COMMUNITY BASED CLIMATE CHANGE ADAPTATION THROUGH URBAN DEVELOPMENT:

EXPERIENCES FROM CAMBODIA

May 2018

Cover photo: ***Post VRA Group Photo, Phnom Penh***

FOREWORD

Cambodia is one of the most vulnerable countries to climate change, given the low adaptive capacity of its communities and high reliance on climate sensitive sectors such as agriculture and water resources. In recent years, high rainfall during the wet season brought more frequent and intense flooding. The occurrence of drought, especially in the dry season, has become more evident.

Urban areas serve as dynamic centers of investment, making them crucial to the economic growth of Cambodia. Since 2004, urban areas have been growing at a rapid pace, with an average growth rate of 2.6% per year. The speed of urbanization has not kept pace with the supply of adequate infrastructure, and access to basic services such as electricity and water. Climate change is exacerbating such problems. Most urban areas are located along coasts and rivers, leading to increased exposure of urban communities, with their assets and livelihood, to hydrometeorological shocks and stresses.

Climate change impacts in urban areas include increases in temperature and rainfall, sea level rise, and extreme weather events, which leads to flooding, sewage overflows, and further health problems. Prolonged and more intense floods are seen to damage infrastructure, interrupt economic activities, cause loss of human life and livestock, and increase the likelihood of water-borne diseases, particularly diarrhea among children.

With the expected growth in urban population, management of climate change risks is necessary. Integrating climate resilience into urban development plans and projects, and strengthening the capacity of local governments to coordinate and integrate climate resilience into local development planning are essential in reducing vulnerability of urban communities to climate change impacts.

Cambodia was one of the first batches of nine countries selected for the Pilot Program for Climate Resilience (PPCR), which aims to demonstrate ways in which climate risk and resilience can be integrated into development planning. The Royal Government of Cambodia, with support from the Asian Development Bank, prepared the Strategic Program for Climate Resilience, comprising seven investment projects and an overarching technical assistance on Mainstreaming Climate Resilience into Development Planning.

Communities are at the forefront in the fight against climate change. Awareness raising and capacity building initiatives, combined with community-level actions on adaptation, are needed to

help communities manage current and future climate risks. But for local actions to be sustainable, community ownership is important.

In Cambodia, Civil Society Organizations (CSOs) play an important role in working with local communities to cope with current and future climatic risks and develop locally appropriate solutions to climatic variability and change. CSOs shape the response to climate change in three ways: they influence how households are affected by impacts of climate change, they enhance the ability of households to respond to climate impacts and to pursue different adaptation practices, and they act as intermediaries for external support to adaptation.

A civil society support mechanism was launched as part of the technical assistance to strengthen the capacity of local CSOs to implement community-based adaptation and disaster risk reduction projects, and to mainstream climate resilience into CSO operations. The Asian Development Bank engaged Plan International Cambodia to coordinate and administer the civil society support mechanism. One hundred and thirty six CSOs expressed interest, of which 19 CSOs in 17 provinces were selected. This report presents case studies of various community-based adaptation initiatives in urban development, the lessons learned, and the opportunities for scaling up and replication.

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Home repair kit beneficiary, Phnom Penh

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We would like to especially thank the communities and individuals who proactively participated in the program, shared their thoughts, anecdotes and leanings; the volunteers who supported data collection and translations and the field staff without whom this document would not have been possible.

PARTICIPATING CSOs	ACRONYM
Bandos Komar Association	**BK**
Culture and Environment Preservation Association	**CEPA**
Community Managed Development Partners	**CMDP**
Cambodia Rural Development Team	**CRDT**
Community Resource Improvement for Development	**CRID**
Child Rights Foundation	**CRF**
Children and Women Development Centre in Cambodia	**CWDCC**
Human Resources and Rural Economic Development Organization	**HURREDO**
Kraing Serei Community Forestry	**KSCF**
Kampuchea Women's Welfare Action	**KWWA**
Live and Learn Cambodia	**LEC**
Learning Institute	**LI**
Life with Dignity	**LWD**
Mondulk Kiri Indigenous People's Association for Development	**MIPAD**
Ockenden Cambodia	**OC**
Samatapheap Khnom Organization	**SKO**
Sovann Phoum	**SP**
Song Saa Foundation	**SSF**
Women's Organization for Modern Economy and Nursing	**WOMEN**

CONTENT

ABBREVIATIONS AND ICONS

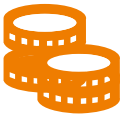
Asian Development Bank	**ADB**
Climate Change Adaptation	**CCA**
Climate Investment Fund	**CIF**
Commune Investment Program	**CIP**
Civil Society Organisation	**CSO**
Civil Society Support Mechanism	**CSSM**
Disaster Risk Reduction	**DRR**
Mainstreaming Climate Resilience into Development Planning	**MCRDP**
Micro-Finance Institution	**MFI**
Participatory Approach to Safe Shelter Awareness	**PASSA**
Pilot Program for Climate Resilience	**PPCR**
Urban Community Resource Centre	**UCRC**
Vulnerability Reduction Assessment	**VRA**
Water, Sanitation and Hygiene	**WASH**

DRIVERS OF TRANSFORMATION

BEHAVIOURAL

TECHNICAL

INSTITUTIONAL



ECONOMIC

POLICY

EXECUTIVE SUMMARY

Communities are at the front line in the fight against climate change. Across Asia and the world, cities are growing rapidly, and the people in them face serious risks. Extreme weather can destroy property, lives and livelihoods. In Cambodia, the speed at which climate change is unfolding is compromising the capacities of poor city-dwellers to cope with flooding and other effects. There is a critical role for civil society to play. Since 2015, Plan International Cambodia has partnered with local Civil Society Organizations (CSOs), financing various local projects in urban and rural areas. This document focuses on urban resilience interventions affiliated with this program. By sharing lessons and insights from this experience, others can learn about entry points for community-based adaptation programming, replicate successes and avoid pitfalls.

The document is divided into three sections. Section 1 provides a background and overview of the program. Section 2 discusses interventions from the two subgrant projects implemented in urban areas, and Section 3 highlights lessons from the project, paired with general recommendations.

Key takeaway messages evolve around why and how urban-oriented planners, authorities, and CSOs can and should address climate change adaptation more directly and strategically: adapt approaches to fit the small scale nature of 'last mile' infrastructure and services to areas difficult to access, make space for more informal private sector providers, and bring funding mechanisms for such. CSOs can and should play an intermediary role of building capacity and bringing stakeholders together, including companies better able to serve local conditions. CSOs also play a role in transforming what would be 'business as usual' infrastructure development into genuine improvements in resilience to climate change through outreach, education, partnerships, and transformation of the urban poor from climate victims to adaptation actors.

Looking more broadly, climate change is straining the urban poor in many ways aside from simply storms and floods. In addition to community-based adaptation responses to climate hazards such as those adopted by the CSSM program, other programming avenues to consider should look at indirect influences like how climate change affects urban crowding and subsequent pressure on social services like health or education, or food prices - to which urban dwellers are more highly exposed. Land laws and insecure property rights are a deterrent for private individuals and local administrations who might otherwise choose and find some means to invest in more resilient infrastructure. Climate change is not just an agriculture or environment issue.

Urban adaptation is an underserved area of climate change, especially interventions in poor settlements. The recommendations and insights in this paper can help urban-oriented CSOs, or rural adaptation CSOs aspiring to work in urban settings, to mainstream climate change into their work. For efforts to be overall more effective and responsive to climate change, continuity of funding is necessary so that key CSO resources are not lost or reshuffled with the end of every short term grant. Inclusion, partnership and shared responsibility matters, especially when paired with a carefully timed combination of 'soft' capacity development and 'hard' physical interventions, technical skills, and genuine respect for target communities.

INTRODUCTION

Communities are at the front line in the fight against climate change. With their growing population, urban communities, in particular, are vulnerable to extreme weather events that often come with devastating impacts to property, lives and livelihoods. It has become a priority to invest in long term urban planning that integrates climate adaptation and risk reduction, and increases the ability of city dwellers and municipal services to respond to climate change (Satterthwaite 2008).

In Cambodia, the speed at which climate change is unfolding is overwhelming the capacity of communities to cope. Rural to urban migration – in part driven by climate change - is further compounding the problem. Although the rate of urban poverty is lower than for rural areas, income inequality and rates of female-headed households are higher, especially in Phnom Penh (Kingdom of Cambodia 2015). A fifth of Cambodia's population is now urban (World Bank 2016); the urbanization rate is 2.6% and recent studies suggest that the urban poverty is more than twice the officially-reported rate of 12.8% (Baker 2017). Cambodia's burgeoning cities will be directly affected by climate change, including severe weather and increasing in-migration. While many think of the impact primarily in terms of 'hard' infrastructure like water pipes, sanitation, and drainage, it is important to think more broadly: for example schools may be unable to accommodate an influx of children from the countryside, and food prices may soar.

There is a critical role for civil society to play to support communities to prepare for climate change through effective community-based adaptation (CBA), which integrates governance approaches and tools for participatory planning. Since 2015, Plan International Cambodia has partnered with local CSOs to finance various local projects in urban and rural areas. This document focuses on urban Resilience interventions affiliated with this program. It aims to spread knowledge about the projects' impacts on various community members. It also discusses lessons for CSOs themselves, drawn from various stages of the projects. In doing so, it provides food for thought to help others replicate successes and avoid foreseeable challenges in future programming.

The document is divided into three sections. Section 1 provides a background and overview of the program. Section 2 discusses interventions, and Section 3 talks about lessons from the project. The data in this document reflects information collected from interviews with community members, CSO representatives, Plan International staff, local government officials, CSO surveys, and visits to the field.

