



Weather Stations, Women Champions and Water Management: Changing the Face of Early Warning in Cambodia



Strengthening Climate Information and Early Warning
Systems to Support Climate-Resilient Development
A Retrospective Report | 2015-2020

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A third of Cambodia's population relies on agriculture.

© UNDP Cambodia

Executive summary

Disasters driven by the climate crisis are increasingly impacting lives and livelihoods and are predicted to reduce Cambodia's GDP by 9.8% by 2050 even under an optimistic scenario¹. In response to these challenges, the Royal Government of Cambodia is building a **comprehensive digital solution for climate change adaptation**. This is based on real-time online data that can be used to detect adverse trends and to prepare for extreme weather events. Under the leadership of the Ministry of Water Resources and Meteorology (MOWRAM), and with support from the Global Environment Facility and the United Nations Development Programme (UNDP), this digital system has been established and extended across all provinces in Cambodia.

Working closely with local authorities and communities, **53 automatic hydrology and weather stations were installed** to digitize the collection of climate data, including rainfall, water levels and temperatures, and to enhance capacity for early warning. Real-time data from these automatic stations is now centralized in an online Integrated Water Management System.

UNDP trained a total of 54 staff from MOWRAM, including meteorologists, hydrologists, technicians and provincial staff, to maintain these stations, in addition to key meteorologists and hydrologists to **accurately forecast and model weather** using the collected data. This has supported a shift from 3-day to 10-day, sub-seasonal, and seasonal weather forecasting in Cambodia and allows communities to prepare for disasters and to adapt to the changing climate.

In order to alert communities to disasters that may affect them, the early warning phone service **EWS1294 was extended to 24,628 new subscribers** in UNDP-supported provinces. The system has now been successfully rolled out nationwide to bolster disaster preparedness.

Provincial coordination mechanisms for drought management were set up through the **establishment of Drought Infohubs in eight provinces**. These hubs support provincial authorities to predict droughts and to coordinate early response and mitigation to reduce losses, which will help almost 6 million people who live in these areas².

These initiatives are sustained by the strong involvement of local authorities and communities, including the **elevation of women's roles in climate action**, and by the **development of key enabling policies**. Among these, the Standard Operating Procedures for Multi-Hazard Early Warning Systems were developed to cover all types of disasters and to strengthen policy and institutional arrangements at national, district and community levels. These procedures are guided by the project-supported **Disaster Risk Reduction Framework (2019-2030) and 5-year National Action Plan for Disaster Risk Reduction (2019-2023)**.

Cambodia's new face of early warning relies on these robust enabling policies and digital solutions to adapt to climate change; and to ensure climate-resilient development in the years to come.

¹ "Addressing Climate Change Impacts on Economic Growth in Cambodia", Ministry of Economy & Finance, National Council for Sustainable Development, UNDP, May 2018.

² "General Population Census of the Kingdom of Cambodia 2019", National Institute of Statistics, Kingdom of Cambodia, June 2019.



Farmers gather under a tree as a storm approaches during a training exchange visit in Kampong Chhnang. © Kelsea Clingeffer/UNDP Cambodia



Many Cambodians rely on fishing for their food and livelihoods.
© Manuth Buth/UNDP Cambodia



In Cambodia, disasters driven by climate change are impacting lives and livelihoods and inflicting enormous economic damage.



Damage caused by Typhoon Ketsana in 2009 resulted in a loss of **US\$130 million**.

Flooding in 2011 **affected 683,498** hectares of agricultural land, causing an estimated **\$451 million** in damages and **\$174 million** in losses across various sectors of the economy.



According to the international disaster database EM-DAT, the country registered **19 climate-related disasters** between 1990 and 2009, leaving more than **1,000 people dead** and more than **16 million people** affected.

The country faces mounting development challenges due to longer dry seasons and shorter, more intense rainy seasons, as well as more frequent floods and droughts.

Recovery from such events stretches limited public resources and forces shifts in development priorities.

At the same time, climate change is impacting agricultural production, affecting household level income and putting pressure on food security.

Climate information and early warning systems play a critical role in anticipating disasters and taking action.

The role of an early warning system is to monitor climate and environmental data on a real-time basis and to detect adverse trends.

An effective early warning system enables timely response to natural hazards and extreme weather events.

The same information is also important for risk-informed development planning.



Rising sea levels will potentially impact Cambodia's coastal systems in a number of ways. © Manuth Buth/UNDP Cambodia

Strengthening Climate Information and Early Warning Systems to Support Climate-Resilient Development in Cambodia

Recognising the challenges associated with climate change, the Royal Government has made climate information and establishing effective early warning systems a priority.

With financial support from Global Environment Facility - Least Developed Countries Fund and technical support from the United Nations Development Programme (UNDP), the project 'Strengthening Climate Information and Early Warning Systems to Support Climate-Resilient Development in Cambodia' (2015-2020) helped the Royal Government to bridge gaps in institutional capacity, inter-ministerial coordination, and infrastructure.

The project focused on three complementary outcomes:



1 Increased institutional capacity to assimilate and forecast weather, hydrological, climate and environmental information



2 Climate and weather information available and utilised for national, sectoral and sub-national planning as well as for transboundary communication in the region



3 Strengthened institutional capacity to operate and maintain early warning systems and climate information infrastructure, both software and hardware, in order to monitor weather

Led by the Ministry of Water Resources and Meteorology, and reaching all 25 provinces, the project worked closely with the Ministry of Agriculture, Forestry and Fisheries and the National Committee for Disaster Management.

This photo book showcases the achievements of the project – and how they support Cambodia towards a more sustainable, climate-resilient future.



Under a changing climate, natural hazards may occur more frequently, and the poor are likely to be disproportionately affected.

