



## **ACKNOWLEDGEMENT**

Water For Life Cameroon thanks

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## **CONTENTS**

1. INTRODUCTION.....	4
2. OUTCOMES OF THE WORKSHOP.....	4
3. PROCEEDINGS OF THE WORKSHOP .....	5
3.1. Opening Ceremony .....	5
3.2. Summaries of Workshop Presentations .....	5
3.3. Summary of discussions .....	15
3.4. Summary of group work.....	16
4. KEY RECOMMENDATIONS.....	23
5. APPENDICES.....	23
5.1. Appendix 1: Workshop programme .....	23
5.2. Appendix 2: List of Experts and Authorities who were mobilized .....	25
5.3. Appendix 3: list of participants day 01 and 02 .....	25
5.4. Appendix 4: EYD2R 1 workshop in pictures.....	26

## **LIST OF ABBREVIATIONS**

**CED:** Centre for Environment and Development

**CPD:** Civil Protection Directorate

**DRR:** Disaster Risk Reduction

**NSPW:** National school of public works

**ENSPM:** Ecole Nationale Supérieure Polytechnique of Maroua

**FAO:** Food and Agriculture Organization of the United Nations

**FASA:** Faculty of Agronomics and Agricultural Sciences

**FMBEE:** Wood, Water and Environment Business Sector

**2 IE Foundation:** International Foundation for Water and Environmental Engineering

**GIZ:** [Gesellschaft International Zeitung](#)

**GWP Cameroon:** Global Water Partnership Cameroon

**GWP-Caf:** Global Water Partnership Central Africa

**JAD:** Active Youth for Development

**JVE:** Young Volunteers for the Environment

**MINADER:** Ministry of Agriculture and Rural Development

**MINATD:** Ministry of Territorial Administration and Decentralization

**MINEPDED:** Ministry of Environment, Protection of Nature and Sustainable Development

**NEWPADUR:**

**ProCISA-GIZ/GADD:**

**W4L Cameroon:** Water For Life Cameroon

**WYN:** Water Youth Network

## 1. INTRODUCTION

Water For Life Cameroon, in collaboration with its partners (GWP-CAF/GWP Cameroon, Water Youth Network, World Meteorology Organisation), held on the **November 03<sup>rd</sup> and 04<sup>th</sup>** 2017 a Youth Training Workshop on Flood and Drought Risk Forecasting and Management at the headquarters of the Global Water Partnership Central Africa (GWP-Caf) in the Bastos Valley (next to FAO). This workshop is one of two workshops planned for youth capacity building under the project “ENHANCING YOUTH PARTICIPATION TO FLOOD AND DROUGHT DISASTER RISK REDUCTION IN DEVELOPING COUNTRIES (EYD2R)”. This project aims at involving young people in awareness-raising, communication, research and action to reduce risks and improve resilience to natural disasters (floods and droughts) in the context of climate change.

## 2. OUTCOMES OF THE WORKSHOP

The two-day workshop mobilized **04 volunteers** from Water For Life Cameroon, **10 Experts** from MINEPDED, MINADER, DPC, White Dove Cabinet, Water Youth Network, and Water For Life Cameroon which helped to build the capacity of 24 young people from:

- **06 regions:** Littoral, Centre, East, North et Far North et West;
- **03 Universities:** University of Yaoundé 1, University of Dschang, University of Maroua
- **04 prestigious Schools:** ENSTP, FASA, FMBEE, ENSPM;
- **08 organisations** (2 IE Foundation , GIZ, ProCISA-GIZ/GADD, CED, GWP-Caf, W4L Cameroon, JVE, Newpadur, RGAE, JAD);

These young people have seen their capacities strengthened on:

- The EYD2R Project and its objectives;
- Concepts related to the risk of flooding and drought, their causes and effects;
- National and international policies, as well as resilience measures (adaptation, mitigation) linked to floods and drought.

The young people identified: the main constraints related to floods and drought in five (05) catchment areas (**Mfoundi, Wouri, Menoua, Logone and Chari, Mayo Tsanaga**), **21 research ideas and 21 ideas for flood and drought adaptation or prevention projects.**

### 3. PROCEEDINGS OF THE WORKSHOP

The workshop was organized around 04 major articulations: the opening ceremony, a series of presentations punctuated by exchanges, group work and plenary discussions.

#### 3.1. Opening Ceremony

The opening ceremony of the workshop began at 09 AM with three speeches:

- Mr. Hycinth BANSEKA, GWP-CAF Regional Coordinator, on behalf of the GWP Cameroon President, Mrs. MBOTO prevented.
- Mrs. ELOUGA Murielle, Administrative and Financial Assistant at GWP Cameroon
- Mr. LAKO M. Stéphane, Executive Secretary of Water For Life Cameroon

**Mr. BANSEKA Hycinth** in his intervention, after welcoming the young participants and expert trainers, thanked Water For life Cameroon for the initiative. He recalled the context in which this workshop was being held and the objective. He then thanked some partners (UNSECO, WMO, WYN) for their multifaceted support which contributed to the good organization of this workshop. He also stressed that this project is in line with the 2014-2019 GWP Youth Strategy, the Water and Climate Initiative and the promotion of water security in Central Africa with a view to achieving the MDGs. He will conclude his remarks by wishing everyone very rewarding work.

**Ms. ELOUGA Murielle** in turn praised the initiative, expressed her joy at having young people involved in the water sector and recalled the opening of GWP-Cameroon to Cameroonian youth for their contribution to the promotion of Integrated Water Resources Management.

**Mr. LAKO Stéphane** expressed his joy at having so many young people involved, then he recalled the context of the EYD2R project and the purpose of this workshop to wish everyone a good stay in the GWP.

#### 3.2. Summaries of Workshop Presentations

The presentations from each of the workshop days were organized in 05 sessions, each followed by discussions.