CONTEXT AND OVERVIEW

SECTION 1

OVERVIEW OF CLIMATE CHANGE IN CAMBODIA

Cambodia is highly vulnerable to climate change, due to both high levels of poverty and frequency of disasters. Climate change is one of the most critical challenges facing Cambodia today. It threatens to undermine livelihoods and reverse the country's impressive economic development gains. It is commonly named as one of the most at-risk countries in the world – in 2014, for example, Standard and Poor's ranked its economy as the single most vulnerable to the effects of climate change worldwide (Kraemer and Negrila 2014). Both socioeconomic and environmental co-factors underpin this vulnerability. This section summarizes some of the most essential points.

- *Cambodia's vulnerability to climate change is exacerbated by high levels of poverty and inequality.* Despite impressive economic growth surpassing 7% per year since 2011, per capita GDP hovers around US$1,000 per year, but the poorest 10% hold only 4% of the nation's income while the top 10% accounts for 27% of it. As of 2011, 43% of the population subsisted on less than $2 per day (PPP). Despite high rates of internal migration, eighty percent of the population remains rural (World Bank 2014), and 65% works primarily in agriculture (FAO 2014), although some 20% of rural households are landless (USAID 2014). Major demographic and land use changes are underway: 22% of the country's land mass have been declared "economic land concessions" (LICADHO & The Cambodia Daily 2012), including for large plantations. These changes also influence capacities to adapt to climate change: agribusiness companies "are largely responsible for this massive clearance for agricultural purposes" (Taylor 2011: 78) which has dispossessed farmers of both their land and to the ways that they previously supplemented their livelihoods. Environmental degradation and poor natural resource management also compromise farming.

- *Rice and fish are the traditional staples of the Cambodian diet. Rural livelihoods and nutrition are largely dependent on subsistence agriculture and small-scale fishing, which are both highly sensitive to both gradual climatic changes and extreme weather events.* Some 80% of the population is rural, and 65% engages in agriculture – primarily rain-fed agriculture. Meanwhile, Cambodia is also home to one of the world's richest freshwater fisheries, particularly the Tonlé Sap. Fish constitutes 80% of the population's protein intake (Baran et al 2009. Climatic changes are likely to compromise both rice harvests and fish yields.

- *Cambodia is one of the most disaster-prone countries in the world.* The primary hazard is variable rainfall, which will almost certainly be exacerbated by climate change. Cambodia already has the world's highest exposure to flooding: 12.2% of the population is affected annually (PreventionWeb n.d.), and more than 70% of Cambodia's rice production loss between 2004 and 2008 was attributed to floods (Heng & Pech 2009).

It should be noted that Cambodia is characterized

by very high frequency of disasters, but it has largely been spared from very extreme disasters such as typhoons. Cambodia's coastline is only 440 km and unexposed. However, the country's population is crowded into low-lying plains and river basins, and subject to annual flooding. Cambodians are well-adapted to these conditions. However, climate change is ushering in more erratic rainfall which may trigger more frequent and severe floods and droughts, beyond their coping capacities.

It is not unusual for both drought and flooding to occur within a single agricultural year. There are often short 'dry spells' in the middle of the rainy season which, if protracted or severe can compromise crops. The heaviest rains, however, occur at the end of the rainy season. If rainfall continues to become more extreme, it is likely that farmers will struggle with both disasters within a single growing season.

- *Rising sea levels pose a serious threat to Cambodia.* Although Cambodia has only four coastal provinces, Cambodia's low-lying central plains would be highly affected by rise in sea levels (Thevongsa 2012). The seasonal 'pulse' of the Tonlé Sap river system is likely to exacerbate the effects of sea-level rise. Not only will flooding be more frequent and severe, but the 'pulse' will flush in salty water, compromising both agriculture and fish stocks. Salinity is extremely difficult and expensive to manage.
- *Rising temperatures can have dramatic effects on agriculture, horticulture, aquaculture, and natural fisheries.* Even small changes in average temperature can affect both crops and fishes. For example, if temperatures climb to 95F for more than an hour during flowering, rice becomes sterile and produces no grain (Senapati, Behera, and Mishra 2013).

TABLE 1: OVERVIEW OF CLIMATE CHANGE EFFECTS IN CAMBODIA

FACTOR	CHANGE PREDICTED	TREND *	REMARK
Temperature	+0.3° to +0.6° by 2025		SP, CWDCC, KWWA, CRDT, KSCF
Rainfall in wet season	+3% to+35%		
Rainfall in dry season	No change or decrease		Direction of change certain but magnitude uncertain
Extreme events	More frequent and more intense		
Runoff	+21%		Extreme events floods, drought, storms
Tonle Sap level in rainy season	+2.3 meters		Higher sediment load in water, impact on fishery productivity
Tonle Sap level in dry season	+0.1 meter		Increased rainfall in wet season will raise flood levels

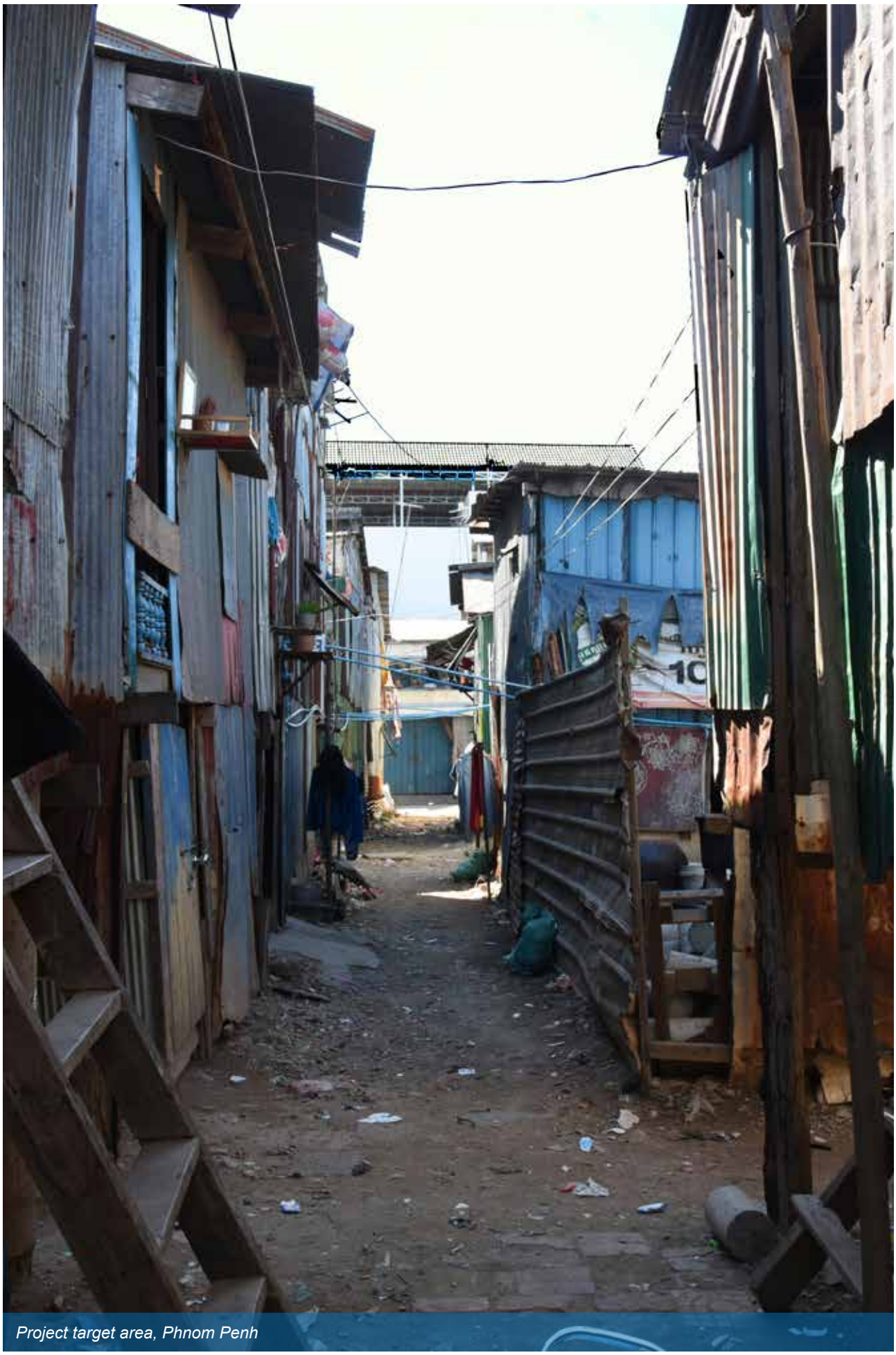
*The thickness of arrows indicates the degree of certainty in findings.

Baran et al 2009: 3

- *The negative effects of climate change are being compounded by more immediate threats to the integrity of Cambodia's natural environment,* which are usually seen as more urgent concerns (CCCN 2014). Cambodia has the third-highest deforestation rate in the world: over 7% of its forest cover was lost between 2002-2012 (Hansen et al. 2013, as cited by Milne & Mahanty 2015). This alarming loss, coupled with threats to aquatic ecosystems (e.g., unsustainable fishing, upstream hydropower dams, etc.) is further compromising rural livelihoods and capacities to adapt to climate change. Ecosystems which are already under stress are less able to withstand climatic changes. It may be useful to be aware that climate change as a global problem has emerged as a discourse in some quarters to shift the blame for environmental degradation in Cambodia to international actors, and thus sidestep responsibility for the impact of deforestation and other natural resource management problems. (Käkönen et al. 2014, Christoplos et al. 2014).