© Manuth Buth/UNDP Cambodia



Twenty percent of agricultural households are headed by women, and nine out of 10 female agricultural household heads are “de facto”, or actual household heads in the permanent absence of their spouses/husbands or adult male members. © UNDP

CONTENTS

EXECUTIVE SUMMARY	IV	APPLYING CLIMATE INFORMATION.....	48
A HISTORY OF EARLY WARNING SYSTEMS IN CAMBODIA.....	1	FARM School.....	50
MODERNISED MONITORING INFRASTRUCTURE.....	4	SESAME App.....	52
New automatic weather and hydrological stations	8	SHARING ACROSS BORDERS	54
A real-time online platform for forecasting and early warning	11	Lower Mekong Early Warning System Conference	57
BUILDING NATIONAL CAPACITY	14	ADVANCING POLICY DEVELOPMENT	60
Improved weather forecasting for farmers	18	Standard Operating Procedures for Multi Hazard Early Warning Systems	62
Operating and maintaining monitoring stations into the future... 19		A National Groundwater Management Strategy	63
Monsoon Forums.....	21	A National Drought Management Strategy	63
DROUGHT MANAGEMENT	26	A Drought Management Manual for practitioners.....	63
Drought management Infohubs	28	A National Disaster Risk Reduction Framework, 2019-2030 and 5-year action plan.....	65
Training in drought resistant agriculture techniques.....	28	A study of flood management and early warning systems in Prek Thnot River Basin	66
Drought trigger points.....	34	A National Strategy for Private Sector Engagement in Climate Information and Early Warning Systems.....	68
GENDER EQUALITY AND WOMEN'S EMPOWERMENT	36	UPDATING CAMBODIA'S NATIONAL DISASTER	
Empowering women in climate action – ‘Women Champions’ ... 38		DATABASE (CAMDI)	70
‘Charter of Demands’ defines priorities of women	41	PROJECT RESULTS	74
Understanding experiences of Cambodian women through the ‘Women’s Resilience Index’.....	42		
EARLY WARNING SYSTEM EWS1294	44		



Cambodia's first weather station in Kampong Cham.
© Cedric Jancloes/UNDP Cambodia

A history of early warning systems in Cambodia

Sitting by the river near a recently installed automatic weather station, Mr. Seng Sopha recounts the rich history of a nearby building as the country's first meteorology station. He explains that at the beginning of the last century, an outpost was established in the town of Kampong Cham. For the French administration, it was a strategic trading point on the Mekong River.

The building remained undisturbed until the rule of the Khmer Rouge, when it suffered minor damage. After the war, the outpost became a meteorology station. That is when Mr. Seng Sopha and one of his school-friends, Mr. Oeuv Sim Hen, joined together to collect data on local river levels, rain, wind and sunlight. They were the first staff in Cambodia's first station. When it was established in 1981, Vietnamese forces were still fighting Khmer Rouge rebels nearby.

The war days are gone and they now smile, agreeing with each other as they recall in turn how they would visit some of the ten stations of the province, on bicycle, at 7am, 11am and again at 7pm. Each and every day they did this. The only way they managed to attend important events and ceremonies was to take turns.

Together, they relayed duties for nearly 40 years. Mr. Seng remembers the hardships of using a clock that had to be wound-up daily. Changing the photovoltaic films for the light meters also required a lengthy procedure that remains a lasting memory of the old friends.

Soon after reconciliation in 1996, a new bridge connected Cambodia to Vietnam. Agricultural trade started flourishing again with the key crops of rice, maize and cassava cultivated locally.





Mr. Oeuv Sim Hen (left) and Mr. Seng Sopha (right) recounting the old days of data collection © Cedric Jancloes/UNDP Cambodia



Installing a hydrological station, Spean Tasal, Kampong Speu Province, 2018. © OTT HydroMet

Modernised monitoring infrastructure

Partners: OTT Hydrometry (ADCON Telemetry; SUTRON)

Locations: Nationwide

Target: Ministry of Water Resources and Meteorology

Key results:

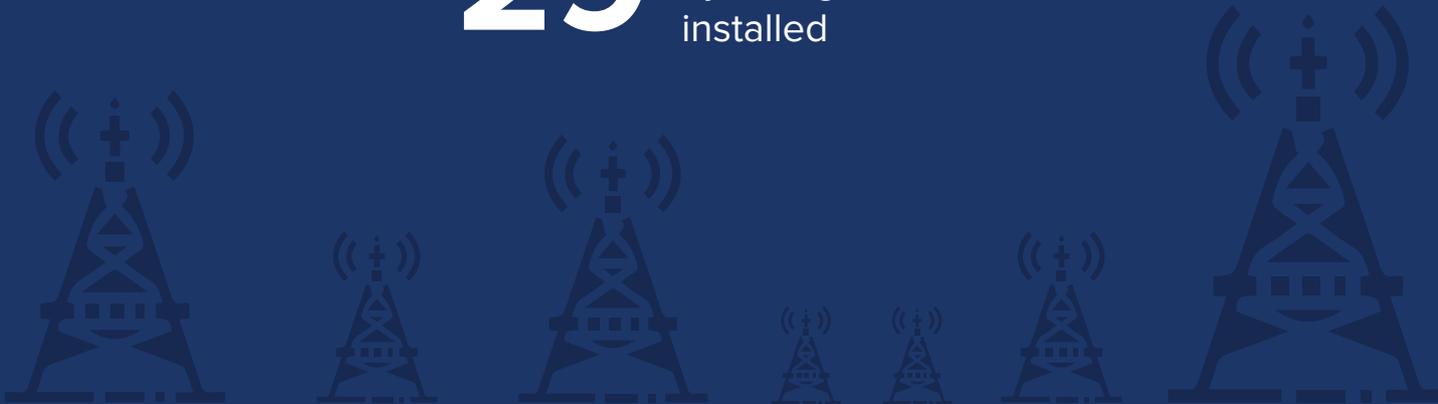


24

Automatic weather stations installed

29

Automatic hydrological stations installed





Recognising that preparation is key to minimising damage, Cambodia has modernised its collection of climate data and capacity for disaster early warning with the installation of the automatic hydrological and weather stations across the country.

