Fostering Climate Resilience through Entertaining Games
Focus: South and Southeast Asia

List of Team Members

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Note: This problem statement was refined to include changes made during the entire Stage 2 process, including changes made after its original submission to the Global Resilience Partnership but before the end of Stage 2.

Problem Statement
How will the problem statement address resilience from the Global Resilience Partnership's perspective?
The problem statement was refined with input from all of our team members, building on the GRP workshop in Bangkok in March and a workshop we held with our team in Bangkok on April 28-29. We chose the development of a mobile game, since across national, ethnic, political and even socio-economic lines, mobile games are increasingly a part of everyday life, allowing us to reach people where they already are across multiple scales, from local to regional to global. Because games are dynamic, they can also be more easily adapted to reflect changes in systems or to account for new types of scenarios and information. This means that they can focus not only on addressing today's problems, but also on helping players to envision future scenarios that will need to be addressed as well. Scenarios can also be developed that encourage players to not only think about how to prepare for and recover from climatic stresses and shocks, but also how they can take advantage of the opportunities that present themselves in an ever-changing world. If successful, there is also the potential to leverage the game as a platform through which the learnings of other GRP teams can be promoted to a broader audience in an engaging and fun way, further fostering collaborative efforts in building collective resilience across geographical and administrative boundaries.

Priorities: *What are the critical and unaddressed barriers to building resilience to acute shocks and chronic stresses?* Ask a thousand people what climate resilience looks like and you will get a thousand *different* answers. The most difficult challenge for many young people—regardless of social, economic or political status—is envisioning future scenarios of climate resilience as they relate to themselves, their families, communities and countries. This lack of agency can lead to apathy, which in turn can create barriers to building resilience, particularly among the next generation of leaders in the region. Current research highlights the importance of linking *disaster risk reduction* (DRR) to development and why this is critical to long-term community resilience. To achieve resilience, communities must be able to envision how investments in DRR and resilience building will positively impact their future state when faced with a changed climate.

Many traditional approaches to building resilience have fallen flat because the subject is perceived as abstract, difficult to articulate and visualize, and is perceived by many as the responsibility of governments, not individuals, businesses or civil society. At the same time, urban planning continues to rely primarily on traditional forecasting methods that assume different levels of predictability and certainty of future events, particularly in population projections, land-use forecasting and transport demand modeling. Infrastructure and facility development based on such approaches often renders cities and communities vulnerable to climatic shocks, such as extreme weather events. Most of the traditional forecasting methods are also unable to capture the ever-changing and increasingly diverse groups of urban citizens, particularly in suburban and peri-urban areas where environmental systems are especially fragile. It is now imperative that city planners and managers adopt scenario-based planning in order to plan and build more resilient cities. Yet most, if not all, urban planning schools in South and Southeast Asia still embrace conventional methods of rational-comprehensive planning, with little attention given to uncertainty and risk. As such, future planners, developers, politicians and civic leaders are not equipped with ideas and tools that they need to enhance their capability to envision and tackle future challenges posed by climate change.

To promote resilience across society, regardless of the country, a multidisciplinary, disruptive response is needed that helps individuals form opinions on how personal and public decisions should be made to minimize conflict about which populations and assets will be protected. This must also include an understanding of what measures must be taken to help governments, businesses and families withstand an array of acute shocks and chronic stresses. In order for vast numbers of people and businesses in low-lying areas in urban and peri-urban communities across South and Southeast Asia to not only break the cycle of chronic vulnerability from climatic shocks and stresses, such as floods, tidal surges, and typhoons, but also to thrive, people must re-imagine the

future. This requires becoming more attuned to the need for DRR planning and management, their roles in resilience building, post-event recovery and general development efforts.

What evidence substantiates this assessment? For many individuals and leaders, acting on, preparing for or advocating for resilient communities and cities is an overwhelmingly complex process, requiring an understanding of various systems (social, political, economic and environmental).This is compounded by the fact that people within these systems tend to work in silos and often do not communicate with each other. While young people may be generally aware of the issues, given this complexity and abundance of silos, they often are unaware of how they can take meaningful action in ways that will contribute to positive change. For some youth, the issue of resilience can feel far removed from their lives, particularly as they might never have directly experienced a severe weather event or climate-related disaster firsthand. This inability to understand what their role is within different systems can lead to apathy and inaction on climate change. Despite this, it is possible to engage youth so they become active proponents of DRR (Partridge, 2008). When games are applied to civic matters, they engage people by redirecting their focus from a specific issue to learning about the wider process that informs that issue. As game designer and theorist Eric Zimmerman notes, "Being able to successfully understand, navigate, modify and design systems will become […] inextricably linked with how we learn, work, play, and live as engaged world citizens." Playing a game puts the player into a system and forces him/her to understand its rules in order to participate; if well designed, games encourage systems thinking that leads to a behavior shift for taking real world action (Arora and Itu, 2012).

