

Islamic Farming

A Toolkit for Conservation Agriculture



By Dr Husna Ahmad OBE

ARC

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One humanity



Then let mankind look at his food
How We poured down water in torrents,
Then We broke open the Earth, splitting [it with sprouts],
And caused to grow within it grain,
And grapes and herbage,
And olives and palm trees,
And gardens of dense shrubbery,
And fruit and grass—
[As] enjoyment for you and your grazing livestock.

Surah `Abasa: 24-32

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In the name of Allah, the most Compassionate, the most Merciful. All praise is due to Allah the Creator and Lord of the Worlds. Peace and blessings be upon all the prophets of Allah, His Last Messenger, Muhammad [SAS], his family and the blessed companions.

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Introduction: ARC

The Alliance of Religions and Conservation is a UK-based charity founded by HRH Prince Philip nearly 20 years ago to work with the world's major faiths to help them protect the environment. In 2010, we began working with faith groups in sub-Saharan Africa on sustainable land and water management. As a result, 27 Christian, Muslim and Hindu groups in 11 countries launched long-term action plans on the environment in Nairobi, Kenya, in September 2012.

This was the first time that African faith traditions had come together to announce major plans to plant millions of trees, engage in widespread community awareness raising, promote sustainable agriculture and train their people in environmentally friendly technologies such as water harvesting and biogas digesters.

We already knew that our faith partners were very keen to help their people grow more food in ways that would not damage the land for future generations. At our September 2012 meeting, our Muslim faith partners were very interested in presentations about a faith-based approach to farming based on Islamic teachings that is helping farmers to increase crop yields and protect their land. It uses practical techniques that are also known as 'conservation agriculture'.

Afterwards our Muslim partners asked us: "Why

isn't there a faith-based approach to farming for Muslim farmers?" It was a good question: approximately 234 million people in sub-Saharan Africa are Muslim and many of them are farmers. ARC decided to develop a faith-based curriculum for farming based on Islamic teachings and commissioned Global One to work with Islamic clerics and scholars to establish the theology underpinning this approach.

This toolkit, Islamic Farming, is the result. The practical farming techniques recommended by Islamic Farming are based on conservation agriculture practices that are widely promoted across Africa by organisations such as the United Nations' Food and Agriculture Organisation (FAO) as a form of climate smart agriculture. However, the concept of the six Ps – Plan, Prepare, Plant, Provide, Protect, Produce – which lies at the heart of the Islamic Farming curriculum, has been created by ARC colleague Sam Adams and is unique to Islamic Farming.

We are grateful to all those who have contributed their hard work, counsel, insight and vision to the development of Islamic Farming. We humbly offer this faith-based approach to agriculture to all Muslim farmers seeking to live faithfully on this Earth, our shared planet.



Delegates at the first Islamic Farming workshop in Kenya see how water runs off bare soil but is absorbed by soil covered in mulch.

Executive Summary

The agricultural crisis in Africa demands a solution which aligns a faith based approach with conservation agriculture. The environmental movement has been active for many decades but has not been able to make inroads into the Muslim communities in Africa because of the language of conservation. By speaking to Muslims in the language of the Quran and Sunnah this manual is unique as the first ever manual to be promoting a faith based approach to farming for Muslims.

The population of Africa is rising rapidly; it is expected to more than double its current level of one billion to 2.3 billion by 2050. This is both a challenge and an opportunity for the people and governments of the continent. Africa is a young continent with a lot of energy; 50 per cent of Africans are aged 19 or younger. However, there is a need to feed all these extra mouths and a growing population means there is less land available to cultivate. This presents a problem if we continue corrupting and misusing the Earth.

As Muslims we are stewards appointed by Allah [swt] to be guardians of the world He created. It is our duty to safeguard this blessing, not to exploit it.

This manual lays out the historical and theological rationale for Islamic farming. The history of Islam shows that Islamic farming is not

a new idea or concept but in fact one that has been lost or forgotten to the Muslim world. The manual outlines the concept of Rizq and the five promises of Allah.

The five promises are :

1. Taqwa (God consciousness)
2. Tawakkul (reliance on Allah)
3. Salah (prayers)
4. Tawba (repentance)
5. Infaq Fisabillah (charity)

It then goes onto the practical aspects of conservation farming from an Islamic perspective. This means it incorporates the idea of rearing livestock and having beehives on the farm land whilst growing a variety of crops. It also brings in aspects of agroforestry. The six Ps are set out in the manual – with the Promises of Allah for one's rizq [livelihood] being the foundation of Islamic farming. The 6 Ps are Planning, Prepare, Plant, Provide, Protect and Produce.

This manual is designed for Trainers to inspire and train Muslim farmers on sustainable Islamic agriculture; incorporating their Islamic duties of stewardship of the land and practical methods to increase their harvests InshAllah. We have already begun piloting the manual in practice on farms in Kenya and Ethiopia through the Islamic Supreme Councils of these two countries.





Section One: From our History

INTRODUCTION

Islamic Farming is seeking to develop an Islamic approach to sustainable agriculture that will in the process restore the glory days of Islamic agriculture, during the eighth century until the 12th century and beyond. The new agriculture that followed in the wake of Islam was a result of the synthesis of a number of new and old elements, skilfully worked into a productive and sustainable system, giving it a particular, characteristic stamp.

Its legacy can be seen today in the landscapes, gardens, crops, botanical diversity and especially in the systems, terminology and institutions relating to irrigation (such as the celebrated Water Tribunals of Murcia and Valencia, Spain). Examples of Islamic agricultural practices can be found across the Mediterranean world and were also transferred by Spanish colonists to parts of South and Central America, the south-western United States, and even the Philippines.

Narrated Anas bin Malik: Allah's Apostle (PBUH) said, "There is none amongst the Muslims who plants a tree or sows seeds, and then a bird, or a person or an animal eats from it, but is regarded as a charitable gift for him."
Sahih Bukhari Vol.3 Book 39, No.513

There has been a resurgence of interest in sustainable agriculture in recent years; 'Rio+20', the short name for the United Nations Conference on Sustainable Development which took place in Rio de Janeiro, Brazil, in June 2012, pledged more than \$513 billion to build a sustainable future to overcome food insecurity, poverty and inequality across the world today. Many of these practices in the form of sustainable agriculture have their roots in the Islamic Agricultural Revolution and were unfortunately until recently lost in the Muslim world.

Why is a new faith-inspired approach to agriculture needed today? The population of Africa is rising rapidly; it is expected to more than double its current level of one billion to 2.3 billion by 2050. This is both a challenge and an opportunity for the people and governments

"It is he who created for you all that is in the Earth." Al Baqarah:29



of the continent. Africa is a young continent with a lot of energy; 50 per cent of Africans are aged 19 or younger. Increasing urbanisation is opening up new spheres for intellectual and political engagement. However, there is a need to feed all these extra mouths and a growing population means there is less land available to cultivate. This presents a problem if we continue corrupting and misusing the Earth. As Muslims we are stewards appointed by Allah to be guardians of the world He created. It is our duty to safeguard this blessing, not to exploit it.