Forecasts and warnings generated from the data will help communities prepare for impending conditions or extreme weather events and facilitate decision-making in weather-sensitive sectors - saving lives, assets and livelihoods.

One of the automatic weather stations installed under the project © Manuth Buth/UNDP Cambodia





Traditionally weather reporting in Cambodia has been conducted manually, with provincial officers of the Ministry of Water Resources and Meteorology recording and sending data to the Department of Meteorology in Phnom Penh, for meteorologists to then develop 3-day forecasts.

Local official Mr. Lok Polyvann, Koh Krong Province, holds a rainfall logbook, along with water-measuring beakers. © Samruol Im/UNDP Cambodia



Ms. Oak Iet – an official with the Provincial Department of Water Resources and Meteorology in Koh Krong – demonstrates the traditional method of measuring rainfall using a beaker in her backyard. © Samruol Im/UNDP Cambodia



New automatic weather and hydrological stations

On March 23 2019, World Meteorological Day, UNDP officially handed-over 53 automatic weather and hydrological stations to the Ministry of Water Resources and Meteorology.

The stations – including 24 hydrological stations for surface water and five for groundwater – are concentrated in the disaster-prone south-eastern provinces of Koh Kong, Kampong Speu, Takeo, Kep, Sihanouk Ville and Kampot.

Three weather stations and a hydrological station were also installed under the project in Kandal, as well as two hydrological stations in the capital Phnom Penh and weather stations in Preah Vihear and Kampong Cham.



One of the installed automatic weather stations. © Manuth Buth/UNDP Cambodia



One of the installed automatic hydrological stations.

© OTT HydroMet



Inside an automatic hydrological station. © Ratha Soy/UNDP Cambodia



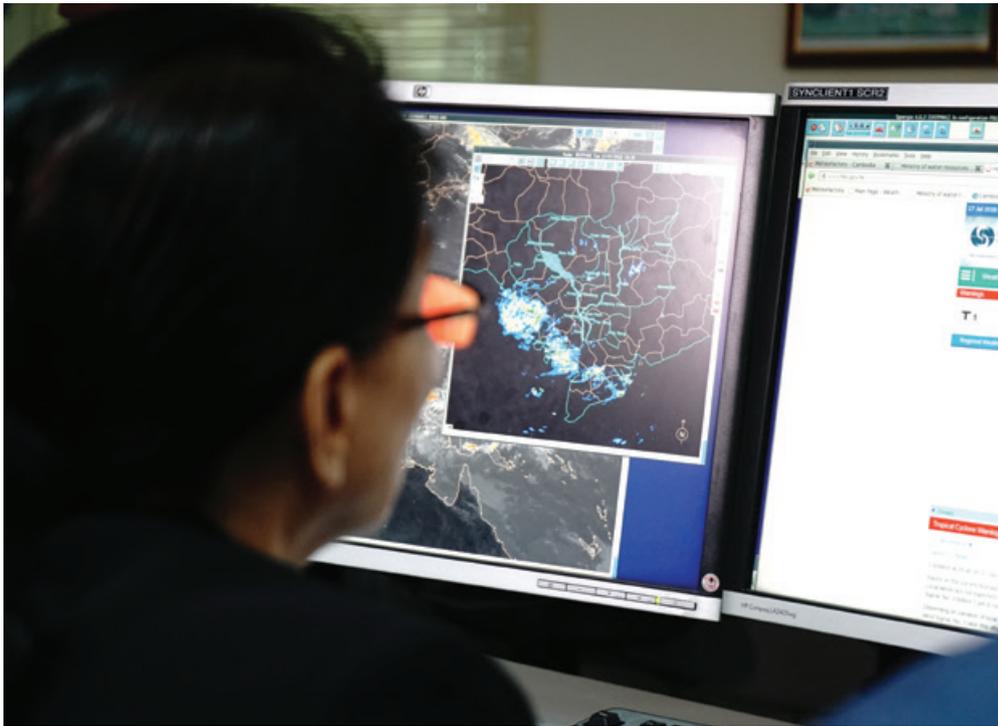
Water level sensor installed on Tatai Bridge under partnership with People in Need. © Manuth Buth/UNDP Cambodia

A real-time online platform for forecasting and early warning

To better understand, analyse, and forecast real-time hydro-meteorological phenomena, the project developed an Integrated Water Management System that centralises data from the Department of Hydrology and the Department of Meteorology.

“ A lot of data comes from the satellites, radar, and the automatic weather stations. Our job is to bring all that data together to display to the forecasters. Technology is key. ”

Mr. Ly Hon, Systems Support Team, Department of Meteorology



Observing real time data at Cambodia's Ministry of Water Resources and Meteorology meteorological operations centre.
© Ratha Soy/UNDP Cambodia





Coastal community in Boeung Kachang, Koh Kong Province © Manuth Buth/UNDP Cambodia



The Ministry of Water Resources and Meteorology in Phnom Penh. © UNDP Cambodia

Building national capacity

Partners: Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES), OTT Hydromet, BRL

Location: Nationwide

Target: Ministry of Water Resources and Meteorology

Key results:



29 meteorologists and hydrologists trained in modelling and forecasting



54 meteorologists, hydrologists and technicians trained in operations and maintenance of automatic weather and hydrological stations



In many countries around the globe access to daily, weekly and even seasonal forecasts are taken for granted. Meanwhile in countries like Cambodia, forecasting is only beginning to advance.

Forecasters observing real time data at the meteorological operations centre in the Ministry of Water Resources and Meteorology, Phnom Penh.
© Ratha Soy/UNDP Cambodia



Skilled meteorologists and hydrologists who can forecast and model weather accurately, and maintain necessary infrastructure, are essential.

Ms. Tep Phollarath, Senior Meteorologist attending training in Kampong Speu
© Kelsea Clingeffer/UNDP Cambodia

Improved weather forecasting for farmers

Historically, Cambodia has only had access to very short-term weather forecasting. However, under the project, meteorologists and hydrologists worked with international partners such as the Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES), to move beyond 3-day forecasts to 10-day forecasts, and seasonal and sub-seasonal approaches.

