

Creation Care in Maasailand
Utunzaji wa Uumbaji katika Mukhadha wa Wamaasai
Erripoto oo Nkitobirunot te Enkop oo Irmaasai

Lessons to Bless the Church and God's Good Creation

Women's Groups

Written by Suzana Sitayo

Edited by Beth E. Elness-Hanson

Forewords by Godson Abel Mollel and Knut Holter

Translations by Daniel Kosia Mokoro and Joseph Kosia

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This document is a section from:

Names: Joseph, Lais (Lais Joseph), author; Megiroo, Ezekiel (Ezekiel Megiroo), author; Sitayo, Suzana (Suzana Sitayo), author; Elness-Hanson, Beth E. (Beth E. Elness-Hanson), editor; Mollel, Godson Abel (Godson Abel Mollel), contributor; Holter, Knut (Knut Holter), contributor.

Title: Creation Care in Maasailand

Identifiers: ISBN: 979-8-234-05793-8

Subjects: Climate change. | Global warming. | Maasai. | Biblical creation care. | Ecotheology. | Ecological justice. | Indigenous environmental knowledge. | Climate science. | Faith-based climate activism. | Evangelical Lutheran Church in Tanzania. | Climate anxiety. | Hope.

2026

Contact: Beth E. Elness-Hanson, <https://www.mamaanya.com/>

Suggested citation: Joseph, Lais, Ezekiel Megiroo, and Suzana Sitayo. *Creation Care in Maasailand*. Edited by Beth E. Elness-Hanson. With Godson Abel Mollel and Knut Holter. Mama Anya, 2026.

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The Bishop's Blessing

It gives much joy and honor, having been entrusted in introducing *Creation and Care in Maasailand*, a work that speaks by itself whereby spiritual, culture, and environmental awareness embrace one another and therefore, compacted within Maasai community in their contextual setting. This work appears in real time with insightful aspects on traditional and spiritual aspects that give birth to the sustainable practices and livelihood that are essential in local and global context.

This multi-disciplinary work finds its roots in systematic and classical integration of biblical creation and care, Maasai traditional environmental knowledge, climate science and other sources within biblical, eco-theological frameworks, and it could not emerge without commitment, love, and the writers' own participation in the spiritual and life experience in Maasai community.

Through theological, cultural, ethnographic, contextual, environmental, and ecological consideration in Maasai sociocultural setting, this work brings to light an outstanding awareness, whereby societal ecological responsibility earns its significant consideration. Bishops, pastors, evangelists, church elders, policy makers, educators, practitioners, and participants in local-global contexts will find this work valuable and a credible source at hand. It paves more ways for meaningful reflections and practices that takes creation care more seriously and meaningfully, where spiritual, cultural, and conservation aspects are seriously considered and, therefore, strengthening these contextual and societal imperatives.

This work embraces critical thinking and takes the context seriously. It is readable, practical, and understandable for all the giraffes and the dik-diks.

One may not but admirably bless the facilitator of *Creation and Care in Maasailand*, a well-known and honored lady by the Maasai of Tanzania as she appears in Maasailand, whose nick name is (Mama Anya), by using the Maasai blessing: *Mikitamayana Engai* (God bless you).

With all my hearty thanks, appreciation, and salutation,

Rev. Dr. Godson Abel Mollel
Bishop of the ELCT North Central Diocese
Evangelical Lutheran Church in Tanzania

A Double Blessing

This book is part of a project on climate change mitigation in Maasailand. The book can be seen as a tangible and concluding result of this project. However, the book should not be taken as an end of the project. On the contrary, the lessons that are found throughout the book have a potential of being used in the time ahead. They can and should be used as tools for facilitating not only reflection around climate change mitigation in Maasailand but also corresponding action on grassroots level, such as in schools, churches, and other community groups.

Climate change mitigation is a topic that attracts much interest today, in Maasailand and beyond. Most projects and researchers, however, approach the question of climate change mitigation from typically sciences perspectives. It might therefore come as a surprise that the present project—now in the form of a book—approaches the challenges of climate change mitigation from perspectives that encourage Maasai reading communities—such as confirmation classes, women’s Bible study groups, theological students, and secondary school students—to let traditional Maasai and biblical wisdom on creation care to interact.

If the approach of the project and book comes as a surprise, it may still exemplify the double blessing of letting traditional Maasai wisdom and practice on creation care interact with corresponding biblical wisdom. Both traditions honor the Creator and our responsibility for continuing creation care. So let us read the two together and then act accordingly!

Rev. Prof. Dr. Knut Holter
Project Supervisor at VID Specialized University, Norway,
NLA University College, Norway

Part 1: Overview of the Creation Care in Maasailand Project



1. Overview of the Project that Developed these Lessons

A Blessing from Mama Anya

Growing up as a Lutheran pastor's daughter and as one who studied in Bible college, I was very familiar with the biblical concept of blessings. I recall my course in Genesis, where I learned that Abraham was blessed to be a blessing to all the people groups of the world (Genesis 12). This is a foundational text laying out God's mission of reconciliation of humans and all creation. Then, through faith in Jesus, we are grafted into this covenant, such that we are also blessed to be a blessing and be part of God's grace-filled work of reconciliation. Yes, I understood this in my *head*.

However, it was during my three years teaching at the MaaSae Girls Lutheran Secondary School in Monduli (2002–2004) that I began to glimpse how blessings were palpable in Maasailand, and this insight profoundly expanded my understanding. When the rains come, the Maasai say, "Ewo Engai" (God has come). The Maasai have helped me understand the power of blessings in all of life. I began to understand blessings with my heart.

Now, with this Marie Skłodowska-Curie postdoctoral research project, primarily funded by the European Union's research commission, I have the privilege of living out being a blessing with my hands—actually doing things together with many wonderful collaborators. I designed a project to be a blessing when developed together with the Maasai. In research language, this means "two-way transfer of knowledge" and "shared impacts." So, when I gathered a stellar group of Maasai Stakeholders to shape this project, I explained that I had come with an empty calabash (gourd), something that carries the true blessing of milk. This metaphor of a calabash makes sense in Maasailand where women milk the cows directly into gourds, providing the staple of the Maasai diet

in a shared calabash for sustaining the life of the family. I came with a calabash—a framework for a research project—yet at the beginning, it was empty. I invited the Stakeholders to fill the calabash with the blessings of Maasai values and traditional wisdom. Then, these blessings would shape the project and be shared with the broader Maasai community. Blessed to be a blessing. (See more information on the Stakeholder role, p. 15.)

In a discussion with one of the Stakeholders, I said, "You help me be a better blessing; this work is shaped by your wisdom." Yes, I brought some resources, thanks to the funding of the EU research council, but as many know, resources can cause problems if used unwisely and do not address identified needs. The Stakeholders and other collaborators made these resources a blessing. So, I was surprised to read in a book on faith-based environmental activism that the red thread (theme) uniting all the essays was "tensions."¹ Providentially, this project was the opposite, characterized by eager participation (all accepted my invitation to be involved), respectful cooperation, and even shared joy, especially seen in Maasai music and dance. Ewo Engai! God has showered blessings upon this project, because the empty calabash was filled with Maasai values and wisdom. I am forever grateful. Asante sana. Ashe naleng'.

Mungu akubariki. /Mikitamayana Engai. / With blessings,
Mama Anya / Beth E. Elness-Hanson, PhD

¹ Jens Köhrsen, Julia Blanc, and Fabian Huber, eds., *Religious Environmental Activism* (Routledge, 2023).

Acknowledgements

I am profoundly grateful for the following people who have helped to facilitate this project and “fill my empty calabash (gourd)” with Maasai values and wisdom, as well as many other significant contributions (see p. 13). “I am because we are, and since we are, therefore, I am.”

Rev. Bishop Dr. Godson Abel Mollel,
North Central Diocese, Evangelical
Lutheran Church in Tanzania

Rev. Prof. Dr. Joseph Parsalaw, retired Vice
Chancellor, Tumaini University Makumira

Rev. Prof. Dr. Knut Holter, Supervisor, VID
Specialized University, Norway

Stakeholders (see p. 15)

- Dr. Neema Kitasho
- Mrs. Sion Kereine
- Mr. Julius Laiser
- Rev. Ezekiel Lemaso
- CPA Elizabeth Loiruck
- Ms. Martha Ntoiopo
- Hon. Benedict Ole Nangoro
- Prof. Dr. Sarone Ole Sena
- Rev. Prof. Dr. Joseph Parsalaw
- Rev. Dr. Suzana Sitayo

Authors (see p. 16)

- Mwl. Lais Joseph
- Rev. Ezekiel Megiroo
- Rev. Dr. Suzana Sitayo

VID Specialized University, Norway

- Dean Vebjørn Horsfjord
- Prof. Tomas Sundnes Drønen
- Prof. Daniela Rapisarda
- Prof. Rebecca Solevåg
- Ms. Maria Tendenes

Core Collaborators and Support

- Office Management Secretary Joyce Felix Mshanga, Vice Chancellor’s Office, Tumaini University Makumira
- Rev. Dr. Seth Mesiaki Ole Sululu, Principal, Makumira Training Institute
- Dr. Daniel Kosia Mokoro, Translator, Statistics Analyst
- Mr. Joseph Kosia, Research Assistant, Translator
- Deputy Principal for Administration Randall Stubbs, Makumira Training Institute, and Director, Cultural Arts Centre
- Deputy Principal for Academics Emmanuel Athanas Ndale, Makumira Training Institute
- Assistant Director Gloria Kileo, Cultural Arts Centre
- Nacco and Imani at Khaki Media Pro
- Mr. Goodluck Natai
- Ms. Laurie Meyer
- Dr. Elenn’ Parrish

Fieldwork Sites

- MaaSae Girls Lutheran Secondary School*
 - Head of School Tulizael Marco Mbise
 - Mwl. Lais Joseph
 - Matron Elisifa Mollel
 - Student research participants and choirs

Moringe Sokoine Secondary School

- Head of School Lazaro Ndooki
- Mwl. Yona Mollel
- Student research participants and choirs

Amazing Grace Widows and Orphans

- Founder and CEO Winny Ene Sirikwa
- Research participants

Asasi Ya Naapok (Naapok Bead Project, CBO)

- Mrs. Bethany Friberg, Lutheran missionary, research project facilitator at *Asasi Ya Naapok*
- Naapok artisan research participants

Kibaya Lutheran Church

- TEE research participants

Wasso Lutheran Church

- TEE research participants

Olchoroonyokie Village

- Mwinj. Raphael Sitelu Laiser
- Rev. Magilani Lesion Molell
- Chairman Silas Loiruk Laiser, Olchoroonyokie
- Choir director Abel Zephania Molell
- Student research participants and choirs

Lendikinya Lutheran Church

- Mwinj. Seth Nnko
- Student research participants and choir

Monduli Special Guests

- Monduli District Office Environmental Officer, Isaack Urassa
- District Pastor Gervas Meitamei
- Retired District Pastor Joel Nangole
- Fr. John Maendeleo

Research Project Background and Funding

This is part of a Marie Skłodowska-Curie postdoctoral research project facilitated by Dr. Beth E. Elness-Hanson (“Mama Anya”), a former volunteer teacher at the MaaSae Girls Lutheran Secondary School (MGLSS) in Monduli, Tanzania, for three years (2002–2004).

The research was funded primarily by the European Commission (European Union) and partially funded and managed by VID Specialized University, Stavanger, Norway, with supervisor, Rev. Prof. Dr. Knut Holter. The Tanzanian local partner was Rev. Prof. Dr. Joseph Parsalaw, who was then Vice Chancellor at Tumaini University Makumira, Usa River, Tanzania. All the Stakeholders, writers, and other collaborators were compensated for their services in alignment with Tanzanian government established rates.



Stakeholders and Other Core Collaborators

The project began by receiving a blessing by Rev. Bishop Dr. Godson Abel Mollel with permission to engage the research in the North Central Diocese of the Evangelical Lutheran Church in Tanzania (ELCT).

Then, a stellar Maasai Stakeholder Group served as the advisory council, meeting twice in Arusha. This group shaped the research by:

- Determining the core Maasai values for the overall project;
- Establishing the learning outcomes for the lessons; and later,
- Evaluating the draft lessons in accordance with the established values and learning outcomes.

The Maasai Stakeholders

These Stakeholders graciously shared their traditional knowledge and expertise:

- Dr. Neema Kitasho, environmental scientist, Lecturer at Sokoine University of Agriculture
- Mrs. Sion Kereine, a leader at *Asasi Ya Naapok* (Naapok Bead Project, CBO), Ketumbeine council member from 2005–2015
- Mr. Julius L. Laiser, CBNRM, Natural Resources Management specialist, Technical Advisor for LOKEEN-Natron, and Co-Lead Implementing Person for the Faith for Restoration Project (4FR) funded by CKU in collaboration with WWF, RECODDA and LOKEEN.
- Rev. Ezekiel Lemaso, Senior Pastor of Ilkiranyi Parish of ELCT North Central Diocese; Lecturer and Deputy Principal (formerly Academic Officer) at Oldonyosambu Theological College; North Central Diocese representative for this project appointed by the bishop.
- CPA Elizabeth Loiruck, Deputy Principal for Planning, Finance, and Administration at the Arusha Lutheran Medical Training Centre and Director and Founder of TAA Finance
- Ms. Ntopoi Martha, environment planning and management
- Honorable Benedict Ole Nangoro, retired Minister of Parliament representing Kiteto who served as the Deputy Minister of Livestock Development and Fisheries
- Prof. Dr. Sarone Ole Sena, Professor and Deputy Vice Chancellor in charge of academic affairs at the International Leadership University, Kenya
- Rev. Prof. Dr. Joseph Parsalaw, retired Vice Chancellor of Tumaini University Makumira, local research partner
- Rev. Dr. Suzana Sitayo, Lecturer at Tumaini University Makumira and Principal of Oldonyosambu Theological College

About the Authors

Mwalimu Lais Joseph: Secondary School Lesson Writer and Teacher

Mwalimu (Teacher) Lais Joseph is an advanced level teacher with expertise in biology and geography. He was located at the MaaSae Girls Lutheran Secondary School at the time of the writing and teaching of the lessons there. He intersected his natural science competence with his Indigenous Maasai knowledge in the development of these lessons. This breadth of knowledge is applied through his honed skills as an effective educator, demonstrated in the lesson writing and his instruction of them. His knowledge and pedagogical skill are demonstrated also in the cleaver coalescing of these aspects with biblical creation care messaging developed in collaboration with Rev. Megiroo. The prayer at the end of Lesson 1, Chapter 12, is a beautiful example of the value he brought to this project.

Rev. Ezekiel Megiroo: Confirmation/Kipa Imara Lesson Writer and Teacher

Rev. Ezekiel Megiroo is a Pastor at Evangelical Lutheran Church in Tanzania, North Central Diocese. He is the pastor in charge of the Monduli Lutheran Parish and former instructor at Oldonyosambu Theological College. With responsibility over worshipping sites and the confirmation program in each location, Rev. Megiroo has developed and taught the lessons for the confirmation ministry. These lessons become an important resource for the entire North Central Diocese and other Maasai contexts. With further developments beyond this project, Rev. Megiroo has initiated the Monduli Parish Youth Campaign on Creation Care. He continues as a vanguard of biblical ecojustice and a resource for the ELCT.

Rev. Dr. Suzana Simon Sitayo: TEE and Women's Bible Study Groups Lesson Writer and Teacher

Rev. Dr. Suzana Simon Sitayo is a Tanzanian theologian, ordained minister, and academic serving the Evangelical Lutheran Church Tanzania. She holds a PhD in Religious Science, with a master's degree in missiology. She has been a Lecturer at Tumaini University Makumira since 2018 and supervises undergraduate and master's research. Alongside her university role, she has served as College Principal of Oldonyosambu Theological College (OTC) for training lay pastors (called evangelists in the ELCT) who are trusted local leaders and teachers in the church. Thus, she is the author of these lessons for the TEE (Theological Education by Extension) students at OTC.

Other Collaborators

Rev. Dr. Seth Mesiaki Ole Sululu

Rev. Dr. Sululu is Principal of the Makumira Training Institute. He is also a lecturer at both the Faculty of Theology and Faculty of Education, Humanities, and Science at Tumaini University Makumira since 2012. He is a leading expert on Maasai music, holding a PhD in ethnomusicology from University of Hildesheim, Germany. He graciously served as the adjudicator for the special choir competitions that integrated main teaching points into traditional Maasai tunes. He also was the managing producer of the music videos sung by the winners of the music competitions.

Dr. Daniel Kosia Mokoro

Dr. Kosia is a Senior Education Lecturer at Tumaini University Makumira where he is an instructor for research methods, educational assessment, and statistics courses. He provided statistical analysis expertise for the data analysis of the 11,240 data points collected in the pre-, post-lesson, and longitudinal surveys. In addition, he provided the final Maa translation language review. Moreover, Dr. Kosia is a mentor for Mama Anya with her ongoing development of understanding of the Maasai.

Mr. Joseph Kosia

Mr. Kosia was engaged as the research assistant for this project. He was the principal facilitator of the orientation and survey data collection during the fieldwork. His multifaceted support and strategic help included the primary Maa language translation of surveys and the lessons, bringing his enthusiasm, diligence, and trustworthiness into every task.

About the Lessons

The Lesson Development Process

After the Stakeholders developed the core Maasai values and established the learning outcomes (see p. 11), three Maasai writers worked with these guidelines and developed three lessons for each of the following four groups.

Lesson Groups	Author
Confirmation/ <i>Kipa Imara</i>	Rev. Ezekiel Megiroo
Secondary education in Diocese owned institutions	Mr. Lais Joseph
Women's Groups	Rev. Dr. Suzana Sitayo
Theological education by extension (TEE) training for lay pastors (called evangelists in the ELCT)	Rev. Dr. Suzana Sitayo

Collaborative Writing

The overall coherence of the content developed by three different writers writing was primarily shaped by the core values and learning outcomes—such as the main point for each lesson—that the Stakeholders had established. Yet, some content is distinct, as it includes the writer's perspective that was curated for their own target group. In addition, there was collaboration in the writing process that supported cohesion. For example, Dr. Sitayo shared early versions of her lessons with the other writers. Rev. Megiroo and Mr. Joseph met and worked together to share their expertise of biblical theology and natural science respectively. They also collaborated with an initial test of a lesson with confirmation student groups. Furthermore, Mama Anya supported the development of the lessons through providing the writers with the lesson plan template; pedagogy training on active learning and integrating cognitive, affective, and behavioral learning outcomes; as well as providing resources on ecotheology and climate change information related to a Maasai or pastoralist context that could be appropriated for their lesson development. These aspects helped to develop core coherence for the project.

The writers revised the lessons twice. First, the writers made revisions after feedback of their draft lessons from the Stakeholders. The Stakeholders evaluated the lessons according to the core values and learning outcomes that they established at the beginning of the project in the first Stakeholder meeting. In this second Stakeholder meeting, the Stakeholders worked in small groups to review the draft lesson content from their expertise and competencies: 1) Bible and theology; 2) Maasai traditional knowledge and anthropology; 3) climate science and environmental studies; and 4) hope within a Maasai context. The writers made the final content revisions after statistical analysis of surveys that were part of Mama Anya's research aspect of this project.

The Research Project

Mama Anya developed a survey, reviewed by the lesson writers and two professors of research methods, to identify knowledge and attitudes related to the four lesson themes: 1) biblical creation care, 2) Indigenous environmental knowledge, 3) climate science, and 4) hope (see p. 19). All surveys were taken anonymously in alignment with international research ethical standards. Ethical reviews include:

- The Data Protection Services of Sikt—the Norwegian Agency for Shared Services in Education and Research (Reference # 484011).
- The Tanzania Commission for Science and Technology (COSTECH) (Project reference: CST00000053-2023).

The participants took the surveys *before* the lessons to determine the baseline understanding of the participants. *After* the instruction of the lessons in a half-day seminar format, the participants took the same survey again. *After several weeks*, the participants took the same survey for the third and final time. The surveys demonstrated what knowledge and attitudes developed through participating in the lessons and how these developments were sustained, or not, over several weeks.

The detailed description of the research project appears in a book written by Mama Anya (Beth Elness-Hanson), *Creation Care and the Church in Maasailand: Leveraging Underutilized Resources in Response to the Climate Crisis* (proposed title, forthcoming 2026). This book describes the theoretical frameworks, research design, ethical reviews, methods, the survey, and the statistical analysis of the survey data with more detail, as well as an examination of how this model of creation care contributes to the scholarship and practice of faith-based climate activism. Some more public interest information of the research appears at <https://www.mamaanya.com/>. The website also provides all the lessons printed in this book for downloading without cost. The introduction in this volume provides only a summary of the research which helps the reader to understand the larger postdoctoral research project.

Three Languages

The lessons were originally written in English. According to the group for which the lessons were developed, the lessons are published in one or two languages. Secondary education in Diocese owned institutions is English medium. Thus, the lessons here are only in English. The Theological Education by Extension (TEE) training for lay pastors (called evangelists in the ELCT) is primarily taught in Kiswahili. Thus, the lessons appear in parallel columns of English and Kiswahili. For both the confirmation groups and the women's groups, it is prudent to have a Maa translation. For the translations, there were two steps of an initial translation and a following check and revision of the translation. The native Maa language speakers who worked diligently on the Maa translation are Dr. Daniel Kosia Mokoro and Mr. Joseph Kosia.

One of the challenges in presenting climate science terminology in Maa was that these are new and rather technical concepts to render into a language without existing terminology. There were three native Maa speakers who all have advanced education in environmental management and/or climate science who checked and developed the Kiswahili vocabulary as well as developed and revised the Maa vocabulary used for this project (see Appendix A). This project is indebted to this crucial contribution of these three experts: Dr. Neema Kitasho, Mr. Julius Laiser, and Mr. Lashumbai Kilolong in collaboration with the Maa translators, Dr. Daniel Kosia Mokoro and Mr. Joseph Kosia.

Engai or Enkai?

The Maa language has several dialects and some variations in spelling. For example, the word for God in Maa has two spellings: *Engai* or *Enkai*. In this collection of essays, the writers had their own preferences for the spelling, thus, both *Engai* or *Enkai* appear in the following lessons. Other Maa language spellings are established by the translators according to their Monduli and Ketumbeine area contexts.

Integrative Lessons

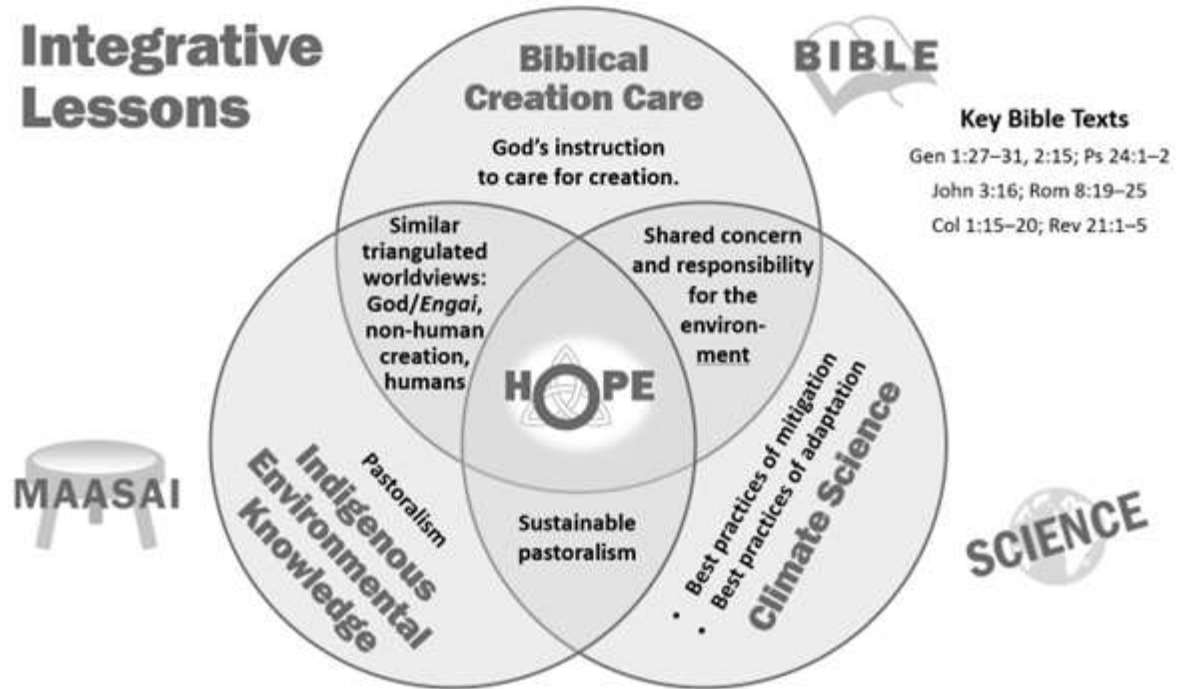
It is undeniable that increasing extreme weather events, changing rainfall patterns, and other environmental degradations have dramatically impacted the traditional Maasai, whose pastoralist livelihoods are dependent upon natural resources.

With these concerns, three Maasai writers—guided by Maasai Stakeholder values and learning outcomes—developed three lessons that enable the community to face the challenges arising from climate change. These lessons are designed to empower the Maasai with biblical, scientific, and practical knowledge to expand the enduring Indigenous environmental knowledge of the Maasai. In addition to knowledge, the lessons include opportunities to enliven motivation for working together and making a difference—engaging the future with hope—as we are commissioned to care for God’s good creation.

There are main points for each of the three lessons that determine the majority of each lesson’s content. Each lesson integrates previews of the next

lesson and subsequent lessons, while also reviewing key concepts from previous lesson (see the illustration). The lessons’ main points are:

1. **Biblical creation care:** God has commissioned (instructed) us to care for God’s good creation. In this lesson, we see how texts in the Bible teach us that God has entrusted us to be part of God’s work. The creation care lessons—the first lesson for each group—represent a general summary of common biblical and ecotheological viewpoints. These lessons are examples from the voices of the writers and do not claim to be the only way of approaching creation care. Additional perspectives and insights are found in the Resources for Lesson 1 in Chapter 15.



2. **Indigenous environmental knowledge:** The Maasai worldview—of the interdependence between humans, the environment, and Engai—is similar to Bible’s “creation triangle” (see p. 45). In this lesson, our Maa community will affirm our Indigenous skills of managing our ancestral land and learn about how our good traditions align with climate science.
 3. **Integrating climate science**—that is appropriate for a Maasai context—can help prevent global climate change as well as prepare for the local challenges faced now. In this lesson, our Maa community will expand our knowledge in caring for creation, by not only supporting Maasai traditions but also appropriating science research that explains the best practices of climate change mitigation (reducing the causes of climate change) and adaptation (reducing the risks of the negative effects of climate change).
 4. **Hope:** Each lesson wraps up with hope shared from the Bible, Maasai wisdom, and the climate scientists.
- Explore the lessons in this volume and discover how each author engaged these main concepts for their group.

Website

These printed lessons can also be found online in a PDF form at <https://www.mamaanya.com/>.

They are free to download and use to be a blessing with the same Creative Commons license CC BY-NC-SA: Attribution-NonCommercial-ShareAlike (see the colophon/publishing information at the front of this book).

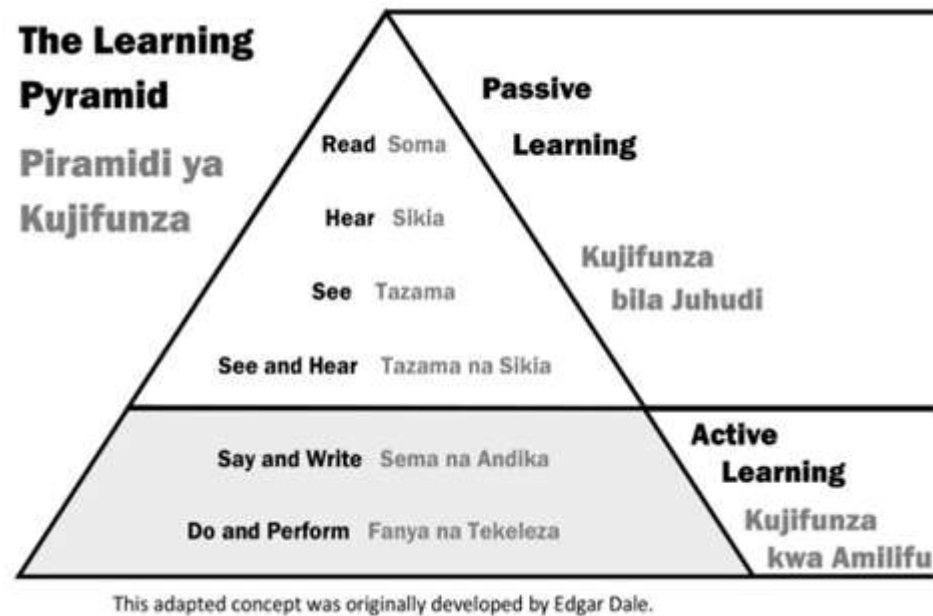
2. Teaching Tips for Teachers

English

- **Adaptable:** These lessons are examples. The Maasai writers wrote the lessons for different groups. Teachers can adapt the lesson plans for other contexts by adding or removing aspects.
- **Italics:** *Words in italics* in the lesson plans are instructional information for the teacher.
- **Active learning:** Active learning methods have stronger learning outcomes rather than lecturing. The most effective and memorable learning happens through methods, such as saying, writing, doing, and performing.
 - This includes small group discussion and exercises where the participants are reflecting upon the concepts and putting them into their own words.
 - Small groups are more productive when there are groups of two to three participants in a group, so that each has an opportunity to speak in short reflection times.

Kiswahili

- **Inayoweza Kubadilika:** Masomo haya ni mifano. Waandishi wa Wamaasai waliandika masomo kwa makundi tofauti. Walimu wanaweza kurekebisha mipango ya masomo kwa muktadha mwingine kwa kuongeza au kuondoa vipengele.
- **Italiki:** *Maneno yaliyoandikwa kwa alama za italiki* katika mipango ya somo ni taarifa za mafundisho kwa Mwalimu/mfundishaji



- **Kujifunza kwa ushirikiv** Mbinu za kujifunza kwa vitendo/ushiriki zina matokeo bora ya kujifunza badala ya kutoa mihadhara. Kujifunza kwa ufansi na kwa kumbukumbu zaidi hutokea kupitia mbinu, kama vile kusema, kuandika, Kutenda, na kufanya vizuri.
 - Hii inajumuisha majadiliano na mazoezi ya vikundi vidogo ambapo washiriki wanatafakari dhana na kuziweka kwa maneno yao wenyewe.
 - Vikundi vidogo vina tija zaidi wakati kuna vikundi vya washiriki wawili hadi watatu katika kikundi kimoja, ili kila kimoja kipate fursa ya kuzungumza kwa muda mfupi wa kutafakari.

- **Singing as a pedagogical strategy:** In several of the lessons in this book, the writers have encouraged an application (“Took”) activity where small groups of students work together to turn the main point of the lesson into a verse that they write in order to sing it with a traditional Maasai song tune. This is a strong pedagogical strategy for many reasons. First, it reviews the main point of the lesson. Second, music is a great way to remember, because singing involves using more and different brain functions. Third, putting the content into their own words is an important part of reflective learning. Furthermore, putting words to a traditional Maasai tune is not only an effective use of limited lesson time, but it also affirms the Maasai culture. Yes, singing is an important pedagogical strategy, but it will take some time. Try to allow 15-minutes in the lesson time, or perhaps, the students can be given an assignment to work on after class and bring back to the next lesson. This would also provide review of the first lesson before the next lesson begins.
- **Minute markings:** Minutes for each activity are suggested in the far-left column to fit into a 60-minute lesson. These can be adapted according to your available time.
- **A lot of information in the lesson plans:** There is a lot of information in the lesson plans. It may be difficult to include all the information in one 60-minute lesson. Some information is provided to have the core lesson content available for the teachers of the lessons.
- **Lessons for four different groups:** Teachers can compare the lessons from the four different groups for other ideas to see how another writer had developed lesson plans for their specific group.
- **Collected resources in the last three chapters:** Additional information appears in the last three Resource chapters: 15, 16, and 17. All the authors contributed to collecting resources, which were combined at the end of the book. These are resources to expand the teacher’s understanding, but there is too much detail that is beyond the scope of each lesson. The intent is that teachers can read through these resources to be better equipped for teaching the lesson plan without having to do independent research.
- **Kuimba kama mkakati wa ufundishaji:** Kwa masomo kadhaa katika kitabu hiki, waandishi wamehimiza shughuli ya matumizi (“Took”) ambapo vikundi vidogo vya wanafunzi hufanya kazi pamoja ili kugeuza hoja kuu ya somo kuwa ubeti ambao wanaandika ili kuiimba kwa ala/sauti ya nyimbo ya kitamaduni ya Wamaasai. Huu ni mkakati imara wa ufundishaji kwa sababu nyingi. Kwanza, unapitia hoja kuu ya somo. Pili, muziki ni njia nzuri ya kukumbuka, kwa sababu kuimba kunahusisha kutumia kazi nyingi zaidi na tofauti kwenye ubongo. Tatu, kuweka maudhui katika maneno yao wenyewe ni sehemu muhimu ya kujifunza kwa kutafakari. Zaidi ya hayo, kuweka maneno kwenye wimbo wa kitamaduni wa Wamasai si tu matumizi bora ya muda mdogo wa somo, lakini pia inathibitisha utamaduni wa Wamasai. Ndiyo, kuimba ni mkakati muhimu wa ufundishaji, lakini itachukua muda. Jaribu kuruhusu dakika 15 katika muda wa somo, au labda, wanafunzi wanaweza kupewa kazi ya kufanya baada ya darasa na kuiwasilisha watakaporudi kwenye somo linalofuata. Hii pia itatoa mapitio ya somo la kwanza kabla ya somo linalofuata kuanza.
- **Alama za dakika:** Dakika za kila shughuli zinapendekezwa katika safu wima ya kushoto ili kuendana na somo la dakika 60. Hizi zinaweza kubadilishwa kulingana na muda uliopo.
- **Taarifa nyingi katika mipango ya somo:** Kuna taarifa nyingi katika mipango ya somo. Inaweza kuwa vigumu kujumuisha taarifa zote katika somo moja la dakika 60. Kuna baadhi ya taarifa hutolewa ili kubaki na maudhui ya msingi ya somo yanayopatikana kwa urahisi kwa walimu wa masomo.
- **Masomo kwa makundi manne tofauti:** Walimu wanaweza kulinganisha masomo kutoka kwa makundi manne tofauti kwa mawazo mengine ili kuona jinsi mwandishi mwingine alivyotengeneza mipango ya somo kwa ajili ya kundi lao.
- **Rasilimali zilizokusanywa katika sura tatu zilizopita:** Taarifa za ziada zinaonekana katika sura tatu zilizopita za Rasilimali: 15, 16, na 17. Waandishi wote walichangia kukusanya rasilimali, ambazo ziliunganishwa mwishoni mwa kitabu. Hizi ni rasilimali za kupanua uelewa wa mwalimu, lakini kuna maelezo mengi sana ambayo yako nje ya upeo wa kila somo. Kusudi ni kwamba walimu waweze kusoma rasilimali hizi ili wawe na vifaa bora vya kufundisha mpango wa somo bila kulazimika kufanya utafiti wa kujitegemea.

**Part 2:
Lessons for Women's Bible Study Groups
(Kiswahili/Maa)**



6. Women's Groups Lesson 1: Kiswahili/Maa

Biblical Creation Care Utunzaji wa Uumbaji wa Kibiblia Erripoto oo Nkitobirunot anaa te-Biblia

Hoja Kuu

Enkiroroto kitok

Matokeo ya Kujifunza

Kujua



Mungu ametuamuru (ametuagiza) kutunza uumbaji mwema wa Mungu.

Kama matokeo ya somo hili, mwanafunzi atafanya yafuatayo:

Mamlaka ya Kibiblia

- Fahamu kwamba Mungu aliumba ulimwengu, na ulikuwa mzuri sana (**Mwanzo 1:31a**); na Mungu anaupenda (**Yohana 3:16**).
- Elewa kwamba tumepewa agizo (tumeagizwa au tumeagizwa) la kutunza kile ambacho Mungu ameumba (**Mwanzo 2:15**).
- Elewa kwamba ulimwengu umeharibika kwa sababu ya dhambi ya mwanadamu (hasa inavyodhihirika katika ubinafsi na uchoyo).
- Kujua kwamba kutopendana ni dhambi (**Mathayo 22:37–39**), kwa hivyo kuharibu maliasili ambazo zingeweza kutumiwa na wengi ni dhambi.
- Tambua kwamba Yesu alikufa kwa ajili ya ulimwengu wote—si wanadamu tu.
- Tambua kwamba ingawa Mungu ana udhibiti wa hali ya hewa, lakini Mungu aliwapa wanadamu jukumu la kutunza mazingira.
- Fahamu kwamba Mungu atarejesha uumbaji wakati Yesu Kristo atakaporudi.



