

Building Climate Resilience in Kurunegala: Capacity Building on Drought Anticipatory Action and AWARE Platform Utilization

Kurunegala, Sri Lanka | October 31-November 1, 2025

Niranga Alahacoon, Winson Gnanatheepan, Sarath Premalal, and Giriraj Amarnath

December 2025



Authors

Niranga Alahacoon, Regional Researcher – Remote Sensing and Disaster Risk Specialist, International Water Management Institute (IWMI), Colombo, Sri Lanka

Winson Gnanatheepan, Anticipatory Action Coordinator, Food and Agriculture Organization of the United Nations (FAO), Colombo, Sri Lanka

Sarath Premalal, Agrometeorologist, FAO, Colombo, Sri Lanka

Giriraj Amarnath, Research Group Leader - Water Data for Climate Resilience (WDCR), and CGIAR Climate Action Program Co-Lead - Digital Advisories and Climate Risk Management, IWMI, Colombo, Sri Lanka

Acknowledgements

This work was conducted under the CGIAR Climate Action Program. We would like to thank all funders who supported this research through their contributions to the CGIAR Trust Fund:

<https://www.cgiar.org/funders/>.

The work was also supported by the Food and Agriculture Organization of the United Nations' (FAO) Anticipatory Action Programme and we thank the funders of FAO's Anticipatory Action initiatives.

We would also like to convey our gratitude to the Ministry of Agriculture, Forestry and Fisheries (MAFF) of Japan, German Federal Foreign Office (GFFO) and Pandemic Fund for their support. Further, we would like to thank the Chief Secretary, Northwestern Province and all district government officers in Kurunegala who participated in this workshop.

CGIAR Climate Action Program

The CGIAR Climate Action Program aims to drive science, innovation, and collaboration to transform food, land, and water systems for a climate-resilient, net-zero, and equitable future. in Bangladesh, Cambodia, Côte d'Ivoire, Ethiopia, Honduras, India, Kenya, Nepal, Nigeria, Pakistan, Philippines, Senegal, Sri Lanka, Sudan, Tanzania, Zambia, Zimbabwe.

Anticipatory Action Initiative

The Food and Agriculture Organization of the United Nations' (FAO) Anticipatory Action initiative in Sri Lanka focuses on drought and flood hazards in Kurunegala and Batticaloa, respectively. FAO is also working on developing an Anticipatory Action system for selected zoonotic diseases.

Citation

Alahacoon, N.; Gnanatheepan, W.; Premalal, S.; Amarnath, G. 2025. *Building climate resilience in Kurunegala: capacity building on drought anticipatory action and AWARE Platform utilization*. Report of the Training on Drought Anticipatory Action and AWARE Platform Utilization, Kurunegala, Sri Lanka, 31 October - 1 November 2025. Colombo, Sri Lanka: International Water Management Institute (IWMI). CGIAR Climate Action Program. 23p.

© 2025 International Water Management Institute. Some rights reserved. This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0)

Front cover photo: Kalana Cooray/FAO

Back cover photo: Winson Gnanatheepan/FAO

Disclaimer

This publication has been prepared as an output of the CGIAR Climate Action Program and has not been independently peer reviewed. Responsibility for editing, proofreading and layout, opinions expressed, and any possible errors lies with the authors and not the institutions involved.

Table of Contents

List of Figures	3
Introduction	4
Objectives of the Training	5
Process of Training Program	5
Welcome Remarks	5
Opening Remarks	6
Introduce the training agenda and training process	7
Key Sector Specific Anticipatory Action	16
Way Forward	17
References	18
Annexures	19
Annexure 1: List of Participants	19

List of Figures

Figure 1: Mr I.M.I. Ilangakoon, Chief Secretary, Northwestern Province, delivering the welcome remarks 6

Figure 2: Mr Sarath Premalal, Agrometereolgist-FAO, delivering the opening remarks for the training program. 7

Figure 3: Mr Winson Gnanatheepan, Anticipatory Action Coordinator, FAO, Introducing the training programme. 8

Figure 4: Dr Niranga Alahacoon train the participants on the concept of disaster risk reduction. 11

Figure 5: Mr Anura Viraj Dissanayake, Deputy Director, Disaster Management Centre, Kurunagala, provides participants with a comprehensive overview of the District Hazard Profile of Kurunegala 13

Figure 6: Group activity on the problem tree analysis. 16

Building Climate Resilience in Kurunegala: Capacity Building on Drought Anticipatory Action and AWARE Platform Utilization

Introduction

Kurunegala District is recognized as one of the most drought-prone regions in Sri Lanka, as highlighted in previous studies (Alahacoon et al, 2021; Alahacoon & Amarnath, 2022). The district's economy is heavily dependent on agriculture, particularly paddy cultivation, which serves as the primary livelihood for a large proportion of farming households. However, with the growing impacts of climate change, including rising temperatures and notable shifts in rainfall patterns, Kurunegala has become increasingly vulnerable to recurrent droughts (Alahacoon et al, 2024; Cho, 2020). These conditions severely affect agricultural productivity, water availability, and the overall resilience of farming communities.

