



FAITH-BASED EDUCATION FOR SUSTAINABLE DEVELOPMENT

TEACHER'S TOOLKIT



ARCC



The Faith-based Education For Sustainable Development Toolkit has been produced by the Alliance of Religions and Conservation (ARC) and the Kenya Organization of Environmental Education (KOE). It would not have been possible without funding from the World Bank, through its TerrAfrica partnership and the Ministry of Foreign Affairs, Norway, with additional support from the Ecological Management Foundation (EMF) in the Netherlands. We would like to register our appreciation for this support - and for all the teachers, pupils, educationalists and faith leaders who gave up their time to help develop the toolkit.

ISBN 9966-956-82-4

Licensed under Creative Commons for discussion and inspiration worldwide

This book has been produced by ARC to inspire and encourage education on the environment in faith-based schools. Please feel free to copy, share and distribute it as widely as you wish, crediting ARC where possible. A PDF version is also available to download from ARC's website, www.arcworld.org.

While the copyright remains with ARC, our policy has always been to offer to anyone, and to any organisation of good will, the right to use the material contained within. We ask that they honour all credits, such as outlined above, or as stated within the publication, as regards the source of the text and images. If you do use the book, please let us know – we'd love to hear about your experiences. You can email us at arcworld@arcworld.org.

Designed and produced by Jacaranda Designs Ltd

Author: Dr. Otieno, B. D.(PhD)

Editors: Barasa Wafula (KOE), Susie Weldon and Mary Bellekom (ARC)

Support Editors: Susan Scull-Carvalho and Helen van Houten

Graphic Designers: Katherine Mamai with assistance of Samuel Gachie

P.O. Box 1202-00606

Nairobi, Kenya

Tel: +254 (0)20 260-4433 or (0) 7220 667 747

Email: info@jacaranda-africa.com

Printed by Pinnacle Data Systems, P.O. Box 28658 00200 Nairobi, Tel: 0721251185,
Email: info@pinnacle-data-systems.com

FAITH-BASED EDUCATION FOR SUSTAINABLE DEVELOPMENT

TEACHER'S TOOLKIT

Table of Contents

Foreword	(i)
Preface	(ii)
Acknowledgement	(iii)
Message from UNEP	(v)
Message from Director General – Nema	(vi)
Message from Religious leaders	(vii)
Introduction	(x)
Overview of themes	(xii)
List of acronyms and abbreviations	(xiv)
Section one: About this toolkit	1
1.1 Aim	1
1.2 General objectives	1
Section two: Basic concepts	3
2.1 Introduction	3
2.2 What is sustainable development?	4
2.3 What development challenges does Kenya face?	4
2.4 What is education for sustainable development?	4
2.4.1 Characteristics of ESD	5
2.4.2 Principles of ESD	6
2.5 Education for Sustainable Development and Faith-based values	7
2.5.1 Why faith-based values?	7
2.5.2 Role of faith in Kenyan Culture in Response to ESD	7
2.5.3 Mainstreaming faith-based values into ESD	8
2.5.4 Approaches to mainstreaming faith-based values into ESD	8
2.6 The Eco-Schools Strategy	8
2.6.1 Steps to establishing an Eco-School	9
2.6.2 What Eco-Schools enhance	10
2.6.3 The link between Eco-schools and ESD	10
Section three: Methodologies	11
3.1 Introduction	11
3.2 Teaching Methodologies	11

Section four: Themes	21
4.1 Water	21
4.1.1 Introduction	21
4.1.2 Sources of Water	21
4.1.3 Uses of Water	27
4.1.4 Water Pollution	32
4.1.5 Water Conservation	40
4.2 Health, sanitation & hygiene	47
4.2.1 Health	48
4.2.2 Hygiene	51
4.2.3 Sanitation	55
4.3.0 Waste	59
4.3.1 Sources of waste	59
4.3.2 Waste Management Issues	63
4.3.3 Waste Management Techniques	66
4.4.0 Energy	75
4.4.1 Forms of Energy	76
4.4.2 Categories of Energy	80
4.4.3 Conservation of Energy	84
4.5 Biodiversity	89
4.5.1 Levels of Biodiversity	90
4.5.2 Conservation of Biodiversity	96
4.6 Agriculture	105
4.6.1 Soil	106
4.6.2 Crops and livestock	113
4.7 Climate change	119
4.7.1 Causes of Climate Change	120
4.7.2 Effects of Climate Change in Kenya	123
4.7.3 Addressing Climate Change	125
Secton five: Summary of School Micro-projects	129
Further reading	139
Appendix I : Glossary of terms	141
Appendix II : Some World Important Days Celebrated	144

The development of any society depends on the quality of education her citizens receive. During the last few years, the Government of Kenya has embarked on a review and reform of the education system as well as school curricula with a view to capturing and addressing emerging issues of current development challenges, such as HIV-AIDS, Peace education and Life-skills education. Sustainable development in the face of climate change poses an enormous challenge for Africa in general and Kenya in particular. While some work has already been done in entrenching the aforementioned emerging issues into the school curriculum, the area of Education for Sustainable Development (ESD) involving the world's faiths remains unexplored. Yet in seeking to deliver on Vision 2030 and the Millennium Development Goals (MDGs), an education that mainstreams religious values into ESD for Kenya is imperative. The National Education Sector Support Programme (NESSP, 2012-2017) captures Education for Sustainable Development (ESD) as instrumental in addressing the immediate and long term challenges of development. The Ministry of Education (MOE) recognizes that promotion of skills, attitudes, perspectives and values that support the attainment of ESD is vital at this point in time. In this respect, all initiatives geared towards this end deserve support from all sectors.

Production of the ESD Toolkit that mainstreams religious wisdom into ESD practice could not have come at a better time. Recognition and enhancement of religious values that promote ESD is an important step in bringing the world's faiths to impact positively on the journey to sustainable development. Engaging Kenya's youthful population in schools to be active practitioners of ESD is a sure choice of a bright tomorrow. Transforming education into an action-oriented and value-based experience makes it an enjoyable engagement for both teachers and learners. This is what this toolkit seeks to do.

It is for this reason that I salute the Kenya Organization for Environmental Education (KOE) and the Alliance of Religions and Conservation (ARC) for this joint and timely initiative. The toolkit will provide an important curriculum support material for use by teachers to promote ESD, while at the same time entrenching the much needed values that religion can offer to promote ESD. I am sure that this piece of work will help Kenya move to the next level in actualising the objectives of the Decade of Education for Sustainable Development (DESD), in line with the country's ESD implementation Strategy.



Prof. George Godia, CBS
Permanent Secretary, Ministry of Education.

PREFACE

As educators and having worked and interacted with young people for a long time in environmental education, we have come to understand, by experience, that giving information about faith and education for sustainable development may not be effective in producing the lasting change in behavior patterns which is the surest way of achieving the goals for education for sustainable development (ESD). Mainstreaming faith-based values in education for sustainable development is the surest way to achieving this. However the need for relevant materials for running faith-based education for sustainable development was a big challenge; this is the reason for faith-based ESD toolkit you are now reading.

This toolkit was developed in such a way that the teaching and learning is done in the traditional subjects offered in our school curriculum, only that the educator and learner shall endeavor to mainstream faith-based values in the classroom and outdoor activities that take place in the school. Deliberate efforts have been done to search the sacred books – and the Holy Qur'an, the Holy Bible and from the sacred Vedas of the Hindu for relevant scriptures and faith-based values that support the subject matter under discussion. The toolkit is designed to be used by educators to guide learners in practicing ESD.

The content has adopted a multi-disciplinary approach. Under this approach faith-based education for sustainable development contents are infused into curriculum subjects and activities carried out in schools. The facts and activities can be incorporated into existing subjects without affecting the integrity of the subject in terms of scope and sequence of content and skills. The toolkit is arranged in units, derived from a survey carried out to find out the sustainable development challenges in different areas referred to as eco node challenges. The teachers' section illustrates how the teacher will mainstream the faith-based values in the different content areas in the existing Kenyan primary school syllabus.



Dr. Dorcas Otieno

Executive Director

The Kenyan Organization for Environmental Education (KOE)

ACKNOWLEDGEMENT

This faith-based ESD toolkit illustrates an approach of solving society's development issues using faith; a context in which God's principles and values are mainstreamed in our day-to-day classroom and out of class learning environments to solve sustainable development issues. This monumental piece of work is a product of a wide range of stakeholders, and therefore quite rich and comprehensive in style, design, content and perspectives.

Special thanks are due to Dr. Dorcas Otieno, the chief author and to the KOEE team and consultants who provided technical support in the development of this toolkit : We are thankful for the editorial work and educational input from Barasa Wafula of KOEE, who also coordinated the development process. This work would not be complete without the enormous support, input and wise counsel from our partner Christian, Muslim and Hindu faith organisations; namely the Anglican Church in Kenya, the Catholic Church in Kenya, the Methodist Church of Kenya, the Presbyterian Church of East Africa, the Supreme Council of Kenya Muslims and the Hindu Council of Africa. To the representatives from the various faiths; we are sincerely grateful that you took your valuable time and resources to ensure that faith-based values are mainstreamed in the content of this toolkit. We are very grateful to all the Schools, individuals, government, private sector institutions and civil society organisations that participated and gave invaluable insights in the course of the faith-based toolkit development.

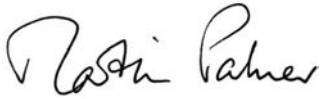
We were delighted to have such support from NEMA and KIE staff and our thanks for remaining engaged throughout during the development of this toolkit. The professional and technical support we received from you shaped the work into what it was intended to achieve.

We would also like to thank The World Bank, The Ministry of Foreign Affairs, Norway and the Ecological Management Foundation for their support and assistance.

The Alliance of Religions and Conservation (ARC) team was led by Mary Bellekom, without whose determination and skills this toolkit would probably never have seen the light of day. She was ably assisted in the various workshops and in the development of the resources by

Kirsty Main-Ellen. Susie Weldon brought her skills as an editor to bear while Alison Hilliard contributed insights and support from the wider ARC programme and experience. Our thanks also extend to our colleagues in the Netherlands and EMF for their support, involvement and insights. Last but not least, we are most grateful to Rosalyn Mckeown (formerly of UNESCO, as Programme Specialist; Section for ESD) for reading the initial manuscript of the toolkit and giving very insightful and practical suggestions that informed the enrichment of the content of the work.

To all those not mentioned here, kindly accept our word of gratitude for the splendid work done. It is my hope that the document will be useful for use in all primary schools in Kenya, and that it will provide priceless insight for other regions of our continent.

A handwritten signature in black ink, reading "Martin Palmer". The signature is fluid and cursive, with the first name "Martin" and last name "Palmer" clearly distinguishable.

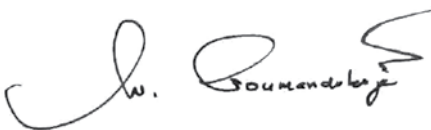
Martin Palmer,
General Secretary, ARC.

Twenty years ago, the world realized that human well-being cannot be achieved without ensuring sustainable development (SD). This 21st Century has made it a compelling and pressing priority. The world is committed to an economically, socially and environmentally sustainable future for our planet, for the present and future generations. As we work towards finding technically and scientifically sound solutions to our challenges, building on our opportunities, we also have to integrate the spiritual and moral values in our undertakings.

UNEP strongly believes that SD can only be achieved through the creation and nurturing of partnerships with all stakeholders, among them the faith based organizations that play a significant role. The faith-based approach to Education for Sustainable Development (ESD) is of critical importance in promoting responsible behaviour to live sustainably for human progress. The development of the faith-based ESD toolkit for Kenya by the Kenya Organization of Environmental Education (KOE), in collaboration with the Alliance of Religions and Conservation (ARC) is a timely step in the right direction. It amplifies the spiritual dimension and the need for a common ethical framework towards achieving sustainable development.

The health of the planet is our health, it is our wealth. Achieving SD is imperative for human kind and the ESD toolkit is an instrument to help us make the youth, positive and powerful agents of change. The joining of hands by the three major religions: Christian, Hindu and Islam is an inspirational show of solidarity for sustainable development that should be supported by all. We at UNEP remain convinced that if we are to overcome the challenges facing this planet and its people, there is no more room for narrow self-interest or single interest group solutions.

It is my hope that this toolkit will be useful to all those who share our common vision, so that we can ensure Kenya and other African countries engage successfully on the path of sound environmental management and sustainable development. Let us celebrate together the beauty of the world and the wonders of the universe, let us embrace the vision and the way of living that teaches love and compassion among all human beings, a vision and a way of living that promotes peace, prosperity and happiness for all.



Mounkaila Goumandakoye
Director and Regional Representative
UNEP Regional Office for Africa

MESSAGE FROM DIRECTOR GENERAL – NEMA

During the last one decade, Kenya has made important strides in promoting Education for Sustainable Development (ESD). An outstanding one of these is the development and adoption of the National ESD Implementation Strategy in 2008. Since then, many other governmental and Non-governmental organizations and institutions as well as the private sector have made various other contributions to attainment of the goals and principles of ESD. As an institution charged with the responsibility of spearheading ESD initiatives in Kenya, the National Environment Management Authority (NEMA) is pleased to be associated with these initiatives from different stakeholders.

The Faith-based ESD initiative is a great innovation that will take the ESD agenda in Kenya yet another step. Uniquely, the initiative brings on board a very important segment of the society whose contribution to conservation has been viewed passively both at the national and global levels – the religious community. The role of faith in shaping our value system cannot be over-emphasized. Entrenchment of religious wisdom into ESD is therefore an innovation that we all ought to be proud of. We congratulate the Kenya Organization for Environmental Education (KOE) and the Alliance of Religions and Conservation (ARC) for this outstanding contribution.

The best way to appreciate this unique initiative is by committing our efforts towards implementation of the faith-based ESD Toolkit in our institutions of learning and congregations. There is no doubt that this initiative will go a long way in enhancing positive behavior change among our school-going youth, by inculcating appropriate values, behaviour and lifestyles that foster sustainable development. It is my hope that this toolkit will prove useful not only in this country, but also in other countries that seek to promote ESD. The faith-based ESD toolkit is yet another material that will enhance our quest to improve the quality of education to deliver on ESD. The toolkit is a milestone in the journey to sustainable development in Kenya as we conclude the Decade of Education for Sustainable Development (DESD, 2004-2015).

In recognition of this effort, I urge all stakeholders in the fields of education, religion and development to embrace and support the use of the faith-based toolkit in our learning institutions. It is the synergy in our concerted efforts in furthering this agenda that will make a difference. Education for Sustainable Development is an issue for all and today. At the heart of any successful development initiative is collaboration from various players that are endowed differently. Let us pool our resources together to ensure this noble innovation comes to fruition.

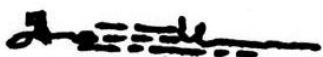


Prof. Geoffrey Wahungu
Director General
National Environment Management Authority

Message from the Christian Churches' Education Association (CCEA)

The world knows Africa primarily as a continent in crisis occasioned by, among other things; political upheavals, poor leadership, poor health care, poor standards of education and general insecurity - to mention but a few. From another perspective, these could be seen as challenges of sustainable development in Africa, and they could be best addressed through education. In this regard Education for Sustainable Development (ESD) offers solutions that could enable third world countries overcome most, otherwise all, of these bottlenecks. An approach that entrenches religious values into the normal principles, practices and strategies of ESD would not have come at a better time. The values embedded in the Christian faith could provide a great motivation to honor, respect, celebrate and take care of our resources, which are God's creation. The destructive nature of Man in the quest for economic development can be rationalized by a deep sense of commitment to conserve and preserve resources at our disposal for today's as well as tomorrow's generation – as the duty of a steward serving the interest of the Master. Such a motivation can be found nowhere else but in one's belief in God. Good stewardship of resources is service to God.

The faith-based ESD toolkit carries hope for Africa. This material will go a long way in improving the quality of education as well moulding the moral and spiritual aspects of our school-going youth into responsible and God-fearing citizens. I salute KOEE and ARC for such an innovative piece of work and encourage as many stakeholders and as many schools as possible to support and adopt the use of this toolkit respectively.



Peter K. Nyagrowa,
Secretary General,
CCEA

Message From Catholic Secretariat

As a key stakeholder in the education sector in Kenya, the Kenya Conference of Catholic Bishops is pleased with the publication of the faith-based ESD toolkit which provides a faith-centred approach to addressing issues of conservation and sustainable development through our learning institutions. We are indeed grateful to have been part of the team that participated in the development of this toolkit. At the Catholic Church, we are convinced that our children, who are the leaders of tomorrow, need to be adequately equipped to face tomorrow's challenges. If we want our children to live in a clean, healthy and secure environment, we need to prepare them for the future they will inherit. This requires us all to make a commitment today to provide the children with sound environmental education that will prepare them

to become better stewards of our natural heritage. As a Church, we play a major role in the education sector in Kenya. In all our institutions of learning, we lay emphasis on the holistic formation of the learner to complement academic work. Spiritual and moral formation of the learner is important ingredients in the development of the human person. We believe that well-formed learners are better equipped to face every day challenges and the values they have learnt will make them develop into better citizens.

This faith-based ESD toolkit is coming at the right moment when the country has started implementing the Basic Education Act 2013. This is an opportunity that we must embrace to have issues of conservation and sustainable development mainstreamed in our curriculum as part of reforms in the education sector. With its faith-based approach, this toolkit complements our work in the education sector and is indeed a great tool to use in moulding our youth to become champions of the environment.



Rev. Fr. Vincent Wambugu

General Secretary,

Kenya Conference of Catholic Bishops

Message From Hindu Council Of Kenya

I wish to congratulate the Kenya Organization of Environmental Education (KOE) for their initiative in providing a Faith-based Teacher's Toolkit that mainstreams religious values into Education for Sustainable Development (ESD). This publication is an important and integral part of imparting faith-based values that enrich ESD, while providing the motivation for environmental conservation.

The toolkit has been developed by a team of experienced curriculum experts, educators, faith leaders from the Christian, Hindu and Muslim communities as well as other stakeholders. With its multi-disciplinary approach, the toolkit will contribute not only to the enhancement of spiritual and cultural heritage of the people of Kenya, but will also promote the spirit of friendship and solidarity among the different races and faiths flourishing in Kenya and other parts of the world.

On behalf of the Hindu Community in Kenya, I assure you of our continued support in this and future endeavors.



S.B. Varma F.C.A. C.P.A (K)

National Chairman

Hindu Council of Kenya

Message From Supreme Council Of Kenya Muslims (SUPKEM)

The fact that this toolkit is well researched and compiled cannot be over emphasized. It will provide the pupils with vital and powerful information. More so, the toolkit is in line with the letter and spirit of the constitution, in that it does not discriminate on the basis of religion since it has factored the vital components of all the major religions in Kenya. It is a comprehensive and broad-based piece of work that will ensure pupils are nurtured with a heart for the environment in their formative years for the benefit of all humanity, both present and future.

The environment is an “endangered species” and it needs combined efforts from one and all if future environmental disasters are to be averted. The toolkit provides a framework which will equip, promote and prepare pupils to advance the course of the environment from an informed and spiritual perspective. It will be useful and contribute tremendously towards the utilization of the powerful framework for action that is provided for by religion, especially with its strong moral message. We all need to faithfully work together on agreed agenda if we are to ensure the survival of the human race and catapult ourselves into a viable and constructive social-economic epoch.

It is the sincere hope and strong belief of SUPKEM that the hard work, soul searching and wealth of information that has gone into the toolkit will serve humanity for many years to come. We appreciate the effort of all those who worked hard to compile the toolkit, and hope it will enjoy the goodwill of all across the board. The book is simple to read and peppered with appropriate illustrations and logical explanation - it will indeed have a transformative impact.



Abdalla M. Kamwana

Programme Manager - SUPKEM

INTRODUCTION

The creation of this innovative and pioneering toolkit has been a fascinating journey for all of us. For those from the educational side and from the secular world, this toolkit shows that faith-based ESD should be a feature of all such toolkits because it touches upon the deeply held values and beliefs of the majority of the world.

For those coming from the faith side it has been a journey of mutual discovery, of working side by side from three very different faiths and of the development of a shared educational language enriched by diverse faith traditions. For the environmentalists, it has been a journey of discovering the degree to which the great faiths of Christianity, Islam and Hinduism share the profoundly held concerns of the environment movements. For all of us it has been a discovery of how much stronger we are walking side by side than on our own.

When I am asked what marks out a faith-based educational approach to environmental issues, I make one observation. The usual environmental education approach is to start by telling everyone how bad things are in the hope that they will be shocked into action. The faith-based approach is one where we start by giving thanks for such a wonderfully beautiful world that the Creator has given us, and then from a position of gratitude we turn to confront the crises we have created within this God-given world.

I have been involved through WWF and then through the Alliance of Religions and Conservation (ARC) in working with faiths around the world on environmental issues for nearly 30 years. What I have found is that every faith is at heart a conservation faith because we all revere the Creator in one form or another.

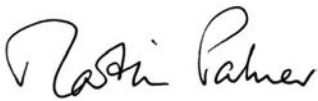
I have also learned that we need to have four relationships right if we are to make any serious progress in addressing so many of the ecological, social and spiritual issues that face us. We need to have a right relationship with God – whomsoever we believe that to be; we need to have a right relationship with our neighbours – around the world as well as next door; we need to have a right relationship with ourselves; and we need to have a right relationship with the rest of Nature.

This toolkit illustrates all of these. Through the wonderful quotes, stories and sayings from the Bible, the Qur'an and the Hindu scriptures, we find a right relationship with God. Through working side by side as faiths and secular agencies we find the right relationship with our neighbours, of whatever faith and none.

I was very struck by the fact that the original intention was to create separate toolkits for each faith. But the first thing the teachers told us was “NO”. They said this must be a shared toolkit where we learn from our neighbours in faith. So here Christians talk about the books of the New Testament such as John or Mark, meaning the Gospels according to John or Mark. Muslims use the initials ‘pbuh’ each time the Prophet Muhammad is mentioned which indicates the term of respect that any Muslim would say on uttering the name of the Prophet. Pbuh stands for ‘peace be upon him’ and the initials ‘swt’ used after Allah’s name stands for ‘Subhanahu wa ta’ala’ and means ‘Glory to Him, the Exalted’. And Hindus can share their teachings drawn from scriptures of such antiquity that they are lost in the mists of time and yet are timeless in their teachings.

The right relationship with ourselves is the moral teaching about sustainability – it tells us we must not take what is not ours or more than we really need. It asks us to confront issues of how we each individually live and relate to the environment and others around us. Finally the whole toolkit is about restoring the damaged relationship with the rest of nature. For in the end, this is the only planet we know that has water to sustain life; that has air for living creatures to breathe; that has soil to grow the plants that feed us.

It’s also the only planet that we know that sings praise to its Creator through the songs of the birds, the wind whispering through the trees, the call of the wild animals, the splash of the fish in the streams – and through the prayers and hopes of all its people.

A handwritten signature in black ink, reading 'Martin Palmer' in a cursive style.

Martin Palmer
Secretary General
Alliance of Religions and Conservation
Kelston
Bath
UK

OVERVIEW OF THEMES

This toolkit presents Education for Sustainable Development in seven thematic areas: namely Water; Health, Sanitation and Hygiene; Waste; Energy; Biodiversity; Agriculture and Climate Change. Each theme begins with a brief introduction followed by faith-based reflections and finally suggested activities for teachers and learners including values and skills to be instilled among the learners. The faith-based reflections in each theme refer to the Christian, Hindu and Islam faiths. The following is an overview of each theme:

Water is seen as the essence of all life. Fresh water is one of our most precious natural resources and were it not for water, there would be no life on this planet as we know it. For Christians, Hindu and Muslims, water is a valuable gift from God. As a gift from God, the religious faiths have a special place for water and talk of its conservation and wise use. The faiths also refer to it symbolically in their holy texts – the religions recognize that water is essential to all forms of life on Earth and appreciate its sacredness (seeing water as a gift of God).

Health, sanitation and hygiene education is a simple cost-effective measure that can reduce occurrence of water related diseases. Poor health, sanitation, and hygiene denies schoolchildren access to education and also makes them less productive in school due to illness. Health, sanitation and hygiene are linked to purity and purification in Christianity, Hindu and Islam. In worship, spiritual and physical purity is a pre-requisite to prayer and lack of cleanliness has a corresponding negative impact upon prayer.

Waste generation is inevitable, but we can learn to reduce our waste and process it sustainably. Christianity, Hindu and Islam teachings remind us that it is our responsibility to care for creation, not to destroy it through pollution and waste.

Energy is presented as essential for the production of goods (food) that human beings consume and the powering of various activities in our daily lives. Energy is present in every living system and its flow enables humans and other organisms to survive. Christians, Hindus and Muslims believe they have a duty to conserve the environment as per their religious teachings. Regulating our energy consumption is one of our responsibilities as people of faith, whether it's turning off the lights, reducing, reusing or recycling, saving our rainwater or using renewable energy such as solar or wind power.

Biodiversity is defined as the variety and numbers of all living organisms on land, water and in air or the variety of habitats which support the existence of these living organisms. For people of faith, biodiversity is God's gift of creation. God created a world with an amazing number and variety of living organisms, millions of plants, animals and microorganisms. This wonderful variety of life, known as biodiversity, is God's gift to us, both to enjoy and to care for.

Agriculture – Most African countries' economies are agriculture-based, with small-scale agriculture practiced by roughly 70 percent of the East African population. And just as water is essential to life, so is soil – the foundation of agriculture. Without it, we would not survive; healthy soil produces the food that, ultimately, provides life to virtually all living creatures on Earth. Yet farmers today face great struggles, with declining crop yields, deforestation, erosion, droughts and the increasingly erratic nature of rainfall patterns. Can anything be done to help? Does faith have anything to teach us here or any guiding principles to help our farmers? Faith teachings tell us that it is God's intention that the Earth should be a place of abundant provision and blessing to His people. The beauty of a healthy, productive and well cared for agricultural landscape should be a testimony to the Christian, Hindu and Muslim faiths. Godly agriculture gives priority to healthy food and to the needs of the poor and hungry and Godly agriculture is not wasteful.

Climate change – The world today is faced with a variety of effects of climate change which can be traced to human activities such as unsustainable agriculture, deforestation and others. It is unfortunate that Africa is most affected by impacts of climate change yet it is largely the least responsible for it. Our environmental destruction threatens not only millions of human beings but also thousands upon thousands of species of plants and animals – threatening an unraveling of God's creation. Our behavior in safeguarding the environment is not because we are fearful of what might happen, but because we want our actions to be in line with God's will for his magnificent creation.

List of acronyms and abbreviations

ACK	Anglican Church of Kenya
AIDS	Acquired Immune Deficiency Syndrome
ARC	Alliance of Religions and Conservation
ASALs	Arid and Semi-arid Lands
CBOs	Community Based Organizations
EMF	Ecological Management Foundation
ESD	Education for Sustainable Development
FAO	Food and Agricultural Organization
FEE	Foundation for Environmental Education
GHGs	Greenhouse Gases
HIV	Human Immunodeficiency Virus
ICTs	Information Communication Technologies
KIE	Kenya Institute of Education
KOEE	Kenya Organization for Environmental Education
MDGs	Millennium Development Goals
MOE	Ministry of Education
NEMA	National Environment Management Authority
NESSP	National Education Sector Support Programme
pH	Hydrogen Potential
SD	Sustainable Development
SMART	Specific, Measurable, Attainable, Realistic and Time-bound
UK	United Kingdom
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
WASH	Water, Sanitation and Hygiene
WED	World Environment Day
WHO	World Health Organization
WWF	World Wide Fund for Nature

About this toolkit

This toolkit was developed to enhance Education for Sustainable Development (ESD) in primary schools in Kenya and beyond, using faith-based values. The international community agrees that integrating religious wisdom and practices in educational materials provides children with an opportunity to acquire holistic knowledge, practical experience and a sense of responsibility towards environmental conservation. The toolkit targets primary school teachers and learners, but will still prove useful to religious leaders and other ESD practitioners.

It is hoped that the toolkit will empower teachers and other ESD practitioners by providing them with the knowledge, skills and values to find innovative solutions to their social, economic and environmental challenges. This toolkit will help complement and bridge gaps in the existing curriculum support materials.



What future awaits us?

1.1 Aim

The main aim of the toolkit is to:

- Enhance the faith-based value system and positive behavior in the school and community to promote sustainable development using the eco-school strategy.
- Demonstrate how faith-based values can be integrated into Education for Sustainable Development (ESD) in the primary school curriculum.

1.2 General objectives

- a. To enhance the faith-based value system and positive behavior in the school and Community to promote sustainable development.
- b. To enable teachers, pupils and the wider community to acquire awareness of and sensitivity towards environmental problems.
- c. To enhance teachers' and pupils' capacity to identify and solve sustainable development challenges.
- d. To encourage multiple approaches in teaching and learning processes for sustainable development.

Achievement of these objectives will make a significant contribution towards addressing current development challenges in Kenya and other developing countries.



ESD builds teachers' and pupils' capacities

Our hope is that this toolkit will be adapted and used by other countries and faith groups and that this process will set a precedent for faith groups, educationalists and government ministries co-operating in a shared belief in the positive contribution such a toolkit can make to the future of young people in Africa.

The toolkit has been structured into five sections: Introduction to the toolkit; Introduction to ESD; Teaching and Learning Approaches; and Themes. A list of reference materials has been included at the end of the toolkit for further reading. Section five gives a summary of micro-projects implemented in seven pilot schools. Reports from three other pilot schools have been used in section four as suggested project-based learning activities. There are two appendices: Glossary of terms (Appendix I) and some world important days celebrated (Appendix II). A

Curriculum matrix showing the mainstreaming of faith-based values into the curriculum is supplied separately with the toolkit as a poster that can be securely and strategically fixed in an open location for access by many users.

Section four deals with seven themes covered in the primary school curriculum in Kenya, namely Water; Health, Sanitation and Hygiene; Waste; Energy; Biodiversity; Agriculture; and Climate Change. Each theme begins with a brief introduction followed by a presentation of general information in sub-themes as envisaged in the curriculum; faith-based reflections and finally suggested activities for teachers and learners. Each sub-theme begins with the objectives.



Religions can play an integral role in ESD

The faith reflections in each theme refer to the Christian, Hindu, and Islamic faiths – with some quotations and suggestions for further reading from the Holy Books. The three faiths have been treated equally in this toolkit, and the presentation of reflections in the order mentioned is purely by alphabetical order and for logical flow.

Suggested activities cover a wide range of teaching methodologies included to reinforce the teaching and learning process. Some of these activities are suitable for out-of-class environments while others are for in-door application; the teacher has the freedom to make a decision on the activity vis-à-vis appropriate age groups and grades of the learners. Teachers are encouraged to apply these innovatively and develop other activities that enhance achievement of the objectives of this toolkit.

