Work Package 1.3

Supplementary Report: Mapping the Institutional Landscape at Partner Institutions

Report by: University of Central Lancashire, UK
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Strengthening University-Enterprise Collaboration for Resilient Communities in Asia (SECRA) Mapping the Institutional Landscape at Partner Institutions.

Introduction

The ERASMUS+ and European Union-funded Strengthening University-Enterprise Collaboration for Resilient Communities in Asia (SECRA) project aims to enhance disaster resilience in communities in Asia by promoting and improving university–enterprise collaborations (UECs). The project consortium included thirteen partners, including nine universities in Thailand, Sri Lanka, and The Philippines. The first work package of the SECRA project examined the current operation of UECs in the South Asian partner countries. The results of this work package provide a detailed map of the current collaborative landscape, and an UEC framework to support effective collaborations Universities and Enterprise organisations working in the area of disaster risk reduction.

A literature review was conducted to develop an understanding of how effective UECs can be initiated and maintained in a general context. This review highlighted several factors that either enabled or hindered effective UECs in a wide variety of settings. From the synthesis of published literature, it was evident that the factors that influence effective UEC formation and maintenance lie in one of four main categories, specifically factors relating to the structural, cultural, material, and relational elements of a partnership. However, it was evident from the literature review completed for Task 1.1. that additional research was required to develop an effective UEC framework specifically for disaster risk reduction in South Asia.

Previous research on UECs has largely focused on the benefits to academia and enterprises collaborations within the industrial and technological environments and linked primarily to economic advancements. Our understand of the experience of university staff working in UECs relating to the disaster field is limited. The country level literature reviews

relating to UECs (see report from Task 1.1) revealed that most academic staff have a preference to focus on teaching and economic development rather than disaster resilience. Further, the literature reviews highlighted that most of UECs relating to disaster resilience and recovery were supported by the government, and the involvement of other enterprise stakeholders was very rare. Nevertheless, all the focus countries demonstrated examples of good practices relating to UECs, and insights into how the general governance of UEC could be strengthened were identified. Therefore, Task 1.3 will explore the experiences of academic staff currently working in the South Asia partner universities to further explore the enablers and barriers to successful UECs in the area of disaster risk reduction.

In summary, the current study expands on our current understanding of UECs to focus on the barriers and enablers which influence the ability of South Asian universities to work effectively with UECs. Further the current study looks beyond traditional university collaborations with private business partners and looks at a wider range of collaborators, such as NGOs and governmental organisations. By focusing on the first-hand experience of university staff and senior managers who are currently working with UECs in South Asia we will be able to refine the development of guidance in relation to UEC formation and maintenance in disaster resilience and recovery.

<center>**Methods**</center>

Study One

The first study explored the experiences of UECs from the perspective of senior managers at the nine partner institutions.

Participants

Participants consisted of senior management staff (n=59) who were recruited via opportunity sampling from partner institutions involved in the SECRA project. The nine partner institutions were from across south-east Asia and included three Thai universities (Chiang Mai University, Mahasarakham University, and Naresuan University), three Sri Lankan Universities (University of Peradeniya, University of Ruhuna, and University of Sri Jayewardenepura), and three Philippines universities (Ateneo de Manila University, Malayan Colleges Laguna, and Philippine Normal University).

Materials

The questionnaire was distributed to senior management staff participants using the online platform Qualtrics at the 9 partnership universities. Each questionnaire contained approximately 20 questions, with additional space provided for participants to expand on their responses. The content of each questionnaire intended to examine the institutional structures and support for UECs. The questionnaire also asked senior managers to identify factors that can enable or hinder successful UECs. The study received full ethical approval from the University of Central Lancashire.

Procedure

Senior management staff at the partner institutions were provided with study information, and consent was obtained before completing the questionnaires. Senior managerial staff then completed the questionnaire independently, which took around 20 minutes to complete. In this questionnaire, participants were first asked to provide basic

demographic information. Example questions included "What is your full job title?" and "Which country are you based in?". Participants were then asked a series of questions relating to UEC support and potential enablers and barriers to UEC formation and maintenance. Example questions include "Is there an external relations department at your university?" and "What direct kind of support for university-enterprise collaboration does your university provide?". Finally, participants were provided with a debriefing and provided appropriate contact details that could be used to ask questions or raise concerns.
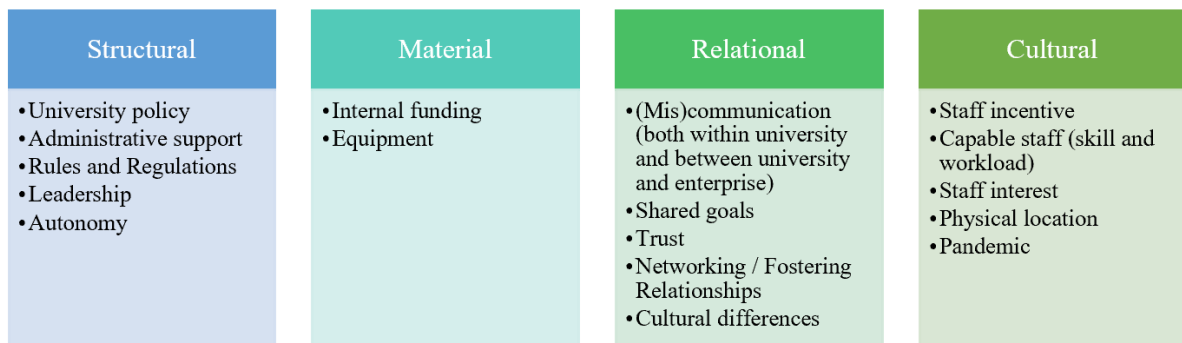
Results

Duplicate responses, incomplete responses, and responses where consent was not provided were excluded from the analysis. Consequently, there were 62 recorded questionnaire responses from senior management staff, but only 59 were included in the analysis once the exclusion criteria had been applied. Specifically, 17 responses from Thailand, 20 responses from Sri Lanka, and 22 responses from The Philippines were included. The results revealed that all senior management participants from Thailand (n=17) were involved personally in UECs. In Sri Lanka, 90% of participants (n=18) were personally involved in UECs, whereas, in The Philippines, this figure dropped to 72% (n=17).