- *Climate change in an inherently uncertain process.* While climate change itself is almost certainly inevitable, the pace and extent of specific changes and cascading environmental effects on cannot be fully predicted – especially at the local level. There is more certainty about global climatic trends than precise local impacts, and the temptation to fixate on specific climate projections can serve to mask how much is in fact unpredictable. Climatic variance also interacts with other local-level factors. The integrity of a watershed, for example, depends on much more than simply rainfall. It is now considered good practice in climate change adaptation to embrace that uncertainty as an inherent characteristic of climate change. Instead, thinking in in terms of 'adaptation pathways' is encouraged (Pringle 2011).

Beneficiaries with Plan International staff and international youth volunteer, Battambang



Project target area, Phnom Penh

THE CSSM PROGRAM

56612 BENEFICIARIES

52.8% FEMALE

34.4% CHILDREN

17176 HOUSEHOLDS

26 SCHOOLS

45 COMMUNES SUPPORTED TO INCORPORATE CCA INTO THEIR INVESTMENT PLANS

55% MEMBERS OF PROJECT LEADERSHIP BODIES WERE WOMEN

17 PROVINCES

19 CIVIL SOCIETY ORGANIZATIONS

For the last few decades, experts have warned about the impacts of climate change, including the threat to global habitats, intensification of "natural" disasters, and the forced changes to the ways people live. Measures to adapt to and prevent climate change were part of this message.

To help raise climate change awareness and adaptation capacity of climate-vulnerable Cambodian communities, Plan International's Civil Society Support Mechanism (CSSM) operated from April 2015 to April 2018. It financed grants to nineteen different Cambodian CSOs to implement 18- to 20-month projects. The CSSM program managed by Plan International received its funding from the Asian Development Bank (ADB) Technical Assistance Project -- Mainstreaming Climate Resilience into Development Planning (MCRDP) program, supported by the Pilot Program for Climate Resilience (PPCR) of Climate Investment Funds. This undertaking was supervised by the Ministry of Environment of Cambodia.

The CSOs received project grants ranging from USD 40,000 – USD 100,000. Various Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRR) interventions were implemented across seventeen provinces in Cambodia. The diagram on the next page maps out sample project interventions implemented by partners, along various sectors and themes covered by the project. Each project was designed based on findings from site- specific participatory community Vulnerability Reduction Assessments (VRAs). Care was taken to ensure that vulnerable groups, including women, children, indigenous people, and ethnic minorities, benefited.

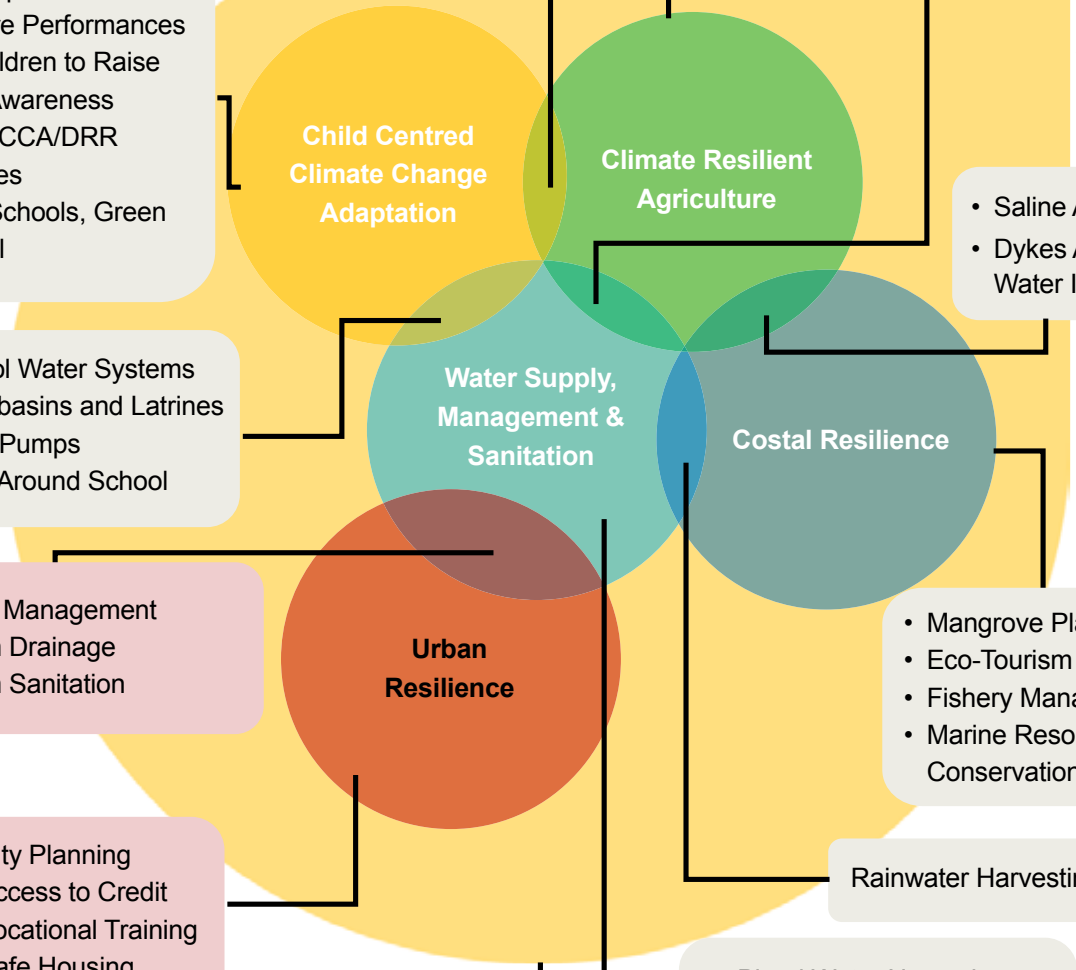
SAMPLE PROJECT INTERVENTIONS BY SECTOR OR THEME

- Biochar
- Biogas
- Income Diversification and/ or Value Addition - Co - Op Led by Women
- Crop Calendars
- Crop Insurance
- Fish Refuge
- Drought and/or Flood Resilient Home Gardening
- Livestock Raising (Chicken)
- Planting and Watering Methods
- Post-Harvest Handling (Rice Mills)
- Distribution of Climate Resilient Seeds
- Soil Conservationand Preparation

- School Tree Planting
- School Plant Nurseries
- School Gardens

- Integrating CCA/DRR into School Curriculum and School Development Plans
- Theatre Performances by Children to Raise CCA Awareness
- Youth CCA/DRR Debates
- Safe Schools, Green School

Irrigation – Canals, Reservoirs and Dams



- Saline Agriculture
- Dykes Against Salt Water Intrusion

- School Water Systems
- Washbasins and Latrines
- Solar Pumps
- Dyke Around School

- Flood Management
- Urban Drainage
- Urban Sanitation

- Mangrove Planting
- Eco-Tourism
- Fishery Management
- Marine Resource Conservation

- City Planning
- Access to Credit
- Vocational Training
- Safe Housing

Rainwater Harvesting

- Piped Water Network
- Community Ponds
- Filter Systems
- Water Management

- Community CCA/DRR Awareness Raising
- Integrating VRA, CCA and DRR Into Commune Investment Programs
- Disaster Preparedness

CLIMATE CHANGE ADAPTATION AND DISASTER RISK REDUCTION (CCA/DRR)

Adaptation:

Adaptation "refers to adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts. It refers to changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change." (p 4)

Climate change:

(a) The Inter-governmental Panel on Climate Change (IPCC) defines climate change as "a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persist for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or in land use". (p 6)

(b) The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods".(p 6)

Disaster Risk Reduction:

"The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to eleven hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events." (p 10)

-UNISDR (2009)

Adaptation is not a new concept. It has always been part of the successful development of human civilizations and cultures, allowing people to successfully live on almost every terrain on earth. Historically, the food eaten, the houses built, and human bodies have all adapted to the local environment. People learn from experience and change over time.

So, why are concentrated efforts for CCA so crucial? Simply put, the sheer speed at which climate change is happening is likely to outpace the ability of humans to smoothly adjust. We are not prepared for what lies ahead.

CCA/DRR projects enhance people's resilience, so that they are better able to cope with the hazards that accompany climate change. They are different from climate change mitigation strategies, which seek to reduce climate change itself (for example, by reducing use of fossil fuels or conserving forests). CCA/ DRR addresses the effects, rather than the causes, of climate change. CCA/DRR can span many kinds of activities. It is not specific to any one sector or group of people.

DRIVING TRANSFORMATION

Vulnerability to climate change results from several interrelated factors, including geography, political climate, financial capacity, technical know-how, skillsets, institutions, behaviours and traditions. To improve the ability of Cambodians to tackle climate change, all these factors need to be addressed simultaneously.

The CSSM program focused on transformation from the ground up, explicitly concentrating on communities and the aspects of local ecosystems that exacerbated a community's vulnerabilities. Because realities vary by location, VRAs informed every community assessment. Interventions were developed based on the idea that long-term community transformation is created by making a series of small, sustained changes in the short-term to shift how things are done.

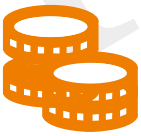
To drive this transformation the program focused on contributing to five key aspects or drivers of transformation across sectors and communities:

BEHAVIOURAL

Factors and approaches which influence individual, and community behaviour towards CCA and DRR

POLICY

Policy factors and approaches influencing local, sub national and national level CCA/DRR



ECONOMIC

Market, economic and financial conditions locally, nationally and internationally that influence CCA/DRR ability

INSTITUTIONAL

Internal and external factors influencing institutions and organizations, and their ability to support communities in CCA/DRR

TECHNICAL

Technical and scientific factors including project design

The aim of the transformational perspective towards climate adaptation is to collaborate on all levels from local to international, directly or indirectly, on climate change policies, strengthening institution, building understanding, improving capacity around climate change, and emphasizing integrating adaptation into development planning (Rufo 2016).

