

**UNDERSTANDING
CLIMATE CHANGE:**
**An information manual for
communities in Omusati**



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WHAT IS CLIMATE CHANGE?

The changes in temperature and rainfall that we see and feel outside every day is the weather. Today might be hot and sunny, and tomorrow might be cold and wet! The climate is something different – it is the type of weather that we normally experience in a place over a longer period of time, usually measured over ten years or more. Climate can also be the normal weather conditions in summer as compared to winter, or the difference in weather between last year and this year.

Climate change, then, is a shift in the normal weather patterns of a place. For example, where a few years ago the first rains of the year might have started falling in January, some regions might now only start to get rain in March. And where people are used to maximum temperatures of 30° in summer, they might now be experiencing more days where the temperature is hotter than usual.



WHAT CAUSES CLIMATE CHANGE?

There have always been natural changes in the Earth's climate. People who study the Earth have seen that in the past, there have been long periods where the Earth is cooler or hotter than it is now. However, over the last 100 years, humans have caused the Earth's climate to change more quickly than ever before. This is because the world's population has grown very fast. All of these people need food, water, energy, land, houses, jobs, transport and basic services. To meet this need, more and more natural resources (such as trees, fresh water, fish, coal

and metal) are being taken from the Earth, and more land is being used for farming and for the development of roads, towns and cities. These things all require energy, which people mostly get from burning wood, coal, oil or natural gas. While these are all useful sources of energy, they are bad for the environment and for human health. They release dirt and harmful gases into the air, which heat the air up and, over time, cause the climate to change.

HOW IS NAMIBIA'S CLIMATE CHANGING?

People who study climate change have seen that Namibia's climate has become hotter and drier over the last 100 years. They have also shown that in the years to come, temperatures in Namibia will likely go up even more, while rainfall will probably become less. Wind patterns are also changing, but the change in wind is not yet clear.

What is clear, however, is that the climate will become more unreliable. For example, although there may be less rainfall in

total, the rain that does come might fall in a short period of time, causing a flood. Or when farmers have prepared their fields for rain, there might be no rain for many months, or even years. These changes mean that the farming practices that people have always used in the past might not work as well in the future. In fact, some methods are even becoming less useful now, as climate change is already happening.

WHAT ARE THE IMPACTS OF CLIMATE CHANGE IN NAMIBIA?

Slow increases in temperature and rainfall over time may cause crops to become less productive, as they might not be suited to the harsher conditions. This means there may not be enough food for the household to eat, or produce to sell at the market. Hotter temperatures could cause greater heat stress in livestock, and may bring more pests such as armyworm. Stronger winds may damage crops, while less wind than usual could make accessing water more difficult for people who depend on windmills. When a drought occurs, animals do not have enough water to drink and may die, while people do not have enough water to drink, cook or wash. Less water also means that the soil becomes less fertile as there is too little

moisture in the ground. This causes crops to die, which results in shortages of food for people, and fodder for animals. Droughts are often followed by floods. This is because when the earth is hard and dry, rainwater cannot easily filter into the soil. When heavy rainfall occurs, the water quickly washes away the dry soil and causes damage to the land. Floods can also damage houses, buildings and roads, which may cost a lot of money to repair. Because there is not enough infrastructure (such as earth dams or water tanks) to catch and store rainwater, it collects in *lishana*. If this water sits still for a long time, it becomes dirty and can cause diseases and sickness to spread.

WHAT IS CLIMATE CHANGE ADAPTATION?

Climate Change Adaptation (CCA) refers to the capacity to deal with climate change challenges by changing and 'adapting' lifestyles, farming practices and overall land use to address the expected changes.

Adaptation aims to reduce vulnerability and improve the capacity of people to adapt, especially those who rely on agriculture for their livelihoods. Generally it is believed that without adaptation, living conditions will degrade severely, while with good adaptation efforts, prosperous lives can be achieved even under the difficult climatic conditions expected.

To 'adapt' to climate change means to change the way that we do things in order to manage climate conditions that we are not used to, and prepare for extreme events such as droughts and floods.

WHY IS ADAPTATION NECESSARY?

While people often react to floods, storms or droughts as they occur, for a long time they have also used adaptation strategies based on available resources, prior experience and knowledge of past weather patterns. Current coping strategies could include actively moving livestock to cattle posts or areas where emergency grazing is available. However, these measurements are no longer adequate for coping with the expected long-term impacts of climate change. This is particularly true with Namibia's rapidly increasing population.