Itanapa iyook Engai pee kirrip ingitobirunot sidan e Engai.

Ore ntilat ena kisoma naa pee iidim oloiteng'eni aataasa kuna:

Engitoria e Biblia

- Neyolou aajo itobirua Engai enkop, naa sidai apa naleng' (**Engiterata 1:31a**); nenyorr Engai (**Yohana 3:16**).
- Neyolou aajo itanapaki iyook (Itanapaki iyook) peekirrip ingitobirunot e Engai (**Engiterata 2:15**).
- Neyolou aajo etarrueyie enkop torbae loong'ok oo iltung'anak (nisulaki torbae letung'anishu oo empiani).
- Neyolou ajo ore engiba naa eng'oki (**Matayo 22:37–39**), metaa ore enginyalata oo n'dupot e asili naaret irkumok naa eng'oki.
- Neyolou aajo etua apa Yesu torbae lolosho pookin—mee iltung'anak ake.
- Neyolou aajo oo enakee eeta Engai engitoria oo m'baa engijape, kake ishoo iltung'anak engitoria pee errip enkop.
- Neyolou aajo eshuku Engai ingitobirat, teneshukunye Yesu.



Utangulizi wa Mabadiliko ya Tabianchi

- Tambua kwamba wanadamu wamesababisha uharibifu kwenye dunia.
- Kumbuka njia mbalimbali ambazo dunia imeharibiwa na shughuli za binadamu na uchoyo (dhambi).
- Tambulisha kwamba maarifa ya kitamaduni ya mazingira ya Wamaasai ni njia nzuri za kutunza uumbaji (zaidi katika somo la 2).
- Eleza maarifa ya msingi ya sayansi ya tabia nchi, kama vile gesi zinazoongeza joto la dunia (GHG au gesi za ongezeko la joto la dunia) (zaidi katika somo la 3).

Tumaini

- Fahamu kwamba Muumba wetu, Mungu wa Tumaini, anapenda ulimwengu na hatauaacha kamwe.
- Kwa maarifa ambayo Mungu amewapa wanadamu, mazingira yanaweza kutunzwa kwa njia zinazokuza upya na urejesho wa uumbaji.



Enaituruku oo Ngibelekenyat Orreje le Enkop

- Neyelou aajo eyautwa iltung'anak enginyala te enkop.
- Nedamu ngoitoo naapaasha nainyalieki enkop too nkiasin e tung'anishu oo iltung'anak oo empiani (eng'oki).
- Nelikyoo aajo ore eng'eno oo orkwaak lemaa torbae le enkop naa ngoitoo sidan naarrip ngitobirunot (Isulaki tengiteng'ena o somo le okuni 3).
- Nelikyoo engarriyano e sayansi orreje le enkop, anaa engijape torrongo, (arashu engijape emponoto engirowaj enkop) (isulaki tengiteng'ena o somo le okuni 3).

Osiligi

- Neyolou aajo ore Alaitobirunoni lang', Engai Osiligi/Naisiligai, enyorr enkop nemeingw'aa aikata.
- Ore te engarriyano naishoo Engai iltung'anak, neidimi aatorrip enkop too ngoitoo naaitubulu teng'ejuko oo enchukunoto oo ngitobirunot.

Hisi



Wanafunzi watatafakari kuhusu jukumu lao katika uumbaji wa Mungu.

- Wamebarikiwa na uumbaji mzuri wa Mungu.
- Wameheshimiwa kutumwa na Mungu kutunza uumbaji.
- Wamejitolea kutunza uumbaji wa Mungu.

N'choo ibirrbirr ilooiteng'eni m'baa naaipirita ngiasin enye tiatua ngitobirat Engai.

- **Etamayana nin'che** ngitobirat sidan Engai.
- **Iyanyita** Engai nirriwaa nin'che pee errip ngitobirunot Engai.
- **Itautuo oote** pee errip ingitobirunot Engai.

Fanya



Wanafunzi katika vikundi vidogo watafanya hivi:

- Kubainisha nyimbo na desturi za kitamaduni zinazoonyesha kwamba Wamaasai wanamtambua Mungu kama muumbaji;
- Kutunga wimbo mpya ubeti mmoja kutoka kwa maudhui ya somo hili;
- Kisha kuimba wimbo huo.



Nn'choo ees iloiteg'eni kuna tooturrurri loo iltung'anak kuti:

- Itodolu isingolioitin oom'baa e mila naaitodolu aajo eyielo Irmaasai Engai anaa Alaitabirunoni;
- Nessiru/nedung'u osingolio ng'ejuk orbeti obo oipirita ena kisoma;
- Neranyi ilo singolio.

Vidokezo kwa Walimu

- Maneno yaliyoandikwa kwa herufi za italiki ni mwongozo kwa walimu.
- Walimu wanahimizwa kutumia mbinu za kujifunza kwa vitendo badala ya kutoa mihadhara. Hii inajumuisha majadiliano na mazoezi ya vikundi vidogo.
- Dakika za kila shughuli zinapendekezwa katika safu wima ya kushoto ili kuendana na somo la dakika 60.
- Tazama nyenzo zingine nzuri katika Sura ya 22 ili kumpa mwalimu ujuzi kabla ya kufundisha somo.
- Kiswahili Biblia kutoka SRUV, [Mwanzo 1 | SRUV Bible | YouVersion](#);

Iyolot oo Rmalimuni/Ilaiteng'enak

- Ore isirat oolwaa naa akeutaa ilaiteng'enak.
- Eyeuni ilaiteng'enak pee eesishore olosek leng'iteng'enare naipirr iasat aalang' irorei ake. Ore ena nitushulu ingirorot oo ngiasin oo ilturrurri kutiti.
- Ore engata naya esiai nesira tenchoto ekedianye pee ishaakinore engisoma oo ldakikani indomoni-ile.
- Ing'urai ingulie nareta engiteng'enare tematwa etikitam oare pee isho alaiteng'anani/engaiteng'anani engarriyano eton itu iteng'enisho.
- Biblia Sinyati naing'waa <https://www.bible.com/bible/1816/GEN.1.MBS>

Vifaa vya Kufundishia Vinahitajika

- Chati ya mabadiliko ya tabianchi yanayosababishwa na binadamu (kwenye ubao mweusi au karatasi kubwa)

Eyewuni Inareta Naaiteng'enishoreki

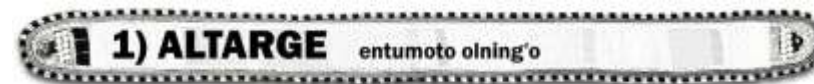
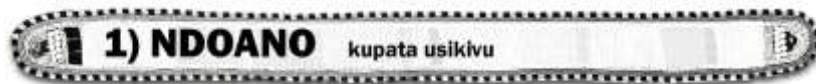
- Ore isirat loo nkibelekenyat orreje le enkop naayau ingiasin oo iltung'anak (nesira torkibao orok arashu tengardasi sapuk nagol)

Vifaa vya Wanafunzi / Vipeperushi vya Karatasi

- Biblia
- Ubao laini/wa matangazo ukutani na kifaa cha kubania karatasi au pini au utepe wa kubandika karatasi kubwa ukutani
- KITABU: Chati ya mistari ya Biblia au vipande vya karatasi vyenye mistari ya Biblia: Mwanzo 1:31; Mwanzo 2:15; Zaburi 24:1–2; Yohana 3:16
- TUMAINI: Vipande vya karatasi vyenye mistari ya Biblia: Warumi 8:19–21; Wakolosai 1:15–17; Ufunuo 21:1–5

Inareta oo Looiteng'eni/Ingardasini Kunyinyi

- Biblia
- Orkibao onana/loo nkitayelounot torkibao oti esundai oo engeene naeniki ingardasini arashu orpinyo arashu naaibung'ieki engardasi sapuk tesundai.
- ENGITABU: Isirat oo rorei le Biblia arashu ingardasini naasira irorei le Biblia: Engiterata 1:31; Engiterata 2:15; Orkerembe 24:1–2; Yohana 3:16
- OSILIGI: Ore ingardasini oororei le Biblia: Irumii 8:19—21; Irkolosai 1:15–17; Em'bolunoto 21:1–5



Hadithi za Maa, Maelekezo ya Kitamaduni, na Namna za Utunzaji wa Uumbaji



- 5
- Hadithi za Wamaasai zinaonyeshaje kwamba Mungu ndiye muumbaji na mmiliki wa uumbaji?
 - Wanafunzi wanahimizwa kuandika maelezo kwa ajili ya marejeleo ya baadaye.

Wanafunzi wabainishe na kushirikisha maarifa na desturi za kitamaduni zinazochochea utunzaji wa uumbaji, kama vile:

- Kanuni na miiko ya kitamaduni inayotetea utunzaji wa uumbaji,
- Mafundisho ya kitamaduni katika makundi rika mbalimbali yanayosisitiza utunzaji wa uumbaji, au
- Vitendo vya kila siku maishani vinavyotambua umuhimu wa utunzaji wa uumbaji.

Kauli kiunganishi (kuunganisha Ndoano na Hoja Kuu)

- 1
- Utajiri wa Maarifa ya kitamaduni ya Wamaasai kama tulivyosikia—juu ya wema wa uumbaji wa Mungu na wajibu wa mwanadamu katika matumizi na utunzaji sahihi wa uumbaji—yanaendana vyema na mafundisho ya Biblia.
 - Hebu tuangalie pamoja baadhi ya maandiko muhimu katika Biblia.

Ngapa/Ngatinin oo Irmaasai, Ilikoorot/Iutarot e Mila, oo Erripoto oo Ngitobirunot

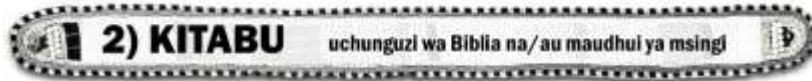
- Kamaa ngapa/ngatinin oo Irmaasai kanyoo naitodolu aajo ore Engai naa ninye alaitobirunoni oo lopeny loo ngitobirunot?
- Eyeuni ilooiteng'eni pee esirr kuna limunot peyie eigili aing'uraa tengaikata.

In'choo itodolu loiteng'enti engarriyano oo rkwaaki lemila oinasaa/oitagol/ooon erripoto oo ngitobirunot, nijo kuna:

- Iutarot oo n'turuja e mila naaretoo/naakeshaa erripoto oo nkitobirunot,
- Nkiteng'emat e mila tiatua ilturrurri loo rkamban/sirito naapaasha naaitagol erripoto oo nkitobirunot, arashu
- Nkiasin e kutwa tenkison naayielo esidano oo erripoto oo nkitobirunot enkop.

Ilomon lenkidikidikoto (enkidikidikoto Altarge oo Em'bae Kitok)

- Ore dupoto oo engarriyano orkwaak loo Irmaasai enaa enekitoning'o—tengipirata oo esidano oo ngitobirunot e Engai oo ngiasin o ltung'ani eesishore o erripoto nasipa oo ngitobirunot—naa irukore esidai ngiteng'emat e Biblia.
- Maing'urai sindai tenebo matwa oo m'baa etipat tiatua Biblia.



Majadiliano ya Biblia

15 Unda vikundi vidogo vyenye wanafunzi watatu hadi

wanne kila kimoja. Vikundi vimepewa jukumu la kusoma na kujadili mojawapo ya mistari ifuatayo. Maswali yanapatikana kwenye ile karatasi yenye mistari ya Biblia.

- Ubeti huu wa Biblia unasema nini kuhusu Mungu?
- Ubeti huu wa Biblia unasema nini kuhusu uumbaji wa Mungu?
- Ubeti huu wa Biblia unasema nini kuhusu uhusiano kati ya wanadamu na uumbaji wa Mungu?
- Chagua mwandishi kwa ajili ya kikundi chako ili aandike mambo muhimu na awe tayari kushiriki maarifa yako kwa darasa lote.

Maandishi ya Biblia kutoka SRUV isipokuwa kama yametajwa vinginevyo.

- **Mwanzo 1:31a** Mungu akaona kila kitu alichokifanya, na tazama, ni chema sana.
- **Mwanzo 2:15** BWANA Mungu akamtwa huyo mtu, akamweka katika bustani ya Edeni, ailime na kuitunza. (727 ni neno la Kiebrania linalomaanisha kazi na kuitumikia.)
- **Zaburi 24:1** Nchi na vyote vilivyomo ni mali ya BWANA, / Dunia na wote wakao ndani yake.
- **Yohana 3:16** Kwa maana jinsi hii Mungu aliupenda ulimwengu, hata akamtoa Mwanawe pekee, ili kila mtu amwaminiye asipotee, bali awe na uzima wa milele. (“Ulimwengu” katika Kigiriki cha Agano Jipya ni ulimwengu, ulimwengu wote uliombwa, ikiwa ni pamoja na uumbaji usio wa kibinadamu.)

Kila mwandishi wa habari wa kikundi hutoa muhtasari wa dakika 1 hadi 2 wa mambo muhimu. Ikiwa kuna vikundi vingi, basi watu wa



Nkiorot e Biblia

Indobira ilturruri kutiti oo looiteng'eni okuni metabaiki oong'wan

toiturrur obo. Ore tiatua lelo turrurri neishooki esiai pee eisom neimaki orkereri obo te kulo kererini. Etumoi iswalii/ nkikilikwanat tiatua napa ardasini naata irkererini le Biblia.

- Kejaa ele kereri le Biblia naipirita Engai?
- Kejaa ele kereri le Biblia naipirita nkitobirunot e Engai?
- Kejaa ele kereri le Biblia naipirita enebaikinore iltung'anak oo ngitobirunot e Engai?
- Edegelu alarirani loiturrur linyi pee esirr im'baa etipat niiruk pee elikyoo nena baa taldarasa pookin.

Isirat le Biblia oing'aa SRUV meteleku eneimakaki te enkai mwa.

- **Enkiterunoto 1:31a** Nedol Engai pooki toki naitobirua ajo aisidai katukul.
- **Enkiterunoto 2:15** Neya Olaitoriani Engai ilo tung'ani apik ninye enkurma e Eden peyie etur neramat sii. (727 oreori leburania oipirita esiai oengitaheikinoto.)
- **Olkerempe le Nkai 24:1** Eno Laitoriani enkop o ntokitin pooki naabore, / enkop o lelo oomanya;
- **Yohana 3:16** Amu etonyorra Engai enkop aiko nji o meishoru Enkerai enye nabo, paa ore pooki ng'ae oiruk nemeimin kake netum enkishui nemeish. (“Olosho” ore te Kigiriki to Osotwa Ng'ejuk naa olosho, olosho pookin oitobirwa Engai te enebo oo nkitobirunot neme iltung'anak.)

Elikioo alarirani lo oiturrur m'baa etipat ten'dorrop to aldakika obo (1) metabaiki aare (2). Tena kumok ilturrurri nitinyikuni iltung'anak

kujitolea wanaweza kualikwa kushiriki na vikundi vingine kuongeza (bila kurudia) habari.

Kusanya mambo muhimu yatakayoambatanishwa kwenye ubao wa ukutani.

Jambo Muhimu: Jukumu la Mungu la Kutunza Uumbaji

- 5 *Dokezo kwa mwalimu: Wamaasai wanaelewa kijadi kwamba Mungu anadhibiti hali ya hewa. Pia kuna mafundisho ya kibiblia kuhusu uhuru wa Mungu juu ya hali ya hewa. Hata hivyo, ikiwa wazo hili lilitumika kwa mabadiliko ya tabianchi, basi baadhi ya wanafunzi wanaweza kufikiri kimakosa kwamba hatuwezi kufanya chochote kupunguza athari mbaya za mabadiliko ya tabianchi (ambayo ni tofauti na hali ya hewa, kama ilivyoainishwa hapa chini). Kwa hivyo, masomo haya yanalenga kuthibitisha uhuru wa Mungu huku pia yakitambua kwamba Mungu ametuagiza kutunza uumbaji, ambao pia unaweza kupunguza athari mbaya za mabadiliko ya tabianchi. Tafadhali shikilia mvutano huu na mawazo yenye mantiki katika ufundishaji wako.*

Biblia inasisitiza kwamba wanadamu wamepewa jukumu la kutunza dunia. **Mwanzo 2:15:** “BWANA Mungu akamtwa huyo mtu, akamweka katika bustani ya Edeni, ailime na kuitunza.” Neno la Kiebrania kutoka Biblia linalotafsiriwa kama “kazi” linaweza pia kumaanisha “kutumikia,” ambalo linaonyesha jukumu la kuhudumia uumbaji kwa njia tofauti na kuwa na mamlaka juu yake au kutawala juu yake.

ooyieu peelikioo nena baa etipat neponaa ilkulie turrurri (kake migili) m'baa.

Inturrurro m'baa etipat naaidikidiki tenebo torkibao le esundai.

Em'bae Etipat: Esiai e Engai Terripoto oo Inkitobirunot

Eutaaroto to alaiteng'enani: Eyielo Irmaasai temila aajo Engai naitaheki orreje le ekijape enkop. Etii sii nkiteng'emat e Biblia naaipirita eyeunoto e Engai tialo orreje lenkijape enkop. Kake, tenetaasishoreki apa enakibirribirrata too nkibelekenyat orreje le enkop, neidim matwa oolooiteng'eni aibirribirra tempong'oto/tempong'ori aajo mekiin'dim aataas oonyoo naaitong'orr entorroni naye nkibelekenyat orreje le enkop (naa epaasha oo enkijape e enkop, enaa enaibalunyeji tiabori tene). Neeku ore ena kiteng'enare naa ipirita aitodolu enkitoria e Engai nitodolu sii aajo itanapa yook Engai pee kirrip inkitobirunot, niidim ina aitong'oro entorroni naye nkibelekenyat orreje le enkop. M'bung'a aakurraki ena yiataaroto oo nkibirribirrat naata tipat tenkiteng'enare ino.

Itirish Biblia aajo ishoki iltung'anak esiai pee errip enkop.

Enkiterunoto 2:15 Neya Olaitoriani Engai ilo tung'ani apik ninye enkurma e Eden peyie etur neramat sii. Ororei le Eburania tiatwa Biblia olikyoori enaa “enkias” eidim sii aitashe enaa “aisiyaki” naake itodolu sii esiai engitaheikinoto oo nkitobirunot too nkoitoi napaasha oo enkitoria oo enkitashekinoto tiatua nena.

Mfano wa Mungu

*Mwezeshaji anapaswa kuwaongoza wanafunzi kugundua uelewa wa mwanzo wa **Mwanzo 1:27**, kwamba wanadamu wameumbwa “kwa mfano wa Mungu.”*

- Fungua Biblia yako kwenye **Mwanzo 1:27**. Nani atasoma kwa ajili ya darasa?
 - Mungu akaumba mtu kwa mfano wake, kwa mfano wa Mungu alimwumba, mwanamume na mwanamke aliwaumba.
- Inamaanisha nini kwamba wanadamu wameumbwa “kwa mfano wa Mungu” kuhusiana na kutunza uumbaji?
 - Mungu alijifunua kupitia asili/uumbaji.
 - Binadamu ni wawakilishi wa kutunza na kutunza ulimwengu ambao Mungu anaupenda.
 - Yesu alifanyika/ alijifanya sehemu ya uumbaji.

Majadiliano yanaweza pia kutafakari jinsi wanaume na wanawake katika nafasi mbalimbali za kijamii katika jamii ya Wamaasai wamechukua jukumu la kuonyesha “mfano wa Mungu.”

- Hata hivyo, ulimwengu umeharibiwa kwa sababu ya dhambi ya mwanadamu—hasa inavyodhihirishwa katika ubinafsi na uchoyo.
- Ambapo ni kinyume na mafundisho ya Yesu katika **Mathayo 22:37–39**, ambayo inaamuru upendo kwa Mungu na upendo kwa wengine.
 - [Yesu] Akamwambia, “Mpende Bwana Mungu wako kwa moyo wako wote, na kwa roho yako yote, na kwa akili zako zote. Hii ndiyo amri iliyo kuu, tena ni ya kwanza. Na ya pili yafanana nayo, nayo ni hii, Mpende jirani yako kama nafsi yako.”

Enkitanyanyukoto e Engai

*Eyieuni alaiteng'enani peerikoo looiteng'eni peetum eyielounoto enkitabu enkiterunoto **Enkiterunoto 1:27** Metaa eitayio Engai oltung'ani te nkitanyaanyukoto enye makewan. Te “nkitanyaanyukoto Engai” eitayio ninye ninche, olee o eng'oruo.*

- Tabolu Biblia ino enkitabu **Enkiterunoto 1:27**. Ke ng'ai naisomaki aldarasa/yook?
 - Itobirwa Engai oltung'ani tenkitanyanyukiet enye, nitobiru tengitanyanyukiet Engai, itobirwa olee oo engitok.
- Kanyoo elikioo ele rorei ojo itobirwaki iltung'anak “tengitanyanyukiet Engai” tenkipirata erripoto oo nkitobirunot?
 - Itodolua Engai kewon tiatua nkitobirunot.
 - Ore iltung'anak naa ilakilini/laramatak oing'uraa nerrip olosho onyorr Engai.
 - Itaaki Yesu/itaa kewon eweji oo nkitobirunot.

Eidim sii nkirorot aibirribirra enetiu ilewa oo ngitwaak, too ng'asiat naapaasha to olosho tiatwa Irmaasai, eesita esiai naitodolu “enkitanyanyukoto Engai.”

- Kake, inyalaki enkop tenkaraki oo ng'ok oo iltung'anak—aisulaki itodolu emakewon/tung'anishu oo empiani.
- Naake epaashare enkiteng'enare e Yesu tiatua **Matayo 22:37–39** (tikitam oaare, orkereri le osom oopishana metabaiki osom ooudo), naake elikioo enyorrata te Engai oo enyorrata toorkulikai).
- [Nejoki Yesu], “Tonyorra Olaitoriani Engai ino to Itau lino pooki ote nkishui ino pooki o te ng'eno ino pooki. Ena kitanapata ene dukuya naa ninye naisul. Ore eni are nenyanyukie naa ena, 'Tonyorra ole latia ino anaa kewon'.”

Utangulizi wa Mabadiliko ya Tabianchi

3

Uzalishaji wa maarifa kupitia maswali ya haraka na majibu mafupi.

- Wamaasai wanaelewaje dhana ya mabadiliko ya tabianchi?
- Ni athari gani za mabadiliko ya tabianchi tunazoziona sasa ambazo ni tofauti sana na zile tulizonazo katika hadithi zetu za kitamaduni?

Hapa kuna taarifa za mwanzo kuhusu jinsi sayansi inavyoweza kutufahamisha nini? Zinazounda uelewa wetu wa kutunza uumbaji wa Mungu. Hapa kuna taarifa za awali kuhusu jinsi sayansi inavyoweza kukuza/kuunda uelewa wetu wa kutunza uumbaji wa Mungu. Tutapitia na kuongeza taarifa zaidi katika somo la tatu.

Ufafanuzi wa Mabadiliko ya Tabianchi

(Hoja muhimu!)

7

- Mabadiliko ya tabianchi yanarejelea mabadiliko ya muda mrefu katika halijoto, mvua, mifumo ya upepo, na vipengele vingine vya mfumo wa tabia nchi wa dunia.

Mabadiliko ya Tabianchi ni:

- Mchakato wowote unaosababisha marekebisha kwenye mfumo wa tabianchi unaweza kuelezewa kama unaosababisha “mabadiliko ya tabianchi.” Michakato hii inajumuisha mlipuko wa volkeno hadi mabadiliko ya mzunguko katika shughuli za jua. Tabia nchi ya dunia imekuwa ikibadilika kila mara kwa wakati wa kijiolojia.
- Hata hivyo, kipindi cha sasa cha ongezeko la joto kinatokea kwa kasi zaidi kuliko matukio mengi ya zamani. Wanasayansi wana wasiwasi na ongezeko la joto la haraka linalosababishwa na binadamu kwa sababu ya athari kubwa kwa uthabiti wa tabia nchi ya dunia.
- Hata hivyo, leo, msemu huo mara nyingi hutumika kama kifupi cha mabadiliko ya tabianchi yanayosababishwa na binadamu—kwa



Enaituruku oo Nkibelekenyat Orreje le Enkop

Eiunoto/Enkitobirunoto enkarriyano naimu nkilikwanat oo wolikinot dorropu.

- Kanyoo eyielo Irmaasai te enkibelekenyata orreje le enkop?
- Kanyoo eyeu enkibelekenyata orreje le enkop nekidolita taata naapaasha naleng' oo napa tiatua ngapa/ngatinin aang' e mila?

Etii ene irkiliku lenkiterunoto oipirita aajo ketyaa mwa eidim sayansi aatoliki iyiook? Im'baa naisho yook eyielounoto nekirripie nkitobirunot e Engai. Etii ene irkiliku lenkiterunoto oipirita aajo ketyaa mwa eidim sayansi aitubulu eyielounoto aang' e erripoto oo nkitobirunot e Engai. Kiimaa nekipon irkiliku tiatwa osomo le okuni.

Elimunoto oo Nkibelekenyat Orreje le Enkop

(Entilata e tipat!)

- Ore enkibelekenyata orreje le enkop naakelikioo nkibelekenyat enkata naado tiatua enkata enkima/enkirowaj, enchan, nkataitin osiwuo, oo nkulie baa orreje le enkop te enkop.

Ore Nkibelekenyat Orreje le Enkop naa:

- Esiaai akeyie nayeu nkitobirat tiatwa orreje le enkop neidimi aatolikyoi aajo enayeu 'nkibelekenyat orreje le enkop'. Ore enarishata naa tenebo oo enkima enkidiridiroto te enkop, metabaiki nkibelekenyat emanaroto too m'baa enkolong'. Ore orreje le enkop/e dunia naa akibelekenya aigiligil tenkata en'chula oo ntokiting' pookin te enkop.
- Kake, ore tenarishata etaata natopone enkirowaj naake epuku tesyooroto sapuk aalang' ingiasin kumok e apa. Ore ilang'eni le sayansi neeta arngash tengaraki emponata enkima/enkirowaj tesyooroto nayeu iltung'anak tenkaraki entorroni sapuk oonkibelekenyat orreje le enkop/e dunia.
- Kake, ore taata, ore ilo rorei naleng' naa eji ten'dorrop nkibelekenyat orreje le enkop naayeu Iltung'anak—ore tengaimwa, nkibelekenyat

maneno mengine, mabadiliko ya tabianchi yanayosababishwa na binadamu. Njia kuu ambayo wanadamu wanayoathiri tabia nchi ni kupitia kutolewa kwa gesi zinazozuia joto angani, kama vile kuchoma mafuta ya visukuku (mafuta, makaa ya mawe, gesi, plastiki).¹

Gesi Zinazongeza Joto Dunia

- Je, umesikia kuhusu ongezeko la joto dunia au “gesi chafu” hapo awali? (“Gesi chafu” si lugha inayopendelewa katika kitabu hiki.)
- Hizi ni gesi zinazozuia joto; zinazonyonya na kunasa mionzi ya jua katika angahewa ya dunia—kama blanketi—hivyo joto haliwezi kutoroka.²
- Kwa hivyo, dunia inapata joto—kama mtu aliyevaa blanketi.
- Lakini dunia inapata joto sana na kusababisha athari kama:³
 - Kupanda kwa usawa wa bahari;
 - Hali mbaya ya hewa kama mafuriko katika baadhi ya maeneo na ukame katika maeneo mengine; na
 - Na ukame huu unaweza kuharibu uoto wa asili na mazao.
 - Kuna athari zaidi ambazo zitajadiliwa zaidi katika Somo la 3.

Mabadiliko ya Tabianchi Yanayosababishwa na Binadamu (Anthropogenic):

- Uchoyo na ubinafsi huwafanya viwanda viendeleo kuchoma mafuta ya visukuku ili kupata pesa badala ya kutunza mazingira.
- Ingawa tunajua la kufanya ili kupunguza athari mbaya za mabadiliko ya tabianchi, maarifa hayatuwezeshi kuyafanya. Dhambi za ubinafsi, uchoyo, na kutojali ni kubwa sana. Ukosefu huu wa upendo ni kwenda kinyume na amri kuu ya kupendana. **Yohana 13:34–35:** [Yesu alisema,] “Amri mpya nawapa, Mpendane. Kama vile nilivyowapenda ninyi, nanyi mpendane vivyo hivyo. Hivyo watu wote watatambua ya kuwa ninyi mmekuwa wanafunzi wangu, mkiwa na upendo ninyi kwa ninyi.”

orreje le enkop naayeu nkiasin oo iltung’anak. Ore enkoitoi sapuk nainyalye iltung’anak orreje le enkop naa enkitaunoto empuruo/irgesii ooiibok enkirowaj talaing’ang’e, nijo kuna, (empejore eilata, nkuk, irgesii, mpirai).¹

Irgesii Oopon Enkirowaj te Dunia/te Enkop

- Itoning’o aikata emponata enkima/enkirowaj tedunia/enkop arashu irgesii torrok te apa?
- Ore kulo naa irgesii/irmuumwani oibooyo enkirowaj/enkima; oobibi eohoto enkolong’ tiatwa olaing’ang’e le enkop—lijo orbiranketi—neeku miidim enkirowaj aaima.²
- Neeku aketum enkop enkima/enkirowaj—anaa oitung’ani oishopito/oimulumulare orbirangeti.
- Kake irowaju enkop naleng’ neyeu n’golikinot nijo kuna:³
 - Enkilepunoto engare too rbalibali /enaipasha;
 - Enkata torrongo enkirowaj nijo enang’unoto oo nkariak toonkulie wejitin, oo alameyu too nkulie wejitin; naa
 - Eidim elamei ainyala m’bulunot easili oo n’daikin oo nkurman.
 - Etii nkulie golikinot naaimakini tosomo le okuni (3).

Nkibelekenyat Orreje le Enkop naayau Tung’anishu/Iltung’anak

- Ore empiani oo tung’anishu/makewon ninche naayaki inkiwandani metapejo iila e petroli pee etum impesai aalang’ errip enkop.
- Ore enakee kiyielo enekinko pee kintong’orr entorrone oo nkibelekenyat orreje le enkop, meretoki iyook enkariyano peekias nena. Ore ng’ok e tung’anishu/makewon, o empiani oo elaunoto en’chilaaroto naa kumok oleng’. Ore enemetii enyorrata neeku empaashata enkitanapata kitok najo entonyorrata. **Yohana 13:34–35** [Etejo Yesu] “Aisho intae enkitanapata ng’ejuk, entonyorrata anaa enatonyorra nanu intae. Te ina eyiolou pooki aajo, irara looiteng’eni laainei, ti niatata enyorrata olikae o likae.”

3) UCHUNGUZI ufafanuzi au tafakari ya maudhui ya msingi

Muktadha wa Wamaasai

- 10 Wamaasai wana msemu “*melaikinoi ororei te enkigwena,*” unaomaanisha, kupitia mijadala ya mikutano kila tatizo hupata suluhisho lake.



Athari za Mabadiliko ya Tabianchi kwa Wamaasai

- Kwa Wamaasai, mabadiliko ya tabianchi hutokea kama mabadiliko makubwa katika mifumo ya hali ya hewa yanayoathiri mtindo wao wa maisha wa kitamaduni.
 - Kwa Wamaasai, mabadiliko ya tabianchi yanamaanisha mabadiliko katika mifumo ya hali ya hewa, kama vile mvua kidogo, ukame zaidi, na misimu isiyotabirika.
 - Mabadiliko haya hufanya iwe vigumu kupata maji na nyasi kwa ajili ya wanyama wao.
 - Wamaasai wanaona hili kama suala la kiroho linalohusiana na Engai na matokeo ya matendo ya binadamu.
- Athari kwa Wamaasai zitajadiliwa zaidi katika somo lijalo.

Utunzaji wa Uumbaji wa Kibiblia

Unaendelea

- 5
- Mungu ametupa Biblia ili ituongoze katika njia zetu zote. Kwa hivyo, wakati Maa wanapokuwa na mikutano ya Biblia inayolenga kutafuta suluhisho na mwongozo, Roho Mtakatifu atatutia nguvu na kutuongoza. Neno la Mungu lina nguvu ya kubadilisha ambayo inaweza kututia moyo!
 - Fikiria tena mahali pazuri zaidi katika eneo lako ambapo unataka kuhifadhi.



3) ENGING'URAROTO enkitalalaunoto arashu engibirribirr e engiteng'ena e tipat

Orkwaak le Maa

Eeta Irmaasai ororei ojo “*melaikinoi ororei te enkigwana,*” ake elikyoo ele rorei aajo, ore too nkirrot te nkigwana netum inaagol pookin nkirragat/enedung'yeki.

Entorrioni oo Nkibelekenyat Orreje le Enkop too

Irmaasai

- Ore nkibelekenyat orreje le enkop too Irmaasai naa akepuku enaa nkibelekenyat sapukin tiatwa orreje le enkijape naainyal orkwaak/oreje lenye le mila.
 - Ore nkibelekenyat orreje le enkop too Irmaasai, naa nkibelekenyat tiatwa orreje lenkijape, nijo anaa; en'chan kinyi, alamei sapuk/oodo, oo nkataitin nemeyelounoi.
 - Ore kuna kibelekenyat nitagol entumoto oo nkariak, oo nkujit eramatere enye.
 - Edolita Irmaasai ena anaa em'bae naipirita Itauja oo Engai oo nkiasin e tung'anishu (oo iltung'anak).
- Ing'uraari entorrioni too Irmaasai tosomo osuju.

Erripoto Oonkitobirunot e Biblia

- Ishoo iyook Engai Biblia pee erikoo iyook too nkoitoi aang' pookin. Neeku, ore too nkataitin naata Irmaasai nkigwanat e Biblia naaipirita enging'orunoto enkirragata oo eutaaroto, neisho iyook Engiyang'et Sin'yati en'golon nerikoo iyook. Eeta ororei le Engai en'golon naidim aayau enkibelekenyata neidim aitagologo iyook!
- Inyaaki im'birribirra ewuei sidai oleng' toltirren lino niyiewoki erripoto.

- Fikiria wanyama wa porini kwenye vichaka na mazingira yao wanaohitaji ulinzi.
- Usisahau udongo ambao unahifadhi kila wakati ili kuepuka mmomonyoko wa udongo.
- Ukweli ni kwamba, hatufanyi hivi kwa ajili ya wanadamu tu bali pia kwa ajili ya Mungu ambaye aliupenda ulimwengu sana na akafa ili kupatanisha ulimwengu na Mungu mwenyewe.

Wanafunzi watatafakari nafasi yao katika uumbaji wa Mungu.

- Fikiria jinsi unavyohisi wakati uumbaji unakupa kila kitu unachohitaji.
 - **Umebarikiwa** na uumbaji mzuri wa Mungu.
- Fikiria nafasi ambayo mwanadamu anayo kama alivyokabidhiwa na Mungu.
 - Taja kazi za wazee wa Maa, viongozi, mashujaa, wanaume, wanawake na wazazi na watoto zinazohusu utunzaji wa uumbaji.
- Fikiria kusudi la Mungu katika kukuweka katika nafasi hiyo katika uumbaji wa Mungu.
 - **Umeshimiwa** kuagizwa na Mungu kutunza uumbaji.
- Fikiria mwikio wako wa dhati kwa Mungu kwa baraka kama hiyo.
 - **Umejitolea** kutunza uumbaji wa Mungu.

Hii ni hatua ya kwanza.

- Katika somo letu la pili kati ya masomo 3, tutaangalia NJIA nzuri za asili za Wamasai za kutunza uumbaji wa Mungu.
- Katika somo letu la tatu na la mwisho, tutaangalia zaidi NJIA ambazo tunaweza kwa vitendo ili kutunza uumbaji wa Mungu.
- Kwa sasa, hebu tutafakari zaidi kuhusu KWA NINI hili ni muhimu na JINSI sisi, watu wa Mungu, tunavyoweza kuleta mabadiliko.