Today, the important environmental agendas that are the focus of international attention are global food security, climate change mitigation and protection of natural resources. Every year 1.3 billion tonnes of food are wasted, equivalent to the same amount produced in the whole of sub-Saharan Africa. At the same time, one in every seven people in the world go to bed hungry and more than 20,000 children under the age of five die daily from hunger.

The depletion of our soil's fertility is regarded as one of the biggest obstacles to our agricultural development. The soil's productivity has been decreasing across Africa for various reasons.

INTRODUCTION

These include:

- overgrazing and deforestation, which has led to bare soil that increases water evaporation and leads to increased erosion of the nutrient-rich topsoil by both wind and water.
- mono-cropping, which has resulted in nutrients being mined from the soil which have not been properly replenished.
- slash and burn practices, which have caused the destruction of soils' organic matter.
- Slash and burn practices, which have caused the destruction of soils' organic matter.

Subsistence farmers account for approximately 85% of the African population, and many of them live undernourished and degraded lives. These farmers produce yields that are well below their family's requirements and this, in turn necessitates the importation of millions of tonnes of grain every year. Therefore increasing food production at the source may go some way towards eliminating global food insecurity.

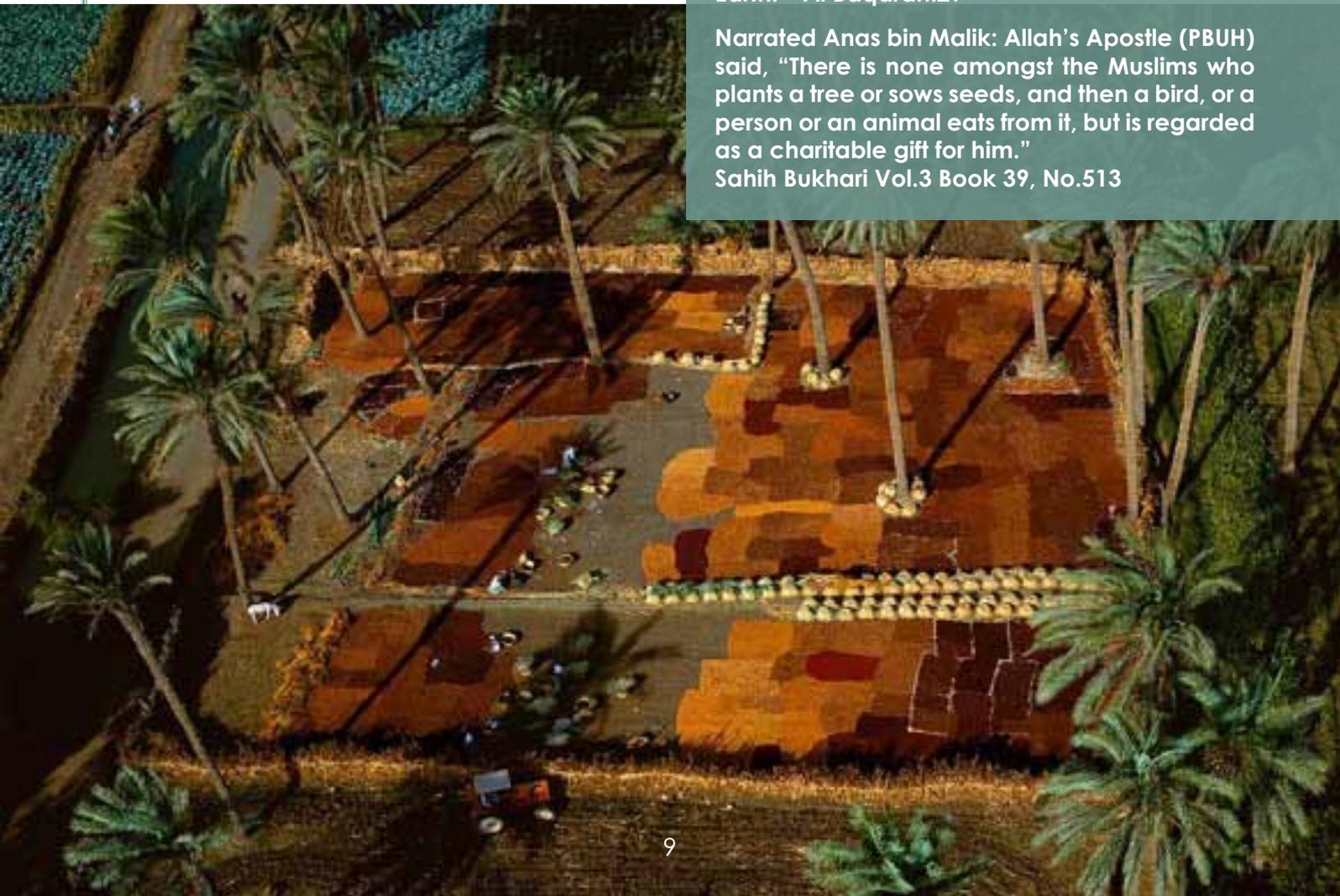
There are between 400 million to 500 million small farms in the world and an increasing

number of experts believe that smallholder farmers are the key agents of change in the doubly green revolution . This toolkit, Islamic Farming, is an initiative to encourage Muslim citizens of Africa to understand that Allah has given a solution to hunger and poverty; there is great benefit to be gained if we can simply try to understand the Islamic message with regard to agriculture.

Knowledge is the key to changing food insecurity in Africa; understanding the how and why of doing things. This manual seeks to fill the gap in literature available today on farming techniques by providing Muslim farmers with the resources to increase their yields, using an approach that is rooted in Muslim beliefs and principles. Despite efforts to diversify the types of crops grown, increase water availability and other attempts to sustain farmers' livelihoods, there have been few initiatives to improve their skills and understanding of the ground they work and live on by engaging them on the basis of their practices as Muslim farmers.

“It is he who created for you all that is in the Earth.” Al Baqarah:29

**Narrated Anas bin Malik: Allah’s Apostle (PBUH) said, “There is none amongst the Muslims who plants a tree or sows seeds, and then a bird, or a person or an animal eats from it, but is regarded as a charitable gift for him.”
Sahih Bukhari Vol.3 Book 39, No.513**



The verb form 'falaha' فَلَاحَ means:

- To cleave, split, cut, slit or crack.
- To furrow or plough (الارض the land), to cultivate it; to till the ground (الارض the land).
- To unfold something in order to reveal its intrinsic properties; to fill and break open the surface of the Earth and make its productivity power active.