Throughout South and Southeast Asia today, higher education continues to rely on large lectures and rote memorization by students of facts from often outdated textbooks rather than collaboration to find answers, objectively evaluate information and apply that information effectively in the right context (Lei Chang, et al). This approach to teaching about DRR and climate change, rather than an interactive, fun, practical and accessible instructional style, limits students' interest. Our five university partners state that even faculty who are aware of the likely devastating impacts of climate change seldom address the critical prioritization of short-term interests over long-term needs with students. At the same time, our partners' experience is that faculty are increasingly struggling to focus the attention of students away from a growing array of electronic devices and games. Although students at public universities often lack access to computers and other modern teaching technologies—and in some cases, universities block access to relevant content, particularly educational games—many have mobile phones (e.g., a recent Nielsen study cited "exponential growth" of smartphone ownership and usage in the Asia Pacific region, with the average smartphone user in Southeast Asia using their phone more than three hours each day). We propose to take advantage of this trend to sensitize youth to the need for DRR activities, in order to prepare them for the potential ways that they can be stimulated to become more engaged in civic affairs and take action related to resilience building on various scales.

Objectives: *How would addressing these priorities and barriers contribute to building resilience in the chosen region?* Today's students and youth are tomorrow's leaders and decision makers. Yet, today, many Asian youth are captivated more by games than by contemplating their future leadership role or how an uncertain and changing climate will affect their communities, environment or country. Few other interventions offer such potential for widespread appeal and replication as do games. We will therefore tap into this energy to use gaming to engage and excite young people so they can better understand the role they can play in DRR and resilience building through an entertaining game with serious content available on the tool they know best—the mobile phone. We propose to use a free, readily accessible, entertaining and interactive mobile game as an active-learning platform to target male and female Asian university students, secondary school students, out-of-school youth and gamers to:

- Help them visualize the complexity of problem solving through self-directed exploration to solve common resilience challenges, survive in different future scenarios or states of climate uncertainty, and require them to make decisions.
- Provide them with immediate feedback on their in-game choices to promote resilience. Games create a compelling need to learn, assimilate and master certain skills and content areas. Failure can lead to improved solutions. Players can learn new material through a game – allowing them to demonstrate increased understanding, better retention, and higher quality learning outcomes than those who learn the same material through traditional studies.
- Help them understand the multi-sectoral challenges policy makers and private sector leaders face.
- Help move them to become more active members of society, change personal behaviors, and connect with like-minded individuals intent on advocating for social change and action.
- Connect with other students and youth from across South and Southeast Asia to identify common solutions and how they can integrate *"resilience thinking"* into their future career pursuits or professions.

Although anyone will be able to play the game, we are targeting urban young people in particular because they are often early adopters of new technologies who create trends that others follow, and because they come from a mix of urban, peri-urban and rural communities, which will allow us to expose people from various vulnerable populations within the region to the game.

What is the potential scale and scope of social impact were the barriers to be overcome? Gaming is one of the most effective ways to capture the attention of youth and focus them on complex societal issues. As Stokes, Seggerman and Rejeski state, "games' particular advantage lies in their scalable experiential learning delivery." The global appeal of games like **Angry Birds** (with over 2 billion downloads) or **Minecraft** (with over 100 million registered users) show that games can quickly achieve meteoric levels of play. Globally, Asia-Pacific accounted for just under half of total global game revenues in 2014. In Southeast Asia alone 70% of people with access to the internet play games, and forecasts call for 130 million gamers by 2017. A well-made climate resilience game has the potential to spread virally across South and Southeast Asia and well beyond, while introducing its players to the concept of resilience. Due to its virtual nature, this project is designed to achieve substantial resilience gains without negatively affecting environmental goods and services in any way.