Senior managers were asked about barriers specific to their university. Of the 46 responses to this question, 59% of senior leadership members reported barriers to forming UECs (31% in Thailand, 59% in Sri Lanka, and 50% in The Philippines). When completing the questionnaire, participants were asked to identify up to five enablers and barriers to forming UECs in general. Overall, the 59 participants noted 201 barriers and 217 enablers for UECs. The responses were analysed using thematic analysis.

In order to complete the thematic analysis, the researchers initially read through all the responses to thoroughly understand the data set. After this, the first researcher read through the data set again and coded the responses into themes across each country. Then the second researcher read through the data set and coded the responses independently. The researchers compared their codes and agreed upon four significant themes which reflected the barriers and enablers of UECs across partner institutions. The main themes matched the themes identified in the literature report for Task 1.1, with the main enablers and barriers being identified as belonging to four main themes, which are structural, material, relational and cultural. The four

main themes contained subthemes, and these are noted in the diagram below (See Figure 1).

Structural	Material	Relational	Cultural
•University policy •Administrative support •Rules and Regulations •Leadership •Autonomy	•Internal funding •Equipment	•(Mis)communication (both within university and between university and enterprise) •Shared goals •Trust •Networking / Fostering Relationships •Cultural differences	•Staff incentive •Capable staff (skill and workload) •Staff interest •Physical location •Pandemic

Figure 1: Four main themes relating to the barriers and enablers of UECs across partner institutions.

Barriers to UEC

Across the three partnership countries factors which related to the Cultural theme were the most reported barrier to initiating and maintaining UECs (31%), followed by Structural barriers (30%). Relational barriers were the third most reported barrier to UEC (25%), and Material barriers were the least commonly reported (13%; refer to Figure 2 below).
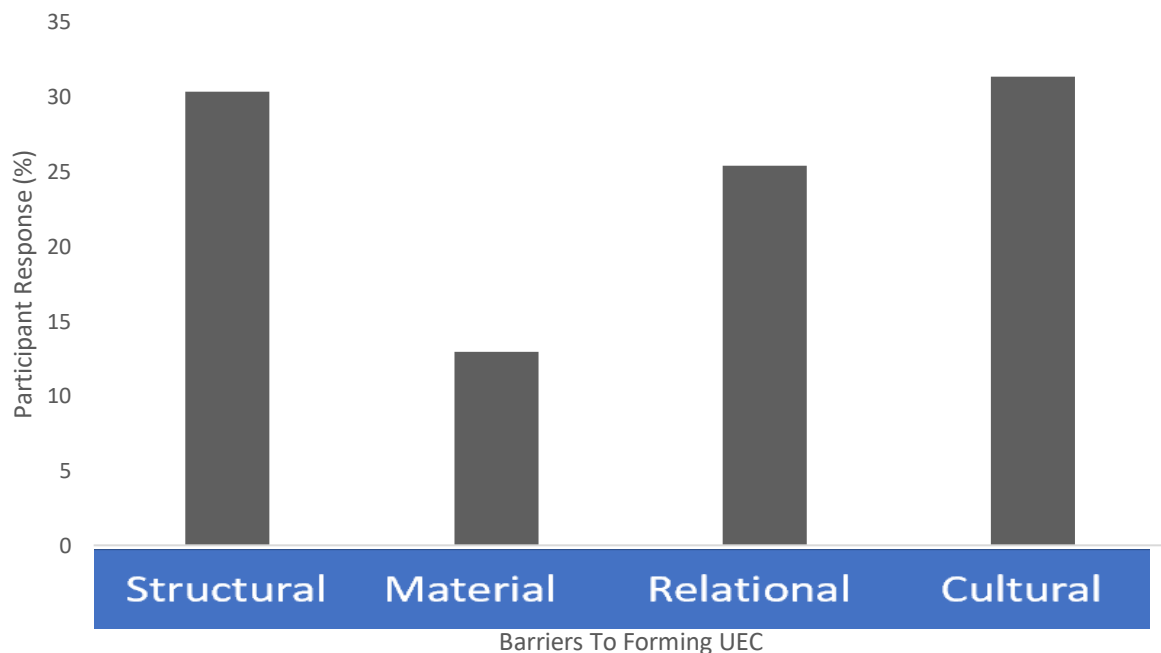
Figure 2. Barriers to forming UECs across all countries

Senior managers in all partner countries reported a similar pattern of barriers to successful UECs. Around 30% of senior managers in all three countries noted that factors which related to the Cultural and Structural themes were likely to be a barrier to UECs. Senior managers at Sri Lankan institutions reported Material barriers to be the least likely barrier to impede successful UEC formation and maintenance. Whereas for The Philippines Relational barriers were least often mentioned. For Thailand barriers to UECs were evenly split across the Relational, Cultural and Structural themes. A full breakdown of reported barriers by country can be seen in Table 1.