URBAN RESILIENCE AND THE CSSM PROGRAM

Beneficiaries and Plan International staff standing where the drain and gravel road was constructed, Battambang

Few can discuss Cambodia without a mention of the splendour of Angkor Wat. A marvel that graces Cambodia's national flag, it reminds us of the once mighty Khmer empire, and the brilliant engineering and water management skills they possessed. A visit to the country's modern day capital, Phnom Penh, gives visitors a glimpse of the ambitions this country has set for itself to reclaim past glory. A new building appears on seemingly every other corner; massive infrastructure projects put the city in perpetual motion; increased transportation services, and multimedia billboard advertisements remind passers-by to keep Cambodia clean and green. This is beautifully juxtaposed against a plethora of pagodas and monuments, referencing Cambodia's culture and traditional practices while it embarks on the road to prosperity.

Cambodia has been urbanizing rapidly. More than three million people live in urban areas of Cambodia, with the urban population growing at around 2.6% annually (The World Bank Group 2016). In 2010, 20 communes from nearby provinces were added to Phnom Penh, effectively doubling its size (Baker 2017).

Urbanization is driven by many factors, but a key one is farming instability, which climate change contributes to (ADB 2012). Poverty and the increasingly educated young population of the rural areas are also partly responsible for this increase in urbanization (Ministry of Planning 2012). Internal migration in Cambodia follows a "gravity model", with out- migration rates higher in places that are close to densely populated areas (ibid), i.e., provinces and villages near cities like Phnom Penh.

Most of those who come into the city are poor or near poor migrants from rural areas, looking for work. The urban poor tend to inhabit the least desirable areas with a high risk of climate hazards, such as lowlands prone to flash floods (People in Need 2015). In addition to this exposure of the urban poor communities to climate related hazards, effects on them are exacerbated by limited access to infrastructure and knowledge and ability to deal with disasters and insufficient institutional support.

While in the last ten years, water supply, solid waste management, and drainage systems in Cambodian cities and towns have improved (Steinberg 2012), the improvements are being outpaced by increased population, climate change and other pressures. VRAs conducted in urban poor communities by Plan International and its partners showed an increase in floods and erratic rains in the last ten years leading to a) an increase in disease outbreaks; b) damage to houses; c) difficult access to markets, schools, and places of work; and d) poor sanitation and hygiene.

While considerable foreign investment is financing real estate development in Cambodian cities, new housing and other structures are primarily oriented towards an elite market. Lower-income housing and real estate is increasingly pushed out to the city peripheries, far from employment opportunities. Moreover, checks and balances are insufficient, and do not fully take into account rising pressure on already climate - vulnerable drainage and waste disposal systems (Baker 2017).

Cities can be very efficient: it is easier to provide services to people living closer together. Cities also typically have the best access to health and education (The World Bank Group 2018), giving those people more ability to cope with climate change. However, as cities grow, so too does the cost of meeting necessities and the need for high level skills and institutional capacity. Since Cambodia is in a phase of growing urbanization, timely mainstreaming of climate change into institutional planning and well-designed climate adaptive interventions are imperative for inclusive growth of Cambodia's urban communities.

Table 1 highlights to what extent various project interventions directly contribute to adaptation by reducing exposure and sensitivity and increasing adaptive capacity.

TABLE 1: REDUCTION OF COMMUNITIES' VULNERABILITY TO CLIMATE CHANGE

INTERVENTIONS	REDUCED SENSITIVITY	REDUCED EXPOSURE	INCREASED ADAPTIVE CAPACITY
URBAN DRAINAGE	✸✸✸✸	✸✸✸✸	✸✸✸
URBAN SANITATION	✸✸✸✸	✸✸✸✸	✸✸✸
CITY PLANNING	✸✸	✸✸	✸✸✸✸
RESILIENT HOUSING	✸✸✸	✸✸✸	✸✸✸
ACCESS TO CREDIT	✸✸	✸✸	✸✸✸
SOCIAL SERVICES AND EDUCATION	✸✸✸	✸✸	✸✸✸✸
AWARNESS RAISING	✸✸	✸✸	✸✸✸✸
MAINSTREAMING INTO CIP	✸✸	✸✸	✸✸✸

The table above highlights how, according to project stakeholders, various interventions:

✸ Minimally contribute,

✸✸ Contribute,

✸✸✸ Significantly contribute,

✸✸✸✸ Very significantly contribute,

to reducing sensitivity, reducing exposure, and increasing adaptive capacity to climate change.

Exposure:
The presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected. {WGII}

Sensitivity:
The degree to which a system or species is affected, either adversely or beneficially, by climate variability or change. The effect may be direct (e.g., a change in crop yield in response to a change in the mean, range, or variability of temperature) or indirect (e.g., damages caused by an increase in the frequency of coastal flooding due to sea level rise).

Adaptive capacity:
The ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences

-**IPCC 5th assessment** (2014)

MEASURING URBAN RESILIENCE

Endline VRA, Phnom Penh

The CSSM intended to increase community resilience by strengthening the capacity of its partner CSOs in CCA/DRR and reducing vulnerabilities, while keeping with national level policies and efforts. Measuring the impact of this program proved to be complex, given its multiple layers, partners, sectors, and target beneficiaries. The monitoring and evaluation framework is best understood when split into the umbrella program and CSO sub-project levels

At the umbrella program level, the indicators and objectives emphasized the capacities of the CSOs themselves. They also aligned relevant activities with key indicators of the official monitoring, reporting, and evaluation frameworks of the PPCR and Ministry of Environment.

CSOs at the sub-project level developed their own sets of indicators specific to each sub-project, supplementing a short set of standardized indicators imposed by the CSSM, which were uniform across all CSOs.

OUTCOME INDICATORS:

Because "resilience" is complex and conceptual, it has no standardized indicators. The most common indicators for resilience at the sub-project level were:

- Change in perceived vulnerability to level and ranking of climate hazard - and associated impact - between baseline and endline VRAs, by VRA participants (men, women, boys, girls)
- Improvement in centrally issued Commune Vulnerability Index (CVI) generated from commune census data before and after the projects.

Like all broadly measured development indicators, there are some attribution challenges associated with the use of such indicators.

OUTPUT INDICATORS

Quantifying adaptation is a necessary part of monitoring and evaluating a program focused on urban resilience. Project outputs are usually used, and can be understood as specific actions and activities that are implemented over the course of a program or project, undertaken by the project, CSO partners, and/or beneficiaries. Output indicators are often clustered into 'soft' activities (e.g., capacity building, awareness/ education, mainstreaming) and 'hard' activities (e.g., digging wells, distributing chickens, school building maintenance, etc.). However, because adaptation is a complex, contextual, and multi-dimensional process, there are no specific metrics to count it. Individual adaptation activities – especially 'hard' ones – do not necessarily look different from other development activities. A drain is, after all, still a drain! Adaptation activities are distinguished from "business as usual" activities because of how they work together to effectively advance a climate change adaptation strategy

"Soft" activity indicators for urban resilience

Community meeting, Phnom Penh

used by the two CSO partners that focused on the urban setting included those that are refer more directly to climate change and disaster awareness. These include level of understanding of the causes and impacts of climate change, and improvement in institutional capacity. Other project-specific indicators drawn from the different sub-projects are shown below.

"Hard" activity indicators: The figure below

SAMPLE SOFT INDICATORS

54 FAMILIES GIVEN TRAINING ON USING HOME REPAIR KITS AND ADVICE ON OPTIMAL CONSTRUCTION

9 BIMONTHLY MEETINGS TO ENSURE HEALTHY PUBLIC-COMMUNITY COORDINATION

172 HOME VISITS DONE TO PROVIDE COUNSELLING AND REFERRALS TO **29** FAMILIES SOCIAL SERVICES SUCH AS EMERGENCY HEALTH AND SAFE SHELTERS