Training under the project included Numerical Weather Prediction modelling and forecasting tools from the European Centre for Medium Range Weather Forecasts.



Woman farmer, Kampong Thom province. © Kelsea Clingleffer/UNDP Cambodia



Operating and maintaining monitoring stations into the future

At the Ministry of Water Resources and Meteorology, a database shows a map of coloured dots. Green dots mean an automatic weather or hydrological station is working correctly and producing real-time data, while red means a station needs attention.

Under the project, 54 meteorologists, hydrologists and technicians were trained by supplier OTT Hydrometry in operations and maintenance of automatic weather and hydrological stations, allowing them to check and rectify issues themselves.

Preparation of sensors for an automatic weather station at Preah Sihanouk. © MOWRAM Cambodia



“ We have progressively extended our forecasts from three days to seven days to ten days; and have introduced sub-seasonal forecasts. We want to be able to provide information early. Sometimes in the past the information was too slow, but now people will have time to prepare and if necessary, evacuate. ”

**– Mr. Oum Ryna, Director of
Department of Meteorology**



Mr. Oum Ryna, Director of the Department of Meteorology of the Ministry of Water Resources and Meteorology.
© Manuth Buth/UNDP Cambodia

Monsoon Forums

Monsoon Forums provide an opportunity for stakeholders to converge and review previous and forecasted monsoon seasons, as well as discuss topics such as sectoral experiences in agriculture. In doing so, risks can be identified and addressed.

Under the project, UNDP hosted Cambodia's 7th and 8th National Monsoon Forums in 2019, three years after a Monsoon Forum was last hosted in the country.



H.E. Mr. Mao Hak, Deputy Secretary General of Tonle Sap Authority, MOWRAM at the 7th Monsoon Forum in Phnom Penh, June 2019. © Manuth Buth/UNDP Cambodia



7th Monsoon Forum, Phnom Penh, June 2019. © Manuth Buth/UNDP Cambodia



“ Accurate, reliable weather forecasts are very important for all countries, particularly with climate change. They inform us of the climate in the coming months – information with which we can plan, especially for productive sectors like agriculture or fisheries ”

– Ms. Peou Phalla, Vice Director, Department of Meteorology



View from Tatai Bridge, Koh Kong.
© Manuth Buth/UNDP Cambodia



A participant taking notes during a project training.
© UNDP Cambodia



Steung Treng, August 2010.
© Arantxa Cedillo/UNDP Cambodia

Drought management

Partner: DanChurchAid Cambodia

Locations: Kampong Speu, Kampot, Takeo, Battambang, Pursat, Kampong Chhnang, Kampong Cham, Kampong Thom, Siem Reap

Targets: Agricultural Cooperative leaders and members; Provincial Committee for Disaster Management members

Key results:



3,308 people trained in drought management

2,389 farmers and Provincial Committee for Disaster Management members trained in drought-resistant agricultural techniques

1,425 women trained in drought-resistant agricultural techniques



Between 1987 and 2020, six major drought events were recorded in Cambodia. According to the International Disasters Database EM-DAT, these events cumulatively impacted

9.05 million
Cambodians.



Thlork Thmey village, Svay Rieng, February 2010. © Arantxa Cedillo/UNDP Cambodia

Drought management Infohubs

Being able to predict droughts is crucial to safeguarding livelihoods and reducing loss and damage.

Under the project, eight Drought Management Infohubs were established in the provinces of Kampot, Takeo, Kampong Chhnang, Pursat, Battambang, Kampong Thom, Siem Reap and Kampong Cham.

Bringing together provincial officials from across departments – including the Provincial Department of Water Resources and Meteorology, the Provincial Department of Agriculture, Forestry and Fisheries, and the Provincial Committee for Disaster Management – the hubs present best practice for provincial-level drought coordination and early response and mitigation.

Training in drought resistant agriculture techniques

Adopting a training-of-trainers model, the project equipped 2,389 farmers and Provincial Committee for Disaster Management members with knowledge on sustainable methods for adapting to drought conditions, including techniques for home gardening, raising chickens, and water-saving techniques such as drip irrigation.

The modules were presented in the context of learning about drought and weather systems, which allows farmers to better predict and plan for upcoming seasons.

Exchange visits between successful agricultural cooperatives facilitated sharing of experiences between villages.



Drought resistant agricultural techniques training, Battambang, August 2019. © Kelsea Clingeleffer/UNDP Cambodia



Practicing planting seedlings at a drought resistant agricultural techniques training, Battambang, August 2019. © Kelsea Clingleffer/UNDP Cambodia



Agricultural cooperative members taking part in a drought resistant agricultural techniques training, Kampong Thom, February 2020. © Kelsea Clingeffer/UNDP Cambodia



“ With the training, we are better prepared. We now have more awareness of weather patterns so we can adapt our conventional techniques. We now know the relationship between climate change and flooding – we still have the traditional warning system, but the training for the management tops up our knowledge. ”

**– Mr. Sem Bunly, Chief of
Steungslakou Agricultural Cooperative**



Chief of Steungslakou Agricultural Cooperative, Sem Bunly. © UNDP Cambodia



Drought trigger points are an essential component of early warning systems, helping detect a hazard and to design or implement adaptation measures.

© Arantxa Cedillo/UNDP Cambodia



Drought trigger points

Under the project, DanChurchAid and UNDP worked in consultation with the Provincial Departments of Water Resources and Meteorology to develop a list of 'trigger points', or thresholds, for declaring localised droughts (for example, the trigger point for declaring a hydrological drought might be water reservoirs of less than 20 percent).

Trigger points were established for Battambang, Kampong Cham, Kampong Chhnang, Kampot, Kampong Thom, Pursat, Siem Reap, and Takeo.



Farmers take part in a training in disaster risk reduction. © UNDP Cambodia



Research shows that women are disproportionately impacted by climate change, in turn deepening existing inequalities.