Table 1: Breakdown of Barriers to Forming UECs by Country

Country	Barriers to UECs (%)			
	Relational	Cultural	Structural	Material
Thailand	23	34	28	15
Sri Lanka	35	29	28	8
The Philippines	14	32	37	18

Enablers for UEC

Across the three countries, senior managers were most likely to mention factors associated to the Relational theme (43%) as key enablers of UECs. The second most common theme was Structural support at 24%, followed by Cultural at 22%. Senior managers were least likely to mention factors associated with the Material theme (11%) as being enablers of UCEs. (See Figure 3 for a further breakdown of the key enablers across each partner country).
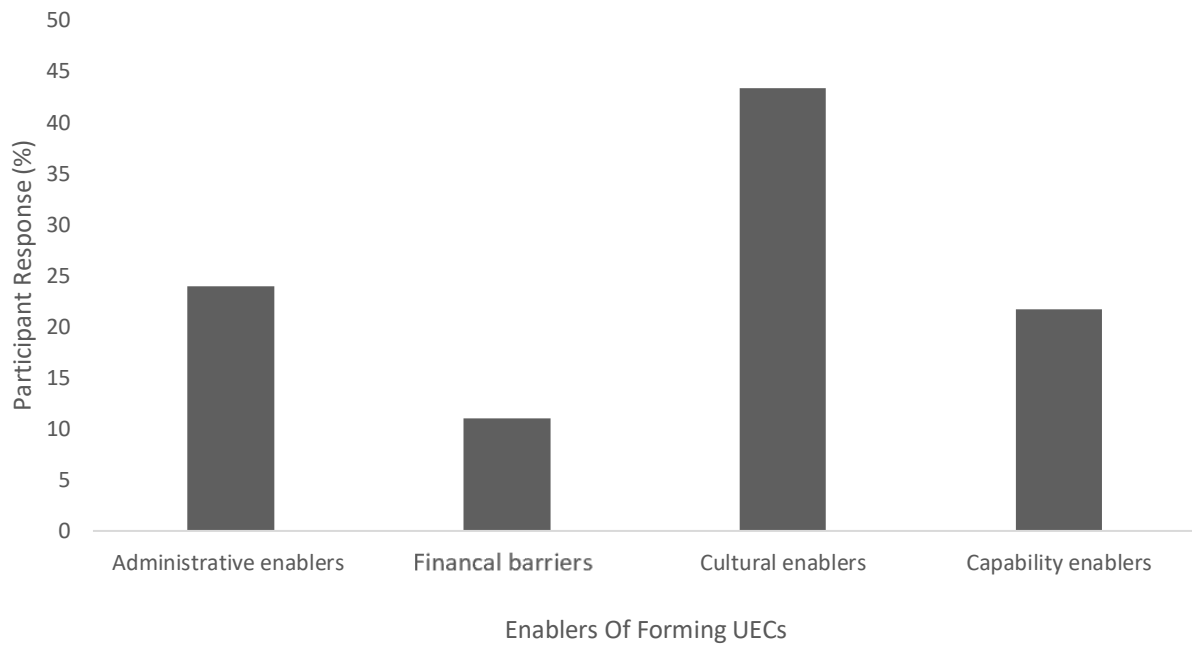
Figure 3. Enablers to forming UECs across all three partner countries.

When the results are broken down by country, senior managers in Thailand, Sri Lanka and The Philippines all reported factors associated with the Relational theme as the most important enablers of UECs. Factors relating to the Relational theme were especially highlighted by senior managers in Sri Lanka. Senior managers across all nine partnerships reported that factors associated with the Material theme had the lowest ability to enable UECs. A full breakdown of reported enablers by country can be seen below in Table 2.

Table 2. Breakdown of Enablers to Forming UECs by Country

Country	Enablers of UECs (%)			
	Relational	Cultural	Structural	Material
Thailand	37	26	23	14
Sri Lanka	53	22	16	8
The Philippines	37	16	35	11

Support for UEC

Senior managers were asked to identify from a set list all the types of support offered by their university for UECs. The list consisted of the following options: Internal funding for UEC projects, administrative support on a university level, administrative support on a faculty level, teaching staff's work time can be allocated to UEC, UEC-facilitating events, dedicated website for external contacts and no support.

Across all countries, the most common type of support given was internal funding (67%), followed by administrative support at the university level and administrative support at the faculty level (65% and 48%, respectively). Following this, the next most reported types of support were teaching staff's work time being allocated to UEC (46%) and UEC facilitating events (37%). The least reported type of support given was a dedicated website (19%), and only 2% of participants said that their university provided no support for UECs. (See Figure 4 for a full breakdown on the support provided for UECs across the nine partnership universities).
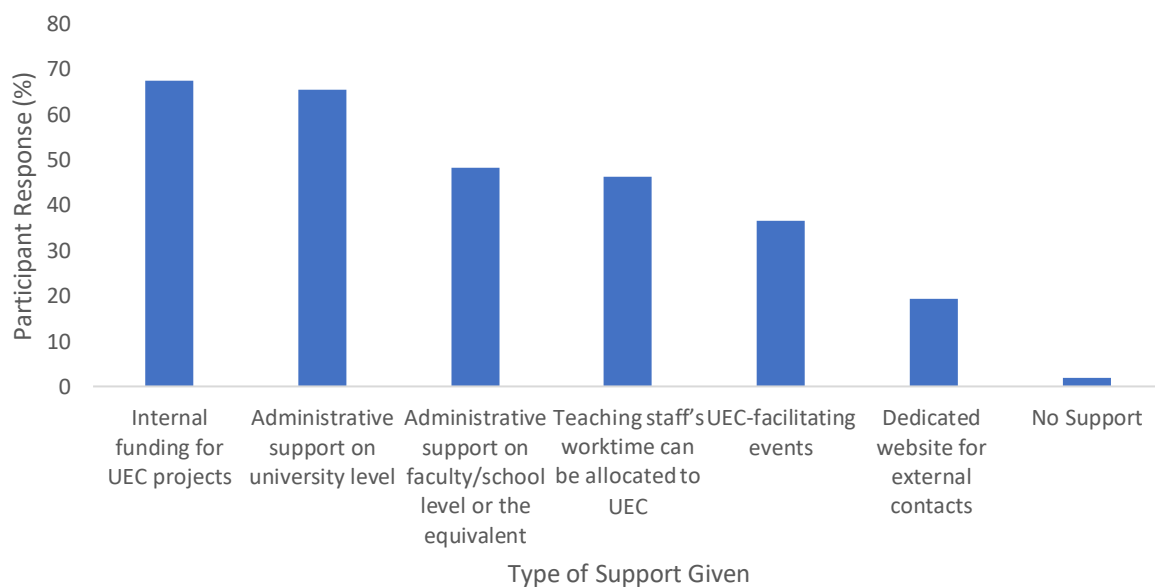
Figure 4: The types of support available for UECs reported across partner countries.