Since the themes covered in the toolkit are cross-cutting, teachers will find it useful for use across the entire primary school curriculum. The wide range of teaching and learning methodologies suggested in this toolkit make it flexible and amenable to use for both curricular and co-curricular purposes.



Pupils can learn about planting trees through songs and dance too.

Basic concepts

2.1 Introduction

This section brings to the fore key issues underlying the subject of Sustainable Development (SD) and Education for Sustainable Development (ESD). Good knowledge of the two concepts is crucial to understanding the sections that follow. Key development challenges in Kenya (and typical to third world countries) have been outlined, with a view that the learners will be able to draw the link between ESD and the potential solutions to these challenges. Emphasis is made that development cannot be sustainable until a balance is struck among the three pillars of Society, Economy and Environment. A strong case has been put forth that the religions of the world can make a significant contribution to the attainment of sustainable development in many ways: by entrenching religious wisdom (or values) into education, guiding the moral backbone in the community and teaching about care for nature. Religions all over the world have strong networks that can help to spread the ESD message with a wide reach, and religious leaders are seen as role models for change and their support can instigate and reinforce behavior change.

While working on the development of this toolkit, it emerged among the religious leaders that although there were variations in their principle issues of faith and doctrine, the faith values were essentially the same, and that they could add value to achieving sustainable development. These values were jointly identified and are outlined in this section. Various approaches that would help mainstream religious wisdom into ESD have been suggested. The Eco-schools approach has been adopted for achieving this purpose, owing to its tremendous success in promoting implementation of ESD in Kenya for over a decade. The lessons learned from this experience are expected to inform this monumental work. Practical guidelines on the journey to becoming an Eco-School are given at the end of this section.



A church



A Hindu temple



A mosque

2.2 What is sustainable development?

The United Nations defines sustainable development as a “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. Present communities have a responsibility to live a useful life within existing ecological limits while conserving natural resources. Sustainability is a way of thinking about a future in which environmental, social, cultural and economic growth are balanced to enable development and an improved quality of life. Sustainable development addresses the local contexts of these three areas.

The ideals and values that form a basis of sustainability include equity among generations, gender equity, peace, tolerance, poverty reduction, environmental preservation and restoration, natural resource conservation, and social justice.

2.3 What development challenges does Kenya face?

Kenya, like other developing nations, faces Sustainable Development challenges that need to be addressed in order to achieve prosperity as envisaged in Vision 2030. Through a participatory field survey carried out by the KOEE, these challenges were identified and are outlined in Table 1.1. It is however good to note that the list is not exhaustive since development is often a dynamic concept that accommodates emerging issues.

“Our biggest challenge in this new century is to take an idea that sounds abstract – sustainable development – and turn it into reality for all the world’s people” – Koffi Annan, former UN Secretary General.

Table 1.1: Sustainable development issues in Developing Countries

Social-Cultural	Economic	Environmental
• Governance and integrity	• Poverty	• Droughts
• Cultural diversity	• Road networks	• Natural disasters e.g. flood, mudslides,
• Ethnicity	• Joblessness	• Climate change
• Gender inequality	• Rural/urban migrations	• Loss of biodiversity
• Health issues	• Unsustainable usage of natural resources	• Forest cover
• HIV/AIDS	• Degradation of resources	• Waste management
• Human Rights	• Economic growth	• Land degradation
• Drug and substance abuse	• Inflation	• Land use problems
• Peace and conflict resolution	• Low income earning	• Insecurity
• Land scarcity	• Over reliance on one source of income	• Water scarcity
• Over-population		• Mono-cropping
• Mushrooming of slums		• Soil erosion
• Illiteracy		• Poor drainages
• Poverty		• Congestion
• Waste management		

2.4 What is education for sustainable development?

To achieve sustainable development, education is essential. Education literally means the process of imparting intellectual, moral and social skills and values to learners for particular purpose. Education and training are the key processes by which human beings and societies

can reach their fullest potential. Education is the key to sustainable development. The education of today is crucial to enable the leaders and citizens of tomorrow to create solutions and find new ways to a better, more sustainable future. Education for Sustainable Development (ESD) is the way forward if we are to equip our young people to meet the environmental challenges of today and tomorrow.

Education for sustainable development (ESD) is the acquisition and development of knowledge, skills, attitudes, and values that enhance participation in providing solutions to environmental challenges, thus making it possible to achieve development that meets the needs of the present without making the future generations fail to meet their own needs.

Educating people for sustainable development should provide skills, perspectives, values and knowledge to live sustainably. ESD is a process of achieving sustainable development and it encompasses the three pillars: Society, Economy and Environment. It includes, among others, education for poverty alleviation, human rights, gender equity, cultural diversity, international understanding and peace among others.



We need an education that addresses today's challenges

2.4.1 Characteristics of ESD

ESD has essential characteristics that can be implemented in many culturally appropriate forms. It:

- Is based on the principles and values that underlie sustainable development
- Includes all three spheres of sustainability – environment, society, and economy – with an underlying dimension of culture;
- Uses a variety of teaching techniques that promote participatory learning and higher-order thinking skills;
- Promotes life-long learning;
- Uses a holistic approach; uses whole school approaches including sound operations and management systems in schools, policy and community outreach.
- Is learner centered and encourages participation, making learning an enjoyable experience.
- Is locally relevant and culturally appropriate
- Is based on local needs, perceptions and conditions, but acknowledges that fulfilling local needs often has international effects and consequences
- Engages formal and informal education
- Accommodates the evolving nature of the concept of sustainability
- Promotes action competencies and self-reliance
- Employs research, innovation and creativity.
- Enhances teacher capacity, morale, ethics and commitment opportunities



ESD is participatory and enjoyable



ESD promotes action competencies

2.4.2 Principles of ESD

- Respect and care for the earth's resources
- Improved quality of human life
- Conservation of the earth's vitality and diversity
- Minimize the depletion of non renewable resources
- Create global partnerships for sustainable
- Keep within the earth's carrying capacity
- Change personal attitudes and practices for a better future
- Enable communities to care for their own environment
- Provide national framework for achieving a balance between societal development, economic development as well as environmental conservation



Global partnerships add value to ESD

Figure 1 shows a diagrammatic illustration of the pillars of Education for sustainable development and their integration in the learning curriculum.

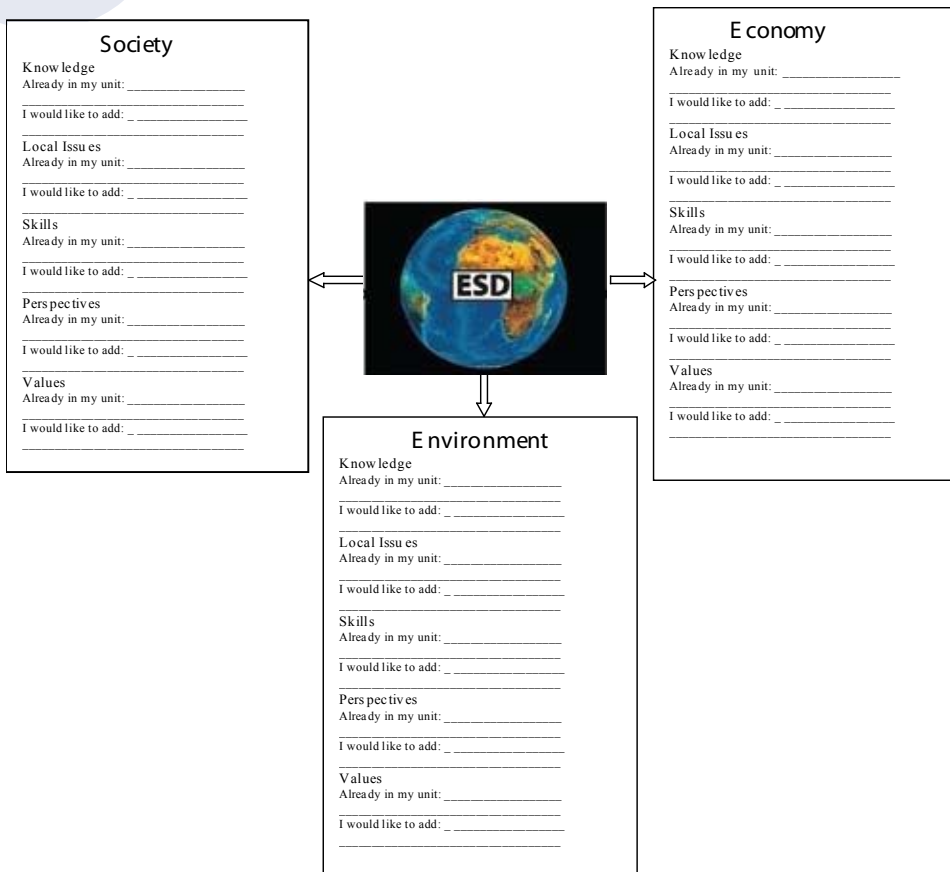


Figure 1: Pillars of ESD

2.5 Education for Sustainable Development and Faith-based values

2.5.1 Why faith-based values?

For us to develop we depend upon resources from the environment - a rich variety of plants, animals and microorganisms and the areas where they live – e.g. soil and water. The wellbeing of the environment is therefore a common concern for all of us. For us to achieve this, faith-based values can play a key role given that the protection of the earth's diversity and its beauty is a sacred trust given to us by God. **Table 1.2** highlights important faith-based values that enable this.

Table 1.2: Faith-based Values

Christian Values	Islamic Values	Hindu Values
1. Respect (care for God's creation)	1. Respect and care for Allah's creation	1. Respect for God's creation
2. Peace (Living in peace)	2. Unity of Allah's creation(Tawhid)	2. God is in everything (All-pervading)
3. Stewardship (Custodian of environment)	3. Khilafa(Steward/Custodian) of environment	3. Everything should be revered
4. Accountability (Responsibility for preserving the earth)	4. (Akhirah)accountability for preserving the earth	4. Stewardship/care/love for nature
5. Harmony (Living in harmony with Nature)	5. Living in harmony with Nature	5. Consider earth as mother and protect her
6. Wisdom (Wise use of resources)	6. Wise use of resources	6. Living in peace /harmony with nature
7. Justice (Fairness in use of resources)	7. Fairness in use of resources	7. Maintaining nature's integrity(preserving nature)
8. Caring for the needy	8. Caring for the needy	8. Uphold justice for all as all is seen as aspects of divinity
9. Faith (Conviction for conservation of God's Creation)	9. Showing mercy on Allah's creation	9. Responsibility/accountability in managing the universe
10. Honesty (doing what we say)	10. Maintaining Ecological Integrity(Mizan)	10. Wise and benign use of resources

2.5.2 Role of faith in Kenyan Culture in Response to ESD

Since Faiths are involved in over 50% of the world's schools as founders, coordinators, funders and managers, they can champion environmental sustainability through schools by integrating religious values that enhance environmental conservation. This toolkit could prove very useful in mainstreaming these values into the school curriculum.

"The world has enough for every Man's need but not for every Man's Greed" – Mahatma Gandhi

From the perspective of many world religions, the abuse and exploitation of nature for immediate gain is unjust, immoral, and unethical. No culture has remained immune from human disrespect towards nature. How can we change the attitude of human beings towards nature? Religious teachings can provide solutions to this since it is here that human values and beliefs are nurtured. Directly and indirectly, religion can be a powerful inspiration for environmental conservation and protection. Thus, we need a strategy for conservation that does not ignore the powerful influence of religions, but instead draws from all religious foundations and cultures. This toolkit does just that. Religions, each in their own way, offer a unique set of moral values and rules to guide human beings in their relationship with the environment and God. Contrary to what has been in the recent past, religions have arisen to join the rest of the global stakeholders in protecting the environment from human greed and

exploitation. Environmental education would be incomplete if it excludes cultural values and religious imperatives, a gap this toolkit seeks to fill.

2.5.3 Mainstreaming faith-based values into ESD

Mainstreaming religious values or wisdom into the curriculum is a strategy of integrating and infusing religious values and ethics into the education system. Generally speaking, and at different levels, all religions respect creation and seek to protect and conserve it. Since religions have a potential to influence one's behavior in a great way, mainstreaming faith-based values into ESD could go a long way in producing individuals who respect and care for the environment.

This can be done through;

- Incorporating religious concerns, ideologies and values in what is taught in the curriculum
- Integrating religious values and ideologies in the learning resources and the curriculum
- Ensuring that religious values are central to all activities
- Policy development
- Advocacy/dialogue
- Resource allocation
- Planning and implementation



Faith teachings can change attitudes

2.5.4 Approaches to mainstreaming faith-based values into ESD

Due to an already crowded curriculum, the Kenya Government recommends mainstreaming emerging or contemporary issues such as ESD and faith-based values into the central school curriculum. Mainstreaming strategies include plug-in points for integration and infusion; text-book driven approach; pilot-project approach; stand-alone subject e.g. madrasa, pastoral programmes and special-event approach.

2.6 The Eco-Schools Strategy

The Eco-Schools strategy is a whole-school approach that uses all members, departments and stakeholders of the school to address local challenges of sustainable development. This way, every member is equipped with the necessary knowledge, skills and values for achieving sustainable development. This is called a “whole-school approach”. The Kenya Organization for Environmental Education (KOE) partners with the Federation for Environmental Education (FEE) to implement the Eco-Schools Program in Kenya. An Eco-School is a school that puts



Training of educators is important

environment in its totality at the center of teaching and learning, ensuring environmental concerns are part of the curriculum and day-to-day running of the school.

As a strategy for implementing ESD, the Eco-schools programme aims at achieving Educational goals as well as Sustainable Environmental Management through schools as entry points to communities. Specific objectives of the Eco-Schools Program include:

- Empowering young people with skills and values to promote healthy lives within their environment.
- Enhancing active learning competencies
- Capacity-building teachers
- Creating opportunity to implement development goals

2.6.1 Steps to establishing an Eco-School:

- First form an Eco-school Committee to enhance democratic and participatory decision making.
- Carrying out an Environmental Audit
- Formulation of an Environmental Policy and development of Eco-codes (agreed values, principles and learning for sustainability goals enshrined in the school policy).
- Formulation of an action plan
- Initiating Micro projects to respond to the audit issues and demonstrate problem solving skills.
- Localizing Curriculum and mainstreaming of sustainability values to make learning practical.
- School-Community cooperation, including the religious groups or institutions around the school
- Networking and information dissemination
- Monitoring and Evaluation
- Graduation of successful schools.

The Eco-schools programme reflects the key focus areas of ESD to:

- a. Promote and improve quality of education
- b. Re-orient existing education systems at all levels to address sustainable development.
- c. Address local community environmental problems through localizing the curriculum
- d. Equip learners with principles, skills, perspectives, and values to address both local and global development challenges.
- e. Enhance public understanding and awareness of sustainability
- f. Build Capacity



Public awareness is central to ESD

2.6.2 What Eco-Schools enhance

- Collaboration and cooperation including communication skills via the internet.
- Community based approaches, empowering women and the poor to contribution to the school
- Social wellbeing,
- Knowledge and critical thinking, leadership and citizenship skills.
- Public understanding and awareness of sustainability through sensitization activities.
- Teachers' access to professional development in Education for Sustainable Development.



Eco-schools uses advocacy & campaigns

2.6.3 The link between Eco-schools and ESD

- Advocacy, campaigns and vision building in integrating environmental concerns in the school curriculum.
- Capacity-building and training of teachers in teaching methodologies in the integration of environmental concerns in the curriculum.
- Use of information communication technologies (ICTs) among students and teachers in sharing experiences through the eco-school link and network activities.
- Monitoring and evaluating the outcomes of micro-projects and other learning activities to assess impacts of problem-solving environment and poverty related problems in schools and community groups.
- Rewarding excelling schools through the eco-schools award scheme provides motivation and recognition for quality learning and school improvement.
- Engages multiple stakeholders to participate in educational activities, including government, civil society and private sectors, particularly in the establishment of micro- projects.
- Innovation via the establishment of school and community projects.
- Community participation in the establishment and implementation of learning programmes particularly through the design and implementation of micro-projects which allow for innovation and integration of community ideas and replication of projects.



Eco-schools rewards the excellent

Summary of faith-based values

Respect and care for God's creation, living in peace, steward/custodian of the environment, responsibility/accountability for preserving the Earth, living in harmony with Nature, wise use of resources, fairness in use of resources, caring for the needy, conviction for conservation of God's Creation, honesty/integrity

SECTION THREE

Methodologies

3.1 Introduction

This section presents the teacher with a “basket of options” in form of teaching and learning methodologies that would help in attaining the objectives of ESD, with faith-based values mainstreamed. The various teaching and learning methods are discussed to highlight their appropriate use while leaving a lot of room for the teacher's innovation. As far as possible, interactive and participatory methods that engage the learner and teacher alike are encouraged for use.

Use techniques that make learners to ask questions, analyse, think critically and make decisions

Faith-based values can form a firm foundation that will promote education for sustainable development. In mainstreaming faith-based values the teacher is expected to provide opportunities that will enable the learner understand what God expects of him or her in line with the goals of ESD.

3.2 Teaching Methodologies

The faith-based values earlier identified under Section One can be integrated into the curriculum using various teaching techniques. These refer to approaches and sets of methods that a teacher can use in presenting the subject matter with the aim of achieving the set specific objectives. This will be realised if we understand how to create a learning environment that will encourage learning. To achieve this we need to know the different teaching strategies that will be effective in learning to achieve specific skills and values. Teachers are advised to choose suitable teaching methods, teaching /learning experiences and sequence them in a logical manner to ensure smooth flow of content between teacher to learner, learner to learner and learner to teacher. The teaching and learning methods presented in this toolkit are the usual strategies used in the teaching process; only that mainstreaming of faith-based values is highly encouraged in the course of teaching. In this section some suggestions to help achieve this have been put forth.

Deciding on a method to use usually requires considering several factors including:

1. The learner;

- The age of the learner
- Background ability of the learner
- The needs of the individual learner remembering that not all learners learn the same way. Some learn best by reading, some prefer listening while others prefer to participate more actively.
- Interest of the learner and their behaviour

Learners learn differently

2. Lesson objectives;

These should be clear and capture the basic facts, skills and attitudes to be taught in accordance with the subject content, the faith values to be enhanced e.g. stewardship, accountability. All activities in the lesson should aim at achieving the learning objectives.

3. Topic/Sub-topic to be taught;

The method selected should be relevant to the topic/sub-topic, making learners develop the desired ESD skill, understand the concept better and embrace the faith based values being taught.

4. Resources available;

Consider how your resources will your objectives. Be innovative in sourcing a variety of relevant teaching resources. It is important that a variety of teaching resources are used in order to cope with the varying needs of learners and to broaden their experience, while improving their ability to listen attentively and observe carefully.

5. Time available;

Some methods require more time and may work best as follow-up, out of class or co-curricular activities.

6. Sitting arrangement;

Vary sitting arrangement to suit the teaching technique used. The seating arrangement should ensure active participation by all.



Be keen on class arrangement

The teaching methods differ considerably in certain aspects. For instance, some are teacher-centred while others are student-centred. Some are more participatory than others and are useful in developing different skills in the learners.

The various methods, their application and characteristics are now discussed:

Story Telling:

This involves telling narratives with a particular theme based on actual events, myths and legends. These can be true or imaginative stories about experiences in the school and in the community. The teacher could make prior arrangement to invite an older member of the community into the school to tell an interesting story. This could be very interesting. In such a case the stranger should be guided in advance, and maybe the teacher could listen to the story first and guide appropriately.

They give a detailed account about an event or life situation in an interesting way while still passing on a message. Stories can be composed or collected based on the specific area you are teaching about. Story telling can be participatory, engaging the learners throughout the story telling of assorted teaching materials helps guide the the story.



Strangers can tell stories!

A good story:

- Is short and not too scary,
- Is neither violent nor confusing.
- Has a clear flow to attract and retain the interest of learners.
- Is made more dramatic to present sensitive messages in an interesting way,
- Could include songs, tonal variation
- Could make use of gestures and mimicry.



You can present stories in songs

For instance, a story from the community could have a character that makes a very important decision. The story line should follow the character and show the consequences of the decision made. If it was a wise decision the character should be portrayed as a winner, if the decision was a poor one, the story should show the character suffering the consequences of this.

After story telling:

Reflect on the pre-stated objective and evaluate to what extent it has been achieved.

To do this;

- Use probing questions,
- Guide learners to describe characters in the story, including their character traits,
- Guide the learners to identify the morals/ values learnt and the application of the lesson(s) in their daily lives,
- Provide follow-up activities to help internalise the story e.g. through modelling, painting.
- Encourage learners to come up with their own stories from their communities and share in the class.

Debates

Debates are discussions that involve two opposing groups with each group expressing opinions or views about a given topic/motion. Each of the groups tries to out-win the other on the argument. At the end of the debate, the group with more points wins the debate. Debates may be used to enhance communication skills, teach values, develop decision making and negotiation skills among others. Debates also allow for role-play, e.g. the speaker, sergeant-at-arms and Attorney-General.



Ensure discipline during debates

Procedure:

- Guide learners to understand the topic or motion under debate, analyze it and come up with relevant points for and against
- Where learners have any specific role-plays to do, they should be guided appropriately.
- Divide the class into two groups: the proposers supporting the motion and the opposers opposing the motion
- Each group chooses a secretary who will note down the points
- Maintain discipline and time the discussion

- The chalkboard summary should have the relevant points for the learners to remember from the debate.
- At the end of the debate review the points and clarify points that may have been misunderstood.

Demonstration

These are carried out by showing the pupils how to carry out an activity or a practice using real objects or resources, and, sometimes, allowing them carry out the activity on their own but under supervision.



This is how to do it

Important points to remember when using this method include:

- Prepare and rehearse the demonstration before hand
- Ensure all necessary materials; tools and equipment are assembled at the site before embarking on the demonstration.
- Make sure that all learners can see what is happening
- If demonstrating in small groups arrange to have alternate meaningful work for the group not engaged in the demonstration at the time (the alternative activity should be in line with your initial demonstration)
- Always ensure safety for all during and after the demonstration

Games

Games require the players to learn the rules and routines for the game, to reason or solve a problem and to work out strategies for winning. Games are very helpful in learning new skills. Difficult games will stretch the older or more able learners whereas simple games will help learners with learning difficulties. There are different types of games you can use, all you need is to be a little bit more creative to suit the game to the content and the values you want to teach.

Puzzles

Simple crosswords or word-search exercises can build knowledge, critical thinking and vocabulary depending on how they are constructed. Games and puzzles can be sources of entertainment and provide more fun in the learning process. Usually, some hints could be given to help learners navigate through the task, but care should be taken not to make it too simplistic!

Role Play/Drama:

Pupils can act out situations in order to acquire communication and problem solving skills and to help understand situations more fully. Pupils can also prepare a drama for the whole school or for the parents e.g. showing situations about the dangers of bad hygiene and the advantages of good hygiene practices.

Role plays are used to:

- Develop specific skills such as negotiation, assertiveness, self-awareness and critical thinking
- Discuss sensitive issues
- Clarify new and unfamiliar concepts
- Demonstrate how a skill can be applied in a given situation

Role plays require little preparation time and are not necessarily rehearsed. They should be as spontaneous as possible. The teacher however needs to understand when and where to use them in the teaching process. The characters should be de-rolled immediately after the role play to avoid labelling and stigmatization.

General guidelines for developing role play:

- Ask for volunteers
- Go over the role play with the learners explaining the situation to be enacted
- Allow them to pick roles
- Allow them time to internalise their roles
- Allow them adequate time to act and stop them at an appropriate time
- Ask them questions based on the role play
- Summarize the presentation and give concluding remarks orally or in writing.

Remember too much control by the teacher can suppress creative thinking and problem solving skills.

Puppet Shows

This is a form of theatre or performance which involves manipulation of objects which represent different themes or personalities. Puppet shows play an important role in disseminating knowledge in most parts of the world. Puppetry uses elements of all art forms such as literature, painting, sculpture, music, dance, drama and enables students to develop their creative abilities. Puppetry can be used as a popular and an inexpensive medium to transmit knowledge about environmental conservation values. Since Puppetry is a dynamic art form that appeals to all age groups, this medium of communication can be used to serve as an aid for imparting environmental knowledge and values in schools.

Experiment

This involves pupils carrying out practical tests e.g importance of water can be illustrated using a wilted plant. The effects of diarrhoea can be shown using a hollow and long polythene tubing and water.

Exercises

Pupils are given exercises which invoke them to think and solve real problems. At the end of each exercise, pupils are asked questions regarding the concept which they have worked on.

Posters

The teacher shows a poster that illustrates various issues and asks pupils to identify them.

These can be used in support of a theme that the teacher is teaching. For instance, a teacher can display a chart showing photographs or drawings of the various sources of water and ask learners to identify and name them.



Say it through posters

Role Models

A Clean, smart student, or one that observes best sanitation and hygiene practices, or one who is very good at taking care of animals reared in the school is identified, recognized and awarded. This helps to encourage and motivate the other pupils and also helps to enhance faith-based values such as stewardship and accountability in learners.

Class Discussions

Class discussions allow for the transfer of information amongst pupils and from the pupils to the teacher. Pupils come to the classroom with a wide variety of life experiences that can enrich the teaching of the mainstreamed faith-based curriculum content. Pupils can therefore contribute a great deal to discussions on sustainability with observations from their



Motivate role models

neighbourhoods about the faith values that can be used to enhance sustainability. The teacher can incorporate these experiences into the lessons providing pupils with real life application of concepts. Discussions develop the ability to communicate orally and in writing. (E.g. developing focus and purpose before speaking, active listening, building on the ideas of others, summarizing, and questioning). Pupils with strong listening skills learn well from discussions, both from listening and expressing their own ideas.

When people are involved in discussing something that concerns them they tend to have a sense of commitment to what they are learning. Let learners give their views, beliefs and suggestions.

Discussion can be around a list of questions, a problem to solve, a plan to be made, or an activity to be completed. There are different forms of discussion forms. Large-group discussions involve the whole class; small-group discussions could involve about two to six pupils. Discussions can be teacher-led, pupil-led, or interactive.

Teachers can use discussions to assess pupils' knowledge and application of the three spheres of sustainable development – environment, society, and economy together with the faith-based values that can be used to achieve the application.

Procedure:

- Introduce the topic under discussion
- Lay ground rules (e.g. one person speaks at a time while the others listen).
- Have a discussion on why it is necessary to develop the value to change behaviour, explore some socio-cultural, economic and environmental benefits of the behaviour change
- At the end of the discussion arrive at some consensus regarding the course of action to be followed.

Note:

- Exercise control while still allowing learners to discuss freely
- Ensure direction and that the required information is obtained through the discussion

Brainstorming

Is a spontaneous expression of ideas, views and opinions on a given topic, issue or situation.

Brainstorming is used when the teacher wants to:

- Generate ideas from learners
- Stimulate learners to think widely and openly about different options of solving a problem or addressing an issue
- Seek different views or opinions of a given situation
- Establish the entry behaviour of the learners
- Explain new concepts and encourage involvement of all learners
- Build consensus or agreement.

Procedure

Explain the idea to be discussed and establish the criteria for discussion e.g. how to combat waterborne diseases such as cholera.

- Ask a question or pose a problem
- Let learners give answers, ideas, opinions spontaneously

- Allow free flow of answers from learners without interruption or criticism
- Note down all the suggestions for other learners to see (focus on generating ideas and not discussing them)
- Guide the learners to select and sequence the suggestion as to how cholera spreads.

Songs and Dance

This involves musical compositions on topical issues and themes. Core messages can be conveyed through song and dance. Ensure that the message is simple and that the right information is given. Songs and dances can be combined with drama to increase the effectiveness of the message. Songs and dances could be organised during national competitions, local functions and religious meetings. They can even be used as an introduction to a lesson to capture the attention of the learners or as an activity to explain the content of the body of the lesson, or even during the conclusion to recap the lesson. When using song and dance, care should be taken to ensure they are of the right length – for ease of time management.



Learning can be fun!

What to consider:

- The song should reflect the content and topic objectives
- Songs should be used in the development of values that will enhance core message
- Should aim at developing and strengthening skills such as decision making and communication
- Songs should be interesting, appealing, easy to learn or familiar to learners

Procedure

Explain the theme of the song in relation to the topic.

The teacher could ask the learners to compose or gather songs ahead of the lesson

Learners are asked to present the song individually, in groups or whole class

Learners are guided to analyse the song, highlighting important values and attitudes relevant to the topic

Summarise the lesson drawn from the song.

Simulations

These are teaching/learning situations in which the teacher defines the context in which the pupils interact. The pupils participate in the scenarios and learn from them. For example, pupils

imagine they live in a small village and have to learn how to manage the forest resources sustainably (i.e. without depleting the forest resources or Starving the people).

Often, simulations are simplifications of complex abstract concepts. Simulations give concrete examples for abstract concepts and these are important for children and adolescents. At the same time, simulations give a sense of reality and thus engage and motivate learners of all ages. Many of our learners are still in concrete stages of mental development.

Simulations help to teach sustainability issues, faith-based values and address real life problems that face communities. They add relevance to the curriculum in addition to promoting effective thinking skills.