Around thirty percent of Cambodia's female workforce are employed in agriculture. © UNDP Cambodia

Gender equality and women's empowerment

Partner: ActionAid Cambodia

Locations: Kampot, Koh Kong, Pursat

Target: Local women and authorities

Key result:



23

'Women
Champions'
trained



“ The important role of women in their communities must be recognised with their active and meaningful involvement in decision-making, implementation and feedback at all levels. ”

– **Dr. Rany Pen, Assistant Resident Representative & Head of Programmes, UNDP Cambodia**



At the heart of the 2030 Agenda for Sustainable Development is a commitment to ensure that 'no one is left behind'.
© Kelsea Clingeffer/UNDP Cambodia



Empowering women in climate action – ‘Women Champions’

Under the project, ActionAid Cambodia and UNDP partnered to train 23 ‘Women Champions’ in gender equality, disaster risk reduction and climate change adaptation.

Receiving training alongside local authorities, the women became disaster-risk reduction focal points for their communities and produced action plans for early warning, including advocacy resulting in construction of a canal to mitigate the impacts of drought, training on gender equality and waste management, and disaster information dissemination.

The women were also involved in other activities to reduce their community’s vulnerability to disasters, such as a mangrove-planting campaign in Kampot, and solar-water pump research and installation.



Community mangrove-planting event under UNDP-supported ‘100,000 Mangroves’ campaign by ActionAid, March 2020. © Manuth Buth/UNDP Cambodia

“ Women are socially constructed to be victims - sometimes society thinks they cannot do big things. But we want to be leaders! ” – **Ms. Nuon Sothy**



Nuon Sothy (right) at Women Champions training, Phnom Penh, September 2019. © Kelsea Clingeleffer/UNDP Cambodia



“ Last year, my community had issues with their rice fields due to the drought. Many hectares were destroyed. The women came together to advocate to our local authorities to dig a small canal – now this year the problem has been fixed because they did it! It worked. It was one of my activities in my action plan. ”

– Ms. Nov Siphon

Nov Siphon at Women Champions training.
© Kelsea Clingeffer/UNDP Cambodia

‘Charter of Demands’ defines priorities of women

Drawing on the views of 350 women across 38 villages, as well as local authorities and Women Champions, the Women’s Charter of Demands outlined needs and priorities for disaster risk reduction and climate change adaptation at the local level. The charter focused on giving women a voice to share their experiences and shape their own future.

According to the Charter’s opening statement, “Women are less likely to be given opportunities to raise their issues. In collecting this data, the women have been courageous in identifying and speaking their needs; in turn they hope to get a timely, accountable response and to further encourage women to increase their engagement in decision-making in disaster risk reduction and climate change adaptation.”

Examples of priorities included infrastructure, such as roads and access to clean water; access to safe areas with adequate food, medical supplies and other resources; sufficient and timely emergency response; access to education and awareness-raising activities; and support for women’s advocacy.



Gender and disaster risk reduction workshop, August 2019. © Manuth Buth/UNDP Cambodia



Mith Somountha from ActionAid Cambodia at a training on gender equality and disaster risk reduction, August 2019.
© Manuth Buth/UNDP Cambodia

Understanding experiences of Cambodian women through the ‘Women’s Resilience Index’

Produced with ActionAid, the Cambodia Women’s Resilience Index assessed women’s resiliency as compared to other groups in the community. As well as a desk survey, data was collected through household surveys, focus group discussions, key informant interviews and in-depth interviews, with particular focus on gathering the experiences of marginalised groups.

While the survey found that overall, resilience is not high across the board for Cambodians, it also highlighted a number of notable gaps between men and women, including in daily income, access to education, ability to read and write, influence in decision-making, and awareness of disaster management plans at commune/Sangkat level.

The results provide a tool for policy development, advocacy, disaster preparedness programming and better understanding of equitable communities.



Women reading training materials, Kampong Thom.
© Kelsea Clingeffer/UNDP Cambodia



EWS 1294 is a free early warning phone service which warns people of impending natural hazards. © UNDP Cambodia

Early Warning System EWS1294

Partner: People in Need

Locations: Sihanoukville, Koh Kong, Kampong Cham, Tboung Khmum, Prey Veng, Svay Rieng, Takeo, Kandal, Phnom Penh, Kep, Pailin.

Target: Local communities

Key results:



24,628 Cambodians subscribed to early warning phone service EWS1294 in UNDP-supported provinces

46,851 people warned in UNDP-supported provinces in 2019



“ My commune members came to me to tell me it was such a good thing because they received a warning from the Provincial Committee before the flood arrived! It alerted them to the impending disaster and helped them to prepare. ”

- Mrs. Try Teang, Boeng Pruol commune chief



Community EWS1294 training in Kampong Cham, August 2019. © Kelsea Clingleffer/UNDP Cambodia



Community members subscribing to the EWS1294 service. © Kelsea Clingeleffer/UNDP Cambodia