Adaptation is necessary to prevent potential damage that can be caused by the impacts of climate change. Through adaptation, threats to human health, economic development, property, infrastructure and ecosystems will be minimised. Lives will be saved and the cost of climate change can be reduced. There is a lot we can learn from past experiences and the adaptation used, and we should keep improving on these efforts through planning and discussion.



ADAPTING TO CLIMATE CHANGE IN NAMIBIA

Use information from seasonal climate forecasts and early warnings

Forecasts give information on how the weather might look daily, weekly, monthly or seasonally. Short-term forecasts can help farmers to make day-to-day decisions. Seasonal forecasts are even more useful as they can help farmers to decide which crop varieties they should plant that year, and when they should plan to start their planting and harvesting seasons. Early warnings are important as they help farmers to prepare ahead of time for droughts, floods or very strong winds.



Diversify livestock

If possible, farmers should keep a variety of different livestock (e.g. mixed goat, sheep and cattle rearing) and invest in breeds of livestock that are less sensitive to changes in climate.



Diversify crops

If a farmer only plants one type of crop and it does not grow well, then there will be a shortage of food, fodder and produce to sell. A variety of different crops should therefore be planted in case one type fails. This should include crop varieties that are resistant to drought.



Store grain and fodder

When there is a good harvest, extra grain and fodder should be stored to prepare for possible poor harvests in the future.



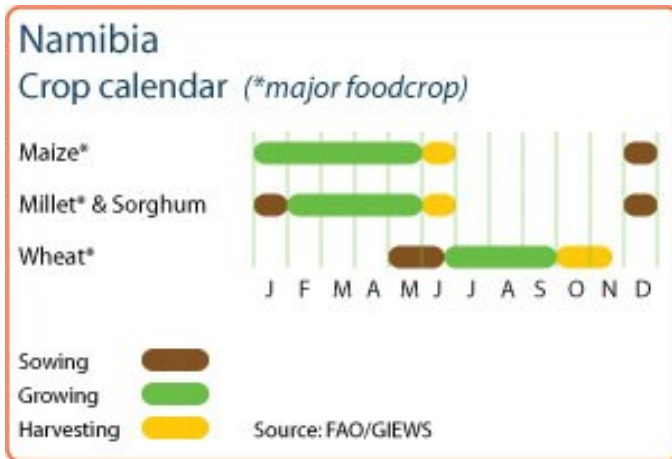
Establish farmer's livelihood cooperatives and credit associations

Forming co-operatives among groups of men and women farmers, or among women only, can help in many ways. For example, by working together and pooling their resources, farmers can improve their access to markets, secure financial credit or loans and help to train one another in new farming techniques. Working together also means that the group will have a stronger voice than if everyone works on their own.



Change planting and harvesting times

When the timing of seasonal rains changes, farmers should either start planting their seeds later, or start preparing their land earlier than usual to be ready for early rains.



Use social networks for assistance

Strong support networks between neighbours, families, friends and community members are important in times of drought or flood when there is a need to share food, water and other resources.



SERIOUS FUN - INTERACTIVE GAMES FOR CCA

CCA and Disaster Risk Reduction processes are challenging and complex processes - and can at times be very confusing. Sometimes this confusion leads to simplified messages which may scare people or lead to frustration and fatalism. None of these feelings are particularly helpful to promote active participation and agency or to release the creativity we need to think about creative and constructive adaptation strategies.

The following pages provide short exercises that you can use in your practice as appropriate to create spaces and interactions that generate energy and creativity, and to allow participants to explore climate change challenges experientially. There are many different ways to include these exercises in ongoing processes such as workshops, team meetings or study groups. Your creativity is the most vital ingredient in this process - so take some inspiration from these exercises to design and facilitate creative adaptation learning processes!



Planning your session

- Plan your sessions carefully and be clear about the sequence of activities - balance serious exploration with more active sessions
- Plan more engaging activities at low energy moments of the day (e.g. after lunch)
- Be clear about roles and responsibilities
- Arrange for all materials needed during the workshop
- Be clear how the workshop is going to be documented
- Be prepared

Opening and welcome

- Be confident and flexible at the same time
- Listen well and observe
- Ensure you are gaining the trust of participants (and ensure you maintain this)
- Allow all participants to introduce themselves
- Memorize the names of participants
- Treat all participants fairly and with respect

This section on experiential learning is based on content developed by the Red Cross Red Crescent Climate Centre, and used with their permission. See the References section on Page 15 for details of where to find more information about experiential learning and more examples of serious games.