Procedure:

- Describe the context of the simulation.
- Explain the rules of the simulation.
- Monitor the activities of the pupils as they engage in the simulation and gently redirecting if necessary, and

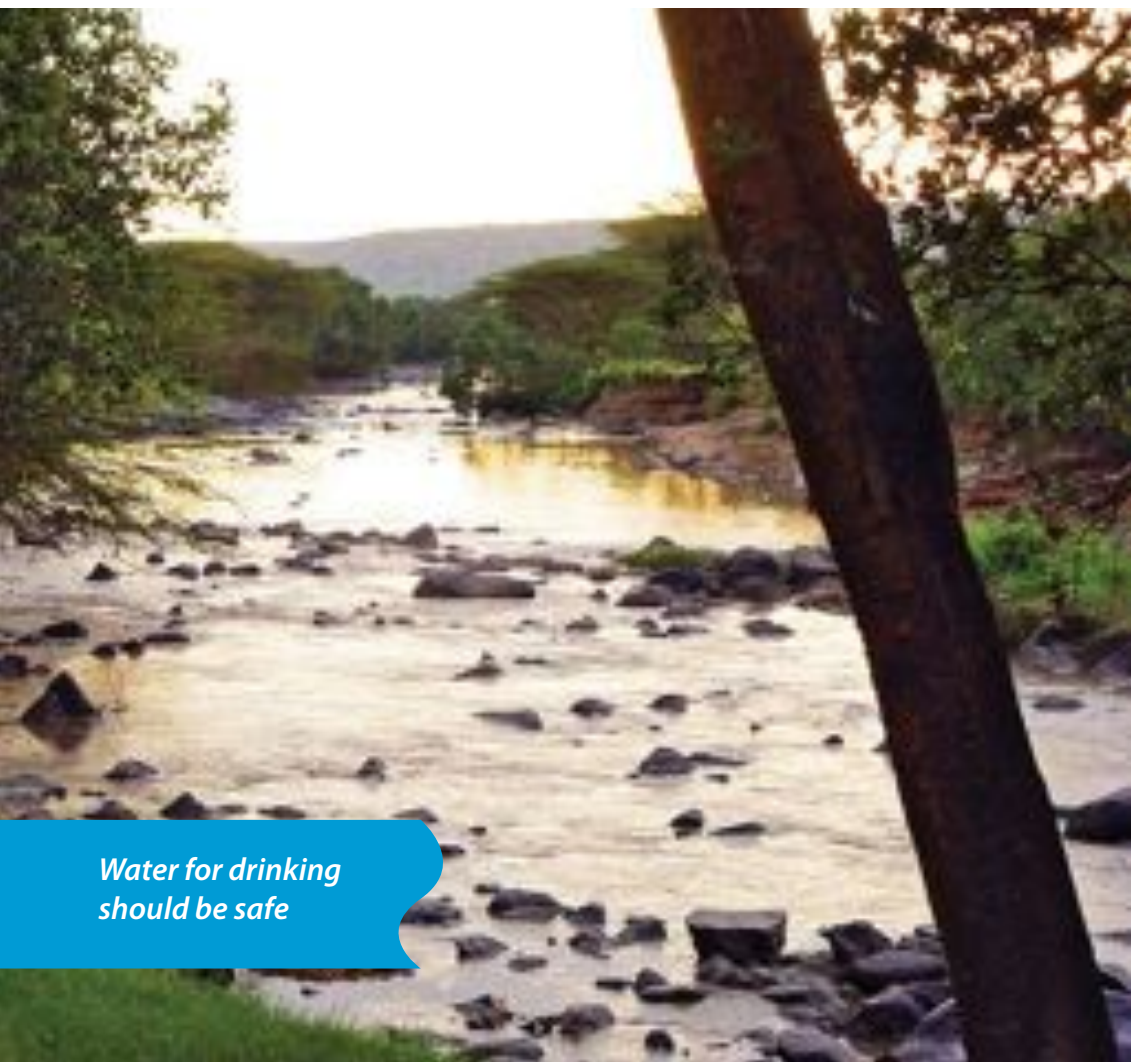
Reinforce the faith values message by asking learners to reflect on the simulation and relate it to the knowledge and faith-based values you intended to teach. This helps the teacher to establish if pupils have taken the right message.

Use the following questions to help learners reflect on the simulation:

1. What did you learn?
2. How is this simulation like in real life?
3. How does the simulation differ from real life?
4. What faith value should we draw on to solve the problems in the simulations?

After using a simulation in class, it is important to reflect on the simulation to find out what the pupils learned. The discussion will also give you the opportunity to deal with any misconceptions that arise.

Simulations help to teach sustainability issues, faith based values and address real life problems that face communities. This adds relevance to the curriculum in addition to promoting high order thinking skills and development of values.



*Water for drinking
should be safe*

Photographer: Emmanuel Keller

4.1: Water

4.1.1 Introduction

Water is an important element across all religious groups. From the beginning, water has always been part of God's creation, bubbling with life and a resource for human kind and all other God's creation. Water is God's creation, we are only stewards. For example in Islam (Qur'an 25:54), "And it is He Who created human beings from water" and "We made from water every living thing" (Qur'an 21:30); in Hinduism, water is referred to as sacred "waters which come from heaven" (Rigveda 7.49.2), while in Christianity God created all the waters in the story of creation (Genesis 1:6-10).

Humans should take care of the sources of water and use that water well so that generations to come can also use the same water. We should not waste or pollute water. We can conserve water at the school level and even at national, regional or global levels. Taking part in celebrations such as Nile Day (Regional - February 22), World Wetlands Day (Global - February 2), World Water Day (Global - March 22), World Environment Day (Global - June 5) and others can enhance our understanding of issues around water and how to manage and conserve water in line with the global agenda.

In this unit, we are going to learn about sources of water, uses of water, water pollution and water conservation in relation to religious values.

4.1.2 Sources of Water



Objectives of the sub-unit:

By the end of the sub-unit the learner should be able to:

- Identify the sources of water in the local community
- Explain how to take care of water sources in the community
- Appreciate the sources of water in the family



Water from a spring



Water from a river

Introduction

Earth is the only planet in our solar system where water is found in all three states: solid, liquid and gas. In particular it is the only planet where water is found in a liquid state.

The sources of water include;

- Rain
- Streams
- Springs
- Dams
- Rivers
- Lakes
- Wells
- Seas
- Boreholes
- Oceans
- Ponds



Lakes



Oceans



Ponds

According to Water Aid Kenya (2008), Kenya is classified as a water scarce country with only 57% of the rural population having access to safe water. Others, mainly women and children, often have to walk 3-4 hours a day to collect unsafe water from shallow wells, taking them away from other domestic duties and/or education. (In the hardest hit areas water is some 12-19 miles away.) This back-breaking work leaves about half of the country's inhabitants vulnerable to serious dangers such as attack from water-borne diseases. The situation for those living in urban situations is not any better, with water being expensive and sanitation conditions poor. The water situation is becoming steadily worse with some areas receiving less rainfall over the seasons. The effects of this include death of livestock, conflicts of water sources and increased diseases for humans and livestock. This pattern is causing widespread food shortage and food insecurity, particularly in parts such as the northern Kenya. In 2011, an estimated 2.4 million Kenyans were short of food.

Faith-based Reflections on Sources of Water



Christianity

According to the Bible, God created the seas on Earth and the rainclouds in the sky:

“Then God commanded, ‘Let there be a dome to divide the water and to keep it in two separate places’ – and it was done. So God made a dome, and it separated the water under it from the water above it. He named the dome ‘Sky’. Evening passed and morning came – that was the second day. Then God commanded, ‘Let the water below the sky come together in one place, so that the land will appear’ – and it was done. He named the land ‘Earth’, and the water which had come together he named ‘Sea.’” (Genesis 1:6–10)

In Gen. 2:10, we encounter rivers: “A stream flowed in Eden and watered the garden; beyond Eden it divided into four rivers.”

These water sources – skies/clouds/rain; seas; streams and rivers – should all be protected as part of God’s creation.



Hinduism

Water has a special place in Hinduism because it is believed to have spiritual cleansing powers. Hindus strive to attain purity by avoiding pollution, both in terms of physical cleanliness and spiritual wellbeing.

Water is considered by Hindus as a powerful media of purification and also as a source of energy. Sometimes, just by the sprinkling of pure water in religious ceremonies, it is believed purity is achieved.

Hindus believe that all water is sacred, especially rivers. There are seven prominent sacred rivers, namely the Ganges, Yamuna, Godavari, Saraswati, Namrada, Sindhu and Kaveri. Most places of pilgrimage are situated on the banks of rivers, streams and springs, and Hindus believe bathing in sacred rivers will wash away their sins. Some lakes (for example, Mansarovar at Kailash Mountain) are also sacred for Hindus.

In Rig Veda 7.49.2; we have the prayer: “The waters in the sky, the waters of rivers and water in the well whose source is the ocean, may all these sacred waters protect me.”

Islam

Islam ascribes the most sacred qualities to water as a life-giving, sustaining, and purifying resource. It is the origin of all life on Earth.

The Qur'an emphasises its centrality: "We made from water every living thing" (Qur'an 25:54) and "And it is He who created the heavens and the earth in six days, and his Throne was upon water" (Qur'an 11:7).

For Muslims it is important to acknowledge water as one of the immense gifts of God to give life and to purify humanity and the Earth. This is why Muslims are frequently reminded that it is God who provides clean 'sweet' water for people to use and water is a blessing and mercy from God that he can just as easily withhold.

Qur'an 25:48: "And it is He who sends the winds as heralds of glad tidings, going before His Mercy (rain) and we send down pure water from the sky."

Allah (SWT – Subhana wa t'ala – which means: 'May He be Glorified and Exalted') alone made water for our use, as the following verses show.

- "...If the source of your water becomes dry, who, besides Allah, is capable of giving you another source of water?" – Qur'an 67:30.
- "And we send down blessed water from the sky, then use produced therewith gardens and grains that are reaped" – Qur'an 50:9.
- "And we sent down from the sky water in measure, and we gave it lodging in the Earth, and verily, we are able to take it away." – Qur'an 23:18.

In the Hadith (collection of teachings) of Abu Dawud, the Prophet Muhammad (pbuh) describes water as one of the three wonders of the natural world that every Muslim is entitled to: "Muslims have common share in three (things). Grass, water and fire." (Abu Dawud, Book 23, 3470).

According to Water Aid Kenya (2008), Kenya is classified as a water scarce country with only 57% of the rural population having access to safe water. Others, mainly women and children, often have to walk 3-4 hours a day to collect unsafe water from shallow wells, taking them away from other domestic duties and/or education. (In the hardest hit areas water is some 12-19 miles away.) This back-breaking work leaves about half of the country's inhabitants vulnerable to serious dangers such as attack from water-borne diseases. The situation for those living in urban situations is not any better, with water being expensive and sanitation conditions poor.

The water situation is becoming steadily worse with some areas receiving less rainfall over the seasons. The effects of this include death of livestock, conflicts of water sources and increased diseases for humans and livestock. This pattern is causing widespread food shortage and food insecurity, particularly in parts such as the northern Kenya. In 2011, an estimated 2.4 million Kenyans were short of food.



Rain is a source of water



Suggested activities

Song and Dance about water sources

Example of a song:

*I pour down as rain across your land
Along the slopes of mountains and rocks
I flow freely to the ocean and to the lakes
Everybody needs me
I am water, I am life*

*In some places am found in wells and
ponds providing for your needs
In other areas am scarce and you have
to find me wherever I am.
Am deep underground, you have to dig deep
I am water, I am life*

*If you do not cut trees at my source and along my path
I will be available for your use
Use me properly, and add no filth in me
I assure you I will continually be available for you.
I am water, I am life!*



Taking shelter from rain



Objective

Identify sources of water in the local environment

I am water, I am life



Materials

- Dancing costumes
- Chart of the song
- Charts or photos of different sources of water



Notes for the teacher

- The song should reflect the content and topic objectives.
- Songs are useful in development of values that will the core message.
- Songs can be used to develop and strengthen skills such as creativity, self-expression, effective communication.
- Songs should be interesting, appealing, easy to learn or familiar to learners.



Procedure

- Explain the theme of the song in relation to the topic.
- Ask the learners to compose or gather songs ahead of the lesson.
- Ask the learners to present the song individually, in groups or whole class.
- Guide learners to analyse the song, highlighting important values and attitudes relevant to the topic.
- Ask questions from the song, focusing on the objectives of the lesson.
- Summarise the lesson drawn from the song.

Follow up questions

1. What are the sources of water brought out in the song?
2. What are the sources of water in your family and local community?
Answers will include: rain, rivers, wells, ponds, streams, dams, lakes, underground water, seas, oceans
3. How can we take care of these water sources?
Answers will include: ensuring that we don't throw waste there, covering water containers to avoid pollution.
4. What are the religious values brought out through the song?
Answers will include: respect for water sources, sharing of the water sources, and respect for each other as people share the water sources.

Values

- Appreciating water sources as God given gift.
- Respect and care for water sources.
- Living in harmony with one another.



Skills

- Self-expression.
- Creativity in creation of songs and dances.
- Communicating effectively through songs.

How clean and safe is
the water you drink?



Tanks for water storage

4.1.3 Uses of Water

Introduction



Objectives of the sub-unit:

By the end of the sub-unit the learner should be able to:

- Explain the uses of water.
- Show ways of using water fairly at school and home.
- Appreciate the uses of water.
- Demonstrate how to use water as a source of income.

Water is the central component of the Earth's ecosystem and it is central to our survival. Without water, plant and animal life would be impossible. From religious perspectives, water is very important for performing certain rituals which are very symbolic to the respective faiths. Other uses of water include:

- Domestic use (e.g. drinking, washing, cleaning, cooking)
- Irrigation of crops and watering livestock
- Industrial use
- Tourism activities/recreation (e.g. swimming)
- Fishing
- Transport/ navigation
- Generation of electricity
- Cultural heritage and uses



Water is life

Just like our bodies need water to function so do other creations of God. Water is used to water animals and irrigate crops from which we get food. The World Health Organization (WHO) estimates that 1.1 billion people in the world live without adequate amounts of water. In Kenya, there are places where people walk long distances to get some water for their animals and for their domestic use. We should use the water we get sparingly and avoid pollution. In so doing we will be showing gratitude to God who has given us water. We should also share the water we have as a sign of gratitude to God.



Livestock require clean water

Water is a home for some plants and animals. Life on Earth is a self sustaining process. All animals depend on plants for food. Lack of water because of wastage will mean less food for all creation. People should conserve water for continued survival. If one component of life is destroyed, the other parts come under increasing pressure. There are

animals and plants that can only survive in water. When the water is drained away or destroyed by adding chemicals, such plants and animals die. Therefore we should not destroy water sources.

Some important points to know about water:

- Our bodies need water to work properly. About 60% of our bodies are made up of water.
- Water is contained in our body's cells which are the building blocks of our bodies.
- The body needs water for its processes such as transporting food around the body.
- Our bodies are always getting rid of water through processes such as urination, sweating and breathing. This water needs to be replaced.
- If we don't have enough water in our bodies, we feel thirsty, and we can get dehydrated (that is the body has less water than it requires). Dehydration leads to feelings of sickness (for example, headaches and dizziness), and even death. To avoid dehydration it is advisable to drink about 8 glasses of water every day.

Faith-based Reflections on Uses of Water



Christianity

Christians use water in baptism to symbolise being born into a new life (John 3:5): "I am telling you the truth," replied Jesus, "that no one can enter the Kingdom of God without being born of water and the Spirit."

The story is told of Naaman, the commander of the Syrian army (2 Kings 5:1–16). He was a fine soldier, but suffered from a skin disease. The king of Syria sent him to the king of Israel for healing. The king of Israel didn't know how to heal him. But the prophet Elisha told Naaman to wash himself seven times in the River Jordan.

Naaman had expected something more dramatic – a miracle cure or at least a prayer not just washing in an ordinary river – but eventually he bathed seven times in the river – and was completely cured. Reflecting on this story Christians need to remember quite how miraculous the gift of water is.

Rivers, lakes and seas are also providers of food, the bounty of God: "Then God commanded, 'Let the water be filled with many kinds of living beings, and let the air be filled with birds.'" (Gen. 1:20)

Water is also used as a symbol of the spiritual sustenance offered by Christian teachings: "Jesus answered, 'Those who drink this water will get thirsty again, but those who drink the water that I will give them will never be thirsty again. The water that I will give them will become in them a spring which will provide them with life-giving water and give them eternal life.'" (John 4:13–14).



Baptism by immersion



Hinduism

Water plays a part in daily Hindu ritual, beginning with the basic obligation of morning cleansing with water. Every day Hindus are encouraged to offer tarpana – libations of water or milk– to the rising sun as a religious duty.

Explain how Sacred Mantras are recited.

Most temples have a pond, lake or river near it. Devotees are supposed to take a bath in one of these bodies of water before entering the temple while on pilgrimage.

In the temple, during the process of performing abhishek (bathing of the presiding deity), continuous drops of fragrant water fall from a small hole in the bottom of the consecration copper pot; tirtha (sacred water) is given for people to sip. Devotees sip the tirtha after puja (worship).

Sixteen ceremonies are prescribed for Hindus, starting at conception and ending at death. They are called Sanskars which means the actions that purify, refine or reform. Water is used during all these 16 Sanskars as a purifier.

Before starting any religious ceremony, a copper pot filled with water is kept at the place of worship and venerated. Thousands of years ago, Hindus discovered that keeping water for hours in a copper pot sterilises the water, making it safe to drink. Explain more what this means.

Islam

Water is an integral part of Islam, not just as a source of sustenance but because of its use in purification when performing wudhu and ghusl (ablution rituals).

All Muslims are required to purify themselves before praying. Wudhu is the name given to the ritual ablutions that Muslim carry out before each of the five daily prayers. Prayers carried out in an impure state are not valid.

This is emphasized in the hadith (collection of teaching) recounted by Jabir ibn Abdullah, who said: "The Messenger of Allah, peace and blessings be upon him, said, 'The key to Paradise is prayer_and the key to prayer is cleanliness'"

Muslims perform their ablutions in a specific way. The Qur'an says: "Oh you who believe, when you intend to offer salat (prayer) wash your faces and your hands up to the elbows, rub your heads, by passing wet hands over them, and wash your feet up to the ankles three times." (Al-Mâ'idah 5:6)

With descriptions of paradise mentioning gardens where rivers flow, Muslims also believe that water will also benefit them in the afterlife, thus reinforcing its importance to mankind: "Say: shall I give you glad tidings of things far better than those? For the righteous are gardens in nearness to their Lord with rivers flowing beneath; therein is their eternal home." (Qur'an 3:15)





Suggested activities

Word search puzzle



Objective

To build vocabulary and develop critical thinking



Materials

Crossword



Notes for the teacher

- Read widely to find out the meanings of terms from which you develop the crossword.
- Draw the crossword and fit the terms.
- Ask questions across and down concerning the terms in the crossword.
- The terms should be within the level of the learners and the topic of discussion.
- Decide whether the crossword will be done in groups or individually.
- Ensure discipline throughout the activity.
- Ensure active participation by all learners.



Procedure

Provide the puzzle to the learners –either produce copies of the puzzle or write it on papers/board.

Instruct and guide the learners on how to solve the crossword and ask them to circle the words.



We all need water

	B											
	I	R	R	I	G	A	T	I	O	N		
C	L	O	U	D	S	W	I	M	M	I	N	G
	H	I	R	I	V	E	R					O
	A	L	L	C	R	E	A	I	O	N		C
	R	P	O	L	L	U	T	I	O	N	D	A
	Z	A	G	R	I	C	U	L	T	U	R	E
	I				I						I	N
W	A	S	H	N	G	N					N	
			C	R	E	A	T	I	O	N	K	
B	A	P	T	I	S	M					I	
				C							N	
				E							G	

Across

1. Important for producing food in dry areas
2. Condensed water in the atmosphere
3. A source of water
4. Made by God/Allah
5. Makes water unfit for its specific use
6. A use of water
7. Making clean
8. A use of water by some Christians

Down

1. A waterborne disease
2. A source of salty water
3. Water in solid form
4. A domestic use of water
5. A form of recreation

Values

- Respect for each other's opinion
- Tolerance when working together as a team



Skills

Ability to think critically and creatively

One of God's expectations is that we should use the resources He has given to us well without wasting or making them unsuitable for others to use for their own needs. If water is polluted, it will harm people's health and well-being. Money will be needed to treat people with water-borne diseases instead of investing in the country's development. Using polluted water for washing before prayers makes our prayers unacceptable before God.

4.1.4 Water Pollution

Introduction



Objectives of the sub unit:

By the end of the sub unit the learner should be able to:

- Identify causes of water pollution in the local community.
- Demonstrate ways of solving water pollution in the environment.
- Appreciate the value of clean water.
- Explain how to use water for economic purposes without polluting it.

Access to clean water is a basic need for all creation yet our water sources are polluted by human activities such as poor farming methods, resulting into soil erosion and later siltation of water bodies. Pollution of water sources also occurs when we deposit human waste on the surface of land, which is then carried to water sources by runoff water. This makes water dirty. Dirty water leads to the spread of water-related diseases.



Clean water is precious: Do not wash in water sources



Water vessels like ships spill oil in water

Water issues: How water is under threat

- Untreated sewage released into rivers, lakes or streams makes the water unsafe for consumption due to the presence of disease-causing organisms. This leads to outbreaks of waterborne diseases such as cholera, dysentery and typhoid.
- Destruction of catchment areas.
- Discharging of industrial wastes into water bodies affects the quality of water, making it unsafe for various uses, such as, for example, drinking. Chemicals present in the wastes can kill the organisms that live in water. This interferes with food chains and food webs in water.
- Leakages of waste from pit latrines and dumping sites contaminate underground water, making it unsuitable for various uses.
- Oil spills into water sources also interferes with the quality of water, making clean water unavailable.
- Uncontrolled diversion of rivers into farms for irrigation upstream reduces the availability
- Increased plant growth in water bodies due to fertilizer runoffs from farms reduces the amount of clean water available for use.

Faith-based Reflections on Water Pollution



Christianity

Since every human being is dependent on water for life, it is important that everyone has access to safe drinking water.

Human activities can make water so dirty that it is not fit for other people to use. As God points out to the prophet Ezekiel, this is selfish and unfair: "Some of you are not satisfied with eating the best grass; you even trample down what you don't eat. You drink the clear water and muddy what you don't drink. My other sheep have to eat the grass you trample down and drink the water you muddy." (Ezek. 34:18)

Generosity, on the other hand, is encouraged: "You can be sure that whoever gives even a drink of cold water to one of the least of these my followers ... will certainly receive a reward." (Matthew 10:42)

In Christianity, water signifies purity. St Paul urges people to "come near to God with a sincere heart and a sure faith, with hearts that have been purified from a guilty conscience and with bodies washed with clean water". (Hebrews 10:22)

Water for baptism, in particular, is supposed to be clean. Clear, fresh water washes away the old life and brings a person closer to God: "As soon as Jesus was baptized, he came up out of the water. Then heaven was opened to him, and he saw the Spirit of God coming down like a dove and alighting on him. Then a voice said from heaven, 'This is my own dear Son, with whom I am pleased'" (Matthew 3:13–17)



Hinduism

Hinduism prohibits the disposal of human waste or other pollutants near holy waters. The following unsocial activities are also banned: brushing of teeth and gargling, cleaning ears of wax, disposing of hairs or dirty clothes, playing in the water, washing of clothes.

The Hindu sacred text Padma Purana says people carrying out such unsocial activities and other acts – for example, killing animals, polluting wells, ponds and tanks, and destroying gardens – will certainly go to hell (Padma Purana, Bhoomikhanda 96.7.8). A Hindu mother instructs her children against spitting on any water body.

Hinduism has this popular story about how Lord Krishna made polluted waters pure again. Lord Krishna spent his childhood in a village called Gokul, on the banks of the River Yamuna. In one part of it, there was a pool where lived a serpent called Kaliya. He had many heads and his poison not only polluted the River Yamuna but the air around it was also contaminated.

The cows of Gokul fell dead after drinking the water. Lord Krishna and his friends observed that trees, birds and fish were dying. Krishna and the boys began to play with a ball which happened to fall into the pool. None dared to go into the poisonous waters but Krishna was looking for a chance to meet Kaliya. He dived into the river and after a fierce battle, defeated Kaliya. He danced on Kaliya's many heads and sent him into exile. In this way Lord Krishna made waters of River Yamuna pure.

Islam

One of Allah's expectations is that we should use the resources He has given to us without wasting or making them unsuitable for others to use. Polluted water not only puts people at risk of disease but may cost money to treat it. Using polluted water for washing before prayers makes our prayers unacceptable.

The Prophet (SAW) has said: "Guard against three things which produce cursing: relieving oneself in watering places, in the middle of the road, and in the shade." (Related by Abu Dawud, Ibn Majah and others).

Such warnings protect water sources from pollution, as well as safeguarding the places where people gather to rest (in the shade) or to walk (or in the middle of the road). "None of you must wash in stagnant water when he/she is in a state of major ritual impurity." (Hadith).

Islam requires clean water for making ablutions and prohibits drinking or using water whose taste, colour or smell is altered. (Qur'an 7:31)



Suggested activities

Lake Game On Water Pollution And Conservation

(Adapted from "The Lake Game" produced by the Minnesota Sea Grant; adapted by Craig Sorley of Care of Creation Kenya)



Objective

To show the causes and effects of water pollution



Notes for the Teacher

How to play the game:

Set up 2 water basins and assorted “pollutants” on a table in front of classroom. One “lake” will remain clean and unpolluted; the other will suffer from various types of pollution resulting from human activity.

Introduce the topic of clean water and its importance to the well-being of the community

Distribute the role-playing scenarios and have each participant clearly read his/her situation to the rest of the group. After the entire group understands the situation, the person will add certain pollutants to the lake as a consequence of their decision. Stir the lake to mix the pollutants like the wind on the lake will mix the water.

Discuss each scenario, and identify which values or motives impacted the decision-making process.

De-role the pupils after the game



Materials

- 2 clear plastic basins or buckets, each filled with clean water
- 2 big spoons
- 1 Pitcher or can, and 2 identical opaque drinking cups or mugs

Pretend fish (a plastic food container can be cut into small fish shapes which will float on the water, punch a hole in the fish body to allow “hooking” of the fish)

Assemble the following “pollutants”

- Use red, green, & blue food coloring to mix up small containers of red, green, and blue “water”
- Small container of loose soil
- Toilet paper roll
- Small container of cow / goat / donkey manure
- Bucket of clean water

Procedure

- Dramatize the ending
- Take 2 identical cups, fill one with clean drinking water, and leave the other empty.
- Keep them both hidden from the audience during the game.
- As the game ends ask a pre-selected "volunteer" to come up and take a drink of water out of the lake.
- Use a pitcher or can to dip out dirty water from the lake and fill one mug.
- Make sure your volunteer gets the clean cup of water without the audience noticing.
- Upon drinking it the volunteer breaks into convulsions and feigns death.

1) Erosion from my farm

Action or Decision:

"I am a farmer living on a hillside next to a Lake. When it rains the soil from my farm washes down into the lake. A farmer nearby told me that God wants us to be good stewards of our land, and that we should design our farmland to stop erosion. This sounds like extra work to me."

Consequence:

Because you decided to do nothing about soil erosion on your farm, add 3 spoons of soil to the bucket and stir.

2) Fishermen and human waste

Action or Decision:

"I go fishing all night in a canoe to catch fish. We have no bathroom in our boat so we use the lake as our toilet. This spreads disease and pollutes the lake. We should bring a bucket to collect our waste and empty it into our latrine at home when we get back, but going to the bathroom in the lake is easier."

Consequence:

Because you decided to use the lake as a toilet add 3 pieces of toilet paper, 2 spoonfuls of yellow water, and 2 spoonfuls of cow manure.

3) Garbage and a leader who is afraid

Action or Decision:

"I am a leader of a town located right on the shore of the Lake. The garbage from our shops and stalls is often blown or washed into the lake. Last week our religious leader taught about how God made the earth to be clean and

beautiful, and that we as believers of God should keep our town clean and not pollute the lake. Since I am a leader I could do something about this, but I am afraid the people in town will not support me."

Consequence:

Since you are afraid to use your leadership abilities to solve this problem add 3 pieces of toilet paper and 1 spoon of everything else and stir...

4) Washing clothes in the lake

Action or Decision:

"My family lives next to the Lake, and I go down to the beach to wash dirty clothes in the lake. I know this can pollute the lake and spread disease, causing problems for other people in my community. I also know that God teaches that we should love our neighbor. To make things safer for my community I should collect my water in a basin and go 50 or 100 meters away from the shore to do my washing. When I am finished the soapy water can be poured on the ground so it does not pollute the lake. But this is extra work and so I have decided to continue washing my clothes in the lake."

Consequence:

Add two spoons of laundry soap and 1 spoon of manure to the lake.

5) Deforestation causes erosion & flooding

Action or Decision

"My people live in villages located next to a river that flows into the Lake. During the past 15 years we have cut down almost all the forest that used to grow on the hills nearby and next to the river. We never replanted these trees. This year when it rained I saw that much of the soil from our farms was washed into the river. I also learned that far down the river the people suffered from damaging floods."

Consequence:

Add 4 spoonfuls of soil to the lake and stir.

6) Farm Chemicals

Action or Decision:

"I grow vegetables in my garden right next to the lake and there are times when my crops are attacked by insects. There used to be a nice forest nearby, and birds used to come from that forest to eat up some of these insects. Now the birds that God made are gone because the forest is gone. I now must use different kinds of pesticides. I know these chemicals can be harmful to my family, and even kill fish

or birds in the lake. I don't know what else I can do, so I have decided to continue using the chemicals."

Consequence:

Add 3 spoonfuls of red water and 3 spoonfuls of blue water to the lake and stir.

7) Car washing business

Action or Decision:

"I started a car-washing business at a site located next to the Lake. There is a nice cement landing area where the boats come and go from the town. This is an easy place to wash cars because they can come and park right next to the lake. I know that the oil and grease from washing the cars pollutes the lake, but I don't think it is a problem. The lake is so big. How could my business do any harm?"

Consequence:

Add 3 spoonfuls of red water and 3 spoonfuls of blue water to the lake and stir.

8) Corrupt Government Official

Action or Decision:

"As a government official I am supposed to enforce the laws that protect the fish and keep the lake healthy. But my salary is too low. When I catch someone doing something wrong I usually let them go as long as they give me some little money. My religious leader says that God does not want us to take bribes, but I don't think it matters. The police do it all the time."

Consequence:

Because you are willing to participate in corruption, add 1 spoon of every item to the lake.

9) Flower factory Pollution

Action or Decision:

"I work in a flower factory with many greenhouses that use water from the lake. As an engineer my job is to make sure that all the equipment is working properly. Some of this equipment helps to clean water used by

the factory. I know that some of this equipment is broken, and that water going back to the lake is now polluted. If I report this problem to my boss he might be angry with me because fixing the equipment will cost a lot of money. I have chosen to keep quiet about this problem."

Consequence:

Add 2 spoons of blue water, 2 spoons of red water, and 2 spoons of yellow water to the lake.

Questions

Discuss how our commitment to religion should impact the decision-making process.

- Is it God's will for us to keep the lake clean, or to pollute the lake?
- What does it mean to glorify God in everything that we do?
- What kind of decisions should we be making in this situation?

Values Developed

Love for nature or stewardship through avoiding the pollution of water sources; responsibility as shown by taking up the task of taking care of the water sources. Respect for others as demonstrated through ensuring clean and safe water for both the environment and fellow human beings. The values of integrity and purity are also promoted as not only cleanliness of water sources is desired but also personal cleanliness.



Skills Enhanced

Ability to communicate effectively enhanced through the dramatization and ability to think critically in providing solutions to challenges and thus informed decision making. Ability to interact with different individuals is also enhanced as the game promotes cooperation among people.

NB: This game could be very appropriate for pupils in upper primary, e.g. class 5 and above (from 12 years of age)

4.1.5 Water Conservation

Objectives of the sub unit:



By the end of the sub unit the learner should be able to:

- Outline ways of conserving water in the community.
- Demonstrate practical ways of conserving water in the environment.
- Appreciate economic benefits of water conservation.
- Identify SMART (i.e. technologies that will deliver specific, measurable, achievable, realistic and time-bound results) or sustainable technologies for conserving water.