Addressing frequent drought events requires a shift toward strengthening climate resilience, particularly through interventions that empower farmers to prepare for and respond to drought impacts. Among the most effective strategies identified is the introduction of Anticipatory Action (AA), which enables communities to take preemptive measures based on reliable early warning information. Through a systematic mapping and prioritization process, the Polpithigama, Galgamuwa and Ehetuwewa Divisional Secretariat Divisions (DSD) were identified as high-priority for implementing AA interventions due to their pronounced drought exposure and vulnerabilities.

To operationalize these efforts, the Food and Agriculture Organization of the United Nations (FAO) in Sri Lanka is implementing a dedicated Anticipatory Action Project for drought hazards, in collaboration with the International Water Management Institute (IWMI) and the Sri Lanka Red Cross Society (SLRCS). The initiative targets three key Divisional Secretariat Divisions in Kurunegala such as Polpithigama, Ehetuwewa, and Galgamuwa with the main aims of this activities:

- Strengthening risk analysis and early warning capacities at national and local levels
- Enabling timely anticipatory actions prior to drought shocks, with strong community participation
- Promoting collective learning, coordination, and partnerships to ensure effective and sustainable AA implementation.

As an initial step toward operationalizing drought Anticipatory Action in Kurunegala, which focuses on the priority sectors of agriculture, livestock, and inland fisheries, a two-day capacity-building program was conducted for government officials. This training aimed to enhance their knowledge, readiness, and technical skills to support on-ground implementation of anticipatory measures that reduce drought-related livelihood impacts and strengthen overall community resilience.

Objectives of the Training

The Anticipatory Action training focuses on achieving the following key objectives:

- Enhance the understanding of Anticipatory Action among provincial and district government officers.
- Validate findings from FAO's analyses on historical drought impacts, rainfall data, and vegetation indices.
- Identify anticipatory actions for key sectors such as agriculture, livestock, inland fishery, water and sanitation, education, and protection.

Process of Training Program

The two-day capacity-building program, which focuses on “Building Climate Resilience in Kurunegala: Capacity Building on Drought Anticipatory Action and AWARE Platform Utilization,” was designed to equip participants with a strong and holistic understanding of the key elements required for proactive drought preparedness. The training covered a wide spectrum of thematic areas, including Disaster Risk Reduction (DRR) principles, the concept and operationalization of Anticipatory Action (AA), impact-based forecasting, and the practical use of the AWARE platform as a decision-support tool for planning and early action.

To ensure an engaging and effective learning experience, the program adopted a blended training approach that integrated conceptual presentations, interactive peer discussions, live platform demonstrations, practical exercises, and collaborative group activities. This structure enabled participants not only to deepen their theoretical understanding but also to strengthen their ability to apply these concepts within their respective institutions and communities. By the end of the program, participants were better equipped to support drought-focused anticipatory actions and contribute to a more climate-resilient Kurunegala District.

Welcome Remarks

The training program commenced with welcome remarks from Mr. I.M.I. Ilangakoon, Chief Secretary, Northwestern Province (Figure 1). In his welcome address, he warmly welcomed all participants (Annexure 1) from government institutions and partner organizations, acknowledging their commitment to enhancing disaster preparedness and climate resilience in the Kurunegala District for Drought Hazard.

Mr. Ilangakoon emphasized the critical importance of Anticipatory Action (AA) in addressing the growing challenges posed by climate variability in the Kurunegala district, one of Sri Lanka's drought-prone districts. He further explained that shifting from reactive disaster response to proactive, early interventions is essential to minimizing impacts on lives and livelihoods.



Figure 1: Mr. I.M.I. Ilangakoon, Chief Secretary, Northwestern Province, delivering the welcome remarks (photo: Winson Gnanatheepan/FAO)

Furthermore, he commended the collaborative efforts Food and Agriculture Organization of the United Nations (FAO), Sri Lanka Red-Cross Society (SLRCS) and the International Water Management Institute (IWMI) in organizing this capacity-building initiative. He highlighted that such partnerships play a pivotal role in empowering local institutions with the technical knowledge and tools necessary to operationalize Anticipatory Action effectively.