- Im'birribirra ilowarak losero too irkun'dun lenye ooyeu sii ninche erripoto.
- Mirikino enkulukoni nashumisho too nkataitin/toorishat pookin peyiee metumi em'bobolata enkop.
- Ore esipata naa, mekiasita kuna tenkaraki oo iltung'anak ake, kake te nkaraki Engai natonyorra apa olosho naleng' neye pee itaiki osotwa olosho oo e Engai openy.

N'choo ibirribirr ilooiteng'eni eng'asiata enye tiatua nkitobirunot e Engai.

- M'birribirra siye enining'ito tiatwa yie tenekincho nkitobirunot intokiting' pookin niyieu.
 - **Kitamayana** inkitobirunoto sidan e Engai.
- M'birribirra eng'asiata naata oltung'ani enaa enaishoo Engai.
 - Tolimu inkiasin oo irpayani loo Irmaasai (le maa), ilarikok, Ilaisulak ilewa, nkitwaak, oo ntoiwo oo nkera naaipirita erripoto oonkitobirunot.
- M'birribirra entilata e Engai pee kipik ina ng'asiata too nkitobirunot Engai.
 - **Kiyanyitaki** kindanapa e Engai pee irrip nkitobirunot.
- M'birribirra eng'amunoto ino nasipa te Engai temayani nijo ina.
 - **Intawuo kewon** pee irrip nkitobirunot e Engai.

Ore ena naa enaituruku.

- Ore tiatua enkisoma aang' eare, tiatua somoi okuni (3), kipuo aing'uraa nkoitoi sidan orkwak le maa naarrip nkitobirunot e Engai.
- Ore tiatua osomo lang' le okuni oo alabayie, kipuo aing'uraa naleng' inkoitoi nekiin'dim too eyasat pee kirrip nkitobirunot e Engai.
- Ore tenarishata maibirribirra oleng' aajo, kanyoo tipat naata ena, oo nkoitoi nekiin'dim iyook iltung'anak le Engai aayau nkibeleyenat.

Tumaini

7 *Matokeo: Jua kwamba Muumba wetu, Mungu wa Tumaini, anaupenda ulimwengu na hatauacha kamwe.*

- Wape wanafunzi 3 karatasi yenye mistari yote mitatu 3 ya Biblia na uwaombe wawe tayari kuisoma kwa darasa zima.
 - **Warumi 8:19–21**
 - **Wakolosai 1:15–17**
 - **Ufunuo 21:1–5**
- Wamaasai au watu wengine wanaposikia kuhusu mgogoro wa mabadiliko ya tabianchi, wanaweza kufadhaika au kuwa na wasiwasi. Hii inaitwa wasiwasi wa tabia nchi.

Wakumbushe wanafunzi jinsi Engai anavyoshughulikia uumbaji kwa huruma kupitia hadithi za Wamaasai.

Kwa mfano, kumekuwa na vipindi vya vita vya kutisha miongoni mwa makundi ya Wamaasai, magonjwa katika historia yaliyoua karibu mifugo yote ya Wamaa, ukame mkali uliowanyima utajiri wa Wamaasai na kusababisha mateso; lakini Mungu ni Mungu wa matumaini, na Mungu hatawahi kuacha uumbaji wa Mungu.

- Hata hivyo, ni muhimu kuwa na matumaini!
- Kwanza, Mungu ni Mungu wa matumaini anayependa na kutegemeza ulimwengu! Na Mungu ameahidi kutouacha bali kuurejesha! Hebu tuangalie mifano 3 ya mistari ya Biblia.

Mwanafunzi aliyeteuliwa asome ubeti wa Biblia kwa darasa zima. Hapa chini kuna maandishi ya kuongoza majadiliano.

- **Warumi 8:19–21** Kwa maana viumbe vyote pia vinatazamia kwa shauku nyingi kufunuliwa kwa wana wa Mungu. Kwa maana viumbe vyote pia vilitiishwa chini ya ubatili; si kwa hiari yake, ila kwa sababu yake yeye atiyevitiisha katika tumaini; kwa kuwa viumbe vyenyewe navyo vitawekwa huru na kutolewa katika utumwa wa uharibifu, hata viingie katika uhuru wa utukufu wa watoto wa Mungu.



Osiligi

Entilata: Tayelo aajo Alaitabirunoni lang', Engai Osiligi, enyorr olosho/enkop nemaing'waa aikata.

- N'choo iloo iteng'eni okuni mpala//nkardasini naata irkererini pookin okuni le Biblia niomon pee irruk aisoma taldarasa pookin.
 - **Rumi 8:19–21**
 - **Ilkolosai 1:15–17**
 - **Embolunoto 21:1–5**
- Ore Irmaasai arashu irkulie tung'anak tenening' ilarrabali loo nkibelekenyat orreje le enkop, neidim aatan'yamala arashu etum orkirutoto. Ore ena naa akeji orkirutoto lo eorreje le enkop.

Ntadamu iloitent'eni eniko Engai eneesishore orng'urr toonkitobirunot tiatua ngatinin e Irmaasai.

Engitan'yany'uket, eetai nkataitin alarrabal torrok tiatua irgilat le Irmaasai, imweyaretin teapa naamutt ermatare pookin oo Irmaasai, ilameitin sapukin oitaa Irmaasai menat (torrobo) neyau engilishoto; kake ore Engai naa Engai osiligi, nemeing'waa aikata Engai nkitobirunot enyena.

- Ore ake sii, tipat oleng' teneetai osiligi!
- Ore Engai naa Engai osiligi nanyorr niibung' olosho! Nishorwa Engai osiligi n'jere meing'waa kake peeshuku! Maing'urai siye ngitenyanyuketa uni oo irkererini le Biblia.

N'choo iisom oloiteng'eni obo otuutaki orkereri le Biblia to oldarasa pookin. Etii abori tene isirat ooutaa ngirorot.

- **Iroma 8:19–21** Keanyita seseni pooki toki naitayioki, te yieunoto kitok, metaboluni nkera e Nkai. Amu etipikaki iseuseu erruoroto, neme nkaraki naa enkop nayieu, kake to siligi, amu keyookini aalaku iseuseu pooki aaitung'uaa rrindikisho enye e nkidaaroto, neng'amu elakunoto e nkitoo oo nkera e Nkai.
 - Itoning'o? Ore nkitobirunot nitaai metaa huru metupuku tiatua enkinyala natong'wa.

- Umesikia? Uumbaji utawekwa huru kutoka katika utumwa wake wa kuoza.
- **Wakolosai 1:15–17** Naye ni mfano wa Mungu asiyeonekana, mzaliwa wa kwanza wa viumbe vyote. Kwa kuwa katika yeye vitu vyote viliumbwa, vilivyo mbinguni na vilivyo juu ya nchi, vinavyoonekana na visivyoonekana; ikiwa ni vitu vya enzi, au milki, au enzi, au mamlaka; vitu vyote viliumbwa kwa njia yake, na kwa ajili yake. Naye amekuwako kabla ya vitu vyote, na vitu vyote hushikana katika yeye.
 - Hapa tunasoma kwamba Mungu ndiye Muumba na Mlinzi wa ulimwengu hataacha kamwe uumbaji wa Mungu bali ataunganisha vitu VYOTE na Yesu Kristo. Hatuelewi jinsi hili litakavyotokea, lakini tunaziamini ahadi za Mungu.
 - Kwa hivyo, tunajua kwamba Yesu anaratibisha vitu vyote—ikiwa ni pamoja na dunia pamoja.
- **Ufunuo 21:1–5** Kisha nikaona mbingu mpya na nchi mpya; kwa maana mbingu za kwanza na nchi ya kwanza zimekwisha kupita, wala hakuna bahari tena. Nami nikauona mji ule mtakatifu, Yerusalemu mpya, ukishuka kutoka mbinguni kwa Mungu, umewekwa tayari, kama bibi arusi aliyekwisha kupambwa kwa mumewe. Nikasikia sauti kubwa kutoka katika kile kiti cha enzi ikisema, Tazama, maskani ya Mungu ni pamoja na wanadamu, naye atafanya maskani yake pamoja nao, nao watakuwa watu wake. Naye Mungu mwenyewe atakuwa pamoja nao. Naye atafuta kila chozi katika macho yao, wala mauti haitakuwapo tena; wala maombolezo, wala kilio, wala maumivu hayatakuwapo tena; kwa kuwa mambo ya kwanza yamekwisha kupita. Na yeye aketiye juu ya kile kiti cha enzi akasema, Tazama, nayafanya yote kuwa mapya. Akaniambia, Andika ya kwamba maneno hayo ni amini na kweli.
 - Hapa, lugha ya asili ya Kigiriki ina maana ya dunia iliyofanywa upya na si mpya. Ndiyo, Mungu ameahidi kutoacha uumbaji wa Mungu bali kuufanya upya!
- **Hii ni habari njema!** Hii ni habari tunayoweza kuiamini, kwa sababu inatoka kwa Mungu wetu anayeaminika. Msingi wa tumaini letu si mawazo ya kutamani, bali ni Mungu anayeaminika na mwenye upendo.
 - Katika somo letu la tatu, pia tunajifunza kuhusu tumaini kutoka kwa wanasayansi.
- **Ilkolasai 1:15–17** Ninnye nyaanyukie e ina Ai nemelioo, olkikau le pooki toki naitayioki; te nkaraki ninnye pee eitayioki ntokitin pooki, naatii shumata o naatii enkop, inaaliio o nemelioo te naa lorikan loo looitoreisho, aashu nkitoriat, aashu looishoro engolon e nkitoria, te ninnye eitayioki ntokitin naa ninnye eitobirakaki. Ninnye otii enkiterunoto oo ntokitin pooki, naa atua ninnye eitasheyie aatumokino ntokitin pooki.
 - Kisomita tene aajo, ore Engai naa ninnye alaitabirunoni o alarriponi le enkop meing'waa aikata nkitobirunot Engai kake idikidik ntokitin pookin oo Yesu Kristo. Mekiyolo aajo tiamwa eesai kuna, kake kiata enkirukoto oo osiligi le Engai.
 - Neeku, kiyelo aajo eesita Engai isiaitin pookin—aatenebo oenkop.
- **Embolunoto 21:1–5** Naitoki adol keper ng'ejuk o enkop ng'ejuk. Amu ore keper e dukuya o enkop e dukuya neidipa aatuluso, meekure eetae enaiposha. Nadol ina anasa sinyati, Yerusalem ng'ejuk edou te shumata eing'uaa Engai, eitobiraki anaa esiankiki naikodokini olpayian lenye. Naning oltoilo kitok oing'uaa olorika le nkitoo ejo, “Ng'ura etii emanyisho e Engai te nebo iltung'ana. Keton ninnye te nebo ninche neaku iltung'ana lenyena. Ore Engai kewan neaku ketii te nebo ninche; naa kejut ninnye pooki kiyioi too nkonyek enye, ore keeya nemeitokini ae kata aata aashu eitokini aata olkiyioi, aashu enkishirata aashu emion ae kata. Amu etulusoitie intokitin pooki e dukuya.” Ore ilo otonita to lorika le nkitoo nejo, “Ng'ura, ekaitaa intokitin pooki ng'ejuko.” Nejo sii, “Ngero ena, amu ore kulo rorei naa keisiligayu nesipa.”
 - Ore tene, enkutuk e asili e kigiriki naa enkop naitang'ejukoki maake ng'ejuk. Ee, ishorwa e Engai osilig aajo meing'waa aikata nkitobirunot enyena kake piitaa ng'ejuko!
- **Ore kuna naa m'baa sidan!** Ore ena naa em'bae nekiin'dim airuko, amu ing'waa Engai aang' naisiligai. Ore entanata osiligi lang' neme nkibirribirrat orng'warr kake Engai naisiligai neeta enyorrata.
 - Ore tiatua enkisoma aang' euni, kinteng'enuo sii osiligi oing'waa lang'eni le sayansi.

4) KUTUMIA kufanya au kutumia mafunzo

Uangalizi wa Uumbaji katika Wimbo



- 6
- Pamoja na mwenzako au kikundi kidogo, jikumbusheni zile nyimbo na desturi za kitamaduni zinazoonyesha kwamba:
 - Wamaasai wanamtambua Mungu kama muumbaji na zile zinazomsifu Mungu kwa uumbaji wa Mungu na kwamba wanaomba Mungu aingilie kati wakati wa ukame mkali.
 - Katika mojawapo ya nyimbo hizo za kitamaduni, andika ubeti mpya kutoka kwa maudhui ya somo hili.
 - Imba wimbo.

Uandishi wa Nyimbo

Shughuli hii inaweza kuchukua dakika 10–15. Kwa hivyo, ingawa ni programu nzuri sana, inahitaji muda wa kutosha kuikamilisha vizuri.

- Katika mojawapo ya nyimbo hizo za kitamaduni, andika ubeti mpya kutoka kwa maudhui ya somo hili. Pitia na uzingatia hoja kuu: Mungu ametuamuru (ametuagiza) kutunza uumbaji mwema wa Mungu.
- Imba ubeti mpya.

Shughuli Nyingine Zinazoweza Kufanyika

1. Zungumzia jambo moja au mawili muhimu ambayo una hamu ya kuwafundisha watoto wako au wajukuu zako kuhusu utunzaji wa uumbaji.
2. Jadili na mwenzi wako/kikundi kidogo kuhusu mazingira mazuri katika kijiji chako, sifa zake, na faida ambayo yanatoa kwa watu na wanyama. Tambua jinsi jamii ilivyochukua hatua za kuyahifadhi.

4) EESISHOREKI eesata arashu eesishoreki engiteng'ena

Enging'urata oo Nkitobirunot tiatua Osingolio

- Tenebo ooilo lithahre, arashu olturrur kinyi entadamu lapa singolioitin oo orkwaak le mila ootodolu aajo:
 - Ore Irmaasai neyielo Engai enaa alaitobirunoni, oo lelo kulie ooisis Engai too nkitobirunot Engai, naa n'jere eomonito Engai pee edamu nin'che tenkata olamei sapuk/opi.
 - Ore obo le lelo singolioitin lemila, tisira orbeti obo ng'ejuk oing'waa ena kisoma.
 - Taranya osingolio.

Esirare oo Isingolioitin

Ore ena siai neidimi neya ildakikani tomon metabaiki tomon oo imet (10–15). Neeku, ore aana ormuradi sidai naleng', eyieu enkata sapuk pee idipai esidai.

- Ore to osingolio obo le losingolioitin lemila, tisira orbeti obo ng'ejuk oing'waa ena kisoma. Iimai nishilaa en'jooto etipat: Irriiwua iyook Engai pee kirrip nkitobirunot sidan e Engai.
- Taranya ilo kereri ng'ejuk.

Isiaitin Kulie Naaidimakinoi pee Eesi

1. Iroro em'bae nabo etipat arashu are nisirai pee inteng'en ingera inono e Kipaimara arashu nakuyani inono naaipirita erripoto oonkitobirunot.
2. Eroro/eimaki oo ilo lithahre/olturrur kinyi m'baa e nkop sidan te enkanasa/enkijiji ino, enkishaa enye, oo dupoto too

3. Zungumzia njia moja au mbili ambazo Mungu anawahusisha wanadamu katika kutunza uumbaji. Swali la 3 litaulizwa tena katika.

Swali la 3 litaulizwa tena katika Somo la 3 ambapo tunaona njia mahususi za utunzaji wa uumbaji ambazo zinaweza kupunguza athari mbaya za mabadiliko ya tabianchi.

Kundi zima litaimba wimbo mmoja wa kitamaduni wa kumshukuru Mungu kwa mvua na nyasi.

Maombi

1 Mungu muumba wa mbingu na dunia, tunakushukuru kwa baraka ya uumbaji na heshima ya kuumbwa kwa mfano wako.

Asante kwa mvua na nyasi, maziwa, na watoto.

Tunaomba—kupitia neema na wema wako unaodumu milele—utuwezeshe kutimiza kazi yetu ya kutunza uumbaji wako. Tupe tumaini lisilotikisika katikati ya mabadiliko makubwa ya tabianchi. Kwa maana wewe ndiye kimbilio letu sasa na milele. Amina.

iltung'ana oo lowwarak. Tadwaa enikuna iltung'anak pee errip nena wejitin enkop.

3. Roro engoitoi nabo ashu are naaing'orie Engai iltung'anak erripoto oo nkitobirunot.

Oswali le/enkikilikwanata e okuni okuni (3) tiatua enkisoma euni naa ake kidolita nkoitoi naaibala e erripoto oo nkitobirunot naaidim aitong'oro entorrone oo nkibeleyenat orreje le enkop.

Erany olturrur pookin osinkolio obo le mila olikinyeki Engai aashe tenchan oonkujit.

Enkomono

Engai, alaitabirunoni le shumata oo enkop, kiliki iyie aashe te emayani oo nkitobirunot oo enkanyit intobirua yook tenkitanyanyikiet ino.

Ashe te enchan oo nkujit, kule oo nkera.

Kiomonu—tiatua empiris oo esidano ino nabik ntarasi—n'dimie iyook pee kindambaya esiai aang' erripoto oo nkitobirunot inono. N'choo iyook osiligi leming'unung'un te empolos oo nkibeleyenat sapukin orreje le enkop. Aamu iyie enkwatikinoto aang' taata oontarasi. Eesaay.

Bibliography



¹ “Climate Change Mitigation and Adaptation: Simple Guide to Schools in Africa” (UNESCO, United Nations Educational, Scientific and Cultural Organization, 2019), 4, <https://unesdoc.unesco.org/ark:/48223/pf0000372168>.

² “Climate Change Mitigation and Adaptation;” 4.

³ “Climate Change Mitigation and Adaptation;” 8–12.

7. Women's Groups Lesson 2: Kiswahili/Maa

**Maasai Traditional Environmental Knowledge and Creation Care
Ujuzi wa Asili wa Wamaasai kwa Ajili ya Utunzaji wa Uumbaji
Engarriyano e Asili oo Irmaasai te Erripoto oo Nkitobirunot**

<p>Hoja Kuu Enkiroroto kitok</p>	<p>Mtazamo wa ulimwengu wa Wamaasai—wa utegemezi kati ya wanadamu, mazingira, na <i>Engai</i>—unafanana na “pembetatu ya uumbaji” ya Biblia.</p>	<p>In’dwaat olosho loo Irmaasai—oretoro oo iltung’anak, enkop, o <i>Engai</i>—akenyanyuk oo ewunishu oo nkitobirunot e Biblia.</p> 
<p>Matokeo ya Kujifunza</p>	<p>Kama matokeo ya somo hili, mwanawake atafanya yafuatayo:</p>	<p>Ore ntilat ena kisoma naa pee iidim oloiteng’eni aataasa kuna:</p>
<p>Kujua</p> 	<p>Biblia</p> <ul style="list-style-type: none"> Fahamu kwamba “pembetatu ya uumbaji” ya kibiblia inarejelea uhusiano kati ya Mungu, ubinadamu, na uumbaji usio wa kibinadamu. <p>Wamaasai</p> <ul style="list-style-type: none"> Elewa kwamba mtazamo wa ulimwengu wa Wamaasai kuhusu umuhimu wa maelewano na <i>Engai</i>, wanadamu, na viumbe visivyo vya binadamu kwa ustawi wa binadamu ni sawa na “pembetatu ya uumbaji” katika Biblia. Dhana ya baraka (<i>empuris e Engai</i>) au laana (<i>eng’oki</i>) kama matokeo ya uhusiano wa uadui kati ya wanadamu na Mungu lakini pia kati ya wanadamu na viumbe visivyo wanadamu. Elewa mtazamo wa ulimwengu wa Wamaasai wa mfumo ikolojia. 	<p>Biblia</p> <ul style="list-style-type: none"> Eyielou aajo “Ore empijataewunishu oo nkitobirunot” e Biblia naa king’uraa enebaikinore Engai, iltung’anak, oo nkitobirunot neme iltung’anak. <p>Irmaasai</p> <ul style="list-style-type: none"> Eyielou aajo ore n’dwaat olosho le maa te enkipirata eyeunoto olning’o te Engai, oo iltung’anak, oo nkitobirunot kulie neme iltung’anak te puuan oo iltung’anak nen’yen’yikie “ewunishu oo nkitobirunot” Engai tiatua Biblia. Ore enkibirribirrata e mayan (<i>empuris e Engai</i>) arashu en’diaa (<i>eng’oki</i>) enaa enayeu mang’atishu too iltung’anak oo Engai, oo too iltung’anak, oo nkulie kitobirunot neme iltung’anak. Neyielou en’dwaata olosho loo Irmaasai naipirita ikolojia (en’chula oontokiting’ pookin te enkop).

- Fahamu kwamba maarifa ya kitamaduni ya mazingira ya Wamaasai ni njia nzuri za kutunza uumbaji. (Tazama sehemu ya rasilimali.)

Tumaini

- Hivyo basi, tunaweza kukabiliana na changamoto za mabadiliko ya tabianchi kwa matumaini.
- Kwanza, tunajua kwamba Muumba wetu, Mungu wa Tumaini, anapenda ulimwengu, na Mungu hatauaacha kamwe.
- Pili, kama wafuasi wa Yesu Kristo, tumewezeshwa na Roho Mtakatifu kuwa baraka kwa wengine (haki ya kijamii) na uumbaji (mazingira).



- Neyielou aajo, ore enkarriyano e mila te enkop oo Irmaasai naa nkoitoi sidan naarrrip nkitobirunot. (Ng'urai ewueji oo nareta engiteng'enare.)

Osiligi

- Neeku naa kiin'dim airisha ng'olikinot oo nkibelekenyat orreje le enkop to osiligi.
- Enaituruku, kiyolo aajo ore alaitabirani lang', Engai o osiligi, enyorr olosho nemeing'waa aikata Engai oopii.
- Eniare, ore enaa ilaurukok le Yesu Kristo, nidimie iyook Enkiang'et Sinyati pee kiaku emayani too irkulikai (haki oo olosho) oo nkitobirunot (enkop).

Hisi



- Tuna sababu ya kujivunia kuwa Wamaasai, wanaodumisha bioanuwai, kulinda mifumo ikolojia, na kudumisha maisha endelevu ya kimazingira.

- Kiaata inekilwaare kira Irmaasai, oitahekito iseuseu enkop, nekirrip m'baa pooki, e ikolojia nekin'taheiki bikoto enkop.

Fanya



- Bainisha changamoto kadhaa zinazozuia utekelezaji wa maarifa ya jadi ya Wamaasai.
- Bainisha njia tatu za maarifa ya jadi ya Wamaasai na mbinu za utunzaji wa uumbaji ambazo pia ni mbinu bora za kupunguza na/au kukabiliana na athari za mabadiliko ya tabianchi.
- Bainisha njia moja au mbili mpya ambazo zinaweza kupanua utunzaji wa uumbaji wa jadi ya Wamaasai kwa madhumuni ya kupunguza na/au kuhimili athari za mabadiliko ya tabianchi.
- Andika ubeti mmoja wa wimbo kuhusu maarifa na mbinu za kitamaduni za mazingira za Wamaasai ambazo pia ni mbinu bora za kupunguza mabadiliko ya tabianchi. Tumia sauti ya kawaida inaojulikana na wanawake wengi.

- Tolimu n'golikinot kuti naaibokito iyasat enkarriyano orkwaak loo Irmaasai.
- Tolimu nkoitoi wuni enkarriyano orkwaak loo Irmaasai o olosek erripieki nkitobirunot naara sii losekin sidan naretoki oitong'orr/arashu orisheki entorroni neyeu nkibelekenyat orreje le enkop.
- Tolimu enkoitoi nabo arashu aare ng'ejuko naaidim aitalala erripoto oo nkitobirunot orkwaak le maa, temwa naaitong'orr/arashu nidimu entorroni nayeu nkibelekenyat orreje le enkop.
- Tisira orbiti obo lo osinkolio oipirita enkarriyano oo losekin le mila te enkop oo Irmaasai naara losekini sidan ooitong'orr nkibelekenyat orreje le enkop. Tipika oltoilo otamoo nkitwaak kumok.

Vifaa vya Kufundishia Vinahitajika

- Picha za athari za mabadiliko ya tabianchi
- Hiari: kigoda chenye miguu 3, *olorika*
- Chati mgeuzo, kalamu ya alama, klipu au tepu

Eyewuni Inareta Naaiteng'enishoreki

- Impichai entorroni oo nkibelekenyat orreje le enkop
- Olorika loo nkejek wuni/uni.
- Enkardasi sapuk naing'or abori, arkalamu osirieki

Vifaa vya Wanafunzi / Vipeperushi vya Karatasi

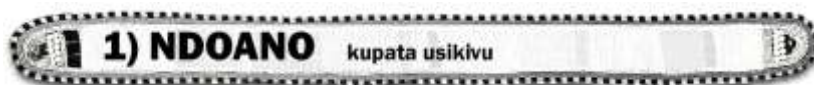
- Ubao wa karatasi au karatasi kubwa na kalamu za alama

Inareta oo Looiteng'eni/Ingardasini Kunyinyi

- Orkibao le enkardasi arashu empalai sapuk oo arkalamu osirishoreki

Dakika

Maudhui



- 4 Tutajaribu kujibu maswali machache ili kuona tunachojua kuhusu sekta ya utalii nchini Tanzania.

Mwalimu atatoa jibu sahihi kila anapokosea.

1. Ni eneo gani la Tanzania linalopokea watalii wengi zaidi?
2. Taja maeneo katika mkoa wa Arusha ambayo watalii hutembelea.
3. Ni kiasi gani cha mapato ya taifa la Tanzania (pato la taifa) hutokana na utalii?
4. Kwa nini unafikiri kwamba mapato mengi ya utalii yanaingia katika sehemu hii ya kaskazini mwa Tanzania?

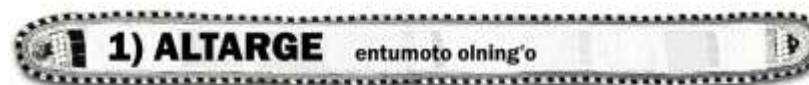
Majibu

1. Arusha
2. Eneo la Hifadhi ya Ngorongoro, Hifadhi ya Taifa ya Arusha, Serengeti, Tarangire, Oldonyo le Nkai, Ziwa Natron na Maasai Manyata ambayo yapo katika maeneo mbalimbali. Tunaona kwamba vivutio 3 kati ya 5 bora vya utalii ni maeneo katika Maasailand!

Tazama Rasilimali za Somo la 2, Sura ya 16 kwa maelezo zaidi.

3. Zaidi ya 20%. Hii ina maana kwamba kila shilingi 10,000 ambazo serikali inapata, angalau shilingi 2,000 zilitokana na utalii. Hii ni

Enaiteng'enuoi



Kinyok aawolu irkutu swalii (nkikilikwanat) pee kidol aajo kanyoo kiyiolo naipirita esiaai oo iltalii tolosho le Tanzania.

Tenepong' oltung'ani, nelimu ormalimui/alaiteng'enani owolet osipa.

1. Kaloosho te Tanzania naiturukito eng'amu iltalii kumok oleng'?
2. Tolimu iwejitin to oltiren loo larusa naanyorr iltalii ashom.
3. Kebaa dupoto (ngohola) naang'amuni te Tanzania to orbae loo iltaliini?
4. Kanyoo imbirribirr aajo ore dupoto sapuk oo iltalii naa enaalo e kopkop e Tanzania epukunye?

Woleta

1. Arusha
2. Enkop oo ng'wesi te Ngorongoro, Serengeti/Siringet, Arusha, Tarangire/Taar e ngare, Oldonyo le Engai, Em'barbal e Natron oo e Manyata oo wejitin oo nkwapi oo Irmaasai naatii iwejitin naapaasha. Kidolita aajo ore nkituoni/wejitin wuni (3) tiatua imiet (5) sidani oo iltaliini naa nkwapi oo Irmaasai.

Ng'urai isirat losomo leare (2), ematwa etomon oile

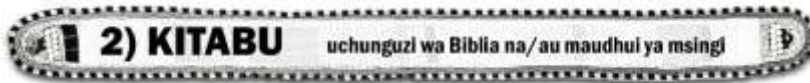
3. Ake egiroo em'bata enabaya tikitam tepooki dupoto. Itodolu ena aajo ore too nkohola nkeek tomon naatum sirkale, ore nkeek are naa m'baa oo iltaliini epukunye. Ore kuna pesai/ngohola naa intrilionini isiet oo

shilingi trilioni 8.25 zilizozalishwa na watalii 1,790,301 waliotembelea Tanzania mwaka wa 2023 pekee.

4. Kwa hivyo, unaona kwamba watalii wengi zaidi wanakuja katika maeneo ya Wamasai, hii ni kwa sababu Wamasai hutunza mazingira yao ya asili vizuri.

Kauli kiunganishi (kuunganisha Ndoano na Hoja Kuu)

- 1 • Sababu kuu kwa nini maeneo ya Wamaasai hutembelewa na watalii wengi ni uwepo wa mazingira ya asili porini.
- Hii inaonyesha ustadi wa Wamaasai katika kulinda mazingira na bioanuwai.
- Sasa hebu tuangalie jinsi Wamaasai wamekuwa wakishughulikia utunzaji wa uumbaji.



Maarifa ya Jadi ya Mazingira ya Jamii ya Wamaasai



- 10 *Waambie wanawake waunde vikundi vidogo. Kuna mada 12 za majadiliano, ambazo zinaweza kugawanywa katika mada moja kwa vikundi 12 au mada mbili kwa vikundi 6, au chochote kinachofaa vizuri. Badilisha vikundi au tenga maswali inavyohitajika.*

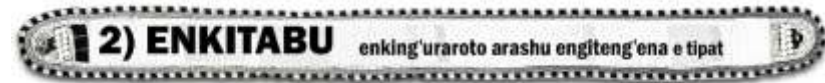
- Jadili maarifa ya jadi ya Wamaasai na mbinu za utunzaji wa uumbaji wa mada yako.
- Mbinu za kitamaduni za Wamaasai za utunzaji wa mazingira zinazoonyesha heshima kubwa kwa asili na maisha endelevu. Hapa kuna baadhi ya njia za kitamaduni za Wamaasai za utunzaji wa mazingira:

mpointini are oo imiet naatupukunye iltalii emilion nabo, oolakin naapishana, oo ntomoni naaudo iip wuni oo nabo oo iltalii ootewo Tanzania ta alari loo nkalifun are oo otikitam ookuni (2023) openy.

4. Neeku, idolita aajo ore iltaliini kumok oleng' naa akeponu nkwapii oo Irmaasai, ore ena naa te nkaraki errip Irmaasai nkwapii enye easili esidai.

Ilomon lenkidikidikoto (enkidikidikoto Altarge oo Em'bae Kitok)

- Ore pee enyorr Italiini kumok nkwapii oo Irmaasai naa te nkaraki etii nkwapii easili toserok.
- Akitodolu ena enkariyano oo Irmaasai te erripoto enkop oo iseuseu (pooki naatii enkop).
- Maing'urari siye eniko Irmaasai enees erripoto oo nkitobirunot.



Enkariyano e Mila Enkop to Olosho loo Irmaasai

Tiaki nkitwaak/ntasati meitobiru lturrurri kutiti. Etii m'baa tomon oo are (12) naaimakini, naaidimi aatirish nishori nabo olturrurri tolturrurri tomon oo are (12) arashu, m'baa are too ilturrurri ille, arashu enaishaakinore sidai. M'belekenya ilturrurri arashu tirisha irswalii (nkilikwanat) anaa enayieuni.

- M'biribirra enkariyano easili oo Irmaasai oo losekin lerripoto oo enkitobirunoto enkisoma ino.
- Ilosekin le asili oo Irmaasai le erripoto enkop naaitodolu enkanyit sapuk te asili oo enkishon naado. Etii ene nk'uti oitoo e asili oo Irmaasai te erripoto enkop:

1. Matumizi ya Maarifa Asilia

Wamaasai hurithisha maarifa kutoka kizazi hadi kizazi kuhusu mimea ya eneo lao na wanyamapori, mimea asilia kwa ajili ya tiba, na kuepuka mbinu hatarishi za kuvuna ili kuhakikisha ustawi wao. Hii inasaidia bioanuwai na matumizi endelevu ya rasilimali.

2. Malisho ya Mzunguko

Wamaasai hugawanya ardhi katika sehemu kwa sababu maalum: *olopololi/osupuko* kwa ajili ya malisho ya msimu wa kiangazi, eneo la malisho ya msimu wa mvua la *oloisukut*, *orpurkel* kwa ajili ya malisho ya jamii. Hii huipa ardhi muda wa kupona na kuzuia malisho kupita kiasi, ambayo hulinda nyasi na kuzuia mmomonyoko wa udongo.

3. Utunzaji wa Maeneo ya Tambiko na Maeneo Matakatiifu ya Asili

Wamaasai wanachukulia baadhi ya maeneo asilia kuwa matakatiifu na kulindwa dhidi ya matumizi mabaya, ikiwa ni pamoja na miti (kama vile *oreteti*), vilima (kwa mfano, maeneo ya Oldonyolengai, Oldonyomorua, na Elerai), na vyanzo vya maji. Pia kuna sheria za kitamaduni za kulinda maeneo haya. Maeneo haya hutumika kama maeneo yenye bayoanuwai na huchangia katika uhifadhi.

4. Uhifadhi wa Maji

Wamaasai huepuka uchafuzi wa vyanzo vya maji asilia kama vile mito na vijito vya msimu, kwa sababu wanategemea hivyo kwa ajili ya kuishi kwa binadamu na mifugo. Badala yake, mara nyingi huchimba visima vidogo karibu na mito iliokauka ili kupata maji safi bila kudhuru mfumo ikolojia.

5. Uchomaji Uliodhibitiwa

Wamaasai hutumia uchomaji wa eneo uliodhibitiwa au uliopangwa mapema ili kudhibiti nyasi. Hii husafisha nyasi za zamani, kavu na kuhimiza ukuaji mpya, na kusaidia kudumisha mfumo ikolojia. (Mizizi ya nyasi husaidia kuhifadhi kaboni kwenye udongo kama ilivyojadiliwa katika somo la 3.)

1. Enaasyeki Enkarriyano e Asili

Itujung' Irmaasai eng'eno/engarriyano enye eishoi oo eishoi naipirita nkujit enkop enye oo ng'wesi naatii, nkujit easili torbae le eramatare oo seseni, nepaashare enkarriyano torrono naamut enkop pee edupoi enkushui/puan enye. Ore ena neretoki iseuseu (pooki naatii enkop) oo eesishore nabik oo n'dupot enkop.

2. N'daat Naamanikini/Naamanaa

Erish Irmaasai enkop torbae loo ntilat etipat: olopololi/alalili/osupuko too n'daat tenkata alamei, eweji oo n'daat tenkata en'chan/alari oo oloisukutuk, orpurkel torbae loo n'daat olosho. Ore ena nisho enkop enkata nanaru nemit en'daata natuluso, nerrip ena nkujit niibok em'bobolata enkop.

3. Erripoto oo Wejitin Esajare oo Wuejitin Sinyat e Asili

Iing'orr Irmaasai nkulie wuejitin easili naa wuejitin sinyat, nerripi pee meesishoreki ainyal, naa tenebo oo irkeek (lijo oreteti), ildonyo/in'donyo (anaa oldonyo le Engai, en'donyo oo irmoruak, oo Elerai), oo nkonyek oo nkariak. Etii sii ncheriani/iutarrot e asili naaripieki kuna wuejitin. Ore kuna wuejitin neesishoreki anaa iwuejitin naata iseuseu (ntokiting pookin naatii enkop) neretoki erripoto e enkop.

4. Erripoto e Engare

Ore Irmaasai elon'y enkinyalata oo nkonyek oo nkariak e asili nijo, irkejek oo yayat oo nkariak, Iturot oowoki talamei, aamu isilig ninje te enkishui oo iltung'anak oo ngishu/eramatare.

5. Empejore Naitashekioki

Epej Irmaasai iwuejitin naaiteng'elaki arashu nkaron pee i tagiligil nkujit, ore ena neretoki aita nkujit musan naatoito, nitelelek em'bulunoto oo nkujit ng'ejuko, neretoki erripoto e asili. (Ore ntana oo nkujit neretoki aatushum kabon te nkulukoni enaa enekiroro te enkisoma ewuni/3).

6. Kuheshimu Sheria za Asili/Sheria za Kitamaduni, Hadithi na Miiko

Wamaasai huheshimu sheria za asili/mila zinazolenga utunzaji wa uumbaji ili kupata baraka na kuepuka laana. Wamaasai wana mfumo wa kiumri wenye seti ya sheria za kitamaduni zinazokataza jaribio lolote lisilo la lazima. Vurugu dhidi ya bioanuwai kwa kawaida hufanywa na watoto hivyo wasiotahiriwa (*ilayok*) wanapaswa kutakaswa kupitia mila kabla na baada ya mila za tohara. Kwa hivyo, ni marufuku na ni aibu kwa wapiganaji (*ilmuran*) kuharibu bioanuwai bila sababu.