**Avoid wasting
water as a sign of
thankfulness to God**

Introduction

Water conservation means using water in responsible ways that reduce wastage and pollution. It also means taking good care of all water sources, protecting water catchments and even carrying out rainwater harvesting. This ensures clean water is available for the various uses, for example, for drinking, cleaning, manufacturing, and in agriculture. When we conserve water we reduce instances of disease and improve the quality of water used by animals, plants and human beings. This in turn means we spend less on treating diseases and water. It is therefore important that we conserve water to avoid these unnecessary costs.

Water conservation is important because water is necessary for hygiene. It is also important that we do not waste water, because we are care-givers of God's creation. All communities need to conserve their water supply to ensure it remains available for present and future generations. Good water conservation ensures a balance between demand and supply. We can improve the water supply by harvesting rain water in tanks and avoiding unnecessary wastage of water at home and in industries.



Avoiding wastage is the first law in conservation

Faith-based Reflections on Water Conservation



Christianity

Because water is a gift from God for all life, the Bible stresses its protection and conservation. For example, God commands Israelites not to cut trees down unnecessarily during wars (Deut. 20:19). As well as ensuring food supplies, this is meant to protect water catchments from destruction. Such a precious resource is not to be abused.

Psalms 65:9–13 is a beautiful description of the role of water and shows how its proper use ensures that the land is fertile, causing all nature to rejoice:

“You show your care for the land by sending rain;
you make it rich and fertile.
You fill the streams with water;
you provide the earth with crops.
This is how you do it:
you send abundant rain on the ploughed fields
and soak them with water;
you soften the soil with showers
and cause the young plants to grow.
What a rich harvest your goodness provides!
Wherever you go there is plenty.
The pastures are filled with flocks;
the hillsides are full of joy.
The fields are covered with sheep;
the valleys are full of wheat.
Everything shouts and sings for joy.”



Hinduism

Water is considered by Hindus as a powerful medium of purification and also as a source of energy so water conservation is very important. Hindus believe that it is their responsibility not to waste water.

Temple tanks are an essential part of traditional Hindu temples. Every village, town or city has a temple with a water tank. As well as providing water for pilgrims to use to purify themselves before entering the temple, the tanks serve as useful reservoirs to keep communities safe from water scarcity.

About 2,500 years ago, the ancient Indian text Arthashastra (believed by many to have been written by the 4th century BC scholar Chanakya) advised the king to store and save water. Chanakya went further to say that a good king must inspire his people to conserve water.

Islam

The Qur'an says: "And have you seen the water that you drink? Is it you who brought it down from the clouds, or is it we who bring it down? If we willed, we could make it bitter, so why are you not grateful?" (Qur'an 56:58-70)

There is a clear reference here to the privilege of clean water and a reminder that God's creation should not waste such a valuable resource. Muslims believe that in the hereafter everyone will be questioned about how they used their blessings – so it is of the utmost importance not to become careless of the natural resources we have, especially water.

The Islamic system of living says that water conservation is necessary at all times –when water is plentiful as well as when there are only a few drops left. Even in exceptional circumstances, such as war, Islam orders that water, along with other necessities of life, should be saved and not harmed in any way.

Muslims believe that the Qur'an offers a basis for teaching people about water conservation and a motivation for them to stick to it and if all the guidelines of Islam are followed, then global water scarcity can be combated and overcome.

Muslims are called upon to stop being wasteful. A hadith tells the story of how the messenger of Allah (pbuh – peace be upon him) had advised one of his companions, who was making ablution (wudhu) for a prayer, to be economical with water, and not use water excessively. The messenger of Allah (pbuh) said: "Why this waste?" Sa'd ibn Abi Waqqas then asked: "Is waste a consideration in making ablution?" The messenger of Allah (pbuh) said: "Yes, even if you stand by a flowing river!"

We see that if it is commanded not to waste water even when making ablutions to worship Allah, it is obvious that in other situations waste cannot be tolerated. (Hadith reported by Ahmad and Ibn Majah)



Suggested activities

Story telling

The story of Hajjar is an inspiration to all women not just Muslim women. It is a story of faith in action; it highlights the importance of water for humanity's existence; and it shows how the action of a woman has been embedded into one of the pillars of Islam.



Objective

Outline ways of conserving water in the community



Materials

Story books



Notes for the teacher

- Choose a good story which is short, not too scary and neither violent nor confusing.
- The story can be true or imaginative about experiences of water conservation in the school and community.
- It involves telling narratives with water conservation themes based on actual events, myths or legends.
- Stories can be composed or collected based on specific topics.
- Stories should be participatory, engaging the learners throughout the story telling process.
- Provide follow-up activities to help internalize the story; for example, through modeling, showing pictures, or painting.



Procedure

- Tell the story in simple language.
- Repeat points for emphasis.
- Involve the learners in the story through questions.
- Use visual aids that will help the learners understand concepts.
- Use intonation that will portray the mood of the story.
- Use gestures appropriately.
- Use songs or chants to make the story interesting.
- Develop the story to a climax.
- Help learners to dramatize the story.
- Ask questions from the story which bring out the religious values in relation to water conservation.
- Develop a summary.

The story

Hajjar was an Egyptian handmaid and the second wife of Prophet Ibrahim. He brought his wife and their young son Ishmail to the dessert plains of Makkah. During this time the city of Makkah did not have any known source of water. The family camped under the shade of a tree where the Holy Mosque of Makkah was later built, and Ibrahim left his wife and son with nothing but a bag filled with dates and a water skin to drink from, telling Hajjar that Allah had ordered him to do this and praying for Allah to provide for them.

Hajjar stayed with her son and nursed him until they had run out of food and water and he was thirsty. She started to search for water by visiting the top of Mount Safa, the nearest mountain to her, the hope that she might be able to see any other inhabitants to help her in the desert. With the scorching desert heat blazing, Hajjar raised her sleeve to protect her eyes from the sun and proceed to climb Mount Marwa hoping to see someone. Growing more frantic, she repeated this act seven times but without success.

In Sahih Bakhari, Ibn Abbas narrated the Prophet Muhammad as saying: "This is the source of the tradition of the walking of people between Safa and Marwa. When she reached Marwa for the last time she heard a voice and she asked herself to be quiet and listened attentively. She heard the voice again and said: 'O, whoever you may be! You have made me hear your voice; have you got something to help me?' And behold! She saw an angel at the place of Zam-Zam, digging the Earth with his heel (or his wing), until water flowed from that place. She started to make something like a basin around it, using her hand in this way, and started filling her water-skin with water with her hands, and the water was flowing out after she had scooped up some of it."

What does this story tell us today? What does it say to us about the level of faith we need to have and how it will be rewarded? What does it say to us about the sacrifices a mother will make and about God's provision for us? Does it, for example, mean that women should be at the forefront of water conservation efforts today and in the struggle to ensure that everyone has access to clean and safe drinking water?

How could you help in your own way to preserve water as precious and blessed resource central to the faith of Muslims and Christians alike and to the survival of our planet? (A beautiful cartoon has been developed about Hajjar and her son. You can watch it on the video sharing website Youtube through this link: <http://tinyurl.com/776d946> And also on ARC's website through this link: <http://tinyurl.com/c9xquzw>)

Every year, pilgrims on the Hajj (Islam's annual pilgrimage) re-enact the story of Hajjar's search for water? Why is it important today for Muslim pilgrims to do this?

Can you think of any simple water saving techniques you could practice? For Muslims, for example, it could be using a minimal amount of water when making wudhu (ablution) such as by filling a small bucket of water and using that small amount to complete your wudhu. Or can you practice at your school rainwater harvesting or using sunlight to make water safe to drink?

Sunlight, for example, can be used to destroy harmful microorganisms in water. Fill transparent plastic or glass bottles with contaminated, but clear water and expose them to the sun for six hours in sunny weather or two days in cloudy weather. If a temperature of 50°Celsius is reached, an exposure time of one hour is sufficient.

Follow up questions:

1. What are the various ways of conserving water?

The answers will include; Close the tap while brushing our teeth, only open the tap when we need it, do not water plants excessively, wash our cars less frequently and use smaller amounts of water, slow the flow of water to consume less water, plant trees as they play an important role in water conservation.

Values

- Caring for water sources
- Sharing water with others



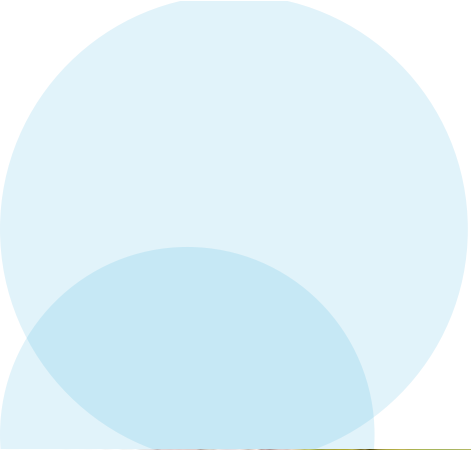
Skills

- Wise use of water
- Hard work
- Creativity
- Negotiation skills

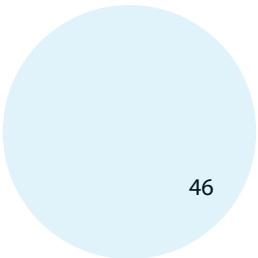
**Polluting water
sources dishonors
God's creation.**



Roof harvesting conserves water



*Did you know that
handwashing with
soap before eating
and after visiting
toilets prevents us
from many diseases?*



4.2.0 Health, sanitation & hygiene



Objectives of the unit:

By the end of the unit the learner should be able to:

- Identify health, sanitation and hygiene issues in the school and community.
- Practice personal hygiene.
- Appreciate the importance of proper sanitation and personal hygiene.

Introduction

This unit deals with facts about health from the sanitation and hygiene points of view. To enable us understand the content it is important that we understand the meaning of some important terms in this section. The terms include:

- **Sanitation:** Refers to safe collection and disposal of solid waste and waste water. For example proper disposal of excreta (human faeces and urine) and good drainage.
- **Hygiene:** The method of using cleanliness as a method of preventing disease e.g. hand washing, body cleaning and personal hygiene (keeping our personal belongings and our bodies clean).
- **Hygiene education:** The provision of education and / or information to encourage people to maintain good hygiene and prevent hygiene-related diseases. It includes education menstruation, sexuality and body cleanliness.
- **Environmental hygiene:** This is keeping the environment clean in order to prevent disease.
- **Health:** a state of complete physical, spiritual, mental and social well being and not merely absence of diseases
- **Drug and substance abuse:** a patterned use of a substance /drug in which the user consumes the substance in amounts or with methods neither approved nor supervised by medical professionals.



Clean toilets at school for good health

We can join the global community initiatives in addressing issues of health, sanitation and hygiene by actively participating in global events to mark the themes. Some of the global events observed include; World Water Day (March 22nd), World Hand Washing Day (October 15th), World Health Day (April 7th), World AIDS Day (December 1st) and others. These can be infused into the school calendar of activities to ensure whole-school participation (See additional information in appendix section).

4.2.1 Health

Introduction

Good health and wellbeing is significant for all. The body has to function properly and the mind be at peace in order to have good health. For this to happen, we need to eat well, exercise, rest, find peace in God and think well.

According to the World Health Organization (WHO), the deaths of 1.6 million children per year can be attributed to unsafe water, poor sanitation and lack of hygiene

We need to examine ourselves so that we look good in the eyes of God and those around us. If children maintain cleanliness then many diseases can be prevented and they will remain healthy and able to go to school. This means they will miss fewer lessons due to sicknesses arising from poor hygiene.

Faith-based Reflections on Health

Christianity

The saying which emerged during the 17th century in Europe that “cleanliness is next to godliness” summarizes the Christian position on health. In the writings of St Paul, the human body is described as a temple that should be kept pure and clean for the glory of God: “Surely you know that you are God’s temple and that God’s Spirit lives in you!” (1 Corinthians 3:16)

Mental health is also important. The impact of guilt and fear on wellbeing is acknowledged by Jesus as a key force in undermining health. Often when he healed people, he linked their recovery not just to their physical but also their spiritual state.

For example, in Matthew 9:1–8, “Some people brought to him a paralysed man, lying on a bed. When Jesus saw how much faith they had, he said to the paralysed man, ‘Courage, my son! Your sins are forgiven... Get up, pick up your bed, and go home!’ The man got up and went home.”

In the wider world, health is linked to environmental and sanitation issues. The Bible clearly documents the importance that ancient communities placed on cleanliness and hygiene, and the traditions that have been built on these values have contributed to the development of public health today.





Hinduism

Ayurveda is the ancient Indian system of health dating back thousands of years. Ayu refers to life and veda means to know.

Ayurveda includes yoga as one of its therapeutic tools. In his book, The Yoga Sutras, the sage Patanjali writes about how yoga plays an important role in keeping the body and mind healthy.

According to Patanjali, physical cleanliness entails body hygiene, good grooming and taking care of the environment. Mental cleanliness refers to having positive thoughts and freedom from emotions such as slanderous thoughts, discrimination, pride, jealousy, anger, hatred and other negative feelings. It also entails freedom from tension and stress.

One of Ayurveda's most important texts is the Charaka Samhita, believed to date to around 400-200 BC and written by a physician called Charaka; he writes about how to keep the body healthy and refers to herbal medicines to cure disease. The Vedic declaration says that offering water to the rising Sun can gain relief from sickness.



Islam

From an Islamic perspective, health is viewed as one of the greatest blessings that God has bestowed on mankind. It should be noted that the greatest blessing after belief is health, as narrated in the following Hadith:

"The final messenger of God, Prophet Muhammad (pubh) mounted the pulpit, then wept and said, 'Ask Allah (SWT) for forgiveness and health, for after being granted certainty, one is given nothing better than health.'" (Related in al-Tirmidhi.)

Health is indeed a favour that we should not take for granted. We should express gratitude to God for bestowing us with health, and we should try our utmost to look after it to preserve this blessing. Islam also teaches us to eat moderately (Qur'an 20:81).



Suggested activities

Case study

Case Study on effects of drug and substance abuse:

Rita and Romesh are standard seven students. A friend introduced them to a group of students who used harmful drugs. Their teachers, parents and community members soon noticed that they lost concentration in their studies and started performing poorly in their class work. They became irritable, lazy, untidy, unkempt and restless. Their behaviour changed drastically. They hated people around them and did not

like to be corrected by others. They turned dishonest. Their physical wellbeing deteriorated as they became addicted to the drugs. After some time they developed health complications (breathing complications) and had to be admitted to hospital.



Objective

Appreciate the importance of proper sanitation and personal hygiene.



Notes for the Teacher

- Use project work to relate the challenges of drug and substance abuse.
- Link the co-curricular activities like clubs, sports, field trips and small projects to meet the challenges of drugs and substance abuse.
- Select any other case study related to drugs and substance abuse (if any) from the locality for more relevance.

This story can be spiced up with more imaginative ideas to make it more interesting and captivating.



Procedure

- Present the case study on drugs and substance abuse.
- Show photographs and posters on effects of drug and substance abuse.
- If possible use a projector to show video on the challenges and solutions for drugs and substance abuse.
- Probe the learners to think about what they can do.
- After the case study ask questions on related problems and solutions

Questions

1. What are the effects of drug and substance abuse?

Answers include: reduced mental performance in relation to judgment, loss of sleep, loss of memory, reduced motivation and energy, academic performance of learners is adversely affected, physical disorientation and risk of injury, abrupt emotional changes.

2. How does drug and substance abuse affect society?

Answers include: effects on health, money spent on medical treatment, loss of productivity or earnings, increased crime in the society.

Values

- Care for own body
- Responsibility
- Commitment to good behaviour



Skills

- Thinking critically
- Creative thinking



Why is it important that you clean your hands after visiting the latrine/toilet?

4.2.2 Hygiene

Introduction

According to scholars, there are three kinds of cleanliness: purification or ritual washing before prayer; keeping the body, clothing, and environment clean; and specifically removing the dirt or grime that collects in various parts of the body, such as teeth, nostrils, under the nails, in the armpits and around the pubic area. God created mankind in His own image and proclaimed him good before His eyes, therefore man is expected to maintain that goodness and cleanliness.

Good health practices require that objects and dressings contaminated with bodily discharges are removed for incineration. Whenever possible, disposable needles, syringes, eating utensils, dishes and other items are used. Non-disposable items are washed, bagged and sterilized before they can be used again. This prevents spread of diseases.

Good hygiene is very important for good health. Research shows that regular hand washing with soap can reduce diarrhoea by almost 50 percent and respiratory infections by nearly 25 percent.



*Proper hand washing
prevents diseases*

It's also important to keep our bodies clean. If you sweat and your feet smell, make sure you wash both the feet and shoes using clean water and soap. Clean your toes well and use a clean towel to dry. Dry your shoes in the sun until they are completely dry before use.

We should also ensure that our personal items are clean. Personal items are things that belong to somebody and are not supposed to be shared by anyone else. These include handkerchiefs, socks, toothbrushes and combs. To promote good health, it is important that individuals take responsibility of cleaning and ensuring that the items are not shared to avoid the spread of diseases. This can be done by:

- Washing handkerchiefs and socks with soap, water and a little salt to kill the germs and remove the slippery texture that develops on them. Air them outside at a place with lots of sunlight to ensure they dry properly.
- Combing, brushing and cleaning hair using warm water. This helps wash away the greasiness of oil found on combs and hair, and also helps clean out insects (e.g. lice) that could hide in long dirty hair. Frequent washing of hair is good practice for hygiene.

Faith-based Reflections on Hygiene

Christianity

The writers of the Old Testament were very aware of the need for hygiene. There is an entire section of the Book of Leviticus that is concerned with how to control or manage leprosy (chapters 13 and 14).

The measures include isolating people who may have the disease and washing their clothes before they re-enter society.

As a Jew, Jesus would have followed the customary practices of hygiene, from washing his hands before meals to the separation of utensils in the kitchen. Clearly



not all of his disciples followed this, and the Pharisees rebuke Jesus for allowing his disciples to eat with unclean hands (Mark 7:3). However Jesus uses this opportunity to draw out the point that just observing a custom is not enough. You need to understand its deeper meaning.



Hinduism

Some of the earliest writings on hygiene can be found in Hindu texts and today Hindus are expected to have very high standards of personal hygiene.

For Hindus, cleanliness is also part of spiritual purification. Every 12 years, millions of Hindu pilgrims take part in ritual bathing at the Kumbh Mela festival at Allahabad in India where the rivers Yamuna and Ganges meet the mythical river Saraswati. Hindus believe this ritual bathing will wash their sins away.

Water therapy, both external and internal, has been practiced for centuries to heal the sick. Usha Kaala Chikitsa is Sanskrit for water therapy. According to this ancient system, 1.5 litres of water should be consumed each morning on an empty stomach, as well as throughout the day. Water therapy is considered a material way of taking an "internal bath".



Islam

Hygiene and cleanliness in the various domains of human life (material, spiritual, mental and physical) are strongly emphasised in Islam, and Muslims are encouraged to implement them in every aspect. Adhering to good hygiene and cleanliness is compulsory for Muslims, particularly when performing religious duties such as prayers or fasting.

With such an emphasis on washing and personal hygiene, adhering to Islam's practical teachings on washing can enhance individual hygiene and therefore reduce the risk of sickness, not just for that individual but for the whole society.

- "It is He who sends down water upon you from the sky with which to purify you" (Qur'an 8:11).
- "...Indeed, Allah loves those who are constantly repentant and loves those who purify themselves." (Qur'an 2:222)



Suggested activities

Demonstration (hand washing)



Objective:

To demonstrate the correct way of washing hands.



ESD is about innovation!

Are you clean?
Are you happy
when you are
clean? Do you
like clean people?



Materials

- Water
- Soap
- Containers

Notes for the teacher:



- Collect the materials for the demonstration.
- Prepare and rehearse the demonstration before the lesson.
- Make sure that all learners can see what is happening.
- If demonstrating in small groups, arrange to have meaningful alternative work for the group not engaged in the demonstration at the time (the alternative activity should be in line with the initial demonstration).

Do you
know how
to wash
hands?



Procedure:

- The teacher demonstrates the correct procedure for hand washing as learners observe.
- Learners wash their hands as the teacher supervises and guides them.

Question

1. Why should we wash our hands with soap?
2. Explain the correct way of washing hands.

Values

- Promote a culture of cleanliness.
- Uphold responsibility for personal cleanliness.



Skills

Ability to clean hands in the correct way for healthy living.

4.2.3 Sanitation

Introduction

Improved sanitation could prevent more than one million deaths from diarrhoeal illnesses every year. Poor sanitation, lack of water and inadequate hygiene can deny girls the right to education as well as result in lower productivity due to illness. Lack of sanitation facilities forces people to defecate in the open. This may happen near rivers, areas where children play or where food is prepared. This increases the risk of transmitting disease. Hygiene education and promotion of hand washing are simple cost effective measures that can reduce diarrhoea cases by up to 45 percent.



Extra facilities for girls enhance hygiene

Faith-based Reflections on Sanitation

Christianity

In the Bible, cleanliness is emphasised and proper sanitary practices specified to preserve the health of communities, as demonstrated in Deuteronomy 23:12–13:

“You are to have a place outside the camp where you can go when you need to relieve yourselves. Carry a stick as part of your equipment, so that when you have a bowel movement you can dig a hole and cover it up.”



Hinduism

Hindu scriptures reveal a clear conception of the ecosystem. On this basis a discipline of environmental ethics developed which formulated codes of conduct (dharma) and defined humanity's relationship to nature.

An important part of that conduct is maintaining proper sanitation. In the past, this was considered to be the duty of everyone and any default was a punishable offence. Hindus consider cremation of dead bodies and maintaining the cleanliness of the human habitat as essential acts.

At the same time, Hindu sacred texts set down principles of sanitary practices aimed at safeguarding the environment and thus health. For example: “One should not cause excrement in ploughed fields, land having crops, dwelling places of cows, public paths, sacred places like rivers, water, on the banks of a pond or in a graveyard.” (Visnu Purana, 3.11.11-12).

Islam

Sanitation is an essential requirement of Islam. "Cleanliness is half of faith..." Prophet Muhammad (pbuh) famously tells his companions in one of the Hadith. Purification through wudhu is a central and obligatory part of prayer – prayers carried out in impure state are not valid. Muslims are required to perform ablution rituals before prayers throughout the day and they are usually done using water.

Islam encourages us to wash our hands before and after eating. The Prophet Muhammad (pubh) is quoted as saying: "Food is blessed when one washes his hands before and after" (Tirmidhi). This is a clear rule in Islam which can help protect our health and prevent diarrhoeal disease and even respiratory infections.



Suggested activities

Case study

School Micro-Project on sanitation and hygiene

Name of project: Smart Sanitation & Hygiene Solution

MCK Kirukuma Methodist Academy: Construction of three ventilated, improved pit latrines

Narrative

In 2012, MCK Kirukuma Methodist Academy constructed three ventilated, improved pit latrines in order to improve the health, sanitation and hygiene conditions in the school. The project was aimed at meeting several objectives in line with the overall goal. They were to:

- Increase sanitary facilities for both girls and boys from one facility to three.
- Provide three hand washing points to promote hygiene.
- Incorporate faith-based ESD values in the teaching/learning of WASH.
- Use the project as a learning resource for neighbouring schools and community members.

Problem statement

The school's inadequate sanitation facilities were a major setback that lowered living standards among both the pupils and teachers. The school did not have enough toilets to support the number of pupils and teachers.

Hand washing with soap was not practiced at all given that there were no facilities in place. The school depended on River Tana as a source of water. The water was not treated before consumption both at the school and the community level. These factors had a detrimental effect on the learning environment due to the poor sanitation.

Project development, operation, stakeholders/participants

The school committee prioritised increasing the sanitation facilities and hand washing facilities in the school. Therefore the school sought to construct a latrine with three cubicles and provide two hand washing facilities with soap for one year. In implementing this project, the school worked with other organisations such as Alliance of Religions and Conservation (ARC) and Kenya Organization for Environmental Education (KOEI).

The various stakeholders in the project had different roles. KOEE and ARC were responsible for funding, monitoring and evaluation. The school administration supervised the construction work and ensured good maintenance of the completed facility. Teachers were very useful in



Old latrines



Newly constructed latrines



Pupils using a WASH point

training the pupils on proper WASH practices. The community/parents helped in instilling values to the pupils as well as in monitoring and evaluation. The school administration and teachers worked with the local religious groups to promote religious values among the pupils through the preaching and supporting project activities.

Project benefits

The project saw the construction of one latrine for boys and two latrines for girls, therefore discouraging sharing of latrines between boys and girls. Two hand washing facilities (using buckets buckets and tippy tap) promoted hygiene. In addition, faith-based ESD values were incorporated in the teaching/learning of WASH and also acted as a demonstration resource for learning by different stakeholders, including local community members.

Challenges

Challenges included; inadequate water for regular cleaning of the toilets, hand washing and cleaning the dusty temporary classrooms. Continuous supply of soap and towels for use was also a challenge. In order to address these challenges, various partners joined hands to provide solutions. The local church offered to provide bars of soap for hand washing while the Eco-school committee provided sanitary towels for girls. Parents provided tissue papers for use in the toilets.

Skills developed

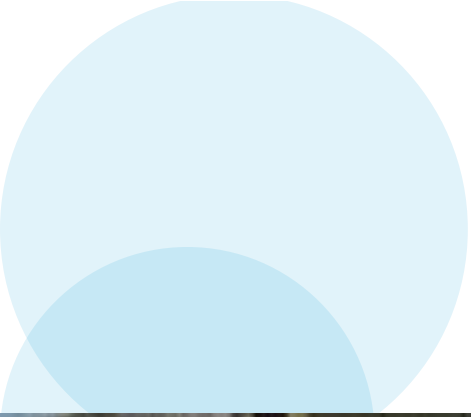
Through the project, critical thinking ability was improved especially through the preparation of hand washing facilities by teachers and pupils who worked together. Proper resource management was also instilled among the participants in the project.

Values enhanced

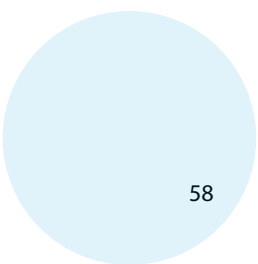
The project enhanced responsibility, accountability, teamwork and leadership among pupils and teachers. The values of sharing with others and appreciation of the environment were also encouraged.

Some food for thought

- What factors do you think led to the success of the project at the school?
- What can be done in your school to improve sanitation?



*How clean is your environment?
What have you done today to ensure a clean environment?*



4.3.0 Waste

Introduction

Waste can be defined as matter discarded as worthless, defective or of no further value and which people either intend to get rid of or throw away, or have already discarded. Waste includes all items such as household rubbish, packaging materials, discarded cars, old televisions, garden waste, old paint containers etc.

Waste is often derived from manufacturing, production and consumption processes. Other human activities, as well as metabolic processes in living organisms, also generate waste. Thus all our daily activities can give rise to a wide variety of wastes. Waste has significant negative impacts on the environment. Some diseases are a result of poor waste management.

However, if waste is managed properly, it can be turned into resources for use. For example, waste organic material can be recycled into to manure through composting. Manure is a very good fertilizer for growing crops.



A mountain of unsorted waste – Kisumu, Kenya

Waste is not only a local issue; other countries all over the world have to deal with this challenge in order to achieve sustainable development. We can take part in this global agenda at the school level in our own small way by actively taking part in world events that address waste issues. Some of the global events addressing waste include: World Environment Day (June 5th), Earth Day (April 22nd), World Health Day (April 7th), World Standards Day (October 14th), International Coastal Clean-up Day (September 20th) and others – see appendix section for details on these important days.

4.3.1 Sources of waste

Objectives of the sub-unit:

By the end of the sub-unit the learner should be able to

- Identify sources of waste in the school and local community.
- Appreciate the importance of a clean environment.
- Create awareness about the dangers of waste.



Introduction

Some of the sources of waste include:

- Household or domestic sources
- Commercial sources
- Industrial sources

All these are human-related sources of waste and people are therefore called upon to be accountable for the waste they produce. Waste can be classified into solid waste, liquid waste and gaseous waste.

- **Solid waste** – waste materials which have a definite shape and form. Examples include garbage and refuse. It consists of both biodegradable and non-biodegradable substances like plastic, glass, waste tins, kitchen refuse and others.
- **Liquid waste** consists of waste that takes the shape of the container in which it is put, has no definite shape and easily flows. It arises as a result of waste materials being dissolved or suspended in liquids. It includes waste from industries, sewage and oil spills.
- **Gaseous waste** is usually in the form of emissions from manufacturing. Some of the common gaseous wastes include carbon dioxide, carbon monoxide, sulphur dioxide, nitrogen dioxide and lead emissions from engines.

Waste can also be classified on the basis of whether they rot (decompose) or whether they have serious effects on health and life of organisms. These categories of waste include biodegradable waste, non bio-degradable waste, hazardous waste and non hazardous wastes.

- Biodegradable waste – a type of waste, typically originating from plant or animal sources, which may be broken down by living organisms.
- Non bio-degradable waste – a type of waste that does not break down even after many years. Examples are plastics, metals and glass. Some dangerous chemicals and toxins are also non-biodegradable, for instance, plastic grocery bags, styrofoam (polystyrene), and other similar materials but which eventually break down over time.
- Hazardous waste – This is a type of waste that is solid, liquid or even gaseous, no longer in use but if not well recycled, treated or disposed of can cause injury, death or pollute the environment.
- Non hazardous wastes – These are less toxic wastes. They are usually from human settlements, social and industrial activities. Examples include food leftovers, animal and plant waste including maize cobs. But remember, waste is not always useless. Waste can often be re-used.



Segregated waste can be recycled

Faith-based Reflections on Waste

Christianity



Human activity is seen as the major producer of waste. Christians are encouraged to keep the environment free of waste so that it is fit for everyone to live in – including God. In Numbers 35:34 God says: “Do not defile the land where you are living, because I am the LORD and I live among the people of Israel.”

Christians are also warned against hoarding, which often produces waste, as not everything can be kept fresh. When the Israelites were in the desert God sent manna every day for them to eat, but if they hoarded it, not trusting that God would supply more the next day, it rotted. This is why in the Lord’s Prayer we ask that God “give us day by day the food we need” (Luke 11:4).

In March 2008 the Vatican added seven new sins for the age of globalisation. The list now includes polluting and causing social injustice.