Opening Remarks

Mr. Sarath Premalal, Agrometeorologist at FAO, delivered the opening remarks, highlighting the critical importance of strengthening both the technical and conceptual understanding of anticipatory action and related approaches among government institutions, local stakeholders, and community representatives (Figure 2). He emphasized that building this knowledge base is essential for enhancing district-level disaster preparedness and ensuring greater climate resilience across vulnerable communities.

In his remarks, Mr. Premalal, further highlighted the need to enhance the capacities of frontline government agencies, who play a pivotal role during disaster events. He stressed that empowering these institutions with data-driven tools, reliable early warning information, and robust anticipatory planning skills would significantly improve the speed, coordination, and effectiveness of disaster response. Such strengthened capacity, he noted, is vital not only for protecting lives and livelihoods during emergencies but also for supporting long-term climate resilience efforts in the Kurunegala District.



Figure 2: Mr. Sarath Premalal, Agrometeorologist-FAO, delivering the opening remarks for the training program. (photo: Winson Gnanatheepan/FAO)

Introduce the training agenda and training process

Following the opening session, Mr. Winson Gnanatheepan, Anticipatory Action Coordinator at FAO, formally introduced the training syllabus and agenda for the two-day capacity-building program on Anticipatory Action for Drought Hazards (Figure 3). He presented participants with a detailed overview of the program's structure (Table 1), core objectives, and the sequence of thematic modules designed to strengthen their understanding of Disaster Risk Reduction (DRR) and Anticipatory Action (AA) within the context of Sri Lanka's increasing climate variability and hazard exposure.

Mr. Gnanatheepan highlighted that the training agenda had been thoughtfully developed to integrate conceptual foundations, practical demonstrations, and applied learning exercises, ensuring a balanced and engaging experience for all participants. The program was designed to progress logically from fundamental concepts such as hazard, vulnerability, and risk assessments to more advanced components, including early warning interpretation, early financing mechanisms, and simulation-based exercises for operational readiness.

He also highlighted the importance of encouraging collaboration across government agencies, technical institutions, and community representatives, noting that effective anticipatory action relies on coordinated effort and shared understanding. The training aimed to cultivate this synergy by encouraging dialogue, joint problem-solving, and the exchange of practical insights from diverse stakeholders.

The two-day program consisted of several comprehensive modules, each addressing a key dimension of drought preparedness and anticipatory action from climate risk analysis and AA protocol development to the use of digital tools such as the AWARE Platform. Together, these modules were intended to build the capacity of participants to implement proactive, timely, and community-centered actions ahead of drought impacts in Kurunegala District.



Figure 3: Mr. Winson Gnanatheepan, Anticipatory Action Coordinator, FAO, Introducing the training programme. (photo: Niranga Alahacoon/IWMI)

Table 1: Detailed training agenda for the training program

Time	Activities / Sessions
Day 01	
Inaugural session	
08:45-09:00	Arrival of the participants and registration
09:00-09:10	Welcome Remarks by Mr. I.M.I. Ilangakoon, Chief Secretary, Northwestern Province.
09:10-09:20	Opening Remarks by Sarath Premalal, Agrometeorologist, Food and Agriculture Organization of the United Nations
09:20-09:30	Introduction to the training by Winson Gnanatheepan, Anticipatory Action Coordinator, Food and Agriculture Organization of the United Nations
09:30-09:45	Announcements and Introduction to Participants

Time	Activities / Sessions
09:45-10:15	Tea Break and Group Photo
10:15-11:15	Key concepts of Disaster Risk Management <i>Hazard, Vulnerability, Risk, risk mapping approaches</i> Facilitator: <i>Dr Niranga Alahacoon: Regional Researcher – Remote Sensing and Disaster Risk Analyst, International Water Management Institute (IWMI)</i>
11:15-12:00	Anticipatory Action Concept, Key Building Blocks, and Process Facilitator: <i>Winson Gnanatheepan, Anticipatory Action Coordinator, Food and Agriculture Organization of the United Nations</i>
12:00-12:15	National Context of Anticipatory Action Facilitator: <i>Winson Gnanatheepan, Anticipatory Action Coordinator, Food and Agriculture Organization of the United Nations</i>
12:15-12:30	District Hazard Profile Facilitator: <i>Mr. Anura Viraj Dissanayake, Deputy Director, Disaster Management Centre, Kurunagala</i>
12:30-12:45	CRIWMP activities Facilitator: <i>Mr. Sarath Wickramasinghe, Manager/District Project Coordinator, SLRCS</i>
12:45-13:30	Lunch
13:30-15:30	Developing Anticipatory Action Protocols including trigger development Facilitators: <i>Basics of AAP Development: Winson Gnanatheepan, Anticipatory Action Coordinator, Food and Agriculture Organization of the United Nations</i> Developing triggers for various hazards: <i>Dr Niranga Alahacoon: Regional Researcher – Remote Sensing and Disaster Risk Analyst, International Water Management Institute (IWMI)</i> Drought trigger Developed for Kurunagala- <i>Mr. Sarath Premalal, Agrometeorologist, Food and Agriculture Organization of the United Nations</i>
15:30-16:00	Role of AWARE platform in Anticipatory Action Facilitator: <i>Dr Niranga Alahacoon: Regional Researcher – Remote Sensing and Disaster Risk Analyst, International Water Management Institute (IWMI)</i>
15:30-16:00	Tea and end Day 01
Day 02	
08:30-09:00	Recap- Day 01 Facilitator: <i>Winson Gnanatheepan, Anticipatory Action Coordinator, Food and Agriculture Organization of the United Nations</i>
09:00-10:30	Problem tree analysis and theory of change to identify anticipatory actions