##### ➤ **Presentation 1 Day 1: Presentation of the project and its partners**

This presentation, done by **Anne YEMDJI** (Water For Life Cameroon) consisted in presenting to the participants the project *“ENHANCING YOUTH PARTICIPATION TO FLOOD AND DROUGHT DISASTER RISK REDUCTION IN DEVELOPING*

*COUNTRIES (EYD2R)*” led by W4L-Cameroon, whose training workshop is one of the major articulations. The presentation showed that the EYD2R project aims at ***involving more young people in action and reflection on flood and drought risks in Cameroon. The aim of this project is to*** involve young people in awareness-raising, communication, research and action to reduce risks and improve resilience to natural disasters caused by water (floods and droughts) in the context of climate change. The main beneficiaries of this project are among others: students from universities and engineering schools, young people from youth organisations/associations, research centres and local authorities (decision-makers) who will benefit from both research results and actions at local level within the communities housing the young people involved in the project. The main activities focus on:

1. Awareness-raising among young people through the sharing of knowledge, information and experiences on flood/drought risks and their management; as well as local populations and authorities.
2. Capacity building of 30 young people on assessment, monitoring, mitigation and adaptation to flood/drought risks for 30 young people
3. Capacity building 30 young people on the setting up and writing of projects related to flood/drought risk management and marketing support.
4. Support/coaching of young people in writing research and development/action projects, finding partners (marketing) and fundraising for selected projects
5. Selection of 16 projects for mentoring and support to fundraising (08 adaptation / mitigation and 08 research proposals)

➤ **Presentation 2 Day 1: Concept, occurrence in Cameroon and in the world, causes, effects, associated risks of flooding and drought,**

In this presentation delivered by **Dr NTSAMA Valérie (MINEPDED)**, the concepts of flooding, risk, hazard, disaster, vulnerability and emergency have been clarified. Then an exposition of the origins and typology of floods.

Floods are natural and anthropogenic. Natural causes are related to extreme meteorological and hydrological factors (e. g.: heavy precipitation), natural events (flooding, landslide,...), failure of a civil engineering structure, etc. Anthropogenic causes include changes in land use, accumulation of waste (plastics, household waste) in sewers, land use or occupation on the slopes of catchment areas, urbanisation and the establishment of activities in flood-prone areas. Moreover we have, the poor drainage of water, the rise in sea level due to climatic variability, the rapid start of the runoff, the waterproofing of soils due to urban constructions. It should be noted that of all anthropogenic causes, global warming is considered a major cause.

In general there are several types of floods. Extensive floods (floods), flash floods, marine floods (or submersions). In Cameroon in particular, there are about 05 types of floods, those linked to climatic variations, those linked to dam rupture, those linked to the rupture of dykes, those linked to the obstruction of gutters and those linked to sea level rise.

These floods can have consequences: social, economic, economic, environmental, sanitary, eco-systemic, functional, security, depending on the magnitude of the hazard concerned (elevated sea level, intensity/duration of precipitation, velocity/volume of liquid or solid runoff, etc.). The presentation concluded with discussions.

➤ **Presentation 3 Day 1: Concept, Occurrence, Causes, Effects and Risks of Drought**

This presentation delivered by Dr. TSAMA Valérie (MINEPDED), has shown that it differs in the concepts of drought and aridity, as well as deforestation and desertification. Thus, drought is an episode of water scarcity that is more or less long, cyclical or exceptional, but sufficient for the soil and flora of a given area or continent to be affected. Aridity, on the other hand, is characterized by a climate with low average annual precipitation or a high deficit compared to potential evapotranspiration. Drought is therefore, is a meteorological concept where the absence of water or water deficits are considered, yet aridity is a climatological concept with spatial reference. From this presentation 04 types of drought emerge, namely:

- Meteorological or atmospheric drought, linked to the lack of rainfall over a given period;
- Agricultural drought, which depends on the moisture content of the soil at a depth of one metre;
- Hydrological drought, which occurs when soil water supplies (aquifers) and rivers fall below average;
- Socio-economic drought, which results in insufficient production of water-related economic goods (consumer water, agricultural products and hydroelectric power) and a significant impact on community life due to a lack of water supply linked to natural climate variability.

Socio-economic drought, which results in insufficient production of water-related economic goods (consumer water, agricultural products and hydroelectric power) and a significant impact on community life due to a lack of water supply linked to natural climate variability.

The consequences are manifold and mainly affect agriculture, livestock, forests, human beings, etc., thereby reducing the availability and accessibility of water. An absence or a deficit that can lead to disasters (wind of dust, destruction of

ecosystems, etc.) or tragedies (deaths of protected animals, destruction of herds, human deaths, etc.).

➤ **Presentation 4 Day 1: Flood and drought risk assessment approaches and tools (administrative approach)**

The administrative approach taken by Mr. Bessala Valère Bertrant (DPC, MINATD) consisted in giving simplistic definitions of the concepts (flood, flood, risk, exposed elements,

The susceptibility and occurrence of damage to environmental features have been highlighted and are at the centre of the administrative approach to responding to flood and drought-related disasters. To keep in mind:

Risk is the result of three factors: the probability of occurrence of the event, its magnitude/intensity, and its spatial distribution.

**Adaptive Capacity** is the set of opportunities, resources and institutions that are specific to a country, region, community or group, enabling them to cope with or support the occurrence of an unusual event in their living space

Vulnerability - the extent to which a system is sensitive to damage - and unable to cope - with the adverse effects of risk.

Possible consequences may include: damage to infrastructure; isolation of islands cut off from all access; interruption of communications (access and telecommunication, disability of relief workers); risk of being swept away or drowned; endangering the population.

## **General approaches to reducing the risk of floods and droughts**

- **Preventive approaches:** measures envisaged before or after the occurrence of risks to reverse their aggravations or other occurrences (infrastructure, functional, organisational, adaptive)
- Post-curative approaches (flood management plans, preparing for events, trying to control them, improving post-crisis management, drawing up a national file, drawing up risk maps, etc.)

## **Flood and drought risk prevention tools**

### **a) Theoretical tools: regulation**

- The organic texts of the Ministry of Territorial Administration and Decentralization related to Civil Protection (organizational decree),
- The organic texts of the Ministry of Defence (organigram decree): in particular on the issue of relief.
- The organic texts of the Ministry of Public Health (organigram decree): particularly as regards health issues.