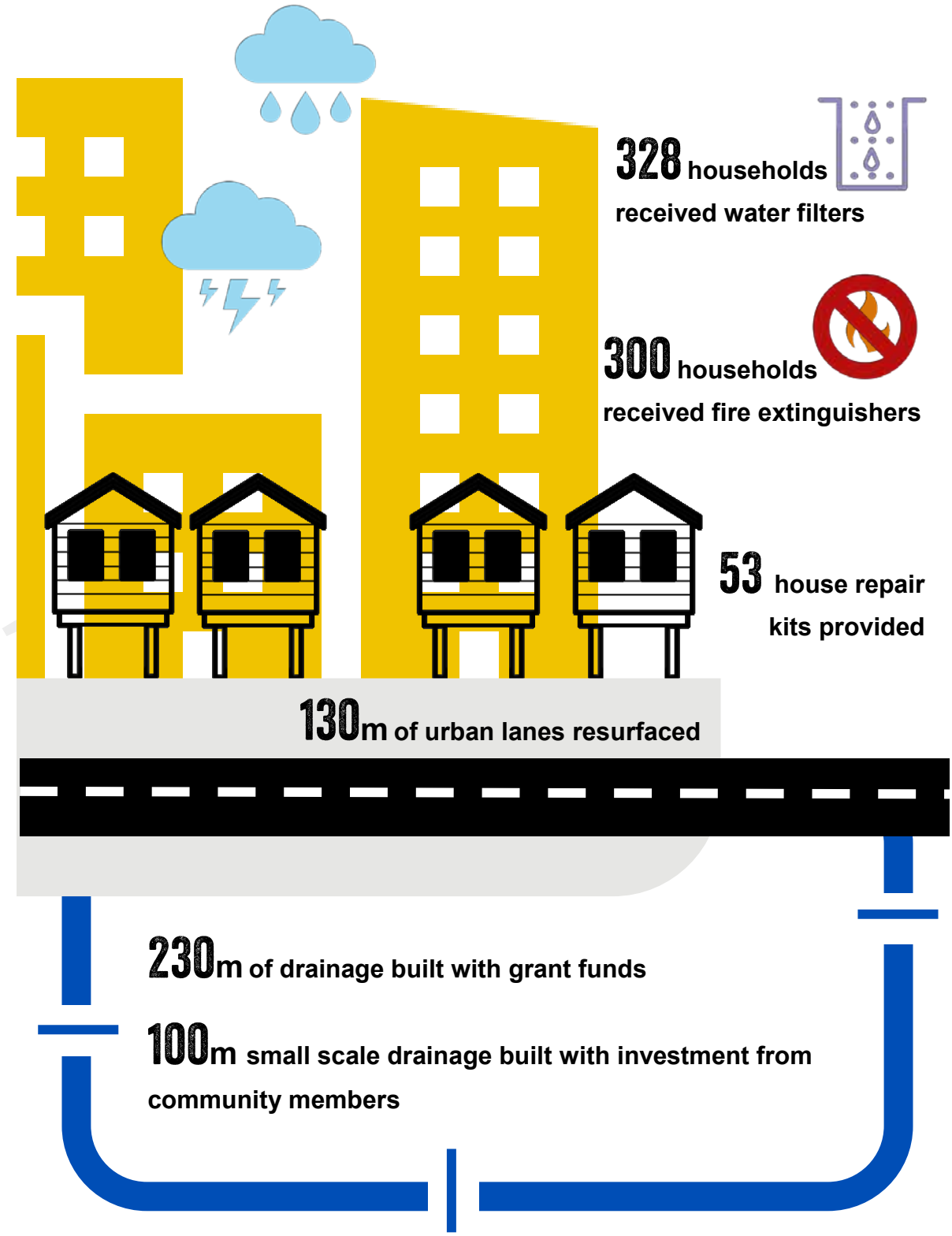
40 COMMUNITY MEMBERS FROM VULNERABLE FAMILIES RECEIVED ENTREPRENEURSHIP TRAINING

62% OF THE PARTICIPANTS AT MEETINGS, WORKSHOPS AND TRAININGS WERE WOMEN

1 WASTEWATER MATER MASTER PLAN DEVELOPED WITH LOCAL STAKEHOLDER PARTICIPATION

displays a few key project indicators associated with urban resilience interventions - in the form of "hard" measurable results. These were achieved through urban planning, infrastructure development, access to credit, and other such undertakings.

SAMPLE HARD INDICATORS



A variety of other indicators were also developed, some are listed in Appendix 1 to this document.

The purpose of this section is to highlight the impact and contributions of specific interventions within a project

CASE STUDIES

SECTION 2

CLIMATE ADAPTIVE URBAN PLANNING AND DRAINAGE SYSTEMS TO SUPPORT VULNERABLE GROUPS IN BATTAMBANG CITY

INTERVENTION DETAILS :

Objective: Better quality of urban infrastructure and improved capacity of local authorities and communities in urban areas to integrate CCA and DRR into actions in CIPs and CDPs.

Output: Wastewater master plan, drainage systems, development, and approval; coordination among target communities and local authorities strengthened.

Beneficiaries: 77 households in two sangkats (communes).

DRIVERS OF TRANSFORMATION:

Technical: Urban water masterplan and extension of drainage network to target areas underserved by main city system.

Institutional: Public-people partnership with sharing of responsibilities between government, civil society and community in identification, implementation, monitoring, and maintenance of systems.

Behaviour: Better community understanding of CCA and DRR builds ownership and commitment to proactively invest in solutions to adapt to climate change.

Decades ago, Battambang City or “Krong Battambang” – the capital of Battambang Province – was a sleepy town along the banks of the Sangkar River, dotted with sporadic pagodas and huts. In 1907, after the arrival of the French, Krong Battambang grew quickly, expanding from the river with a series of criss-crossing roads spreading outward from the banks of the river.

This Western province is ideally located between Phnom Penh and Thailand, and is poised to become a transit agro-economic hotspot (Emerging Markets Consulting 2010). Situated on the outer rims of the Tonle Sap Basin, the province is vulnerable to climate change, with a high poverty rate – 20.1% in 2011 (RGC 2014) – and much of its workforce reliant on agriculture (Asian Development Bank 2012). Rural populations in the province are increasingly moving to cities and towns, chased away from their dried-out fields by climate change, and searching for alternate work options. Some people also live in urban areas to access better schools for their children while continuing small-scale farming nearby.

That said, net migration levels to Krong Battambang are growing slowly, as inward migration is offset by outward migration of workers, often males, to bigger cities and nearby Thailand, leaving the elderly, women, and children behind. In 2015, VRAs and hazard mapping were conducted by Plan International's partner, Community Management and Development Program (CMDP) in two of Battambang's sangkats (communes): Tuol Ta Aek and Rattanak. Key findings showed that migrants to Battambang who build new homes in informal settlements often fill up canals, swamps, or wells to create land for houses or vegetable gardens, without any information or awareness of how local water flows may be affected. People living in these settlements also stated that seasonal flooding has become more frequent and intense due to overflow from the river and increased localised rainfall.

No drainage existed to evacuate rainwaters from the dirt alleys of the poor neighbourhoods in Sangkat Rattanak. Its residents were severely affected: after every heavy rain they would be mired in stagnant, knee-deep floods for as long as ten days. Mosquito and water-borne diseases thrived. Rains turned even a simple commute to school or work into a treacherous and filthy journey. When not taking shelter in unaffected relatives' homes, community people spent enormous amounts of time and money repairing their houses, raising floors, building temporary dykes and little walkways around homes, constructing structures above flood levels, and creating ad-hoc temporary drainage solutions. They also had high healthcare costs. Communities had regularly attempted to bring the issue to the attention of local authorities.

CAPACITY BUILDING AND AWARENESS:

CMDP recognized that it was important for community residents to understand climate change in order to act on it in a practical way by improving drainage and flood management. Building a drainage system would only be sustainable and supported by both government and community if all local stakeholders first understood how it contributed to reducing their vulnerability and were committed to maintaining the project in the long term.. Through its awareness building activities, the CSO ensured that community leaders and key players were motivated to spread the word to other community members.

CMDP developed onsite human resources through an Urban Community Resource Centre (UCRC) to research, document, and provide technical support to communities and local authorities in matters related to urban planning. The UCRC assisted and supported the identification and execution of local level

Community meeting, Battambang

initiatives and interventions as an extension of CMDP. The UCRC hosted a Training of Trainers (TOT) on CCA/DRR awareness building for local leaders and authorities and multiple awareness workshops for community members, all who demonstrated a substantial increase in understanding of CCA/DRR after the events.

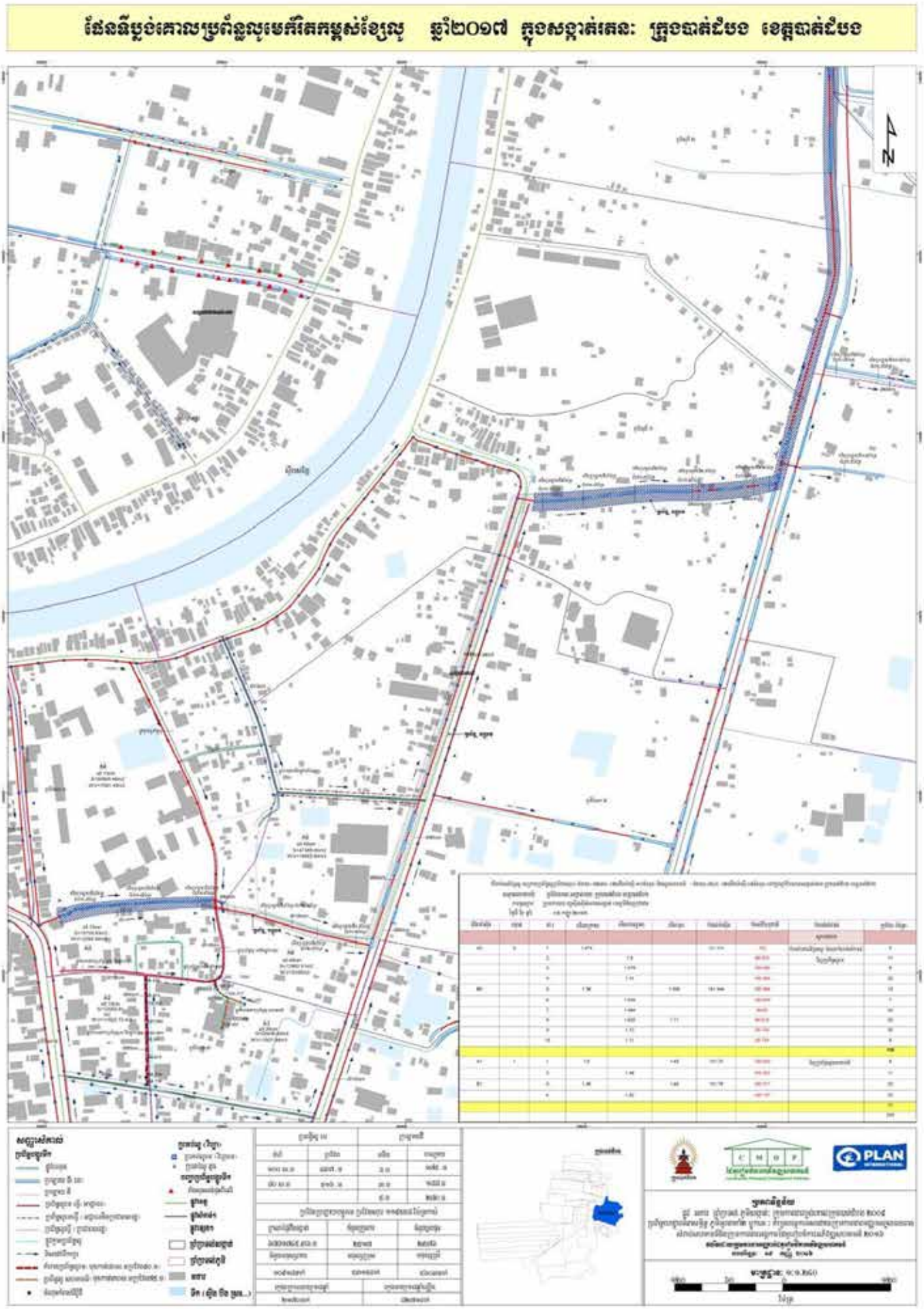
57-year-old Touch is one of the community members who attended a workshop. She learned that everyone in the community has a role to play in adapting to climate change. She also believes she has a better understanding of why her community has suffered increased flooding over the years. “I feel every human being should be aware of climate change,” she says.