Time	Activities / Sessions
	Facilitator: <i>Dr. Niranga Alahacoon, Regional Researcher, International Water Management Institute</i>
10:30-11:00	Tea break
11:00-11:30	Plenary- <i>Problem tree analysis and theory of change to identify anticipatory actions</i>
11:30-12:30	Anticipatory Action Protocol Operationalization Facilitator: <i>Facilitator: Winson Gnanatheepan, Anticipatory Action Coordinator, Food and Agriculture Organization of the United Nations</i>
12:30-13:30	Discussion on proposed next steps
13:30-14:00	Feedback and wrap-up
14:00	Lunch-End of Programme

Training process

The training program was delivered over two and a half days using a well-structured, carefully designed teaching flow tailored specifically for this capacity-building initiative. The content was developed to comprehensively address the requirements for strengthening participants' understanding of the disaster risk management framework, including key concepts, processes, and institutional responsibilities. In addition, the syllabus provided an in-depth understanding of Anticipatory Action (AA), ensuring that participants gained a clear understanding of the principles, triggers, and operational steps involved in implementing AA on the ground. Overall, the training framework ensured that participants were equipped with both the theoretical knowledge and practical competencies necessary for effective anticipatory planning and action.

Key concepts of Disaster Risk Management Hazard, Vulnerability, Risk, risk mapping approaches

Key concepts of Disaster Risk Management, facilitated by Dr Niranga Alahacoon – Regional Researcher, Remote sensing and Disaster Risk Analyst at the International Water Management Institute (IWMI) - laid the foundation for understanding the core principles of disaster risk management (Figure 4). The session opened with an interactive discussion in which participants shared their immediate thoughts upon hearing the word “disaster,” allowing them to connect theoretical concepts with personal and community experiences. Building on this engagement, Dr Niranga introduced definitions of hazard, vulnerability, exposure, risk, and disaster, using simple, relevant local examples, such as drought hazard, to reinforce understanding. Participants were guided through the interrelationships among these concepts, with particular emphasis on how disaster risk emerges from the interaction between existing hazards, the people and assets exposed to them, and the vulnerability of those elements.

Furthermore, Dr. Niranga explained the progressive nature of drought development, illustrating how drought conditions emerge and intensify over time. He elaborated on the four key

dimensions of drought such as meteorological, agricultural, hydrological, and socio-economic, highlighting how each stage affects communities and ecosystems differently. Dr. Niranga emphasized the critical importance of early recognition of drought signals to enable timely planning, proactive interventions, and effective management of its impacts.

Following this conceptual introduction, Dr Niranga Alahacoon introduced an in-depth module on hazard, vulnerability, exposure, and risk mapping, with a specific focus on drought hazards. This session bridged theoretical knowledge with practical application, helping participants strengthen their ability to identify, analyze, and visualize disaster risks at both community and regional scales. As a core component of the Anticipatory Action (AA) training program, the module demonstrated how spatial information combined with community insights can support early warning, preparedness, and anticipatory decision-making. Dr. Alahacoon introduced risk mapping as a critical decision-support tool, showing how hazard exposure can be assessed, vulnerabilities analyzed, and high-risk areas prioritized for interventions.



Figure 4: Dr Niranga Alahacoon train the participants on the concept of disaster risk reduction. (Photo: Winson Gnanatheepan/FAO)

Anticipatory Action Concept, Key Building Blocks, and Process

This module provides participants with a deep, structured understanding of the Anticipatory Action (AA) approach, with special emphasis on its application to slowly developing drought hazards, which require well-timed, informed interventions. The session begins by introducing the core concept of Anticipatory Action and explaining how proactive measures taken before the onset of a hazard can significantly reduce its impact on lives, livelihoods, and critical systems. Participants learn how AA bridges the gap between early warning information and rapid, community-centred action, positioning it as a vital component of modern disaster risk management frameworks.