Meanings of the word falah:

- The attainment of that which one desires or seeks, or that whereby one becomes in a happy or good state.
- Striving to discover one's hidden talents and then using them to one's best ability; (whatever of noble and good hidden in us must come out and whatever is in the form of potentiality in human mind must be converted into actuality) just like ploughing of land and cultivation results in the actualisation of the potentialities of a seed;
 - Reaping the fruits of labour. Since the result of ploughing and cultivation of crops is its multiplication and abundance, the word falah is used to mean success and prosperity or the attainment of that which one desires or seeks. It also means 'to thrive, prosper, be successful, lucky, or happy', the two meanings being brought together beautifully by Ibn 'Abdūn in the quotation below.

Moreover, the word is sung out from the minarets of every mosque throughout the Muslim world five times each day during the call to prayer – hayya 'ala 'l-falā : “Come to success, come to salvation.” Husbandry, well-being (in this world and the next) and worship are thus inextricably linked in the Arabic language. This toolkit is an attempt to highlight the significant links between how we care for our land as farmers and our beliefs as Muslims about our responsibility towards the world Allah created for us. Faith and actions can go hand in hand if we permit ourselves to open our hearts to Allah's divine message. We can then truly become stewards of this planet and protect the Earth for our children and future generations.



“Husbandry is the foundation of civilisation – all sustenance derives from it, as well as the principal benefits and blessings that civilisation brings.”

Ibn 'Abdūn in his treatise on hisba (Arabic for verification), c. 1147, Seville

This section looks at the way in which the Islamic agricultural revolution from the eighth century led to the transformation of agricultural practices in large parts of the world, including the Middle East and North Africa. The message that came to the Arabian peninsula in the seventh century was the book of Allah, the Holy Qur'an, which was revealed to the seal of the Prophets, the Prophet Muhammad (pbuh). Both the Qur'an and the hadith of the Prophet Muhammad (pbuh) refer to agriculture and Allah's bounties to mankind. In all accounts there is an emphasis on sustainable use of natural capital, i.e. producing land. Traditions of haram and hima, an Arabic term meaning 'protected place', and early urban planning were expressions of strong social obligations to stay within carrying capacity of the land and to preserve the natural environment as an obligation of Islamic or 'stewardship'.

With the migration of the Prophet and his companions to Madina, the practical aspects of agriculture started to develop. Prophet Muhammad (pbuh) surveyed the natural resources in the region: the wadis (riverbeds); the rich, black volcanic soil; the high rangelands – and decreed that they be preserved and set aside as a hima. We can find similar examples in the world today where areas are protected as national trusts and heritage sites. With the spread of Islam came the dawn of the Islamic Agricultural Revolution in the eighth century.

Such advancement of Muslim farming was owed to the adaptation of agrarian techniques to local needs, and to "a spectacular cultural union of scientific knowledge from the past and the present, from the Near East, the Maghreb, and Andalusia. A culmination subtler than a simple accumulation of techniques, it has been an enduring ecological success, proven by the course of human history".

وَهُوَ الَّذِي أَنْزَلَ مِنَ السَّمَاءِ مَاءً فَأَخْرَجْنَا بِهِ نَبَاتَ كُلِّ شَيْءٍ فَأَخْرَجْنَا مِنْهُ خَضِرًا نُخْرَجُ مِنْهُ حَبًّا مَتْرَاكِبًا وَمِنَ النَّخْلِ مِنْ طَلْعِهَا قِنْوَانٌ دَانِيَةٌ وَجَنَّاتٍ مِنْ أَعْنَابٍ وَالزَّيْتُونَ وَالرَّمَانَ مَشْتَبِهَا وَغَيْرَ مُتَشَابِهٍ انظُرُوا إِلَى ثَمَرِهِ إِذَا أَثْمَرَ وَيَنْعِهِ إِنَّ فِي ذَلِكَ لَآيَاتٍ لِقَوْمٍ يُؤْمِنُونَ

"And it is He who sends down rain from the sky, and We produce thereby the growth of all things. We produce from it greenery from which We produce grains arranged in layers. And from the palm trees - of its emerging fruit are clusters hanging low. And [We produce] gardens of grapevines and olives and pomegranates, similar yet varied. Look at [each of] its fruit when it yields and [at] its ripening. Indeed in that are signs for a people who believe." Al-An`aam: 99

Muslim agronomists of this period approached agriculture as the art of balancing four basic 'elements' – soil, water, air, and manure/ compost – corresponding to earth, water, air and fire in the humoral system. These four elements are always in dynamic relationship, so that a change in one affects all the others. The number four has important symbolism in Islam and represents the supreme concept of unity. It is associated with the perfection of Paradise and the four rivers that flow with water, milk, wine and honey.

Agricultural innovation in the early Islamic world can be summarised thus: "Foremost was the introduction, acclimatisation and further diffusion of new food crops, mainly fruit trees, grains and vegetables, but also plants used for fibres, condiments, beverages, medicines, narcotics, poisons, dyes, perfumes, cosmetics, timber and fodder, as well as garden flowers and ornamental plants. At the same time, a fertile intellectual climate of scientific enquiry and experimentation among botanists and agronomists, and the propensity of traditional husbandmen everywhere to select for local

conditions, produced a profusion of cultivars of the old and new crops (as well as new breeds of livestock)."

FOUR KEY AREAS

We will discuss the four key areas of development that played a vital role in making the Islamic Agricultural Revolution a success.

These were:

1. Islamic rules on land ownership and labour rights
2. Irrigation methods
3. Improved farming techniques and a scientific approach to farming
4. Introduction of new crops.

These developments were positively affected by changes in other areas of the economy, such as growth of trade and the money economy.



Elaborating on the Islamic agricultural revolution, the picture that emerges is that of a large, unified region, which for a long period of time amounting to more than four centuries, was unusually receptive to all that was new. It was also unusually able to diffuse novelties: both to effect the initial transfer, which introduced an element into a region, and to carry out the secondary diffusion, which changed rarities into commonplaces. Attitudes, social structure, institutions, infrastructure, scientific progress, technological inventions and economic development all played a part in the making of this medium of diffusion. Agriculture, as well as other spheres of the economy and many areas of social life, were touched by this capacity to absorb and to transmit ...

An important development in Islamic agriculture took root and flourished in the form of an Arabic literary genre which portrayed agriculture as a science: the Books of Filāha. The Books of Filāha (agriculture), were written in different parts of the Muslim world – the Maghreb, Andalusia, Egypt, Iraq, Persia and Yemen. They are scattered in hundreds of

manuscripts in libraries across the world, and have only recently been rediscovered. The Books of Filāha are a combination of things: they combine instruction on husbandry, agronomy and botany with scientific thought and theoretical discourse.

What is particularly interesting in today's context is the fact that the system described by the Muslim agronomists has much in common with the various methods of alternative farming practised today under such names as sustainable agriculture, organic farming, permaculture, biodynamic farming, holistic agriculture, low-input farming, ecological farming, and regenerative agriculture, which all have sustainability as their ultimate goal: the ability to farm productively in perpetuity, without depletion of natural resources or harm to the environment and without compromising the needs of future generations. In this light, we should approach the Books of Filāha not simply as valuable historical sources but as beacons of good practice that present a viable model for the future of farming.