7. Mtindo wa Maisha wa Kiwango cha Chini

Wamaasai wanaishi maisha ya kuhamahama kidogo yenye athari ndogo ya kimazingira. Nyumba zao (*manyatta*) zimetengenezwa kwa nyenzo asilia, zinazoweza kuoza kama vile matope, vijiti, na kinyesi cha ng'ombe.

8. Mtindo wa Maisha wa Kupambana na Uchafuzi

Mtindo wa maisha wa kitamaduni wa Wamaasai hauzalishi taka ngumu na gesi hatari zinazodhuru mazingira.

9. Matumizi ya Rasilimali kwa Ushirika na Usimamizi wa Rasilimali Adimu

Maeneo yenye rutuba au yenye hali nzuri ya hewa lakini pia vyanzo vya maji na mimea ni adimu sana katika Maasai, na hivyo, yanamilikiwa kwa pamoja. Hakuna umiliki kupita kiasi wa watu wachache.

10. Kufuga Wanyama wa Nyumbani

Wamaasai hawau au kula wanyama wa porini. Kwa hivyo, wao si wawindaji haramu.

11. Hifadhi Miti na Vichaka

Kijadi, Wamaasai hawakati miti hai. Wanakusanya kuni zilizokufa kwa ajili ya kupikia (na sasa kuna harakati za kuelekea matumizi ya majiko yanayotumia nishati kidogo). Wamaasai hutumia mimea kwa ajili ya

6. Eanyitata oo Ncheriani/Iutarot e Asili/Ncheriani/ Iutarot e Mila, Nkapa/Natinin oo Nturuja

Iyenyit Irmaasai ncheriani/iutarot e asili/mila naaipirita erripoto oo nkitobirunot pee etum imayianat nepaashare oldeket/eng'oki. Eeta Irmaasai iltimito loo lajjjik osuj orreje le asili nemit m'baa pooki nemetipat. Ore m'baa naainyal iseuseu naa nkera nememurrata (*ilayok*) oas, naake ishaakinore pee emayiani te mila eton itu ejing' oo idipe emurati e mila. Neeku mishoruno naa esulare too irmurran teniinyal iseuseu metii tipat.

7. Orreje le Enkishui e Abori

Ore maisha oo irmaasai naidurrudurr penyo neeta enkinyala kiti/kinyi te enkop. Ore nkajjik enye (manyisho/engang') nwitobirwaki too nareta e asili naidimakinoo peeng'wei, nijo anaa nkulukok, nkeek, oomodiok oonkishu.

8. Orreje le Enkishui Opaashare Enkinyala

Ore orreje le maisha e asili oo Irmaasai nemeiu/nemeyau altaka ogol o irgesii torrok ooinyal enkop.

9. Eng'arata oo N'dupot oo Enkitashekinoto oo N'dupot Kuti

Ore iwuejitin naatii entulugumi arashu naatii enkijape sidai enkop, oo nkonyek oonkariak naa kuti naleng' tiatua wuejitin oo Irmaasai, neeku akerripitoi pookin tenebo. Metii sii iltung'anak kuti laa ninje oitore n'dupot enkop aalang' irkulikai.

10. Eramatare Teaang'

Meerr Irmaasai ilowuarak loserok/ing'wesi nemenya sii. Metaa mera nin'je ilainyamok torrok (oos ilowarak).

11. Erripoto oo Irkeek lo Osero Ooirkudun

Ore te mila, nemedung' Irmaasai irkeek ooshal. Ake iturrurr irkeek ootoito pee eyerihore (ore taata neetai enkitayanakino pee eesishoreke iljikoi le enishati kinyi). Eyasishore Irmaasai ilchanito lo oserok pee eramatie oote, ore irkeek naa torbae liang', oo nkujit te

dawa, miti kwa madhumuni ya nyumbani, na nyasi kwa mifugo yao, kwa hivyo wana sheria za kuhifadhi mimea.

12. Majukumu ya Wazee na Viongozi

Jukumu kuu la viongozi wa Wamaasai ni kuhakikisha mila na sheria zao zinazingatiwa kwa ustawi wa jamii. Hii inajumuisha sheria za mazingira, kwani wanaamini kwamba ili kuishi vizuri, lazima kuwe na mahusiano mazuri kati ya watu na mazingira.

Sayansi

- 20 Fikiria mbinu zifuatazo ambapo sayansi ya mazingira na tabianchi huthibitisha maarifa ya kitamaduni ya mazingira ya Wamaasai.

Soma njia tano zifuatazo za kisayansi za kutunza mazingira. Baada ya kila moja, bainisha njia moja au mbili zinazoweza kuthibitisha na kuimarisha (kilichotambuliwa hapo juu) au pambanua utunzaji wa kitamaduni wa uumbaji wa Wamaasai kwa ajili ya kupunguza na/au kukabiliana na mabadiliko ya tabianchi.

Ikiwa kuna wanawake wa kutosha kuwezesha usomaji kwa kikundi kidogo, kuchapisha maandishi kwa kila moja ya njia 5 zifuatazo za kisayansi. Kisha wagawe wanawake katika vikundi vitano ili kusoma taarifa za kikundi chao. Kila kikundi kitajadili na kuwasilisha kwa darasa zima njia ambazo zinaweza kuthibitisha na kuimarisha (kile kilichoainishwa hapo juu) au kupanua utunzaji wa kitamaduni wa uumbaji wa Wamaasai kwa ajili ya kupunguza na/au kukabiliana na mabadiliko ya tabianchi. Waandike kwenye chati mgeuzo/ubao wa karatasi.



nkaraki eramatara enye, neeku eeta ncheriani/iwutarot naarripie irkeek.

12. Isiaitin oo Irpayiani oo Larikok

Ore esiai sapuk oo larikok loo Irmaasai naa pee errip mila oo ncheriani/wutarot pookin oo Irmaasai tenkishon olosho. Ore ena nitushulu ncheriani/utarot enkop, aamu isilig aajo ore pee eetai enkison sidai nishaakinore netii eseriani too iltung'anak oo enkop.

Sayansi

M'birribirra kuna oitoo naa niche eesishore sayansi enkop oo orreje le enkop pee itodolu enkariyiano e asili enkop oo Irmaasai.

Isoma kuna baa/oitoo imiet e sayansi naarrip enkop. Ore teniin'dip aisoma pookin, tolimu engoitoo nabo arashu are naaidim aitodolu neitasheki (nena naasira tehumata ten'de) arashu tolimu erripoto e asili oo nkitobirunot too Irmaasai naaitong'orr arashu nairisheki nkibelekenyat orreje le enkop.

Tenetii nkitwaak kumok pee idimie enkisoma to olturrurr kinyi, nesiri isirat/irkigerot le kila enkoitoo tiatwa kuna oitoo imiet (5) e sayansi. Tirisha nkitwaak too ilturrurri imiet pee iisom m'baa olturrurr lenye. Iro olturrurr nelimu taldarasa pookin nkoitoo naaidim aibalunye nitagol (nena naaitolimwoki teshumata tine) arashu enkitalala erripoto easili toonkitobirunot oo Irmaasai pee itong'orr/arashu irishi nkibelekenyat orreje le enkop. N'choo esiri to orkibao le enkardasi sapuk.

Ufugaji endelevu Eramatare nabikoo	Kulinda bioanuwai Erripoto oo iseuseu	Kulinda mifumo ikolojia ikiwemo nyasi Erripoto e ikolojia (nnatii enkop) oo nkujit	Kuhifadhi nyasi Erripoto oo nkujit	Maisha endelevu ya mazingira Enkishon nabikoo te enkop
<i>Andika majibu kwenye chati mgeuzo.</i>				

1. Ufugaji Endelevu

- Ufugaji endelevu ni mfumo wa uzalishaji wa mifugo unaosimamia ardhi na mifugo kwa njia iliyopangwa ili kutoa faida ya kiuchumi, kijamii, na kimazingira.
- Ufugaji endelevu huchangia huduma za mazingira: kuhifadhi ardhi na mfumo ikolojia, uhifadhi wa bayoanuwai, usalama wa chakula na maji, na kusaidia riziki thabiti.
- Kuna dhana iliyoenea, “Wafugaji hugaribu mazingira kwa sababu wanahifadhi wanyama wengi.” Ushahidi wa kisayansi unaonyesha kwamba uharibifu hutokea wakati mifumo ya mali ya pamoja inapoanguka na katika maeneo ambapo mifugo huzuiwa kuhamia, jambo ambalo haliruhusu malisho kujihuisha upya.
- Hata hivyo, kulingana na Kifungu cha 3 cha Azimio la Umoja wa Mataifa kuhusu Haki za Watu wa Asili, Wamaasai wa Asili wana haki ya kujitawala. Hivyo, Wamaasai wafugaji wana haki ya kuendelea kusimamia mifugo yao kwa ufanisi na kusimamia ardhi yao ya malisho kwa uangalifu.
- Dhana nyingine iliyoenea: “Wafugaji huunda migogoro.” “Ufugaji duniani kote una sifa ya amani, kutokana na mila imara ya ushirikiano na ugawanaji wa rasilimali miongoni mwa jamii za wafugaji. Pale ambapo migogoro inatawala, kwa kawaida kuna sababu za msingi kama vile mmomonyoko wa mipango ya utawala wa ndani, unyang’anyi wa maliasili au kutengwa na huduma na kutoshirikishwa kufanya maamuzi. Migogoro kwa kawaida ni dhihirisho la kushindwa kutoa usalama na huduma za msingi, na kutetea haki za msingi, ikiwa ni pamoja na Haki ya Ardhi ya Pamoja.”
- Maadui wanne wa ufugaji: Unyang’anyaji wa ardhi kwa ajili ya uhifadhi, mabadiliko ya tabianchi, sera zisizo rafiki kwa wafugaji, na changamoto za idadi ya watu.

1. Erramatare Nabikoo

- Ore erramatare nabikoo naa em’bae naitaou ermatate naitasheki enkop oo oeramatate te enkoitoi naidanyaki natumieki dupoto too nkohola, to olosho, oo te enkop.
- Ore eramatate nabikoo neyau siaitin enkop: erripoto enkulukoni oo ikolojia,erripoto e iseuseu, entumoto en’daa o engare, neretoo ntumot esidai.
- Etii engibirribirr natii aajo, “Inyalita ilaramatak enkop torbae lermatate sapuk (ngishu/ndare kumok).” Itodolu shakenishu e sayansi aajo elotu enkinyalare teneurori/teneiting’mbaa oo n’dupot/malin naang’ari neeku emitikini eramatate idurraki, em’bae naake misho enkop metanaru (metubula).
- Kake, ore enaa anajo ematwa e wuni (3) le Enairukokinoteke te Enaboishu oo Loshon le Enkop naipirrita haki (enaishaakinore) oo iltung’anak le asili, eeta Irmaasai le asili haki narikie oote. Neeku, eeta Irmaasai ooramatishe haki naitasheki ermatate enye t esidano neitasheki enkop enye naramatishore te eng’eno.
- Ore engay kibirribirrata natii: “Eeu ilaramatak ilarrabali.” “ore eramatate te enkop pookin neeta eseriani, tarbae/tengaraki e mila sidai e oo erishata oo n’dupot too laramatak pookin. Ore tenetii ilarrabali, naa ake etii inaayetwa, nijo tenerrwoyo n’kidanyat erikore tiatwa armaa oo eworunoto oo n’dupot e asili, arashu egelariteramatata oo tenemetii irmaasai aatwa en’dung’oto oo m’baa’. Ore ilarrabali naake itodolu aajo metii eseriani nemetumitoo eramatata e tipat nitashekini haki e tipat naa tenebo oo Haki e Enkop e-Pooki ng’ai.”
- Irmang’ati oong’wan le eramatate: Eworunoto e enkop torbae le enkarna “erripoto,” nkibeleyenat orreje le enkop, iserai/n’cheriani torrok too ilaramatak, oo n’golikinot enkumoi oo iltung’anak.

2. Kulinda Bioanuwai

- Kwa maneno rahisi, bioanuwai inamaanisha aina zote za maisha Duniani. Kulinda bioanuwai ni ulinzi kwa zaidi ya spishi milioni 100 zinazoishi duniani.
- Utofauti wa spishi (ikiwa ni pamoja na mimea, wanyama, bakteria, na kuvu) na mifumo ikolojia huweka mfumo ikolojia wa kimataifa katika usawa, na kutoa kila kitu katika asili ambacho sisi, kama wanadamu, tunahitaji ili kuishi, ikijumuisha chakula, maji safi, dawa, na makazi.
- Hapa kuna njia tano za kulinda bioanuwai:
 - Zuia ukataji miti.
 - Weka marufuku ya uwindaji wa wanyama wengi.
 - Tumia maliasili kwa ufanisi zaidi.
 - Dumisha maeneo yaliyolindwa kwa wanyama ambapo hakuna shughuli za kibinadamu zinazoruhusiwa.
 - Uwindaji haramu na uwindaji wa wanyama wa porini unapaswa kuzuiwa.

2. Erripoto oo Iseuseu (Oontokiting' Pooki te Enkop)

- Ore too rorei oolelek, ore iseuseu naa enkishon pooki tolosho. Ore erripoto e seusu naa erripoto oo ntokitin naagiroo milionini iip (100) naishu te enkop.
- Ore etii ntokitin naishu napaasha (naa tenebo oo nkujit, ilowuarak, bakteria) oo m'baa e ikolojia nepik m'baa e ikolojia oo loшон pookini te esidano nitau ntokitin pookin e asili nekiyeu yook iltung'anak pee mekimuta, naa tenebo oo en'daa, engare sidai, irkeek/alchani,oo manyisho.
- Neena nkoitoi imiet naarripieki iseuseu (pookin naishu te enkop):
 - Mb'ooi en'dung'oto oo irkeek.
 - Tomito eerare oo ilowuarak kumok.
 - Taasishore dupot e asaili esidai oleng'.
 - Torripo wejitin naing'oreiki lowarak nemeesieki nkiasin oo iltung'anak.
 - Ishaakinore pee iboori ilainyamok ooar lowuarak loserok.

3. Kulinda Mifumo Ikolojia

- Tuanze mada hii ndogo kwa kupitia mtazamo wa ulimwengu wa Wamaasai wa mfumo ikolojia, pambetatu ya utegemeano wa pande zote.
 - **Upande wa kwanza:** Umuhimu wa ardhi (*Oldonyo le Engai* kwa ajili ya ibada), vyanzo vya maji, na hali nzuri ya hewa (*osupuko* na *orpurkel* kwa ajili ya malisho) kwa ajili ya kuishi kwa binadamu na mifugo.
 - **Upande wa pili:** Umuhimu wa mifugo na mimea (*irkeek*) kwa ajili ya kuishi kwa binadamu na kwa ajili ya ibada (mnyama kwa ajili ya kafara na mila, miti kwa ajili ya madhabahu, n.k.).
 - **Upande wa tatu:** Umuhimu wa mahusiano mazuri na wanadamu wenzake, Mungu, na uumbaji usio wa binadamu kwa ajili ya baraka na riziki ya Mungu kwa ajili ya uumbaji wa binadamu na usio wa binadamu.
- Sasa, hebu tuone jinsi dhana hii inavyofanana na dhana ya kisayansi ya mfumo ikolojia.
 - “Mfumo ikolojia ni eneo la kijiografia ambapo mimea, wanyama, na viumbe vingine, pamoja na hali ya hewa na mandhari, hufanya kazi pamoja ili kuunda kiputo cha uhai.”
 - Mifumo ikolojia ina viumbe hai na vitu visivyoo hai kama vile halijoto, unyevunyevu, na ardhi.
- Umuhimu wa mifumo ikolojia:
 - “Mimea na wanyama wote wa Dunia hutegemea mifumo ikolojia kutoa chakula na makazi. Mifumo ikolojia lazima idumishe usawa mzuri ili kubaki hai.” Kwa mfano, nyumbu wanaoishi katika mfumo ikolojia wa savannah wa Serengeti wanahitaji vyanzo vya maji na nyasi za kula. Ikiwa kundi la nyumbu litakula nyasi zote, litalazimika kutafuta nyasi kwingine hadi mvua itakaporudi na kuiboresha nyasi.
- Mifumo ikolojia ya dunia inweza kulindwa kupitia matumizi yanayofaa:
 - Hifadhi rasilimali za maji na uwajibikaji kuhusu matumizi ya maji.
 - Kuendeleza na kutumia usimamizi sahihi wa taka.
 - Epuka matumizi ya dawa za kuua wadudu za kemikali na kuendeleza matumizi ya dawa za kuua wadudu za asili.

3. Erripoto e Ikolojia

- Maiteru ena bae kiti naimu en’dwaata olosho loo Irmaasai te ikolojia (e’chula oo ntokitin te enkop, ewunishu naisiligaro n’jot pookin.
 - **En’choto naituruku:** entipato enkop (Oldonyo le Engai torbae le enkisiyaiare), nkonyek oo nkariak, enkijape sidai (osupuko o orpukel torbae le eramatare) te enkishui oo iltung’anak oo ermatare.
 - **En’choto e eare:** tipatishu eramatare oo nkujit (irkeek) torbae le enkishui oo iltung’anak oo enkisiyaiare (enkiteng e esajare oo e mila, irkeek torbae lo orkitaret).
 - **En’choto e wuni:** tipatishu e eseriani oo irkulie tung’anak, Engai, oonkulie kitobirunot neme iltung’anak torbae le emayiani nkishorunot e Engai te enkitobirunoto oltung’ani oo ineme otung’ani.
- Onaa, matodol siyie enkitanyanyukiet ena kibirribirrata oo enkbirribirrat e sayansi te ikolojia (en’chula oo ntokitin).
 - “Ore en’chula oo ntokiting pookin naa ewueji enkop naake, ore nkujit, ilowuarak pookin, oo nkulie kitobirunot oo orreje le enkijape oo enkop neesisho tenebo pee itobirru entumoto enkishui.”
 - Ore ikolojia neeta oo ntokitin naaishu, oo nemeishu, anaa enkirowuaj, en’chalan, oo enkop.
- Tipatishu e ikolojia (en’chula oo ntokitin):
 - “Ore nkujit oo lowuarak pookin le enkop ning’orita ikolojia (en’chula) te en’daa oo man’yisho. Eyieu ikolojia/en’chula erisoroto sidai pee ebik ishu.” Enkitanyanyukiet, ore iingatin oomanya aatua en’chula/ikolojia e was e siringet/Serengeti neyieu nkonyek oo nkariak oo nkujit naanya. Tenenya iingatin nkujit pookin, nepuku aapuo aing’oru te engay wueji oo meeu en’chan (oo metasha) nebulu nkujit.
- Oore ikolojia/en’chula e enkop nidimi aatorrip tiatua easishore naishaakinore:

Women / Wanawake

- Panda spishi za asili.
- Shiriki katika upandaji miti tena ambapo miti imekatwa.
- Kuendeleza mifumo mbalimbali ya upandaji miti ili kusaidia kudumisha uzalishaji wa udongo na kuzuia mmomonyoko badala ya mfumo wa upandaji wa mazao ya aina moja.
- Tumia mbolea asilia na kupunguza matumizi ya mbolea ya kemikali.
- Kulinda wanyamapori katika eneo lako kwa kuheshimu makazi ya wanyamapori, kuripoti matukio ya biashara haramu ya wanyamapori au ujangili, na usiunge mkono shughuli za unyonyaji wa wanyamapori.
- Torripo n'dupot oo nkariak niasishore tenkoitoi sidai engare/nkariak.
- Enkitashekinoto sidai o olduruki/altaka (pee miinyal enkop).
- Tapaashare nipal ilchanito le esayet oar nkowarak niasishore alchanito le asili oar nkowarak.
- Tuuno n'daikin e asili.
- Tuuno irkeek iisul too wuejitin naatudung'oki irkeet.
- Ntubulai m'baa naapaasha e wunoto oo irkeek pee eretoki enkitobirunoto/erripoto enkulukoni niibok em'bobolota nemeeku ewunore oo n'daokin boo nabo ake.
- Taasishore embolea e asili nintong'orr iasishore embolea naata esayet.
- Torripo ng'wesi/lowarrak te ewueji ino niyanyit manyisho oo lowarak losero, tolimu/isitai ilainyamok le jurusishu torriono/iljangilini loo ng'wesi/lowarak, nemiindik engaina enkitaruooroto/erogon'yata oo lowarak lo osero.

4. Kuhifadhi Nyasi

Nyasi pia ni aina ya mfumo ikolojia, lakini itakuwa na mwelekeo maalum hapa katika muktadha wa Wamaasai.

- “Nyasi za malisho hupatikana pale ambapo mvua ya kawaida haitoshi kuhimili ukuaji wa msitu, lakini si kidogo sana kiasi cha kuunda jangwa. Kwa kweli, nyasi za malisho mara nyingi ziko kati ya misitu na majangwa.”
- Nyasi za malisho ni vyanzo vyema vya kuhifadhi kabon. (Ikimaanisha zina uwezo wa kuhifadhi kiasi kikubwa cha kaboni kwenye mizizi yao ya kina na kuhamisha kaboni kwenye udongo.)
- Kuruhusu nyasi za malisho kupumzika wakati wa kiangazi (kwa kuhamia *osupuko*) na kurudi kutoka maeneo ya juu (*osupuko*) kwenda maeneo ya chini (*olpurkel*) mvua zinaporudi ni njia nzuri ya kudhibiti nyasi, miti, maua (mimea).
- “Nyasi za malisho huhifadhi takriban 34% ya akiba ya kaboni duniani kote...Tofauti na misitu ambapo mimea ndiyo chanzo kikuu cha uhifadhi wa kaboni, kaboni nyingi ya nyasi huhifadhiwa kwenye udongo.”
- “Kuongezeka kwa hatari ya ukame na moto kunafanya nyasi za malisho kuwa vyanzo vya kaboni vinavyotegemewa zaidi kuliko miti...Hata hivyo, Miti bado ni muhimu sana. [Utafiti] haupendekezi kwamba nyasi za malisho yanapaswa kuchukua nafasi ya misitu kwenye mandhari au kupunguza faida nyingine nyingi za miti.”
- “Vitisho kwa nyasi asilia, pamoja na wanyamapori wanaoishi juu yake, ni pamoja na kilimo, ufugaji kupita kiasi, spishi vamizi, uwindaji haramu, na mabadiliko ya tabianchi.”

4. Erripoto oo Nkujit

Ore sii nkujit naa nabo oo m'baa e ikolojia (en'chula), kake eeta en'joto naibala tiatwa Irmaasai.

- Ore nkujit oo 'ndaat eramatare netumi tenesha en'chan nemeidim aitubulu ntimi, kake mee kinyi sii naleng'nayau alamei. Ore tesipata ore nkujit oo n'daat eramatare netii erishata oo ntimi oo irpurai.
- Ore nkujit oo n'daat eramatare nashum oleng'kabon. (Ake eeta enkidimata nashumie kabon sapuk too ntana enye adoru, nidurrakinye kabon aatwa enkulukoni.)
- Tenishori nkujit oo n'daat eramatare miyang'iyang'ata tenkata alamei (nidurrakini osupuko) neshukunyie too n'chumat (osupuko) aadoiki wejijin e abori (orpukel), tenelotu en'chan naa enkoitoi sidai naing'orieki nkujit, irkeek, irmauya (irkeek).
- “Ore nkujit oo n'daat eramatare nashum ematwa nabaya osom oong'wan (34%) e kabon te enkop pookin...epaaha oo ntimi naa nkujit naleng' naashum kabon. Ore kabon sapuk oo nkujit neshuma tiatua enkulukoni.”
- “Ore tenepona en'golikinoto alamei o enkima/enkirowaj, nisho nkujit oo n'daat metaa ninje niashoru kabon aisul aalang'irkeet...Kake, iletipat ake irkeek oleng'. [En'jurre] ore nkujit eramatare neya eng'asiata oo ntimi te enkop arashu itong'orr dupot kuliek kumok oo ikeek.”
- “Ore naaiture nkujit e asili tenebo oo ng'wesi/lowarak lo oserok oomanaya naa tenebo oo enturore, eramatare sapuk natuluso, ngujit naaing'waa kulye kwapi, eerare oo lowarak/ngwesi, oo nkibelekenyat oireje enkop.

5. Maisha Endelevu Kiikolojia Yanayolingana na Mazingira

- Kuishi kwa uendelevu “...kunajumuisha ujuzi, mali (nyenzo na kijamii) na mbinu zitakazotumiwa na watu binafsi na jamii ili kuishi. Kipengele cha maisha uendelevu kinamaanisha kwamba watu hawa au jamii wanaweza kukabiliana na kushinda nyakati za msongo wa mawazo na/au mgogoro, na kwamba wanaweza kudumisha au hata kuboresha ujuzi na mali za sasa na za baadaye bila kutumia rasilimali zao za asili.”
- Vitisho kwa usalama wa maisha endelevu ya mazingira vinajumuisha mambo ya nje, kama vile mabadiliko ya tabianchi, ukuaji wa idadi ya watu, na sera za serikali.
- Kuna rasilimali za msingi (“mtaji”) kwa maisha endelevu: rasilimali za asili, binadamu, kijamii, kimwili, na kiuchumi.

5. Enkishon Nabikoo, te Ikolojia Naarisioro/Naaishaakinore Enkop

- Ore enkishui nabikoo “...itushulu enkarriyiano, n’dupot oo losekin oasishore iltung’anak makewon oo olosho te enkishui. Ore em’bae enkishui/enkishon nabikoo nitodolu aajo, ore kulo tung’anak arashu olosho, neidim airisha niisul nkataitin naagol oo nkibirribirrat arashu ilarrabali, naa eidim sii aatobikie arashu aaitaa sidai enkarriyiano oo n’dupot e taata oo ne ade itu eesishore n’dupot enye e asili.”
- Ore naaiture eseriani enkishui/enkishon nabikoo enkop tenebo oo m’baa e boo, nijo anaa: nkibeleyenat orreje le enkop, emponato oo iltung’anak/olorere, oo serai/n’cheriani e sirkale.
- Etii dupoto e tipat (“ormutaji”) te enkishon/enkishui nabikoo: n’dupot e asili, iltung’anak, tolosho, too seseni, oo too nkohola.

3) UCHUNGUZI ufafanuzi au tafakari ya maudhui ya msingi

Wamaasai

- 5
- Kwa hivyo, hebu sasa tuunganishe mbinu hizi za kupunguza na kuhimili mabadiliko ya tabianchi na mtazamo mkubwa wa Wamaasai kuhusu ulimwengu (mtazamo wa ulimwengu).
 - Mbinu hizi za kitamaduni za maarifa ya mazingira za Wamaasai ni nzuri kwa utunzaji wa uumbaji.
 - Mbinu hizi za utunzaji wa uumbaji zinawakilisha uelewa wa Wamaasai unaozingatia utegemezi wa pande zote mbili na mazingira ambayo yameundwa na Engai—yanayoonekana katika kuwatunza watu, mifugo, viumbe vyote vilivyo hai, na ardhi (wanadamu na viumbe visivyo binadamu)—ambayo hudumisha maisha na riziki ya Wamaasai.
 - Kwa hivyo, Wamaasai wanaelewa kwamba ustawi wa binadamu maishani unatokana na uhusiano mzuri na 1) *Engai*, 2) watu wengine, na 2) viumbe visivyo binadamu.
 - Vipengele hivi vitatu vinaonekana kama kigoda chenye miguu mitatu, *olorika*.
 - Kwa kuwa ina miguu mitatu inakuwa na nguvu na imara—hata kwenye ardhi isiyo na usawa—na kufanya kazi vizuri zaidi.
 - Mtizamo wa Wamaasai wa baraka (*empuris e Engai*) au laana (*eng'oki*) kama matokeo ya uhusiano wa uadui kati ya wanadamu na Mungu lakini pia kati ya wanadamu na viumbe visivyo wanadamu.
 - Uliwafanya Wamaasai kuheshimu sheria za asili/sheria za kitamaduni zinazowataka kutunza uumbaji ili kupata baraka na kuepuka laana.
 - Wamaasai wana mfumo wa rika pamoja na sheria za kitamaduni zinazokataza jaribio lolote lisilo la lazima la kuvuruga bioanuwai na wapiganaji (*ilmuran*).



3) ENGING URAROTO enkitalalaunoto arashu engibirribirr e engiteng'ena e tipat

Irmaasai

- Neeku, maitutumo siye kulo osekin ootong'orr niirish nkibelekenyat orreje le enkop oo enkibirribirrata sapuk naata Irmaasai to olosho (enkibirribirrata olosho).
- Ore kulo osekin le mila/orkwaak le enkariyiano enkop too Irmaasai naa sidan te erripoto oo nkitobirunot.
 - Ore kulo osekin le erripoto oo nkitobirunot naake itodolu eyelounoto oo Irmaasai naipirita eretoto oo n'chot pookirare oo enkop naitobirwa Engai—nalioo aajo eretokito iltung'anak, eramatare, n'tokiting pookin naishu oo enkop (iltung'anak oo ntokiting' neme iltung'anak)—naake itobik enkishui oo ntumot/en'daa oo Irmaasai.
 - Neeku, eyielo Irmaasai aajo ore empuan oo iltung'anak tenkishon tenetii esidai oo Engai (1), iltung'anak kulie, oo ingitobirat' neme iltung'anak (2).
 - Ore kuna kipengeleni wuni nelioo enaa olorika loo nkejek wuni (olorika le maa).
 - Ore aamu eeta nkejek wuni neeku eeta en'golon nitashe esidai—baiki te nkop nemerisyo—nees esiai esidai naisul.
 - Ore enkibirribirr oo Irmaasai te emayani (*empuris e Engai*) arashu oldeket (*eng'oki*) nayeu mang'atishu too iltung'anak oo Engai, oo ake sii too iltung'anak oo nkitobirunot neme iltung'anak.
 - Ishoo ena Irmaasai miyenyita n'cheriani/wutarot e asili/e mila naayieu nin'che pee errip nkitobirunot Engai pee etum emayani nepaash ildeketa.
- Eeta Irmaasai em'bae oo lajijik tenebo oo n'cheriani e mila naaibooyo m'baa pooki torrok naainyal sesuseu naa iljeshi (irmurran).

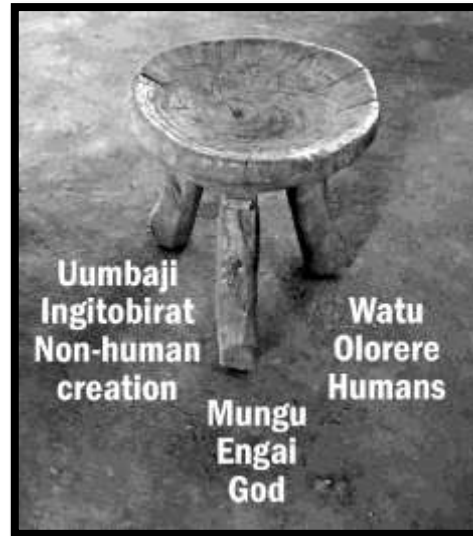
- Vurugu dhidi ya bioanuwai kwa kawaida hufanywa na watoto; wasiotahiriwa (*ilayok*) hata hivyo wanapaswa kutakaswa kupitia mila kabla na baada ya ibada za tohara. Kwa hivyo, ni marufuku na ni aibu kwa *ilmuran* kuharibu bioanuwai bila pasipo na ulazima.

- Ore ilarrabali oinyal iseuseu naa nkera oshi naas; nkera memurata (*ilayok*) nake, ishaakinore pee itisin'yi te mila oo enkisiyare eng'orr emurata, oo idipaki emurata. Neeku, entaboi naa esulare too irmuran te niinyal iseuseu (nkitobirunot enkop) tenemishaakinore.

Pembetatu ya Uumbaji wa Kibiblia



- 5
- Uelewa wa Wamaasai kuhusu ulimwengu—unaowakilishwa na kiti chenye miguu mitatu (*olarika*)—unafanana na uelewa wa kibiblia kuhusu ulimwengu unaoonekana katika “pembetatu ya uumbaji.”
 - Wasomi wa Biblia wanaita hii “pembetatu ya uumbaji,” ambapo amani (*shalom* katika Kiebrania cha Biblia) hutokana na upatanisho na Mungu, wanadamu, na uumbaji usio wa kibinadamu.
 - Amani (*shalom*) hutokana na kupatanishwa (katika uhusiano sahihi) na Mungu ambao huishi kwa amani na wengine (haki ya kijamii) na amani na uumbaji (utunzaji wa uumbaji/mazingira).
 - Kwa hivyo, mtazamo wa Kikristo wa ulimwengu unazingatia injili—habari njema inayowapatanisha watu wenye dhambi na wenye ubinafsi na Mungu Muumba.
 - Nguvu ya injili huwezesha mabadiliko tuliyojadili katika somo la kwanza.
 - Ubinafsi, kutojali na uchoyo vinasababisha mgogoro wa mabadiliko ya tabianchi.
 - Sayansi nzuri haitoshi. Maarifa hayatuwezeshi kushinda ubinafsi na uchoyo wa kibinadamu.
 - Tunahitaji kubadilishwa! Tunahitaji kuwa na maana na kusudi maishani ambalo si tu uchoyo wa kibinadamu, ulaji, na kufanya



Ewunishu e Enkitobirunoto te Biblia

- Ore eyelounoto oo Irmaasai too m'baa olosho nitodolu olorika loo nkejek wuni (*olorika*)—nyenyanyikie, eyelounoto te Biblia te nkipirata olosho elioo tiatua “ewunishu oo nkitobirunot,” naa wore eseriani, (*shalom*) tiatua Brania te Biblia) naa tenkaraki osotwa te Engai, iltung'anak, oo nkitobirunot neme iltung'anak.
- Ore Eseriani (*shalom*) naa osotwa nayau (tiatua osotwa osipa) te Engai naboitare oorkulie tung'anak te eseriani (haki olorere/olosh) oo eseriani too nkitobirunot (erripoto oo nkitobirunot/enkop).
- Neeku, ore enkibirribirr e Kirisianishu to olosho nesujita ewangelion, orerei sidai oitutum/oitaki osotwa iltung'anak loong'ok (aing'okok), oo le makewon, oo Engai Alaitabirunoni.
- Ore en'golon e Wangelion neeu nkibelekenyat nekiimakitia te enkisoma engaiterr/edukya.
 - Ore orreje le makewon, nemishilaarisho, oo empiani neyau alarrabal loo nkibelekenyat orreje le enkop.
 - Ore sayansi sidai nemeidip. Midimie iyiook enkariyiano maisula makewon oo empiani etung'anishu.
 - Kiyeu nkibelekenyat! kiyeu nekitum em'barakinoto oo entilata te enkishui, ne mee empiani etung'anishu ake, daare, nekias m'baa

mambo yanayopata pesa nyingi lakini pia yanachangia gesi zinazoongeza joto duniani na, hivyo, mabadiliko ya tabianchi.

- Kuishi kama watu wanaozingatia injili kunatupa kusudi maishani la kuleta mabadiliko.
- Roho Mtakatifu hutuwezesha sisi na jamii zetu za Kikristo kuishi kulingana na imani zetu za kibiblia kwa njia ya kuwa baraka kwa ulimwengu.
- Kama wafuasi wa Yesu, tunaishi kulingana na imani yetu—tukiwezesha na Roho Mtakatifu—katika kuwahudumia wengine (haki ya kijamii) na kuwahudumia viumbe (mazingira).
Waefeso 1:18–21 [Naomba hivyo] “macho ya mioyo yenu yatiwe nuru, mjue tumaini la mwito wake jinsi lilivyo; na utajiri wa utukufu wa urithi wake katika watakatifu jinsi ulivyo; na ubora wa ukuu wa uweza wake ndani yetu tuaminio jinsi ulivyo; kwa kadiri ya utendaji wa nguvu za uweza wake; aliotenda katika Kristo alipomfufua katika wafu, akamweka mkono wake wa kuume katika ulimwengu wa roho; juu sana kuliko ufalme wote, na mamlaka, na nguvu, na usultani, na kila jina litajwalo, wala si ulimwenguni humu tu, bali katika ule ujao pia...”