- ▶ Act No. 86/016 of 6 December 1986 on the general reorganization of civil protection;
- ▶ Decree n°96/054 of 12 March 1996 fixing the composition and powers of a National Civil Protection Council;
- ▶ Decree No. 98/031 of 9 March 1998 on the organization of emergency and relief plans in the event of disasters or major risks.

#### **b) Strategic tools: plans**

- ▶ **At the national level:** the National Contingency Plan (developed in July 2002 with the assistance of UNDP and with the support of OCHA (Office for Coordination of Humanitarian Affairs)).
- ▶ **At the local level:**
  - Mapping of risk areas: maps are used for theoretical crystallization to geographically identify risk areas and disaster sites;
  - Relief Organisation Plans (Orsec): out of 58 departments in Cameroon, 12 are already covered by an ORSEC Plan and 05 are in the process of being finalized.

#### **Tools for intervention/prevention of flood and drought risks**

Prevention is based on a multi-disciplinary monitoring and evaluation system (Minatd/Dpc, the populations concerned, the focal points of the ministries involved and development partners) coordinated by the Directorate of Civil Protection. It mobilizes institutional means (all the institutional bodies that can play a role in prevention/intervention) and logistical means (all the means to identify the adaptive capacities of the environments and people exposed).

#### **Measures to reduce flood and drought risks**

These are recovery or rehabilitation measures which concern: infrastructure, social organisation, exposed persons, the organisation of basic services, spatial planning, etc. These measures are categorised according to the duration of the effect induced by the measures taken; the recovery targeted may be early or sustainable, while rehabilitation may be ad hoc (assistance) or sustainable (accompaniment).

##### ➤ **Presentation 5 Day 1: Flood and drought risk assessment approaches and tools (operational approach)**

In his presentation, Guy Ketchatcham Ngamy, Senior Disaster Management Consultant and Director of the Cabinet White Dove Company, Yaoundé, discussed key concepts of vulnerability, susceptibility, resilience, risk and disaster. Elements to remember:

**VULNERABILITY:** the predisposition to suffer damage due to external events. **Vulnerability** is about **Susceptibility** (Proximity and Exposure... easy to map) and **Resilience** (access to resources, capacities and capabilities... more difficult to assess...)

**RISK = HAZARD**+ ELEMENTS AT RISK + VULNERABILITY

**DISASTER = EVENT** + ELEMENTS AT RISK + VULNERABILITY

Assessing the Risk requires to **i) consider the hazards** (natural/manmade), **ii) identify the elements at risk** (population, environmental assets, economic assets, social and cultural assets), **iii) Assess the vulnerability of elements at risk**, **iv) assess the risk** (seriousness, manageability, urgency, growth)

### **Possible local responses to reduce vulnerability**

- Work out a policy or strategy (Vision and objectives, Priority action plans, Resources)
- Inform, educate, communicate (Improve on Risk awareness, Design early warning systems, Prepare updated monographies)
- Mobilise and act collectively (Use social networks, volunteering)
- Identify ways of managing vulnerability (policies, infrastructures, maintenance, communication, education, ...)

### ➤ **Presentation 1 Day 2: Legal and Institutional Framework for Flood and Drought Risk Management in Cameroon and at the International Level**

This presentation, given by **Mr. MOUKOUE Joseph Maurice, Human Rights and Humanitarian Rights Specialist at Water For Life Cameroon**, focused on the regulatory framework and actors at the international, regional and national levels of flood and drought management.

Many international agreements contain provisions on disasters or their direct consequences. **On the Global Level:**

- the 1966 International Covenant on Civil and Political Rights
- the 1966 International Covenant on Economic, Social and Cultural Rights
- the 1979 Convention on the Elimination of All Forms of Discrimination against Women (CEDAW)
- the 1990 Convention on the Rights of the Child.
- The 1990 International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families covers foreign workers who have migrated for climatic reasons
- Sendai's Framework for Action (2015-2030)

### **At the regional level**

- the 1950 European Convention for the Protection of Human Rights and Fundamental Freedoms
- the American Convention on Human Rights of 1969 and the African Charter on Human and Peoples' Rights of 1981
- the African Union Convention on the Protection and Assistance of Internally Displaced Persons in Africa (2012, also known as the Kampala Convention).
- The Operational Guidelines on Human Rights and Natural Disasters (2011) of the Inter-Organizational Standing Committee
- The European Union's Host Nation Support Guidelines (2012) for countries participating in assistance activities during a large-scale emergency
- The 1998 Guiding Principles on Internal Displacement of Persons

### **At the national level**

- the organic texts of the Ministry of Territorial Administration and Decentralization related to Civil Protection (organizational decree),
- The organic texts of the Ministry of Defence (organigram decree): in particular on the issue of relief).
- The organic texts of the Ministry of Public Health (organigram decree): in particular as regards health issues.
- Act No. 86/016 of 6 December 1986 on the general reorganization of Civil Protection.
- Decree No. 96/054 of 12 March 1996 establishing the composition and powers of a National Civil Protection Council.
- Decree No. 98/031 of 9 March 1998 on the organization of emergency plans and relief in the event of a disaster or major risk.
- Order No. 037/PM of 9 March 2003 establishing, organising and operating a National Risk Observatory (ONR).
- Decree No. 2004/320 of 8 December 2004 on the organization of government in its article 5: "The Minister of Territorial Administration and Decentralization (MINATD) is responsible for preparing, implementing and evaluating the nation's policy on territorial administration, civil protection and decentralization"
- Decree No. 2005/103 of 13 April 2005 on the organization of the Ministry of Territorial Administration and Decentralization
- The Framework Convention on Civil Protection Assistance in 2002

### **Actors on the international scene**

- Food and Agriculture Organization (FAO) and the World Food Programme (WFP) for the provision of food aid,
- World Health Organization (WHO) for surveillance of epidemics,
- Office of the United Nations High Commissioner for Refugees (UNHCR) for the management of possible population displacements...
- the Red Cross movement
- United Nations Disaster Relief Organization (UNDRO) tasked with coordinating the relief activities of major UN agencies to transform into Office for the Coordination of Humanitarian Affairs (OCHA)
- International Seismological Center d'Edimburg (ISC)
- FAO/UNDP warning system to monitor drought and famine trends

### **Actors on national scene**

- Decentralised local and regional authorities;
- The United Nations system;
- Intergovernmental organizations;
- Other development partners;
- Non-governmental organizations;
- The population.