Street market, Ghana

1. Islamic rules on land ownership and labour rights

In the 21st century land is considered to be in short supply while at the same time demand for food, livestock and biofuels is growing, driven by population growth, changing diets and increasing food and oil prices. In an effort to ensure national food and energy security, some countries over the past decade have been buying land in other countries on which to grow crops and livestock a phenomenon known as 'land grabbing'. The World Bank has estimated that around 45 million hectares of land has been purchased since 2008, with 62 countries involved in the 'grabbing' in 41 countries across every continent except Antarctica.

Land grabbing is also associated with an appropriation of freshwater resources. Land grabs have hit the headlines and received strong criticism when large-scale land investments have proven to be inequitable and unsustainable. Problems include the reduction in natural resource access for local land users, displacement of local inhabitants without compensation and without the creation of job opportunities or consideration for the environment. Indeed, in many places land that was a natural landscape or dominated by smallholder farming is transformed to large-scale commercial farming.

In Ethiopia residents are said to have been moved to new villages lacking adequate food and water resources in order to make way for the lease of land to foreign investors. Where 100% rights over natural resources such as water are part of the deal, both environmental sustainability and the livelihoods of local land users are negatively impacted. This has been seen in Sudan where land deals around the Blue Nile have affected water users further downstream.

Between the eighth and 12th centuries, the Islamic rules and land ownership and labour rights created big incentives to engage in agriculture. There are a number of hadith of the Prophet Muhammad (pbuh) which relate to land ownership and the importance of

equitable distribution of yields from agricultural production. During the Islamic Agricultural Revolution, Islamic precepts and customary laws ensured that farming was conducted more fairly and more effectively. For the first time in many places, any individual – man or woman – had the right to own, buy, sell, mortgage and inherit land, and most importantly, farm it as he or she liked.

Relatively low rates of taxation, where they existed at all, were paid as a fixed proportion of output, freeing farmers from uncertain taxes. Large estates, which had come to dominate everywhere and monopolise agriculture, were often broken down into smaller ownerships, or at least had to compete with smaller farms and individual peasant smallholdings. The lands around cities were given over to small market gardens and orchards. Serfdom and slavery were virtually absent from the countryside in the early Islamic world; instead, the legal and actual condition of the overwhelming majority of those who worked on the land was one of freedom.

Africa today has complex governance procedures for land ownership and management, and women, who comprise 70% of Africa's farmers, often struggle to acquire land because of customary laws. Lack of protection of land rights, poor administration and unequal distribution of power are some of the reasons why only 10% of Africa's rural land is registered and how on average, across Africa, the governments own and manage 97% of forestland in comparison to 36.1% government ownership in Latin America and 67.8% in Asia.

There are positive examples from across the world that prove that an increase in land rights directly results in a reduction in poverty. In 1978, China saw the largest reduction in poverty in history by removing collective farms and issuing long-term leases to confer land rights on households; this resulted in incredible agricultural growth that transformed rural China.

Narrated 'Aisha: The Prophet said, "He who cultivates land that does not belong to anybody is more rightful (to own it)." Urwa said, "Umar gave the same verdict in his Caliphate."

- Volume 3, Book 39, Number 524

Some countries in Africa have taken steps to improve land security. For example, in 2004 Uganda released a Land Amendment Act that gave women equal ownership and established District Land Offices to provide technical services to communities in land rights.

Narrated 'Amr: I said to Tawus, "I wish you would give up mukhabara (share-cropping), for the people say that the Prophet forbade it." On that Tawus replied, "O 'Amr! I give the land to share-croppers and help them. No doubt; the most learned man, namely Ibn 'Abbas told me that the Prophet had not forbidden it but said, "It is more beneficial for one to give his land free to one's brother than to charge him a fixed rental." - **Volume 3, Book 39, Number 522**

Narrated Rafi' bin Khadij: We worked on farms more than anybody else in Medina. We used to rent the land at the yield of specific delimited portion of it to be given to the landlord. Sometimes the vegetation of that portion was affected by blights, etc, while the rest

remained safe and vice versa, so the Prophet forbade this practice. At that time gold or silver were not used (for renting the land). If they provided the seeds, they would get so-and-so much. Al-Hasan said, "There is no harm if the land belongs to one but both spend on it and the yield is divided between them."

Az-Zuhri had the same opinion. Al-Hasan said, "There is no harm if cotton is picked on the condition of having half the yield." Ibrahim, Ibn Siain, 'Ata', Al-Hakam, Az-Zuhri and Qatada said, "There is no harm in giving the yarn to the weaver to weave into cloth on the basis that one-third or one-fourth (or any other portion) of the cloth is given to the weaver for his labour." Ma'am said, "There is no harm in hiring animals for a definite (fixed) period on the basis that one-third or one-fourth of the products carried by the animals is given to the owner of the animals." - **Sahih al Bukhari Volume 3, Book 39, Number 520**

"The example of those who spend their wealth in the way of Allah is like a seed [of grain] which grows seven spikes; in each spike is a hundred grains. And Allah multiplies [His reward] for whom He wills. And Allah is all-Encompassing and Knowing." - Al-Baqara: 261

مِثْلُ الَّذِينَ يَنْفِقُونَ أَمْوَالَهُمْ فِي سَبِيلِ اللَّهِ كَمِثْلِ حَبَّةٍ أَنْبَتَتْ سَبْعَ سَنَابِلٍ فِي كُلِّ سَنَابِلَةٍ مِائَةٌ حَبَّةٌ وَاللَّهُ يُضَاعِفُ لِمَنْ يَشَاءُ وَاللَّهُ وَاسِعٌ عَلِيمٌ



2. Irrigation Methods

هُوَ الَّذِي أَنْزَلَ مِنَ السَّمَاءِ مَاءً لَكُمْ مِنْهُ شَرَابٌ وَمِنْهُ شَجَرٌ فِيهِ تُسِيمُونَ

“It is He who sends down rain from the sky; from it is drink and from it is foliage in which you pasture [animals].” An-Nahl: 10

From Andalusia to the Far East and from the Sudan to Afghanistan, irrigation remained central, and the basis of all agriculture. With the spread of Islam the Muslims inherited ancient systems of irrigation that were in an advanced state of decay. Muslim communities repaired them and constructed new ones. They devised new techniques to catch, channel, store and lift the water, and ingeniously combined these with existing devices. Irrigation became cheap, transforming lands that were previously impossible or uneconomic to irrigate with as many as four harvests annually. Damming of rivers to provide households and mills with power, and for irrigation, was also widespread. The Muslims also captured rainwater in trenches on the sides of hills or as it ran down mountain gorges or into valleys; surface water was taken from springs, brooks, rivers and oases, while underground water was tapped by creating new springs, or digging wells.