Tazama Inaendelea: Tumaini

- 2
- Hivyo, tunaweza kukabiliana na changamoto za mabadiliko ya tabianchi kwa matumaini.
 - Kwanza, tunajua kwamba Muumba wetu, Mungu wa Tumaini, anapenda ulimwengu, na Mungu hatauacha kamwe.
 - Pili, kama wafuasi wa Yesu Kristo, tumewezeshwa na Roho Mtakatifu kuwa baraka kwa wengine (haki ya kijamii) na uumbaji (mazingira).



naata mpesai/nkohola kumok kake, eponita sii orgesi oyau enkirowaj sapuk te enkop, oon kibebekenyat orreje le enkop.

- Tenekiaku tenkishui enaa iltung'anak oosujita ewangelion, nikitum entilata naayau nkibebekenyat.
 - Idimie iyook oo olorere lang'le Kirisianishu Engiyang'et Sinyati pee kiaku enaa enayew inkirukoto aang' e Biblia nekiaku emayiani tolosho.
 - Ore enaa ilairukok le Yesu, nekitii anaa enayew engirukoto aang'idimie iyook Engiyang'et Sinyati—kiretoki irkulikai, (haki oo lorereni) oo erripoto oo nkitobirunot (enkop).
Ile Efeso 1:18–21 “Aomon pee eitawang inkonyek oo Itauja linyi pee itumutumu aatayiolo ilo siligi oipotokoki intae, aatayiolo aajo kebaa ina golon enye nemetemayu naa ninye naasisho ti atua iyook iloiruko, te risioroto easata enkidimata enye kitok. Enapa nataasishore ti atua Kristo pee eitopiu aitung'uaa enkeeya neisho metotona te nkaina enye e tatene too wuejitin e shumata. Te ine eitore tukul pooki ootoreisho, o nkidimat pooki, o engolon e nkitoria, neitoreisho oleng te shumata pooki arna naipoti neme kuna ake e na kata kake o ne idia nalotu.”
- ## Ng'urai Ake: Osiligi
- Neeku, kiin'dim aataapare/airisha n'golikinot oo nkibebekenyat orreje le enkop to osiligi.
 - Enaituruku, kiyielo aajo, ore Alaitobirani lang', Engai o Osiligi, enyorr olosho, nemeing'waa aikata Engai.
 - Eneare, ore enaa ilairukok le Yesu Kristo, idimie iyook Engiyang'et Sinyati pee kiaku emayiani too irkulikai (haki olosho/olorere) oo nkitobirunot (enkop).

4) KUTUMIA

kufanya au kutumia mafunzo

14 *Maswali ya majibu mafupi.*

- Kwa nini ni muhimu kudumisha mifumo ikolojia?
- Ninawezaje kuhifadhi maji katika mazingira yangu?
- Ni miradi gani ya urejesho ambayo naweza kujiunga nayo?
- Ninaweza kufanya nini ili kulinda wanyamapori katika eneo langu?

Saidia mazungumzo kama vile:

- Kushiriki katika miradi ya urejesho:
 - Miradi ya urejesho wa mifumo ikolojia inalenga kuimarisha uadilifu wa ikolojia na kuboresha ustawi wa mifumo ikolojia na jamii za wenyeji.
 - Mashamba na miti huchukua jukumu muhimu katika ufyonzaji wa kaboni na kutoa makazi kwa wanyama.
- Kuelimisha na kuongeza uelewa:
 - **Endelea kupata taarifa:** Jijulishe kuhusu masuala ya mazingira, desturi za uhifadhi, na maendeleo ya kisayansi yanayohusiana na mifumo ikolojia.
 - **Shirikisha maarifa:** Ongeza uelewa miongoni mwa familia yako, marafiki, na jamii kuhusu umuhimu wa kudumisha mifumo ikolojia na hatua wanazoweza kuchukua.
 - **Shiriki katika programu za elimu ya mazingira:** Saidia au shiriki katika mipango ya elimu ya mazingira katika eneo lako: mipango inayokuza uelewa wa ikolojia na kutoa mafunzo kwa jamii za wenyeji kuhusu masuala kama vile kilimo endelevu.

Uandishi wa nyimbo

Au 14 *Shughuli hii inaweza kuchukua dakika 10–15. Kwa hivyo, ingawa ni programu nzuri sana, inahitaji muda wa kutosha kuikamilisha vizuri.*

4) EESISHOREKI

eesata arashu eesishoreki engiteng'ena

Ingikilikwanat oo wolikinot dorropu.

- Kanyoo tipat nayeu erripoto e ikolojia (en'chula oontokiting pookin)?
- Kaja aiko paa ashum/arrip engare te enkop aai?
- Kakwa miradini le enkitapuata enkop aidim aatijing'a?
- Kanyoo aidim aataasa pee arrip ngw'esi e enkop te enkop aai?

Taretoki nkirorot nijo kuna:

- Enkidikore oo irmuradini ootopok enkop:
 - Ore irmuradini ootopok m'baa e ikolojia (en'chula oontokiting pookin te enkop) netil pee eretoo aitagol enkishaa e ikolojia (en'chula oo pookin te enkop) oo empuan oo m'baa e ikolojio oo olosho loo iloopeny.
 - Ore nkurrman oo irmitii neeta eng'asiata e tipat eibibi kabon lowuarak manyisho.
- Enkiteng'ena oo emponota eyolounoto:
 - **Tonyorrai pee itum ilomon linteng'enwo:** ntayolo kewon m'baa enkop, mila erripore enkop, oo dupoto/maendeleo e sayansi naaipirita m'baa e ikoloji (en'chula oo ntokiting' pookin te enkop).
 - **Tang'arie irkulikai enkarriyiano/eng'eno:** topono eyelounoto tiatwa armarei lino, ilchorweta, oo olosho esidano erripoto e ikolojia (en'chula oo ntokitin pookin te enkop) oo m'baa naaidim aataas.
 - **Tijin'ga aatwa irmudadini le enkiteng'ena oo m'baa enkop:** Taretoki arashu tijing'a aatwa nkidan'yat enkiteng'enwo oo m'baa enkop tewueji/te enkop ino: Nkidan'yata naaponaa eyelounoto e ikolojia nitau enkiteng'ena too loopeny enkop anaa enturore nabikoo.

En'dungunoto/Enkitobirata oo Sinkolioitin

Ore ena siai neidim aawa ildakikani tomon metabaiki tomon oo imiet (10–15). Neeku, ore enaake engiteng'ena/ormuradi sidai naleng', eyieu enkata naishaakinore naidipieki esidai.

Women / Wanawake

- Kila kikundi kidogo: Tengeneza maneno kwa ubeti mmoja wa wimbo kuhusu maarifa na desturi za kitamaduni za kimazingira za Wamaasai ambazo pia ni njia bora za kupunguza mabadiliko ya tabianchi. Tumia sauti ya kawaida inayojulikana na wanawake wengi. Wimbo wa Wamaasai wa kupokezan unaweza kuwa njia nzuri ya kuanzia. Kisha, kila kikundi kiimbe ubeti wao.
- Ore kila olturrurr kiti: Tudungu/ntobiru orbeti obo lo osinkolio oitodolu enkariyiano orkwaak le mila te enkop oo Irmaasai naara sii nkoitoidan naaitongorr' nkibeleyenat orreje le enkop. Taranye to-oltoilo otamoo nkitwaak kumok. Ore osinkolio loo Irmaasai ong'amakinoi neidim aataa enkoitoidan sidai ninterunyene. N'choo erany kila oturrurr orbeti lenye.

1

Maombi

Enkomono

60

Mwisho wa Somo

Engiting'oto Osomo/Enkisoma

8. Women's Groups Lesson 3: Kiswahili/Maa

Integrating Climate Science

Kuunganisha Sayansi ya Tabianchi katika Muktadha wa Wamaasai Enkidikidikoto e Sayansi Orreje le Enkop to-Rkwaak loo Irmaasai

Hoja Kuu Enkironoto kitok

Kuunganisha sayansi ya tabianchi—ambayo inafaa kwa muktadha wa Wamaasai—kunaweza kusaidia kuzuia na kukabiliana na changamoto zinazotokana na mabadiliko ya tabianchi.



Enkidikidikoto e sayansi orreje le enkopnanare torkwaak lo Irmaasai — iidimaataretoki aiboo n'torrok— naapukunye nkibeleyenat orreje le enkop.

Matokeo ya Kujifunza

Kama matokeo ya somo hili, mwanafunzi atafanya yafuatayo:

Ore ntilat ena kisoma naa pee iidim oloiteng'eni aataasa kuna:

Kujua



Sayansi ya tabianchi

- **Mapitio:** Kuelewa dhana kuu za sayansi ya tabianchi, yaani, mabadiliko ya tabianchi, athari athari ya blanketi, gesi zinazosababisha ongezeko la joto duniani zinazosababishwa na binadamu na athari zake kwa mifumo ikolojia na wanadamu.
- **Mapitio:** Elewa athari kuu za mabadiliko ya tabianchi kwa mifumo ya ikolojia na binadamu
- Fahamu tofauti kati ya kupunguza mabadiliko ya tabianchi (kinga) na kukabiliana nayo (kupunguza hatari ya athari mbaya).
- Elewa kanuni kuu za ufugaji endelevu.



Sayansi Orreje le Enkop

- **Nkiimat:** eyolounoto oo m'baa sapukin e sayansi orreje le enkop, enaa, nkibeleyenat orreje le enkop, entorroni nayau irgesii torrok (entorroni orbiranketi), irgesii oitaa sapuk em'ponoto engirowuaj te enkop naa iltung'anak ooyau oo n'golikinot enyena too m'baa pookin oo iltung'anak.
- **Nkiimat:** Tayelo n'golikinot sapukin oo nkibeleyenat orreje le enkop too m'baa pookin oo iltung'anak.
- Tayelo empaashata natii, tenkitong'orata oo nkibeleyenat orreje le enkop (enkibooroto) oo enkirishata (enkitong'oroto oo n'golikinot torrok).
- Tayelo nkoitoi sapukin eramatara nabikoo.

Wamaasai

- Fahamu mbinu bora za kukabiliana nayo zinazofaa kwa muktadha wa jadi ya Wamaasai.
- Fahamu mbinu bora za kukabiliana nayo kwa ajili ya ustahimilivu unaofaa kwa muktadha wa jadi ya Wamaasai.
- Fahamu changamoto zinazoendelea katika muktadha wa Wamaasai.



Irmaasai

- Tayelo nkoitoi sidan enkirishata naaishaakinore torkwaak le asili oo Irmaasai.
- Tayelo nkoitoi sidan enkirishata tenkaraki orng'iria oishaakinore torkwaak le asili oo Irmaasai.
- Tayelo n'golikinot neton etii tiatua orkwaak loo Irmaasai.

Pembetatu ya Uumbaji wa Biblia

- Elewa jinsi sayansi ya tabianchi inavyoweza kusaidia utunzaji wa uumbaji katika mapana yake ya kiroho na kimaadili ya uwakili wa mazingira yalivyoelezwa katika mafundisho ya Biblia.



Tumaini

- Elewa kwamba wanasayansi wa tabianchi na wanamazingira wana matumaini kwamba juhudi za binadamu zinaweza kupunguza mabadiliko ya tabianchi, ambayo huhimiza matumaini.
- Fhamu maandiko muhimu ya Biblia yanayofundisha kwamba Mungu ameahidi kutowahi kuuacha uumbaji na kwamba hatimae uumbaji utapatanihwa na kurejeshwa kikamilifu.
- Tambua kwamba juhudi zetu za kushughulikia mabadiliko ya tabianchi ni sehemu ya shughuli inayopelekea hatima yenye tumaini kutoka kwa Mungu huku tukiwa waaminifu kwa agizo la Mungu la kutunza uumbaji.



Ewunishu oo Nkitobirunot e Biblia

- Tayelo eniko sayansi orreje le enkop teneret erripoto oo nkitobirunot tiatua elalai enye oo ltauja oo rkwaak sidai too m'baa enkop enaa enalimuno too nkiteng'emat e Biblia.

Osiligi

- Tayelo aajo ore ilang'eni le sayansi orreje le enkop oo lang'eni le enkop neeta osiligi aajo ore ny'waat oo iltung'anak neidim aaitong'oro nkibeleyenat orreje le enkop. Naake eyau osiligi.
- Tayelo irkigerot letipat le Biblia oo iteng'enisho aajo ming'waa aikata Engai nkitobirunot neeku ore nkitobirunot neitutumi nitopoki tesidano.
- Tayelo aajo ore nywaat ang' eepareto oo nkibeleyenat orreje le enkop naa tenebo oo m'baa naayau osiligi oing'waa Engai tenebo oo tenekiaku asipak torkilikwai le Engai lerripoto oo nkitobirunot.

Hisi



- Wamepewa maarifa yanayofaa.
- Wamewezeshwa kupitia maarifa ya kupunguza na kuhimili mabadiliko ya tabianchi katika ardhi ya Wamaasai.
- Wana hamu ya kuleta mabadiliko.
- Wana wajibu wa kusababisha mabadiliko mazuri.
- Wana matumaini kwa mustakabali wao, kwa sababu Mungu anaupenda ulimwengu na hatauacha kamwe.

- Ishooki enkariyiano nanare.
- Idimieki tiatua enkariyiano enkitong'oroto oo rng'iria loo nkibeleyenat orreje le enkop te enkop oo Irmaasai.
- Eeta esirai peeyau nkibeleyenat.
- Ishaakinore pee eyau nkibeleyenat sidan.
- Eeta osiligi too m'baa enye, amuu enyorr Engai olosho nemeing'waa aikata.

Fanya



- Chora jedwali lenye safu mbili na ibainishe baadhi ya mbinu bora za kupunguza mabadiliko ya tabianchi kwenye safu moja na za kukabiliana na hali kwenye safu ya pili (njia zinazofaa katika muktadha wa Wamaasai).
 - Bainisha njia 3 zinazofaa ambazo mtu anaweza kuleta mabadiliko katika kupunguza mabadiliko ya tabianchi (kupunguza) katika muktadha wa kitamaduni wa Wamaasai.

- In'geru isirat oojing m'bat are, nisirr matwa oo m'baa sidan naaitong'orr nkibeleyenat orreje le enkop tem'bata nabo, oo nenkirishata tengkayi bata (nkoitoi naaishaakinore torkwaak loo Irmaasai).
 - Tolimu nkoitoi wuni naaishaakinore naaidim oltung'ani aayau nkibeleyenat tiatua enkitong'orato oo nkibeleyenat orreje le enkop (enkitong'orata) tiatua orkwaak le asili oo Irmaasai.

Vifaa vya Kufundishia Vinahitajika

- Michoro ya mabadiliko ya tabianchi
- Picha ya athari ya blanketi kwenye ubao wa karatasi au karatasi kubwa
- Ubao wa karatasi au ubao wa kawaida

Eyewuni Inareta Naaiteng'enishoreki

- Impichai oo nkibelekenyat orreje le enkop
- empicha entorroni irgesii torrok/orbiranketi torkibao le nkardasi arashu enkardasi sapuk.
- Orkibao lenkardasi sapuk arashu orkibao orok

Vifaa vya Wanafunzi / Vipeperushi vya Karatasi

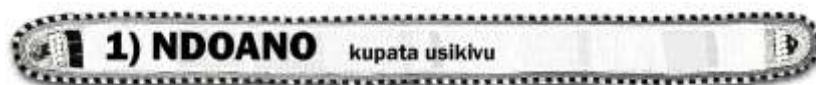
- Ubao wa karatasi au karatasi kubwa na kalamu za alama

Inareta oo Looiteng'eni/Ingardasini Kunyinyi

- Orkibao le enkardasi arashu empalai sapuk oo arkalamu osirishoreki

Dakika

Maudhui



8 *Wanafunzi wanapaswa kuunda vikundi vidogo na kujadili kwa dakika 2.*

- Bainisha athari za mabadiliko ya tabianchi zilizotokea katika mazingira yao ya Asili.
- Linganisha mazingira wakati wa utoto wao na hali ya mazingira ya sasa.

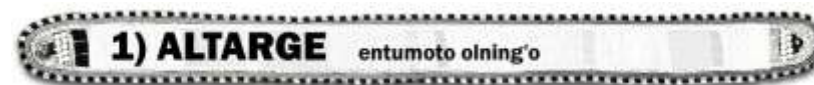
Mmoja kutoka kila kundi anapaswa kuwasilisha uchunguzi mmoja mbele ya darasa. Kila mtoa mada anapewa dakika 1.

Jaribu kupitia hili haraka sana, kwani hili linajadili kile tunachokijua tayari, ili kutoa muda zaidi wa kukuza maarifa mapya.

Kauli kiunganishi (kuunganisha Ndoano na Hoja Kuu)

- 1
- Kutokana na maoni yaliyoshirikishwa, ni wazi kwamba kuna mabadiliko makubwa katika mazingira yetu, jambo ambalo huathiri vibaya mtindo wetu wa maisha wa kitamaduni.
 - Kupitia mitazamo ya kisayansi sasa, hebu tuone kinachotokea kwa mazingira yetu. Maarifa haya yatatuwezesha kuelewa vyema kinachoendelea nje ya muktadha wetu na kuathiri hata katika ardhi yetu.

Enaiteng'enuoi



Ishaakinore ilooiteng'eni piitobirr ilturrurri kutiti neimaki kuna baa tooldakikani aare.

- Nelimu n'golikinot oo nkibelekenyat orreje le enkop naatupukutuo tiatua enkop enye e asili.
- Nitanyanyuk enkop tenkata aakutiti/tem'bulunoto enye oo tenarishata etaata.

Kila olturrurr neyieuni peeta oltung'ani obo olikioo nena baa taldarasa pookin taldakika obo.

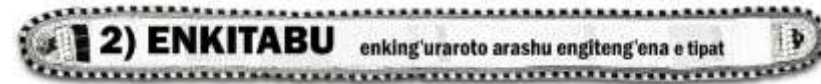
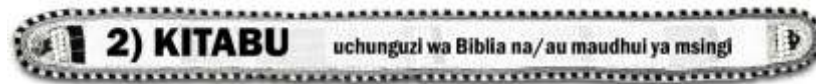
Tanywaa iimai kuna aaseki naleng' aamuu kin'dipa aing'urai kuna baa metaa kiyiolo, pee kitum enkata neking'uraa enkariyiano ng'ujuk.

Ilomon lenkidikidikoto (enkidikidikoto Altarge oo Em'bae Kitok)

- Ore Enaa n'dwaat nekitoning'o, nibala aajo etii nkibelekenyat sapukin aatwa enkop ang' em'bae naakee eyau en'golikinoto torrono tenkishon easili.
- Ore enaa n'dwaat e sayansi taata, matodol siyie nena naaidim aatupuku tiatua enkop aang'. Ore ena arriyiano nidimie iyook matayielo esidai nena naatii bata orkwaak lang' naaidim aayau n'golikinot tiatua enkop ang'.

- Katika somo la kwanza, tulikumbushwa agizo la Mungu kwa wanadamu la kutunza uumbaji wa Mungu. Katika somo la pili, tulitambua jinsi maarifa ya jadi ya mazingira ya Wamaasai na ufugaji endelevu vinavyoendana na maagizo ya Mungu ya kutunza uumbaji. Katika somo hili, tutazingatia sayansi ya tabianchi kwa njia mbili.
 - Kwanza, tunaona kwamba ufugaji endelevu unaendana na uhifadhi na sayansi ya tabianchi kwa njia nyingi.
 - Pili, tutaangalia jinsi ambavyo tunaweza kupanua maarifa yetu ya kitamaduni kupiti taarifa kutoka kwa wanasayansi ili kutusaidia kukuza njia za kupunguza athari za mabadiliko ya tabianchi na jinsi ya kupunguza hatari ya athari mbaya ambazo tayari tunazipata.

- Ore tiatua enkisoma naiturukwo, nitadamwaki iyook orkilikwai le Engai toltung'anak lerripoto oo nkitobirunot Engai. Ore tenkisoma eare, nekitadua eniko enkariyiano easili enkop oo Irmaasai oo eramatare nabikoo eniko enenyanyuk oo orkilikwai le Engai lerripoto oo nkitobirunot. Ore tenakisoma, neking'uraa sayansi orreje le enkop toonkoitoo are.
 - Enaituruku, kidolita aajo ore eramatare nabikoo nepuo tenebo oo erripoto oo sayansi orreje lenkop toonkoitoo kumok.
 - Ore eniare, king'uraa enekingo pee kintalala enkariyiano aang' easili naimu ilimunot oo iltung'anak le sayansi peeretoki iyook peekishumu nkoitoo naaitong'orr n'golikinot naayau nkibeleyenat orreje lenkop oo ene kingo tenikintong'orr n'golikinoto nekin'dipa aainoto.



18 *Maelezo ya kufundisha: Uliza maswali 7 yafuatayo na uongoze majadiliano, ukijaza nafasi zilizowazi na maudhui yaliyo hapa chini. Katika somo la dakika 60, kila kitu hakiwezi kujumuishwa. Taarifa zaidi zimetolewa hapa ili kumjulisha mwalimu. Wastani wa dakika 3 kwa kila swali kati ya maswali 6 ya kwanza; #7 ina dakika 10.*

Irkiliku lengiteng'ena: Nkilikwanu irmaswali naapishana ootii ene nirikoo ilo turrurr, niim'put iwuejitin nemesira toom'baa naatii aabori tene. Ore tenkisoma oo ldaikani ntomoni ile, meidimi aaimaki m'baa pookin. Itawuoki orkilikwai tiabori tene piiliki alaiteng'enani/armalimui.

Sayansi ya Tabianchi: Kupunguza na Kukabiliana na Mabadiliko ya Tabianchi



Tuanze na marudio ya dhana kuu ihusuyo mabadiliko ya tabianchi.

1. Mabadiliko ya tabianchi ni nini?

- **Marudio:** Mabadiliko ya tabianchi hurejelea mabadiliko ya muda mrefu katika hali ya joto, mvua, mifumo ya upepo, na vipengele vingine vya mfumo wa tabianchi wa Dunia. (Dhana muhimu!)

Sayansi Orreje le Enkop: Engitong'orata oo Enkirishata oo Nkibeleyenat Orreje le Enkop

Maiteru oo ngigilat em'bae sapuk naipirita nkibeleyenat orreje le enkop.

1. Kanyoo nkibeleyenat orreje le enkop?

- **Iimai:** Ore nkibeleyenat orreje le enkop naa nkibeleyenat engata naado tengata enkima/enkirowuaj, enchan, nkataitin osiwuo, oonkulie baa pookin orreje le enkop tolosho. (Em'bae etipat!)
- Eeta ilang'eni le sayansi wasiwasi aamu ore orreje le enkop naakibeleyenya te enkop pookin.

- Wanasayansi wa tabianchi wana wasiwasi kwa sababu tabianchi inabadilika kote duniani
- Mchakato au tukio lolote linalozalisha tofauti katika mfumo wa tabianchi linaweza kusababisha mabadiliko ya tabianchi. Mojawapo ya matukio hayo ni kama vile milipuko ya volkeno.¹
- Wakati utafiti wa kisayansi unaonyesha tabianchi imebadilika kwa maelfu ya miaka, dunia inazidi kuwa na joto na kasi zaidi kuliko wakati mwingine wowote katika historia ya Dunia.²
- Sasa, sababu kuu ya mabadiliko ya tabianchi ni matokeo ya shughuli za kibinadamu. Hii inaitwa “mabadiliko ya tabianchi yanayosababishwa na binadamu.”³

2. Tofauti kati ya hali ya hewa na tabianchi ni ipi?

- **Hali ya hewa** “ni ya ndani na ya muda. Hali ya hewa hutokea kwa wakati na mahali fulani...”
- **Tabianchi** “inaelezea hali kwa muda mrefu na kwa eneo zima. Tabianchi ni **kwa mtazamo mpana**. Ni mtazamo mpana wa halijoto, mvua, upepo na hali zingine katika eneo kubwa na muda mrefu zaidi kuliko hali ya hewa ya kila siku.”⁴
- Sasa, nitawapa hali fulani, na nyote mniambie kwa kila moja kama inahusiana na hali ya hewa au tabianchi.
 - Kulikuwa na mvua ya 13 mm jana. [Hali ya hewa]
 - Wastani wa halijoto ya juu ya Arusha katika mwezi wa Januari katika kipindi cha miaka 25 iliyopita ni nyuzi joto 28. [Tabianchi]
 - Wastani wa mvua huko Arusha kwa mwezi wa Aprili ni 360 mm. [Tabianchi, kwa sababu ni wastani wa hali ya hewa kwa miaka mingi.]
 - Wiki iliyopita, wastani wa halijoto ya juu ulikuwa nyuzi joto 28. [Hali ya hewa]
 - Wastani wa mvua ya kila mwaka ya Arusha ni 1,180 mm. [Tabianchi, kwa sababu ni wastani wa hali ya hewa kwa miaka mingi.]
 - Kasi ya wastani ya upepo jijini Arusha jana ilikuwa kilomita 5 kwa saa. [Hali ya hewa]

- Ore esiaai arashu em’bae akeyie naitu empaashata tiatua m’baa orreje le enkop neidim aayau nkibelekenyat orreje le enkop.
- Ore nabo enana baa naa engiswakunye nkuruon e folkeno.¹
- Ore egira en’jurrore e sayansi aitodolu nkibelekenyat orreje le enkop toongalifuni oo larin, neeku ketum dunia enkirowuaj oleng’ aalang’ nkataitin pookin enaa enaiteru enkop.²
- Neeku, ore enkipirata sapuk oo nkibelekenyat orreje le enkop naa ngiasin oo iltung’anak naayau. Ore ena naakeji “Ingibelekenyat orreje le enkop naayau nkiasin ooltung’anak.”³

2. Kanyoo naitoorr orreje le enkiyape oo orreje le enkop?

- **Ore orreje le enkiyape** “naa eniatwa, tengata dorrop. Ore orreje lenkiyape naakepuku tengata oo tewueji neje...”
- **Orreje le enkop** “akelikioo em’bae tengata naado naa tewueji pookin. Ore orreje le enkop naa **ten’dapasho**. Elalai oo m’baa enkima/ engirowuaj, enchan, osiwuo, oo nkulie baa tiatua ewueji sapuk tengata naado oleng’ aalang’ orreje le enkop loongolong’i pookin.”⁴
- Neeku, aliki n’tai kunabaa, nekijokiki pookin aajo kaamatwa anabo ipirita, ke enkiyape enake orreje le enkop.
 - Etii ng’ole enchan enkadoro nabaya 13 te enkipimata. [Orreje lenkiyape]
 - Ore eneba enkata enkima talapa liobo toltiren loolarusa toolarin tikitam oimet oima naa erishata nabaya tikitam oisiet. [Orreje le enkop]
 - Ore eneba enchan toltirren loolarusa talapa liong’wan naa engadoro oolakin wuni oo ntomoni ile. [Orreje le enkop, amuu orreje lenkiyape toolarin kumok.]
 - Ore en’da jumaa natulusoiye, eneba enkima/engirowuaj naa tikitam ooisiet. [Orreje lenkiyape enkop]
 - Ore eneba enchan toolarin pookin toltiren loolarusa naa engalifu nabo, oo elaki oo ntomoni isiet. [Orreje le enkop, amuu ake orreje lolaing’ang’e toolarin kumok.]
 - Ore eneba osiwuo toltiren loolarusa ng’ole naa engadoro oo rarwat imiet tesaa nabo. [Orreje lenkiyape]

3. Chanzo kikuu cha mabadiliko ya tabianchi ni nini?

- “Njia kuu inayofahamika ambayo kwao binadamu wanaathiri hali ya hewa ni kwa kutoa gesi zinazoshikilia joto hewani.⁵
- Gesi hizi huitwa gesi zinazoongeza joto la dunia kwa sababu gesi hizi hukusanyika angani na kunasa joto ambalo kwa kawaida hupanda angani. Kwa hivyo, hupasha joto uso wa dunia.
- Tunaweza kufananisha gesi hii kama blanketi linalotupa joto, kwa hivyo tunaweza kufananisha kama blanketi linaloipa Dunia joto.

Onyesha picha au chora picha rahisi ya athari ya chafuzi/blanketi kwenye ubao mweusi—kulingana na picha iliyo hapa chini.

Athari ya Blanketi kwa Ongezeko la Joto la Dunia

1. Mionzi mingi hufyonzwa na uso wa dunia na kuipasha joto.
2. Baadhi ya mionzi ya jua huakisiwa na dunia na angahewa.
3. Baadhi ya mionzi ya infrared hupita kwenye angahewa. Baadhi hufyonzwa na kutolewa tena pande zote na molekuli za gesi zinazoongezeka kwa joto duniani. Athari ya hii ni kupasha joto uso wa dunia na sehemu ya chini ya angahewa.
4. Mionzi ya infrared hutolewa na uso wa dunia.

Tazama jalada la kitabu hiki upande wa nyuma.

4. Vyanzo vya gesi zinazoongeza joto duniani ni vipi?⁶

- Gesi kuu zinazoongeza joto duniani zinazosababishwa na binadamu:
 - **kaboni dioksidi** (CO₂) huzalishwa kwa kuchoma mafuta ya visukuku, kama vile makaa ya mawe na petroli katika magari.
 - Na hata kuchoma chupa za plastiki za maji!



3. Kanyoo sapuk naye nkibelekenyat orreje le enkop?

- Ore enkoitoi sapuk nayioloi naa ninye eyaunye iltung'anak en'golon/entorroni orreje lenkijape naa enkitaunoto em'puruo torrono naake iibung' enkima/irgesii torrok tolaing'ang'e.⁵
- Ore kulo gesii naakeji irgesii oopon enkima/enkirowuaj tolaing'ang'e amuu akiturrurro tolaing'ang'e newuap enkima naakiilep oshiaake shumata. Neeku, iilang'/epej engomom enkop.
- Kiin'dim aitanyanyikie kulo gesii oo orbiranketi oisho iyook enkirowuaj, metaa kiin'dim aitanyanyikie enaa orbiranketi oisho enkop enkirowuaj.

Intodolu empicha arashu iin'gerr empicha nalelek naitodolu ina torroni torkibao enaa enetiu enapicha natii aabori.

Inaayau Orbirangeti te Emponata Enkirowuaj e Dunia

1. Ore ngilang'at kumok naake ibibi olchoni le enkop nirowuaje.
2. Ore matwa oo ngilang'at engolong neshuki te enkop oo alaing'ang'e.
3. Ore matwa engilang'ata nado niim aatwa enkijape olaing'ang'e. Ore matwa neibibiy neinyaakini aita too mm'bat pokira oo irgesii torrok. Ore enayau ena naake ake lang'ilang'/irowaje olchoni le enkop oo ewueji eabori olaing'ang'e.
4. Ore engilang'ata nado nitau olchoni le enkop.

Ng'urai en'jalada te syadi ena kitabu.

4. Ntokiting naayau irgesii torrok oopon enkirowuaj te enkop?⁶

- Irgesii oopon enkirowuaj te enkop naaltung'anak ooyeu:
 - **Kabon** (CO₂) orgesi itobiruni tenkaraki empejore iila niyo nkuk-soitok, oo petroli oo motokaani/n'garrimi.
 - Tenebo oo empejore ilchupai loo ngariak!

- **Uzalishaji na uchomaji wa plastiki hutengeneza 5% ya gesi zinazoongeza joto duniani kote.**
- Nusu ya plastiki hii ni plastiki zinazotumika mara moja, ambazo zinapaswa kuepukwa.
- Kumbuka kwamba **kuchoma chupa za plastiki hutoa kemikali zenye sumu ambazo ni mbaya sana kwa wanadamu na mazingira** (tazama Nyenzo za Somo la 3).⁷

Zingatia matatizo ya plastiki, hasa chupa za plastiki, kwani ni rahisi kubadilika na kuacha matumizi yake, na kwa sababu plastiki ni sumu sana kwa afya ya binadamu na mazingira. Zaidi ya hilo kuna kemikali zenye sumu ambazo hutoka kwenye chupa za plastiki pamoja na chembe ndogo na nanoplastiki ambazo matokeo yake zinapatikana katika viungo vyote vya binadamu ikiwa ni pamoja na ubongo wa mtu aliyetumia chupa za plastiki. Muhtasari: epuka plastiki kwa sababu nyingi!!!

- **Methane** (CH₄) huzalishwa na kilimo cha kisasa, kama vile gesi ya ng'ombe, na biomasi inayowaka. Ingawa si ya kawaida kama kaboni dioksidi, methane ina nguvu zaidi ya mara 30 katika kunasa joto.
- Kuna gesi na vitu vingine vya kiasili vinavyosababisha joto duniani. Hizi ni pamoja na:
 - Mvuke wa maji (H₂O) husababishwa na uvukishaji wa mvua au njia za mvuke ambazo ni mawingu ya ubeti ulionyooka yanayofuata ndege yanayosababishwa na moshi wa injini au mabadiliko katika shinikizo la hewa; na
 - Majivu ya volkeno, yanayosababishwa na mlipuko wa volkeno.

5. Je, ni madhara gani ya msingi ya mabadiliko ya tabianchi?⁸

- Joto lililokwama angani kutokana na gesi zinazozalishwa na binadamu zinazosababisha ongezeko la joto duniani husababisha dunia kupata joto. Dunia yenye joto zaidi husababisha matatizo.
- Hapa chini kuna makundi 4 ya matatizo, ingawa athari zinaweza kuingiliana katika kundi moja au zaidi.

- **Ore enkitobirunoto oo empejore oo mpirai oo nkariak neitobirr asilimia imiet oorgesii/enkijape napon enkirowuaj te enkop pookin.**
- Ore matwa enena pirai naampirai naa nabokata ake eesishoreki, naake ishaakinore pee epaashareki.
- **Tadamu aajo ore empejore oo mpirai nitau isayieti torrok oleng' too iltung'anak oo te enkop** (ng'urai enkisoma ewuni).⁷

Tayelo enyamali oompirai, aaisulu ilchupai loongariak, amuu elelek piibelekenya ning'waa engiaas enye, naa tengaraki sii eesayiet naleng' tooltung'anak oote enkop. Ore sii engay naaisul ina etii kemikali naata esayet naing'waa impirai oonkariak naake ore entorroni enye netumi tiatua irubat pookin oltung'ani naa tenebo ooelukunya oltung'ani ataasishore mpirai oonkariak. Tipat: tapaashare mpirai tengaraki entorroni sapuk!!!

- **Methane** (CH₄) Itobiruni te enkata enturore ekisasa, nijo orgesi oitau ingishu, oo enake metiu enaa orgesi le kabon, ore methane neeta en'gonon nalang' aigil osom (30) tenkibibiyata enkirowuaj.
- Etii irgesii oo nkulie baa tokitin easili naayau enkirowuaj te enkop. Naa Tenebo oo kuna:
 - Engiroebuk e engare (H₂O) ore orpukunei lenye naa empuruo enkare enchan arashu enkoitoi empuruo naa ngatambo orbeti oitoriori osuj enteke nayau empuruo e injin arashu nkibelekenyat tiatua erogonyata enkijape; oo
 - Nkuruone folkono nayau enkima naiswaunye tiatwa engop/oldonyo).

5. Kanyoo entorroni naibala oo nkibelekenyat orreje le enkop?⁸

- Enkima/enkirowuaj natuune tolaing'ang'e nayau empuruo naitau iltung'anak naayau emponoto enkima te enkop ninye nayau enkirowuaj/enkima oleng' te enkop. Ore enkop nairowua naleng' neyau ntorrok kumok.