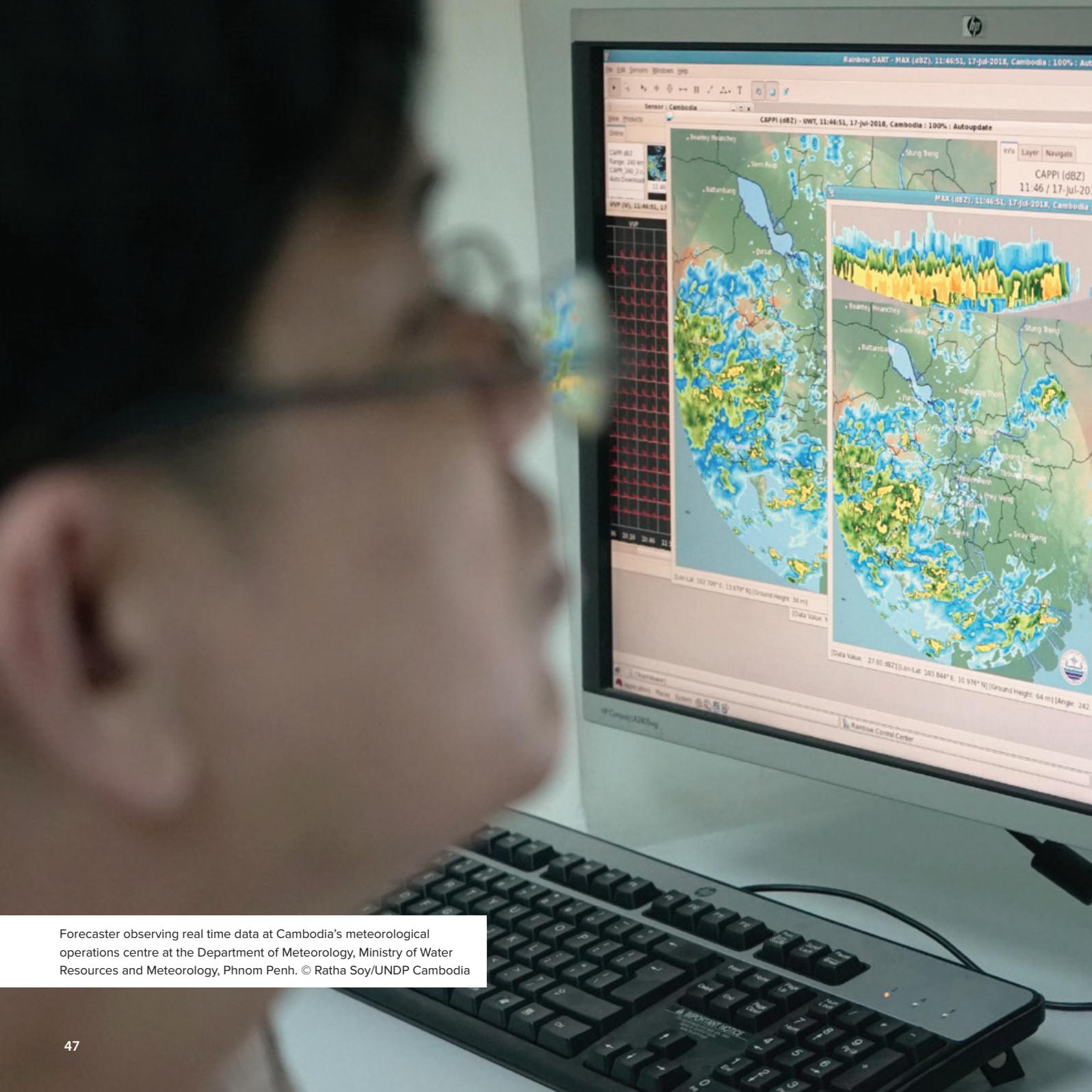
Named after the government-supported mobile short code '1294', EWS1294 is a free early warning phone service developed by NGO People in Need.

As well as supporting the extension of EWS1294 in 11 provinces, UNDP also worked with People in Need to establish shelters and disability-friendly toilet blocks.

By mid-2020, the system was rolled out nationwide, with activation in all provinces.



Safe site infrastructure constructed under the project in Kampong Cham. When community members receive a warning, they can gather resources and livestock and evacuate to the nearest site. © Kelsea Clingeleffer/UNDP Cambodia



Forecaster observing real time data at Cambodia's meteorological operations centre at the Department of Meteorology, Ministry of Water Resources and Meteorology, Phnom Penh. © Ratha Soy/UNDP Cambodia

Applying climate information

Partner: Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES)

Target end user: Farmers

Key results:



- 1** SESAME (Specialised Expert System for Agro-Meteorological Early Warning) app developed
- 1** National curriculum for FARM (Forecast Application for Risk Management) Schools developed
- 1** Climate Zone developed
- 12** Department of Meteorology staff trained to generate long-range forecasts

Being able to apply meteorological and hydrological data to address the needs of a country is a critical part of climate change adaptation.



FARM School training, Kampong Speu, September 2019. © Kelsea Clingleffer/UNDP Cambodia



FARM School

Projections show extreme weather events – such as storms, floods and droughts – are set to increase in frequency and severity across Cambodia.

Under the project, a standard training programme for the use of climate information in agricultural practices, dubbed 'FARM' School (short for Forecast Application for Risk Management in Agriculture), was developed with RIMES for use by the Ministry of Agriculture, Forestry and Fisheries.

As well as teaching aspects of climate monitoring, prediction and forecasting application, the curriculum includes regular discussions between farmers, extension workers and meteorological authorities.



A group of men are gathered outdoors around a weather station instrument. The instrument is a cylindrical metal structure with a rusted top section and a white-painted lower section. One man in a pink shirt is in the foreground, looking towards the instrument. Other men in light-colored shirts and lanyards are looking on. The background is filled with green foliage.

Alongside training in meteorological modelling, RIMES partnered with UNDP to develop apps and a curriculum that support the application of climate information in the Cambodian context.

FARM School training, Kampong Speu, September 2019.
© Kelsea Clingeffer/UNDP Cambodia



SESAME App

Under the project, RIMES customised their Specialised Expert System for Agro-Meteorological Early Warning app (known as ‘SESAME’) and transferred it to the Department of Agriculture.

The app allows government departments to coordinate and create accessible advisories for farmers, localised for each province, crop and growth stage.