Water, such a precious commodity, was managed according to stringent rules. Any waste of the resource was banned, and the most severe economy enforced. Several techniques for preserving water were used such as the qanāt, the clepsydra, and the norias. The qanāt is called different names such as kārīz, khattara, galería, or falaj in various parts of the Middle East and North Africa. It is a water-management system used to provide a reliable supply of water to human settlements and for irrigation in hot, arid and semi-arid climates.

Qanāts are constructed as a series of well-like vertical shafts, connected by gently sloping tunnels. Qanāts tap into subterranean water in a manner that efficiently delivers large quantities of water to the surface without need for pumping. The water drains relying on gravity, with the destination lower than the source, which is typically an upland aquifer. Qanāts allow water to be transported over long distances in hot, dry climates without losing

a large proportion of the water to seepage and evaporation. Qanāts are sometimes split into an underground distribution network of smaller canals located below ground to avoid contamination. In some cases water from a qanāt is stored in a reservoir, typically storing night flow for daytime use.

The qanāt system has the advantage of being resistant to natural disasters such as earthquakes and floods, and to deliberate destruction in war. Furthermore, it is almost insensitive to the levels of precipitation, delivering a flow with only gradual variations from wet to dry years.

Disputes of laws on water were dealt with by a court whose judges were chosen by the farmers themselves. This court, named The Tribunal of the Waters, sat on Thursdays at the door of the principal mosque. Ten centuries later, the same tribunal still sits in Valencia, but at the door of the cathedral. The clepsydra or water clock (an ancient device for measuring time by the flow of water or mercury through a small aperture) was used by farmers to determine the duration of water use for every user in the area. This clepsydra regulated with precision, night and day, the amount going to each farmer, timed by the minute, throughout the year, and taking into account seasonal variations. Each farmer was informed of the timing of his turn, and required to take the necessary action to ensure effective supply to his plot. The noria was a water-lifting device that had revolutionary consequences upon agricultural productivity. Being relatively inexpensive to build and simple to maintain, the noria enabled the development of large areas that were intensively irrigated.

The new Islamic institutions and legal frameworks for the equitable distribution and management of water, and the undoubted skill of the irrigators themselves, transformed the agricultural landscape. All disputes and violations of laws on water were dealt with by a court whose judges were chosen by the farmers themselves. This court, named The Tribunal of the Waters, sat on Thursdays at the door of the principal mosque. Ten centuries later, the same tribunal still sits in Valencia, but at the door of the cathedral.

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3. Improved farming techniques and a scientific approach to farming

The adoption of a scientific approach to farming during the Islamic Agricultural Revolution enabled the Muslims to improve farming techniques derived from the collection and collation of information throughout the whole of the known world in that time. Farming almanacs were produced in every corner of the Muslim world detailing where, when and how to plant and grow various crops.

As Ibn al-'Awwām, one of the writers of the Filaha texts, makes clear: "The first consideration in farming is knowledge of the land/soil ... and whoever does not have this understanding lacks the basic principles, and in relation to farming deserves to be treated as ignorant." And he gave the example of how repeatedly sowing beet on saline land will reduce, and then eliminate, all salinity from the soil, leaving it in fine condition, free from all defects.

Soil rehabilitation was constantly cared for, and preserving the deep beds of cropped land from erosion was "the golden rule of ecology", and "subject to laws of scrupulous careful ecology".

The need for a sustainable agricultural project in Africa, like the one prescribed by Islamic Farming, is demonstrated by the state of environmental conditions. Most notably by the recent severe drought and consequent



food emergency that resulted in a full-blown humanitarian emergency across all of the Horn of Africa that reached its peak in 2011. Large parts of Africa are arid and semi-arid, characterised by poor soil quality and chronic water shortage. The severe drought has made these conditions deadly for the local population. Rehabilitation is now a priority.

The return of organic matter to the land to restore lost fertility lies at the heart of traditional Muslim agriculture. A variety of fertilisers were used according to a well-advanced methodology while a maximum amount of moisture in the soil was preserved. The Books of Filāha devote much attention to the preparation and application of all types of special manures, composts, soil conditioners, mulches and dressings, each tailored to the soil and the crop to be grown. Also, the growing of legumes and nitrogen-fixing green manures, livestock rearing and crop rotation were vital elements of Muslim agriculture.

4. Introduction of new crops

“He causes to grow for you thereby the crops, olives, palm trees, grapevines, and from all the fruits. Indeed in that is a sign for a people who give thought.” - An-Nahl: 11

يَنْبِتُ لَكُمْ بِهِ الزَّرْعَ وَالزَّيْتُونَ وَالنَّخِيلَ وَالْأَعْنَابَ
وَمِنْ كُلِّ الشَّجَرَاتِ إِنَّ فِي ذَلِكَ لَآيَةً لِّقَوْمٍ يَتَفَكَّرُونَ



The influx of new crops and plants, many of which came from India, South-East Asia and Central Africa, was only made possible by the unprecedented unification of a large part of the Old World under Islam, which facilitated long-distance travel by merchants, diplomats, scholars and pilgrims, and unleashed the free movement of peoples from very different climates and agricultural traditions – Indians, Malays, Persians, Yemenis, Africans, Berbers and Syrians, among others. This human flow and cultural exchange facilitated not only the diffusion of crops and plants but the know-how to grow them ... The Muslim agronomists introduced a diversity of new crops including sugar cane, rice, citrus fruit, apricots, cotton, artichokes, aubergines and saffron. This great diversity not only provided a varied and balanced diet for both humans and livestock and supplied most of the medicines and many raw materials for clothing and industrial processes, but also ensured food security

throughout the year. This was achieved by spreading risk in times of unseasonal weather and other unforeseen events, when at least some crops would be likely to succeed. Close attention was given to the keeping of bees, which not only provided honey but ensured the successful pollination of fruit and field crops



Section Two: From Our Scriptures

PROMISES OF ALLAH (RIZQ)

Islam places the highest emphasis on ethical values in all aspects of human life. In Islam, ethics governs all aspects of life.

“You are the best nation produced [as an example] for mankind. You enjoin what is right and forbid what is wrong and believe in Allah”
Imran: 110

This section reflects on why there is so much inequality in the world and why Africa, with such a vast natural resources and land, has not lifted itself out of poverty.

The Qur’anic verse below reminds us that we are temporarily on this Earth and if we want to achieve Paradise we must metaphorically sow our seeds in this life so

our spiritual rizq can grow through our actions on Earth. Your rizq will not come to you if you do not work for it. That is the essential difference between hiba — a gift — and rizq.

Your rizq is written for you but in order for you to unlock the door, you need to work as if your rizq depended on how hard you try, but in your heart, you know that nothing will come to you except what Allah (swt) has written for you.

Islamic farming wishes to remind people that every person is sent to this Earth with their rizq assigned at their birth and on top of that, Allah (swt) made five promises of rizq which means they are to be provided with the necessities of life, so all aspects of a person’s subsistence and livelihood fall under the definition of rizq, including, but not restricted to, wealth, status, business and children.