Hinduism

According to Hinduism, when Paramatma (the Supreme Soul) created nature, he made the environment self-sustaining. Human beings destroy the environment by polluting it, through building factories, releasing chemicals, creating rubbish and other activities. Hindu teachings tell us that because we are not separate from nature, when we destroy the environment by polluting it, we also harm ourselves.

Hindus believe our actions affect our karma. Karma, a central Hindu teaching, holds that each of our actions creates consequences – good and bad – that determine our future fate. So our environmental actions will have consequences on our future lives, and because we have free will, we can choose to protect the environment.

Islam



Muslims are taught to consider that others may be bothered and the natural beauty of nature spoiled by their littering. They consider it a requirement for being a mature believer to avoid littering the shells of seeds and nuts after eating, or bottles, cans, papers, packaging materials and other items that could be harmful to people and animals in the street, school compounds and other public places.

Disposing of waste so carelessly on the environment could be considered a form of corruption of the Earth which Allah created. The Qur’an warns us: “Do not spread corruption on the Earth after it has been so well ordered” (Qur’an 7:85), and warns against anyone who “strives throughout the land to cause corruption therein and destroy crops and animals. And Allah does not like corruption” (Qur’an 2:205).



Suggested activities

Brainstorming on sources of waste



Objective

Identify sources of waste in the school and local community



Materials

Pictures showing waste in the environment



Notes for the teacher

Find out the different sources of waste in the school and community before the lesson.

Have the issue of discussion and establish the criteria for discussion, for example, waste found in the school and community.



Procedure

- Pose a problem – for example; what are the sources of waste in your community?
- Let learners give answers, ideas and opinions spontaneously.
- Allow free flow of answers from learners without interruption.
- Note down all the suggestions for other learners to see (focus on generating ideas and not discussing them).
- Display the pictures showing the sources of waste.
- Guide the learners to select and group the different sources of waste.
- Summarise the main points of the lesson incorporating responses from the learners.

Did you know
that poor
waste disposal
contributes to
climate change?

Action points

- What are the sources of waste in school and community?
- What can we do to reduce amount of waste produced from different sources?

Values enhanced

- Respecting each other's opinions
- Taking care of the environment



Skills developed

- Ability to think critically

4.3.2 Waste Management Issues



Objectives of the sub-unit:

By the end of the sub-unit the learner should be able to:

- Identify waste management issues in the local community.
- Explain the importance of proper waste management.
- Solve problems related to waste management.

Waste breeds diseases, manage waste well!

Introduction:

Waste brings about different effects in sectors and dimensions such as socio-cultural, biophysical and economic. Some of these effects include:

- Water pollution brought about by waste deposited in water. Living organisms in water are affected negatively.
- Air pollution caused by emissions especially from our industries, or from decomposing waste. Some waste gases are hazardous to living organisms.
- Land (soil) pollution brought about by waste such as garbage and excessive use of chemical fertilisers.

The environment (our surroundings) should be kept clean all the time. Careless disposal of litter makes our environment untidy. Animals and plants are destroyed when the air is interfered with. Clean air is needed for respiration of living things. Livestock are harmed when they swallow large amounts of plastics.

Toxic and contaminated sites present health and safety risks to schoolchildren. To keep our environment clean both in school and home we need to clear litter, sweep our classrooms and houses, trim hedges and clear tall grass. We can also plant and weed the flower beds, removing any litter.



Let's learn to sort waste

Collected waste should be disposed of well, for example, through composting, burying deep in the soil (landfills) or taken to recycling centres, e.g. for plastics and glass. Using different waste bins to collect different type of waste makes it possible to dispose each type of waste appropriately.

Organic materials can be composted to produce manure for planting trees or crops. Recycled plastics may be made into other useful products. In towns, the municipal council manages waste from households.

**Care for God's creation.
Some wastes are
a treasure in disguise.
Use creatively.**

Faith-based Reflections on Waste Management Issues

Christianity



The story of Joseph in Egypt reminds us not to waste our resources but to put them to good use for all (Genesis chapters 37–41). The Pharaoh of Egypt had a dream where seven gaunt cows consumed seven fat cows and where seven heads of lush grain were swallowed up by seven heads of scorched grain.

This dream, interpreted by Joseph with God's help, foretold of seven years of plentiful harvest to be followed by seven years of intense drought. Joseph proposed a wise plan of action to the Pharaoh: don't waste the harvest now – store it for later use.

Because of his insight and vision, the Pharaoh made him governor over all Egypt. When the seven years of plenty came to an end and the seven years of famine began, "there was famine in every other country, but there was food throughout Egypt" (Gen. 41:54).



Hinduism

Hindu sacred texts contain many teachings on environmental matters and environmental activists have drawn much inspiration from them.

In the Charaka Samhita, we are told: "The destruction of forests is most dangerous for the nation and human beings. Vanaspati [a Sanskrit word meaning the plant kingdom or forests] has a direct relation with the wellbeing of society. Due to the pollution of the natural environment and the destruction of forests, many diseases crop up to ruin the nation." (Vimansthan, 3.2)

Other examples are:

- "Do not cut trees, because they remove pollution." (Rig Veda, 6:48:17)
- "Do not disturb the sky and do not pollute the atmosphere." (Yajur Veda, 5:43)



Islam

The Qur'an says "waste not by excess for Allah loveth not the wasters" (Qur'an 7:31) In this way, Muslims are warned to use resources carefully.

Yet there are signs of waste all around us. The Hajj is a once-in-a-life time experience of pilgrimage for Muslims. It's the annual pilgrimage to Saudi Arabia and one of the pillars of Islam. However, even at the Hajj, an estimated 100 million plastic bottles are left behind each year. Muslim environmentalists are working to combat this.

Muslims are reminded that “Allah loves not those who create mischief” (Qur’an 28:77). The word mischief can be interpreted as meaning the extravagance and materialism of humans, which leads to pollution and waste.

“Those who squander are the brothers of Satan, and Satan is most ungrateful to his Lord” (Surah Al-Israa 17:23-30). “Allah’s servants are those who are neither wasteful nor niggardly when they spend, but keep to a just balance” (Qur’an 25:67).

By reflecting serenity and beauty in his heart, a Muslim treats other human beings, animals, plants and even non-living beings well. In Islam it is very clear that human beings must avoid causing a nuisance to others; pollution and littering the land, water, air and our surroundings are acts that do not fit with a person’s honour and dignity.



Suggested activities

Group Discussion

Group discussion on effects of poor waste management in school and at home



Objective

To identify effects of poor waste management.



Materials

Writing materials

Using resources wisely generates less waste.



Procedure

- Introduce the topic of discussion.
- Lay ground rules (for example, one person speaks at a time while the others listen).
- Divide the class into small groups of mixed abilities and gender where applicable.
- Let the groups select a chairperson and a secretary (gender balance should be observed in a mixed class).
- Provide guide questions for each group (for example, effects of plastics, broken glass, metals and polythene in school and at home).
- Move round the groups to provide guidance and ensure that discussions are within the topic.
- Let every group present their discussion points.
- Summarise the main points of the lesson from the group discussions.

Questions

- What religious values do we need to handle waste appropriately?
- What materials or equipment may we need to handle waste properly?

Values

- Taking responsible actions to care for the environment
- Working hard to make the activities a success



Skills

- Ability to solve problems related to poor waste management
- Ability to think critically in solving challenges of waste management

4.3.3 Waste Management Techniques



Objectives of the sub unit:

By the end of the sub unit the learner should be able to:

- Develop projects to manage waste for income generation.
- Perform activities that promote waste management.
- Create awareness of proper waste management

Introduction

Waste management techniques refer to the various ways used in the collection, transportation, processing, safe disposal, and monitoring of waste materials.

Waste may be disposed off in several ways, among them:

- Land-filling for non-segregated waste, i.e. not separated into categories.
- Incineration or burning of wastes under enclosed and controlled conditions. This is applicable to explosive liquid and dry solid wastes.
- Composting of organic wastes in pits or heaps

Show concern
with waste
around you.



Modified waste bin

Sustainable waste management

There are many benefits that come with good ways of managing waste, such as:

- Provision of a clean environment in schools and their surroundings to check pollution of the environment. This contributes to the reduction of bad smell and ugly dump sites within school environments.
- Production of energy from waste, e.g., methanol from land-fills. This could be an alternative to fossil fuels, which are fast depleting, and other conventional sources of energy.
- Improved health of communities around the schools by preventing waste-related diseases.
- Generation of income from waste – for example, manure from compost is sold for income generation.
- Creation of employment from waste-related activities, e.g. at recycling points for plastics. Research shows that waste-related work creates 2-5% employment in Asian towns.



Poor waste management in a city dwelling

There are several ways of proper waste management. These are known as the four 'R's – reduce, reuse, recycle, recover.

Reduce – Waste reduction means reducing the amount of waste that we produce each day. By producing less waste we reduce the challenge of handling large volumes of waste. Reduction is the first choice in dealing with the waste stream. For example, when buying manufactured products, we could choose those with the least amount of packaging, or we could carry a basket for shopping and not use polythene or plastic bags from the shop or supermarket.

Reuse – The next best way to reduce waste is to reuse something before we either recycle it or throw it away. Storing food in reusable containers rather than disposable bags is one example of reusing.

Recycle – Many things like soda cans, milk containers, newspapers and some plastics can be recycled. Recycling is the process of taking a product at the end of its useful life and using some or all of it to make another product.

Recover – This refers to getting back materials or energy from waste that cannot be reused or recycled. Recovering energy from waste materials is a growing technology.



The Four 'Rs' of waste management



Used bottles are still useful-Samaj School, Nairobi

Faith-based Reflections on Waste Management Techniques

Christianity



There is major emphasis on waste management in the Christian faith, especially on the collection of remnants for re-use, as when Jesus fed the 5,000: "When they were all full, he said to his disciples, 'Gather the pieces left over; let us not waste any.' So they gathered them all up and filled 12 baskets with the pieces left over from the five barley loaves which the people had eaten." (John 6:12–14)

Waste that cannot be reused or recycled should be disposed of in the right way. Leviticus 4:11–12 advises: "But he shall take [the bull's] skin, all its flesh, its head, its legs and its internal organs including the intestines, carry it all outside the camp to the ritually clean place where the ashes are poured out and there he shall burn it on a wood fire."

In those days homesteads had special sites a short distance away for the incineration of waste. Since then there have been many innovations in waste-management technology, but Christians still have a responsibility to handle waste properly.



Hinduism

Karma teaches that people should use the world unselfishly in order to maintain the natural balance and to repay God for the gifts he has given: "For, so sustained by sacrifice, the gods will give you the food of your desire. Whoso enjoys their gift, yet gives nothing, is a thief, no more nor less." (Bhagavad Gita 3:12)

Using the world unselfishly also means avoiding waste through restraint in consumption and simplicity in living. A well-known Hindu teaching from the Isa Upanishad – "Tain tyakten bhunjitha" – has been translated as: "Take what you need for your sustenance without a sense of entitlement or ownership." Or, as the great Indian leader Mahatma Gandhi said: "Nature provides enough for everybody's need but not enough for even one person's greed."

**Do not waste wastes.
Many wastes are re-usable**

Islam



Islam teaches that we are the successors of Allah on Earth and as successors; our task is to preserve and appreciate the beauty and goodness we find. For this reason Muslims must know they should avoid acts that may bother people such as littering, spitting in public places, disposing of waste carelessly.

- ".....and do not throw yourselves into destruction and do good. Truly Allah loves al-Muhsinin (people who do good deeds) – Hadith.
- "...Removing a harmful thing from the road is a charity." (Related by Bukhari and Muslim)



Suggested activities

I. Nature walks

Visit to local community/town/farm to observe how waste is managed



Objective:

Identify different ways of waste management in the local community



Materials

Writing materials



Notes for the Teacher

- Identify the site to visit and make all necessary arrangement well in advance, e.g. if some special person will give a talk to the pupils.
- Obtain permission from concerned people such as, parents, education officers, head teachers and other relevant authorities.
- Maintain discipline throughout the visit.
- Explain and clarify any facts that may confuse pupils.
- Supervise the learners to ensure full participation by all.
- Time the activities.
- Ensure safety of the learners.



Procedure

- Discuss the topic with the learners before the visit.
- Come up with specific objectives for the visit.
- Visit the place in advance (pre-visit) to identify areas of interest.
- Prepare questionnaires (make simple questions) to be used by learners.
- Make available the resources needed for the visit.
- Organise the learners into working groups and give them activities.
- During the visit let the learners take notes on how the community manages waste.
- Give learners time to compile their findings.
- Hold a class discussion on the findings of the visit after the groups have compiled their reports (group presentations may be good).

Questions

- How does the community manage waste?
- What best practices of managing waste did you identify?
- What religious values could be useful for the effective management of waste?
- What practical things can you do at home or school to promote a clean environment?

Values:

- Respect for each other and the environment
- Personal responsibility to promote clean environment
- Promote peace and harmony in the environment



Skills

- Ability to think critically in coming up with ways of managing waste
- Ability to work cooperatively with one another

II. Clean-Up Campaign at a Nearby Market or Town

In this activity, pupils are expected to team up with other stakeholders (e.g. community members, business owners, local leaders, members from the local religious congregation such as the school sponsors or nearest worship place) in a Clean-up Campaign at the nearest market or town centre. This will require advance planning in order to involve as many relevant stakeholders as possible, and gather all the necessary materials and equipment.



Objectives:

The activity is aimed at attaining the following objectives:

- Mobilise teachers, learners and other members of the school and local community to clean-up the market.
- Sensitise and create awareness on proper solid waste management among school and community members.
- Build capacity of participants in proper handling and disposal of waste.



Materials:

The following materials and equipment may be needed for the activity, but various improvisations can be done: wheelbarrows, spades, rakes, gloves (or improvise with polythene sugar-bags), hard and soft brooms, waste collection containers.



Notes for the teacher:

- Identify the location for the clean-up exercise
- Inform and invite the relevant stakeholders ahead of time, giving full details of the activity and their expected roles. These could include the town/municipal council staff, other schools, local administration, local church members and NEMA officers.
- Identify and gather all the necessary materials and equipment in time. Remember that most of the items can be borrowed from the various stakeholders, so it makes it cheaper.
- Reflect and plan how the team and the equipment will be transported to the venue. If the team will walk to the site then there is need to ensure safety measures especially for the pupils.
- Prior to the exercise, organise a brief talk to the participants about waste, e.g. the types, sources, effects and disposal. You could consider inviting a specialist from a government or private agency for this task.
- Organise the pupils and teachers to design and produce posters carrying catchy issues on waste. These would be very useful in publicity and advocacy during the actual activity. Plan how they could be used. It would also be nice to think of publicity notices posted at strategic places a few days to the activity, asking members of the public to participate.
- Make elaborate plans and share out roles to ensure everybody knows his/her role, when the activity begins and ends. It would be nice to assign a team for reporting, including photography.



Procedure:

On the day itself ensure:

- The participants arrive on time to the site. They could gather at a church/mosque/temple as the start point.
- That all the materials and equipment are assembled to the site.
- Participants are divided into working groups and assigned different sections of the site, each with a member acting as coordinator.
- That agreement is reached on a common collection point for the various types of waste, exploring possibility of recycling organic wastes through composting.
- A brief evaluation of the whole work is done. Have members mention lessons learnt, what was interesting or challenging – this would be useful for future planning.
- Ensure all equipment is returned to the owners.



A joint clean-up exercise in progress – Serem Market, Kenya

Follow up questions:

The following questions could be useful:

1. What aspects of the exercise did you find very interesting?
2. What lessons (or knowledge) have you learned from the exercise?
3. What challenges did you face in carrying out the exercise?
4. What should be done to improve the exercise next time?



Waste bins facilitate sorting of waste.

Values enhanced:

Stewardship, responsibility for the environment, humility, accountability and wise use of resources.



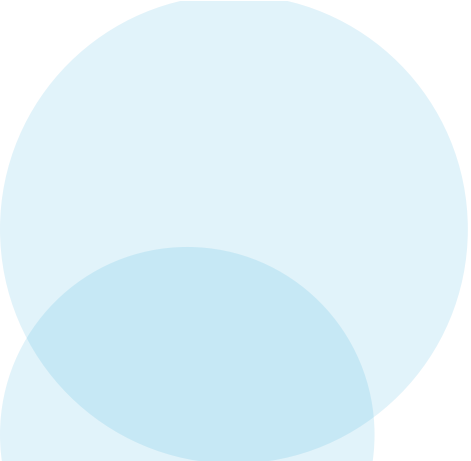
Skills developed:

Cooperation and teamwork, respect for each other, sharing resources, negotiation skills.

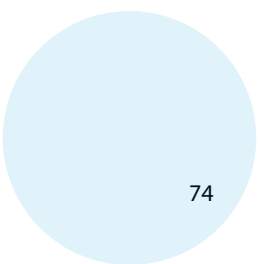


Waste is an eyesore; dispose it properly.

Waste endangers our health



*Energy can't be
created but it
can be wasted.
Save it!*





4.4.0 Energy

Introduction

Energy is the ability to do work. Energy can neither be created nor destroyed but can be transformed or converted from one form to another. Human beings, together with all other living organisms, depend on energy in everyday life. Energy plays an important role in various household works; for example, we use energy for cooking, lighting, ironing, heating, among others. The environment as a natural resource base is the source of all energy on Earth. Production, distribution and consumption of energy are the largest sources of negative effects on our environment.

The sun is the primary source of energy on Earth. The Earth and other planets receive energy and light from it. Upon reaching the Earth, solar energy is transformed into various forms of energy which are then used in different ways. The sun thus acts as the Earth's energy capital. Religion holds that all creation is the work of God, including the sun and the energy it gives. As human beings, we have an ethical and moral obligation to sustainably use energy.

Issues around energy are now a global debate as sustainable sources and ways of using energy dominate world development agenda. At the school level we can contribute to sustainable energy use by checking wastage of energy and proper management of the sources of energy. We can further make our efforts felt by actively taking part in global events addressing energy. For example; World Environment Day (June 5th), World Desertification and Drought Day (June 17th), World Ozone Layer Day (September 16th) and others (See more details in Appendix section).

Under this theme we have three sub themes to study. They include: forms of energy, categories of energy and conservation of energy.

4.4.1 Forms of Energy



Objectives of the sub unit

By the end of the sub-unit the learner should be able to:

- Identify different forms of energy in the local environment
- Explain the importance of energy in school and community
- Demonstrate alternative sources of energy

Introduction

When work is done, energy is converted from one form to another. For example, a light bulb converts electrical energy to radiant and heat energy. When we use batteries to light a torch, energy is converted from chemical to electrical, heat and light energy. Therefore energy exists in different forms such as:

Table 4.1: showing some forms of energy

Forms of Energy	Examples
Kinetic energy	A rolling ball or something in motion
Potential energy	A book on a table or any object at rest
Heat energy	A hot cup of tea or fire
Electric energy	a switched on television, wind energy
Sound energy	Speech, music, animal sound
Light energy	Sunlight, glowing bulb
Magnetic energy	Magnets used in speakers
Chemical energy	Energy stored in firewood/ fossil fuels, nuclear

Table 4.2: Types and uses of energy

	When work is done, energy is converted from one form to another. For example, a light bulb converts electrical energy to radiant and heat energy.
	Energy is necessary for carrying out various household works, for example we use energy for cooking, lighting, ironing, heating, among others.
	In the rural households the main source of energy is wood fuel in form of firewood and charcoal.
	Vehicles, planes, ships and trains make use of fossil fuel such as, petrol, diesel and aviation spirits to move.
	A lot of energy is required in industries. This is usually in the form of coal, electricity, oil and firewood.
	Machines used in land cultivation, control of pests and diseases, harvesting and processing of farm produce all require energy. The energy used is in the form of animal power, electricity and petroleum fuels.

Table 4.3: Traditional resources of energy and their uses

Energy resources	Use	Method
• Wood, charcoal, plant wastes (bio mass energy)	Cooking and heating	Open fires and energy saving stoves
• Human and animal energy	Agricultural and pastoral activities	Ploughing, planting, harvesting and processing
• Wood, solar energy, human power	Food preservation	Smoking, drying, grinding
• Animal power, wood	Art and Craft work	House building
• Wood and solar energy	Brick and pottery making	Kilns
• Animal power and wind power, wood	Transportation and communication	On foot, camel, donkey, boat, dhows, smoke and fire

Faith-based Reflections on Forms of Energy

Across all the major religions of the world, different forms of energy have a spiritual perspective. Since energy resources are part of God's creation, taking care of them is our collective responsibility.

Christianity



Christians believe that God created the heavens and the Earth and then He created the sun (which is the primary source of energy on Earth), the moon and the stars and planets: "Then God commanded, 'Let lights appear in the sky to separate day from night and to how the time when days, years, and religious festivals begin; they will shine in the sky to give light to the earth' – and it was done." (Gen. 1:14)

From the sun we can get many forms of energy. For example, coal, oil and gas are the energy of the sun trapped in fossilized organic materials formed from decayed plants and animals over hundreds of millions of years. However the burning of these fossil fuels has contributed to major environmental problems that have affected us all including climate change. Solar panels are now becoming a better way of trapping and using the energy of the sun than via these "fossil fuels".



Hinduism

In Hinduism, the Shakta tradition glorifies Devi, the consort of Shiva, as the World Mother who, as Shakti, is the energy-giving power behind all creation. Shakti is shown in many forms. As Uma or Parvati, she is the gentle consort of Shiva. As Kamakshi or Rajarajeshwari she is the Great Mother. In the form of Durga she rides a tiger, the ego and arrogance that man must subdue. In her angry form she is Kali. We therefore see that in Hinduism energy is associated with a religious origin.

Islam



Islam acknowledges that the sun is a star at the centre of the solar system. There are verses referring to wind, stars, sun, moon, day and night which Almighty Allah has created, for instance;

"By the sun and brightness, And [by] the moon when it follows it, And [by] the day when it displays it, And [by] the night when it covers it, and [by] the sky and He who constructed it, And [by] the Earth and He who spread it, And [by] the soul and He who proportioned it. (Qur'an 91: 1-7).

That is all to honour these environmental components and to uphold their status, and to emphasis that Allah created them: "He created the heavens and the earth in true (proportions): He makes the Night overlap the Day, and the Day overlap the Night: He has subjected the sun and the moon (to His law)." (Qur'an 39:5)



Suggested activities

Learning Game
Light



Objective:

Identify sources of light



Materials

- Manila paper/flip charts
- Cartons
- Clean sisal sacks
- Felt pens



We can tap energy from the sun



Notes for the teacher

- Look for relevant information and materials.
- Decide on the venue where the game will take place.
- Choose the learners who will be involved in the game.
- Encourage learners to incorporate the values of fairness, love, respect for each other as they play the game.
- Maintain class control.
- Manage time effectively.
- Guide the learners on the game and how to record key points.



Procedure

- Draw a chart having all sources of light to be learnt in the lesson and leave spaces for the labels.
- Make a paper ball.
- Prepare separate labels for the sources of light and place them in a small carton.
- Divide the children into two groups and let them sit in a circle.
- Position the chart having the sources of light in a strategic position where all the children can see.
- Teach the children a song/poem on welcoming light that will be used to identify the sources of light by the pupils.
- Instruct the learners on how to play the game:
 - Pass the ball to one learner (the learner who receives the ball picks a label from the box, shows the team-mates the label, they agree on the source and stick it under the correct drawing/picture of the source of light on the chart).

- The learner then passes the ball to another learner who goes through the same process.
- Each team should take a maximum of one minute to pick a label and stick it correctly.
- A score of two marks is given for the correct label matched to the source of light within the time limit, and one mark if it takes more than one minute.
- A total score for each group is done at the end of the game and the winners rewarded.
- Summarise the lesson by asking learners to record the sources of light used in the community and at school in their books.

Values

- Fairness when working on a common task
- Respect for each other
- Teamwork
- Promoting a culture of tolerance and fair competition



Skills

- Ability to communicate effectively
- Ability to think critically

4.4.2 Categories of Energy



Objectives of the sub-unit:

By the end of the sub-unit the learner should be able to:

- Identify categories of energy.
- Demonstrate the value of conserving renewable and non-renewable energy.
- State practical ways of using energy wisely.



Schools use a lot of wood-fuel – Goibei School

Introduction

There are two major categories of energy:

- Renewable energy
- Non-renewable energy

Renewable Energy

Renewable energy sources are those that cannot be exhausted and therefore can be used again and again, provided we do not exceed their rates of regeneration (those that cannot get used up or get finished). Energy from such sources is called renewable energy. Renewable energy includes hydro power, geothermal energy, solar energy, nuclear energy, wind energy, tide/wave/ocean energy, biogas, animal wastes, and wood. Trees take a long time to grow to maturity but when this is done, their energy is available for use.



A biogas plant



The passing wind is power

Non-Renewable Energy

This is energy obtained from sources that get exhausted. Such energy sources get used up and they cannot be replaced. Examples are fossil fuels such as coal, petroleum (petrol, diesel, oil) and natural gas. These energy resources are fixed in total quantity and thus the more we use them today, the less they will be available for tomorrow's use.

Faith-based Reflections on Categories of Energy

Across the religions, various accounts have been given pertaining to categories of energy.

Christianity

In the beginning God creates light (Genesis 1:3): "Then God commanded, 'Let there be light' – and light appeared." Light is a primary source of energy that enables plants to grow, the wind to blow and the seasons to follow on from one another.

- * Plants are a source of food for different animals and other organisms. They are also the source of fossil fuels such as coal and oil, and wood fuel.



- * The blowing of the wind may cause rain to fall. This can in turn form rivers and streams that can be used to generate electricity, grind grain and transport goods.
- * Wind can also be used to generate electricity, pump water, grind grain and move boats and ships.

In this sense, God's gift of light causes the formation of other types of energy.

Energy in the Christian tradition is also about the power and force of truth which in the opening of John's gospel (1:1–9) is likened to the brilliance of light dispelling darkness.



Hinduism

Hindus believe that humans, gods and nature were integral parts of one "organic whole". Ancient Hindu writers, later on, personified each of the divine force as a Devata or deity worthy of reverence and worship. Even Charvaka, the atheist philosopher of ancient India, who totally rejected Vedas (the Hindu scriptures) considered the principles of vayu (air), bhumhi (earth), jala (water) and agni (fire) as important factors in regulating the lives of humans, animals and plants.

This Hindu worldview of ancient Vedic times became formalised into the Samkhya system of philosophy that promoted ecology-care in Hinduism. Thus issues of energy are dear to Hindus as it is one of the integral aspects in their teachings.



Islam

The Holy Qur'an has referred to balance in creation, saying, "Indeed, all things were created in proportion and measure" (Qur'an 54:49). For all living and non-living objects there is wisdom in their creation, their number and balance. Almighty Allah says: "It is He who created all things and ordered them in due proportion." (Qur'an 25:2)



Suggested activities

A project on tree planting



Objective

Develop skills of tree planting to provide sources of renewable energy in the community



Materials

Case study write-ups
Charts (to depend on case study)



Notes for the teacher

Discuss the topic to be studied with the learners.

Provide the case study write up.

Decide whether it will be done in groups or individually.

Set guiding questions that the learners will use in order to get required information on sources of renewable energy



Procedure

Let the learners read the procedure of tree planting:

- Dig a hole twice the length and width of the container.
- Fill the hole with water one day before planting and let it drain.
- Prepare a mixture of top soil and a handful of compost or a teaspoonful of fertiliser.
- Position the tree next to the hole.
- Cut off the plastic as near to the bottom as possible.
- Remove the plastic from the top.
- Re-fill the hole with soil so that the top of the container will be just lower than the surrounding soil, after the tree has been planted.
- Keep the tree upright and fill the cavity under the container with soil so that the tree stands up by itself.
- Pound or trample the soil firmly around the tree.
- Water the tree and mulch if rains are not expected soon. Continue watering every morning or evening until the tree can sustain itself.

Guide the learners to discuss the procedure



Learners can plant trees- Goibei and Kapsoi schools

Questions

- What is the importance of trees in relation to our energy requirements?
- Which religious and other inspiration could drive us to planting and taking care of trees?
- What do we need to start such a project in our school and community?

Values

Care for the community livelihood
Taking responsibility for the environment



Skills

Ability to solve energy challenges in the community to promote livelihoods.
Practical steps in planting and taking care of trees.

4.4.3 Conservation of Energy



Objectives of the sub unit:

By the end of the sub unit the learner should be able to:

- Appreciate the importance of conserving energy.
- Identify ways of conserving energy in the local environment.

Be modest in
using energy
that God has
provided freely

Introduction

There is need to manage and conserve our energy resources well. This will ensure continued use by the current and future generations. It will also minimise the environmental effects associated with energy production and use. To do this there is need for collective efforts by all of us. The following are some tips for efficient and effective energy use:

i. Reducing unnecessary energy waste. This can be done through:

- Reduced energy consumption by turning off lights and electrical appliances when not being used.
- Using less energy to do the same amount of work, for instance investment in energy saving equipment like improved jikos for cooking.
- Using less energy to do more work, for instance taking public transport instead of several private cars.
- Reducing the frequency of cooking meals.
- Having cold bath instead of a hot one.
- Completing drying of fuel wood in the sun before using it.

- Reducing the intensity of the fire after the food has begun boiling.
- Covering cooking pots with lids while on the fire.
- Soaking dry food before cooking it.
- Boiling only the amount of water that you may need as boiling a lot of water takes long to heat hence using more energy.
- Ensuring that your stove is fuel efficient.



Fireless cookers save energy

ii. Improving the energy efficiency of commercial and residential buildings,

for instance designing mechanisms for solar energy depending on whether one is in low or high temperature zones instead of employing cooling devices that consume energy.

iii. Improving efficiency in transport sector through having well maintained vehicles, using public transport in place of personal cars, encouraging use of railway transport as this uses less energy compared to road transport.

iv. Improving industrial energy efficiency. Industry as a sector consumes more energy than all other sectors. So improved efficiency in manufacturing industrial processes will be useful in the long run.

v. Using environmentally friendly energy resources like solar power, wind power, biomass (biogas) and briquettes from waste material.

Faith-based Reflections on Conservation of Energy

Since ESD aims at shaping our behaviour and attitudes for socio-cultural, economic and environmental stability, it is necessary to bring about positive change in how we use energy. Religious perspectives in this respect can be very useful.

Christianity

The essence of the Christian attitude to energy conservation is the phrase "Waste not, want not," reputedly first used in the late 18th century by the founder of the Methodists, John Wesley.

Therefore the gifts of energy should be used well but not wastefully, and renewable sources, like solar, wind and wave power, should be used wherever possible.





Hinduism

Ancient Hindus felt Brahman's presence in everything around them. Brahman is a Sanskrit word that refers to a transcendent power beyond the universe – the power that upholds and supports everything.