Whilst it is apparent that some types of support for UEC are more commonly implemented than others, the support offered in each of the partner countries also varied to

some degree. It is important to note that very few participants reported that no support for UECs was provided, with only managers at one Sri Lankan institution reporting no support was provided. The senior managers at universities in The Philippines reported higher levels of support in all areas except for a dedicated website for external contacts. (For a full breakdown of the support provided by country for UECs see Table 3).

Table 3. Breakdown of Support Provided for UECs by Country.

Country	Support Provided (%)						
	Internal funding for UEC projects	Administrative support on the university level	Administrative support on faculty/school level or the equivalent	Teaching staff's worktime can be allocated to UEC	UEC-facilitating events	Dedicated website for external contacts	No support
Thailand	62	69	46	46	38	31	0
Sri Lanka	61	56	44	44	22	27	6
The Philippines	76	71	52	48	48	5	0

Study Two

The second study explored the experiences of UECs from the perspective of university staff working on UECs in relation to disaster risk reduction at the nine partner institutions.

Participants

For this study 190 university staff employed on academic or research contracts (Thailand, n=56 responses, Sri Lanka, n=63 and The Philippines, n= 71) were recruited via opportunity sampling from partner institutions involved in the SECRA project. The nine partner institutions as reported above were included in this study.

Materials

The questionnaire was distributed to university staff employed on academic or research contracts using the online platform Qualtrics to the 9 partnership universities. The questionnaire contained approximately 50 questions with the exact number of questions presented to participants varying because of previous responses. The study received full ethical approval from the University of Central Lancashire.

Procedure

After academic and research staff provided informed consent to take part in the study they were invited to completed the questionnaire with the support of a research assistant. The research assistant was either physically present or joined the participant remotely using an online virtual meeting platform, such as Zoom or TEAMS, in line with local Covid-19 guidelines. The questionnaire took around 40 minutes to complete. Participants were first asked to provide some basic demographic information such as their "age" and "gender" and academic background (e.g., years of experience in academia). The questionnaire then asked questions relating to the participant's experiences of UECs and the support available for UECs at their institution. For example, "Is University-Enterprise collaboration part of the university's

strategy as outlined in internal policy documents?" and "Is there allocation of time in your contract specifically to foster relationships with external partners?".

Results

Two hundred forty-two responses were received from academic/research staff in universities across Asia. Duplicate responses, incomplete, and responses where consent was not provided were excluded from the analysis. Once the exclusion criteria had been applied 190 responses were included in the subsequent data analysis with responses from Thailand (n=56) , Sri Lanka (n=63) and The Philippines (n=71).

Demographics

The age range across all countries was 18-65+ with a median age range of 45-54. The gender split across all countries was 62% male, 37% female, and 1% preferring not to say. (See Table 4 for participant demographics).

Table 4: Breakdown of participant demographics by country.

	Median Age Range (years)	Male (%)	Female (%)	Prefer not to say (%)
Thailand	45-54	63	35	2
Sri Lanka	45-54	76	24	0
The Philippines	35-44	48	51	1

Overall, participants were more likely to have a science background (66% compared to 34% humanities). The years of academic experience ranged from 0-20+ across the countries, with the median years of experience being 11-20. The number of years of professional experience outside of academia ranged from 0-20+ years, with the median years of professional experience being reported as 0-5 years across all three countries. (See Table 5 for the academic participant's background).

Table 5: Academic background and experience of participants.

	Academic Background (%)		Median Experience Range (years)	
	Science	Humanities	Academic	Professional
Thailand	80	20	11-20	0-5
Sri Lanka	75	25	11-20	0-5
The Philippines	48	52	11-20	0-5

The seniority of participants across the countries also varied, with 18% of participants being at a Principal Lecturer position or higher, 32% of participants were at the Senior Lecturer level, 35% were at the Lecturer level, 10% were Researchers, and 4% were Teaching Assistants. (See Table 6 for breakdown of staff roles by country).

Table 6: Staff roles of participants breakdown by country.