In complex, adaptive systems, it is often the interconnections and relationships among diverse groups that are critical for ultimate success and sustainability. Likewise civic or social action-oriented games, by design require a deliberate, collaborative approach. Our process maximizes the contribution potential of partner institutions from across Asia, including five regional universities, DRR specialists, NGOs and game developers. Furthermore, our multidisciplinary group will convene a wide variety of other stakeholders to collaboratively define how a youth-focused game might address the problem, determine the structure and content of the game, and develop a plan for game distribution.

Role of Gender
Women and men, as well as different socioeconomic groups, are affected differently from the impacts of both gradual climatic stresses and more immediate severe shocks. Women and poor households are often more vulnerable to disasters when they strike. In addition, they often have different roles and approaches in response to these stresses and shocks. Moreover, there are often pronounced differences in the ability of men and women to initiate action in their community due to societal constraints. Of course, all of these factors vary by country as well. By considering these differences from the beginning of the project, we can improve the quality of the learning and, therefore, outcomes and work to mitigate any inequity in terms of

access to the game and the comfort with using it as a tool for learning. Specifically, the game will provide opportunities for both men and women alike to envision and learn alternative roles they can possibly play without the real-world constraints.

In terms of access to technology, in some countries in the region there is a noticeable disparity between men and women's mobile phone ownership, although that gap is much lower among young people. In Thailand, for example, 74% of young males aged 18–24 owned a smartphone, compared to just 65% for young females, although that was still more than double the overall access from all age groups (Our Mobile Planet). There are also differences between men and women in terms of their preferences for entertainment, which also extends to the types of games that they generally choose to play. Added to this is the fact that the game developer community tends to be heavily male, which has contributed to a well-documented gender bias within many games. Female representation in games often reinforces stereotypes by portraying them as the "damsel in distress," objectifying and sexualizing them, or ignoring them all together. Firms such as Her Interactive have found that the first-person perspective offered through a female protagonist can be inspiring to female players. Unfortunately though, as recently as 2013, female protagonists existed in only 5% of video games, despite the fact that women account for around 50% of the gaming audience. Thankfully, there is increasing awareness of these issues and slowly the industry is starting to adjust (see examples from Minecraft and Temple Run), although significant gaps will continue to persist for some time.

While researching for, designing and testing the game, we will take deliberate steps to ensure that the likelihood of the game reinforcing these biases is minimized, if not altogether eliminated. This will be done in part by making sure to solicit equal input from female players and game developers as we progress through the development process. Also, we are cognizant of the fact that our primary target population for testing the game (university students), are not reflective of the general population in a number of ways, including gender balance and socio-economic status. Among our university partners, women often have higher overall representation across the student body, but lower representation in fields of engineering and computer science. A majority of them are from middle-class families. Therefore, any testing groups will need to be promoted and recruited from across the student body. We will also make a concerted effort to engage with community-based organizations to understand the differences at the community level regarding gender roles and socio-economic status in preparing for and responding to climatic stresses and shocks so that they can be accurately addressed within the game in a way that is both realistic and does not reinforce stereotypes. It will also be designed in a way that will help people recognize the gender and equity implications of climatic shocks and stresses, and the important role gender and equity can play in building collective resilience.

Unique Selling Point
Tapping into the popularity of mobile gaming to inform and engage young people on climate resilience is the primary unique selling point of our team's approach. Mobile games can be continually developed upon and have huge potential for scale. Development costs are largely incurred upfront, and unlike traditional development approaches, which often cost almost as much to replicate as they do to develop, replication costs for a mobile game are much lower. Translations into multiple languages can be crowd-sourced to minimize costs, as has already been evidenced by Facebook and Twitter's success with localizing their sites into dozens of languages. Adding new content and scenarios can also be done using a gaming platform, allowing the game to remain continually relevant.

Our approach to developing and rolling out the game is also a unique selling point. The game will be co-

produced with multiple stakeholders (including youth) from multiple sectors. We will use a process of rapid prototyping to design and test the game with target users, maximizing the likelihood that the game play and its content will match the interests of players with its learning objectives. We plan to promote the game to both the general public and through our partnering academic institutions in Thailand, Malaysia and Bangladesh, giving us two potential pathways for success: as a general awareness tool and as a tool that can be used to enhance higher education. In addition, the game has the potential to link individuals beyond borders and to facilitate cross-border learning. All of these elements, we believe, have the potential to open pathways that will enable the attainment of resilience dividends.