Facilitating a process

- Be yourself - everyone has her/ his style of facilitation
- Know where you are in the process and refer to the programme
- Be neutral and do not bring in your point of view
- Summarize discussions where appropriate
- Re-focus the discussion when needed
- Treat all participants as adults
- Visualize discussions and agreements on a flip-chart or cards
- Ensure that all participants agree if consensus is discussed
- Do not ask closed questions
- If confronted with a process challenge - ask the group to reflect and take a decision (e.g. there is not enough time: shall we close late or skip an item on the programme?)

General atmosphere

- Keep it interactive, lively, with good humour
- Emphasize learning between neighbours, and shared experiences
- Be mindful of language and cultural barriers
- Encourage sharing of experiences and thoughts in a safe environment

Closure

- Reflect on the process
- Appreciate what went well BEFORE you explore what could be improved
- Be clear about the way forward and next steps
- Allocate clear times and responsibility for action items (if appropriate)

After the workshop

- Reflect in the team: what was good - what was not so good - what could be improved next time?
- Reflect on your facilitation skills: appreciate what went well, think about what you would like to try differently next time
- Document your learning process

SEASONAL FORECASTS *at a glance*

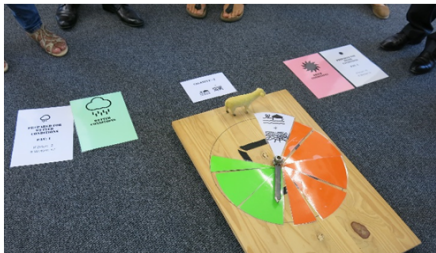
In this game, each player is a livestock farmer. The goal is to see how well each farmer can adjust their farming decisions based on seasonal forecasts. At the end of the game, participants should understand the possible uses and limitations of these forecasts, their personal risk-taking preferences, and how seasonal forecasts can affect livelihood decisions.

Facilitators: 1

Time to play: 45 mins +

Process

1. Set the scene
2. Give 5 beans to each participant (farmer)
3. Set the seasonal forecast (as determined by you; announce it or write it on a board for everyone to see)
4. Farmers group according to their investment plans
5. Spin the dial to get the actual weather conditions
6. Farmers pay or get paid based on their investment decisions (*see Winners and Losers table overleaf*)
7. Repeat steps 3-6
8. Introduce wild cards at times (eg. calamity and insurance) to keep things interesting
9. Play until very few players have beans left
10. End game
11. Reflect



Things to note and highlight

- Tweak the narrative to make the context appropriate and relevant for your players (see examples overleaf).
- Luck plays a role in determining the outcomes and individual players will tend to play according to their inherent risk preferences.
- Keep an ear open for sweeping statements and messages that are dangerous, unethical, and untrue. Use these comments as opportunities to reflect on important issues.
- It's important to highlight that the game is highly simplified, and that real life is far more complex, with many more factors influencing decision-making.
- The true value of the game emerges when you relate it to real life contexts, so during the reflection process it is crucial to discuss and explore the connection between this game and sustainable and resilient farming practices.

Materials



Spinning dial with removable segments



5 beans per player



3 props representing insurance policies

Making the game regionally-relevant

Tweak the game in whatever way makes it most relevant and meaningful for the context you are in.

Adjust the narrative

Players can farm anything such as sheep, sorghum, or cattle.



Instead of focusing your seasonal forecasts on droughts versus heavy rainfall, you could focus them on the early or late onset of the monsoon or rainy season.

drought vs. heavy rain



early vs. late



Adjust the game mechanics

You can also tweak the mechanics of the game. For example, you could adjust how people gain or lose beans (see table below) to speed up or slow down the game, and create different levels of stress and anxiety.