#### **➤ Presentation 2 Day 2: Government policy and action on flood and drought risk management in Cameroon**

Cameroon's drought control policy is based on the DLDD (Desertification, Land Degradation and Drought) approach. There is also an institutional and functional body providing support services for the assistance and accompaniment of people exposed to floods or drought

**Planning structures:** the Ministry of Environment, Nature Protection and Sustainable Development, the Ministry of Territorial Administration and Decentralization, all the ministries in charge of forests, fauna, flora, and the production of social and economic goods and services

**Operational structures:** The Cereal Office (cereal bank to regulate the supply of cereals in times of drought) and the Provincial Committee for Drought Control (Committee to promote resilient practices: support for forestry, reforestation, establishment of nurseries), the Directorate of Civil Protection, National Centre for Natural Risk Management, Emergency and Disaster Reduction

**Monitoring and early warning structures:** The Department of Meteorology of the Ministry of Transport, the Hydrological Research Centre (HRC), the National Observatory of Risks (ONR), the National Observatory of Climate Change (ONACC), the National Information and Early Warning System (SNIAR)

**Effect monitoring structures:** ministerial structures in charge of the various factors likely to be affected by floods or droughts

**Planning documents** for the Government's response to hazards: National Action Plan to Combat Desertification (PAN/LCD), National Adaptation Plan for Climate Change, elaboration of multi-risk contingency plans

**Sub-regional and African initiatives:** the AFR100 initiative (Restoration of African Forest Landscapes), REDD+, the Great Green Wall (reduce the rate of desertification in Sahelian zones)

**Projects and programmes:** Sahel Vert project (Restoration of Degraded Lands), REPECC (resilience of populations to climate change)

**Awareness-raising and education measures:** focusing on riverside communities and other populations: World Environment Day, World Wetlands Day, strategic environmental audits (Lagdo dam, Maga dam),

**Endogenous measures:** crop conservation, diversification of grazing areas, hay and forage storage, hay and fodder storage, water jar burial, dyke construction, adjustment of agricultural and irrigation schedules, population relocation/migration, construction of green corridors against bush fires, reduction of the number of meals,

➤ **Presentation 3 Day 2: concepts, approaches and purposes of Adaptation and Mitigation**

This presentation given by **Mr. LAKO M. Stéphane, Engineer, Expert in water management and Executive Secretary of Water for Life Cameroon, discusses the concepts of adaptation and mitigation. Key points:**

Adaptation refers to activities that make people, ecosystems and infrastructure less vulnerable to the impacts of climate change

Mitigation refers to any activity that reduces the overall concentration of greenhouse gases in the atmosphere. The objective is to soften the effect or slow it down

The link between these two concepts, vulnerability, sensitivity, exposure, resilience and adaptive capacity were defined.

It was clarified that adaptation and mitigation approaches depend on scales, elements exposed and actors that can be mobilized. They can focus on geography, ecosystems, activities, territories, social targets, decision-making processes or economic systems. The main objective being water safety in all its dimensions.

The adaptation/mitigation intervention involves one or a combination of four (04) objectives: i) Reducing exposure to hazard (reducing, retaining or diverting), ii)

Improving adaptive capacity, iii) Improving preparedness, iv) Responding to the occurrence of the event.

The systems on which it is possible to intervene are : The drainage system (natural or artificial), Control infrastructures (avaloirs, regulation basin, dikes, etc.), Socio-economic infrastructures, people (mentalities, psychology), services (roads, rescue, urban planning), activities and institutions.

The main adaptation and mitigation measures to drought are:

- Reduce temperatures to scale or Create micro scale controlled environments (oasis, greenhouse, tree planting)
- Reducing greenhouse gas emissions
- Adapt habits (consumption of shaï, teas or coffee, dates, clothing, etc.)
- Adapt practices (timing adjustments, shelter construction)
- Reduce exposure to noise and heat waves (Paravent, technological construction options, information,...)
- Adapting activities (water sales, equipment sales, ...)
- Adapt services (selling water on the runway, selling fruit, rationing of water distribution, etc.)

➤ **Presentation 4 Day 2: Sharing experiences on approaches to climate change response: Lessons learned from ICRAF Activities**

This presentation given by **Mr. TSAFACK Sygnola Tsafack, Expert Consultant in Agricultural Consulting Services** recalled the missions of the International Research Centre for Agro-Forestry and highlighted some innovative approaches to adaptation to climate variability:

- Research on and popularization of domestication techniques
- Integration of selected and shortened cycle fruit trees into production systems
- Research and dissemination of good soil conservation practices (structure, fertility, stability)
- Promoting the conservation of biological biodiversity
- Sharing knowledge and promoting systemic approaches.

A striking lesson learned is that: *“For a well-informed farmer, the risks of flooding and drought are not inevitable. if managed properly, they will become a real financial asset”*

➤ **Presentation 5 Day 2: Youth engagement, actions and involvement in DRR**

This presentation from **Lydia CUMISKEY, DRR Team Coordinator at Water Youth Network** presented his institution as “An inclusive connector in the water sector with

a vibrant community of young professionals and students, and across disciplines”. Its strategy is based on practice, science and policy in practice WYN

- i) connects active youth groups in the water sector across disciplines, boundaries and with other generations,
- ii) creates continuity between the existing youth initiatives in the water sector
- iii) manages the knowledge that already exists and helps push the edge of innovation
- iv) support meaningful youth participation to decision processes

implementation strategy is supported by: i) networking, knowledge sharing and collaboration ii) supporting innovative youth-led initiatives, iii) supporting meaningful science-informed youth engagement in policy.