Corn growing in Kampong Thom.
© Kelsea Clingleffer/UNDP Cambodia



Sharing across borders

“ The fact is that we simply cannot achieve all 17 Sustainable Development Goals unless we leverage cooperation, share practical solutions and give each other the support, inspiration and indeed push in the right direction. ”

- **UNDP Administrator, Achim Steiner**

Location: Southeast Asia

Target: Disaster management practitioners, project partners

Key result:



1 regional conference on early warning systems bringing together representatives from five countries



**Disasters in one country
can impact its neighbours.
As a result, it is important
to consider transboundary
approaches for sharing
data, information and best
practices.**

Flooding on the Mekong River floodplain, Thailand and Lao PDR, December 2015. © NASA



“ We need to ensure that good practices on early warning systems are shared within the Lower Mekong sub-region in order to strengthen the capacity of disaster management organisations and hence increase resilience of vulnerable populations ”

- Federico Barreras, Disaster Management Program Manager, People in Need



Kompong Phluk village. © Manuth Buth/UNDP Cambodia

Lower Mekong Early Warning System Conference

In December 2019, the Lower Mekong Early Warning Systems Conference brought together more than 80 representatives from Cambodia, Vietnam, Laos, Thailand and Myanmar.

The result of a regional transboundary study on early warning systems conducted by project partner People in Need, the conference invited each country to present on early warning systems in their own country. Discussions and demonstrations also covered early warning technology, including 3D printing of a water sensor, with other presenters including Asian Disaster Preparedness Centre, Mekong River Commission and RIMES.

Civil society and others took part in discussion around advancing transboundary early warning systems in the region. Participants were encouraged to develop networks which will lead to increased sharing of data and best practices.



3D printing of water sensors is revolutionising the ability to set up detection systems for incoming hazards.

© People in Need





Coastal community of Boeung Kachang, Koh Kong,
November 2018 © Manuth Buth/UNDP Cambodia



Project Manager Muhibuddin Usamah at a consultative workshop towards developing a National Framework and Action Plan for Disaster Risk Reduction.
© Manuth Buth/UNDP Cambodia

Advancing policy development

To further sustainable disaster management and knowledge, the project supported the development of a range of national strategies and research papers including:



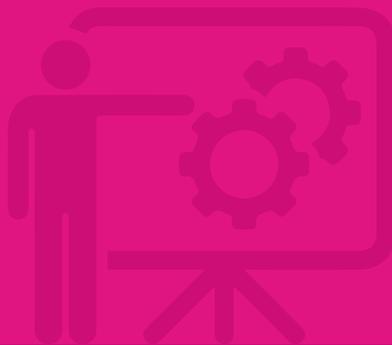
Standard Operating Procedures for Multi Hazard Early Warning Systems

A National Groundwater Management Strategy

A National Drought Study of Cambodia

A Drought Management Manual for Cambodia; and

A National Disaster Risk Reduction Framework 2019-2030 and National Action Plan for Disaster Risk Reduction 2019-2023





Kompong Phluk village, July 2019. © Manuth Buth/UNDP Cambodia



Standard Operating Procedures for Multi Hazard Early Warning Systems

While previous versions of Cambodia's early warning systems plan focused solely on flooding, a multi-hazard approach more accurately reflects the diverse nature of disasters in the country.

Developed in close consultation with the Ministry of Water Resources and Meteorology; Ministry of Agriculture, Forestry and Fisheries; and National Committee for Disaster Management, the Standard Operating Procedures for Multi Hazard Early Warning Systems focused on the integration of policy and institutional arrangements at national, district, and community levels for reducing disaster risk.



Aerial view of rural house in Siem Reap. © Kimheang Tuon/UNDP Cambodia

A National Groundwater Management Strategy

A changing climate, conversion of land for agricultural and industrial purposes, and increasing usage are impacting Cambodia's precious water resources.

The National Groundwater Management Strategy focused on solutions for the sustainable use of groundwater in the country, including recommendations on strengthening institutional arrangements and law enforcement, human resources development, data management, enhancing coordination and cooperation, awareness-raising, and resource mobilisation.

Development of the plan was accompanied by training of Department of Water Supply and Sanitation staff.

A National Drought Management Strategy

From a drought research study, the project also developed a National Drought Management Strategy with recommendations on how models could be applied in the development of drought-specific early warning for Cambodia.

A Drought Management Manual for practitioners

Developed in partnership with DanChurchAid, the Drought Management Manual for Cambodia outlines topics such as understanding climate variability, drought concepts, definitions, practices and analysis, the Standardised Precipitation Index, risk management, and case studies.



Trabek village, Kampong Thom. © Chansok Lay/UNDP Cambodia





School disaster drills in Koh Kong, Cambodia.
© Manuth Buth/UNDP Cambodia

A National Disaster Risk Reduction Framework, 2019-2030 and 5-year action plan

Under the project, UNDP supported the National Committee for Disaster Management to produce a national Disaster Risk Reduction Framework as well as a 5-year action plan for 2019-2023.

The national framework proposes a five-pronged approach to strengthen Cambodia's resilience to disaster and climate risks:

- 1) Increased awareness and understanding of climate and disaster risks
- 2) National and sub-national disaster risk assessments
- 3) Strengthened disaster risk governance
- 4) Investments in disaster risk reduction; and
- 5) Enhanced preparedness for effective response & recovery

Resulting from extensive analysis of previous plans and consultation with key stakeholders, the action plan details what and how to implement disaster risk reduction at a national level.

As well as synchronising with national laws and guidelines, the documents link closely with global resilience agendas including the Sendai Framework for Disaster Risk Reduction, the Paris Agreement for climate change action and the Sustainable Development Goals.



Consultative workshop towards developing a National Action Plan for Disaster Risk Reduction 2019-2023. © Manuth Buth/UNDP Cambodia





A study of flood management and early warning systems in Prek Thnot River Basin

To address gaps in flood management in Prek Thnot River Basin, Cambodia's Department of Hydrology and River Works commissioned a report to provide an up-to-date picture of Prek Thnot flooding and its management.

The report – which will inform the development of a disaster risk management strategy – highlighted a number of important findings including the impact of changes to land use and development as well as opportunities for extending the coverage of monitoring infrastructure; leveraging water management infrastructure; improving cooperation between stakeholders; and improving early warning procedures at the local level.