WASTEWATER MASTERPLAN

Secondly, CMDP elaborated a wastewater master plan over a period of four months of consultations and evaluations with the community, commune chiefs, the Office of Land Management, and the Office of Public Works and Transport. It became a tangible and visible document, detailing the present situation of drainage systems in Krong Battambang, what it should be in the future, and what is required to get there.

Touch and other community members were given a chance to contribute to the development of the wastewater master plan. Master plans are most successful when they represent the insights, concerns, and recommendations of different technical and community groups. Community representatives played a key role in ensuring all the issues faced by people living in areas prone to climate hazards were properly considered.

Touch used to worry about her grandson. The constant flooding of their neighbourhood regularly prevented easy access to essential services and schools. It also affected her family’s livelihood. Touch wondered if the effort it took to get to school during floods would diminish her grandson’s commitment to learn.



Wastewater Masterplan, Krong Battambang

Drainage construction, Battambang

The initial VRA data, additional consultations, and the wastewater master plan helped CMDP prioritise physical investment decisions, keeping in mind vulnerable sub-groups. 62% of participants in the meetings, trainings, and consultation processes during project implementation were women and girls.

REHABILITATION OF DRAINAGE TO BETTER COPE WITH FLOODING

In the final stages of developing a master plan, CMDP began work on connecting the main city drainage network to targeted areas underserved by the main system. The connection would help direct wastewater from these communities to the main drainage system.

CMDP selected two secondary drainage systems, each 230m long, that reached two different communities. The intervention focused on applying what CMDP called a Public-People Partnership model promoting mutual understanding and sharing of responsibilities between authorities, CMDP, and residents for main, secondary, and tertiary infrastructure and services, through inclusive, decentralized, and de- concentrated approaches to development and operation of drainage infrastructure.

CMDP ensured that the drainage system was constructed to the expected quality by reinforcing payment condition language in the contract, and empowering the community to monitor construction progress, since residents would be in the best position to keep an eye on the work under way.

"I USED TO WORRY ABOUT MY GRANDSON'S LOW SCHOOL ATTENDANCE BECAUSE OF THE FREQUENT FLOODS"

- TOUCH

Touch standing at the location of the drainage, post construction, Battambang

The communities understood the long-term benefits of the drainage system towards becoming less vulnerable to climate change. They organised themselves to extend the drainage system by an additional 26m in one sangkat, and 74m in the other. They contributed labour, funds, and sometimes materials, to help ensure the extension of the system could reach into the narrower alleyways of the flood- prone neighbourhoods. Personal investment has given the community more incentive to look after the drainage system.

Touch is elated that her grandson's route to school is safer. As an added benefit, people are now able to set up small shops alongside the road in areas that used to become too waterlogged to be used several months of the year. This has improved income for some households.

95% of families who live in the project area reported improved living conditions due to improved drainage systems. Focus group discussions showed that both adults and children perceived that their travel to work, school attendance, and livelihoods are less dependent on climatic conditions like rains than before CMDP's intervention.

Drainage outlet/inlet, Battambang

FIGURES:

Beneficiaries of drainage system: 77 households.

Length of drainage construction: 80cm diameter x 230 m lengths and 12 main outlets - two main drainages in Sangkat Ratanak, and Sangkat Toul Ta Aek in Krong Battambang are functioning.

Community built drainages: Line 1 is 74m length x 30cm diameter with four main outlets and Line 2 is 26m length x 40cm diameter with one main outlet.

Project contribution to two drainage networks: 12,683.80 USD (Toul Ta Aek: 8,000 USD; Ratanak: 4,683.80 USD).

Awareness workshops: 8 workshops, 210 participants in total.

AVENUES FOR SCALING UP:

WHAT: Participatory urban planning, investment decision making, implementation and monitoring in partnership between communities and municipal government. There is a continued need for a CSO or potentially a local government program to act as facilitator for the process and interaction between government and communities, building awareness around CCA/DRR to foster higher engagement from stakeholders, and bringing technical support if needed. Donor funded capital investment can be injected initially, although preferably through decentralizing government channels, to spur 'match' contribution from government for central level systems, and community for tertiary levels, but should eventually be phased out. Assets are ultimately under government responsibility.

VECTOR: Government or donor funded program to local government to promote bottom-up urban adaptation needs identification and planning processes, and inform top-down infrastructure funding mechanisms.

CLIMATE ADAPTIVE HOUSING AND SOCIAL SERVICES, PROTECTING SLUM DWELLERS FROM FLOODS IN PHNOM PENH

INTERVENTION DETAILS :

Objective: Improved resilience to climate change impact and disaster preparedness in vulnerable urban poor communities.

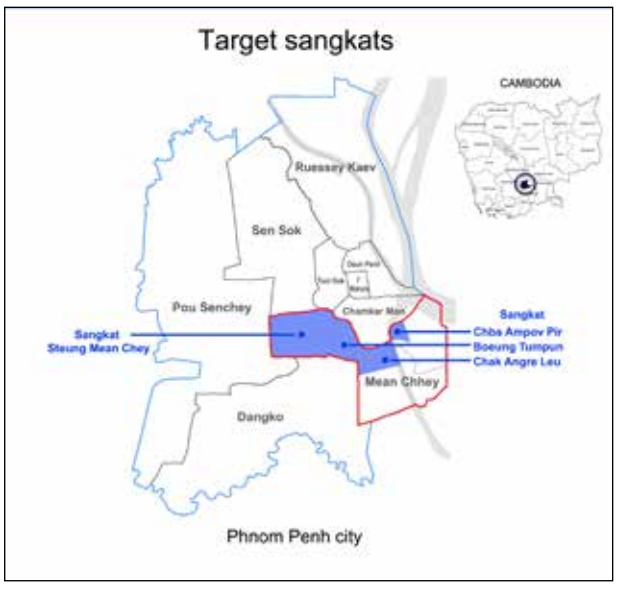
Output: Unsafe or at-risk individual shelters in targeted villages rehabilitated; capacity of vulnerable families to manage climate risks and prepare for disasters strengthened.

Beneficiaries: 376 families (1963 people; 53% women).

DRIVERS OF TRANSFORMATION:

Technology: Technical training, design, and commercialization of house improvement kits.

Behaviour: Building the confidence of vulnerable groups, especially women, to seek support and find income, and in doing so adapt to climate change.



In Cambodia, 94% of all migrants looking to move to urban areas head to Phnom Penh for a range of reasons, starting with education and work opportunities. Phnom Penh's poorer quarters are home to en eclectic medley of people working in construction, garment factories, mototaxi driving, cleaning, small businesses and many other activities to make ends meet. These settlements continuously absorb new migrants from the country. City infrastructure and services do not always reach those in in informal settlements, which often lack

PASSA training in progress, Phnom Penh

proper water and sanitation, waste collection, transportation, schools, and clinics. These slums are usually located in flood-prone areas and have inadequate housing and poor living conditions. In recent years the flooding in these areas has increased, because the city's former ponds, canals, and swamps, natural formations that used to receive the city's surplus monsoon waters, have been claimed, filled with land, and developed into high-end office buildings and luxury residential developments. This consequently further limit residents' ability to cope with climate hazards.

VRAs conducted in 2015 by Samatapheap Khnom (SKO) and Plan International in communes of Phnom Penh's Mean Chey district showed that most of the communities were affected by floods. These floods resulted in an increase of mosquito and water-borne diseases, poor sanitation, and contamination of drinking water. Communities have been using sandbags and tree logs to block water, spending their limited financial resources raising and repairing their houses and pit latrines.

Risks and vulnerabilities are increasing due to the impacts of climate change and rising socio-economic marginalisation and urbanization. At the same time, institutional resources to back safe and adequate housing are low due to limited financial resources typically available to local governments (International Federation of Red Cross and Red Cresent 2012).

The VRAs also showed low literacy rates and high unemployment rates. Households and communities that were previously able to safeguard their lives and assets using their own resources and knowledge are increasingly finding that the type, scale and frequency of

the hazards they are now facing are exceeding their capacity to cope and pose a threat to their safety and well-being. The local CSO, SKO and Plan International saw the need to improve awareness of climate change in the communities and facilitate access to better shelters in the target area, to make communities more resilient to climate change.

CIVIC ENGAGEMENT TO INCREASE COMMUNITY AWARENESS OF CLIMATE CHANGE AND TO INCREASE LOCAL COPING CAPACITY

To ensure that the community was properly invested in and fully understood the project, SKO employed a Participatory Approach for Safe Shelter Awareness (PASSA).