Some of the activities to which WYN take part are: development of flood risk management plan (Ex.: Yucatan, Mexico); Earth Observation + DRR – NASA Summit, workshops on Understanding Risk 2016 / 2018; developing Early warning community bringing together research and volunteering; building and animating an interactive map of youth led activities in the water sector; support of Youth-led projects on Flood and Drought risk management (ongoing or innovative); support of local research on DRR, ...

She presented the Sendai Framework for disaster risk reduction (2015 – 2030). Its expected outcomes being Reduction of losses in lives, livelihoods and health and [...] assets of persons, businesses, communities and countries. Its main goal: Prevent new and reduce existing disaster risk [...] by implementing measures to reduce hazard exposure and vulnerability [...] and strengthen resilience. The main pillars on which this framework base its orientation are: i) Understanding disaster risk, ii) Strengthen disaster risk governance to manage disaster risk; iii) Investing in DRR for resilience; iv) Enhancing disaster preparedness for effective response and build back better.

Some high level policy events were also presented to youth in various period in the year (March, July, November ...) both regional and international.

Lesson drawn from her engagement in the water youth network was very appealing : *“When you are part of a Youth Network, you get to know more about what is happening around the world and how things are being solved in different areas. This, gives you ideas on how to implement actions in community or how to adapt the best practices that are being successfully done by others.”*

### 3.3. Summary of discussions

Discussions focused on:

- clarifying the notions of hazard, risk and vulnerability;
- Support actions of the World Meteorological Organization in Cameroon

- the effectiveness of political action at municipal level;
- the lack of coordination of emergency interventions and the problem of their anchoring in territorial development processes;
- Conflicts related to migration of flood- and drought-prone communities;
- the contribution of agricultural advisory services in adapting to the effects of climate change;
- the plans for organizing the Cameroonian relief operations carried out in Cameroon (Mfoundi, Boyo, Mezam, Mentchum, Lom and Djerem, Fako, Logone and Chari, Mayo tsanaga, Mayo kani, Mayo danay, Faro and deyo).

### 3.4. Summary of group work

The group work was held over the two days with homogeneous groups gathered according to the origin and knowledge of the study area.

They will have the following objectives:

- Identify the difficulties associated with floods and drought in each of the sub-basins (TG 1);
- Identify the research, development and action opportunities presented by flood and drought risks (TG2).

The groups were followed by the facilitator (**Mr. NGUELEODAI Joseph**, Development Expert) and two Experts from Water For Life Cameroon. The groups were regionally organized and each comprised 6-7 members:

#### **Group 1: Centre**

Ines KOUAYIM TONFEU  
Charles Aimé NZEUSSI  
MBOUENDEU  
Christian NJIGO  
Jordan KUIDJO  
KUETCHE  
Aimé Jacques RIM  
Alain Michel KODIA A  
ZIEM  
NKEN Michèle  
MOUKOUE Joseph  
Maurice

#### **Group 2: Littoral and South-West**

Tatiane Mireille SIAKA  
Vannel FEUDJEU  
Errole NGOUATEU  
Hervé NDOMBONG  
Ibrahima MAMOUDOU  
Michel AWOUNANG  
BIBOUM Pierre ALain  
KITIO Winnie

#### **Group 3: North**

Josée Perec DIMO  
NYAMBOU  
Raymond OKOUNOU  
BANYOOMO  
Gael TSIDA NGUDA  
St Joseph Mathieu  
ETEME ONANA  
Anne YEMDJI  
Rodrigue DJAKOU  
YOPO  
Moise MBIMBE

**Water For Life Cameroon**

The results of the group's work were presented, discussed and enriched in the plenary. In summary, the consequences, hazards and responses are summarized in the table below:

Consequences	Hazards	Type of response
<b>Floods in the Mfoundi basin (Yaoundé)</b>		
<ul style="list-style-type: none"> <li>• Groundwater contamination</li> <li>• Progressive deterioration of public roads with the formation of potholes</li> <li>• Pits overflow</li> <li>• Waterborne diseases</li> <li>• Slowdown in intercity traffic</li> <li>• Closure of local shops and slowdown of economic activity in the Mfoundi market</li> <li>• Accumulation of landfills</li> <li>• Drowning of children</li> <li>• Destruction of Exposed Persons' Property</li> <li>• Flooding of exposed crops (in farming areas)</li> <li>• Diffusion of pathogenic germs</li> </ul>	<ul style="list-style-type: none"> <li>• Torrential rainfall</li> <li>• Long-lasting rains</li> <li>• Anarchic urbanization</li> <li>• Anarchical deforestation of basins</li> <li>• Incivism of populations (anarchic dumping of waste)</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage System Upgrade</li> <li>• Raising public awareness of waste management</li> <li>• Raising public awareness of wastewater management</li> <li>• Rehabilitation of the riverbed.</li> <li>• Relocation of populations.</li> <li>• Distribution of drinking water</li> <li>• Prohibition of approaching flooded areas.</li> <li>• Establishment of a river contract</li> <li>• Wetland management</li> </ul>
<b>Floods in the Wouri basin (Mabanda)</b>		
<ul style="list-style-type: none"> <li>• Loss of life and property</li> <li>• Proliferation of waterborne diseases,</li> <li>• Disturbance of traffic,</li> <li>• Groundwater and surface water recharge,</li> <li>• Involuntary displacement of populations</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Heavy rainfall in a short time,</li> <li>• Mabanda River level rise.</li> </ul>	<ul style="list-style-type: none"> <li>• raising awareness of the populations for the non-occupancy of risk areas,</li> <li>• plan for resettlement of indigenous peoples)</li> <li>• Material and psychosocial assistance for families affected by the disaster,</li> <li>• Cleans drains or ditches on roadsides</li> <li>• Medico-sanitary care for the victims, distribution of drinking water and WASH kits.</li> </ul>