Country	Staff Roles (%)				
	Teaching Assistant	Researcher	Lecturer	Senior Lecturer	Principal Lecturer or above
Thailand	6%	12%	61%	22%	0%
Sri Lanka	4%	6%	6%	46%	38%
The Philippines	4%	13%	38%	30%	16%

Priorities for disaster risk reduction

Participants were asked to select up to two priorities, with which they felt their work aligned, from the four Sendai priorities for disaster risk reduction. Across the three countries, 345 responses were recorded, with 36% of participants reporting working on Priority 1 (Understanding disaster risk). Twenty-six percent reported working on Priority 2 (Strengthening disaster risk governance to manage disaster risk). At the same time, 13% of participants had their work aligned with Priority 3 (Investing in disaster risk reduction for

resilience). Finally, 25% of participants had their work focused on Priority 4 (Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation, and reconstruction). A breakdown of priorities per country can be seen in Table 7.

Table 7: Breakdown of participant's priorities by country per the four priorities outlined in the Sendai agreement.

Country	Priority One	Priority Two	Priority Three	Priority Four
Thailand (n=96)	50	25	7	18
Sri Lanka (n=116)	30	26	17	27
The Philippines (n=133)	36	26	13	25

Barriers to UEC

When asked if they had faced any barriers in forming UEC's, 187 responses were received across all partner countries. Forty-five percent of participants (n=85) reported facing no barriers, and 55% of participants (n=102) reported that they had faced barriers to creating and maintaining UECs for disaster resilience. When broken down by country, the results suggests that 62% of academic staff in Thailand, 48% in Sri Lanka and 55% in The Philippines reported facing barriers to UEC formation and maintenance. The barriers reported were then grouped into themes identified by the senior managers in the institutional landscape questions, specifically themes relating to Structure, Material, Relational and Cultural barriers.

Across all partner countries, the main barrier to forming UECs reported by academic staff were Structural barriers (39%), with issues relating to the lack of admin support and time delays being the main barriers within this theme. The next most common barriers were Cultural barriers at 29%, which arose from issues regarding staff workloads, ability, and incentives, as well as the geographical location of the institution and COVID-19 pandemic. Material barriers

at 17% were the next most common barrier and encompassed issues such as internal funding and availability of equipment. The least reported barriers were Relational at 15% such as communication difficulties and lack of networking opportunities. (See Table 8 for a breakdown of barriers to successful UECs by country).

Table 8. Breakdown of barriers to successful UECs by country.

Country	Barriers to UEC formation and maintenance (%)			
	Structural	Cultural	Material	Relational
Thailand	52	24	14	10
Sri Lanka	42	31	15	12
The Philippines	23	33	25	19

Support for UEC

When asked about the support provided by their university for forming UEC's, 187 responses were received from academic/research staff. Across all partner countries, universities' primary support for forming UECs was administrative support at a university level (69%) and administrative support at a faculty level (61%). They were followed by work time allocated to UEC (56%) and UEC facilitating events (49%). The least reported types of support were internal funding (27%) and a dedicated website for external contacts (23%). However, very few participants reported that their university did not provide support for forming UECs (5%). The support provided for UECs across the three countries is demonstrated in Table 9.

Table 9: The types of support reported by staff in Thailand, Sri Lanka, and The Philippines.

Type of support given	Participant response (%)		
	Thailand (n=55)	Sri Lanka (n=63)	Philippines (n=69)
Internal Funding	27	33	74
Administrative support – University level	60	70	75
Administrative support – Faculty level	45	60	75
Worktime allocated to UEC	53	49	64
UEC facilitating events	29	52	61
Dedicated website for external contacts	22	30	17
No support	9	5	1

Fostering UEC

Academic/research staff were asked if they were given allocated time within their contracted work time to foster relationships with external partners. A total of 186 responses were received across all partner countries, with 54% of participants reporting that they had time allocated on their workload to foster relations with external partners, but the number of hours was unspecified. A further 11% had a specified number of hours in their contract dedicated to fostering relations. However, 35% of participants had no allocated time to foster relations with external partners. (See Table 10 for a breakdown of time given to foster relationships with external partners across the three partner countries).

Table 10: Breakdown of workload allocation by country for fostering relationships with external partners.

Country	Time is given to foster relationships with external partners (%)		
	No time allocated	An unspecified number of hours	A specified number of hours
Thailand (n=54)	31	59	9
Sri Lanka (n=63)	30	68	2
The Philippines (n=69)	43	36	20

Participants were asked if their university had an external relations department at university or faculty levels. Of the 189 responses, 74% of participants had an external relations department at the university level, whilst 14% of participants reported an external relations department at the faculty level. However, 13% of participants were not aware of an external relations department at their university (See Table 11).

Table 11: Breakdown of the level of awareness of external relations department provision at university and faculty by country.

Country	Awareness of External Relations Department Provision (%)		
	At the university level	At Faculty Level	No external Relations Provision
Thailand (n=56)	50	32	19
Sri Lanka (n=63)	76	5	19
The Philippines (n=70)	90	7	3

Note: See Appendix 1 for a list of External Relations information provided by participants

Participants were asked if their university had an internal policy related to UECs. Across all partner countries, 153 responses were received, with 97% of participants reporting that their university had an internal policy relating to UEC. However, 3% of participants said they were not aware of whether their university had an internal UEC policy. (See Table 12).

Table 12: Breakdown of the level of awareness of internal policy relating to UEC by country.

	Awareness of Internal Policy Relating to UEC		
Country	No internal policy (%)	Internal policy available (%)	No response to the question (n)
Thailand (n=38)	5	95	18
Sri Lanka (n=52)	2	98	11
The Philippines (n=52)	2	98	8

Note: See Appendix 2 for a list of the internal policy documents provided by participants.