Ancient Hindus felt the natural forces that governed their daily lives were considered as manifestations of an almighty creator. Since these divine forces sustained all living creatures and organic things on this Earth, to please that creator, they felt they must live in harmony with his creation, including the Earth, rivers, forests, sun, air, and mountains. This belief spanned many rituals that are still followed by traditional Hindus.



Islam

A Muslim lives his life enlightened with the teachings of Qur'an and guided by the teachings of the Prophet Muhammad (pbuh). Islam instructed all Muslims not to be extravagant or wasteful. Allah says in the Qur'an: "And eat and drink, but be not excessive" (Qur'an 7:31). He also says: "Indeed, the wasteful are brothers of the devil" (Qur'an 17:27). In this light, wasteful use of energy is against Islam teachings.



Suggested activities

Project Based Learning

Name of project: Energy Project: Nambale A.C Primary School
Narrative



Objectives

- To provide an alternative form of energy
- To reduce rate of deforestation
- To promote use of energy saving devices
- To promote the culture of tree planting among pupils

Problem statement

The school had been experiencing scarcity of wood fuel as a source of energy as the school uses firewood as the main source of cooking fuel. The school grounds and surrounding area were therefore experiencing extensive deforestation due to the high demand for wood, charcoal, and wood for building materials. The school community formulated a school energy policy that led to conservation and sustainable use of energy resources in the school and surrounding area.

Project development, operation, stakeholders

After carrying out an energy audit, it was found necessary to implement micro-projects that would promote conservation and sustainable use of energy resources. The Eco-school Committee also found it wise to start promoting the tapping of renewable sources of energy

such as solar power. In this regard a solar energy project was implemented and a tree nursery established to supply seedlings to the school and local community.

Project benefits

- Expenditure on wood fuel reduced drastically since the school forest supplemented supplies, leading to financial savings.
- The school's micro-climate improved – the forest created more shade for use during hot afternoons.
- Improved aesthetics in the school– beauty from the trees as well as fresher air.
- The forest serves as a natural classroom for teaching of science, as well as a demonstration site for community members.

Curriculum links (action learning)

The forest is used for outdoor teaching of science.

Challenges

The implementation phase of the project had some challenges, including time and funding constraints, as well as fluctuation of prices for materials due to the long period of implementation. In order to address these challenges, the school collaborated with the local community to help provide cheap labour. Materials were procured in bulk to ensure affordable prices.

Follow up questions to prompt action

- In what ways did the project help solve energy constraints at the school?
- How would you compare the state of energy supply at the school before the project with the current state at your school?
- What can you do at your school to improve the energy situation at your school?
- What challenges do you think you would face in implementing a similar project at your school?

Values enhanced

- Collective responsibility through forest establishment and conservation
- Taking care and respect of God's creation, such as forests



Skills developed

- Critical and creative thinking
- Resource mobilisation
- Collaboration and cooperation
- Teamwork and communication

We can help save energy, what you can do:

E is for electricity – turn off when out and about.

N is for nights – switch off the lights.

E is for the end – when all the oil will be gone.

R is for reduce, reuse, recycle.

G is for girls and boys, don't spend too long in the shower.

Y is for YOU do your best in the energy test!



Using charcoal briquettes saves woodfuel



Energy saving stoves use less woodfuel



***Appreciating God's
creation – We must
be thankful for the
variety of life forms
that we have.***

4.5 Biodiversity

Introduction

God is the creator of all living things.

For people of faith, biodiversity is God's gift of creation. This is summed up by the Most Reverend Thabo Makgoba, Archbishop of Cape Town:

"We worship a creator God. The more we learn about the natural world, the more wonderful we discover it to be. There is a real danger that with all our modern technical discoveries we lose sight of the magnificence and intricacy of creation. We are discovering that creation is seriously under threat.

"That there is life on this planet is a miracle in itself. It is the most serious of sins that we humans are threatening this life. For too long we have selfishly misused and abused God's mandate to 'have dominion over' creation (Genesis 1:28). Now is the time to recognise that we have a responsibility to God to care for this intricate web of life, acknowledging that 'the Earth is the Lord's and all that is in it.'" (Psalm 24)

The religions of the world recognise this diversity of life as a sacred gift from God that should be wisely used and celebrated. This variety of life is known as biodiversity. Man has the privilege to benefit from this resource and ensure tomorrow's generations benefit from it too.

We can become part of the global community in tackling issues of biodiversity by actively taking part in global initiatives geared towards addressing biodiversity conservation. One way of ensuring this is by participating in global events on biodiversity, e.g. by planning related events at school. Some of the world days addressing biodiversity issues include; World Wetlands Day (February 2nd), World Biodiversity Day (May 22nd), World Environment Day (June 5th), World Desertification and Drought Day (June 17th), World Animal Day (October 4th), World Habitat Day (October 6th), World Forests Day (March 21st) and others (See more information in Appendix section)

This unit has two sub-units, namely forms of biodiversity and conservation of biodiversity.



Do you enjoy nature?



Objectives of the unit:

By the end of the unit the learner should be able to:

- Identify different forms of biodiversity in the school and its neighbourhood.
- Appreciate the need for conservation of biodiversity.
- Explain ways of conserving biodiversity.
- Carry out activities that will help conserve biodiversity in the school and the local community.
- Explain how we can promote harmonious co-existence between humans and the rest of nature.

4.5.1 Levels of Biodiversity

Biodiversity refers to the variety of life, occurring at three levels: species, genetic and ecosystem.

Species Diversity – Species diversity is the number and kinds of different plants, animals and micro-organisms.

Genetic diversity – This is the variety of genes found in different populations of organisms.

Ecosystem diversity – These are the different ecosystems, habitats and biological communities where organisms live. Examples are oceans, lakes, grassland, ponds, forests and swamps among others.

Biodiversity in Kenya

Kenya has an estimated 35,000 known different types of animals, plants and micro-organisms found in different environments (ecosystems). These ecosystems where the different life forms live are the ocean, the various lakes (e.g. Lake Victoria), rivers, swamps, arid and semi arid lands (ASALs) and forests. These animals include various species of amphibians, birds, mammals and reptiles. The survival of some of these animals is threatened or endangered.

The forest ecosystem is one of the ecosystems with a variety of life forms and serves as a home of many plants and animals, including microorganisms. Kenya's forest cover is 2.4% of the total land area, yet the global required standard is 10%. The forests are currently being lost at an estimated rate of 5,000 ha. per annum.

Natural forests in Kenya include parts of Nandi forests, Mau forest, and Kakamega forest. Planted or man-made forest includes parts of Nandi forests, Koderia forest in Rachuonyo district, Timboroa forest, Turbo forest in Uasin Gishu county and Kipkorere in Nandi. Forests have an important economic role to play; for instance, they are a source of paper and building materials. Every form of life plays an important role in the environment to create balance in nature –a role that no other organism can play. All living things are interdependent. Some plants and animals have religious significance, such as the Kaya forests on the Kenyan coast, which are sacred to the Mijikenda people, and the mugumo trees among the Kikuyu community. Plants purify the air and also play a leading role in water and soil conservation. When plants and animals die, they decompose to release manure for use by other organisms for growth and development.

Biodiversity is important in food chains and food webs; a food chain is a feeding relationship in which one organism feeds (predator) on another organism (prey). The materials we have for survival, such as water and air, are limited in quantity. They have to be recycled through natural cycles such as the water and nitrogen cycles to be able to benefit the present and future generations. There are some organisms that live in water (aquatic organisms). These purify water. All animals depend on plants for food. Human beings depend on different plants and animals for food. Insects, bats and birds are important in agriculture since they are agents of pollination for food crops.

“A nation that destroys its soils destroys itself. Forests are the lungs of our land, purifying the air and giving fresh strength to our people.” – Franklin D. Roosevelt



Tropical ecosystem–Nairobi National Park

God created so many beautiful creatures. He created different life forms and saw that they were good. Therefore man should appreciate God's creation and thank him for his goodness.

Faith-based Reflections on Levels of Biodiversity

Christianity

The opening chapters of Genesis tell the Biblical story of the creation of the biodiversity of nature by God: "...God created the great sea monsters, all kinds of creatures that live in the water, and all kinds of birds. And God was pleased with what he saw... Then God



commanded, 'Let the Earth produce all kinds of animal life: domestic and wild, large and small' – and it was done. So God made them all, and he was pleased with what he saw." (Genesis 1:21–26)

The biodiversity of God's creation is celebrated in Psalm 104 24:27:

"Lord, you have made so many things!
How wisely you made them all!
The Earth is filled with your creatures.
There is the ocean, large and wide,
where countless creatures live,
large and small alike."

The Archbishop of Canterbury referred to this in July 1997: "As the psalmists so eloquently sang, God's glory is to be found in the whole of the vast order of the universe and in the miraculous detail of nature in all its forms."

Christians throughout the centuries have celebrated the many wonders of God's creation. In a quote attributed to Martin Luther (1483–1546): "God writes the Gospel not in the Bible alone, but also on the trees, and in the flowers and clouds and stars."

The late Professor Wangari Maathai, the 2004 Nobel Peace Prize-winner, asked us to re-read Genesis, "the book for environmentalists", and to reflect on our place in the ecosystem. "If we had been created on Tuesday," she said, "there would have been nowhere for us to stand! God, with infinite wisdom, waited until the last day."

Hinduism

All Hindu scriptures bring out the importance of pancha mahabhuta, the five elements – vayu (air), bhumi (earth), jala (water), agni (fire) and akasha (space). These elements are the foundation of an interconnected web of life. They are not outside us but also part of us; for Hinduism, nature and the environment are an inseparable part of our own existence.

There are principles relating to the unavoidability of what should follow of one's actions, the interconnectedness of all things, the linkage between past, present and future, the integrity of the human family, the harmony that is necessary between humanity and the natural order and many others.

It is clear that the most ancient texts on Hinduism demonstrate through the praise of the deities an environmental awareness and great respect for the natural world. For example, in the Charaka Samhita, we are warned that destroying forests is like destroying the state, and reforestation is an act of rebuilding the state and advancing its welfare.





Islam

Everything in nature is a sign of Allah's existence – (Qur'an 51:20-21). All creation is the loving action of God, who brought everything in existence and continues to care for it. Humans are stewards.

We are accountable before God and to the community of life as servants, stewards, tillers of land and keepers.

This then calls for attitudes of compassion, respect and humility towards God's creation. The Prophet said, "Whoever kills a sparrow or anything bigger than that without a just cause, Allah will hold him accountable on the Day of Judgment." The listeners asked, "O Messenger of Allah, what is a just cause?" He replied, "That he will kill it to eat, not simply to chop off its head and then throw it away." (Nisai, Hakim).



Suggested activities

I. Role Play

Animals



Objective

To identify different types of animals, their use and how to live with them



Materials

Masks



Notes for the teacher:

- Internalise the content of the role play before the lesson.
- Identify and prepare the materials required.
- Select appropriate venue for the activity



Procedure

- Assign alphabetical letters to the pupils to represent different animals.
- Guide the pupils to take their roles and enact them.
- Pupils should role-play the different animals' behaviour and sounds; for example, walk and roar like a lion, meow like a cat, croak like a frog etc.



Both domestic and wild animals are important

Background sound saying:

- Everything belongs to God.
- Avoid deforestation; forests are home for many animals (The birds are seen crying: "Where is my nest?"; The monkeys are crying: "Where is the branch I usually rest on?").
- Avoid polluting water bodies, they are home for fish (the fish is seen struggling to breathe).
- Avoid unnecessary fires; this destroys animals in those environments. (The insects are heard screaming: "Fire! fire! Where do I go?")

During role play the teacher could prompt with different scenarios that could be happening in the forest. This could prompt different role play behaviours for each animal. Depending on the age group, make more complicated scenarios. For example, the monkeys are playing and the birds are singing, animals are feeding, trees are being cut down by humans, somebody has lit a fire to cook and it has spread out of control.

Did you know that each one of us can help protect plants and animals from destruction? It is your God-given responsibility.

After the role play; the teacher should ask questions to the whole class. For example:

- i) Where do these animals live?
- ii) How do we care for these animals?(In terms of food, water, shelter)
- iii) What human activities affect animals? (Answers to include: Deforestation, water pollution)
- iv) What can we do to care for these animals? (Answers to include planting trees and controlling water pollution)
- v) How do different animals contribute to the source of income in your local community?

Values to be developed

- Care for God's creation with understanding, compassion and love.
- Treat all living beings with respect



Skills to be developed

- Creativity
- Effective communication
- Self-expression
- Teamwork

II. Developing a Picture Book of Creation on Wild animals



Objective

Develop picture book to show wild animals.

Materials

- Pictures of different wild animals
- Plain paper/clean cartons
- Glue/locally made sticking material
- Scissors/razor blades
- Marking pens/colored pencils



They have a right to live



Notes for the teacher

- Read widely about wild animals.
- Ask learners to get pictures of different wild animals in advance.

NB: Guide pupils through the appropriate materials to take pictures from, to avoid cutting out of books.



Procedure

- Let the learners observe the pictures they have come with to identify the different animals. This could be done in small groups.
- Learners should trace or cut out pictures from existing materials such as magazines, newspapers, foods packs and calendars, or draw their own.
- Sort the pictures in alphabetical order and stick on plain papers or clean cartons and organise them into a simple book.
- Guide learners to make the content and cover page.
- Encourage learners to make their book covers attractive and interesting (so that people want to find out more about it).

Values

- Working together as a team
- Respecting each other's opinion



Skills

Ability to think creatively and critically

4.5.2 Conservation of Biodiversity

Introduction

Although biodiversity is very important in our lives, many species are becoming increasingly rare. We need to conserve our biodiversity because it holds our future. Human activities have had serious negative effect on both animals and plants, with many of them becoming extinct. An idea of how important biodiversity is can be seen from the words of EO Wilson, a renowned American biologist and research professor and Professor Emeritus at Harvard University: "If all mankind were to disappear, the world would regenerate back to the rich state of equilibrium [balance] that existed 10,000 years ago. If insects were to vanish, the environment would collapse into chaos."

Creatures that God created depend on each other for survival

A square kilometre of a coastal ecosystem such as mangrove forests can store up to five times more carbon than the equivalent area of mature tropical forests. But these areas are being destroyed three to four times faster than forests. When mangroves are cut, they release substantial amounts of carbon dioxide into the atmosphere and the ocean, which contributes to climate change.

Biodiversity is also important to Africa's tourist industry. Tourists spend billions of dollars every year to watch birds or whales, or witness the spectacular migration of wildlife such as the great annual migrations from the Maasai Mara ecosystem of Kenya to the Serengeti in Tanzania, where an estimated number of 1.5 million wildebeests, 500,000 Thomson's gazelles and 200,000 zebras cross the Serengeti plains and Mara River.



Migration of the wildebeests - Maasai Mara, Kenya

Visitors to National Parks are drawn by the wildlife they see. The tourism industry is largely based on the species of coral, fish, and other marine species and wild animals in many parts of Kenya.

Causes of loss of biodiversity

There are various reasons that lead to loss of plant, animal and micro-organism species. These include:

- Soil erosion, e.g. due to overgrazing and poor farming methods such as digging up and down hills-lobes;
- Improper use of agro-chemicals, leading to the death of micro-organisms in the soil.
- Drought which reduces amount of water available, thereby affecting growth of plants on which animals depend for food. Drought also causes many animals to die for lack of water and food.
- Uncontrolled felling of trees for human settlement in protected areas such as forest land leads to loss of forest cover, which then results in loss of species and affects climate especially, rainfall patterns.
- Wastewater from factories and farms can contain chemicals which pollute the water sources, killing aquatic life.
- Introduction of foreign species such as Nile perch fish and water hyacinth colonise the water bodies where they are introduced. These species interfere with the normal food chains in the environment. This affects the survival of indigenous species.
- Poaching and illegal game hunting of animals such as rhinos and elephants may lead to their extinction. Kenya has suffered great loss from illegal killing of elephants for their tusks and rhinos for their horn.
- Over-exploitation of indigenous tree species for herbal medicine and other reasons destroys the habitat for many organisms.

Some practical ways of conserving biodiversity

- Don't start a fire you can't put out. Check the wind before you light a fire outdoors, especially during hot, dry and windy weather. Fires destroy topsoil by removing plant cover and destroy the habitat of the different animals and plants that live in that area.
- Get involved in your community by protecting wetlands, cleaning up rivers and planting trees. Make sure the trees are appropriate to the area where you will plant them– i.e., they are indigenous species that will contribute to biodiversity, not damage it –and that you do not plant water-hungry trees in arid areas with scarce water sources.
- Report pollution or waste dumping to the relevant authorities.
- Use safe cleaning products at home, mosque, church and temple. Make sure the cleaning products are not harmful to the environment.
- Improve your local environment: Plant indigenous shrubs and trees in your street, around church/ mosque/temple or communal land. Do this every time you have a celebration like a baptism, birthday, weddings or other anniversaries.



Accidental fire in a school forest –Western Kenya

Local organizations and the government can work together to conserve biological diversity by doing the following:

1. Enacting laws banning the hunting and shooting of animals for a specific period of the year.
2. Declaring important areas to be protected.
3. Finding out the possible impacts of development projects on the environment and ensuring plans are made to avoid negative impacts.
4. Creating awareness on the usefulness of biodiversity.
5. Strengthening indigenous knowledge on the importance of plants and animals in the environment.
6. Schools can celebrate the international day for protection of biological diversity by participating in competitions and quizzes.

Caring for the whole of creation shows our love for God.



Planting trees to enhance biodiversity

Faith-based Reflections on Conservation of Biodiversity

Christianity

God created a huge diversity of living forms – and seeks to protect all these forms. In the story of Noah, God makes it very clear that every kind of animal and bird is to be kept alive. The phrase “every kind” and similar terminology is used more than 15 times between chapters 7 and 9 of Genesis.

Caring for the whole of creation therefore is one way that Christians can demonstrate their love of God. Failure to do so, which is what is now happening, has been called a sin by many Christian leaders.



Archbishop Emeritus Desmond Tutu says, “We who recognize that all good things come from the Divine Creator have taken too long to acknowledge that the living out of our beliefs concerns most deeply the care and nurture of all living things and the environment on which they depend.” The Ecumenical Patriarch of the Orthodox Churches even calls the destruction of biodiversity by humanity “blasphemy”.

As the Anglican Church of Southern Africa states in the book *Season of Creation*:

“God created a world with an amazing number and variety of living organisms, millions of plants, animals and microorganisms. This wonderful variety of life, known as biodiversity, is God’s gift to us, both to enjoy and to care for. Life is a miracle. It’s a miracle that on this one planet in the universe, which is our only home, there is just the right mix of gases to allow the correct atmosphere in which life can flourish.

“But life itself is sustained through a web of interdependence. All living things interact with the rest to maintain a balance. Humans are reducing and destroying this intricate and delicate balance. As we bring about the loss of biodiversity, we threaten the web of life and, consequently, the sustainability of future life on the planet.

“Biodiversity loss is like dismantling a brick wall. You can remove some bricks, but if too many are removed, the wall collapses. It is said that if all the bees on Earth were to die, we humans would survive for only three or four years. So it is with the web of life, everything is dependent on the other. Christians can talk in stronger terms. It is not just biodiversity loss we are bringing about – but the extinction of God’s creation. This is a sin.”



Hinduism

Hindu teachings advocate sanctity of life and condemn the killing of humans and animals alike. That’s because one of Hinduism’s most important ideals is ahimsa which is often translated as compassion or non-violence, but means much more than this. Ahimsa means we should avoid causing any hurt or harm to any living thing, mental, physical or emotional; it is a whole way of life. The scriptures tell us that protection of animals is a sacred duty. “Oh wicked persons! If you roast a bird, then your bathing in sacred rivers, pilgrimage, worship and yagnas are useless” (Narasimha Purana, 13.44).

And the Yajur Veda tells us, “Do not injure the beings living on the earth, in the air and in the water”, and also, “No person should kill animals helpful to all. By serving them one should obtain heaven.”



Islam

The diversity and variety of species are often mentioned in the Qur'an. And it is the same for the importance of pairs, which are complementary but different.

"He created the heavens without any pillars that you can see; He set on the Earth Mountains Standing firm, lest it should shake with you; And He scattered through it Beasts of all kinds. We send down rain from the sky, and produce on the Earth every kind of noble creature, in pairs. (Qur'an 31-10)

"And among His Signs is the creation of the heavens and the Earth, and the variations in your languages and your colours: verily in that are signs for those who know." (Qur'an 30-22)

Islam prohibits the cutting or destruction of trees and plants, and encourages people to protect and increase plants. Great reward is associated with such practice. The speech of Abu Bakr, the first caliph of Islam, made to his soldiers when dispatching them, included the prohibition to destroy trees as an act of vengeance or collective punishment. "He who cuts a lot of tree [without justification], Allah will send him to Hellfire." (Al-Tirmidhi, 5239)



Suggested activities

I. Debate

Motion: Grazing grounds should be open to all



Objective

To develop skills of solving conflicts using faith-based values



Notes for the teacher:

- Give the motion early for pupils to research.
- Consider enriching the motion by providing the pupils with some materials on issues of grazing grounds (e.g. newspaper cuttings or passages from books).
- Guide learners to make two groups i.e. opposers and proposers.
- Let pupils appoint a speaker to chair the debate.
- Let each group appoint a secretary to take notes for the group.
- After the debate summarise the main points of the debate.



Managing grazing grounds is road to peace

Values to be enhanced

- Respect and care for God's creation
- Living in peace with one another and the environment
- Wise use of resources
- Care for the environment



Skills to be developed

- Self-expression
- Critical thinking
- Creativity
- Negotiation skills

**We are accountable
before God and
to the community
of life as servants,
stewards and
keepers of the land**

II. Poem on Biodiversity



Objective

To appreciate the need to respect the environment



Materials

Manila papers
Felt pens



Notes for the teacher:

- Read and understand the poem before the lesson.
- Read and understand the questions on the poem.



*All were
created by God*



My heart cries

At every strike of the woodcutter's axe
I feel the strike was meant for my heart
It seems to me I lost a loved one
My heart aches at the thought of losing a tree

As every petal touches the Earth
Knowing it is the last time it does so
Along with the rose is dying
It makes me want to say
Why do you allow this?
The beauty of forests has turned

To a dull grey building
The lively fragrance of gardens
Has become a shopping complex
The bright light of a cottage is
Now a regular pub

The world is now bare and empty
As heartless as ever
As cruel as a stone
And as cruel as the wind
Of a once joyous and happy world

By Aliya Sumra (aged 11 years), Muslim Academy, Nairobi



Reciting a poem during World Environment Day



The beauty of conserving biodiversity-Nairobi National Park, Kenya

Questions

1. What is the poem about?
2. Why is the author sad?
3. What are the environmental challenges brought out in the poem?
4. Suggest solutions to these challenges.
5. What does our faith teach us about this?
6. Is this happening in your community? How do you feel about it?

Values to be developed

- Respecting God's creation
- Care for God's creation and preserve its beauty



Skills

- Ability to be creative in response to challenges facing the environment
- Communicating effectively about the environment



The 16th century Christian Martin Luther wrote: "God writes the Gospel not in the Bible alone, but also on the trees, and in the flowers and clouds and stars." We should not abuse God's creation.

Sustainable agriculture emphasises the need to protect the environment while ensuring farms are economically viable.



4.6 Agriculture

Introduction

The word agriculture originates from two Latin words *ager*, which means land or soil and *cultura*, which means cultivation, care or management of the land. Agriculture therefore is the science, art, and business of cultivating the soil, producing crops, and raising livestock.

Agriculture wholly depends on land – virtually all agricultural activities take place on land or in water bodies that occupy some portion of land. The wellbeing of land is therefore a common concern for all of us. For us to achieve this faith-based values play a key role in understanding that protection of the land and its beauty is a sacred trust given to us by God; Hindu, Muslim and Christian teachings all emphasise this principle.

Agriculture is one of the major drivers of Kenya's and the global economy. If not well done, agricultural activities can seriously damage the environment. Sustainable agriculture is agriculture that balances between increased production, income and conserving the environment at the same time. This is sometimes called climate smart agriculture.

Climate change will affect agriculture through higher temperatures, greater water demand by crops, more variable rainfall and extreme climate events such as heat waves, floods and droughts. Sub-Saharan Africa is expected to be one of the hardest-hit areas. Climate-smart agriculture is a form of sustainable farming which seeks to adapt to these challenges; for example, by improving the soil's ability to retain water better through mulching and minimum disturbance of the soil (minimum tillage); this is also called conservation agriculture. (See Unit 4.7 for more information on climate change.)

Several global events have been set aside to enlighten the world on celebrations that have a strong bearing on agriculture. These include World Water Day (March 22nd), World Environment Day (June 5th), World Population Day (July 11th), World Food Day (October 16th), World Peace Day (September 21st), Human Rights Day (December 10th) and others (See more details in the Appendix.)

This section on Agriculture has two sub-units, namely soil and crops.

4.6.1 Soil



Objectives of the sub unit:

By the end of the sub unit the learner should be able to:

- Explain causes of soil erosion.
- Develop activities to promote soil conservation in school and the community.
- Appreciate the importance of agriculture as a source of income.

Introduction

Soil is defined as the top layer of the Earth's crust. It is formed of mineral particles, organic matter, water, air and living organisms. Soil is fundamental to crop production. Without soil, no food could be produced, nor would livestock be fed. Because it is finite and fragile, soil is a precious resource that requires special care from its users. Soil is vital for our existence. God gave us this resource for our use. It is therefore everyone's responsibility, as spelt out in Hindu, Muslim and Christian teachings to take care of soil.

Agricultural production depends on soil fertility. Soils are easily destroyed if not properly managed. Soil degradation results when the physical, biological and chemical properties of soil are affected negatively and its ability to provide the various functions we need is reduced.

Human activities that may cause soil degradation include:

- Uncontrolled irrigation activities.
- Burning trash, which kills soil microorganisms and other organisms in the soil.
- Poor agricultural practices, such as improper use of artificial fertilisers and pesticides (leading to soil pollution), digging up and down slopes (leading to erosion).
- Over-cultivation of land to produce crops.
- Over-grazing by animals which destroys soil cover and encourages erosion.

Importance of agriculture

Agriculture has several benefits to humans:

- a. It provides food for both rural and urban populations.
- b. It is a source of employment, e.g. people working in agro-based industries such as sugar and tea factories.
- c. It provides raw materials for industry, e.g. the sugar, milk and coffee processing industries.
- d. It provides a market for industrial goods, e.g. packaging materials, agro-chemicals and farm machinery.
- e. Agriculture earns farmers a source of income through the sale of their produce, which helps to raise their living standards thus alleviating poverty. This is a form of self-employment.
- f. It is a source of foreign exchange through the export of surplus agricultural goods such as tea, coffee, sisal flowers and pyrethrum.



Agriculture provides food to grow



Agro-forestry can improve soil structure

Soil erosion

Soil erosion is the carrying away of the fertile top layer of soil through agents of erosion such as wind, water and animals. This is a naturally occurring process on all land. However, poor land management and poor agricultural practice can greatly increase the rate at which soil is eroded. The loss of soil from farmland may be seen in reduced crop production, lower surface water quality and damaged drainage networks.

Soil conservation

Soil conservation is a set of management strategies that help prevent soil being eroded from the Earth's surface or becoming chemically altered by over-use, acidification, salinisation or other forms of chemical soil pollution.

Soil conservation methods

There are several methods recommended for soil and water conservation. Some are very simple and we can do them at school or home, while others require guidance from specialists. These include:

- **Planting trees** – Tree roots help to hold soil particles together, thus preventing soil erosion.
- **Building terraces** – Terraces prevent rapid surface runoff of water.
- **No-till farming** – This is a way of growing crops without disturbing the soil through tillage.
- **Contour farming** – This practice of farming involves carrying out all field operations such as planting and weeding across the slope. It helps control erosion and increase penetration of water into the soil.
- **Crop rotation** – This is a method of growing different crops in an area in a particular sequence. It helps in the improvement of soil structure and fertility, as well as controls pests and diseases.
- **Maintaining pH** – Soil pH is the level of acidity or alkalinity of the soil, and has a strong effect on how plants absorb and use nutrients from the soil. Maintaining the correct value of soil pH is thus essential for soil conservation.



Mulching enhances soil fertility

- **Irrigation** – This is watering of the soil, which provides moisture for growth of plants and also reduces soil erosion by wind.
- **Salinity management** – Salinity is the level of salts such as sodium sulphate in the soil. High salinity has a negative effect on plant growth. Death of vegetation leads to soil erosion.
- **Promoting helpful soil organisms** –Earthworms and other organisms in soil enhance the availability of nutrients. These helpful organisms boost soil fertility and help in soil conservation.
- **Mulching** –This reduces loss of water from the soil

Faith-based Reflections on Soil

Agriculture is the oldest profession mentioned in the Bible, the Qur'an and in Hindu scriptures. The original duty given to human being was to take care of all crops and animals. Agricultural activities and soil take special significance in several religious teachings.

Christianity

The name "Adam", given in the Bible to the first man, simply means "earth" or "soil" in Hebrew, which emphasises that we come from the very soil upon which we depend for life. Christians recognise that we come from the Earth and to the Earth we will return. As the Theological Charter of the Environment adopted in Rwanda in 2011 states:

"We commit to mobilise Christians from Protestant Council of Rwanda member churches to value more the land, to protect and manage it in proper manner, because we human beings were created out of the land, the soil; we live on it, get our livelihood from it and will return to the land as we depart from our present-day existence."

This also means that Christians believe that the land does not belong to us but that we belong to the land. Ultimately, both we and the land belong to our Creator, God.

The Bible was written in agrarian and pastoral times, so there are lots of verses related to farming, including Gen. 1:11, Gen. 1:28, Gen. 2:15, Gen. 3:19, Deut. 7:13, 1 Kings 21, 1 Chron. 27:26–31, 2 Chron. 26:10, 2 Chron. 32:28, Psalms 115:16 and Isaiah 5:8. The emphasis is on working with the land in a sustainable and sacred way:

"You shall sow your fields, prune your vineyards, and gather your crops for six years. But the seventh year is to be a year of complete rest for the land, a year dedicated to the Lord. Do not sow your fields or prune your vineyards. Do not even harvest the corn that grows by itself without being sown, and do not gather the grapes from your un-pruned vines; it is a year of complete rest for the land." (Leviticus 25:3–5)





Hinduism

In Hindu scriptures, it is said that the line drawn by the plough is the line dividing wilderness and civilization in human history. Some of the oldest writings on agriculture are found in Hindu scriptures. Agriculture gives you property and intellect or mental sharpness, according to Krishi Parashar, a reference book on agriculture written around 1000 AD. Krishi Parashar talks in detail about the area that has to be ploughed and different types of soils.