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Consequences	Hazards	Type of response
<b>Drought in the Menoua Basin</b>		
<ul style="list-style-type: none"> <li>• Disturbance of rainfall regime and agricultural calendar, watering points that dry up</li> </ul>	<ul style="list-style-type: none"> <li>• Scarcity of rainfall</li> </ul>	<ul style="list-style-type: none"> <li>• Improvement of farming practices,</li> <li>• Prioritisation of freshwater for human consumption)</li> </ul>
<b>Floods in Logone and Chari</b>		
<p><b>Economic:</b></p> <ul style="list-style-type: none"> <li>• Devastation of fields and pastures,</li> <li>• Property destruction,</li> <li>• Rising prices for basic necessities,</li> <li>• Food Insecurity,</li> <li>• lower agricultural yields</li> </ul> <p><b>Social:</b></p> <ul style="list-style-type: none"> <li>• Agropastoral, land and inter-ethnic conflicts</li> <li>• involuntary displacement</li> <li>• loss of life,</li> <li>• risk of epidemics,</li> <li>• epizootics,</li> <li>• loss of cultural heritage,</li> <li>• increased risk of delinquency,</li> </ul> <p><b>Environmental</b></p> <ul style="list-style-type: none"> <li>• loss of biodiversity,</li> <li>• plant canopy destruction,</li> <li>• loss of soil fertility,</li> </ul>	<ul style="list-style-type: none"> <li>• Rainfall intensity</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<b>Drought in the Mayo Tsanaga</b>		
<p><b>Economic:</b></p> <ul style="list-style-type: none"> <li>• Decrease in agro-pastoral yields,</li> </ul>	<ul style="list-style-type: none"> <li>• Persistence of high temperatures</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>

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<b>Consequences</b>	<b>Hazards</b>	<b>Type of response</b>
<ul style="list-style-type: none"><li>• Disappearance of grazing land, Social:</li><li>• Increase in waterborne diseases,</li><li>• Poor sanitation/hygiene conditions,</li><li>• Reduced access to traditional care,</li><li>• Land and agropastoral conflicts</li></ul> <p><b>Environmental:</b></p> <ul style="list-style-type: none"><li>• Soil Degradation,</li><li>• Desert/Dry Watercourse Progress,</li><li>• loss of biodiversity,</li><li>• outbreak of bush fires,</li><li>• starvation,</li></ul>		

**PROPOSALS FOR ACTIONS AND RESEARCH PROJECTS EYD2R**

No.	PROBLEMS	FIELD ACTIONS	RESEARCH ACTIONS
1	Proliferation of waterborne diseases due to flood phenomena	<ul style="list-style-type: none"> <li>- Raising awareness of the need for Home Water Treatment</li> <li>- Promotion of simple techniques for drinking water purification</li> </ul>	Impact of drinking water quality on the health of populations in flood-prone areas of the Biyem-assi quarter
2	Groundwater contamination following floods	Construction of stormwater drainage structures	Impact of floods on groundwater quality in the Mfoundi Basin
3	Involuntary displacement of populations	<ul style="list-style-type: none"> <li>-Shelter construction</li> <li>-Resettlement of populations</li> <li>-Distribution of WASH kits</li> <li>-Material and psycho-social support</li> <li>-Creation of income-generating activities</li> </ul>	Flood hazard mapping in the Mabanda area (Douala)
4	Waterborne diseases	Raising awareness of exposure risks and the signs and symptoms of waterborne diseases	Mapping flood zones and the supply of preventive and curative care in a locality.
5	Accumulation of anarchic landfills	<ul style="list-style-type: none"> <li>-watercourse remediation and creation of retention barriers</li> <li>- Rehabilitation of the riverbed</li> </ul>	Flood Prediction and Analysis of Flood Response Mechanisms in the Basin .....
6	Accumulation of wild landfills	Raising public awareness of the dangers of waste discharge into gutters and streams	Health and environmental risks of flooding in the Mfoundi basin
7	Damage to public roads with formation of potholes	Road maintenance with local materials (land, gravel), bitumen or concrete	Adaptability of non-bituminous surfacing technologies to rainfall and traffic in the Mfoundi basin (e. g. pavers in...)
8	Septic tank overflow	Promotion of low-cost, watertight pit systems adapted to flood-prone areas	Mapping of waterborne disease risk areas related to climatic hazards in the locality of...
9	Recharging the groundwater table following floods	Identification and securing of groundwater recharge sites by surface runoffs	Study on strategies for the extension of well and borehole construction standards

**Water For Life Cameroon**

<b>No.</b>	<b>PROBLEMS</b>	<b>FIELD ACTIONS</b>	<b>RESEARCH ACTIONS</b>
	(utilization of runoff)		
10	Flooding in Logone and Chari	<ul style="list-style-type: none"> <li>- promotion of construction in durable, erosion-resistant materials</li> <li>- construction of Mayo dams and vegetal barriers in sensitive areas</li> </ul>	Plant protection potentialities of sensitive sites in logone and chari
11	Soil degradation (Mayo Tsanaga)	<ul style="list-style-type: none"> <li>- Promotion of biomass valuation for maintaining fertility of soils exposed to water erosion</li> <li>- Promotion of soil conservation techniques</li> </ul>	Analysis of the potentialities of the compost industry to preserve soil fertility of Mayo Tsanaga's soils
12	Proliferation of waterborne diseases	Sensitize affected populations to good hygiene practices in the event of flooding	Preventive measures for waterborne diseases in emergency situations in a flood context
13	Loss of life and property	Information, sensitization and training of disaster victims in Mabanda on building on stilts (technology?)	Traditional knowledge and tools for resilience to natural disasters.
14	Disturbance of the agricultural calendar	Capacity-building of farmers on good farming practices and calendar management	Characterisation of the vulnerability of agricultural holdings to global warming in West Cameroon
15	Drought	Planting trees in the town of Figuil	Situation, challenges and opportunities of drought in the locality of Figuil, Northern Region
16	Disturbance of traffic flow	<ul style="list-style-type: none"> <li>Extension of endogenous practices with a high impact on the resilience of populations exposed to floods</li> <li>Construction and development of drains</li> </ul>	Enhancement of endogenous measures in flood prevention in the Mabanda sub-basin
17	Flooding in Yaoundé City	Education of populations on psychological flood preparedness	Psychological impact of floods on the populations of Yaoundé's flood-prone areas
18	Drought	<ul style="list-style-type: none"> <li>- Construction of rainwater harvesting systems for AEP and sanitation</li> <li>- Creation of deeper boreholes</li> </ul>	<ul style="list-style-type: none"> <li>Impacts of climate change on water supply and sanitation systems in the Far North region</li> <li>Endogenous responses to the effects of climate change on water and sanitation services in the Far North region (locality of...)</li> </ul>