SKO conducted eight PASSA modules over the course of 16 days, during which the community reflected, assessed their own needs, and prioritised the problems relevant to CCA.

Among the challenges that SKO came across was the lack of self confidence among beneficiaries, especially women. They felt that they were "just housewives" and did not have the skills or ability to contribute to the project. In addition, community members would often not choose to spend time in project workshops or trainings, citing that it was taking too much time away from their household and income responsibilities. To encourage participation, SKO-PASSA facilitators spent time talking to community members individually, encouraging them to join the workshops. The participants were also provided a per diem to make up for loss of livelihoods.

> "Participatory Approach for Safe Shelter Awareness (PASSA) is a participatory method of disaster risk reduction (DRR) related to shelter safety. The aim of PASSA is to develop local capacity to reduce shelter-related risk by raising awareness and developing skills in joint analysis, learning and decision-making at community level."
>
> • International Federation of Red Cross and Red Crescent 2012

SAFER SHELTERS

Through the consultation process the community identified the 80 most vulnerable households, with technical and selection support from a partner Habitat for Humanity Cambodia, and keeping in mind budget constraints and timelines. In the end, 53 families elected to purchase the housing repair kits, benefiting from the project's partial subsidy.

SKO also helped organise microloans for 12 families to access the repair kits, using a partnership with microfinance institution CMK. Although the community was first hesitant to invest in the house repairs, the community's interest in the kits increased once the first set of houses were complete. In addition, SKO provided WASH training, water filters, and fire extinguishers to target communities to help decrease the cases of illnesses especially among children and to increase the safety of the wooden houses.

An illustration of the shelter plan

Sokhom works in a farm collecting morning glory greens to support her family. She describes what the situation was like in 2015: “I used to look at my children, cold and vulnerable to illnesses as I evacuated the house by boat when floods damaged my house. It hurt me to see them look like that.” Hers is a story that many in the area related to. Sokhom now lives in a house that is more resilient to flooding. “Before the SKO intervention, my children were often sick. I had to stay home and I could only work for around 10 days in a month. I think SKO helped improve my confidence. My children attend school more regularly, and compared to last year I can spend almost twice as much time working to earn money.

SOCIAL SERVICES:

SKO wanted to ensure that the community was benefiting from its interventions and could support themselves even after the end of the project cycle. SKO conducted individual household visits for beneficiaries to keep track of the psycho-social improvements of the households and the improvements in wellbeing in the community. The visits were made to understand individual household problems after which SKO referred beneficiaries to relevant service providers such as employment or health services. They also set up workshops to help community members establish small business that would help increase and diversify their income, further increasing their capacity to adapt to climate change. Women’s participation in these workshops was encouraged.

Safer home - pre,during and post repair, Phnom Penh

“SKO HELPED IMPROVE MY CONFIDENCE, I HAVE NOW ESTABLISHED MY OWN BUSINESS”

- BENEFICIARY

Vocational training, Phnom Penh

FIGURES:

House repair kits: 53

Access to microloans: 12, of which 50% have made regular and timely pay backs.

Entrepreneurship training: 40 participants (25 females)

Home visits to provide information and counselling on social and emergency services: 172 visits to 29 families participating in more in-depth psycho-social meetings.

AVENUES FOR SCALING UP:

WHAT: The PASSA, or the aspect of the project encouraging civic engagement in decision-making, can supplement the VRA tool to inform CIP and local development planning processes. The National Council for Democratic Development could opt to include this in its existing guidelines on local development planning in urban areas.

Local service providers can be completely responsible for the shelter improvement mechanism, whereby a private enterprise/social enterprise or contractor takes on the role of supplier, builder, and technical support provider. Until a supply and demand market is established, competitive, and transparent, the service would need to be regulated or balanced with the help of a government entity, social service provider, or CSO to ensure quality and affordability of services.

Vulnerable households need access to capital to support housing improvements, which may be feasible under a municipal social housing scheme (subsidy portion loan guarantee or match grant) and microfinance institutions.

VECTOR: There is a continued role to be played by CSOs initially to build awareness on CCA/DRR, catalyse demand for the house improvement service, and provide livelihood strengthening services to enable households to afford and fully benefit from the home improvements. This role can eventually be continued by municipal social services where those exist.

This section discusses observations collected over the life of the project both from CSO project and CSSM umbrella program representatives. They cover both CSO level and community level observations and are to be used to strengthen future efforts to drive transformation towards adaptation and vulnerability reduction in Cambodia.

LESSONS

SECTION 3

LESSONS

The primary objective of the MCRDP-CSSM project, as its title states, was to enhance the capacity of CSOs to implement community based adaptation. As a result, a lot of the lessons generated in the immediate aftermath of the project primarily focus around the approach these CSOs took to implementing their projects. Drawing broader conclusions about how urban communities in Cambodia best adapt to climate change must take in a wider perspective and comparative analysis over larger populations and a longer time frame. In this section, we highlight a few more practical observations from the two individual sub-projects implemented in urban areas. The various lessons are structured around the five drivers of transformation listed at the beginning of this document.

BEHAVIOUR

- When promoting individual private investments into housing improvements or WASH on a voluntary basis, one must **anticipate for only a gradual build-up of the number of adopters at first.** Even if there are subsidies involved, it is only after a few risk-taking households have decided to invest and demonstrate satisfaction, that broader uptake happens. Project timeframes, materials and equipment supply, and construction plans must be structured accordingly.

- People's lives are busy – perhaps even more so in urban settings where daily schedules may be less flexible, and with less 'downtime' as during certain points in the agricultural cycle. Participation is ideal, but trying to maximize it can backfire. **People will drop out altogether if they are unable to keep up with expectations.** Community and local authority representatives want to participate, but their time is limited. CSOs should be thoughtful and considerate about expectations and demands. Meetings, trainings, and other events could also be on weekends for optimal attendance.

- Cost of living is much higher in cities than in villages, and per diems should reflect that.

- **Early awareness and understanding** of CCA/DRR and pilots were effective in prompting community action for adaption, as was the case with CMDP in prompting community mobilization and investment in tertiary drainage networks. It is important to invest the time developing a genuinely interested group so that the interventions continue to flourish even post project implementation.

- **Community financial or in-kind investment** can also contribute to ensuring that an intervention is properly maintained in post project implementation.

TECHNICAL

- **Balance between donor and community demand:** The capacity of communities to distinguish between climate and non-climate driven impacts and related needs is very limited, and hinders their ability to express demand for adaption services specifically. Similarly, the fine line that exists between resilience building and development as usual, and difficulty for many development practitioners - including CSOs- to distinguish between both, makes it difficult to isolate exclusively adaptation interventions as prioritized by climate finance. In addition to the use of VRA, on way to address this challenge is to **actively communicate and coordinate interventions with complementary government and non-government programs** to best address community needs as a whole.

- **Systematically check and test new equipment** such as water filters, even when buying in bulk, to prevent equipment going prematurely obsolete and harming trust and goodwill. Set expectations and anticipate shorter than expected lifespans when planning for replacement of parts. Ensure that communities understand the lifespan of their equipment, maintenance requirements, and know how to get replacements. Distributing faulty equipment to the community or sooner-than-expected wear and tear can affect the goodwill and credibility the CSO has accumulated through the course of the project.

- **Simplify the VRA.** The knowledge gained from conducting VRAs is well appreciated by the Commune Councils, but it is currently too complex for the councils to do themselves and for participants to grasp the finer details and created confusion at times.

- Projects take time to mature, **'endline' data may under-report impact if it is conducted too soon.** Donor agency timeframes should fit needs: for example to allow for endline data and reporting to be done after implementation closes, rather than concurrently.

- **Leveraging CSSM forward:** Although the CSSM was intended to allow CSO partners to build on their own project experiences and technical expertise in community based CCA work, the work of one group may also be useful for another. For example, the CSO partner CMDP was unfortunately unable to continue operations due to changes in leadership and lack of further funding. However, SKO, supported by international NGO Enfant et Developpement, was able to secure funding to expand their operations to include interventions like what CMDP had piloted. Thus, SKO is engaging with former CMDP personnel to retain institutional memory, approaches, and possibly human resources across the two organizations. Similarly, CWDCC has received more grants to pursue work on the theme of Gender and Climate Change and CRF is continuing work on safe schools under new funding from other sources.

INSTITUTIONAL

- Credit and loan programming is inherently challenging, and partner SKO found **conducting successful partnership with a particular microfinance institution (MFI) agency challenging.** Management changes, miscommunications, contractual issues and bureaucratic inefficiencies related to their chosen MFI contributed to delays in rolling out financing. Moreover, people may be unwilling to enter into debt with an unfamiliar source. A suitable alternative may be to provide beneficiaries with training on loan and debt management and allow them to choose MFI/creditors themselves.

- Vulnerability Reduction Assessments are standard practice for CCA programs, and the government has endorsed a particular methodology/handbook that all are required to use. Although Commune Councils do appreciate the VRA findings, in its present form, **some face challenges applying the VRA tool independently.** This limits 'mainstreaming' of the VRAs and CCA into local government planning. The VRA questions should be simplified further so that both participating communities and implementing persons can apply it easily, using language that would be understandable by people of all levels of technical knowledge.

- Even when those were difficult, the project **nurtured partnerships** with local authorities and line agencies **to,maximize local support and ownership for sustainability.** Commune chiefs, elders, and local authorities played a key role in responding to challenges and ensuring good coordination. The adoption of demand-driven and needs-based design (VRA), all-stakeholder capacity building, participatory implementation, and harmonization with national policies contributed to strengthening local ownership.