School disaster preparedness drill, Koh Kong.
© Manuth Buth/UNDP Cambodia



Automatic weather station installed under the project in 2018.
© Manuth Buth/ UNDP Cambodia

A National Strategy for Private Sector Engagement in Climate Information and Early Warning Systems

Partnering with the public sector, the private sector can support the operations and maintenance of hydrological and hydro-meteorological stations, as well as to provide tailored climate information products and services.

To help drive private sector engagement in these areas, the project conducted a detailed review in to which private sector actors produce and can use climate information and early warning systems (for example, mining, aviation and insurance); the existing gaps in products and services; areas for expansion; international models to learn from; and whether there is any willingness by the private sector to invest in or pay for climate information.

The findings of the study and a resulting national strategy were made available to Ministry of Water Resources and Meteorology in May 2020. Throughout the implementation period, UNDP approached potential private sector partners for collaboration with the Royal Government of Cambodia.



Updating Cambodia's National Disaster Database (CAMDI)

In 2015, the Cambodia Disaster Loss and Damage Information System (CAMDI) was developed to collect, store and analyse disaster loss and damage data, and to improve understanding of risks and vulnerabilities. A technical team from the National Committee for Disaster Management and UNDP was established to collect data about disasters from various agencies at commune, district, provincial and national levels.

Data collection efforts were spread over several months and resulted in 7,800 records of disaster events covering the period 1996 to 2013. The data was used to undertake analysis at various levels using different techniques, such as temporal, spatial and composition analysis to identify various aspects and characteristics of impacts. However, ongoing updates to this database were limited.

In 2020, under the project, UNDP updated CAMDI's damage and loss information, as based on historical disasters, and updated CAMDI's web application to fit the targets articulated under the Sendai Framework for Disaster Risk Reduction.



Having updated and open access data on disasters is important in policy making, research, and even understanding future events.

Aerial view of mangrove trees in Kampot. © Manuth Buth/UNDP Cambodia



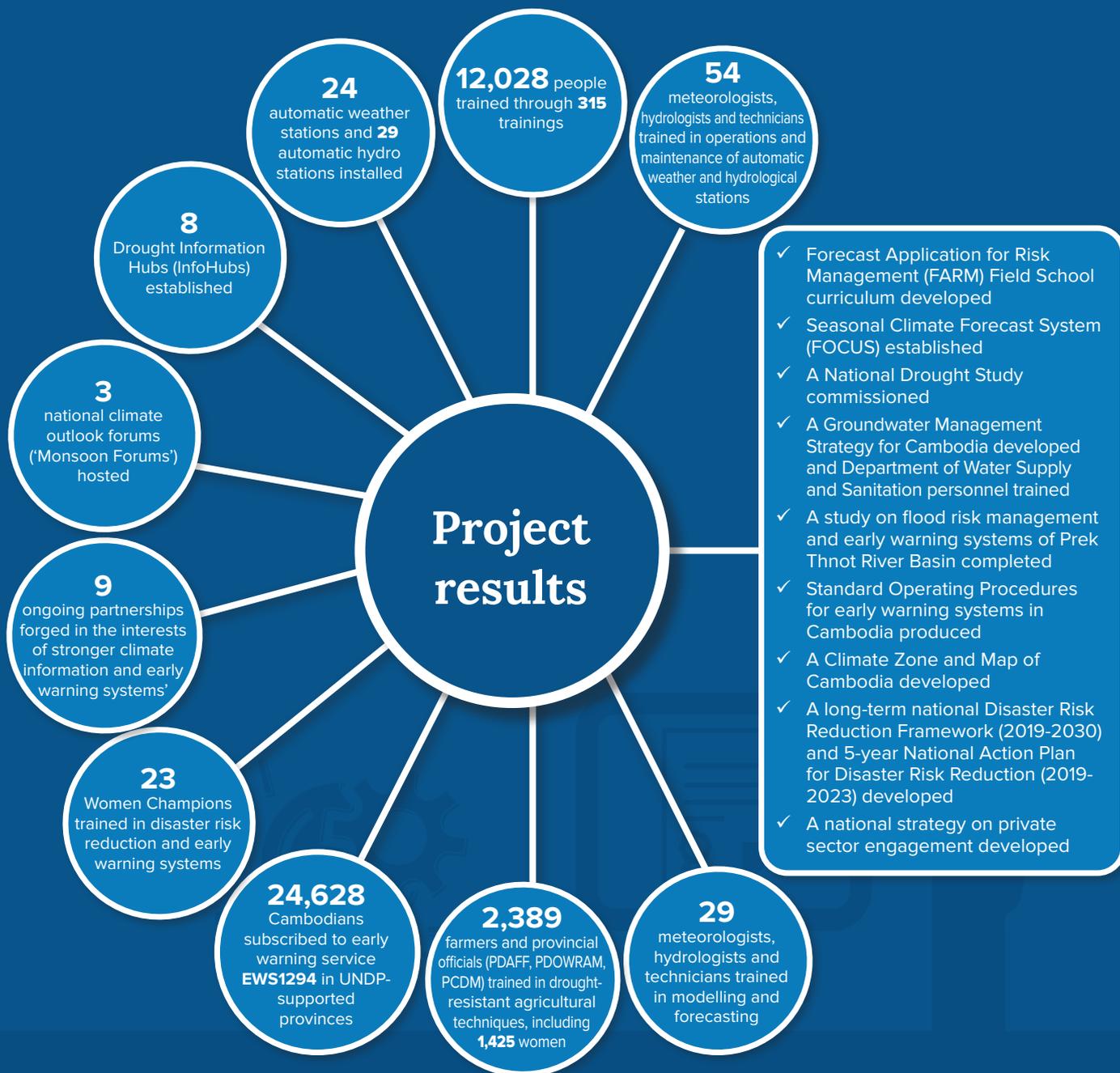
Kompong Phluk village.
© Ratha Soy/UNDP Cambodia



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Experienced fishermen observe the skies and wind to predict weather, but now they can also access forecasts on TV, radio and the Ministry of Water Resources and Meteorology's Facebook page © Samruol Im/UNDP Cambodia





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