Qualitative comments

The qualitative comments regarding the formation and maintenance of UECs from Thailand indicate that the administrative burden of UECs is a barrier. Participants noted a need to "improve the legislation" and that "too many steps [were] required for the UEC process." It was suggested that "Business relations can be further supported with clear-cut platforms." Participants also noted that "university policy and strategy for UEC is very important" and that "IT platform for submitting the requirements from external partners."

In Sri Lanka, it was noted that Culture around UECs can be a significant barrier to success with "misunderstanding on expectations" and that "faculty members' lack of initiative or interest to do this due to the workload." Communication was noted as a critical enabler with the need for "open communication and mutual understanding" and the need for "trust and assurance." Policies were also noted as necessary, with UECs needing to be "part of the strategic direction of the university" and that "there should be a strategic framework that leads to the direction of collaboration."

In The Philippines, suggestions to enhance the Relational factors associated with UECs were noted including support to initiate such as "Engagement of enterprises with symposiums", "online mechanism should be launched for quick collaboration", "Sharing students for internship enrolments", "introducing a clear performance-based promotion system", "preparing guidance, resources and infrastructure facilities for the development of University - Enterprise

partnership", "arranging progress preview meetings with the relevant bodies to understand the programmes activities better and to ensure the expectations", "job fairs for interact with enterprise in faculty", "a dedicated unit should be available for online purchases and other external collaboration activities" and "a proper system should be available with dedicated staff to keep healthy relationships with external parties."

Discussion

The purpose of two studies undertaken here was to develop an understanding of factors that can either enhance or hinder the development and maintenance of effective UECs relating to disaster risk reduction in the Philippines, Sri Lanka, and Thailand. The two studies drew on the experiences of managerial and academic staff from nine partner institutions drawn from across South Asia. In the first study senior managers outlined the key factors which they believed acted as enablers or barriers to UEC formation and maintenance in their institutions. Using thematic analysis, the factors identified were placed into four main themes. The themes identified related to Structural, Material, Relational and Cultural factors. The four themes identified by senior managers in relation to formation and maintenance of UEC in the disaster field matched the themes identified in the literature review (Task 1.1). This suggests that the enablers and barriers experienced in relation to UECs for disaster risk reduction in South Asia are largely similar to those experienced more widely by people working in UECs across the world and in different fields.

When exploring the demographic backgrounds of the university staff (those on academic contracts) participants were primarily male lecturers and senior lecturers aged between 45 and 54 years old, with 11-20 years of academic experience. Inclusion of a more diverse population of staff working in UECs could enhance the number of UECs within partnership institutions. Encouraging more women and more early career researchers will be important to increasing the number of UECs in each institution. When looking at the academic background of university staff who are currently taking part in UECs in Thailand and Sri Lanka most participants were from a science background. This may reflect the fact that most UECs for disaster risk reduction are currently in the field of engineering and medicine. However, participants from The Philippines were more equally divided between humanities and scientific backgrounds. The inclusion of academic staff from a humanities background in UECs which

focus on disasters is important. The societal impact of a disaster is far reaching and disciplines other than engineering and medicine can play an important role in disaster planning and recovery. Exploration of how the university partners in The Philippines incorporate academics from humanities into UECs could also provide insight into how UECs can be formed to support disaster risk reduction.

The results of the two studies presented here clearly show that both managerial and academic staff acknowledged that barriers and enablers to successful UECs exist within their institutions. What was interesting was that there were differences in the enablers and barriers identified by managerial staff and academic staff. For example, across all partner countries, Cultural factors were the most often reported as barriers to UEC success by managerial staff. In contrast, academic staff across all partner countries commonly reported Structural barriers (especially administrative support) to be the main barrier. This suggests that senior managers may have a different view regarding the factors which act as barriers and enablers to UEC formation and maintenance. It is important that any mismatch in understanding between senior managers responsible for the policy formation and resourcing relating to UECs and academic staff who are undertaking UECs is understood. If senior managers are not aware of the barriers/enablers which are experienced by staff undertaking UEC work this could hamper UEC success. However, although there are some disagreements regarding the barriers and enablers of UECs between senior managers and university staff there is still a considerable overlap in the barriers and enablers identified. The disagreements between senior managers and university staff could be in part down to the role responsibilities that each group has. Senior managers are likely to be more concerned with staff capacities/training for example.

With regard to the barriers and enablers identified within Study one, according to managerial staff across all partner countries, the most common theme for promoting UEC's was Relational enablers. In Study two, university staff also highlight the importance of

Relational factors such as building trust between universities and enterprises, enhancing communication and networking skills. This finding supports the importance of enhancing networking opportunities for staff and local enterprise organisations to aid the formation of UECs. Events such as University-Enterprise networking days and improving communication skills in university staff so that they can communicate their ideas of potential Enterprise partners is an important UEC enabler. It is clear from the qualitative comments received that academic staff understand the importance of promoting UECs and called for "Engagement of enterprises with symposiums" and "job fairs for interacting with enterprise in faculty". Raising awareness of UECs and educating potential stakeholders at facilitating events is a key strategy which will help with the formation of UECs. Additional work is also needed to build trust between universities and enterprise partners. The establishment of clear guidance relating to issues such as intellectual property rights is essential to help build trust and understanding.

