topic would be an important complement to this piece of work. Moreover, commentary and other contributions from university alumni might be an exciting source for fresh import. These could become a repository of viewpoints as a result of professional practice, any necessary adjustments (resulting from environmental degradation itself), and emerging trends and workstreams.

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Appendix A

Table A1. Number of reported disasters and total number of people killed (2005–2014). Source: Federación Internacional de Sociedades de la Cruz Roja y de la Media Luna Roja. Informe mundial sobre desastres 2015: Agentes locales, clave para la efectividad de la acción humanitaria (Resumen). 2015. 1–44 p. Available online: <https://reliefweb.int/report/world/informe-mundial-sobre-desastres-2015-agentes-locales-clave-para-la-efectividad-de-la> (accessed on 29 November 2022).

		Climate, Hydro, and Meteorological Disasters	Geophysical Disasters	Reported Disasters	Number of People Reported Dead
2005	Number of reported disasters	407	33	440	
	Total number of people reported killed	12,639	76,244		88,883
2006	Number of reported disasters	392	37	429	
	Total number of people reported killed	17,140	6708		23,848
2007	Number of reported disasters	390	27	417	
	Total number of people reported killed	16,063	791		16,854
2008	Number of reported disasters	335	33	368	
	Total number of people reported killed	147,217	88,054		235,271
2009	Number of reported disasters	342	26	368	
	Total number of people reported killed	8914	1924		10,838
2010	Number of reported disasters	386	31	417	
	Total number of people reported killed	80,797	227,058		307,855
2011	Number of reported disasters	315	36	351	
	Total number of people reported killed	20,376	1166		21,840
2012	Number of reported disasters	334	31	365	
	Total number of people reported killed	8800	727		9527
2013	Number of reported disasters	306	33	339	
	Total number of people reported killed	20,674	1166		21,840
2014	Number of reported disasters	281	34	315	
	Total number of people reported killed	7090	873		7963
Total		3488	321	3809	764,204

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