The module then explores the key building blocks essential for establishing an effective AA system, particularly in drought-prone contexts. These building blocks include hazard monitoring and forecasting, vulnerability and exposure assessment, trigger development, early financing mechanisms, and pre-agreed anticipatory actions tailored to local conditions. Each

of these components is examined in detail to demonstrate how they collectively support a reliable, timely, and scalable anticipatory response.

A major focus of the module is the process of operationalizing Anticipatory Action for drought events, given the unique challenges posed by slow-onset hazards. During the session, participants engaged in a group exercise where they identified and discussed actions under each of the key building blocks of Anticipatory Action. Through this activity, they gained a clearer understanding of how early warning, early action, and early financing are interconnected and collectively contribute to an effective anticipatory response.

District Hazard Profile

This session, conducted by Mr. Anura Viraj Dissanayake, Deputy Director, Disaster Management Centre, Kurunegala, provides participants with a comprehensive overview of the District Hazard Profile of Kurunegala, serving as a foundational component for understanding the local risk landscape and its implications for drought-focused Anticipatory Action (Figure 5). The session introduces the key climatic, environmental, and socio-economic characteristics that shape hazard exposure in Kurunegala, with particular emphasis on the district's high vulnerability to drought and other recurrent hazards, including heat stress, seasonal water scarcity, floods, and strong winds.

Participants are guided through the structure and purpose of the District Hazard Profile, which compiles historical disaster data, hazard maps, critical hotspots, and sector-specific impacts on agriculture, livestock, water resources, and community livelihoods. The module highlights how these localized risk insights support informed decision-making, early warning interpretation, and the prioritization of anticipatory actions at the divisional and Grama Niladhari levels.



Figure 5: Mr Anura Viraj Dissanayake, Deputy Director, Disaster Management Centre, Kurunegala, provides participants with a comprehensive overview of the District Hazard Profile of Kurunegala (photo: Winson Gnanatheepan/FAO)

Climate Resilience Integrated Water Management Project (CRIWMP) activities

Mr. Sarath Wickramasinghe, Manager/District Project Coordinator of Sri Lanka Red-Cross Society (SLRCS), highlighted the importance of the Climate Resilient Integrated Water Management Project (CRIWMP) in strengthening drought management in Sri Lanka and its alignment with Anticipatory Action. Targeting vulnerable farming communities in the Malwathu, Mi, and Yan River basins, the project enhances water security, climate-resilient agriculture, and access to safe drinking water. He also introduced the seven cascade management approaches, including lake and bund improvement, groundwater restoration, climate-smart agriculture, environmental conservation, and community disaster preparedness.

Developing Anticipatory Action Protocols, including trigger development

This session was facilitated by three facilitators covering three different sections, such as Basics of Anticipatory Action Protocol Development (Mr. Winson Gnanatheepan), Scientific approach for AA trigger development (Dr Niranga Alahacoon) and Case study of the drought trigger developed for Kurunegala (Mr. Sarath Premalal - Agrometeorologist, Food and Agriculture Organization of the United Nations).

During this session, guides participants through the complete process of designing Anticipatory Action (AA) Protocols, with a strong focus on establishing scientifically sound and context-specific trigger mechanisms. Participants learn how to translate early warning information into

actionable steps by defining pre-agreed roles, responsibilities, timelines, and sector-specific interventions. Furthermore, explain to the participants who does what, when, and with what resources once a trigger is activated. The module covers the identification of drought indicators, threshold setting, vulnerability considerations, and community priorities. Participants learned about the relationship between thresholds and triggers and the use of multiple data sources like rainfall, soil moisture, river discharge, and vegetation indices from satellite and ground-based observations. Through practical exercises and group work, participants develop draft AA protocols and refine their triggers to ensure timely activation of early actions, enabling more effective and coordinated drought preparedness at local and district levels.

Role of AWARE platform in Anticipatory Action

This module provided a comprehensive demonstration of the AWARE Platform, showcasing its role in linking early warning information with timely Anticipatory Action. Participants were introduced to AWARE's three core components of Early Warning, Early Action, and Early Finance, and how these modules work together to strengthen preparedness and response to climate hazards. The Early Warning Module displays short-, medium-, and long-range forecasts, integrating real-time satellite data and historical indicators to support continuous monitoring. The Alert Dashboard enables users to track rainfall anomalies, drought and flood indices, and soil moisture conditions, helping to determine scientifically grounded triggers. The Early Action Module allows institutions to digitize AA protocols and activate them across preparedness, readiness, and activation phases. Meanwhile, the Early Finance Module links triggers to pre-arranged funding, ensuring financial readiness for rapid implementation. Tools such as the Rapid Response Dashboard and automated online bulletins support real-time impact mapping and stakeholder communication. Through hands-on practice, participants learned to navigate AWARE, analyze datasets, and simulate activation procedures to operationalize AA effectively.