Agriculture is the basis of human life and farming is a noble profession because farmers sustain the world and its creation. There are several mantras devoted to agriculture and methods of farming, irrigation systems, and plantations.

In the Rig Veda we have this hymn (Rig Veda, 4:57):

"We will win (cultivate) this field with the Lord of the Field; may he nourish our cattle and our horses; may he bless us thereby.

"O Lord of the Field! bestow on us sweet and pure and butter-like and delicious and copious rain, even as cows give us milk. May the Lords of the water bless us.

"May the plants be sweet unto us; may the skies and the rains and the firmament be full of sweetness; may the Lord of the Field be gracious to us. We will follow him, uninjured by enemies.

"Let the oxen work merrily; let the men work merrily; let the plough move on merrily. Fasten the traces merrily; ply the goad merrily."

Islam

There are many examples in the Qur'an where Muslims are taught to care for and respect the Earth and to respect the close relationship with the Earth. Verses 17 and 18 of Surat Nuh say: "And Allah has produced you from the Earth, Growing (gradually) And in the End He will return you into the Earth, And raise you forth."

Planting trees and cultivating land, instead of leaving it barren and unfruitful, is an integral part of Islam. The Prophet Muhammad (pbuh) told his followers they would be rewarded by God for taking care of the Earth.

He said: "If any Muslim plants any plant and a human being or an animal eats of it, he will be rewarded as if he had given that much in charity." (Sahih Al-Bukhari, 8:41) He also said: "Whoever bringeth the dead land to life; that is cultivateth waste land, for him is reward therein."

Islam is considered a comprehensive way of life whose teachings cover, directly or indirectly, every possible human relationship including that with the environment. These teachings are primarily available in the revealed knowledge which comprises the Qur'an and the Sunnah.



Farming God's Way

Farming God's Way is a form of sustainable agriculture that has been developed by a group of Christians in East Africa. They believe that the Bible is crucial to bringing hope to farmers, reducing hunger and restoring the value we place on farming. They often ask farmers: "What does your faith in Jesus Christ mean for your way of life as a farmer?"

What would you say if someone asked you that question?

Farming God's Way says that God should be put back into the centre of agriculture. He is the First Gardener, the First Farmer and the First Forester. Farming God's Way teaches a vision for transforming agriculture that begins with God, and His intention that the Earth would be a place of abundant provision and blessing to His people.

"The beauty of a healthy, productive and well cared for agricultural landscape should be a testimony to the Christian faith," says Craig Sorley, a Farming God's Way trainer in Kijabe, Kenya, in his book *Farming that Brings Glory to God and Hope to the Hungry*.

He adds: "Farming is a meaningful and noble way of life because God was the First Farmer and God has given farmers a special responsibility to care for their landscapes in the best way possible. Godly agriculture gives priority to healthy food and to the needs of the poor and hungry. Godly agriculture is not wasteful. Godly agriculture pays attention to detail and pursues excellence in all aspects of its practice."

Farming God's Way says it is unbiblical to use land year after year without reprieve. They point to quotes such as Leviticus 25:2-5 – "the land is to have a year of complete rest" – and say God understands that the land needs rest, just like people need rest. Leaving the land for one year is not possible for many farmers and so Farming God's Way has developed a method of farming that not only restores the strength of the land but also has great potential to dramatically improve crop yields, even in drought prone areas.

This uses a combination of no tillage or minimum tillage (so you disturb the soil as little as possible), crop rotation and mulching (covering the soil with a protective layer of vegetation, such as grasses) to help it absorb water much better than bare soil.

Could you write a poem to the land about its need to rest?

"When you enter the land that the Lord is giving you, you shall honour the Lord by not cultivating the land every seventh year. You shall plant your fields, prune your vineyards, and gather your crops for six years. But the seventh year is to be a year of complete rest for the land, a year dedicated to the Lord. Do not plant your fields or prune your vineyards. Do not even harvest the grain that grows by itself without being planted, and do not gather the grapes from your un-pruned vines; it is a year of complete rest for the land." (Leviticus 25:2-5)

In these verses from Leviticus, we understand that God ordains that the land is given a time of rest, a "Sabbath", a common practice in many traditional societies. What do you think the advantages of allowing land under protection to rest?

In our world, does the concept of Sabbath have anything to contribute to the way in which we view our land today?

The key to Farming God's Way is a very deliberate attempt to restore the health and fertility of the soil by covering the agricultural soil, at all times, with a layer of mulch called "God's blanket". This can include old crop residues, leaves, grass and other plant material. It protects the soil from erosion and helps to conserve soil moisture, even during dry conditions. This reverses the process of degradation and exhaustion in the land. It aims to feed and protect the soil, to revive and refresh its strength, so that in turn the soil will be able to feed us.

The ideas behind Farming God's Way are now being taken up by Muslim farmers in Kenya who are developing a similar system of farming called Farming Islam or Farming in Allah's Way.

Suggested activities

Learning from micro-projects

Example of a project on soil and agriculture

Name of project: Planting fruit-bearing trees in Young Muslim Primary School - Garissa

The Project

Young Muslim Primary School, Garissa, Kenya, engaged in planting of fruit trees. The school is located in Northern part of Kenya, which is largely a semi-arid region, receiving rainfall of less than 500 mm per year. The general weather conditions are therefore dry and hot most of the year.

The school was motivated to undertake the fruit-tree growing project in order to cut down on costs of importing fruit from Thika, about 300 km away. The open, bare school ground meant there was no shade where pupils and teachers could enjoy some coolness in the day. The project was therefore designed not only to supplement the diet of the pupils by providing fruit, but to also to provide shade where pupils could rest and even take lessons during extreme hot weather conditions.

It was also hoped that the project could help generate income from the sale of fruit to the local community, and that it would challenge the community members to learn from the school and engage in similar enterprises to improve their livelihoods.

Project development, operation, stakeholders/participants

The school collaborated with the local community to plant 10 mango, 40 pawpaw and 100 Neem seedlings. The local community members were very helpful in sharing indigenous knowledge on the trees, selection of the site and in preparing holes for planting. The school also partnered with KOEE and ARC which assisted with funds as well as in monitoring and evaluation.

Apart from being involved in the actual planting of the trees, the school environmental club members and teachers worked to ensure the trees would be safe, protecting them from

livestock and watering the seedlings. The Young Muslim Association, a local community-based organisation, was instrumental in mobilising the community to partner with the school and support the project fully.

In the words of Deputy Head Teacher Mohammed Youssef Dahir, the school is proud of the project: "My school is a faith-based school, the sponsors are the Young Muslim Association. For us, happiness is when we see that religious values are incorporated into the learning process, and that learning can help us address our local challenges. This is something we have advocated for and been looking forward to achieve."



Dry land is not wasteland

Project benefits

The project is already turning the school green. Increased vegetation cover from the planted trees is transforming the school scenery. It is expected that once the trees mature and bear fruit, the project will greatly contribute to the food supply and make savings for the school. With an improved diet for pupils, the school expects the enhanced learning will lead to improved academic performance.

Curriculum links

As both pupils and teachers work on the project to see fully-grown, fruit-bearing trees, they are learning practical skills of dry-land farming. The project will further enhance the teaching and learning of science since the emerging forest can be used as a natural classroom, especially for biological sciences, or be a source of specimens.

Challenges

The school had some challenges in implementing the project, but the top on the list was scarcity of water for irrigating the young trees as the school is in a semi-arid area. An improvised drip irrigation system was used to address this challenge. Plastic pipes with perforated holes were laid to provide water for the young trees. This method is economical in water use, with almost no wastage, as water drips directly at the base of the plant's root zone. Mulching with dry grass was also used to reduce water evaporation.

Follow up questions to prompt action

1. From the project carried out at Muslim Primary School, what local problems did it seek to address?

2. What factors led to the success of the project?
3. In what ways do you think the pupils will benefit directly from the project?
4. What lessons can we learn from the project?

Values enhanced

The success of the project required collaboration of all school community members, e.g. in planting and watering of the trees. Teamwork was therefore enhanced, alongside learning to practice sustainable farming, e.g. use of the drip irrigation method as opposed to overhead or use of watering cans. This demonstrates how the school community avoided wasting the precious scarce water – an innovation that pupils and local community members could try at home.



Skills developed

Practical skills in agriculture and changed attitudes towards the subject were achieved. Communication skills as well as creativity in solving local challenges using education were also enhanced.

'Climate smart'
agriculture
increases
agricultural
productivity

4.6.2 Crops and livestock



Objectives of the sub-unit:

By the end of the sub-unit the learner should be able to:

- List types of crops in the school surrounding
- Participate in planting different types of crops in the school and local community
- Appreciate different types of crops as a source of livelihood

Introduction

A crop is a domesticated plant grown for food and other uses. In order to get high crop yields, it is necessary to ensure the land is proper land preparation, timely planting, use of good seed, as well as good management of the crop in the field. Weather conditions also play an important role in determining the yields a farmer can get.

Types of crops

The major types of crops are food crops and cash crops.

Food crops

These are grown for food. They are classified into cereals (e.g. maize, wheat, sorghum, rice, and millet); pulses (e.g. beans, pigeon peas, cowpeas, chickpeas, green grams); roots and tubers (sweet potatoes, Irish potatoes, cassava, arrow roots and yams). The main food crops in Kenya are maize, rice, wheat, sorghum, potato, cassava, vegetables and beans.



Some common food crops (From Left: sorghum, maize and vegetables)

Cash crops:

These are crops grown for sale. Types of cash crops include beverage crops, fibre crops and oil crops. Some of these crops provide raw materials for industry. Examples of cash crops include: tea, coffee, sugar cane, cotton, sunflower, pyrethrum, barley, tobacco, sisal and coconut.

Farming God's Way increases crop yields and makes us faithful stewards of the land.



Farming God's way promotes mulching

Livestock production

This involves the rearing of animals for their products such as meat, milk, eggs, wool, and honey. Some animals provide farm power for transportation of farm produce and tilling of land. Examples of livestock: cattle, donkeys, camels, goats, rabbits and pigs; birds (poultry) such as chickens, turkey, geese, pigeons and ducks. Other livestock includes fish and insects such as bees.

Agriculture as a Business

Agri-business is a term for the various businesses involved in food production, including farming; supply of seeds, agro-chemicals, and farm machinery; wholesale and distribution, processing, marketing, and retail sales. For a long time, agriculture in rural communities has been more a way of life than a business. This has led to low profits against very high capital or financial investments. There is a need to employ the basic principles/rules of economics in farming to ensure efficient allocation of labour, capital and other resources in return for higher profits.

Faith-based reflections on Crops and Livestock



Christianity

The Bible makes it clear that crops and livestock are the gifts of God:

“I give you every seed-bearing plant ... and every fruit with seed in it. They will be yours for food.”(Genesis 1:29)

Throughout biblical times, however, food production could be disrupted by bad weather, war and agricultural malpractice. Famine was a real risk. When Jesus told the parable of the sower, it would have been easily understood by his listeners:

“Once there was a man who went out to sow corn. As he scattered the seed in the field, some of it fell along the path, and the birds came and ate it up. Some of it fell on rocky ground, where there was little soil. The seeds soon sprouted ... but when the sun came up ... because the roots had not grown deep enough, the plants soon dried up. Some of the seed fell among thorn bushes, which grew up and choked the plants. But some seeds fell in good soil, and the plants produced corn...” (Matthew 13:3–8)

Good agricultural practice has always been of vital importance. When the Roman Empire, which covered most of Europe, the Middle East and North Africa until the fifth century AD, collapsed, it was partly because it had so over-exploited the land that the soil was exhausted and deserts had spread into former fertile land. Sustainable agriculture was re-introduced by Benedictine monks in the sixth century, based on Old Testament models such as letting the land rest every seven years, replanting and protecting watershed areas with trees and re-introducing proper organic fertilisers.



Hinduism

In Hindu scriptures, Sage Parashar talks about the best time to collect seeds and how they must be dried in the sun and then kept in a good, safe place. Krishi Parashar also describes the rainfall needed for crops. This ancient book on agriculture makes it clear how valuable crops are.

The cow is considered sacred in Hinduism. Eating what it produces – milk, curds, butter – will, Hindus believe, cleanse the body and purify the soul. An idea of how important the cow is can be seen in Hymn 169 of the Rig Veda: “May the wind blow upon our cows with healing; may they eat herbage full of vigorous juices. May they drink waters rich in life and fatness...”

Hindu scriptures contain hymns to Mother Earth (Bhumi Sukta): “Earth, in which the seas, the rivers and many waters lie, from which arise foods and fields of grain, abode to all that breathes and moves, may She confer on us Her finest yield.” (Atharva Veda XII 1:3)

Islam

In Islam agriculture is clearly articulated in the teachings of the Qur'an which makes it clear that everything comes from Allah. "It is He who produces gardens, both cultivated and wild, and palm-trees and crops of diverse kinds, and olives and pomegranates, both similar and dissimilar. Eat of their fruits when they bear fruit and pay their due on the day of their harvest, and do not be profligate. He does not love the profligate." (Qur'an 6:141)

We need to respect agricultural activities and show gratitude to Allah for his generosity as a fulfillment of our religious responsibilities.

- "Then we brought forth you therewith gardens for date-palms and grapes, wherein is much fruit for you and whereof you eat." (Qur'an 23: 18-19)
- "And do they not see that we do drive rain to parched soil (bare of herbage), and produce therewith crops, providing food for their cattle and themselves? Have they not the vision?" (Qur'an 32:27)



Suggested activities

Brainstorming

Brainstorm on importance of crops in community



Objective

To explain the importance of crops in the community

Man is accountable to God for how he treats God's creation.



Materials

- Real crops
- Charts showing crops in the community
- Pictures of crops in community



Notes to the teacher

- Find about the different crops found in the community and their importance before the lesson.
- Identify the issue for discussion, e.g. crops found in the community and their importance.



Procedure

- Pose a question such as: “Which crops are grown in your community?”
- Let learners give answers, ideas or opinions spontaneously.
- Allow a free flow of answers from learners without interruption.
- Note down all the suggestions for other learners to see (focus on generating ideas and not discussing them).
- Guide the learners to select and sequence the suggestions as to how the crops can be used (food, income generation, offerings at places of worship, religious festivals).
- Summarise the main points of the lesson, incorporating responses from the learners.

Questions

- What religious values do we need to use the crops wisely?
- What can young people do to help their parents/guardians at home in practicing agriculture?
- Explain how crops can be used to reduce poverty in the community.

Values enhanced

- Love/fairness in sharing of crop products
- Respect for God’s creation
- Positive attitude towards agriculture as a form of livelihood



Skills

- Ability to think critically
- Ability to tend for crops
- Oral communication skills improved

*Deforestation
accelerates
climate change*



4.7 Climate change

Introduction

Climate change is a serious problem facing our world and our country today. To understand climate change, we need to understand what weather is and the relationship between weather and climate. Weather is the condition of the atmosphere of a particular place at a given time. The sum total of weather conditions over a long period of time is climate.

Climate is expected to change after a period of time. Extreme weather changes such as floods, droughts and cyclones have become frequent in different parts of the world, and usually cause loss of lives and property. As a result of climate change these extreme weather changes are happening with increased intensity and have become less predictable. Effects of climate change affect all of us because we depend on each other and on the same natural resources of the world.

In this unit we shall discuss the causes of climate change, effects of the climate change and possible solutions to climate change. We learn that appropriate application of religious values will help us address some of the challenges of climate change.



Flooding is more frequent and severe – Kano, Kenya

Climate change is a major global concern that requires everyone's contribution, no matter how small it may appear. Every sector of our country's economy, and thus the global economy, is affected by climate change. We can take part in the global fight towards climate change at the school level by learning about climate change and how to mitigate it, and through school-based activities anchored on the global agenda on climate change.

This can be done by taking part in world events that address issues of climate change, such as the following (see more information in the Appendix):

- World Wetlands Day (February 2nd)
- World Water Day (March 22nd)
- World Forests Day (March 21st)
- World Health Day (April 7th)
- World Environment Day (June 5th)
- World Desertification and Drought Day (June 17th)
- World Population Day (July 11th)
- World Ozone Layer Day (September 16th)
- World Tourism Day (September 27th)
- World Food Day (October 16th)
- World AIDS Day (December 1st)

This unit has three sub-units, namely causes of climate change; effects of climate change and suggested solutions to climate change.

There are suggested activities that the teacher could guide learners to carry out to help them acquire faith-based values and develop skills to enable them to contribute towards solving the challenges brought about by climate change, which in turn promotes sustainable development.



Objectives of this sub-unit

At the end of the unit the learner should be able to:

- State causes of climate change.
- Explain effects of climate change on human activities.
- Carry out activities that will help solve challenges of climate change in the school and neighbourhood.

4.7.1 Causes of Climate Change

Introduction:

To understand climate change we need to understand what greenhouse gases are. When light rays from the sun hit the Earth's surface, some of the rays are turned into heat while some are sent back (reflected) into the atmosphere. The rays reflected back are then absorbed by some of the gases in the atmosphere. These gases act as a 'blanket' to keep some of the warmth wrapped within our planet, otherwise all the heat energy would escape back into space. These gases work more or less like the glass of a greenhouse that 'traps' the heat inside the greenhouse. Gases which have this kind of behaviour are known as greenhouse gases (GHGs). Examples include carbon dioxide, methane, nitrous oxide and water vapour.

GHGs are very important for life on Earth. Without them the average temperature of the Earth would be -180 C. Heat energy from the sun would be lost back into space making the Earth very cold. However, humankind's activities are helping to create more and more greenhouse gases

in the atmosphere, leading to more heat being absorbed and so causing the temperature on Earth to rise. This scenario is commonly called global warming.

Human activities that increase amounts of GHGs such as carbon dioxide in the atmosphere are also responsible for bringing about climate change. These activities include:

- Burning of fossil fuel oils, e.g. gas and coal.
- Agricultural practices such as burning bushes.
- Deforestation – cutting trees without replanting others.
- Converting forests into agricultural land.
- Poor servicing of vehicle engines.
- Using chemical substances that destroy the ozone layer.



Unchecked logging impacts on climate

Activities that increase carbon dioxide in the atmosphere are said to leave a “carbon footprint”. Just as walking through mud leaves a footprint on the land, so many of our choices and actions can either increase or reduce our carbon footprint and therefore increase or reduce the effects of climate change.



Suggested activities

Weather

Develop a picture story on weather changes



Objective

Identify weather changes



Materials

- Charts
- Puppets
- Costumes
- Real items



Notes for the teacher

- Identify a story that is relevant to weather changes, e.g. the story of Noah and the flood in the Bible.
- The story should be short, not too scaring or confusing.
- Ensure the story brings out religious values such as love, respect, harmony, accountability to God.

NB: You can also ask learners to develop their own picture stories based on elements of weather.



Cutting trees without replacing reduces access to water



Procedure

- Read through the story with the learners. Choosing one of them to read a section at a time may be better. If the story is not written, then it can be narrated.
- Use probing questions to help pupils imagine what the situation would have been like.
- Give learners some hints on what pictures are expected.
- Guide learners to develop pictures that will tell the story. The pictures should be clear and easy to follow.
- Let the learners put the story in writing.
- Guide the learners to tell the story; encourage them to use gestures, mimicry, tonal variation.
- Encourage learners to use songs or chants to make the story interesting.
- Use probing questions to guide learners internalise the story.

Questions

- What are the weather elements in the story?
- What are the religious values brought out in the story?
- How does weather affect our community?

Values

- Treat all people with respect and consideration
- Live in harmony with nature



Skills Developed

- Ability to think creatively
- Ability to solve problems related to weather challenges
- Effective oral communication
- Writing/reporting skills

4.7.2 Effects of Climate Change in Kenya

Although drought is a normal hazard in arid and semi-arid regions, our country has time and again experienced pro-longed droughts with many negative effects. Climate change has led to increased severity, frequency and unpredictability of droughts. Droughts are periods when rainfall is not received in an area for a long time – usually leading to inadequate food, pasture and water. In some areas, such as Magadi, droughts have lasted for as long as three years. In such cases many crops and livestock are lost.

Current research shows that the effects of climate change are going to be experienced in many ways such as:

- Extreme fluctuations in rainfall, drought and floods. Farming will be difficult since these events will be more unpredictable.
- Reduction of ice on Mount Kenya due to increasing atmospheric temperature, leading to melting of ice.
- Reduced crop and livestock rearing will lead to food insecurity.
- Reduced rainfall will reduce the generation and supply of hydro-power.
- Disruption of migration patterns of wildlife, which will affect tourism and related activities.
- Rising sea levels; this will affect coastal areas and cause people to move from their areas in search of safer places. This will bring about environmental refugees and also affect tourism.

These are just a few of the effects of climate change. Which others can you think of? How do you think your community is affected by climate change now?



Suggested activities

Brainstorming

Effects of climate change



Objective

To explain the effects of climate change in the community



Materials

- * Manila papers
- * Felt pens
- * Pictures showing incidences of climate change



Notes for the teacher

- Find out about the different effects of climate change in the community before the lesson.
- Identify the issue for discussion and establish the criteria for discussion, for example, the effects of climate change on farming activities in the community.



Procedure

- Pose a problem. For example, how has farming been affected by climate change in your community?
- Let learners give answers, ideas and opinions spontaneously.
- Allow free flow of answers from learners without interruption.
- Note down all the suggestions for other learners to see (focus on generating ideas and not discussing them).
- Guide the learners to select and sequence the suggestion as to how the effects of climate change can be beneficial (increased food production, income generation).
- Summarise the main points of the lesson incorporating responses from the learners.
- Record the effects both positive and negative on charts.

Man is
entrusted to
care for God's
resources

Questions

- What religious values do we need to cope with effects of climate change?
- What can we do to adjust to climate change and its effects?
- Explain how effects of climate change can be positively used to improve livelihoods of the community

Values

- Live in harmony with nature
- Appreciate elements of weather as a creation of the supreme being



Skills

- Ability to think creatively
- Ability to solve problems related to weather challenges
- Ability to communicate effectively orally and in writing

"Nature is a good servant, but can be very unforgiving if mistreated" – Prof. Wangari Maathai (Nobel Peace Prize Winner 2004)

4.7.3 Addressing Climate Change

Introduction

The extreme fluctuation in rainfall means people may not be able to grow or purchase enough food for their needs. We need to devise ways that help store and conserve rainwater for later use by communities. Such ways include construction of sand dams and water pans. The stored water can then be used for raising crops and livestock. If treated, the water can also be used for domestic purposes.

Crop varieties that are tolerant or resistant to drought need to be developed and promoted. Such crops will ensure a continuous supply of food even during droughts. Traditional crop varieties such as cassava, sweet potatoes and simsim have been proved resistant to drought by scientists. Some communities are already turning to increased production of such crops. Seed-banking for such crops is now being encouraged over the world. The older members of society are very helpful in identifying and advising about these crops as they share indigenous knowledge.

Widespread education of the general public about the reality of climate change and its effects should be carried out. An informed society will make wiser decisions and choices.



Use of biogas reduces GHGs

Faith-based Reflections on Climate Change



Christianity

Ultimately, God is the one in control of the climate. When He was disappointed with the violent and wicked lives people were leading, He used a flood to wipe them from the Earth and start afresh with Noah, the “only good man of his time” (Gen. 6:10).

However, God then set a rainbow in the sky and proclaimed that He would never again use floods to destroy life. The Covenant that God made (Gen. 9:8–17) was with every living thing, not just human beings. Christians believe that God has always honoured this Covenant. This means that the disasters we now face must be because of our own sinful and foolish actions.

As the Rainbow Covenant launched by WWF in 1987 says:

“Now we need a new Covenant. God’s promises we do not doubt. It is humanity that we cannot trust. We hold the power of life or death. We have already swept away countless ‘living creatures of every kind that are found on the Earth’. Unless we change, we, not God, will destroy life. Unlike God, however, we cannot ... create a new heaven and a new Earth.”

The Christian response to global climate change should therefore be to uphold humanity’s part of the Covenant and have respect for God’s creation.



Hinduism

Hindu scriptures teach that “after creating the Universe God entered into every object created” and consequently his creations must be treated with respect. As Sri Krishna says in the Bhagavad Gita: “On me the Universe is strung like clustered pearls upon a thread... In water I am the flavour, in sun and moon the light... I am the fragrance of earth, the brilliance of fire.”

This view of the relationship between God and creation inspires Hindus to maintain a harmonious relationship between human beings and nature. As the Hindu Declaration on Climate Change, made in 2009, makes clear:

“The Hindu tradition understands that man is not separate from nature, that we are linked by spiritual, psychological and physical bonds with the elements around us. Knowing that the Divine is present everywhere and in all things, Hindus strive to do no harm. We hold a deep reverence for life and an awareness that the great forces of nature—the earth, the water, the fire, the air and space, as well as all the various orders of life, including plants and trees, forests and animals, are bound to each other within life’s cosmic web. ...

“We cannot continue to destroy nature without also destroying ourselves... We must, in short, move rapidly towards a global consciousness that replaces the present fractured and fragmented consciousness of the human race.”

Islam

Islam urges humans to use natural resources well and engage in useful production, but without doing harm to people and nature. Interestingly, Islam teaches that species including plants and wildlife are in a state of prayers (tasbeeh). The harm of any species means that we are disrupting the symphony of life and silencing worshippers.

Islam not only asks humanity to protect and conserve the environment, it also invites mankind to respect, cherish and enjoy nature. As God says in the Qur'an: "...But do thou good, as Allah has been good to thee, and seek not (occasions for) mischief in the land: for Allah loves not those who do mischief."

Ihsan is an Arabic term meaning "perfection" or "excellence". It is also translated as "to do beautiful things" and is associated with intention. It is a key concept in Islam driving notions of human stewardship, responsibility and excellence.



Suggested activities

Developing a Picture Book

Solutions to Climate change



Objective

Develop a picture book to show solutions to climate change



Materials

- Pictures of different activities in response to climate change such as irrigation schemes, agro-forestry activities, soil conservation, use of renewable sources of energy (biogas, solar, wind)
- Plain paper/clean cartons
- Glue/locally made sticking material
- Scissors/razor blades
- Marking pens/coloured pencils



Notes for the teacher

- Read widely about solutions of climate change.
- Ask learners to obtain pictures of different activities on solutions to climate change in advance.

NB: Guide pupils to the appropriate materials to get pictures from, to avoid cutting them out of books.



Procedure

- In groups let the learners observe the pictures they have come with to identify the different responses to climate change.
- Learners should trace or cut out pictures from existing materials such as magazines, newspapers, food packs, calendars or draw their own.
- Sort the pictures in alphabetical order and stick them on plain papers or clean cartons and organise them into a simple book.
- Guide learners to make the content and cover page.
- Encourage learners to make their book covers attractive and interesting (so that people want to find out more about it).



Water pans trap and store water

Values

- Working together as a team
- Respecting each other's opinion



Skills

- Ability to think creatively and critically

Summary of school micro-projects

Introduction

This section is a brief summary of the pilot projects implemented by ten schools in Kenya. They all demonstrate good practice in various thematic areas as covered in this toolkit. Projects in the first three schools have already been discussed as project-based learning case studies in section four of the toolkit, hence are not described in detail in this section. A project on re-use of waste tyres by Samaj school in Nairobi is included in this section, though Samaj was not one of the pilot schools.

1. **Smart Sanitation & Hygiene Solution at M.C.K Kirukuma Methodist Academy:**
The project: Construction of three ventilated improved pit latrines – see details in section four.
2. **Energy Project: Nambale A.C Primary School**
The Project: Tree planting for provision of wood fuel - see details in section four.
3. **Agriculture Project: Young Muslim Primary School - Garissa**
The Project: Planting fruit-bearing trees - see details in section four.
4. **Water and Sanitation: Iriaini Primary School, Meru County**
The project: Construction of 5 Hand Wash Facilities

Iriene primary school is located in Imenti South district on the eastern slopes of Mount Kenya, Meru County. Poor sanitation conditions led to high level of absenteeism among pupils due to water and sanitation related illnesses. With only one hand washing facility against hundreds of pupils, the facility suffered frequent breakages due to the ensuing competition as pupils scrambled for the service. This led to confusion and waste of time for learning since the attention of teachers and prefects was always needed to create some order at the WASH facility. The school thus constructed a 2000 liter water tank to harvest rain water. The number of WASH points was also increased from one to five. The school also aimed at incorporating faith-based ESD values in the teaching/learning of WASH using the project.

Project development, operation, stakeholders/participants

With financial support from KOEE and ARC, five (5) hand-washing facilities were constructed to increase the number of wash points from one to eleven. Since the only existing water point was far away from the toilets, pupils found it difficult to access the facility after visiting the toilet. The new hand wash facilities were constructed near the toilets to solve this challenge. Parents and the larger community made financial contributions through the school management committee to help supply soap for the pupils. This was a great boost to the project.



Pupils at a new wash point



Teachers' wash point



Pupil's water drinking point

Project Benefits

A major benefit from the project was improved hygiene conditions among the pupils. According to the school management, the number of stomach-upset cases among pupils reduced by almost 90%. Absenteeism by pupils due to water-related diseases resulting from consumption of unsafe water also reduced drastically.

Curriculum Links

The project has been found useful in the teaching/learning of practical aspects of WASH, e.g. demonstration of proper hand-washing procedure.

Project challenges

Inadequate supply of soap was reported the outstanding challenge, coupled with theft of the same. Inconsistency in use of soap compromised the expected benefits from the project.



Follow-up questions for action

1. What local problems did the project seek to address?
2. What factors led to the success of the project?
3. In what ways do you think the pupils are benefiting from the project?
4. What lessons can we learn from the project?

Skills and Values enhanced

Through the project, teaching of responsibility and stewardship among pupils has been done using various methods, including weekly school pastoral programmes, school assemblies and through environmental club meeting sessions.

The project enhanced innovativeness among the pupils especially in developing the designs of WASH points and in development of talking walls /murals. Proper resource utilization was also developed among the pupils as the project stressed the importance of using water responsibly. Teamwork and cooperation is also enhanced as the pupils work jointly to maintain the WASH facilities and talking walls/murals.

5. Smart Rain Water Harvesting and Hygiene Solution- Kambala Primary School

The project: Rain water harvesting

Kambala primary school is situated in Molo, Nakuru County of the Rift valley region. The school had no source of water of its own; thus depended on piped water from a community borehole which it paid for, yet got insufficient amounts of water for the daily needs. This compromised the sanitation and hygiene standards in the school, leading to frequent outbreaks of waterborne diseases among pupils. A lot of money was spent on treatment of pupils, with cases of absenteeism rating high and negatively affecting performance.

The school thus started a project to harvest rain water in order to reduce water shortages in the school at a lower cost. With financial support from KOEE a plastic tank with a capacity of 5000 litres was installed (alongside the gutter and pipe systems) to trap and store rain water. In addition, three hand washing facilities were provided to ensure improved hygiene and sanitation.