1. Matukio ya hali mbaya ya hewa

- Mawimbi ya joto
- Ukame katika baadhi ya maeneo na ongezeko la matuta ya mchanga
- Mafuriko na mmomonyoko wa udongo katika maeneo mengine
- Vimbunga vikali na typhoons, ambavyo hutokea mara kwa mara na kwa nguvu zaidi kutokana na maji ya bahari yenye joto zaidi

2. Athari kwa binadamu

- Njaa na ukosefu wa usalama wa chakula, kutokana na ukame na mafuriko yanayoharibu mazao
- Uhaba wa maji safi
- Matatizo ya kiafya, kama vile malaria na magonjwa mengine yanayotokana na mabadiliko ya tabianchi na hali mbaya ya hewa husababisha magonjwa ya kupumua
- Msongo wa joto la muda mrefu na wenye joto kali zaidi kuliko kawaida husababisha: Matatizo ya kiafya yanayohusiana na joto, hasa kwa wanawake wajawazito na wazee, na vifo kwa watu walio katika mazingira magumu, hasa wagonjwa na wazee pamoja na mifugo
- Uharibifu wa nyumba, kutokana na mafuriko na vimbunga
- Uhamiaji au “wakimbizi wa mabadiliko ya tabianchi” kutokana na uhamiaji unaosababishwa na ukosefu wa maji, kwa mazao, hali mbaya ya hewa, n.k. hivyo, mabadiliko katika upatikanaji wa riziki
- Changamoto za haki za ardhi/umiliki wa ardhi.
- Kemikali zenye sumu na uzalishaji wa CO₂ kutokana na plastiki zinazoungua

3. Athari kwa mifumo ikolojia

- Afrika inatarajiwa kuongezeka joto mara 1.5 zaidi kuliko wastani wa kimataifa unaoathiri mifumo ikolojia na maliasili.
- Uharibifu wa maeneo ya malisho ikiwa ni pamoja na spishi vamizi
- Kuongezeka kwa viwango vya bahari, kutokana na kuyeyuka kwa barafu kwenye ncha za Kaskazini na Kusini za dunia na

- Etii aabori tene ilturrurri oong'wan lentorrone, oo enake iin'dim ntorrok aataa nabo tolturrurr obo arashu olikai.

1. M'baa orreje torrone le enkop

- Orkutati le enkirowuaj
- Alamei too kulie wuejitin oo emponata oo wululuni osunyai.
- Enang'unoto oo nkariak oo em'bobolata oo nkulukok too kulie wuejitin
- Isiwoitin sapukin oo typhoons, naake epuku aigiligil naa tesapuko oleng' tenkaraki engare enaipasha/arbabal nairowua oleng'

2. Entorrone too iltung'anak

- Esumash oo elaunoto oo n'daikin, tengaraki ilameitin oo enang'unoto oo nkariak naayau enginyala toon'daikin
- Enginyishu/elaunoto engare sidai
- Imueyiaraitin, nijo engajang'ani oo nkulie naapukunore nkibelekenyat orreje lenkop oo enkijape torrone tolaing'ang'e neyau imueyaratin oo ngiyang'at
- Enkirowuaj sapuk engata naado oleng' aalang' sii naa keyau: imuyieratin naaipirita enkirowuaj, aisulaki nkitwaak/ntwaan oorpayiani, oo engeeya toltung'anak ootii nkwapi naagol, nisulaki iltamueyia oo irrpayiani tenebo oo eramatare
- Enginyalare oo ngajjik, torbae loo ngarika sapukin naanang'ari oo osiwuo
- Enkidurrakinoto arashu “ilaisikak loo nkibelekenyat orreje lenkop” tengaraki enaidurra nayau elaunoto oo nkariak, toon'daikin, orreje torrone lenkop, n.k. neeku nkibelekenyat ten'tumoto oon'daikin
- En'goloto e haki enkop/enkibung'ata enkop
- Kemikalini naata isayieti oo enkitobirunoto orgesi le kabon (CO₂) torbae loo mpirai naaikita/naatapejoki

3. En'golon te ikolojia

- Ore te Africa ejoitoo epona enkirowuaj aigil nabo oorpisiai (1.5) oleng' aalang' emponanta oo nkwapi pookin ,neyau en'golon too ntokiting' pookin oom'baa oo n'dupot e asili.
- Enginyalare oo n'n'daat e eramatare

milima mingine ya barafu, kunaharibu jamii za pwani na baadhi ya visiwa, kama vile Visiwa vya Marshall, Kiribati, Tuvalu, na Maldives.

4. Athari kwa usalama wa taifa

- Migogoro itaongezeka kutokana na rasilimali asilia chache, ndani ya maeneo ndani ya nchi na kati ya mataifa.
- Mito na maji yake ya thamani mara nyingi ni rasilimali za pamoja kati ya maeneo na mataifa. Maeneo ya mwisho ya mito yatapata maji kidogo.
- Ingawa mgogoro mwingi wa tabianchi umesababishwa na maeneo makubwa ya viwanda kama vile Ulaya, Marekani, na China, nchi maskini zaidi—kama Tanzania—zitaathiriwa zaidi!
 - Sababu moja ni kwamba Waafrika wengi wanategemea rasilimali asili kwa ajili ya riziki zao.
 - Kwa bahati mbaya, nchi maskini zaidi—ambazo zitaathiriwa zaidi—zina kiasi kidogo cha rasilimali za kudhibiti athari hizo!

6. Tofauti kati ya kupunguza na kukabiliana na hali ni ipi?⁹

- Hatua za kupunguza hali ni zile hatua zinazochukuliwa ili kupunguza uzalishaji wa gesi unaotokana na ongezeko la joto duniani.
- Mbinu za kuhimili mabadiliko ya tabianchi zinatokana na kupunguza hatari na urahisi wa kuathirika kwa binadamu na mazingira.
- Hivyo, kukabiliana na hali kunalenga kupunguza sababu za mabadiliko ya tabianchi, huku kukabiliana na hali kunalenga kuwafanya watu wawe na ustahimilivu zaidi au wasiwe na hatari kubwa kutokana na athari za mabadiliko ya tabianchi.

- Emponata enaipasha, tengaraki nehola orbarafu te kopkop oo moikuape olosho ool'donyo kulie, eyau enginyala toom'bat oo nkulie wuejitin, nijo nkisiwani e Marshall Islands, Kiribati, Tuvalu, oo Maldives.

4. En'goloto te seriani olosho pookin

- Epono ilarrabali torbae eeku dupoto easili kuti, tiatua iwuejitin, tiatua enkop oo tooloshon.
- Ore irkejek oo engare enye easili naa dupore enaboishu too wuejitin oo tooloshon. Ore iwuejitin naabayie too rkejek netum engare kinyi.
- Oo enakee ore empukunoto oo larrabali kumok lo orreje le enkop naa tengaraki iwuejitin sapukin oo nkiwandan nijo idialo oo looiborr, Marekani, oo China, ore olosho menat oleng'—nijo Tanzania—negoliki oleng'!
 - Ore sababu nabo naa tengaraki ore iltung'anak le Africa kumok ning'orita n'dupot easili torbae loon'daikin enye.
 - kake ore iloshon menat oleng'—naake etum n'golikinot oleng'—neeta nareta kunyi (en'golon kinyi) naaretoki mirisha nena golikinot!

6. Kanyoo naitoorr engitong'orata oo enkirishata orreje?⁹

- Ore nkoitoi naaitong'orr naa nkoitoi naasi pee itong'ori empuruo nayau emponoto enkirowuaj tolosho.
- Ore nkoitoi naairishieki nkibelekenyat orreje le enkop naakepukunore engitong'orata entorrone oo eleleki entumoto entorrone tootung'anak oo enkop.
- Neeku, ore engirishata enye naakipirita engitong'orata oo nkibelekenyat orreje le enkop, ore engirishata naa eretokinoto oo iltung'anak midima aating'iria arashu peemetum n'golikinot sapukin torbae loo n'golikinot orreje le enkop.



7. Ni njia zipi za kupunguza na kukabiliana na mabadiliko ya tabianchi ambazo:

- Zinatokana na sayansi ya tabianchi na
- Zinafaa kwa muktadha wa kitamaduni wa Wamaasai?

Toa karatasi na chora ubeti katikati ya karatasi, upande wa kushoto andika kupunguza athari, alafu upande wa kulia andika kuhimili athari. Mwalimu anaweza kuchagua kutoka kwenye orodha zifuatazo bila mpangilio na kuongoza majadiliano. (Wanafunzi wanatakiwa kusema/kuandika kwenye karatasi aliyoigawanya kama njia iliyotajwa ni ya kupunguza au kuhimili athari.) Orodha hizi zina maelezo mengi na zimetolewa ili kusaidia uelewa wa mwalimu. Mwalimu hapaswi kujadili haya yote bali kuchagua vipengee vinavyofaa zaidi kwa kundi lake. Andika matokeo kwenye chati mgeuzo au ubao mweusi kwa majadiliano ya baadaye.

IKIWA KITINI KINAWEZEKANA: Njia nyingine ya kufundisha swali hili ni kutoa kitini kilicho hapa chini orodha ya kina ya mikakati ya kupunguza na kukabiliana. Kisha-wanafunzi wasome na kujadili maswali wanaposhirikisha maudhui ya kitini.

- Nitataja vipengele tofauti. Hebu tuvijadili na tufanye kazi pamoja ili kubaini ni vitendo gani kati ya hivi vinavyohusiana na kupunguza na/au kukabiliana (kuongezeka kwa ustahimilivu kwa athari za mabadiliko ya tabianchi).

Jadili mikakati ya kupunguza makali na kukabiliana nayo kwa dakika 10.

7. Kakwa nkoitoi naaitong'orr neyau engirishata too ngibelekenyat orreje le enkop naa akee:

- Naapukunye sayansi orreje le enkop, naa
- Naaishaakinore torkwaak lemila oo Irmaasai?

Intau engardasi niin'gerr orkereri tempolos engardasi, ore enchoto ekedianye nisirr engitong'orata oo n'golikinot, ore tenchoto etetene tisira engirishata oon'golikinot. Iidim alaiteng'enani aategelu nabo tiatua lelo turrurri nerikoo engiteng'ena. (Eyieuni ilaiteng'enak pee esirr ina palai naigero empolos aalimu aajo kamaa engoitoi natolimwoki kenake enaitong'orr enake enairish n'golikinot.) Kumok kulo kigerot kake akitawuoki peeretoki engarriyiano alaiteng'enani. Mishaakinore pee ing'uraa alaiteng'enani/armalimui kuna pookin kake peegelu nena naaishaakinore oleng' tolturrurr lenye. Tisira matokeo torkibao orok torbae leade.

Tenidimai empalai: Ore engay oitoi naiteng'enieki ele swali naa aintau embalaii natii aabori tene naitodolu enikoni tenitong'ori oo rng'iria. Nisoma niimaki sii iloitenteng'eni irmaswali enaa enejo ina palai.

- Akalimu ntilat naapaasha. Maimaki siyie nekiaas esiaai tenebo peekidol aajo kakwa nena tiatua kuna naadim aitong'ora arashu kakwa naayau engirishata (emponata org'iria too ntorrok oo nkibelekenyat orreje le enkop).

Eimaki nkoitoi naaitong'orr emion oo engirishata too ldakikani tomon.

Kupunguza	Kukabiliana	Engitong'orata	Engirishata
<p>1. Panda miti ambayo inachukua kaboni dioksidi, CO₂ (hasa miti ambayo ni ya asili ya eneo la hilo).</p> <p>2. Ufanisi wa nishati (kupunguza kiwango cha kaboni)</p> <p>a) Tumia majiko ya kuni yenye ufanisi zaidi ya kuni ili kupunguza uchomaji wa kuni (ambao huweka gesi zinazongeza joto kwenye dunia kwenye mazingira).¹ [Tazama Nyenzo sura ya 17 kuhusu kuchoma biomasi chini na mfano wa jiko linalotumia mafuta kidogo.]</p> <p>b) Kuongeza matumizi ya nishati mbadala kama vile nishati ya jua.</p> <p>c) Tumia taa za LED zisizo na nishati au taa za fluorescent (CFL) badala ya balbu za zamani za incandescent.</p> <p>d) Zima taa za umeme wakati hautumiki.</p> <p>3. Punguza matumizi ya chupa za plastiki na urejeshe tena chupa zinazotumika.</p>	<p>5. Maji</p> <p>h) Tengeneza njia za kuvuna na kuhifadhi maji.</p> <p>i) Katika uhaba mkubwa wa maji, hamia kwa muda kwenye maeneo ambayo maji yanapatikana.</p> <p>j) Kuendeleza maeneo ya kukusanyia maji, visima, maji ya bomba, na mabwawa.⁴ [Tazama picha hapa chini katika Nyenzo sura ya 17.]</p> <p>6. Usalama wa chakula</p> <p>k) Weka mikakati ya kuimarisha usalama wa chakula (hifadhi ya chakula).⁵</p> <p>l) Uwezo wa kaya kununua chakula ndio mkakati muhimu zaidi wa usalama wa chakula.⁶</p> <p>m) Chanzo cha mapato kinachotegemewa na msingi wa mali ni muhimu kwa mwikitiko wa kaya dhidi ya majanga ya tabia nchi.⁷</p> <p>n) Asilimia 58 ya kaya ziliripoti kuwa zimeamua kuuza mifugo...ili kudhibiti majanga ya tabia nchi.⁸</p> <p>7. Ustahimilivu wa miundombinu</p> <p>o) Maeneo salama zaidi ya nyumba na kituo</p> <p>p) Hatua za kuzuia na za tahadhari (mipango ya uokoaji, masuala ya afya, n.k.)</p> <p>8. Mfumo wa ikolojia na mandhari</p> <p>q) Marejesho ya mazingira (mandhari ya asili) na upandaji miti upya</p> <p>r) Uhifadhi wa mfumo ikolojia asilia (bioanuwai na maji)</p> <p>9. Maarifa ya jadi ya mazingira</p> <p>s) Tambua na udumishe maarifa asilia/jadi ya Wamaasai na mazoea ambayo ni mazuri kwa kutunza mazingira; "...mfumo na taasisi za maarifa za wenyeji zinapaswa kuimarisha utungaji na utekelezaji wa sera ili kukuza ustahimilivu wa wenyeji."⁹</p> <p>t) "Mpango wa mseto wa maisha wa taratibu na wa kati hadi mrefu ni mkakati wa kisera unaopendekezwa ili</p>	<p>1. Tuono irkeek oibibi kabon isulaki irkeek le asili ine weji.</p> <p>2. Enkishaa e nishati (itong'orr kabon)</p> <p>a) Taasishore orrupie loo irkeek lemitau irgesii oirowaje enkop pee itong'orr enkinuata oo irkeek (oopen enkirowaj te enkop).¹ [Ng'urui enaret te ematwa e 17 nijo orrupie le enishati kinyi.]</p> <p>b) Taasishore oleng' enishati sidai anaa esola.</p> <p>c) Taasishore iltaai sidan le LED aalang iltaai musan.</p> <p>d) Taara iltaai le umeme tenemiasishore.</p> <p>3. Ntong'oro enkiasishore oo ilchupai loo mpirari nishukoki ng'ejukishu ilchupai oasishoreki.</p> <p>e) Amu ore empire naasishoreki nabo kata ning'waa e nishati musana naa ore enkitobirunoto oo kuna pirai nitau irgesii</p>	<p>5) Engare</p> <p>h) Ntobiru enkarriyano niwounye nishum engare.</p> <p>i) Ore te erishata kiti engare naleng' n'duraki wejitin naatii engare.</p> <p>j) Taramata wejitin naaibok engare (enipirunyeke, orpomba, irbwaan/irmalambo).⁴ [Ngurai empicha te abori te naret ematwa e 17]</p> <p>6. Entumpoto e en'daa</p> <p>k) Tipika n'kidanyat e endtumoto e-en'daa (enchumata e-en'daa).⁵</p> <p>l) Ore enkidimata engaji/armarei pee inyag'u en'daa naa enkidanyata tipat oleng' te enumoto en'daa.⁶</p> <p>m) Ore ening'orita armarei te dupoto neeta tipat pee irishe armarei n'golikinot naayeu nkibelekenyat e enkop.⁷</p> <p>n) Ore irmarei ono moo isiet tiatwa iip (58%) netolimutwo aajo etimira ermatate too n'golikinot oo nkibelekenyat enkop.⁸</p> <p>7) En'olon wejitin naasheta.</p> <p>o) Wejitin sidan naatii nkajjik oo neesheta</p> <p>p) Nkoitoi naiboorieki (nkidanyat esaurnoto, m'baa em'biotishu oo seseni)</p> <p>8) M'baa e ikolojia oo enkop</p> <p>q) Enkitang'ejukoto e enkop (enkop e asili) oo eunoto oo irkeek te ng'ejukishu</p> <p>r) Erripoto e ikolojia e-asili (iseuseu oo engare)</p> <p>9) Enkarriyano e mila te enkop</p> <p>s) Tayolo niim'bung engariyano e asili/mila oo Irmaasai sidan naarrip enkop: "...ore m'baa engarriyano oo iltung'anak loo nkwapi oo Irmaasai ishaakinaore pee eretoo nitagol enkitobirunoto oo enkias e sera pee eshumu orng'iria loopeny enkop."⁹</p> <p>t) "Ishaakinore ngidanyat e sera/ncheriani naibelekenyeke orrje le enkishui neyauni akiti aatwa ilaramatak pee eeta olosho loo laramaak orng'iria</p>

Kupunguza	Kukabiliana	Engitong'orata	Engirishata
<p>e) Kwa sababu plastiki ya matumizi moja huzalishwa kutoka kwa nishati ya mafuta (kama petroli), kupata na kuunda plastiki hizi hutoa kiasi kikubwa cha gesi za joto za dunia.</p> <p>f) Tumia ukusanyaji wa taka badala ya kuchoma takataka.²</p> <p>4. Takataka zinazochomwa hutoa kaboni hewani.</p> <p>g) Kuchoma plastiki huweka kaboni dioksidi na kemikali za sumu katika hewa na ardhi ambayo ni hatari kwa afya ya binadamu na wanyama na mazingira. (Angalia maelezo “f.”)</p>	<p>kuongeza ustahimilivu miongoni mwa jamii za wafugaji kinyume na sera ya sasa inayolaani ufugaji kuwa ni shughuli ya kurudi nyuma na kuharibu mazingira.”¹⁰</p> <p>10. Kilimo-ufugaji/kilimo kidogo</p> <p>u) Tumia njia rahisi na tofauti za kilimo.</p> <p>v) Kuendeleza utunzaji wa mbegu.¹¹</p> <p>w) Jumuisha mazao yanayostahimili ukame zaidi kuliko mahindi, “kama vile mtama, njegere, mtama, viazi vitamu na kunde.”¹²</p> <p>11. Uongozi na utawala</p> <p>x) Wajumuishe wanawake katika kufanya maamuzi ambayo yanaathiri maisha yao na ya watoto wao ili kupunguza hatari ya kaya nzima.</p> <p>y) Waimarishe viongozi wa kimila kwani wazee ndio wanaosimamia uhibititi na ugawaji wa rasilimali hasa nyakati za uhaba mkubwa,¹³ na kutoa msaada wa miundombinu, kijamii, kisheria na kifedha.</p> <p>z) Imarisha halmashauri ya kijiji jinsi ya kutafuta msaada wa serikali...kwa msaada wa miundombinu, kijamii, kisheria na kifedha.¹⁴</p>	<p>tesapuko oirowaje enkop.</p> <p>f) Ore empejoto oo mpirai nepic esayeti aatwa engijape oo enkulukoni naa torrongo te em'biotishu oo seseni too ilung'anak oo kulie tokitin naishu.²</p> <p>4. Nturrurro altaka, mipejoo.</p> <p>g) Ore empejoto oo mpirai nepic esayeti aatwa engijape oo enkulukoni naa torrongo te em'biotishu oo seseni too ilung'anak oo kulie tokitin naishu. (Ngurai wutarot te enkipengele “f.”)</p>	<p>elang' iserai/ncheriani/wutarot e tata naaiba eramatatare ejo eisai e siadi niinyarl enkop.”¹⁰</p> <p>10. Enturore-oo-eramatatare (enturore kiti)</p> <p>u) Taasishore nkoitoi naalelek naapaasha tenturore.</p> <p>v) Enchumata embeu.¹¹</p> <p>w) Ntushulaki n'daikin naairish alamei aalang' irpaek, “anaa ormutama, njegere, irmurungu, irkisoya oo irpombo/mboosho.”¹²</p> <p>11) Erikore oo enkitahekinoto</p> <p>x) Ntushulu ndasati tiatwa nkigwanat oo m'baa naipirita enkishui enye oo nkera enye pee itong'or enyamali armarei olulung'a</p> <p>y) Ntagolo larikok le le mila amu irpayani oitasheki enkitahekinoto oo erishare oo n'dupot naleng' enkata eng'orikinoto sapuk,¹³ nitau erototo oo ntokitin,naaipir iltung'anak, too ncheriani oo too nkohola</p> <p>z) Ntagolo erikore enkijiji/enkanasa eniko pee ing'oru erototo te sirkale...te erototo oo neesheta,iyeunot oo iltung'anak, ncheriani oo nkohola.¹⁴</p>

Table Bibliography

¹ Ndesanjo, Theilade, and Nielsen. “Water scarcity is a common determinant of migration among pastoral communities.” (Berkhout 2012; Brockhaus et al. 2013). 2602, https://doi.org/10.1007/978-3-030-45106-6_128.

² Verma et al., “Toxic Pollutants from Plastic Waste-A Review,” *Procedia Environmental Sciences, Waste Management for Resource Utilisation*, 35 (January 1, 2016): 701–8, <https://doi.org/10.1016/j.proenv.2016.07.069>.

³ Ndesanjo, Theilade, and Nielsen, 2603.

⁴ Mwandosya, “National Adaptation Programme of Action (NAPA),” 2007, ix, <https://unfccc.int/resource/docs/napa/tza01.pdf>.

⁵ Ndesanjo, Theilade, and Nielsen, 2601.

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⁹ Mwandosya, ix.

¹⁰ Ndesanjo, Theilade, and Nielsen, 2607.

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¹² J. Douwe Meindersma and Jan J. Kessler, eds., 44. Meindersma, J. Douwe, and Jan J. Kessler, eds. *Planning for a Better Environment in Monduli District*. Netherlands Economic Institute, 1997.

¹³ Ndesanjo, Theilade, and Nielsen, 2604.

¹⁴ Ndesanjo, Theilade, and Nielsen, 2605.

Wamaasai: Ni desturi zipi ambazo Wamaasai tayari wanafanya?

- 5
- Angalia orodha zetu.
 - Piga ubeti chini ya mambo ambayo Wamaasai hufanya.

Hapa chini kuna orodha iliyohaririwa ya ile iliyo hapo juu inayozingatia desturi za Wamaasai.

Irmaasai: Kakwa iyasat mila nena naasita Irmaasai?

- N'gurai inikitisira.
- Tipika orkereri m'baa naas Irmaasai.

Ore tiabori tene netii m'baa enena naalimuno tengaiterr nasuj mila oo Irmaasai.

Kupunguza	Kukabiliana	Engitong'orata	Engirishata
<p>1. Miti: Kijadi haikatwagi miti. Baadhi: Chimba mashimo ya "tabasamu" ambayo "hurudisha kijani" eneo hilo kwa mimea inayotoa CO₂ kutoka hewani (na pia hupunguza mmomonyoko wa udongo). [Tazama Rasilimali Sura ya 17.]</p> <p>2. Ufanisi wa nishati: Wengi: Tumia usafiri wa umma na kutembea. a) Baadhi: majiko ya kupikia ya kuni yenye ufanisi zaidi b) Baadhi: nishati ya jua c) Baadhi: taa za LED zinazotumia nishati kidogo d) Baadhi: Zima taa za umeme zisipotumika</p>	<p>5) Maji h) Baadhi: Kuendeleza uvunaji na uhifadhi wa maji i) Wakati wa kiangazi, huhama kwa muda j) NDIYO! Kuendeleza maeneo ya kuinga maji</p> <p>7) Ustahimilivu wa miundombinu o) Baadhi: Maeneo salama zaidi ya nyumba na vituo</p> <p>8) Mfumo ikolojia na mandhari r) NDIYO! Uhifadhi wa mfumo ikolojia na viumbe hai</p> <p>9) Maarifa ya jadi ya mazingira s) Baadhi: Kutambua na kudumisha maarifa ya jadi t) Baadhi: Ubadilishaji wa utaratibu wa maisha</p> <p>11) Uongozi na utawala x) Baadhi: Kuwajumuisha wanawake katika kufanya maamuzi y) Baadhi: Kuimarisha viongozi wa kitamaduni wa mitaa kwa ajili ya kudhibiti na kushiriki rasilimali z) Baadhi: Kuimarisha baraza la kijiji kutafuta msaada wa serikali</p>	<p>1. Irkeek: Ore te mila medung'i. Irkulie: Eturr kulie ingumot/ululuni "enchipai" nashuku en'oriji too irkeek oibibi kabon ta alaing'ang'e nitong'orr sii em'bobolata e engulukoni. [Ng'urai nareta natii emwate e 17.]</p> <p>2. Enkishaa e nishati: Ore irkumok: epweiyee motokaani e pooki nepwo sii too ngejek. a) Irkulie: eeta irrupieta loo irkeek sidan/ikishaan. b) Irkulie: eeta isolai. c) Irkulie: eeta iltaai le LED ooya enishati kinyi. d) Irkulie: eer iltaai le umeme tenemeesishoreki.</p>	<p>5) Engare h) Irkulie: Itobiru enkiwounoto e en'chumata e engare. i) Ore te enkata elamae, niidurr. j) EE! Eshetu wejitin naabokie engare</p> <p>7) Oringiria oo wejitin neesheta o) Irkulie: Wejitin sidan too nkajijik oo neesheta.</p> <p>8) M'baa e ikolojia oo enkop r) EE! Erripoto e ikolojia oo nkitobirunot naishu</p> <p>9) Engarriyano e mila te enkop s) Irkulie: Eyolo negolie engarriyano e mila. t) Irkulie: Engibeleyenata akiti orkwak le enkishui</p> <p>11) Erikore oo enkitahekinoto x) Irkulie: Itushulu ndasati tiatwa ngigwanat y) Irkulie: Itagol ilarikok le mila te enkitashekinoto oo eng'arata oo n'dupot. z) Irkulie: Eer itlaai le umeme tenemeesishore.</p>

Kuunganisha Sayansi ya Tabianchi kwa Mukadha wa Wamaasai

- 4 • Ni mazoea gani ambayo Wamaasai hawayafanyi kijadi, lakini ni mambo ambayo WEWE unaweza kuyafanya kwa urahisi—baadhi yake bila rasilimali nyingi?
 • Tukiangalia tena orodha yetu, pigia mistari miwili chini ya mambo tunayoweza kufanya!

Engidikoto e Sayansi Orreje le Enkop Torkwaak le Irmaasai

- Kakwa moot mees irmaas temila, kake m'baa naake iin'dim iyie aataasa teleleki—ore nkulie nias miaata eretoto sapuk?
- Tenikiin'gil aing'uraa ntokitini nikitisira, in'georki irkererini aare aabori oom'baa nekiin'dim aataas!

Kupunguza	Kukabiliana	Engitong'orata	Engirishata
<p>1. Panda miti: Panda miti ambayo ni ya asili katika eneo hilo; Chimba mashimo ya "tabasamu" ambayo "yanarudisha kijani" katika eneo hilo kwa mimea inayotoa CO₂ kutoka hewani (na pia hupunguza mmomonyoko wa udongo).</p> <p>2. Ufanisi wa nishati (kupunguza kaboni) a) Zaidi: Tumia majiko ya kupikia ya kuni yenye ufanisi zaidi ili kupunguza uchomaji wa kuni. b) Zaidi: Ongeza matumizi ya nishati mbadala kama vile nishati ya jua. c) Zaidi: Tumia taa za LED zenye ufanisi wa nishati. d) Zaidi: Zima taa za umeme wakati hazitumiki. Pia, usiendeshe injini ya gari huku ukisubiri na huingii ndani ya gari.</p> <p>3. Punguza chupa za plastiki</p> <p>4. Ukusanyaji wa taka badala ya kuchoma</p>	<p>5. Maji h) Uvunaji na uhifadhi zaidi wa maji j) Maeneo mengi ya vyanzo vya maji (mabwawa)</p> <p>6. Usalama wa chakula k) Mikakati zaidi ya usalama wa chakula (hifadhi ya chakula)</p> <p>7. Ustahimilivu wa miundombinu o) Nyumba salama zaidi p) Weka hatua za tahadhari (yaani, mipango ya uokoaji).</p> <p>8. Maarifa ya jadi ya mazingira q) Utambuzi zaidi wa maarifa ya jadi kwa kutumia mbinu ambazo ni nzuri kwa utunzaji wa uumbaji</p> <p>10. Kilimo-ufugaji/kilimo kidogo u) Tumia kilimo kinachonyumbulika na cha aina mbalimbali. w) Ongeza mazao yanayostahimili ukame, kama vile mtama, njegere, mtama, viazi vitamu na kunde.</p> <p>11. Uongozi na utawala x) Jumuishwa wanawake wengi zaidi katika kufanya maamuz. y) Waimarisha viongozi wa kimila kwani wazee ndio wanaosimamia udhibiti na ugawaji wa rasilimali hasa nyakati za uhaba mkubwa. z) Iimarisha halmashauri ya kijiji jinsi ya kutafuta msaada wa serikali.</p>	<p>1. Eun irkeek: Eun irkeek lina kop; neturr ingumoto/iululuni 'e "enchipai" nashuku en'oriji too irkeek oibibi kabon ta alaing'ang'e nitong'orr sii em'bobolata e engulukoni.</p> <p>2. Enkishaa e nishati (enkitong'oroto e kabon) a) Aisul: Taasishore irupieta loo irkeek sidan aisul pee itong'or empejoto oo irkeek. b) Aisul: Taasishore naleng' nishati sidai anaa solai. c) Aisul: Taasishore iltaai sidan le LED. d) Aisul: Taara iltaai le umeme tenemiasishore. Ore sii, miinok emotokaa ianyisho nemijin'gita aatwa e motokaa.</p> <p>3. Ntong'oro ilchupai loo mpirai</p> <p>4. Enkiturrurroto altaka me empojoto</p>	<p>5. Engare h) Enkiwounoto oo enchumata sapuk e-engare j) Wejitini kumok oo ngariak (ilturot)</p> <p>6. Endumoto sidai e en'daa k) Nkidanyat kumok e endumoto e en'daa (enchumata e en'daa)</p> <p>7. Orng'iria oo wejitin naasheta o) Engaji nara sidai oleng' p) Tipika nkoitoi engarriyano (aa, nkidanyat esarunoto).</p> <p>8. Engarriyano e mila te enkop q) Eyolounoto sapuk e engarriyano e mila iasishore losekin sidan te erripoto oo nkitobirunot.</p> <p>10. Enturore-oo-eramatare/enturore kiti u) Taasa entorore naibeleyenai nashulushula n'daikin. w) Topona n'daikin naairish alamei ni jo ormutama, njegere/mboosho, irmurungu, irkishoya oo irpombo.</p> <p>11. Erikore oo engitashekinoto x) Ntushulaki ndasati kumok oleng' aatwa ngigwanat. y) Ntagolo larikok le le mila amu irpayani oitasheki enkitahekinoto oo erishare oo n'dupot naleng' enkata eng'orikinoto sapuk. z) Ntagolo erikore enkijiji/enkanasa eniko pee ing'oru eretoto te sirkale.</p>

3) UCHUNGUZI ufafanuzi au tafakari ya maudhui ya msingi

Kwa hivyo, ni jambo gani MOJA WEWE unaweza kufanya katika kila kipengele/kundi?

- 5
- Kwenye karatasi yako zungushia kitu kimoja katika kila kipengele ambacho WEWE unaweza kufanya na familia yako na marafiki ili kuleta mabadiliko katika kutunza uumbaji wa Mungu?
 - Kumbuka kwamba utunzaji wetu wa uumbaji unahamasishwa na wito wa Mungu kwetu wa kutunza uumbaji (**Mwanzo 2:15**). Tunapopatanishwa (katika uhusiano sahihi) na Mungu, asili ya imani yetu inadhihirika 1) kwa amani na wengine (haki ya kijamii) na 2) amani na uumbaji (utunzaji wa uumbaji/maadili ya mazingira).
 - wanafunzi wawili au watatu washirikishe darasa jambo moja wanalotaka kufanya ili kuleta mabadiliko.

Tumaini

- 3
- Tukijua kwamba tuna Mungu anayeaminika na mwenye upendo, tunaweza kukabiliana na changamoto za mabadiliko ya tabianchi kwa matumaini.
 - Kwanza, tunajua kwamba Muumba wetu, Mungu wa Tumaini, anapenda ulimwengu, na Mungu hatauacha kamwe.
 - Pili, kama wafuasi wa Yesu Kristo, tunawezeshwa na Roho Mtakatifu kuwa baraka kwa wengine (haki ya kijamii) na uumbaji (mazingira).
 - Hatimaye, hata baadhi ya wanasayansi na wanamazingira wana matumaini kwamba sote tunaweza kufanya kitu kidogo na kwa pamoja kuleta mabadiliko makubwa.

Huenda kusiwe na muda wa kutosha kuangazia mifano ifuatayo.

3) ENGING'URAROTO enkitalalaunoto arashu engibirribirr e engiteng'ena e tipat

Neeku, kaa siaai nabo ina niin'dim iyie aataasa tekuna tiatwa engkipengele?



- Ore tinaardasi ino, n'tamaniki ina nabo niin'dim iyie oo rmarei lino aataasa oo lcherueti pee eyau nkibelekenyat tiatua erripoto oo nkitobirunot Engai?
- Tadamu aajo ore erripore aang' oonkitobirunot naa engitanapata Engai teyiook peekirrip nkitobirunot (**Enkiterunoto 2:15**). Ore tenitakini iyiik osotwa (tiatua em'baikinoto nasipa) oo Engai, nibalai engirukoto oo Itauja lang' 1) tooltauja oorkulie (haki olosho) oo 2) amani oo nkitobirunot (erripoto oo nkitobirunot/orkwaak le enkop).
- N'choo elimu ilooiteng'eni aare arashu wuni tele darasa aajo kaaba nabo iidim aataas pee eyau ngibelekenyat.

Osiligi

- Tenekiyolou aajo kiata Engai nemekiurishore naata enyorrota, nekiin'dim aataapare n'golikinot oo nkibelekenyat orreje le enkop tosiligi.
- Ore Enaituruku, Kiyolo aajo ore alaitobirunoni lang', Engai osiligi, enyorr olosho, nemeing'waa aikata Engai.
- Eniare, ore enaa ilairukok le Yesu Kristo, idimie iyook engiyang'et sinyati peekiaku emayiani toorkulikai (haki olosho) oo nkitobirunot (enkop).
- Neeku, ore matwa oo lang'eni le sayansi oo le enkop neeta osiligi aajo kiin'dim pookin aataas engiti bae tenaboishu peekiyau enkibelekenyata sapuk.

Ebaiki nemetii engata naidip pee king'uraa kuna baa.

- **Wangari Maathai**—mshindi wa Tuzo ya Nobel ya Kenya tuliyemzungumzia mwanzoni mwa somo.
 - “Miti milioni 30 iliyopandwa na waliojitolea wa Green Belt Movement—hasa wanawake wa vijijini—kote nchini Kenya katika kipindi cha miaka 30 iliyopita ni ushahidi wa uwezo wa watu binafsi kubadilisha historia ya mazingira.
 - “Kwa kufanya kazi pamoja, tumethibitisha kwamba maendeleo endelevu yanawezekana; upandaji miti upya katika ardhi iliyoharibiwa unawezekana; na utawala bora unawezekana wakati raia wa kawaida wanapoarifiwa, kuhamasishwa, na kushiriki katika hatua za moja kwa moja kwa mazingira yao.”
- **Jane Goodall** alifanya utafiti na sokwe katika Hifadhi ya Taifa ya Gombe nchini Tanzania kwa miaka 30 (1960–1990). [Tazama Rasilimali za Somo la 3.]
 - “Matumaini ndiyo yanayotuwezesha kuendelea mbele katika hali ngumu.”¹¹
 - “Ninaamini kweli, na siko peke yangu kama mwanasayansi, kwamba tuna wakati ambapo tukikusanyika pamoja na kuchukua hatua, tunaweza kupunguza kasi ya mabadiliko ya tabianchi na upotevu wa bayoanuwai...**Siwezi kuokoa ulimwengu, lakini naweza kufanya nini hapa?...Chochote unachojali, ungana na marafiki na uchukue hatua. Fanya unachoweza kufanya ili kutatua kile unachopenda na utaona unaleta mabadiliko.**”¹²
- **Wangari Maathai**—enkaisulani e Tuzo e Nobel tolosho le Kenya lekiimakitia duoo tengaiterr enkisoma.
 - “Irkeek oobaya imilionini osom ootuuno nkitwaak e Green Belt Movement—aisulaki nkitwaak oo rkijijini—tolosho pookin le Kenya tengata oo larin osom ooima, ore ina nitodolu njere aajo idimakinoi iltung’anak maote peeyau nkibelekenyat te enkop.
 - “Tenekiaas esiaai tenaboishu, kitaduaa aajo ore maendeleo aadoru neidimakinoi; eunoto oorkeek teng’ejuko too wuejitin nainyalaki nidimakinoi; idimakinoi erikore sidai tenelikini iltung’anak, nitanapi, neesisho tiatua m’baa pookin naaipirita enkop enye.”
- Etaasa **Jane Goodall** en’jurre ore oo ltulal tiatua oserok le enkop oji Gombe otii Tanzania toolarin osom (aiteru 1960–1990). [N’gurai tenkisoma ewuni.]
 - “Osiligi oretoki iyook maape dukuya toongataitin naagol.”¹¹
 - “Aiiruk esipa, nematii openy enaa ilang’eni le sayansi, aajo etii nkataitin naa tenekindurrro tenebo tengirukoto, nekiin’dim aitong’oro m’baa oo nkibelekenyat orreje le enkop oenkiminata e bayoanuwai...**Maidim aatomitu olosho, kake kanyoo aidim aataasa tene?...ore nena nishilaa, inotore ilcherueti niesiese. Taasa ina niin’dim aataasa piirrip nena ninyorr nekin’todol aajo iyauta nkibelekenyat.**”¹²



Kwa hivyo, nini sasa?