Study one also identified that senior managers believed that barriers relating to the Structural and Cultural themes had a similar impact on UEC formation and maintenance. In Study two university staff reported that they felt that Structural barriers were instrumental in failure of some UECs. The structural factors which seemed to be the biggest barrier in UECs related to administrative support with staff noting time delays caused by administrative services. The lack of administrative support led to the need to follow bureaucratic procedures that hindered the liquidation of funds, delayed procurement of equipment, and development of contracts. In addition, a lack of investigating in IT systems, an absence of a skilled workforce, and inadequate university infrastructure and technological capabilities can all contribute to administrative barriers to forming and maintaining UECs. Qualitative comments made by academic staff also highlight the administrative barriers they faced. For example, one staff member reported that there were "too many steps [were] required for the UEC process" and that "Business relations can be further supported with clear-cut platforms." In line with the

findings of the literature report it would seem that poor administrative support can be a major barrier to successful UECs and that universities should invest in their administrative infrastructure if they wish to enhance their UEC capabilities.

Senior managers also noted that one of the key Structural barriers that might be experienced is a lack of clear guidance on how UECs should be set up and run. University staff also identified the importance of internal UEC policies, with one participant noting that a clear "university policy and strategy for UEC is very important." However, from the academic staff questionnaire in Study two, it was clear some participants were unaware of their universities internal UEC policies and whether their university had an external relations department. Therefore, it is important that partner universities ensure that not only do they have the correct regulations in place, but also provide staff training which raises awareness of the governance documents relating to UEC formation and maintenance.

Cultural factors were also identified by senior university managers as being barriers to UEC success and this was supported to a degree by academic staff. The key barriers within the Cultural theme related to staff workloads and staff lacking the relevant expertise, skills, and incentives to form and maintain UECs. Cultural barriers to UECs were also noted in the literature review and highlighted the need for additional investment to help develop a skilled workforce that possesses the relevant expertise to work in UECs. Moreover, the literature review also noted that the workloads of teaching staff in each of the partner countries were demanding and thus created barriers to developing effective UECs, both generally and for disaster resilience, as staff did not have adequate time for engaging with them. Although all partner countries noted that staff were allocated worktime for UEC, many staff noted that the number of hours allocated was unspecified. The allocation of specified hours for UEC may incentivise academic staff to engage with collaborative projects. Further UECs could be enhanced in partner universities by providing additional initiatives for staff engaging in UECs

such as promotional opportunities or bonus payments. Finally, providing additional training on UEC formation and governance could increase staff capabilities and so reduce the Cultural barriers to UECs.

From the country reports, it was evident that Cultural barriers to UEC can be a wider issue than just a lack of staff capacity or incentives for staff to undertake UEC work. Cultural barriers may well be more deep set and result from a lack of an established research culture and the divergence between the aspirations and values of academics and enterprises. For example, the Philippines country report highlighted a 'Filipino cultural trait': a fear of failure, which was believed to prevent academics from engaging with UECs for disaster resilience. In the Sri Lankan country report, the lack of an established research culture and a lack of entrepreneurial drive amongst academic staff were significant barriers to UECs for disaster resilience. The findings were echoed in some of the qualitative responses from academic staff at Sri Lankan institutions. For example, the culture around UECs can be a significant barrier to success with "misunderstanding on expectations" and that "faculty members' lack of initiative or interest to do this due to the workload." Therefore, it will be important to address these wider cultural issues and help universities establish a research culture which aligned the goals of universities and enterprise organisations to support UEC success.

The final barrier to forming UECs that emerged from this study was Material barriers. Material barriers (such as lack of grant funding or the necessary equipment) were the least commonly reported barriers by amongst managerial staff and the second least reported amongst academic staff across all partner countries. This finding somewhat contradicts the literature review completed for Task 1.1 which suggested that Material factors were a significant barrier to UEC formation and maintenance. In particular, the country reports highlighted the lack of research and government funding to develop UECs for disaster resilience, the high cost of knowledge exchange, and the lack of early-stage investors and venture capital as key barriers

to UECs. Whilst it may be that currently senior managers and university staff see Material barriers are less significant than others, many of the barriers to UEC may be underpinned by the availability of funding. As a result, the degree to which funding may have created barriers to the formation of UECs may not have been fully appreciated by participants. Barriers such as inadequate university infrastructure, systems, lack of investment in staff training and investment in the infrastructure to support UECs may also become more of an issue as the number of UECs undertaken grows. Therefore, although Material barriers and enablers may currently be less reported than other barriers/enablers universities still need to invest in the infrastructure to support UECs if they are to increase the number of UECs undertaken at their institution.

Conclusions and Future Research Directions

It is evident that significant efforts need to be made on the part of universities in the partner institutions to provide effective support for UECs. However, the research conducted here has identified important barriers and enablers of UECs relating to disaster resilience. The barriers and enablers identified for disaster focused UECs in partner institutions largely align with those identified from previous research (and reported in the literature review). Good administrative support, clear policies on UEC governance, defined staff workload for UECs, training and incentives would enhance UEC support in partner institutions. When working with Enterprise partners, a budget to provide pump priming for research projects and the purchase of equipment would be useful. Partner universities can also enhance the formation of UECs by promoting UECs via an external facing website and networking events. However, most importantly institutions in the partner countries need to change the culture surrounding UECs for disaster risk reduction by educating all the potential UEC stakeholders of their values and benefits. The results of these surveys have feed into the development of the proposed UEC framework.

Appendix 1: List of External Relations information weblinks provided by participants.