AWARE Platform

The AWARE platform of CGIAR's initiative on Climate Resilience strengthens the links between early warning for early action and early finance. The platform assists stakeholders in taking action to reduce the impact before the disaster unfolds. The key feature of the AWARE platform is to promote multi-level coordination and collaboration and enhance accountability to enable responsiveness. The platform disseminates information on climate, market, health, nutrition, and population displacement to promote collaborative efforts by multiple partners at local- to-national scales to enhance preparedness, response, advocacy, and resource mobilisation in times of extreme climate events.

Problem tree analysis and theory of change to identify anticipatory actions

Problem tree analysis and theory of change to identify anticipatory actions session conducted by Dr Niranga Alahacoon to train participants with the analytical tools needed to systematically identify root causes, impacts, and pathways for effective Anticipatory Action (AA). It introduces Problem Tree Analysis as a structured method for unpacking the underlying drivers of drought vulnerability, mapping the cause-and-effect relationships, and distinguishing between

immediate issues and deeper systemic factors. Participants learn how to collaboratively construct a problem tree that visualizes the central hazard-related problem, its contributing causes (environmental, institutional, socio-economic), and its effects on communities, livelihoods, and ecosystems. Through this process, they develop a clearer understanding of where early actions can reduce risk before impacts escalate.

Building on the problem tree, the module transitions into developing a Theory of Change (ToC), a results-oriented framework that connects desired outcomes with the interventions needed to achieve them. Participants learn how to transform identified problems into opportunities for anticipatory interventions by defining outcomes, outputs, preconditions, and assumptions. The ToC exercise guides them to outline logical pathways linking early warning information, community needs, institutional roles, and feasible anticipatory actions.

The module also consists of a group exercise (Figure 6), which was designed to enable participants to apply Problem Tree Analysis and Theory of Change together to design context-specific, evidence-based, and actionable AA interventions that strengthen early preparedness and reduce hazard impacts of sectors such as Agriculture, Livestock, Inland Fisheries, Water and Sanitation, and Cross-sectoral enablers.

Key Findings of Problem Tree Analysis

Reduced food security and livelihoods due to water scarcity, poor resource management, and climate variability.

Root Causes

- Irregular rainfall and rising temperatures.
- Declining groundwater and poor reservoir maintenance.
- Weak irrigation management and poor institutional coordination.
- Land degradation, reduced feed, and poor water quality.

Effects

- Declining crop and fish production, livestock health issues, and income loss.
- Rural poverty, migration, and community conflicts.

Outcomes

- Decreased national food security, weakened resilience, and rising socioeconomic and health challenges.



Figure 6: Group activity on the problem tree analysis. (photo: Kalana Cooray/FAO)

Anticipatory Action Protocol Operationalization

This session, facilitated by Winson Gnanatheepan, trains participants with practical skills to activate and operationalize Anticipatory Action (AA) protocols in real-world drought scenarios. Building on earlier sessions on triggers and protocol design, the module walks participants through the step-by-step processes required to move from early warning information to timely on-the-ground early actions. Participants learn how to interpret trigger thresholds, coordinate between agencies, communicate alerts, and mobilize pre-agreed resources in alignment with preparedness, readiness, and activation phases. The module also emphasizes the importance of institutional roles, decision-making timelines, and Standard Operating Procedures (SOPs) to ensure smooth execution of AA protocols.

Key Sector Specific Anticipatory Action

During this training program, government participants developed sector-specific key anticipatory actions, outlined broadly in preliminary drafts in Table 2. As Anticipatory Action (AA) is fundamentally a community-driven approach, these initial action plans will need to be further refined and strengthened through community consultations to ensure they reflect local needs, priorities, and contextual realities.

Table 2: Sectoral Anticipatory Action

Sector	Anticipatory Action
Agriculture	<ul style="list-style-type: none"> • Apply forecast-based irrigation and water-saving techniques (Alternative Wet and Dry – AWD). • Promote short-duration and drought-tolerant rice varieties.