**Water For Life Cameroon**

<b>No.</b>	<b>PROBLEMS</b>	<b>FIELD ACTIONS</b>	<b>RESEARCH ACTIONS</b>
19	Waterborne diseases due to lack of hygiene and sanitation during drought in Mayo-Tsanaga)	Raising public awareness on the rational management of water resources Establishment of drinking water distribution points by sector in the locality of ...	Domestic Drought Adaptation Practices in the Mayo Tsanaga
20	Water-related disease outbreaks in drought season, Mayo-Tsanaga)	AEP and awareness raising	Water-related disease outbreaks in the dry season in Mayo Tsanaga: favourable factors and endogenous mitigation measures
21	Vulnerability of the Mayo Tsanaga to drought	Strengthening the resilience of communities at risk of drought in the Mayo Tsanaga basin	Inventory of local rainwater storage practices in the Logone and Chari basin

## 4. KEY RECOMMENDATIONS

- 1) Introduce flood or drought risk prevention actions in local development plans
- 2) Operationalize community-based relief plans at the grassroots level and align them with local resources
- 3) Focus on simple actions to reduce community exposure or vulnerability
- 4) In the prevention and management of floods or droughts, focus on integrated and systemic approaches
- 5) Strengthen collaboration between research, communities, advisory support services and civil society
- 6) Develop adaptation support professions in each of the sectors vulnerable to the effects of climate change

## 5. APPENDICES

### 5.1. Appendix 1: Workshop programme

Schedules	Activities	Responsibles
<b>DAY 1</b>		
08:00AM-09:00AM	Welcoming, Registration and Installation	Water For Life Cameroon
09:00AM-09:20AM	Opening Ceremony Family photo	GWP-Caf
09:20AM-10:00AM	<b>Presentation 1:</b> Presentation of the project and its partners <b>Discussions + knowledge assessment</b>	Mrs Yemdji (W4L)
10:00AM-10:20AM	Coffee break	
10:20AM-10:50AM	<b>Presentation 2:</b> Floods: concept, occurrence in Cameroon and in the world, causes, effects, associated risks <b>Discussions</b>	Dr.TsamaValérie (MINEPDED)
10:50AM-11:20AM	<b>Presentation 3:</b> Drought: concept, occurrence in Cameroon and in the world, causes, effects, associated risks <b>Discussions</b>	Dr.TsamaValérie (MINEPDED)
11:25AM-12:15AM	<b>Presentation 4:</b> Flood and drought risk assessment: approaches and tools for assessing flood and drought risks <b>Discussions</b>	Mr. <b>Ambassa</b> (DPCMINATD) Mr Ngami (White Dove)
12:15PM-01:30PM	<b>Group work No.01</b>	
01:30PM-02:20PM	Lunch break	
02:30PM-03:30PM	<b>Group work No.01 (Continued)</b>	Team EYD2R
03:30PM-04:20PM	Restitution and Discussions	Facilitator
04:30PM	closing of the workshop	Facilitator

## Water For Life Cameroon

Schedules	Activities	Responsibles
<b>DAY 2</b>		
08:00AM-09:00AM	Welcoming, Registration and Installation	Water For Life Cameroon
09:00AM-09:10AM	Opening of the session	GWP-Caf
09:10AM-09:30AM	<b>Presentation 1:</b> Legal and institutional framework for flood and drought risk management in Cameroon and at the international level <b>Discussions</b>	Mr. Moukoué Joseph (W4L)
09:30AM-10:00AM	<b>Presentation 2:</b> Flood management and drought control policies <b>Discussions</b>	Mrs Mendomo (MINEPDED)
10:00AM-10:20AM	Coffee break	
10:20AM-10:50AM	<b>Presentation 3:</b> The implemented and ongoing actions in Cameroon related to flood management and drought control <b>Discussions</b>	Mrs Mendomo (MINEPDED)
10:50AM-11:30AM	<b>Presentation 4:</b> Adaptation and mitigation: concepts, approaches, objectives <b>Discussions</b>	Mr. Lako Stéphane
11:30AM-12:10PM	<b>Presentation 5:</b> <b>State</b> and endogenous resilience measures (communities, individuals) <b>Discussions</b>	Dr Tsama Valérie (REPECC Expert)
12:10PM-01:30PM	<b>Presentation 6: Sharing experiences on approaches to climate change response</b> 1. Climate Change Response Approaches: Lessons learned at ICRAF 2. Youth engagement, actions and involvement in DRR <b>Discussions</b>	Tsafack Sygnola (ICRAF)  Lydia Cumiskey (WYN DRR coordinator)
01:30PM-02:15PM	Lunch break	
02:20PM-03:20PM	<b>Group work No.02:</b> Opportunities for research, development and action related to flood and drought risks	Team EYD2R
03:20PM-03:45PM	Restitution and Discussions	Facilitator
03:45PM-03:55PM	Knowledge assessment + workshop evaluation	Team EYD2R
04:00PM	closing of the workshop	Facilitator

### 5.2. Appendix 2: List of Experts and Authorities who were mobilized

No	Name and Surname	Organization /Institution	Responsibility	E-mail
1	Pierre Nka	Le Quotidien de l'Économie	Journalist	pierrelegrandnka@gmail.com
2	Sygnola Tsafack	ICRAF	Consultant	
3	Marthe Mendomo épouse Essane (Rep. Dr NDONGO)	MINEPDED	Head of the Nature Protection Service	marthemendomo@yahoo.fr
4	Dr Tsama Valérie	MINEPDED/REP ECC	Expert Consultant	tsama80@yahoo.fr
5	Joseph Ngueleoidai	MINADER	Independent Consultant	nguelo@yahoo.fr
6	Anne Yemdji	Water For Life Cameroon	Science and Development Specialist (EYD2R)	anneymdji@yahoo.fr
7	Stéphane Lako M.	Water For Life Cameroon	Coordinator (EYD2R)	lakostef@yahoo.com
8	Valère Bessala	Civil Protection Directorate (MINATD)	Senior Civil Administrator	Mongonnam33@yahoo.fr
9	Guy Ngamy Ketchatcham	White Dove Company Cabinet	Director, Disaster Management Expert	guykngamy@yahoo.fr
10	Joseph Maurice Moukoue	Water For Life Cameroon	Human Rights and Humanitarian Rights Specialist	jmoukoue@hotmail.fr