Investment based on seasonal forecast	If actual weather is drier than average	If actual weather is wetter than average
Prepare for drought <i>*1 bean to the bank*</i> <i>Invest in extra feed, make sure water points are intact.</i>	Get 1 bean back (break even) <i>Livestock survive, but nothing thrives. Receive cost of investment but make no profit.</i>	Get 0 beans back (small loss) <i>Extra feed goes mouldy, lose out on other opportunities.</i>
Prepare for high rainfall <i>*1 bean to the bank*</i> <i>Invest in growing more fodder for livestock.</i>	Lose 2 beans (give 1 more bean to the bank: big loss) <i>No fodder grows, livestock die.</i>	Get 2 beans back (big win) <i>More and better quality fodder means that livestock thrive.</i>

PAYING FOR PREDICTIONS *at a glance*

During the game players face changing climate risks, have to make both individual and collective decisions to prepare for these risks, and must deal with the consequences of their decisions. Importantly, players experience the value of forecasts in helping to inform their decisions.

Facilitators: 1 (highly skilled)

Time to play: 45 mins – 1 hour

Process

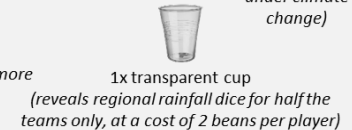
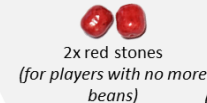
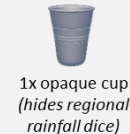
- Group players into teams of three. Give each player a 6-sided white dice, and each team a 6-sided coloured dice and an opaque cup.
- Explain the following basic concepts carefully and play practice rounds to demonstrate them:
 - Practice 1 - How is flooding determined?** Teams roll regional rainfall dice (but keep them hidden under opaque cups), then individuals roll local rainfall dice. Then teams lift the cup to uncover regional rainfall dice. All players sum the scores of local and regional rainfall dice to determine local flooding (see *table overleaf*). Play 1 round like this.
 - Practice 2 - How to prepare for floods?** Give each player 10 beans, explaining that these can be used to prepare for floods or to pay for disaster relief (see *table overleaf*). No beans can be swapped or recuperated. If players run out of beans give them a red stone to represent a humanitarian crisis, but they continue playing. Play 2 rounds like this, and then return all beans to players.
- Introduce Early Warning Systems. Hold an auction and based on the highest bids, award transparent cups to half the teams. For the rest of the game, these cups will allow these teams to see the regional rainfall forecast before making flood preparation decisions.
- Start the game proper. Play 6 rounds following these steps:
 - Teams roll regional rainfall dice. Teams with transparent cups see regional rainfall patterns, teams with opaque cups do not.
 - Teams discuss flood preparations. Those who want to prepare for floods stand up and give 1 bean to the facilitator.
 - Players roll local dice.
 - Teams with opaque cups reveal their regional rainfall.
 - Resolve the round (see *table overleaf*).
- Round 7: introduce climate change.
 - Replace the teams' 6-sided regional rainfall dice with 8-sided dice to increase the probability of flooding. Try to do this secretly.
- Play 3 rounds with the 8-sided dice, then end the game.
- Determine individual and team winners (see *table overleaf*).
- Reflect (see *possible reflection questions overleaf*).

Materials

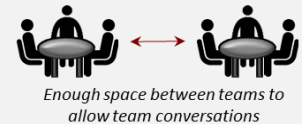
Per player



Per team
(of 3 people)



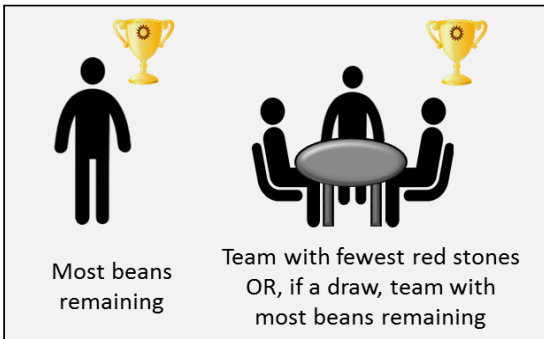
General



Flood preparations and disaster relief

	FLOOD <i>(local rainfall dice + regional rainfall dice $\geq$ 10)</i>	NO FLOOD <i>(local rainfall dice + regional rainfall dice $<$ 10)</i>
PREPARED <i>(paid 1 bean before round)</i>	Celebrate, no disaster relief needed.	Acted in vain, but nothing happens.
NOT PREPARED	Pay 4 beans for disaster relief.	Nothing happens.

Winners



Possible reflection questions

- What did you experience during this game?
- Does this experience link to your reality?
- What happened when we introduced climate change?
- Do you think this was an accurate representation of climate change?
- Share one insight you have gained from this game.