Sector	Anticipatory Action
	<ul style="list-style-type: none"> • Strengthen soil moisture conservation and tank maintenance. • Disseminate early advisories via SMS, radio, and farmer field schools.
Livestock	<ul style="list-style-type: none"> • Pre-position fodder and promote drought-tolerant grasses. • Deepen wells and tanks to ensure water availability. • Vaccinate and deworm animals and deploy mobile vet teams. • Establish collective grazing areas during critical dry periods.
Inland Fishery	<ul style="list-style-type: none"> • Desilt reservoirs and maintain minimum water levels in hatcheries. • Coordinate controlled water release for aquaculture. • Temporarily restrict overfishing and strengthen community monitoring.
Water and Sanitation	<ul style="list-style-type: none"> • Implement pre-drought water rationing and tank cleaning. • Promote greywater reuse. • Pre-position purification tablets and repair wells. • Launch community awareness campaigns on water saving and hygiene.
Cross-Sectoral Enablers	<ul style="list-style-type: none"> • Establish real-time drought monitoring using rainfall and soil moisture indicators. • Activate district drought coordination cells linking multiple sectors. • Introduce trigger-based financing mechanisms for early implementation. • Strengthen community disaster management committees (VDMCs) for last-mile action delivery.

Way Forward

The two-day workshop successfully enhanced understanding of Anticipatory Action and produced a set of sector-specific drought actions for Kurunegala District. The outcomes will guide FAO and partner agencies in:

- Validating the identified anticipatory actions with the stakeholders and community members
- Preparing drought operational plan for Kurunegala
- Developing Standard Operating Procedures (SOPs) for drought triggers.

- Integrating anticipatory measures into district and provincial disaster management plans.
- Promoting collaboration and knowledge sharing among technical and local actors.

The workshop concluded with strong commitments from all stakeholders to further advance the mainstreaming of Anticipatory Action in Sri Lanka's drought preparedness framework.

References

Alahacoon, N., Edirisinghe, M. and Ranagalage, M., 2021. Satellite-based meteorological and agricultural drought monitoring for agricultural sustainability in Sri Lanka. *Sustainability*, 13(6), p.3427.

Alahacoon, N. and Amarnath, G., 2022. Agricultural drought monitoring in Sri Lanka using multisource satellite data. *Advances in Space Research*, 69(11), pp.4078-4097.

Alahacoon, N., Thathsarani, G., Sivananthan, P. and Amarnath, G., 2024. Evaluating climate hazard hotspots and hazard impacts in Sri Lanka: an analysis of historically reported data.

Cho, H., 2020. Climate change risk assessment for Kurunegala, Sri Lanka: Water and heat waves. *Climate*, 8(12), p.140.

Annexures

Annexure 1: List of Participants

ID	Name	Designation	Organization	M/F
1	I. M. Ilangakoon	Chief Secretary	North Western Province (NWP)	M
2	Suraj Sirisena	Provincial Director of Fisheries	Provincial Ministry of Fisheries - NWP	M
3	U. H. N. H. De Silva	Engineer	Irrigation Department	M
4	W. M. S. Wanninayake	Acting Provincial Director of Agriculture	Provincial Department of Agriculture	M
5	I. A. R. Damayanthi	Deputy Director	Provincial Department of Agriculture	F
6	T. S. Rajapaksha			M
7	W. M. D. Weerakoon	Agriculture Extension Officer	National Aquaculture Development Authority (NAQDA)	F
8	H. W. U. Weerage	Agriculture Extension Officer	National Aquaculture Development Authority (NAQDA)	M
9	W. M. C. J. Wijekoon	Deputy Director (Planning)	Provincial Planning and Monitoring Division	F
10	D. M. I. Dissanayake	Development Officer (Planning and Monitoring)	Planning and Monitoring Division	F
11	D. M. C. K. Disanayake	Development Coordination Programme Officer (Planning) (<i>assumed</i>)	Provincial Planning Unit	F
12	A. M. I. Sumanasooriya	Development Officer (Planning and Monitoring)	Planning and Monitoring Division	F
13	R. J. T. Adikari	Disaster Relief District Officer (Kurunegala)	National Disaster Relief Services Centre (NDRSC)	F
14	G. S. Dharmasena	District Agriculture Officer	District Secretariat	F
15	J. M. D. K. Jayasingha	Disaster Officer, Ehetuwewa	NDRSC / Ehetuwewa Agrarian Office	M
16	W. W. M. Ranjula	Development Officer	Ministry of Fisheries	F
17	I. B. J. Bandara	Assistant Director of Agriculture (Research)	Rice Research and Development Institute	M
18	R. J. Rathnayake	Assistant Director of Agriculture	Department of Agriculture - NWP	F
19	U. R. A. K. C. Kemarathne	Deputy Director	Agriculture and Agrarian Insurance Board	M
20	A. M. L. G. Adikari	Assistant Director	Agriculture and Agrarian Insurance Board	M
21	T. M. Dasantha Bandara	Development Officer	Divisional Secretariat, Polpithigama	M