- **High CSO staff turnover can delay implementation.** This causes delays in project implementation, accompanied by a loss of institutional knowledge and capacity. Successive refresher training and follow-up mentoring helped ensure information eventually got to the person that needed it the most.

- There are **knowledge disparities** between CSO management and CSO on-the-ground staff. Targeted one-on-one trainings help to supplement initial formal training sessions, especially on procurement and other aspects of operations and programming. Try to ensure that the who attend training are long lasting, and time trainings appropriately.

POLICY

- One of the chief lessons learned was that **scale matters when it comes to meeting the construction needs of the poor and vulnerable.** Their communities can be crowded and narrow, and heavy equipment cannot navigate unpaved, narrow pathways. Moreover, when the scale of construction is small, construction companies are uninterested in going through time-consuming competitive bidding processes. NGOs, donors, and authorities should recognize that their procurement processes may impede access to the poor and vulnerable. Small-scale projects are important, and there should be an appropriate procurement pathway that does not deter the private sector. The fact that it was difficult for the project to find contractors also demonstrates significant unmet demand and a market gap for small contractors to fill. Most people are, after all, poor rather than rich – and there is potential for a great deal of money to be made by catering to a large number of disadvantaged rather than competing for a small number of elites.

- Almost all CSOs worked with local government to **mainstream CCA/DRR into commune investment program planning.** In the short-term, CSOs can help local government implement national policies and guidelines, while supporting the communes' larger CCA/DRR goals.

- **Turnover in local governing bodies** for political reasons, or electoral campaign priorities caused delays in permissions and approvals. Re-establishing communication channels and goodwill between CSOs and local governing bodies and careful timing of decision and approvals can be necessary.

- **National commitment to adaptation is strong**, but service delivery at the line agency level can be inadequate. Further planning, capacity building, government incentive structures, and better resourcing are necessary.

ECONOMIC

- **Financial tracking and money saving is not common for community members,** it make any economic assessment of an adaptation intervention more difficult. Financial litteracy training help them understand the concepts better and get into the habit of tracking finances.
- **Livelihood diversification is effective** in reducing risk exposure and smoothing income. Strengthen diversification by ensuring that different income generation options are not all sensitive to the same climatic factors.
- **Promote adaptation incentives that also appeal to the private sector.** The best adaptation decisions may not always align with **short term** commercial and productivity decisions. Filling the information gap on adaptation will also better align decisions.

CONCLUSION AND THE WAY FORWARD

In the end, many of the interventions described in this document build on traditional, but carefully coordinated actions affecting behaviour, infrastructure, economics, and institutions within communities vulnerable to climate change. What sets climate change adaptation apart from development 'business as usual' is the extent to which an **intervention** like sanitation or shelter improvement **intersects with climate hazards and population vulnerabilities**. Some of the way that this was achieved was through participatory assessments, trainings, and engagement which make the linkage between climate change and the everyday burdens of the urban poor.

The role played by the project's soft interventions was critical in increasing communities' understanding of climate change, and as a result provided an incentive to adapt. By strengthening associated institutions and relationships, soft interventions are making hard physical investments more viable – and more specifically related to the overarching climate change context.

In Cambodia and globally, adaptation is often thought about as a rural issue, because agriculture and food security are so very sensitive to weather variation. Urban adaptation, meanwhile, is most typically associated with large-scale infrastructure upgrades (and often without a strong social component). Our programs demonstrate that **adaptation can and should fall squarely into integrated programming for the urban poor.** Their neighbourhoods are often situated in areas with low property value and prone to flooding.

Small-scale infrastructure and housing improvements can make a strong impact on people's lives. As climate change ushers in more extreme and erratic weather, the urban poor can expect to increasingly struggle. And yet, companies and authorities are often less interested in 'small' contracts into the narrow unpaved pathways where the poor live, and households are naturally hesitant to invest their very limited resources into homes situated on unsecured land. These **barriers compromise typical efforts** to upgrade sanitation and other city services, or private homes.

The two programs funded by CSSM **demonstrate why and how** urban-oriented planners, authorities, and CSOs can and should **address climate change adaptation** more directly and strategically: adapting approaches to fit the small scale nature of 'last mile' infrastructure and services to areas difficult to access, facilitating the role of more informal private sector providers, and funding mechanisms for such. CSOs can and should play an intermediary role of building capacity and bringing stakeholders together, including companies better able to serve local conditions. CSOs also play a role in transforming what would be 'business as usual' infrastructure development into genuine improvements in resilience to climate change through outreach, education, partnerships, and transformation of the urban poor from climate victims to adaptation actors.

Depending on whether the assets and responsibilities involved fall under the domain of local communities, private sector, or the government, **strategies for scaling out and scaling up vary.** However, there is a continued role by CSOs in the short term to measure, support, replicate, and advocate through programs over longer time frames, until community institutions, private sector, subnational or national government levels have fully replaced them.

Looking more broadly, climate change is straining the urban poor in many ways aside from simply storms and floods. In addition to community-based adaptation responses to climate hazards such as those adopted by the CSSM program, other programming avenues to consider should look at indirect influences like how climate change affects urban crowding and subsequent pressure on social services like health or education, or food prices - to which urban dwellers are more highly exposed. Are city schools prepared to accommodate a growing influx of children? The informal nature of the settlements concerned associated with land tenure insecurity are a deterrent for households, service providers, and local administrations to invest in more resilient private and public infrastructure and services. Climate change is not just an agriculture or environment issue!

Urban adaptation is an underserved area of climate change, especially interventions in poor settlements. Steps like those of the two projects presented in this document can **help urban-oriented CSOs mainstream climate change into their work.** They can also help agencies with expertise on rural adaptation consider opportunities in urban settings. Above all, participation and partnership matters, especially when paired with equal doses of technical skills and respect for the poor.

Market, Phnom Penh

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APPENDIX

APPENDIX 1

SAMPLE OUTCOME INDICATORS

- % of families that feel that their targeted issues have reduced after referrals (example from SKO)
- % of families that feel that floods no longer effect their livelihoods and income (example from CMDP)
- Increase in % of children attending classes regularly and safely (example CRF)
- % of extreme poor households with debts to multiple creditors decreased (HURREDO)

SAMPLE SOFT OUTPUT INDICATORS

- Urban Community Resource Center team members increasing skills and knowledge to provide technical support to develop drainage master plan, cost estimates, and design supporting communities, local officials, and possibly private sector for better understanding of climate resilience, identification, and resolution at the local level.
- % women typically participating in meetings between CSOs, target communities, and local authorities exceeds 30%.
- One Wastewater Master Plan agreed to by target community and local authority.
- Designs and cost estimates of two drainages approved by communities and local authorities.
- At least two communities' CCA and DRR action plans are prepared and integrated in CIPs/CDPs.
- % of vulnerable families with savings.
- # of villages where information and referrals on savings, emergency health concerns, access to employment, and DRR and CCA (including safe shelter) have been dispersed.
- % of 80 target families have access to employment.

SAMPLE HARD OUTPUT INDICATORS

Sample 'Hard' Adaptation Indicator Used for Urban Resilience Interventions	CSO using the indicator	Achieved Performance
• 50% of households in target area notice substantial improvement level relative to flooding, from a baseline where 1 to 3m deep flooding occurred 3 to 6 months in the year	CMDP	95% Water disappears within 1-2 hrs after rains, with no more negative effect to the community. According to the endline VRA, there is no more flooding in the community. The project supported one line of drainage and laterite road, and Commune Councils sup-ported cement (concrete)
• # of meters of rehabilitated and functional drainage in communities	CMDP	230 m of drainage and additional 100m small-scale drainage by community
• # of community drainage systems rehabilitated	CMDP	Two systems
• # of meters of urban lane resurfaced	CMDP	130m of lane
• % of vulnerable families living in safe housing conditions		66% of the 80 houses identified as most unsafe during PASSA have been rehabilitated
• # unsafe shelters identified in PASSA have been repaired/restored		53 houses improved
• housing repair kits provided (solf with subsidy)		53 kits
• # of Housing repair loans accessed • Loans are being repaid regularly on schedule	SKO	12 loans 50% with late payments, and (of which) 16% expected payment default all together
• # households benefiting from WASH and safety investments		342 households get WASH and safety materials (328 filters and 300 fire extinguishers)

APPENDIX 2

CSO SPECIFIC CHALLENGES

CSO	Challenges	Corrective action and Suggestions by CSOs
SKO	Pilot Project: New staff and new approach of PASSA	Continuously self-corrected and explored new ways to achieve our overall goals.
		Regular meeting management meetings to solve problems
	Staff turnover affected project progress	Recruited new staff to continue project work
	Change in CMK (micro credit agency) leadership between proposal and implementation stages required design adjustments after the proposal was approved to meet new leadership's points of view. This caused start-up delays in the saving and lending scheme for the housing kits.	Worked with Plan International, ADB and other partners to approve the guarantee process
		Next time we will leave it up to the beneficiaries to choose MFI/ creditors, and instead provide them with training on loan and debt management
	Turnover in local government caused delays and redesign of project interventions	
	WASH infrastructure investments did not materialize as originally intended because investments prioritized by needs assessments and identified for support were either: eventually taken on by another funding source outside the project, or were too expensive compared to the earmarked budget.	Project invested in needed WASH equipment (filters) and safety equipment instead.
CMDP	Government led investment overlapped with planned activities	To address the issue project then changed construction site but with similar beneficiaries
	Staff turnover	Replaced staff with urgency
		Since the project included a lot of new concepts, models it is important to recruit ground staff that is open to a learning-based, experimental environment.

COMMUNITY BASED CLIMATE CHANGE ADAPTATION THROUGH URBAN DEVELOPMENT: EXPERIENCES FROM CAMBODIA

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