VULNERABILITY WALK *at a glance*

The ways in which people, households and communities are socially differentiated determines how vulnerable people are to the range of risks they are exposed to – both climatic and non-climatic – and shapes their abilities to respond and adapt to these risks. Understanding these social differences in vulnerability is therefore essential to ensure that adaptation efforts are sustainable and successful, and to help local communities address the risks they face without compromising their wellbeing or exacerbating inequities. This game helps explore the different vulnerabilities that exist within a community and reflects on how adaptation efforts can effectively address these.

Process

1. Devise context-appropriate characters that cover the wide range of social differences that exist in your region (e.g. gender, class, ethnicity, caste, disability, socio-economic status, urban vs. rural, proximity to village centre).
2. Devise context-appropriate questions (10 or more) that will elicit Yes/No responses from the characters based on these social differences.
3. Randomly assign characters to participants, and ask them to keep their character secret until the end of the game.
4. Participants stand in a straight line, with plenty space to move forward.
5. Ask each question. If characters answer 'yes', they take one step forward. If characters answer 'no', they remain in place.
6. End game once all questions have been asked.
7. Reflect on the game using questions like these:
 1. Why could you or could you not move forward?
 2. How did you feel when you moved forward?
 3. Where are the men? Where are the women? Where are the poor? Where are the old? Where are the young?
 4. What does this tell us about vulnerability?
 5. What are the implications of these dynamics for adaptation efforts?
 6. How could we change the vulnerability status quo?

Facilitators: 1

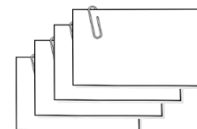
Number of players: 2 - Many

Time to play: 20 mins +

Materials



List of context-appropriate characters



Small pieces of paper (one for each character)

YES ? NO

List of context-appropriate Yes/No questions



A large enough space for people to move around (inside or outside)

FARMING JUGGLE *at a glance*

The way people deal and cope with challenges depends on the capacity they have and the time in which they can react. If the severity of a situation increases, but capacity to respond remains the same, problems develop, strain increases and eventually, things break down. The Farming Juggle is a dynamic exercise that can be used to explore the complex and compounding effects of multiple stressors in any system.

Facilitators: 1

Number of players: 10-50

Time to play: 10-15 mins

Process

1. Gather everyone into a circle, yourself included. Explain the context for the game, making it relevant to the area in which you work.
2. Introduce the first ball, explaining that this ball represents a stressor that the players should manage together. The players should throw the ball around the circle, keeping it in the air continuously, not letting it touch the ground or stay in anyone's hands for longer than 2 seconds. If the ball drops, a player should simply pick the ball up and throw it back into play.
3. Give the players awhile to develop a rhythm; once they do leave the circle.
4. At any point you can introduce additional stressors – in the form of more balls. You can either stop play to warn the players about the arrival of a new ball, or you can surprise the players by adding the ball during play.
5. Keep adding balls into the mix, until the play becomes too chaotic, with balls being dropped very often.
6. End the game with a round of reflections:
 1. How did you feel in the first stage of the game?
 2. By comparison, how did you feel when multiple balls were in the circle?
 3. Seeing as it is virtually impossible to keep all balls from dropping on the ground, how did you/the group prioritize which balls to put the most energy into catching?
 4. What qualities (e.g. size, colour, texture) might have played a role in this decision?

Materials

A range of soft, lightweight balls. If it's relevant for your context, you can use balls of different sizes to represent differences in the magnitude or scale of the stressors.



A large enough space for people to move around (inside or outside)

Before you play, check that all the players are comfortable with having something thrown at them. Ask those that are not comfortable with this to move outside the circle and observe the process.

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ABOUT ASSAR

ASSAR uses insights from multiple-scale, interdisciplinary work to improve the understanding of the barriers, enablers and limits to effective, sustained and widespread climate change adaptation out to the 2030s. Working in seven countries in Africa and South Asia, ASSAR's regional teams research socio-ecological dynamics relating to livelihood transitions, and the access, use and management of land and water. One of four consortia under the Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA), ASSAR generates new knowledge of climate change hotspots to influence policy and practice and to change the way researchers and practitioners interact.

This is achieved by:

- Collaboratively generating knowledge with stakeholders on vulnerability and adaptation to climate change
- Developing innovative communication approaches for effective knowledge sharing on climate change vulnerability and adaptation
- Strengthening capacity for adaptation in research, policy and practice domains.



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