- 5
- Katika somo la kwanza, tuliona kwamba uelewa wa jadi wa Wamaasai ni kwamba *Engai* hudhibiti hali ya hewa.
 - Hata hivyo, katika masomo haya, pia tulijifunza kwamba kuna tofauti kati ya hali ya hewa na tabianchi, na tunaona kwamba athari kubwa zaidi kwa mabadiliko ya tabianchi ni kwa sababu ya shughuli za



Neeku, oo taata?

- Ore tengisoma engaiterr, nekitaduaa aajo ore engarriyiano e mila oo Irmaasai naa Engai naitaheki orreje lenkijape/enkop.
- Ore ake sii, tekulo somoi kulie, nekitaduaa aajo epaaha orreje lenkijape enkop oo orreje le enkop, nekidolita aajo ore n’golikinot kumok too ngibelekenyat orreje lenkop naa tengaraki nkiasin oo

binadamu—hasa kuzalisha gesi zinazoongeza joto la dunia hewani, kama vile kaboni dioksidi hwanjia ya kuchoma petroli.

- Kwa hivyo, tunaona kwamba wanadamu wanaweza kuwa na jukumu muhimu katika kupunguza athari mbaya za mabadiliko ya tabianchi. Jukumu letu muhimu kimsingi ni lile agizo la Mungu kwetu kutunza uumbaji wake mzuri. Kwa hivyo, ni dhahiri kwamba shughuli za binadamu ndizo sababu kuu za mabadiliko ya tabianchi na kwamba wanadamu wana kitu cha kuchangia katika kubadilisha tabianchi kijadi na kisayansi. Mitazamo ya kisayansi na ya Kikristo inasisitiza kwamba wanadamu wana jukumu la kuwa wasimamizi wa dunia na kuilinda kwa ajili ya vizazi vijavyo.
- Tunaweza kuleta mabadiliko! Hebu tujadili hili katika vikundi vidogo.

Shughuli za Kuleta Mabadiliko katika Mgogoro wa Tabianchi

- 8
- Bainisha njia 3 zinazofaa ambazo WEWE unataka kuleta mabadiliko katika kupunguza mabadiliko ya tabianchi katika muktadha wa jadi ya Wamaasai.
 - Bainisha njia 3 zinazofaa ambazo UNATAKA kuleta mabadiliko katika kukabiliana na mabadiliko ya tabianchi (ustahimilivu) katika muktadha wa kitamaduni wa Wamaasai.

Ikiwa kuna muda, mwandishi kutoka kila kikundi ashirikishe jambo moja ambalo wanakikundi watalifanya ambalo lilikuwa muhimu katika mazungumzo ya kikundi chao.

Uandishi wa Nyimbo

- Au
8
- Shughuli hii inaweza kuchukua dakika 10–15. Kwa hivyo, ingawa ni programu nzuri sana, inahitaji muda wa kutosha kuikamilisha vizuri.*

Kila kikundi kiandike ubeti mmoja wa wimbo kuhusu maarifa na desturi za kitamaduni za kimazingira za Wamaasai ambazo pia ni njia bora za kupunguza mabadiliko ya tabianchi. Tumia sauti ya kawaida

iltung'anak—aisulaki too irgesii oopon enkirowuaj tenkijape, nijo kaboni dioksidi torbae le em'pejore eilata e petroli.

- Neeku, kidolita aajo iidim iltung'anak aataas esiaai etipat tengitong'ortao oo n'golikinot torrok oo nkibeleyenat orreje le enkop. Ore esiaai sapuk teyiook naa ilo kilikwai le Engai lerripoto oo nkitobirunot enyena sidan. Neeku, ibala aajo nkiasin oo iltung'anak naayau nkibeleyenat orreje le enkop naake eeta inas iltung'anak tiatua enkibeleyenata orreje le enkop temila oo te sayansi. Ore nging'urat e sayansi oone Kikristo nelimu aajo eeta iltung'anak engias naaku ilaitahekinok le enkop, nitaheiki tengaraki eishoi nasuju.
- Kiin'dim aayautu! Nkibeleyenat! Maing'urai siyie kuna too ilturrurri kutiti.

M'baa Naayau Nkibeleyenat tiatua Ilarrabali lo Orreje le Enkop

- Tolimu nkoitoi wuni naanare niyeu IYIE pee iyaunye nkibeleyenat tengitong'ortao oo nkibeleyenat orreje le enkop torkwaak lemila oo Irmaasai.
- Tolimu nkoitoi wuni naanare NIYEU niyaunye nkibeleyenat tengirishata oo ngibeleyenat orreje le enkop torkwaak lemila oo Irmaasai.

Tenetii engata, neliki iyook iltung'anak tolturrurri pookin em'bae naidim aataas nara tipat tolturrurr lenye.

Esirata/En'dung'unoto oo Sinkolioitin

Ore enasiaai neidim aataasai too ldakikani tomon arashu tomon oimet. Neeku, ore enakee esiaai sidai oleng', eyieu enkata naishaakinore naidipieki esidai.

Ore kila olturrurr kiti nchoo esirr orbeti obo lo osinkolio oipirita enkariyiano orkwaak le asili te enkop oo Irmaasai naake sii nkoitoi sidan naaitolong' nkibeleyenat orreje le enkop. Taranye oltoilo

inayojulikana na wanafunzi wengi. Wimbo wa Wamaasai wa mtindo wa kupokezana unaweza kuwa njia nzuri ya kuanzia. Kisha, waalike kila kikundi kuimba ubeti wao.

otamoo iloiteng'eni kumok. Ore osinkolio loo Irmaasai ang'amakinoini niidim aataa enkoitoi sidai naiterunyeki. Netumoki Iturrurri pookin aatarany orbeti lenye.

1

Prayer

Engomono

60

Mwisho wa Somo

Engiting'oto Osomo/Enkisoma

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- ⁴ “Climate Change Mitigation and Adaptation,” 3.
- ⁵ “Climate Change Mitigation and Adaptation,” 4–5.
- ⁶ “Climate Change Mitigation and Adaptation,” 5–6.
- ⁷ Rinku Verma et al., “Toxic Pollutants from Plastic Waste—A Review,” *Procedia Environmental Sciences*, Waste Management for Resource Utilisation, vol. 35 (January 2016): 701–8, <https://doi.org/10.1016/j.proenv.2016.07.069>. “...plastics is burnt, releasing **toxic gases** like Dioxins, Furans, Mercury and Polychlorinated Biphenyls into the atmosphere. Further, burning of Poly Vinyl Chloride liberates *hazardous halogens and pollutes air*, the **impact of which is climate change**. The toxic substances thus released are posing a **threat to vegetation, human and animal health and environment as a whole**. Polystyrene is harmful to Central Nervous System. The hazardous brominated compounds act as **carcinogens** and **mutagens**. Dioxins settle on the crops and in our waterways where they eventually enter into our food and hence the body system. These Dioxins are the lethal persistent organic pollutants (POPs) and its worst component, 2,3,7,8 tetrachlorodibenzo-p-dioxin (TCDD), commonly known as agentorange is a **toxic compound which causes cancer and neurological damage, disrupts reproductive thyroid and respiratory systems**. Thus, **burning of plastic wastes increase the risk of heart disease, aggravates respiratory ailments such as asthma and emphysema and cause rashes, nausea or headaches, and damages the nervous system**. Hence, a sustainable step towards tomorrow’s cleaner and healthier environment needs immediate attention of the environmentalists and scientists. This review presents the hazards of incineration; open burning of plastics and effects of plastic in water and also a possibility of working out strategies to develop alternate procedures of plastic waste management.”
- ⁸ “Climate Change Mitigation and Adaptation,” 8–12.
- ⁹ “Climate Change Mitigation and Adaptation,” 13.
- ¹⁰ Maathai, *The Green Belt Movement*, xi. See also, Wangari Maathai. *The Green Belt Movement: Sharing the Approach and the Experience*. Revised edition. Lantern Publishing & Media, 2003; and Wangari Maathai. *Replenishing the Earth: Spiritual Values for Healing Ourselves and the World*. Random House, 2010.
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- ¹² Jane Goodall. “Reasons for Hope” About the Planet’s Future, *Greater Boston*, GBH News’. 29 September 2023. <https://www.youtube.com/watch?v=LXXb5MjPbPI>.

Part 3: Resources for the Lessons





15. Resources for Lesson 1:

Biblical Creation Care

Resources Below

1. More Creation Care Related Bible Verses
2. If more time, here are more teaching suggestions
3. Creation Care Resources and Quotes from African Scholars
4. Creation Care Resource Books and Quotes

1. More Creation Care Related Bible Verses

These are more Bible verses (beyond what has been discussed in the lessons) that reveal:

- We have been given a mandate to look after what God has made.
 - We are called to care for our fellow humans.
 - Jesus died for all creation—not just humans.
 - All creation has suffered due to bad human actions.
 - God will restore creation when Jesus returns.
-
- **Genesis 1:25-28** “God made the wild animals according to their kinds, the livestock according to their kinds, and all the creatures that move along the ground according to their kinds. And God saw that it was good. Then God said, ‘Let us make man in our image, in our likeness, and let them rule over the fish of the sea and the birds of the air, over the livestock, over all the earth, and over all the creatures that move along the ground.’ So God created man in his own image, in the image of God he created him; male and female he created them. God blessed them and said to them, ‘Be fruitful and increase in number; fill the earth and subdue it. Rule over the fish of the sea and the birds of the air and over every living creature that moves on the ground.’”
 - **Genesis 4:9–10** Then the LORD said to Cain, “Where is your brother Abel?” / “I don’t know,” he replied. “Am I my brother’s keeper?” / The LORD said, “What have you done? Listen! Your brother’s blood cries out to me from the ground.
 - We are commissioned to care for others, which includes caring for the environment which others are dependent upon for their livelihoods.
 - **Leviticus 25:1–7** The LORD spoke to Moses on Mount Sinai, saying, “Speak to the people of Israel and say to them, When you come into the land that I give you, the land shall keep a Sabbath to the LORD. For six years you shall sow your field, and for six years you shall prune your vineyard and gather in its fruits, but in the seventh year there shall be a Sabbath of solemn rest for the land, a Sabbath to the LORD. You shall not sow your field or prune your vineyard. You shall not reap what grows of itself in your harvest, or gather the grapes of your undressed vine. It shall be a year of solemn rest for the land. The Sabbath of the land shall provide food for you, for yourself and for your male and female slaves and for your hired worker and the sojourner who lives with you, and for your cattle and for the wild animals that are in your land: all its yield shall be for food.
 - The land itself must be given a rest and not abused.

- **Leviticus 25:23-24** “The land must not be sold permanently, because the land is mine and you are but aliens and my tenants. Throughout the country that you hold as a possession, you must provide for the redemption of the land.”
- **Deuteronomy 10:14** “Behold, to the LORD your God belong heaven and the heaven of heavens, the earth with all that is in it.
 - All of heaven and earth belong to the LORD.”
- **Psalm 8:3-8** “When I consider your heavens, the work of your fingers, / the moon and the stars, which you have set in place, what is man that you are mindful of him, the son of man that you care for him? / You made him a little lower than the heavenly beings and crowned him with glory and honor. / You made him ruler over the works of your hands; you put everything under his feet: / all flocks and herds, and the beasts of the field, / the birds of the air, and the fish of the sea, all that swim in the paths of the seas.”

- **Psalm 104:14-24**

You cause the grass to grow for the livestock
and plants for man to cultivate,
that he may bring forth food from the earth
and wine to gladden the heart of man,
oil to make his face shine
and bread to strengthen man’s heart.
The trees of the LORD are watered abundantly,
the cedars of Lebanon that he planted.
In them the birds build their nests;
the stork has her home in the fir trees.
The high mountains are for the wild goats;
the rocks are a refuge for the rock badgers.
He made the moon to mark the seasons;
the sun knows its time for setting.
You make darkness, and it is night,

when all the beasts of the forest creep about.
The young lions roar for their prey,
seeking their food from God.
When the sun rises, they steal away
and lie down in their dens.
Man goes out to his work
and to his labor until the evening.
O LORD, how manifold are your works!
In wisdom have you made them all;
the earth is full of your creatures.

- This selection of Psalm 104 is a beautiful creation psalm. The psalmist praises God for both creating and caring for the many, many different created beings in our world.
- **Matthew 6:26-27** “Look at the birds of the air: they neither sow nor reap nor gather into barns, and yet your heavenly Father feeds them. Are you not of more value than they? And which of you by being anxious can add a single hour to his span of life?”
 - God cares for the birds and all of God’s creation.
 - God’s care for us gives us hope in spite of challenges.
- **Romans 8:22-23** “We know that the whole creation has been groaning as in the pains of childbirth right up to the present time. Not only so, but we ourselves groan inwardly as we wait eagerly for our adoption as sons, the redemption of our bodies.”
- **1 Corinthians 10:26** For “the earth is the Lord’s, and the fullness thereof.” (Quote from Psalm 24:1)
 - Creation and all created things are inherently good because they are of the Lord.
- **Colossians 1:19-20** “For God was pleased to have all his fullness dwell in him [Christ] and through him to reconcile to himself all things, whether things on earth or things in heaven, by making peace through his blood shed on the cross.”

2. If more time, here are more teaching suggestions:

Invite students to reflect on their position in God's creation.

- Think of how you feel when the creation provides you with all you need. (Blessed by God's good creation)
- Think of the position humans holds, being entrusted by God. Mention the tasks of Maa elders, leaders, warriors, men, women and parents and children concerning creation care. Think of God's purpose in placing you in that position in his creation. (Honored to be commissioned by God to care for creation)
- Think of your sincere response to God for such a blessing. (Committed to care for God's creation)

3. Creation Care Resources and Quotes from African Scholars

Here are some quotes from African men and women scholars and others on biblical creation care. They can be applied for Maasailand. They are organized into **creation care principles**, **gender and stewardship**, and **cultural perspectives**.

1. Creation Care Principles

- **Kirsteen Kim** (2015, African theologian): "In Africa, caring for creation is about respecting God's gift of nature, not just protecting it."
 - This quote emphasizes that **caring for creation** is not just about environmental protection, but about **honoring and respecting** the earth as a divine gift.
- **J. Kameri-Mbote** (2000, Kenyan scholar): "African cultures, like the Maasai, believe creation should be respected, which aligns with the Bible's call to care for the earth."
 - This highlights the **biblical call to respect and care** for creation, which is also deeply rooted in **African cultural values**, such as those in Maasai culture.

2. Gender and Stewardship

- **Nyambura J. Njoroge** (2009, Kenyan theologian): In Africa, women, like Maasai women, are key to protecting nature, reflecting the biblical call to nurture the earth."

- Njoroge points out how **women**, especially Maasai women, play a critical role in **protecting the environment**, which is aligned with the **biblical responsibility** to nurture creation.
- **Grace Ji-Sun Kim** (2012, Ecofeminist theologian): "Women's care for the earth reflects God's love, and their role in nature is part of biblical stewardship."
 - Kim connects **eco-feminism** with **biblical stewardship**, recognizing **women's role in creation care** as an expression of God's love and care for the world.

3. Cultural Perspectives on Creation Care

- **Vusimuzi Madonsela** (2014, South African theologian): "God created the earth to be cared for by all people. In Maasailand, men and women share responsibility for creation care."
 - This quote acknowledges the **shared responsibility** of **men and women** in Maasailand for **creation care**, showing the **cultural practice of stewardship** in line with **biblical principles**.

4. Creation Care Resource Books and Quotes

The following are quotes on: **Core Principles of Creation Care**, **Environmental Stewardship as a Christian Duty**, and **Practical Implications and Theological Reflections**.

1. Core Principles of Creation Care

- **Moo, Douglas J., and Moo, Jonathan A.** (2018): “Creation care is not an optional add-on to the Christian life but is integral to the biblical mandate for humanity to steward the earth as God’s vice-regents.”
 - This emphasizes that **creation care** is a fundamental **biblical mandate**, central to the Christian faith.
- **Middleton, J. Richard** (2004): “The gospel encompasses not just the salvation of humanity but also the redemption of creation, making environmental stewardship an essential aspect of Christian witness.”
 - This highlights that **stewardship of creation** is tied to **salvation**, showing the **holistic** scope of the gospel.

2. Environmental caretaking as a Christian Duty

- **Bouma-Prediger, Steven** (2001): “The biblical vision of creation care calls Christians to a holistic approach where environmental stewardship is seen as a form of worship and obedience to God.”
 - **Environmental stewardship** is viewed as a **spiritual act**, a way to **worship and obey God**.
- **McCormick, Michael R.** (2009): “Understanding creation care from a Christian perspective involves recognizing that the natural world is a sacred trust from God, requiring us to manage it responsibly.”
 - **Creation care** is described as a **sacred responsibility** entrusted to humanity by God.
- **Stamps, Dennis L.** (2018): “Biblical stewardship is grounded in the understanding that God entrusts humanity with the responsibility to nurture and protect the environment as part of our divine mandate.”
 - This quote stresses that **biblical stewardship** is about **nurturing** and **protecting** the earth as part of God’s command.

- **Wirzba, Norman** (2013): “Biblical foundations for environmental ethics reveal that caring for the earth is not merely a practical concern but a spiritual duty reflecting our relationship with God as the Creator.”
 - **Caring for the earth** is framed as a **spiritual duty** that reflects humanity’s relationship with God as **Creator**.

3. Practical Implications and Theological Reflections

- **Robinson, Timothy S.** (2020): “Christians are called to be proactive in addressing environmental issues because caring for the earth is a reflection of our commitment to God’s creation and His commands.”
 - Christians are encouraged to be **active participants in environmental solutions**, demonstrating their **commitment to God’s creation**.
- **Wright, Christopher J. H.** (2020): “The church must embrace creation care as a central element of its mission, integrating environmental stewardship into its theology and practice.”
 - The church is called to make **creation care** a key part of its **mission**, incorporating it into both **theology and practice**.
- **Bauckham, Richard** (2022): “Creation care is deeply embedded in biblical theology, reflecting God’s concern for the entire created order and our role in maintaining its integrity.”
 - **Creation care** is deeply connected to **biblical theology**, emphasizing God’s **concern** for all of creation and humanity’s role in **maintaining its integrity**.
- **White, Lynn Jr.** (2012): “A biblical vision for environmental responsibility challenges Christians to reassess their relationship with nature and embrace a more ecologically aware lifestyle.”
 - A call to **reassess relationships with nature**, encouraging a **more ecologically conscious lifestyle** as part of **biblical responsibility**.



16. Resources for Lesson 2:

Maasai Traditional Environmental Knowledge

Resources Below

1. Information about the Maasai
2. Maasai Traditional Environmental Knowledge (TEK) are Good Ways to Take Care of Creation.
3. If more time, here are more teaching suggestions
4. Scientific Analysis of Maasai Traditional Environmental Knowledge (TEK)
5. Quotes from Resource Articles and Books
6. Sustainable Pastoralism

1. Information about the Maasai

- **The Maasai, a semi-nomadic pastoralist** community in East Africa, have developed a range of environmental practices that contribute to ecological balance and sustainability. The Maasai live in harmony with nature, caring for their cattle as a gift from the land.
 - In recent decades, the Maasai have faced significant challenges, including land pressure due to population growth, changes in land tenure systems, and climate change.
 - These challenges have sometimes strained their traditional practices.
- **Maasai traditional environmental knowledge (TEK):** The Maasai continue to adapt, blending their traditional knowledge with new strategies to sustain their way of life and care for the environment.
 - The Maasai traditional environmental knowledge (TEK) is a testament to their deep understanding of and respect for the natural world.
 - Rotational grazing, water conservation, and communal land management enable the Maasai to live sustainably in challenging environments.
 - As modern challenges arise, the Maasai continue to adapt their traditional practices, ensuring that their cultural heritage of environmental caretaker remains vital in the care of creation in Tanzania.
- **Community-Based Wildlife Conservation:** The Maasai have developed various community-based conservation initiatives that integrate wildlife protection with pastoralist practices. For instance, they participate in wildlife management programs and support conservation areas, recognizing the benefits of preserving wildlife for maintaining ecological health and promoting tourism.

2. Maasai Traditional Environmental Knowledge (TEK) are Good Ways to Take Care of Creation.

1. Traditional land use plan, e.g., zoning per season
2. Management of scarce resources
3. Shared use of nature and natural resources
4. Preserving trees for domestic and medicinal purposes
5. Prohibition of killing wild animals for cultural reason
6. Keeping domestic animals for food and worship purposes
7. Traditional rules, regulations, and taboos for environmental conservation
8. The responsibility of community leadership in environmental care

3. If more time, here are more teaching suggestions

- **Organize a debate** on topics like “The Role of Culture in Environmental Conservation.”
 - Use the Maasai example to highlight the value of cultural knowledge.
 - Pose a real-world problem, such as managing overgrazing or conserving water.
 - Challenge students to propose solutions using Maasai-inspired principles of caretaking and coexistence with nature.
- **Create a “Creation Care” Action Plan:**
 - **Activity:** After discussing Bible texts, have students create an “action plan” for how they, their school, or community can better care for the earth.
 - **Task:** The plan should be based on the biblical idea of stewardship, where they apply the principles of caring for the earth with reverence and responsibility.
 - **Outcome:** This encourages students to think practically about how they can implement biblical teachings in their daily lives.
- **Parent Engagement:** Have the students ask their parents three key questions:
 - What are the best ways to mitigate climate change?
 - What are the causes of climate change?
 - What are the best ways to reduce climate change?
- **Traditional practices:** Divide students into groups to discuss one of these traditional practices. Each group will explain the practice’s environmental benefits and how it reflects the principle of mutual dependence.
 - **Mutual Dependence:** Maasai life is centered around the interdependence of people and the environment.
 - **Pastoral Practices:** Traditional sustainable grazing methods that ensure ecosystems are preserved.
 - **Sacred Natural Sites:** Reverence for certain trees, rivers, and mountains that are vital to Maasai spirituality and physical well-being.
 - **Water Management:** Techniques for efficient use and conservation of water resources.
 - **Fire Management:** Controlled burning to prevent larger wildfires and encourage the regeneration of vital plant species for grazing.

4. Scientific Analysis of Maasai Traditional Environmental Knowledge (TEK)

Compiled by Beth Elness-Hanson

- **Sustainable pastoralism** (semi-nomadic pasturing of cattle)
 - "...pastoralism was...a highly productive system of land use that was more compatible with wildlife conservation than other rural production systems."¹
 - "Once vilified as a destructive land use, since the late 1980s pastoralism has come to be understood as the livelihood system most compatible with wildlife. Unlike agriculturalists, who directly compete with wildlife habitat for productive land, pastoralists typically manage their rangelands in ways that support both wildlife and livestock."²
 - "Pastoralism is the dominant livestock production system in most of Africa. Pastoral practices are based on local endogenous knowledge of both the environment and the animal. It is based on the continued capacity to adapt to a harsh environment, characterized by the scarcity, dispersion and variability of natural resources over vast territories."³
 - Making strategic and sustainable use of land areas where, "Farming in the arid and semi-arid zones is socially unacceptable (low food security because of crop failure risks) and economically not feasible."⁴ Arid lands "...are unsuitable for rainfed agriculture (the driest spot [in Monduli District] is Mfereji village in the rift valley with about 200 mm rainfall annually). Soils are generally shallow and not fertile."⁵
- **Protecting biodiversity**⁶
 - Not hunting wild animals or poaching, because they are not used as food sources.
 - Even lion hunting, a former prestigious act for a warrior, is no longer supported.
- **Protecting ecosystems**
 - "Manzano and others pointed to a growing body of scholarly research demonstrating what the Maasai had long known: that their management of the land did not degrade the Serengeti ecosystem but had actually helped sustain and even create it—the grasslands the Maasai had cultivated for hundreds of years were the same grasslands that many wild animals needed to thrive."⁷
 - Not cutting down wood, in general, no logging industry; no mangrove destruction. Rather scrounging for deadwood for fires.
 - Not burning for slash and burn agriculture. Perhaps limited burns for pest management.
 - Not making charcoal.
- **Preserving grasslands, which are "carbon sinks"** (meaning they have the ability to store large amounts of carbon). (Grasslands are also an ecosystem, but it has a special focus here in a Maasai context.)
 - Allowing grasslands to rest during the dry season by moving to high grounds (*osupuko*) and returning from high grounds (*osupuko*) to go to low grounds [*olpurkel*] when the rains return, which is a good way of managing grass, trees, and flowers (flora).
 - "Grasslands store approximately 34% of the global terrestrial stock of carbon according to the World Resources Institute. Unlike forests where vegetation is the primary source of carbon storage, most of the grassland carbon is stored in the soil."⁸
 - "Increased drought and wildfire risk make grasslands more reliable carbon sinks than trees... Trees are still critical. The study does not suggest that grasslands should replace forests on the landscape or diminish the many other benefits of trees."⁹
- **Environmentally sustainable livelihoods**
 - Pastoralist Maasai are not engaged in heavy industries that produce global-warming gases, such as agro-business, manufacturing, mining, and the like. However, cows do produce some methane, CH₄.

- Pastoralist Maasai do not use artificial fertilizers that causes water pollution through phosphate and nitrate runoff.
- Pastoralist Maasai do not use herbicides and pesticides that are applied in industrial agro-business.
- Pastoralist Maasai do not practice blast fishing.
- Pastoralist Maasai do not engage in mining industries which often result in arsenic, lead, and other contaminants in the groundwater.
- Pastoralist Maasai do not engage in shipping that produces black carbon pollution, hydrocarbon oil spills from shipping refuse at the ports, as well as disposing excess nutrients from wastewater into the oceans.
- Pastoralist Maasai do not significantly contribute to the environmental challenges of urban cities.

Bibliography:

- ¹ Benjamin Gardner, *Selling the Serengeti: The Cultural Politics of Safari Tourism* (Athens, London: University of Georgia Press, 2016), 6. Footnote Ellis and Swift 1998; Coppock, Ellis, and Swift 1986; Warren 1995.
- ² Gardner, 24.
- ³ Gaafar Rizgallah. “AU Guidelines to secure Pastoralism [sec] and prevent conflict in Africa”. African Union, 26 Sept 2022. <https://au.int/en/pressreleases/20220926/au-guidelines-secure-pastoralism-and-prevent-conflict-africa>
- ⁴ J. Douwe Meindertsma and Jan J. Kessler, eds., Meindertsma, J. Douwe, and Jan J. Kessler, eds. *Planning for a Better Environment in Monduli District*. (Netherlands Economic Institute, 1997) 46.
- ⁵ Meindertsma, 10–11.
- ⁶ Philip Isdor Mpango, ed., “National Environmental Master Plan for Strategic Interventions (2022 – 2032)” (United Republic of Tanzania Vice President’s Office, June 2022), 61, https://www.vpo.go.tz/uploads/files/MASTER%20PLAN-English_eBOOK_FINAL.pdf. Now this chart from page 62, representing left to right, 1975, 1995, and 2015. After the Serengeti, which has the strictest prohibitions of no hunting or human activity, then the most “high” and “medium” biodiversity quality habitat is in Maasailand, especially Ngorongoro—where the Maasai are being restricted (no cultivation) and forcefully displaced from. Note, there is little (or undiscernible) change since 1995 from these images. Furthermore, the Loliondo area is where hunting safaris are increasingly located, which impacts the natural ecosystems of biodiversity. Note, p. 61, “...most fires are caused by human activities particularly farm preparation. Driving forces include game hunting, honey collection, charcoal burning, and burning to simultaneously improve pasture quality...”
- ⁷ Stephanie McCrummen. ““This Will Finish Us:” How Gulf Princes, the Safari Industry, and Conservation Groups Are Displacing the Maasai from the Last of Their Serengeti Homeland.” (*The Atlantic*, 8 April 2024) 24.
- ⁸ Gord Vaadeland, “Grasslands, Forests & Wetlands - Nature’s Carbon Capture & Storage Solution,” *CPAWS*, 22 March 2016, <https://cpaws.org/grasslands-forests-wetlands-natures-carbon-capture-storage-solution/>.
- ⁹ Katherine E. Kerlin, “Grasslands More Reliable Carbon Sink Than Trees,” *University of California–Davis*, 9 July 2018, <https://climatechange.ucdavis.edu/climate/news/grasslands-more-reliable-carbon-sink-than-trees>.

5. Quotes from Resource Articles and Books

1. Creation Care & Environmental Stewardship

- **Hayhoe, Katharine** (Climate Scientist and Evangelical Christian) “Caring for the earth is an expression of our love for God and for our neighbors and should be an essential part of the Christian mission in the world.”
- **Maathai, Wangari** (Kenyan Environmentalist and Nobel Laureate) *The Challenge for Africa* (2009) “Indigenous knowledge and traditions can teach us valuable lessons in environmental stewardship and how to live in harmony with the land, honoring both creation and the Creator.”

2. Ecotheology & Spirituality

- **Njoroge, Nyambura J.** (African Theologian) “For African communities, creation care is not only an ecological practice but a spiritual one, deeply rooted in our cultural beliefs about the sacredness of the earth and its connection to the divine.”

3. Gender & Environmental Justice

- **Wright, Beverly.** (Women’s Environmental Advocate) “Women’s roles in environmental conservation are not just about resource management, but also about preserving the sacred relationships between community, land, and God.”

4. Maasai Ecological Practices & Sustainability

- **Bertram, Chris, and Chantal Vivier.** *Pastoralism and Development in Africa: Dynamic Change at the Margins*. Routledge, 2018. “Understanding Maasai environmental practices reveals the intricate connection between pastoral lifestyles and sustainable land management, highlighting how traditional knowledge can contribute to modern environmental solutions.”
- **Homewood, Katherine.** *Ecology of Pastoralism: The Maasai of East Africa*. Routledge, 2019. “The Maasai’s ecological practices, grounded in traditional knowledge, reflect a sophisticated understanding of environmental balance and sustainability, essential for the long-term health of their landscapes.”
- **Nugent, Paul.** *Smelling the Roses: Land Use and Livelihoods among the Maasai*. Oxford University Press, 2009. “The Maasai’s land management strategies, including their rotational grazing systems, are not merely traditional practices but reflect a deep-seated ecological wisdom that ensures resource sustainability.”

5. Traditional Knowledge and Environmental Stewardship

- **Maathai, Wangari.** *The Challenge for Africa*. Pantheon Books, 2009. “Indigenous practices, such as those of the Maasai, offer invaluable lessons in environmental stewardship, illustrating how traditional knowledge can inform and enhance modern conservation efforts.”
- **Spear, Thomas.** *The Maasai of Matapato: A Study of Rituals of Rebellion*. University of Chicago Press, 1981. “Maasai rituals and cultural practices are intertwined with environmental stewardship, demonstrating how cultural norms can shape and sustain ecological practices.”

6. Sustainable Pastoralism

Pastoralism Making variability work

Source: Food and Agriculture Organization of the United Nations (FAO). 2021. Pastoralism – Making variability work. FAO Animal Production and Health Paper No. 185. Rome. <https://doi.org/10.4060/cb5855en>; Creative Commons Attribution-NonCommercial ShareAlike 3.0 IGO licence. Page numbers listed refer to the document's pages.

A specialization in taking advantage of variability

Working with the natural environment

Pastoralism “refers to a wide family of livestock-based, livelihood and food production systems that are highly diverse but that all share a specialization in improving animals’ diets (and welfare) by managing their grazing itineraries at a variety of scales in time and space. Better nourished animals are healthier and more productive. Adding value by managing grazing itineraries requires adaptation to levels of variability that are characteristic of natural environments, especially the ways in which temporal and spatial variability in the distribution of moisture combines with the diversity of plant species and differences in soil and terrain morphology to result in sequences of short-lived concentrations of potential inputs. The place and time of such concentrations cannot be predicted from one year to the next, but the concentrations can be used by pastoralists who are able to arrive at the right place at the right time, and by animals that are able to benefit from the opportunities created by their herders. For this reason, pastoralism is also described as a specialization in taking advantage of variability (p. 3).

“Pastoralism is based on close interactions among animals, humans and their environment. In this document, this characteristic is referred to as working with the natural environment, not simply extracting fodder or water but actually increasing resources for livestock, and doing so in ways that make the circular interaction with the ecosystem a constitutive part of the pastoral system itself (p. 5).

“Pastoralists pay great attention to their animals’ behaviour and skills, trying to influence and improve them and secure their continuity in

the breeding population. Production systems centred on proved knowledge and integrated landscape management offer great latitude for creating ‘health’ for soil, plants, wild and domestic animals, people and the climate (p. 5).

“Pastoralism takes advantage of the variability in potential inputs – which are maximized and turned into actual inputs – by matching it with the variability (or “flexibility” or “optionality”) in its own operational processes. Mobility and flexible land tenure systems are the most obvious examples of variability embedded in the operational processes of pastoralism (p. 6).

“Pastoralism’s specialist approach makes it not only a sustainable livestock system, but also a vantage point from which to obtain a particularly clear and open view of the much-needed reconsideration of agriculture and food systems in relation to resilience and climate change. Around the world, pastoral systems have effectively managed to produce food with the natural environment rather than in antagonism with it. This alone deserves attention and the mobilization of efforts to better understand, secure and promote the specialization of pastoralism” (p. 8).

Pastoralism provides a host of benefits

Climate Change

“Pastoralism has the potential to contribute to both adaptation to and mitigation of climate change. Pastoralism requires little fossil energy and is solar powered, as animals walk to their naturally grown feed instead of having it cultivated and transported to them” (p. 12).

17. Resources for Lesson 3:

Climate Science for a Pastoralist Maasai Context

Resources below:

1. Maasai: Helpful information for teachers about the Maasai culture
2. Climate Change Mitigation and Adaptation
3. Climate Change Mitigation and Adaptation in a Pastoralist Maasai Context (table)
4. Maasai Context: Mitigation (prevention) and Adaptation (risk reduction): “Smile” Pits, Fuel-efficient stoves, Water Catchment or Reservoir
5. Teaching Notes on Hope: Wangarĩ Maathai and Jane Goodall
6. Global Warming Temperature Increase (image)
7. Sources of Greenhouse Gases (image)
8. Global-warming Gases Percent Effect on Climate Change (table)
9. Increase of Carbon Dioxide in the Atmosphere (CO₂) (image)
10. Methane Facts (CH₄)
11. If more time, here are more teaching suggestions
12. Additional Resources: Books and Articles

1. Maasai: Helpful information for teachers about the Maasai culture

- When the rains come, the Maasai move their herds to new pastures, allowing the land to recover and grow fresh grass. This rotational grazing ensures that the land remains fertile and productive. The Maasai have inherited this practice from their ancestors, who understood that balance and respect for the land were key to their survival.
- In the dry season, when the earth cracks under the relentless sun, the Maasai must travel long distances to find water sources for their herds. The Maasai know where to find hidden springs and seasonal rivers, passed down through generations of knowledge. Water is not just a resource; it is a lifeline, a critical element that shapes their movements and daily routines.
- The Maasai community, known for their rich cultural heritage and traditional pastoralist lifestyle, has long depended on the natural environment for their livelihood. However, in recent years, the effects of climate change such as unpredictable rainfall, prolonged droughts, and diminishing grazing lands have posed significant challenges to their way of life. Therefore, integrating climate science into the Maasai context is crucial for understanding these changes and developing strategies to adapt and thrive in a changing environment.
- By blending modern climate science with the Maasai’s traditional ecological knowledge, we can create a holistic approach that respects cultural practices while promoting sustainable solutions. This integration not only empowers the Maasai to protect their environment and sustain their livelihoods but also enriches their understanding of the world around them, fostering resilience in the face of climate challenges.