Benefits

The water storage capacity at the school was increased hence ensuring continuous and consistent water supply. Construction of more wash points led to improved hygiene standards among pupils, thus reducing water-borne illnesses and cutting on treatment costs.



Washing hands with soap prevents infections



Curriculum links

The projects' facilities are used by teachers across all curriculum subjects in teaching of practical aspects about water, sanitation and hygiene.

Challenges

The urinal facility for boys collapsed during heavy rains experienced in 2012, causing congestion in the facility that survived.

Follow-up questions for action

1. What local problems did the project seek to address?
2. In what ways do you think the pupils are benefiting from the project?
3. How do the conditions at Kambala primary school before the project compare with the current conditions at your school?



Skills and Values enhanced

Faith-based values such as respect and care for resources as God's creation; living in peace; stewardship and responsibility for the environment are being enhanced through the project. Alongside these values, teamwork and peaceful sharing of resources is encouraged among the pupils.

6. Construction of latrines and Hand washing facility - Kanyore primary school

The project

Kanyore primary school is located in Githunguri constituency, Kiambu County. It was started in 1927 by a group of twelve catholic Christian church families which had come from Tigoni location in Limuru.

There were only six boys' latrines and a urinal to be used by 360 boys, and 6 latrines to be used by the 320 girls in the school against the UNICEF requirement/standards of 30 boys per toilet, 50-60 boys per urinal and 25 girls per toilet. The situation worsened when two of the latrines were shut down by the public health officials due to their bad condition leaving just four functional toilets. The school had a temporary hand washing facility which was vandalized - leaving the pupils with nowhere to wash their hands after visiting the toilet. Water was obtained from a shallow operated manually by use of a rope and bucket. The school experienced rampant cases of pupil absenteeism.

Following an audit on the school's hygiene and sanitation conditions, a decision was made to construct 8 latrines for boys, and provide more hand-washing points in order to stem the prevailing conditions. The design adopted for the drop hole for the latrines was the key-hole type. This design was preferred to other traditional shapes since it prevented splashing of urine. The drop hole was made smooth for easy cleansing and the floor made with unnoticeable gradient towards the drop hole to prevent stagnation of water after cleaning.



Toilet under construction



Key-hole toilet hole

Project benefits

Construction of new toilets provided greatly reduced competition among pupils for the sanitary facilities, and improved hygiene standards arising from the new wash-points. The overall result was reduced absenteeism.

Curriculum links

The project is now being used for practical lessons on hygiene and other aspects of WASH. The Catholic Church (sponsor of the school) has also moved in to supplement teachers in reinforcing responsible use of the facilities as a form of worship to God.

Challenges

The implementation phase of the project had some challenges, including time and funding constraints, as well as fluctuation of prices for materials due to the long period of implementation. In order to address these challenges, the school collaborated with the local community to help provide cheap labour. Materials were procured in bulk to ensure affordable prices.



Follow-up questions for action

1. What challenges were faced at the before the project was implemented?
2. In what ways would such state of affairs compare to the current status at your school?
3. What lessons can we learn from the project?

Skills and Values enhanced

Learners are able to appreciate the fact that cleanliness is a godly virtue, and that responsible use of resources honors God. Involvement of learners in the design of murals (talking walls) enhanced their critical thinking capacities.

7. Agriculture - Poultry Farming- Nambale AC Primary School The project

The project was conceived as an income generating activity to support other eco-school projects that were already in operation. The production and sale of eggs from the project was expected to not only generate income for the environmental club but also create employment opportunities to the youth from the local community.

Local breeds of chicken were selected for breeding in order to produce eggs and meat as the major products. The choice of local breeds as opposed to exotic was informed by the fact that they are well adapted to the prevailing climatic conditions and are resistant to most poultry diseases. With financial support from KOEE, a semi-permanent structure (using locally available materials) and chain-link fence were put up and ten birds bought as the initial stock, including drugs and feeds.

Project benefits

Through continuous breeding, the population of chicken has since increased to 20 in one year. The eggs and chicken from the project are sold to generate income that is used to support needy pupils in the school, as well as purchase seeds for vegetables for use in the school garden. The chicken project is integrated with fish farming such that droppings from the birds fall directly into the fish-pond water. The manure is food for fish and also promotes growth of water plants fed on by fish. Pupils from the environmental club help in the regular management of the flock – e.g. feeding, watering and collection of eggs, thereby acquiring entrepreneurial skills. Many teachers and pupils have since initiated their own poultry projects in their homes after learning from the success of project at school.

In terms of teaching and learning, the project has been useful in the teaching of science and other subjects. As teachers and pupils work together at the project, hands-on learning (Environmental Action Learning (EAL) is achieved, especially in animal husbandry. Further, members from the local community come to learn from the project, in aspects such as proper management techniques on poultry and how to construct a simple poultry structure from locally available materials. The values of responsibility, care and respect for God's creation are developed among pupils as they are taught how to handle animals.



Feeding chicken



Eggs from chicken

Follow-up questions for action

1. What was the motivation for the project?
2. Would a similar project be appropriate at your school?
3. What would you require to start a similar project at your home?



8. **Waste Management and Agriculture: Tyre-Gardening, Tree Planting, Bottle Recycling at S.C.L.P. Samaj School, Nairobi County.**

The project

The Environmental club at Samaj school initiated a project that would use old tyres from their school buses and vans to grow flowers and tree seedlings as an alternative to burning, which would be a source of pollution to the environment. Other solid wastes at the school included old cement bags, nylon sacks and plastic bottles (especially from bottled water). The members of the environmental club had innovative ways of managing these wastes.

The tyres were cut into halves to form rainbow shapes, and filled with a mixture of soil and manure from the school's compost pit. Students sourced seeds for various plants - sukuma wiki, spinach, cabbages, carrots and tree seeds-Jacaranda, Greavillea, Nandi flame, Gum tree, and acacia which were raised in nurseries. The resulting seedlings were then potted into the waste polythene bags, cement bags and the cut tyres. Vegetables were raised in sacks filled with manured soil. The tyres were painted for beauty, and could be moved to different locations as mobile gardens. Growing of vegetables in the sacks and tyres was a learning experience for students on how waste can be managed in a productive manner. The vegetables were used to feed fish in the school's micro-fish pond.

Project benefits

Through the project solid waste in school was reduced considerably. The first batch tree nurseries raised 10,000 tree seedlings of different varieties. These were donated to various schools in Nairobi. Some donations were also made to Karura Forest Department and Ndakaini Dam, where the eco-club members planted over 1000 tree seedlings. In 2011 the school



Waste tyres can be re-used

donated 1600 seedlings to the Greenbelt Movement Foundation at the Freedom's Corner, Uhuru Park, prior to the Requiem Mass for the late Nobel Prize Laureate Hon. Wangari Maathai. The seedlings were distributed to various schools and people who attended the function to plant in memory of the fallen environmental heroine. The school also set aside a Peace Corner within the Botanical garden in her memory. The beauty in the school was greatly boosted from the planted flowers arranged in strategic points of the school compound.

Curriculum links

Through the project, practical issues of waste management and environmental conservation were taught to the pupils, e.g. recycling and reuse of solid wastes. Teachers used the project facilities as an outdoor resource in explaining classroom content. The fact that the project was borne from the students' idea was a strong point for sustainability and many of them confessed to using the same skills to manage solid waste at their homes.

Follow-up questions for action

1. What innovations do you identify in the project?
2. What factors led to the success of the project?
3. How do you manage solid waste at your school?
4. What lessons can we learn from the project?



Values enhanced

In the course of the project pupils learnt respect for nature as a motivation to take responsibility in ensuring a clean environment. Entrepreneurship and innovation (creativity) skills were enhanced among pupils through raising vegetables in the waste sacks.

9. WASH Project: Construction of Hand Washing Facilities at Star of The Sea Primary School – Mombasa

The project

Star of the sea primary school is located in Coast province, Mombasa County. With the school's pupil population growing steadily over the years, inadequate water for consumption became a challenge in the school, including constrained sanitation and hygiene facilities. Few water points in the school meant a lot of time wasted due to long queues. The Muslim learners had

a difficult time when there was no water since it was required for purification before prayers. Frequent cases of water related illnesses were also witnessed among pupils – leading to poor school attendance. It is against this background that the project to construct hand-wash points was conceived.

With financial support from KOEE, a water tank (for roof-catchment and increased water storage) and hand washing facilities were installed to address the aforementioned problems at the school in 2012. The following pictures show the various components of the project.



Fitting roof water harvesting systems

Project benefits

With increased water storage capacity at the school, and more wash points in place, the level of sanitation and hygiene conditions improved greatly. Water-related illnesses among pupils dropped significantly, hence school attendance improved, with less time spent at the wash points due to reduced congestion. Muslims pupils and teachers could then perform purification rites for prayers without much constrain.

Curriculum links

The project has proved useful in the teaching and learning practical aspects of WASH.

Follow-up questions for action

1. How would you rate the current water situation at your school in relation to that at the Star of the Sea Primary School before the project?
2. What innovations can you identify from the project (see photographs)?
3. What would you need to implement a water and sanitation project at your school?

Values enhanced

In the course of project operation, learners and teachers alike are learning wise use of resources such as water, and taking responsibility to conserve God-given resources while sharing with others in a peaceful way.

10. Toilet Construction - Kwa Jomvu Primary School

The project

Kwa Jomvu Primary School is located in Jomvu Kuu Sub- Location, Miritini Location Changamwe constituency, Mombasa County. After an environmental audit of the state of the school environment, several challenges were identified at the school. Major among these was the fact that there were only ten latrines used by over 1300 pupils.

In partnership with KOEE, the school constructed a four-door toilet facility to ease congestion, two of which were designed for use by children with disability – who usually needed special attention and assistance. The following photograph shows the new facility at the school.

Project benefits

The constructed toilets reduced congestion at the toilets that translated into reduced time wastage at toilets. Uniquely, the needs of pupils with disability were catered for through the project.



Indoor wash-points

Follow-up questions for action

1. How does the situation of sanitation facilities at the school before the project compare with the current state at your school?
2. What innovations were incorporated in the project?
3. Other than reducing competition over sanitation facilities at the school, what other benefits could the project bring?



- Anas, A. H. (2004). *Men and the Universe*.
- Ahmad, H. (2011). *Islam and Water. The Hajjar (R.A.) Story and Guide*.
- Barasa, W., Okongo, P., and Mwai, M. (2011). *A Resource Book on Biodiversity: an ESD Approach to Benefits, Threats and Conservation*.
- Bird Life South Africa. (2000). *Learning for Sustainable Living: An Integrated Learning Resource for Environmental education*.
- Breuilly, E. et al (1997). *Religions of the World*.
- Brien, J. et al. (1992): *A Wealth of Faiths, Economics and Religion*.
- Fenger, C. (2006). *40 Green World Actions*.
- Ibrahim, I. A. (1997). *A brief illustrated guide to understanding Islam*
- Islam, K.I. (1989). *Islamic Religious Education 8-4-4; Islam - Our Religion for Standard 7 Islamic Religious Education. Pupils' Book One*.
- Kenya Episcopal conference. (2008). *Making Life's Responsible Choices. Pupils' book*.
- KIE. (2004). *Ministry of Education Science and Technology. Primary Teachers' Education Syllabus. Volume two*.
- KIE (2002). *Ministry of Education. Primary Syllabus. Volume two*.
- KOEE. (2006). *Health. Education for Sustainable Development. The Eco-schools Programme. Action learning guide*.
- KOEE. (2002). *Starters' Pack: Education for Sustainable Development. Eco schools Programme, Kenya*.
- KOEE. (2002). *Handbook, Education for Sustainable Development .Eco-schools Programme–Kenya*.
- Lubega, C.M. et al (2003). *Islamic Religious Education for Kenya. Pupils' Book Five*
- Martin, P. (1988). *Lord of Creation*.
- Martin, P. and Esther, B. (1988). *Worlds of difference*.
- McKeown, R., Hopkins, C., Rizzi, R., and Chrystalbridge, M. (2002). *Education for Sustainable Development Toolkit, Version Two*. Available online at www.esdtoolkit.org
- Netherlands Water Partnership (2007). *Smart Hygiene Solutions*, www.partnersforwater.nl
- Netherlands Water Partnership (2006). *Smart Sanitation Solutions*, www.partnersforwater.nl
- Otieno, B. D., et al. (2006). *Education for Sustainable Development. Primary Teacher's Guidebook, Eco-Schools Programme in Kenya*.
- Otieno, B.D., et al. (2006). *Waste. Education for Sustainable Development. Secondary Eco-schools programme in Kenya*.
- Otieno, B.D., et al. (2006). *Water, Education for Sustainable Development. Secondary Eco-schools programme in Kenya*.
- Otieno, B.D., et al. (2006). *Agriculture, Education for Sustainable Development. Secondary Eco- schools programme in Kenya*.
- Otieno, B.D., et al. (2006). *Energy, Education for Sustainable Development. Eco-schools programme in Kenya*

- Otieno, B.D., et al. (2006). *Health, Education for Sustainable Development. Primary Eco-schools programme in Kenya.*
- Otieno, B.D., et al. (2006). *Biodiversity , Education for Sustainable Development. Eco-schools programme in Kenya.*
- Otieno, B.D., et al. (2006). *Agriculture, Education for Sustainable Development. Eco-schools programme in Kenya.*
- Otieno, B.D. (2006). *Biodiversity, Education for Sustainable Development. Upper Primary, Eco-schools programme in Kenya.*
- Otieno, B.D., et al. (2006). *Biodiversity: Education for Sustainable Development. Secondary, Eco-schools programme in Kenya.*
- Otieno, B. D., et al. (2006). *Energy: Education for Sustainable Development. Secondary Eco-schools programme in Kenya.*
- Otieno, B. D., et al. (2002). *Teachers' Training manual for Action Learning, Eco-school Programme in Kenya.*
- Otieno, B.D. (2002). *The importance of a dynamic school curriculum in the promotion of environmental ethics in Kenya schools; A Thesis submitted in fulfillment for degree of doctor of philosophy of Kenyatta University.*
- Sayyed, Q.K. (2004). *Seeing the Invisible Good in Invisible Nature*
- Stephen, H., et al. (2012). *Partnering with Religious Communities for Children.*
- The Holy Bible*
- The Holy Qur'an*
- UNICEF (2011). *Water, Sanitation and Hygiene for School Children in Emergencies (A Guidebook for Teachers)*
- UNICEF (2012). *Wash in schools. Monitoring package*
- UNICEF (2012). *Partnering with Religious Communities for Children*
- UNEP (2008). *My Future Begins Now! Environment in Children's Eyes*
- UNEP (2003). *Water World: Children's Voices. An Educational Booklet on Water for Children*
- UNEP (1999). *Our Earth– Our Future, by Young People of the World.*
- UNESCO. (2011) *Education for Sustainable Development. An Expert Review of Processes and Learning.*
- WWF (2012). *Environment for Sustainable Development Toolkit: Primary Schools in Mara River Basin: Teacher's Guide. .*

Glossary of terms

Action-learning–An educational process whereby people work and learn together by tackling real issues and reflecting on their actions. Learners acquire knowledge through actual actions and practice rather than through traditional instruction/teaching.

Biodiversity– The variety and variability of life forms on Earth.

Catchment area – an extent of land where water from precipitation/rainfall drains into a body of water (drainage basin).

Climate Change– The long time or significant variability and changes in weather patterns over periods ranging from years, decades to millions of years.

Conservation ethic– Treatment of the environment and the resources (land, air, water, forests, wildlife) with consideration, love and respect by balancing strictly human needs with those of other living species and the self-renewal of the environment.

Conservation– Wise use and useful management of resources so as to obtain the maximum possible benefits from them for the present and future generations.

Culture– The totality of a people's way of life and values as influenced by the process of continuity and change and dictates of the environment. Includes; language, beliefs, norms, science, technology, music, taboos, behaviour, socio-economic activities, architecture, literature, food, dressing and others.

Desertification– The process of converting rangeland or croplands into desert-like land.
Development– The process of improving human life quality or living standards.

Doctrines– A belief or set of beliefs accepted and taught by a church, political party, or other group.

Drug and substance abuse– a patterned use of a substance /drug in which the user consumes the substance in amounts or with methods neither approved nor supervised by medical professionals.

Ecology– Relationship/interactions between living organisms and their environment

Economy – Consists of the activities or system of a certain country or region, which comprises the production, distribution or trade, and consumption of goods and services in that country or area.

Eco-School– A school that has adapted an environmental policy to guide its activities by putting environmental consideration at the centre of all its activities.

Ecosystem– Unit of the environment made up of both living and non-living things in continuous interaction with each other.

Education for Sustainable Development– Education for sustainable development (ESD) is the process of acquisition and development of knowledge, skills, attitudes, and values that enhance participation in providing solutions to environmental challenges, thus making it possible to achieve development that meets the needs of the present without preventing future generations from meeting their own needs. Is usually achieved through formal, non-formal and informal education and training.

Environmental conservation– Wise use and useful management of environmental resources so as to obtain the maximum possible benefits from them for the present and future generations.

Environmental ethic– Ideal/desired human behaviour towards both the man-made and the natural environment.

Environmental ethics– The morals and values held by humans about the environment around them. Includes their duties, responsibilities and obligations about the environment.

Environment– All external conditions affecting an organism/everything around us.

Ethic– Ideal of human behaviour.

Ethics– Principles underlying the actions and behaviour of mankind/moral philosophy.

Faith – Confidence or trust in a person or thing, or a deity or in the doctrines or teachings of a religion. It may also be belief that is not based on proof.

Faith-based values – Moral principles/standards of behaviour from which people define their priorities of conduct in respect to religious beliefs.

Gender equality – A concept which implies that men and women should receive equal treatment unless there is a sound biological reason for different treatment.

Health – The general condition of a person's mind and body, usually meaning to be free from illness, injury or pain.

Hygiene–Conditions and practices that serve to promote or preserve health.

Information and Communication Technologies (ICTs)– Role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers as well as necessary enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information.

Kenya Vision 2030– is the Kenya's development programme covering the period 2008 to 2030. Its objective is to help transform Kenya into a "newly industrializing, middle-income country providing a high quality of life to all its citizens by 2030 in a clean and secure environment".

Knowledge– Facts, information and skills acquired through experience or education and training.

Land degradation– Destruction of land resources (soil, grassland, forest cover) through activities that encourage their use which is faster than their rate of renewal. Involves the reduction of soil ability to support productivity either by biophysical/physical activities

Mainstreaming – The integration of an issue into existing systems so they can be viewed or learned alongside each other.

Moral– Relating to, or concerned with, the principles or rules of right conduct or the distinction between right and wrong; ethical.

Natural Resource– Anything obtained from physical environment to meet human needs. They include land, fresh water, air, minerals, forests, petroleum.

Nature– Whole systems of existence, forces and events of the physical world that are not controlled by humans.

Philosophy– Search for knowledge especially about nature and the meaning of existence. System of thought resulting from a search of knowledge.

Policy– A principle or rule to guide decisions and achieve rational/desired outcomes.

Pollutant– A substance that makes air, water, soil (land) or something dirty.

Pollution– The process of making air, water, soil or something dirty.

Precept– Moral instruction as a guide for behaviour.

Religious wisdom– Knowledge about faith and moral beliefs.

Resource– Any material obtainable from the Earth's physical environment and able to satisfy human needs and wants at the present.

Sanitation– The hygienic means of promoting health through prevention of human contact with the hazards of wastes as well as the treatment and proper disposal of wastewater.

Siltation – The pollution of water by fine particulate terrestrial (land) material, with a particle size dominated by silt or clay.

Skills– Ability to do something well.

Society– System of coexistence of people in human activities and institutions (family, school, churches, mosques, Temples) including organisations.

Stewardship– Responsibility, duty/charge of managing the environment by human beings (guardianship).

Sustainability– the potential for long-term maintenance of well being, which has ecological (environmental), economic, social, political and cultural dimensions.

Sustainable development– Pattern of resource use or development that aims to meet human needs while at the same time conserving the environment so that these needs can be met not only in the present but also in the indefinite future.

Tenets– Principles, beliefs or teachings.

Toolkit– A collection of ideas or equipment through which you can perform various tasks.

Value-based education– Learning process in which the learner is recognised as an individual who functions as a complete being with other beings.

Values– Moral principles/standards of behaviour from which people define their priorities of conduct.

Whole Schools Approach – an organisational or whole systems approach with the aim of integrating health and well-being within the ethos, culture, routine life and core business of the school setting. It involves addressing the needs of pupils, staff and the wider community, not only within the curriculum, but across the whole-school and learning environment.

Wisdom– The possession of knowledge and the capacity to use it effectively. It gives a person good judgment on intellectual and practical matters in their environment.

APPENDIX II

Some world important days celebrated

There are several important international days that are celebrated across the world to help enhance public understanding and interest in matters of global significance, such as food insecurity, climate change and human conflict. With the world being viewed as a global village today, it is important that school communities join the rest of the world in observing and celebrating these important dates. In Kenya such celebrations are usually guided by government line ministries or departments, with guidelines sent out to stakeholders ahead of the celebrations. For instance, the World Environmental Day (WED) celebrations are usually coordinated by the National Environment Management Authority (NEMA) in collaboration with Ministries of Environment and Forestry.

The World Water Day on the other hand is coordinated by the Water Resources Management Authority (WRMA) in collaboration with the Ministry of Water and Irrigation. As far as possible, schools are encouraged to make appropriate arrangement to enable members of the school community such as teachers and learners to participate in these days at various levels. This can be done by joining organised activities within the neighbourhood, collaborating with the local community or planning and implementing activities within or around the school. It would also be a good idea to have several schools working together on a project as this enhances knowledge and experience sharing. The following table gives a summary of the important international dates.

S/N	Month	Date	Celebration	Background and Activities
1	February	2nd	World Wetlands Day	The day was started during the signing of the Ramsar Convention on 2nd June 1971 in Iranian city of Ramsar to promote national action and international cooperation for conservation and wise use of wetlands through actions to raise awareness of the values and benefits of wetlands as well as important role they play in sustainable freshwater use by governments, NGOs, schools and individuals.

2	February	22nd	Nile Day	A regional day started on 22nd Feb 1999 as a partnership among the Nile riparian states that seek to develop the river in a cooperative manner, share substantial socio-economic benefits, and promote regional peace and security. Local actions include raising of awareness of the values and benefits of the River Nile Basin as well as important role they play in sustainable freshwater use by governments, NGOs, schools and individuals.
3	March	8th	World Women's Day	The first national women's day was observed on 28th February 1909 in the United States following a declaration by the Socialist Party of America. In August 1910, an International Women's Conference was organised in Copenhagen, Denmark. Inspired in part by the American socialists, German Socialists Luise Zietz proposed establishing an annual International Woman's Day. Delegates (100 women from 17 countries) agreed with the idea as a strategy to promote equal rights including suffrage for women. This includes actions to encourage respect appreciation and love towards women for their economic, political and social achievements.
4	March	21st	World Forests Day	First observed on 21st March 2013 after it was established by the UN General Assembly to be a world platform for people with an interest in forests and climate change to share views and work together to ensure forests are suitably incorporated into any future climate change mitigation and adaptation strategies.
5	March	22nd	World Water Day	Declared an international day in 1992 by the UN General Assembly to address problems regarding the supply of drinking water, it aims to increase public awareness about the importance of conservation and protection of water resources and increase participation by governments, NGOs, schools and the private sector in water conservation.
6	March	23rd	World Meteorological Day	Held on 23rd March every year, this day commemorates the day the World Meteorological Organization (WMO) was established. The day focuses on a different theme each year related to weather, climate and water issues. It aims to bring attention to role of meteorology and meteorological services in humankind's welfare. Provides an overview of climatological data that can assist in planning for construction, agriculture, forestry and forecast weather that may have devastating effects on a country.

7	April	7th	World Health Day	Celebrated on 7 April every year since 1950, under the sponsorship of the World Health Organization (WHO). In 1948, the WHO held the First World Health Assembly. World Health Day is seen as an opportunity to focus on global health each year. This can be done through actions that stimulate discussions on global health, the impact of diseases and the factors causing change in these processes.
8	April	22nd	Earth Day	An annual day to demonstrate support for environmental protection. Earth Day is observed on April 22 each year and in 2009 was designated as International Mother Earth Day by the United Nations. Earth Day is now coordinated globally by the Earth Day Network, and is celebrated in more than 192 countries every year. Includes actions to address issues such as greenhouse effect, the hole in the ozone layer, toxic waste, groundwater contamination, destruction of rainforests, expanding deserts and ocean pollution.
9	May	22nd	World Biodiversity Day	A United Nations–sanctioned international day for the promotion issues of biodiversity. Created in 1993, it used to be held on December 29 but in 2000, the date was shifted 22nd May 1992. It includes actions to promote conservation and protection of different forms of life, for example, crops, livestock, wildlife, forests, ecosystems/ biomes (mountains, lakes, rivers, oceans, deserts, grasslands).
10	June	5th	World Environmental Day	An international day run by the United Nations Environment Programme (UNEP) since 1973, it encourages people to become active supporters of sustainable and equitable living, to promote awareness of the role of communities in changing attitudes towards environmental issues and to develop partnerships that will ensure all nations and people enjoy a safer, more fulfilling future.
11	June	17th	World Desertification Day	This day was proclaimed on 30th January 1995 by the United Nations as a day to promote awareness of the effects of drought, the impact of desertification on Earth and the need for global cooperation and education to address these problems and find solutions.
12	June	20th	World Refugee Day	Celebrated since 2001, World Refugee Day – the 50th anniversary of the 1951 Convention relating to the Status of Refugees – this promotes awareness of the situation of refugees throughout the world.

13	July	11th	World Population Day	An annual event, observed on July 11 every year, which seeks to raise awareness of global population issues. The event was established by the United Nations Development Programme in 1989. It was inspired by the public interest in Five Billion Day on July 11, 1987, approximately the date on which the world's population reached five billion people. It includes actions to promote human population control (birth control), improving human health, education, and housing and employment opportunities for a controlled human population for sustainable living on Earth.
14	September	16th	World Ozone Layer Day	World Ozone Day is celebrated on September 16. Also known as the United Nations' (UN) International Day for the Preservation of the Ozone Layer, the day marks the date the Montreal Protocol on Substances that Deplete the Ozone Layer was signed in 1987. It includes actions that promote ways of living that do not contribute to the depletion of the ozone layer and the reflect on the progress to combat threat to ozone layer by individuals and organisations.
15	September	20th	World Coastal Clean up Day	In 1986 the American Centre for Marine Conservation held the first beach clean-up on the Texas coast with the aid of 2,800 volunteers. Since then, the International Coastal Cleanup (ICC) has included inland lakes, rivers, streams and underwater sites. It includes actions that aim at removing debris from all bodies of water, to collect valuable information about the debris, to heighten public awareness of the causes of litter and promote water pollution prevention efforts globally.
16	September	21st	World Peace Day	In 1982 the United Nations General Assembly declared, in a resolution sponsored by the United Kingdom and Costa Rica, September 21st to be the International Day of Peace. It is devoted to strengthening the ideals of peace and non-violence and encouraging organisations and individuals to take promote peace and harmony.
17	September	27th	World Tourism Day	Since 1980, the United Nations World Tourism Organization (UNWTO) has celebrated World Tourism Day on September 27. The celebration includes actions to create awareness among the international community of the importance of tourism and its social, cultural, political, economic and environmental values.

18	October	4th	World Animal Day	World Animal Day is celebrated each year on October 4th. It started in Florence, Italy in 1931 at a convention of ecologists. On this day, animal life in all its forms is celebrated, and special events are planned all over the globe. October 4 was originally chosen because it is the feast day of Francis of Assisi, a nature lover and patron saint of animals and the environment. Many churches observe the Sunday closest to October 4 with a Blessing of the Animals. It celebrates our relationship with the animal kingdom, acknowledges the diverse roles that animals play in our lives and encourages us to be thankful for the way in which animals enrich our lives.
19	October	6th	World Habitat Day	World Habitat Day is observed every year on the first Monday of October throughout the world. It was officially designated by the United Nations and first celebrated in 1986. The aim is to reflect on the state of our cities and towns and the basic human right to adequate shelter. It includes actions that promote the conservation of various natural habitats for species and biodiversity balance which is essential for human survival and the well being of the planet.
20	October	14th	World Standards Day	World Standards Day is celebrated internationally each year on 14 October. The day honours the efforts of the thousands of experts who develop voluntary standards and aims to raise awareness of the importance of standardisation to the global economy.
21	October	15th	World Hand Washing Day	It was made at the annual World Water Week 2008, which was held in Stockholm and initiated the Public Private Partnership for Hand-washing (PPPHW). The Global Hand-washing Day took place for the first time on October 15, 2008.. Includes actions to mobilize people around the world to wash their hands with soap as a key approach to disease prevention.
22	October	16th	World Food Day	World Food Day is celebrated every year around the world on October 16th to celebrate the founding of the Food and Agriculture Organization in 1945. The day is celebrated widely by many other organisations concerned with food security, including the World Food Programme. It aims to raise public awareness of hunger; draw attention to agricultural food production; encourage the inclusion of rural communities in decision making that influences their living conditions; strengthen solidarity in the struggle against hunger, poverty and malnutrition; and encourage economic/ technical cooperation among developing countries.

23	November	20th	Universal Children's Day	Children's Day is often celebrated on other days as well. International Day for Protection of Children, observed in many countries as Children's Day on June 1 since 1950, was established by the Women's International Democratic Federation on its congress in Moscow and includes actions that promote the safety and the rights of children and empower the world's children.
24	November	21st	World Fisheries Day	World Fisheries Day is celebrated every year on November 21st by fishing communities worldwide through rallies, workshops, cultural programmes and exhibitions to highlight the importance of maintaining the world's fisheries..
25	December	1st	World AIDS Day	World AIDS Day, observed on December 1st every year, is dedicated to raising awareness of the AIDS pandemic caused by the spread of HIV infection. Government and health officials observe the day, often with speeches or forums on the AIDS topics. Since 1995, the President of the United States has made an official proclamation on World AIDS Day. Governments of other nations have followed suit and issued similar announcements.
26	December	10th	Human Rights Day	The day was chosen to honour the UN's adoption on 10th December 1948 of the Universal Declaration of Human Rights (UDHR), the first global enunciation of human rights and one of the major achievements of the new UN. The formal establishment of the day occurred at the 317th Plenary Meeting of the General Assembly on December 4th 1950. The day is marked by actions to promote the respect and the upholding of human rights for social, cultural, political and physical development.



NOTES



NORWEGIAN MINISTRY
OF FOREIGN AFFAIRS



THE WORLD BANK



ISBN 9966-956-82-4