وَمَا مِنْ دَابَّةٍ فِي الْأَرْضِ إِلَّا عَلَى اللَّهِ رِزْقُهَا وَيَعْلَمُ
مُسْتَقَرَّهَا وَمُسْتَوْدَعَهَا كُلِّ فِي كِتَابٍ مُبِينٍ

“And there is no creature on Earth but that upon Allah is its provision, and He knows its place of dwelling and place of storage. All is in a clear register.” - Hud: 6



مَنْ كَانَ يُرِيدُ حَرْثَ الْآخِرَةِ نَزِدْ لَهُ فِي حَرْثِهِ وَمَنْ كَانَ
يُرِيدُ حَرْثَ الدُّنْيَا نُزَتْ مِنْهَا وَمَا لَهُ فِي الْآخِرَةِ مِنْ نَصِيبٍ

“Whoever desires the harvest of the Hereafter - We increase for him in his harvest. And whoever desires the harvest of this world - We give him thereof, but there is not for him in the Hereafter any share.”
Ash-Shura: 20



Section Two: From Our Scriptures

The five promises are:

1. Taqwa (God consciousness)
2. Tawakkul (reliance on Allah)
3. Salah (prayers)
4. Tawba (repentance)
5. Infaq Fisabillah (charity)

One of the beautiful names of Allah (swt) is Ar Razzaq meaning, in short:

- The Provider, The Providence, The Supplier, The Bestower of Sustenance.

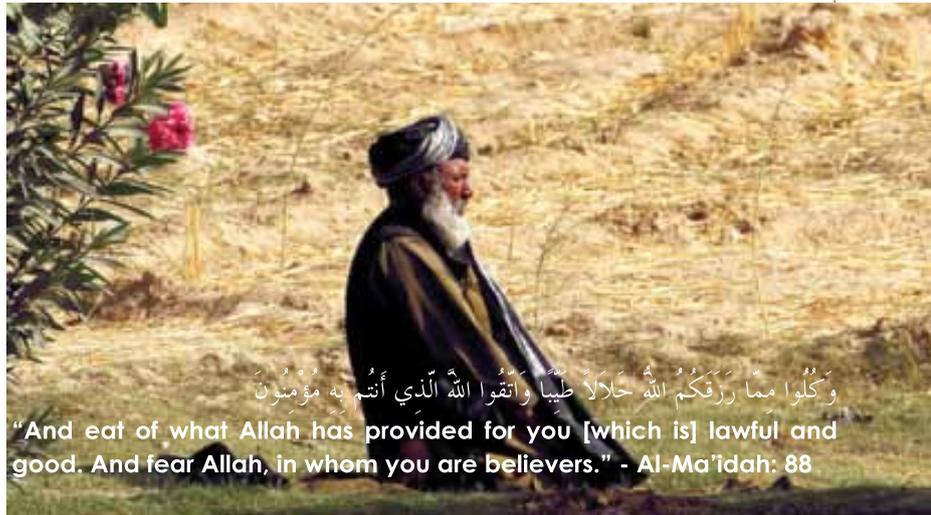
- The One who creates all means of nourishment and subsistence. The One who is the giver of all things beneficial, both physical and spiritual. The One who provides everything that is needed.

- The One who causes the means of sub sistance to come. The One who bestows all means of support and growth, for the body, the mind and the spiritual life.

It may be easy for someone to believe that Allah (swt) does not provide. "Where is the rizq of the poverty-stricken populations living in Africa?" Yet we need to understand that there are consequences for our actions. Allah (swt) reminds us that if we do not rule with

justice then there will be corruption on Earth.

Overusing resources, abusing human beings and hoarding wealth are things that are despised in our religion and Allah (swt) warns us severely against them. We cannot blame Allah (swt) when we have created man-made systems which go precisely against the way



Allah (swt) has ordered us to live. If we want to see poverty alleviation in Africa and sustainable food production we need to remember that our intentions and actions need to be aligned to Allah's commands. Islamic Farming will only succeed if we firmly place our faith in Allah and strive through hard work and diligence to cultivate our lands in a sustainable and equitable manner.

Surah An-Naml: 60-64

[More precisely], is He [not best] who created the heavens and the earth and sent down for you rain from the sky, causing to grow thereby gardens of joyful beauty which you could not [otherwise] have grown the trees thereof? Is there a deity with Allah ? [No], but they are a people who ascribe equals [to Him].

أَمْ مَنْ خَلَقَ السَّمَاوَاتِ وَالْأَرْضَ وَأَنْزَلَ لَكُمْ مِنَ السَّمَاءِ مَاءً فَأَنْبَتْنَا بِهِ حَدَائِقَ
ذَاتِ بَهْجَةٍ مَا كَانَ لَكُمْ أَنْ تَنْبِتُوا شَجَرَهَا أَلَيْسَ اللَّهُ بِمَعْلُومٍ لِقَوْمٍ يَعْدِلُونَ

Is He [not best] who made the earth a stable ground and placed within it rivers and made for it firmly set mountains and placed between the two seas a barrier? Is there a deity with Allah ? [No], but most of them do not know.

أَمْ مَنْ جَعَلَ الْأَرْضَ قَرَارًا وَجَعَلَ خِلَالَهَا أَنْهَارًا وَجَعَلَ لَهَا رَوَاسِيَ
وَجَعَلَ بَيْنَ الْبَحْرَيْنِ حَاجِزًا أَلَيْسَ اللَّهُ بِمَعْلُومٍ لِقَوْمٍ لَا يَعْلَمُونَ

Is He [not best] who responds to the desperate one when he calls upon Him and removes evil and makes you inheritors of the Earth? Is there a deity with Allah? Little do you remember.

أَمَّنْ يَجِيبُ الْمُضْطَرَّ إِذَا دَعَاهُ وَيَكْشِفُ السُّوءَ وَيَجْعَلُكُمْ خَلَائِفَ الْأَرْضِ إِلَهَ مَعَ اللَّهِ قَلِيلًا مَا تَذَكَّرُونَ

Is He [not best] who guides you through the dark-nesses of the land and sea and who sends the winds as good tidings before His mercy? Is there a deity with Allah? High is Allah above whatever they associate with Him.

أَمَّنْ يَهْدِيكُمْ فِي ظُلُمَاتِ الْبَرِّ وَالْبَحْرِ وَمَنْ يُرْسِلِ الرِّيَّاحَ بُشْرًا بَيْنَ يَدَيْ رَحْمَتِهِ إِلَهَ مَعَ اللَّهِ تَعَالَى اللَّهُ عَمَّا يُشْرِكُونَ

Is He [not best] who begins creation and then repeats it and who provides for you from the heaven and Earth? Is there a deity with Allah? Say, "Produce your proof, if you should be truthful.