2. Climate Change Mitigation and Adaptation

Mitigation: Focuses on reducing global-warming (greenhouse) gases

- Mitigation centers on the root cause of climate change: the heat-trapping greenhouse gases humans are adding to the atmosphere faster than our planet can absorb them. These can be addressed by reducing the sources of greenhouse gas emissions, or enhancing “sinks” of greenhouse gases that remove them from the atmosphere.
- **Reducing sources:** Almost three-quarters of humans’ greenhouse gas emissions come from burning fossil fuels like coal, oil and natural gas,² so mitigation often focuses on replacing those fuels with other sources of energy, like renewables and nuclear power. Mitigation can also tackle other sources of greenhouse gases: protecting forests from being cut down, for instance, or collecting methane from landfills.
- **Enhancing sinks:** Other forms of mitigation, like growing new forests and designing and building “direct air capture” systems, work by taking greenhouse gases out of the atmosphere—sometimes called “carbon removal.” These approaches are challenging to do at a very large scale, and they do not eliminate the need to drastically lower our emissions. Still, authorities like the Intergovernmental Panel on Climate Change agree that some carbon removal will be needed to head off the worst climate change scenarios.³

Adaptation: Focuses on reducing the risk of negative impacts from climate change

- If mitigation is successful worldwide, then one day greenhouse gases will stop building up in the atmosphere, and the planet will slowly stop warming. Even so, we will already have created a hotter world, changed the Earth’s weather patterns, and “locked in” some future changes—like sea level rise, which may continue for hundreds of years after the Earth’s temperature stabilizes.
- Adaptation to these changes will vary from place to place. Often, it involves building or retrofitting infrastructure, like a better storm drain system to manage increased flooding. But adaptation can also include natural solutions, like restoring wetlands to buffer hurricanes, or behavior and policy changes, like growing new food crops that can better handle warmer seasons and droughts.
- Ideally, adaptation is proactive, building systems to withstand not only current but future climate change. In Bangladesh, one of the most vulnerable countries in the world to sea level rise and saltwater intrusion, the port city of Mongla is investing in embankments, drainage, flood-control gates and water treatment to get ahead of rising waters, and economic development to provide refuge and work opportunities for thousands of people displaced from nearby towns. Areas that don’t take early steps like these will find themselves adapting reactively: rebuilding after climate change has already destroyed buildings, forced people from their homes, and taken livelihoods and lives.

Source: <https://climate.mit.edu/explainers/mitigation-and-adaptation>; Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International license (CC BY-NC-SA 4.0)

3. Climate Change Mitigation and Adaptation in a Pastoralist Maasai Context

Mitigation	Adaptation	Kupunguza	Kukabiliana
<p>1. Plant trees which absorb CO₂ (especially trees that are native to the area).</p> <p>2. Energy efficiency (reducing carbon)</p> <p>a) Use more efficient wood burning cooking stoves to reduce burning of wood (which puts global-warming gases into the environment).¹ [See Resources Chap. 17 for an example stove.]</p> <p>b) Increase the use of renewable energy such as solar power.</p> <p>c) Use energy efficient LED lights or compact fluorescent lights (CFLs) instead of old incandescent light bulbs.</p> <p>d) Turn off electrical lights when not being used.</p> <p>3. Reduce the use of plastic bottles and recycle the bottles that are used.</p>	<p>5. Water</p> <p>h) Develop water harvesting and storage mechanisms.³</p> <p>i) In acute water scarcity, temporarily migrate to areas where water is accessible.</p> <p>j) Develop water catchment areas (reservoirs) boreholes, piped water, and dams.⁴ [See Resources Chap. 17.]</p> <p>6. Food security</p> <p>k) Put in place food security enhancement strategies (food reserve).⁵</p> <p>l) The households' ability to purchase food is the most important food security strategy.⁶</p> <p>m) A reliable income source and asset base is crucial for household response to climate shocks.⁷</p> <p>n) 58% reported that they resort to selling livestock... in response to shocks.⁸</p> <p>7. Infrastructure resilience</p> <p>o) More secure house and facility locations</p> <p>p) Preventive and precautionary measures (evacuation plans, health issues, etc.)</p> <p>8. Ecosystem and landscapes</p> <p>q) Landscape restoration (natural landscape) and reforestation</p> <p>r) Conservation of natural ecosystem (biodiversity and water)</p> <p>9. Traditional environmental knowledge</p> <p>s) Identify and sustain indigenous/traditional Maasai knowledge with practices that are good for caring for the environment; "...local knowledge systems and institutions should buttress policy-making and implementation to promote local resilience."⁹</p> <p>t) "Gradual and medium to long-term livelihood diversification initiative is a highly recommended</p>	<p>1. Panda miti ambayo inachukua kaboni dioksidi, CO₂ (hasa miti ambayo ni ya asili ya eneo la hilo).</p> <p>2. Ufanisi wa nishati (kupunguza kiwango cha kaboni)</p> <p>a) Tumia majiko ya kuni yenye ufanisi zaidi ya kuni ili kupunguza uchomaji wa kuni (ambao huweka gesi zinazongeza joto kwenye dunia kwenye mazingira).¹ [Tazama Nyenzo sura ya 17 kuhusu kuchoma biomasi chini na mfano wa jiko linalotumia mafuta kidogo.]</p> <p>b) Kuongeza matumizi ya nishati mbadala kama vile nishati ya jua.</p> <p>c) Tumia taa za LED zisizo na nishati au taa za fluorescent (CFL) badala ya balbu za zamani za incandescent.</p> <p>d) Zima taa za umeme wakati hautumiki.</p> <p>3. Punguza matumizi ya chupa za plastiki na urejeshe tena chupa zinazotumika.</p>	<p>5. Maji</p> <p>h) Tengeneza njia za kuvuna na kuhifadhi maji.</p> <p>i) Katika uhaba mkubwa wa maji, hamia kwa muda kwenye maeneo ambayo maji yanapatikana.</p> <p>j) Kuendeleza maeneo ya kukusanyia maji, visima, maji ya bomba, na mabwawa.⁴ [Tazama picha hapa chini katika Nyenzo sura ya 17.]</p> <p>6. Usalama wa chakula</p> <p>k) Weka mikakati ya kuimarisha usalama wa chakula (hifadhi ya chakula).⁵</p> <p>l) Uwezo wa kaya kununua chakula ndio mkakati muhimu zaidi wa usalama wa chakula.⁶</p> <p>m) Chanzo cha mapato kinachotegemewa na msingi wa mali ni muhimu kwa mwikitio wa kaya dhidi ya majanga ya tabia nchi.⁷</p> <p>n) Asilimia 58 ya kaya ziliripoti kuwa zimeamua kuuza mifugo...ili kudhibiti majanga ya tabia nchi.⁸</p> <p>7. Ustahimilivu wa miundombinu</p> <p>o) Maeneo salama zaidi ya nyumba na kituo</p> <p>p) Hatua za kuzuia na za tahadhari (mipango ya uokoaji, masuala ya afya, n.k.)</p> <p>8. Mfumo wa ikolojia na mandhari</p> <p>q) Marejesho ya mazingira (mandhari ya asili) na upandaji miti upya</p> <p>r) Uhifadhi wa mfumo ikolojia asilia (bioanuwai na maji)</p> <p>9. Maarifa ya jadi ya mazingira</p> <p>s) Tambua na udumishe maarifa asilia/jadi ya Wamaasai na mazoea ambayo ni mazuri kwa kutunza mazingira; "...mfumo na taasisi za maarifa za wenyeji zinapaswa kuimarisha utungaji na utekelezaji wa sera ili kukuza ustahimilivu wa wenyeji."⁹</p>

Mitigation	Adaptation	Kupunguza	Kukabiliana
<p>e) Because single-use plastic is produced from fossil fuels, obtaining and creating these plastics produces large amounts of global-warming gases.</p> <p>f) Burning plastics puts toxic chemicals into the air and land that is harmful to health.²</p> <p>4. Use garbage collection instead of burning garbage.</p> <p>g) Burning garbage releases carbon into the air. (See note “f” on burning plastic.)</p>	<p>policy strategy to increase resilience among pastoral communities as opposed to the current policy which condemns pastoralism as a backward and environmentally destructive activity.”¹⁰</p> <p>10) Agro-pastoralism/small-scale agriculture</p> <p>u) Use flexible and diverse cultivation</p> <p>v) Develop seed banking.¹¹</p> <p>w) Incorporate crops that are more drought resistant than maize, “such as sorghum, pigeon-pea, finger millet, sweet potato and chickpea...”¹²</p> <p>11) Leadership and governance</p> <p>x) Include women in decision making that affects their and their children’s lives to reduce the vulnerability of the entire household</p> <p>y) Strengthen local traditional leaders as the elders are in charge of resource control and allocation especially during periods of intense scarcity¹³ and provide infrastructural, social, legal, and financial support</p> <p>z) Strengthen the village council for how to seek government support...for infrastructural, social, legal, and financial support.¹⁴</p>	<p>e) Kwa sababu plastiki ya matumizi moja huzalishwa kutoka kwa nishati ya mafuta (kama petroli), kupata na kuunda plastiki hizi hutoa kiasi kikubwa cha gesi za joto za dunia.</p> <p>f) Tumia ukusanyaji wa taka badala ya kuchoma takataka.²</p> <p>4. Takataka zinazochomwa hutoa kaboni hewani.</p> <p>g) Kuchoma plastiki huweka kaboni dioksidi na kemikali za sumu katika hewa na ardhi ambayo ni hatari kwa afya ya binadamu na wanyama na mazingira. (Angalia maelezo “f.”)</p>	<p>t) “Mpango wa mseto wa maisha wa taratibu na wa kati hadi mrefu ni mkakati wa kisera unaopendekezwa ili kuongeza ustahimilivu miongoni mwa jamii za wafugaji kinyume na sera ya sasa inayolaani ufugaji kuwa ni shughuli ya kurudi nyuma na kuharibu mazingira.”¹⁰</p> <p>10. Kilimo-ufugaji/kilimo kidogo</p> <p>u) Tumia njia rahisi na tofauti za kilimo.</p> <p>v) Kuendeleza utunzaji wa mbegu.¹¹</p> <p>w) Jumuishia mazao yanayostahimili ukame zaidi kuliko mahindi, “kama vile mtama, njegere, mtama, viazi vitamu na kunde.”¹²</p> <p>11. Uongozi na utawala</p> <p>x) Wajumuishe wanawake katika kufanya maamuzi ambayo yanaathiri maisha yao na ya watoto wao ili kupunguza hatari ya kaya nzima.</p> <p>y) Waimarishe viongozi wa kimila kwani wazee ndio wanaosimamia uhibitaji na ugawaji wa rasilimali hasa nyakati za uhaba mkubwa,¹³ na kutoa msaada wa miundombinu, kijamii, kisheria na kifedha.</p> <p>z) Iimarisha halmashauri ya kijiji jinsi ya kutafuta msaada wa serikali...kwa msaada wa miundombinu, kijamii, kisheria na kifedha.¹⁴</p>

See p. 117–118 for a Kiswahili and Maa table.

Table Bibliography

¹ Ndesanjo, Theilade, and Nielsen. “Water scarcity is a common determinant of migration among pastoral communities.” (Berkhout 2012; Brockhaus et al. 2013). 2602, https://doi.org/10.1007/978-3-030-45106-6_128.

² Verma et al., “Toxic Pollutants from Plastic Waste-A Review,” *Procedia Environmental Sciences*, Waste Management for Resource Utilisation, 35 (January 1, 2016): 701–8, <https://doi.org/10.1016/j.proenv.2016.07.069>.

³ Ndesanjo, Theilade, and Nielsen, 2603.

⁴ Mwandosya, “National Adaptation Programme of Action (NAPA),” 2007, ix, <https://unfccc.int/resource/docs/napa/tza01.pdf>.

⁵ Ndesanjo, Theilade, and Nielsen, 2601.

⁶ Ndesanjo, Theilade, and Nielsen, 2601.

⁷ Ndesanjo, Theilade, and Nielsen, 2602.

⁸ Ndesanjo, Theilade, and Nielsen, 2601.

⁹ Mwandosya, ix.

¹⁰ Ndesanjo, Theilade, and Nielsen, 2607.

¹¹ Ndesanjo, Theilade, and Nielsen, 2601.

¹² J. Douwe Meindersma and Jan J. Kessler, eds., 44. Meindersma, J. Douwe, and Jan J. Kessler, eds. Planning for a Better Environment in Monduli District. Netherlands Economic Institute, 1997.

¹³ Ndesanjo, Theilade, and Nielsen, 2604.

¹⁴ Ndesanjo, Theilade, and Nielsen, 2605.

4. Maasai Context: Mitigation (prevention) and Adaptation (risk reduction)

“Smile” Pits (Mitigation)

Digging many small 2-meter wide half circles—“smile” pits—“regreens” the area with plants that take out CO₂ from the air (and also reduces soil erosion).

- One recent example from the Lead Foundation: The Regreening Arusha Program’s “goal is to reach more than 3,600 households in Monduli district and restore at least 86,400 trees and 440 hectares of rangeland. This is achieved by reversing the process of desertification and degradation of ecosystems through the techniques of Kisiki Hai and Rainwater Harvesting in order to improve livelihoods and climate change resilience.
- See the amazing pictures at the link provided to see the Regreening Arusha Program: <https://leadfoundation.org/service/regreening-arusha-program/>
- See a short documentary of this Lead Foundation project in Engaruka at the link provided: <https://www.youtube.com/watch?v=RPJ9T4yAEGs&t=4s> (7:08 minutes)

Fuel-efficient stoves for the Maasai (Mitigation)

In Ketumbeine, Maasai women in the Naapok Bead Project are trained to build fuel-efficient stoves. These fuel-efficient stoves:

- Reduce the burning of firewood by 60% (less work to collect and haul wood),
 - Reduce the smoke in the home by 90% (less respiratory diseases) and
 - Reduce the number of children burned by cooking fires.
- See also: <https://internationalcollaborative.org/news-resources/>



(Photos: Beth E. Elness-Hanson; with permission)

Water Catchment or Reservoir (Adaptation)

This reservoir is in the Nanja area and was hand dug with the cooperation of 3 or 4 neighboring families who all share the water. The rain collects during the rainy season and fills the reservoir. The thorn fence keeps animals out, so it is cleaner water. The water sustains the community for most of the dry season. Then, they dig out the bottom, bringing the soil to the top of the sides of the reservoir to make it deeper. (Photo: Beth E. Elness-Hanson, with permission)



5. Teaching Notes on Hope: Wangari Maathai and Jane Goodall

Jane Goodall

Goodall began her career in 1960 in Gombe National Park, Tanzania.

“Hope is what enables us to keep going in the face of adversity.”¹ “I truly believe, and I’m not alone as a scientist, that we have a window of time when if we get together and take action, we can at least slow down climate change and loss of biodiversity...I can’t save the world, but what can I do locally?...Whatever it is you care about, get together with some friends and take action. Do what you can do to solve what you are passionate about and you will find you make a difference.”²

¹ Goodall, Jane. *The Book of Hope: A Survival Guide for an Endangered Planet*. Viking, 2022.

² Goodall, Jane. “Reasons for Hope” About the Planet’s Future, Greater Boston, GBH News’. 29 September 2023. <https://www.youtube.com/watch?v=LXXb5MjPbPI>.

Photo: Nicolas Richoffer; https://commons.wikimedia.org/wiki/File:Jane_Goodall_2010.jpg;
Creative Commons Attribution-Share Alike 4.0 International licens



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Prof. Wangari Maathai: Kenyan Woman Awarded Nobel Peace Prize (2004)

Wangari Muta Maathai (1940–2011) “was a Kenyan social, environmental, and political activist who founded the Green Belt Movement, an environmental non-governmental organization focused on the planting of trees, environmental conservation, and women's rights. In 2004 she became the first African woman to win the Nobel Peace Prize.”¹

- “...for her contribution to sustainable development, democracy and peace.” Wangari Maathai was the first African woman to receive the Nobel Peace Prize. She was also the first female scholar from East and Central Africa to take a doctorate (in biology), and the first female professor ever in her home country of Kenya. Maathai played an active part in the struggle for democracy in Kenya, and belonged to the opposition to Daniel arap Moi’s regime.
- “In 1977 she started a grass-roots movement aimed at countering the deforestation that was threatening the means of subsistence of the agricultural population. The campaign encouraged women to plant trees in their local environments and to think ecologically. The so-called Green Belt Movement spread to other African countries, and contributed to the planting of over thirty million trees.
- Maathai's mobilisation of African women was not limited in its vision to work for sustainable development; she saw tree-planting in a broader perspective which included democracy, women's rights, and international solidarity. In the words of the Nobel Committee: “She thinks globally and acts locally.”²

“The 30 million trees planted by Green Belt Movement volunteers—mostly rural women—throughout Kenya over the past 30 years are a testament to the individuals’ ability to change the course of environmental history.

“Working together, we have proven that sustainable development is possible; the reforestation of degraded land is possible; and the exemplary governance is possible when ordinary citizens are informed, sensitized, mobilized and involved in direct action for their environment.”²



¹ Source: https://en.wikipedia.org/wiki/Wangari_Maathai

² Source: <https://www.nobelprize.org/prizes/peace/2004/maathai/facts/>

² Wangari Maathai. *The Green Belt Movement: Sharing the Approach and the Experience*. Revised edition. (Lantern Publishing & Media, 2003) xi.

See also: Maathai, Wangari. *Replenishing the Earth: Spiritual Values for Healing Ourselves and the World*. Random House, 2010.

Photo: Kingkongphoto & www.celebrity-photos.com; https://commons.wikimedia.org/wiki/File:Wangari_Maathai_in_2001.jpg;

Creative Commons Attribution-Share Alike 2.0 Generic license.

6. Global Warming Temperature Increase

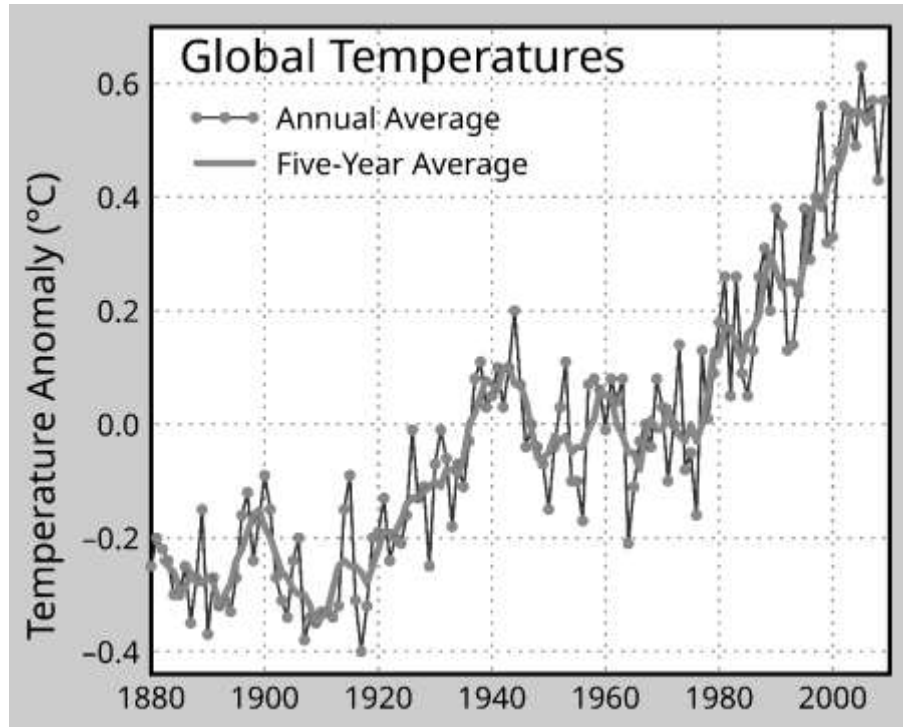
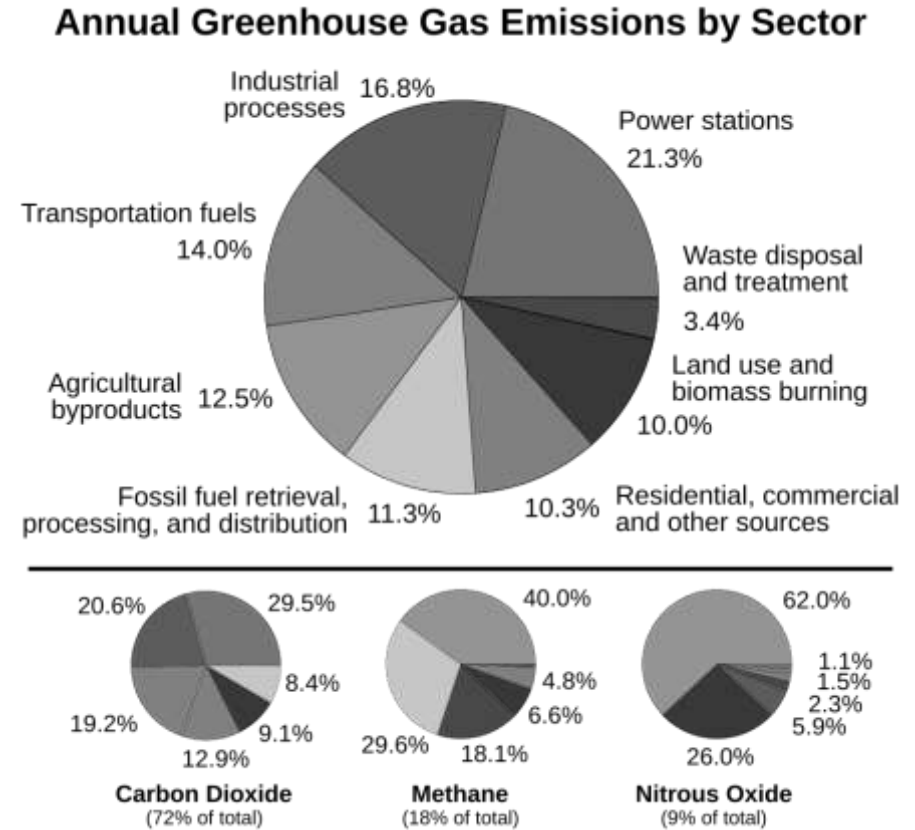


Image: Public Domain, Author, Schapel: Instrumental Temperature Record GISS.svg Instrumental Temperature Record GISS - File:Instrumental Temperature Record GISS.svg - https://commons.wikimedia.org/wiki/File:Instrumental_Temperature_Record_GISS.svg

7. Sources of Greenhouse Gases Image



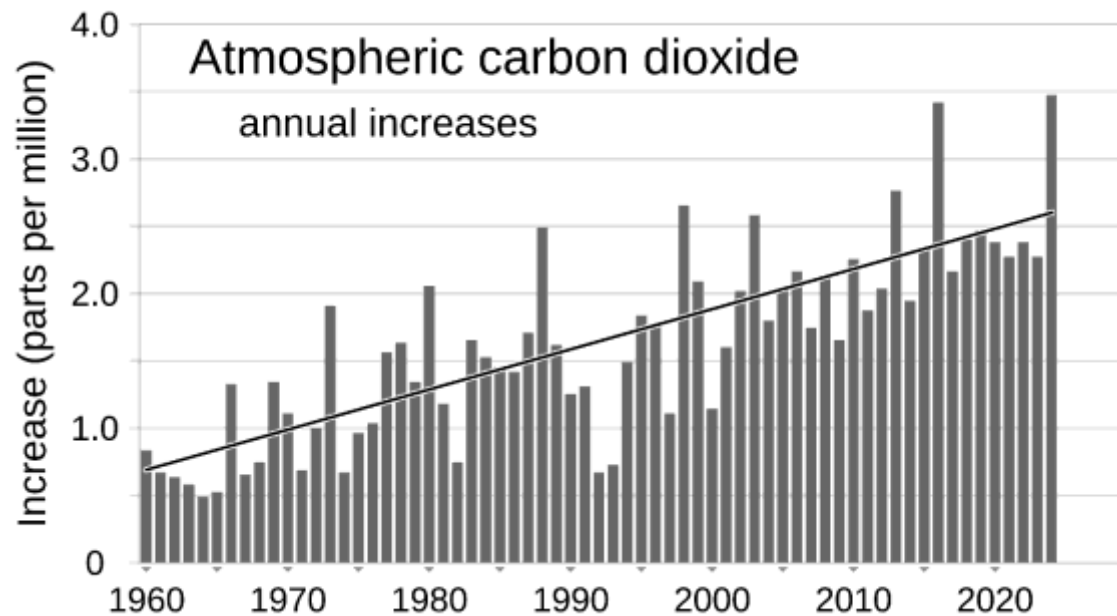
Source: https://commons.wikimedia.org/wiki/File:Greenhouse_gases.svg
 Greenhouse Gas by Sector.png: Robert A. Rohde, Creative Commons Attribution-Share Alike 3.0 Unported license.

8. Global-warming Gases Percent Effect on Climate Change

Source: https://commons.wikimedia.org/wiki/File:Greenhouse_Gases.jpg; Public Domain (modified, expanded info)

Effect on climate	Chemical formula	Name	Source
60%	CO ₂	carbon dioxide	burning fossil fuels (like coal and petrol in cars) deforestation, wildfires, burning wood
16%	HFCs	hydrofluorocarbons	refrigerants, aerosol propellants in medicinal applications, and degreasing solvents
15%	CH ₄	methane	wetlands, organic waste, livestock, modern agriculture, burning biomass
5%	N ₂ O	nitrous oxide	fertilizers, fuels, medical uses, rocket propellants, and motorcar racing
2%	PFCs	perfluorocarbons	paint, textile and aluminum production
1%	SF ₆	sulphur hexaflouride	electrical industry, rubber production
1%	H ₂ O	water vapor	irrigation, evaporation of rain, ice melting

9. Increase of Carbon Dioxide in the Atmosphere (CO₂)



Source: RCraig09, Creative Commons Attribution-Share Alike 4.0 International license.
https://commons.wikimedia.org/wiki/File:1960-_Annual_increases_in_atmospheric_carbon_dioxide.svg

10. Methane Facts (CH₄)

- Approximately 40% of methane gas emissions are from natural sources.
 - The rest (60%) is produced by human activity, known as anthropogenic emissions.
 - The largest human-caused source of methane is agriculture, which produces about one quarter of methane emissions.
 - closely followed by the energy sector, which includes emissions from coal, oil, natural gas and biofuels.
- (<https://www.iea.org/reports/global-methane-tracker-2022/methane-and-climate-change>)

11. If more time, here are more teaching suggestions

- **Adapt Teaching Materials to Different Maasai Regions:** While the core lesson is relevant across Maasai communities, consider adjusting examples or activities based on the specific challenges faced in different regions (e.g., water scarcity, soil degradation).
- **Local Experts:** Consider inviting local environmental experts or Maasai elders who practice sustainable land management to share their experiences and knowledge.
- **Study and teach others about the Maasai:** including traditional practices, beliefs, and their deep connection to the land. Understanding their cultural heritage helps appreciate their way of life.
- **Engage with Maasai community leaders and members** to hear their perspectives on climate change and environmental issues. Their traditional knowledge and experiences provide valuable insights into adapting to changes.
 - “How did our ancestors take care of the land and animals to ensure they stay healthy?”
 - “What natural signs do you look for to know when it’s time to move the cattle or plant crops?”
 - “How do you make sure that water sources and pastures are used wisely and not overused?”
 - “What lessons from the past can we use today to protect nature and our way of life?”
 - “How did the elders in our community teach you to care for the environment when you were young?”
 - “In your view, how has the climate changed over the years, and what did you do to adapt?”
- **Integration of Maasai Tradition and Modern Science:**
Objective: Show how combining Maasai traditional knowledge with modern climate science can lead to effective climate action. Here are the instructions:
 - Discussion (5 minutes):
 - **Ask:** “How can we use our Maasai traditions alongside modern science to tackle climate change?”
 - Discuss how traditional Maasai practices, such as sustainable land and water management, align with modern scientific methods for mitigating and adapting to climate change.
 - Class Activity (5 minutes):
 - **Pair Work:** In pairs, students discuss how a traditional Maasai practice could be combined with a modern climate solution. For example, traditional water conservation methods could be paired with modern rainwater harvesting techniques, or traditional grazing methods could be adapted with modern sustainable farming practices.
 - **Class Sharing:** Invite students to share their ideas with the class.
- **Real-Life Examples:** Take students on a visit to a Maasai community or a local farm where they can see how people are adapting to climate change. This helps them learn directly from the community’s practices.
- **Talk to Elders:** Students can ask their grandparents (babu or koko) about how they adapt to changes in the weather and environment. These stories can be shared in class to learn from past generations. Here’s a question that students can ask their grandparents (babu or koko) about adapting to changes in the weather and environment:
 - “Babu/Koko, how did you and people in your time adjust to changes in the weather or environment? Have you noticed any differences in how the weather is now compared to when you were younger?”
 - This question encourages grandparents to reflect on their personal experiences and observe any environmental changes over time, helping bridge the generational gap and connect traditional knowledge with current environmental shift.

12. Additional Resources: Books and Articles

Combining Climate Science and Traditional Maasai Knowledge

- **Brockington, Dan, and Jim Igoe.** *Pastoralism and Climate Change: Bridging Science and Indigenous Knowledge*. Routledge, 2017. Highlights how connecting science with Maasai traditions creates culturally relevant climate solutions.
- **Homewood, Katherine and Trench, Pauline.** *Climate Change and the Future of Pastoralism in Africa: A Maasai Case Study*. Routledge, 2022. Explores how blending climate science with Maasai traditional knowledge helps address climate change's impacts on pastoralism.
- **Leach, Melissa, and Scoones, Ian.** *Sustainable Livelihoods and Climate Change: The Maasai and Beyond*. Routledge, 2021. Focuses on merging climate science with indigenous systems to build effective adaptation strategies.
- **Moss, Keith.** "Climate Change Adaptation Strategies Among the Maasai: Integrating Traditional Knowledge and Climate Science." *Global Environmental Change*, vol. 40, 2022, pp. 100–112. Discusses how blending Maasai knowledge with climate science creates culturally suitable and effective adaptation strategies.
- **Ogutu, Joseph O., and Owen-Smith, Norman.** "Integrating Indigenous Knowledge and Climate Science for Pastoralist Adaptation: Lessons from the Maasai." *Pastoralism: Research, Policy and Practice*, vol. 9, no. 1, 2018, pp. 23–37. Explores how integrating indigenous knowledge and science can strengthen resilience and adaptation.

Building Adaptation and Resilience

- **Gibson, Craig C., and Stephen A. Marks.** *Integrating Climate Adaptation into Maasai Pastoralism: Policy and Practice*. Cambridge University Press, 2019. Examines how scientific and traditional insights can foster resilience against environmental challenges.
- **Homewood, Katherine.** "The Impact of Climate Change on Maasai Pastoralism: A Review of Current Knowledge and Future Directions." *Environmental Science & Policy*, vol. 70, 2021, pp. 1–10. Reviews how combining science with Maasai practices aids in addressing climate variability impacts.
- **Ndegwa, Samwel.** "Climate Change and Pastoralism: Analyzing the Maasai Adaptation Strategies in the Context of Climate Science." *African Journal of Environmental Science and Technology*, vol. 15, no. 2, 2018, pp. 91–105. Examines how Maasai strategies informed by both tradition and science showcase the potential for integrated climate management.
- **Nugent, Paul.** *The Climate Crisis and Pastoralism: Insights from the Maasai*. Oxford University Press, 2020. Discusses adaptive strategies that integrate scientific and ecological practices of the Maasai.

Appendix A:

Climate Change Vocabulary in English, Kiswahili, and Maa

Initial Maa translation by Mr. Lashumbai Kilolong, Dr. Neema Kitasho and Mr. Julius Laiser continued with the development of the concepts. Additional contributions by Dr. Daniel Kosia Mokoro and Mr. Joseph Kosia. This is a vocabulary in development.

English	Kiswahili	Maa
Maasai indigenous knowledge for the care and protection of creation	maarifa ya asili ya Wamaasai kwa ajili ya kujali na utunzaji wa uumbaji	eng'eno e tipat oo Irmaasai narripyeki inkitobirunot
traditional Maasai knowledge of care for the environment	maarifa ya kitamaduni ya Wamaasai kuhusu utunzaji wa mazingira	eng'eno/engarriyiano o orreje lo ilmaasai narripyeki enkop
adaptation	ustahimilivu	emokunotto/eng'iryata
average surface temperature	joto wastani la eneo	enkirowuaj te enkop
biodiversity	bioanuwai	iseuseu enkop
biofuel	nishati itokanayo na mabaki mimea	engima empuuti oo ingaitubulu
carbon dioxide	kaboni dioksidi	enkijape e kabon
carbon footprint	kanyagio za kaboni	iraruat e kabon
carbon neutral	uwiano wa kaboni	kabon nemeponari
caring for the environment	kutunza mazingira	erripoto/enking'urata enkop
clean energy	nishati safi	nishati sidai
climate	tabianchi	orreje le enkop
climate change	mabadiliko ya tabianchi	engibelekenyatta orreje le enkop
compost	mbolea	endulugumi
creation care	utunzaji wa uumbaji	enking'urata/erripoto o ingitobirat
deforestation	ukataji wa miti	endung'oto orkeek
drought	ukame	alamei
eco-friendly	rafiki wa ikolojia	naning'ore iltirenito

Creation Care in Maasailand

English	Kiswahili	Maa
ecosystem	mfumo wa kiikolojia	enchula oopookin toltiren
emissions	utoaji wa gesi hatari au gesi la joto duniani	emburuo torriono/engijape nainyalisho
energy-efficient	nishati fanisi	enishati/enkima nanarikino
environment	mazingira	enkop
environmental care	kutunza mazingira	enking'urata/erripoto enkop
exhaust fume	moshi wa magari	emburuo oo motokaani
extinction	kutoweka	engidaaya/enkiting'oto
extreme weather event	tukio kali la hali ya hewa	erishata sapuk enkiyape enkop
famine	njaa	esumash/alamei
flood	mafuriko	ingarriak sapukin naaruko
food waste	mabaki taka ya chakula	irmong'oitie loon'daikin
fossil fuels	mafuta ya visukuku	iila e tetrolu
global average temperature	wastani wa halijoto duniani	engirowaj rishati te enkop
global warming	ongezeko la joto duniani	emponata engirowaj te enkop
greenhouse effect or blanket effect	athari ya blanketi la joto angani	inaayau, orkila lenkirowaj toloing'ang'e
greenhouse gas (GHG) or global-warming gases	gesi zinazopasha joto dunia or gesi iongezayo joto la dunia (<i>gesi ya chafu</i> is not preferred in this project)	irmuumwani ooirowaje enkop
habitat	makazi ya asili	manyisho e tipat
heat wave	wimbi la joto kali	engima nairowua naleng', ingatitin enkima sapuk
infectious diseases	magonjwa ya kuambukiza	imoyiaretin naahurtakinoi
mitigation	kupunguza/kudhibiti	engirishata
non-renewable energy	kawi isiyotumika tena nishati isiyojizalisha	enishati nemeponari
ozone	ozoni	erishata olaing'ang'e le ozon
petrol	petroli	petroli
pollutants	vichafuzi	olchafu /enkitarruoroto/altaka

Creation Care in Maasailand

English	Kiswahili	Maa
recycling	kuchakata	enkigilata oonkitobirunot
reforestation	upandaji miti	eunoto orkeek
refugee	mkimbizi	ilaisikak
renewable energy, energy from the sun and wind	nishati jadidifu, nishati kutoka kwa jua na upepo	enishati naponikino, enishati naing'waa engolong' o osiwuo
reservoir (of water)	hifadhi (ya maji) utunzaji wa maji	en'chumata o inkariak
sea-level rise	kupanda kwa kiwango cha maji baharini	edokunotto engare enaipasha
solar panels	seliumeme za jua	esolla
sunlight	mwanga wa jua	ewang'an engolong'
sustainability	endelevu	nemeiting'/enkata naado
temperature	halijoto	engirowaj
weather patterns	mabadiliko ya hali ya hewa	ingibelekenyat enkijape tolaing'ang'e
weather	hali ya hewa	enkijape
wind	upepo	osiwuo
wind turbine	vinu vya upepo	emashine osiwuo
world	dunia	enkop/olosho

Appendix B:

Website Resource: Visit MamaAny.com

<https://www.mamaanya.com/>

- The website also provides all the lessons for downloading without cost. Karibu!
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