### 5.3. Appendix 3: list of participants day 01 and 02

No	Name and Surname	Organization /Institution	City	E-mail
1	AWOUNANG Michel	ProCISA-GIZ/GADD	Dschang	awounangm@yahoo.fr
2	BIBOUM PIERRE ALAIN	Water For Life Cameroon	Yaoundé	pierrealain9000@yahoo.fr
3	DIMO NYAMBOU José perec	University of Yaoundé 1	Yaoundé	dimopeggy05@gmail.com
4	DJAKOU YOPO Rodrigue	GIZ / PAPHR	Bertoua	djakourodrigue@yahoo.fr
5	ELOMBA NGOH Gabriel	RGAE	Yaoundé	elombag@yahoo.fr
6	ETEME ONANA ST JOSEPH MATHIEU	ENSTP	Yaoundé	maranatayes@gmail.com
7	FEUDJEU MEDZEPO VANNELE	ENSTP	Yaoundé	feudjvannou21@gmail.com
8	KITIO WINNIE	Global Water Partnership Central Africa	Yaoundé	winnie.kitio@gwpcaf.org
9	KODIA À ZIEM Alain Michel	University of Yaoundé 1	Yaoundé	alainmichelkodiaziem@yahoo.com
10	KOUAYIM TOMFEU INES	ENSTP	Yaoundé	itomfeu@gmail.com
11	KUIDJO KUETCHE BONAVENTURE	ENSTP	Yaoundé	kuidjojordan92@gmail.com

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No	Name and Surname	Organization /Institution	City	E-mail
12	MAMOUDOU Ibrahima	Young Volunteers for the Environment	Douala	ibigoyaro@yahoo.fr
13	MANTCHONG SIAKA Mireille Tatiane	2iE FOUNDATION	Yaoundé	mitalaflam@gmail.com
14	MBENDA Juliette Sarah	FASA University of Dschang	Dschang	mbendajuliettesarahdodo@yahoo.fr
15	MBIMBE NLOM MOISE	CED/CELPRO-FIGUIL	Figuil	moisembimbenlom@gmail.com
16	MOUKOUE Joseph Maurice	Water For Life Cameroon	Yaoundé	<a href="mailto:jmoukoue@hotmail.fr">jmoukoue@hotmail.fr</a>
17	NDOMBONG HERVE BERTRAND	NEWPADUR / Quotidien Emergence	Yaoundé	ndombong@gmail.com
18	NGOULATEU TEUFACK SERGINE ERROLE	ENSTP	Yaoundé	errolengouateu@yahoo.fr
19	NGUEDA TSIDA gaël	ENSPM University of Maroua	Maroua	gaelngueda@gmail.com
20	NJIGO Christian	University of DSCHANG	Yaoundé	njigochristian@yahoo.fr
21	NKEN MICHELLE	Young for Water and Climate	Yaoundé	<a href="mailto:michle_okala@yahoo.fr">michle_okala@yahoo.fr</a>
22	NZEUSSI Charles Aimé	Active Youth for Development (JAD)	Ébolowa	nzeussicharles@yahoo.com
23	OKOUNOU BANYOMO Raymond	FMBEE University of Dschang	Bertoua	okounouraymond@gmail.com
24	RIM AIMÉ JACQUES	University of Yaoundé 1	Yaoundé	rim_jacques05@outlook.fr

#### 5.4. Appendix 4: EYD2R 1 workshop in pictures

## Water For Life Cameroon

### Opening Ceremony



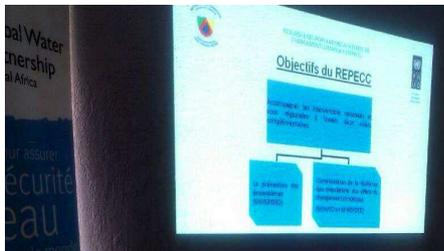
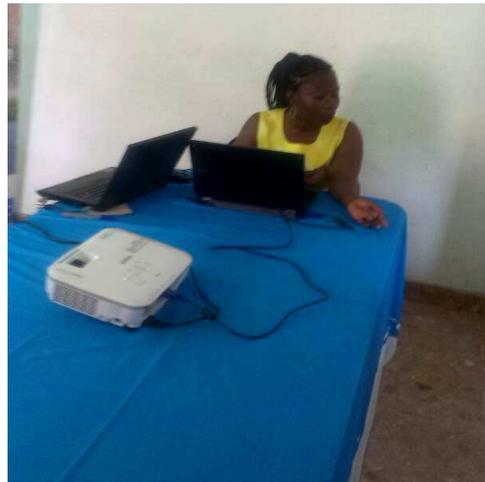
### Participants Picture



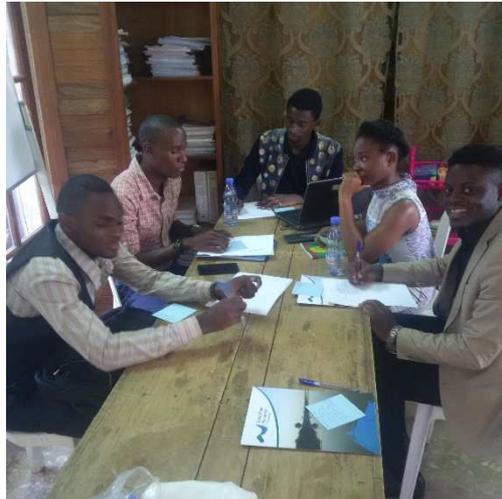
Presentations Day 1



Presentations Day 2



Group Work



Warm Discussion between Volunteer, GWP Staff, Participants and Experts