أَمَّنْ بَدَأَ الْخَلْقَ ثُمَّ يُعِيدُهُ وَمَنْ يَرْزُقُكُمْ مِنَ السَّمَاءِ وَالْأَرْضِ إِلَهَ مَعَ اللَّهِ قُلْ هَاتُوا بُرْهَانَكُمْ إِنْ كُنْتُمْ صَادِقِينَ

1. Taqwa (God consciousness)

Taqwa (Arabic: تقوى taqwā/taqwá, "piety") is the Islamic term that denotes God-consciousness, mindfulness and piety as an ethical base for the Muslim community; taqwa plays a significant role in one's relationship to Allah by reminding us of His great power and knowledge. According to Tafsir ibn Kathir, the root meaning of taqwa is to avoid what one dislikes. It was reported that Umar bin Khattab asked Ubay ibn Kaab about taqwa. Ubay said, "Have you ever walked on a path that has thorns on it?" Umar said, "Yes." Ubay asked, "What did you do then?" to which Umar replied, "I rolled up my sleeves and struggled." Ubay said, "That is taqwa, to protect oneself from sin through life's dangerous journey so that one can successfully complete the journey unscathed by sin."

Allah connects having taqwa with the provision of rizq in the following verse:

"And upon Allah rely, if you should be believers." All-Ma'idah: 23

"The believers are only those who, when Allah is mentioned, their hearts become fearful, and when His verses are recited to them, it increases them in faith; and upon their Lord they rely"
Al-Anfaal: 2

"And whoever fears Allah - He will make for him a way out And will provide for him from where he does not expect." At- Talaq: 2-3

In this relation, the Lord of the universe says: "O you who have believed, fear Allah . And let every soul look to what it has put forth for tomorrow - and fear Allah . Indeed, Allah is Acquainted with what you do." Al- Hashr: 18

On benevolence and doing good, Allah says: "... But if you do good and fear Allah - then indeed Allah is ever, with what you do, Acquainted." An-Nisa: 128

2. Tawakkul (reliance on Allah)

When Muslims talk about the future we always use the word inshallah, meaning “If God wills”, which denotes that what will happen is out of our control and is down to the discretion of Allah; only he knows what will happen.

In many parts of Africa people practice ancient forms of witchcraft and ancestral worship. For example, witch doctors and wizards are found in many villages and are consulted at all critical stages of life including birth, sickness, adolescence, circumcision, weddings and funerals. The witchdoctors are also brought in to pray over the land so that it will produce a bumper harvest. Here they perform rituals including sacrificing chickens, sprinkling animal blood, spreading bones, spreading potions and the placing of animal skulls on corner posts.

The practice of ancestral worship is the honouring of one's dead ancestors through sacrifices, rites and ceremonial oaths. Similarly, in East-Asian cultures the practice of worshipping nature, including rocks and trees, is prevalent because people believe that everything important to life has a sacred spirit. In Japan, these are called Kami. The spirits can be corrupted by evil spirits, so acts of purification and prayer are offered to the Kami to avoid angered backlash.

Throughout the history of the world, human beings have faced natural disasters, war, fear and the unknown; lack of understanding causes people to grasp for control and performs acts that have little reasoning or evidence to prove successful. But, as Muslims, we put our dependency on God and therefore our actions are out of devotion, praise and trust, in contrast to what some may consider these days as ‘superstition’.

“And whoever relies upon Allah – then He is sufficient for him. Indeed, Allah will accomplish His purpose. Allah has already set for everything a [decreed] extent.” At-Talaq: 3

To a Muslim, Allah is the Almighty, Creator and Sustainer of the universe, Who is similar to nothing and nothing is comparable to Him. The Prophet Muhammad (pbuh) was asked by his contemporaries about Allah; the answer came directly from God Himself in the form of a short chapter of the Qur’an, which is considered the essence of the unity or the motto of monotheism. This is chapter 112 which reads:

“Say, “He is Allah , [who is] One, Allah , the Eternal RefugeHe neither begets nor is born, Nor is there to Him any equivalent.” Al-Ikhlās: 1-4

“And your Lord is the Free of need, the possessor of mercy. If He wills, he can do away with you and give succession after you to whomever He wills, just as He produced you from the descendants of another people.” Al-An’am: 133

Making compost- Islamic Farming, Kenya



3. Salah (prayers)

Salah (performing the daily prayers) is the second pillar of Islam. Performing salah five times a day is mandatory for every able and mature Muslim; and can be performed either individually or in congregation.

"The believing men and believing women are allies of one another. They enjoin what is right and forbid what is wrong and establish prayer and give zakah and obey Allah and His Messenger. Those - Allah will have mercy upon them. Indeed, Allah is Exalted in Might and Wise." At- Tawbah: 71

"They arise from [their] beds; they supplicate their Lord in fear and aspiration, and from what We have provided them, they spend." As-Sajdah: 16

"And establish prayer and give zakah and bow with those who bow [in worship and obedience]." Al- Baqarah: 43

Prayer helps to purify a person when he or she sins. A person who performs his daily prayers can be as pure as the person who takes a bath five times a day in a river as mentioned by the Prophet Muhammad (pbuh) in the following hadith: Abu Hurairah (May Allah be pleased with him) reported: I heard the Messenger of Allah (pbuh) saying, "Say, if there were a river at the door of one of you in which he takes a bath five times a day, would any soiling remain on him?" They replied, "No soiling would be left on him." He (pbuh) said, "That is the five (obligatory) Salah (prayers). Allah obliterates all sins as a result of performing them." Al-Bukhari and Muslim

This hadith tells us about the merit and benefits of the performance of the prescribed five daily Salah, as it will clean the human soul and purifies man's heart and performing them will wash off one's sins.

According to the Qur'anic statements all creatures on Earth and in Heaven remember and praise Allah (Isra, 17/44). They are in a state of prayer in their own language and form of expression. Salah in this context is the embodiment of all forms of prayers performed by these creatures.

"And establish prayer and give zakah, and whatever good you put forward for yourselves - you will find it with Allah. Indeed, Allah of what you do, is Seeing." Al- Baqarah: 110

"And enjoin prayer upon your family [and people] and be steadfast therein. We ask you not for provision; We provide for you, and the [best] outcome is for [those of] righteousness." Surah Taha: 132



Planting a tree seedling Tanzania





4. Tawba (repentance)

"And said, 'Ask forgiveness of your Lord. Indeed, He is ever a Perpetual Forgiver. He will send [rain from] the sky upon you in [continuing] showers. And give you increase in wealth and children and provide for you gardens and provide for you rivers.'" Surah Nuh: 10-12

One of the things that prevents our rizq from reaching us is our sins. But some may say that many seemingly sinful people appear to receive rizq, so is there even a correlation? Yet if that is all we see, then we are being superficial. They may have received their material rizq, but Allah (swt) may deny them their spiritual rizq. And this is far worse. This is especially so when the bounty we have been given is used in illegitimate ways.