Naresuan University

http://ww2.eng.nu.ac.th/
http://www.diald.nu.ac.th/eng/
http://www.socsci.nu.ac.th/en/?page_id=2129
https://www.nu.ac.th/?page_id=15340&lang=en
https://www.nu.ac.th/?page_id=21251&lang=en
http://www.research.nu.ac.th/en/
http://www.bec.nu.ac.th/COE_SMEs/description.php

Mahasarakham University

https://inter.msu.ac.th/
https://spmsu.msu.ac.th/
http://engineer.msu.ac.th/th/P_administratives1.php
https://iroffice.msu.ac.th/th/
https://webresearch.msu.ac.th/
https://prf.msu.ac.th/en/

Chiang Mai University

https://www.cmu.ac.th/en/

University of Sri Jayewardenepura

http://research.sjp.ac.lk/icmdsfhss/contact/,
http://ublcell.sjp.ac.lk/https://mgt.sjp.ac.lk/research-center-management-studies-commerce/,
https://www.sjp.ac.lk/international/
http://innovation.sjp.ac.lk/

University of Ruhuna

http://dceu.ruh.ac.lk/tto/
http://www.dceu.ruh.ac.lk/tto/attachements/Intellectual_Property_Policy.pdf
http://www.dceu.ruh.ac.lk/tto/contact-us.php
https://adm.ruh.ac.lk/intaffairs/ www.agri.ruh.ac.lk

University of Peradeniya

https://inro.pdn.ac.lk/index.php
https://eng.pdn.ac.lk/pages/Centers/edc/

Philippine Normal University

https://www.pnu.edu.ph/linkages-and-international-office/international-linkages/
https://www.pnu.edu.ph/pnu-south-luzon

Malayan Colleges Laguna

https://www.mcl.edu.ph/office-for-strategic-partnerships-and-global-engagement/

Ateneo de Manila University

Ateneo Intellectual Property Office (https://www.aipo.ateneo.edu/about)
Office of Placement and Career Services (https://placement.ateneo.edu/)
ACSEnt (Ateneo Center for Social Entrepreneurship), https://www.aipo.ateneo.edu/
https://www.ateneo.edu/umco
Office of University and Global Relations https://global.ateneo.edu/partnerships/office-of-university-and-global-relations http://www.ateneo.edu/about/amdg-2030-strategic-plan-ateneo-de-manila-university
The Office of Alumni Relations (https://www.ateneo.edu/alumni/office-alumni-relations)
https://ateneo.edu/research/research-centers
University Marketing and Communications Office (http://www.ateneo.edu/umco),
The Office of University and Global Relations (https://global.ateneo.edu/partnerships/office-of-university-and-global-relations).
The Office of Social Concern and Involvement (https://www.ateneo.edu/ls/office-social-concern-and-involvement-osci).
The Office of Placement and Career Services (https://www.ateneo.edu/ls/ateneo-placement-office

See Appendix 2: A list of the internal policy documents relating to UECs provided by participants.

Naresuan University

Three management approaches (Hybrid, Partnerships, and Networking)
(1) https://www.nu.ac.th/?page_id=16754&lang=en
(2) http://www.international.nu.ac.th/research/international-partners-and-membership/
(3) http://scipark.nu.ac.th
https://drive.google.com/drive/folders/1LHODADYWhpRosoQ6cYMYargUryGQ9QeS)

Mahasarakham University

https://inter.msu.ac.th/goal-all-goal-mission-vision.html
https://spmsu.msu.ac.th/
http://www.techno.msu.ac.th/tag/ลงนาม-mou
http://engineer.msu.ac.th/th/index.php

Chiang Mai University

Code of Public Works and Town & Country Planning Department
https://www.cmu.ac.th/en/article/b399e39b-ceae-4686-905f-dcb78f8779c9

University of Sri Jayewardenepura

Strategic plan of the university MOUs http://career.sjp.ac.lk/
https://www.sjp.ac.lk/research/council/
Corporate plan in University of Sri Jayewardenepura http://innovation.sjp.ac.lk/

University of Ruhuna

http://www.dceu.ruh.ac.lk/tto/attachements/Intellectual_Property_Policy.pdf
WHO ad hoc consultation on Community centered approaches to health emergencies: Progress, gaps and research priorities.

University of Peradeniya: University Strategic Plan -
https://www.pdn.ac.lk/uop/about/document/Strategic_plan_17.pdf - Only goes to 2021

Philippine Normal University

SDP 2012-22 PNU Strategic Planning Activities/Directions, Memorandum of Agreement (MoA) at PNU website (pnu.edu.ph)
ISO 14001: 2015 Environmental Policy Statement and Environment Management System Manual
https://www.pnu.edu.ph/linkages-and-international-office/international-linkages/
University Extension Manual
https://www.pnu.edu.ph/wp-content/uploads/2019/07/CPEO-Extension-Manual.pdf
Internationalization and collaboration Mandate https://www.pnu.edu.ph/linkages-and-international-office/

Malayan Colleges Laguna

Business Continuity Plan: Standards on Emergency Management and Disaster Recovery;
Institutional Linkages and Partnerships
Green University Policy

Ateneo de Manila University

Not all documents are publicly available
Policies within AIPO (Ateneo Intellectual Property Office)
Internal Policies on OJT/Internship Programs and Startup/Business Incubation Program
University's Mission-Vision statement (http://www.ateneo.edu/about/vision-mission) does specify a "service to the community" aspect.
AMDG 2030 (University Strategic Plan)
SOSS Strategic Plan
Coastal Cities at Risk in the Philippines Project
Department strategic plan, and the School strategic plan (not publicly available)
Internationalization and linkages, Private-public partnerships (internal, no publicly available link)
Sustainability policies and guidelines provided in the Ateneo Sustainability Report
Commercialization Arm of ARISE
International relations strategy of Ateneo de Manila University
https://global.ateneo.edu/partnerships/office-of-international-relations
Policies in Office of International Relations
Office of University Global Relations policies