22	S. Y. D. A. Somawansa	Deputy Commissioner	Agrarian Development Office	M
23	V. K. Rajapaksha	Development Officer	Agrarian Development District Office	F
24	Kaushal Attanayake	Programme Policy Officer - Emergency Response	World Food Programme (WFP)	M
25	Viraj Dissanayake	Deputy Director - Disaster Management Centre	Disaster Management Centre (DMC)	M
26	J. M. U. Jayasingha	Development Officer (Irrigation)	Galgamuwa Irrigation Office	M
27	J. H. D. S. K. Jayathilake	Deputy Director (Planning)	Provincial Planning Department	F
28	R. M. I. M. A. Jinna	Zonal Director of Education	Zonal Education Office, Maho	M
29	K. M. O. Y. Piyaratne	Deputy Director of Education	Zonal Education Office, Maho	F
30	Hansika Shiromi	District Child Rights Promotion Officer	District Secretariat, Kurunegala	F
31	D. M. S. Jayalath	Officer in Charge	Department of Meteorology	M
32	R. M. N. S. Elamy	Secretary	Ministry of Agriculture	M
33	S. P. D. S. M. Sooriyathna	Development Officer	Agrarian Development District Office	F
34	Damayanthi	Deputy Director (Planning)	Ministry of Agriculture	F
35	P. M. A. N. Bandara	District Management Officer (or District Medical Officer – verify)	Disaster Management Centre (DMC)	M
36	W. M. C. K. Wijekuruppu	Additional District Secretary	District Secretariat	F
37	Dr. R. Fernando	Medical Officer in Charge	Regional Director of Health Services (RDHS), Kegalle	M
38	H. A. W. Kamalsiri	Provincial Director	Provincial Irrigation Department	M
39	R. Wijesinghe	Deputy Director	Department of Animal Production and Health (DAPH)	F
40	Dr. W. A. S. D. Weerasooriya	Provincial Director	Department of Animal Production and Health (DAPH)	F
41	Dr. B. M. N. B. Basnayake	Deputy Director	Department of Animal Production and Health (DAPH)	M
42	W. M. M. Gerotheep	Agribusiness / Agriculture Coordinator	Food and Agriculture Organization (FAO)	M
43	Sarath	Manager - Water / Disaster Preparedness Coordinator	Sri Lanka Red Cross Society (SLRCS)	M
44	Lumbini Pushpakumara	Director (Planning)	District Secretariat, Kurunegala	F
45	E. M. L. Ananda	Deputy Director (Planning)	Divisional Secretariat, Galgamuwa	M
46	N. B. Abhayaratne	Branch Executive	Sri Lanka Red Cross Society (SLRCS)	M

47	K. P. D. S. N. Somarathna	Assistant Director (Planning)	Divisional Secretariat, Polpithigama	F
48	Y. M. J. Y. Bandara	Deputy Director (Planning)	Divisional Secretariat, Ehetuwewa	M
49	S. Premalal	Agricultural Extension Consultant (<i>assumed</i>)	Food and Agriculture Organization (FAO)	M
50	J. A. Asanka	District Officer	Disaster Management Centre (DMC)	M
51	K. V. Nalinda	Officer	Department of Agriculture	M
52	S. P. Bandara	Finance and Administration Officer	World Food Programme (WFP)	M
53	K. S. B. Coorey	Finance and Administration Officer	Food and Agriculture Organization (FAO)	M
54	Kasun Harshana	Programme Assistant (<i>assumed</i>)	Food and Agriculture Organization (FAO)	M
55	Disanayake	Assistant Director (Planning) (<i>assumed</i>)	Agrarian Development Project (ADP)	M
56	K. A. M. A. L. Jayasena	Agriculture Officer	Department of Agriculture	M
57	T. M. W. R. T. B. Dissanayake	Research Assistant	Rice Research and Development Institute	M



CGIAR is a global research partnership for a food-secure future. CGIAR science is dedicated to transforming food, land, and water systems in a climate crisis. Its research is carried out by 13 CGIAR Centres/Alliances in close collaboration with hundreds of partners, including national and regional research institutes, civil society organisations, academia, development organisations and the private sector. www.cgiar.org

To learn more about this program, please visit: <https://www.cgiar.org/cgiar-research-portfolio-2025-2030/climate-action/>

Contact

Niranga Alahacoon, Regional Researcher – Remote Sensing and Disaster Risk Analyst, IWMI Sri Lanka (n.alahacoon@cgiar.org)



CGIAR

CLIMATE
ACTION

IWMI

International Water
Management Institute

MAFF

Ministry of Agriculture,
Forestry and Fisheries
農林水産省