Theory of Change

What are the root causes and drivers from social, institutional, economic, and environmental perspectives?
Although an emergence of awareness and action has been observed among young people in the region regarding social and environmental issues in recent years, a large proportion remain disengaged and ill-equipped to respond. As previously stated, many public and private universities employ traditional teaching methods, reliant on outdated curricula with an emphasis on rote memorization of materials as a means to test students' learning and knowledge. In Bangladesh, for example, despite the growing importance of disaster preparedness, very few universities in the country have taken steps to incorporate disaster management into their curriculum (Anik, 2012). Additionally, urban youth across the region, particularly university students, often do not feel the direct impacts of disasters and climate change as heavily as the poor and marginalized communities that live in particularly vulnerable areas, despite the connection of some urban youth to these communities.

What is your vision of success?
Our vision of success is an increased awareness and knowledge about collective adaptation, disaster risk reduction (DRR), and climate change among young people, along with an understanding of the roles they can play and actions they can take in creating more resilient communities. This will be accomplished by young people becoming engaged and learning from a mobile-based game (described in more detail in the following sections). Further, the game will be designed to encourage young people not only to change their attitudes about the roles they can play in terms of climate resilience, but move them to take action in the careers or life paths they eventually pursue. We anticipate that by reducing apathy among youth toward the subject and demonstrating constructive actions that they can take, they can become resilience champions on behalf of their communities, businesses, local economies, and society. In turn, this will lead to communities that are better equipped to mitigate, adapt, recover from, learn from, and thrive in the face of shocks and stresses.

How will your project contribute to systematic change within the teams' chosen region or topic?
Even without a game "going viral' and reaching millions of people, a mobile game's low marginal delivery cost means that it is possible to achieve massive scale, exponentially increasing the likelihood of contributions to systemic change, with the goal of creating an ecosystem of resilient behaviors and that lead to development of new social norms. Our approach will build off of the successful approaches of using live action games to teach resilience (like those developed by the Red Cross/Red Crescent Climate Centre), research on integrated games done for the US Environmental Protection Agency, Jane McGonigal's work on how games can change the world, and others. It will raise awareness among those who play the game, estimated at 200,000 people during the period of performance, about institutional issues, the barriers and benefits of collective action, and alternative scenarios that are fundamental to systemic change.

We have chosen to initially focus on three countries with different levels of climate and disaster vulnerability awareness among the general population, classified based on the experience in each country by our team members (see accompanying table). We will also factor in differences in the urbanization levels, using World

Bank data. By designing the game in such a way that it is relevant to all of these profiles, we increase the likelihood that it will be scalable to most other countries in the region, thus increasing its chances of contributing to systemic change within South and Southeast Asia.

Country	Vulnerability awareness	Urbanization
Bangladesh	High	Low (34%)
Malaysia	Medium	High (74%)
Thailand	Emerging	Medium (49%)

Influencing factors and barriers/incentives
Unlike traditional behavior change approaches that target behaviors that people may not be willing to change, our team members' experience with young people has revealed that the main barriers inhibiting young people from taking action that would lead to increased resilience are primarily a lack of knowledge, as well as a lack of incentives, as to what roles they can play, with whom they can collaborate, and specific actions they can take. There are also geographical, technological, and language barriers that make it difficult for people to not only learn but also take collective action across boundaries. Our conversations with young people in Bangladesh, Malaysia, and Thailand show that in general there is an openness to take action, if only they knew what types of actions would help to increase the resilience of their communities. To tap into this openness, we will introduce true-to-life actions that players could take in the game so they can learn from the consequences of their decisions in the game—which can then be applied to real life.

Self-efficacy is an important condition for behavior change. If an individual does not feel he/she has the skill-set to act on information or the knowhow or confidence to do something, they will not take action. So the game needs to help individuals and groups overcome self-doubt and lack of confidence to act. By their nature, games are incentive systems, with players rewarded for progressing (i.e., learning) in the game. If the game is fun, young people will be incentivized to play it, and if it simultaneously contributes to learning, educators will be incentivized to use it. Striking this balance will be a priority as we develop, prototype, and roll out the game.

How you will create change? What strategy to employ, who you will work with, what will you do in the medium and long term?
Change in our case is contingent upon young people playing the game long enough so that they learn, and ideally, are inspired toward action. We will work through our university partners and their networks of universities and secondary schools in the region to promote game use by students as part of their general education syllabi. In addition, we will promote the game to the general public through targeted marketing, strategic partnerships and word of mouth promotion from players and other stakeholders that we engage as part of our stakeholder consultation process and content development workshops.