"Do they not know that it is Allah who accepts repentance from His servants and receives charities and that it is Allah who is the Accepting of repentance, the Merciful?" At-Tawbah: 104

"But when He tries him and restricts his provision, he says, "My Lord has humiliated me." Al-Fajr: 16

Allah (swt) tests us with our rizq and can withhold it if He so wishes. Repentance is a path that the believing Muslim can take to increase his rizq. "Or who is it that could provide for you if He withheld His provision? But they have persisted in insolence and aversion." Al-Mulk: 21

5. Infaq Fisabillah (charity)

It's no secret that when spending or giving charity in the path of Allah, Allah (swt) according to His boundless mercy gives back many times more.

"Who is it that would loan Allah a goodly loan so He may multiply it for him many times over?" Al-Baqarah: 245

"Whoever comes [on the Day of Judgement] with a good deed will have ten times the like thereof [to his credit]" Al-An'aam: 160

"They ask you, [O Muhammad], what they should spend. Say, "Whatever you spend of good is [to be] for parents and relatives and orphans and the needy and the traveler. And whatever you do of good - indeed, Allah is Knowing of it." Al-Baqarah: 215

"O you who have believed, do not invalidate your charities with reminders or injury as does one who spends his wealth [only] to be seen by the people and does not believe in Allah and the Last Day. His example is like that of a [large] smooth stone upon which is dust and is hit by a downpour that leaves it bare. They are unable [to keep] anything of what they have earned. And Allah does not guide the disbelieving people." Al-Baqarah: 264

"And whatever you spend of expenditures or make of vows - indeed, Allah knows of it. And for the wrongdoers there are no helpers." Al-Baqarah: 270

"Those who spend their wealth [in Allah 's way] by night and by day, secretly and publicly - they will have their reward with their Lord. And no fear will there be concerning them, nor will they grieve." Al-Baqarah: 274

"Indeed, the men who practice charity and the women who practice charity and [they who] have loaned Allah a goodly loan - it will be multiplied for them, and they will have a noble reward." Al-Hadid: 18

"And spend [in the way of Allah] from what We have provided you before death approaches one of you and he says, "My Lord, if only You would delay me for a brief term so I would give charity and be among the righteous." Al-Munafiqun: 10

The full story of the Prophet Yusuf (AS) in the Qur'an (12) is a beautiful example of succeeding despite all the odds. In this section we are interested in the wonderful management skills that Prophet Yusuf (AS) used to combat drought and starvation for the people of Egypt. Prophet Yusuf (AS) endures many trials but eventually succeeds. The surah clearly demonstrates the Islamic concept of 'Iman bil Ghaib' (belief in the unseen), as well as forward planning, precision timing and minimal wastage.

The Tafsir Ibn Kathir explains the story of the Prophet Yusuf (AS) and the Pharaoh's dream in Surah Yusuf of the Holy Qur'an (12:43-50).

The King of Egypt had a dream that Allah the Exalted made a reason for Yusuf's release from prison, with his honour and reputation preserved. When the king had this dream, he was astonished and fearful and sought its interpretation. He gathered the priests, the chiefs of his state and the princes and told them what he had seen in a dream, asking them to interpret it for him. They did not know its interpretation and as an excuse they said, had your dream been a vision rather than a mixed up false dream, we would not have known its interpretation.

The man who was saved from the two, who were Yusuf's companions in prison, remembered. Shaytan plotted to make him forget the request of Yusuf, to mention his story to the king. Now, years later, he remembered after forgetfulness and said to the king and his entourage, "I will tell you who can interpret this dream, it is Yusuf who is in prison." So they sent him, and he said to Yusuf, "O Yusuf, the man of truth! Explain to us" and mentioned the king's dream to him.

This is when Yusuf, peace be upon him, told the interpretation of the dream, without criticising the man for forgetting his request that he had made to him. Neither did he make a precondition that he be released before explaining the meaning. Rather, he said, "For seven consecutive years, you shall sow as usual, you will receive the usual amount of rain and fertility for seven consecutive years."

He interpreted the cows to be years, because cows till the lands that produce fruits and vegetables, which represent the green ears of corn in the dream. He next recommended what they should do during these fertile years, and that the harvest which you reap you shall leave it in the ears, all, except a little of it which you may eat.



He said, "Whatever you harvest during those seven fertile years, leave it in the ears so as to preserve it better. This will help the harvest stay healthy longer, except the amount that you need to eat, which should not be substantial."

He said, "Whatever you harvest during those seven fertile years, leave it in the ears so as to preserve it better. This will help the harvest stay healthy longer, except the amount that you need to eat, which should not be substantial.

"Stay away from extravagance, so that you use what remains of the harvest during the seven years of drought that will follow the seven fertile years." This was represented by the seven lean cows that eat the seven fat cows.

During the seven years of drought, they will eat from the harvest they collected during

the seven fertile years, as represented by the dry ears of corn in the dream.

Yusuf told them that during these years, the remaining ears will not produce anything and whatever they try to plant, will not produce any harvest, so he said, which will devour what you have laid by in advance for them, all except a little of that which you have guarded stored. He delivered the good news to them that after the consecutive years of drought, there will come a fertile year, during which people will receive rain and the land will produce in abundance. The people will then press wine and oil as usual.

Surah Yūsuf: 43-49 and 55

And [subsequently] the king said, "Indeed, I have seen [in a dream] seven fat cows being eaten by seven [that were] lean, and seven green spikes [of grain] and others [that were] dry. O eminent ones, explain to me my vision, if you should interpret visions.

وَقَالَ الْمَلِكُ إِنِّي أَرَى سَبْعَ بَقَرَاتٍ سِمَانٍ يَأْكُلُهُنَّ سَبْعٌ عَجَافٌ
وَسَبْعَ سِنْبَلَاتٍ خَضِرٍ وَأَخْرَ يَابِسَاتٍ يَا أَيُّهَا الْمَلَأُ أَفْتُونِي فِي
رُؤْيَايَ إِن كُنْتُمْ لِلرُّؤْيَا تَعْبُرُونَ

They said, "[It is but] a mixture of false dreams, and we are not learned in the interpretation of dreams."

قَالُوا أَضْغَاثٌ أَحْلَامٍ وَمَا نَحْنُ بِتَأْوِيلِ الْأَحْلَامِ بِعَالَمِينَ

But the one who was freed and remembered after a time said, "I will inform you of its interpretation, so send me forth."

وَقَالَ الَّذِي نَجَا مِنْهُمَا وَادَّكَرَ بَعْدَ أُمَّةٍ أَنَا أُنَبِّئُكُمْ بِتَأْوِيلِهِ
فَأَرْسَلُونِ

[He said], "Joseph, O man of truth, explain to us about seven fat cows eaten by seven [that were] lean, and seven green spikes [of grain] and others [that were] dry - that I may return to the people; perhaps they will know [about you]."

يُوسُفُ أَيُّهَا الصِّدِّيقُ أَفْتِنَا فِي سَبْعِ بَقَرَاتٍ سِمَانٍ يَأْكُلُهُنَّ سَبْعٌ
عَجَافٌ وَسَبْعِ سِنْبَلَاتٍ خَضِرٍ وَأَخْرَ يَابِسَاتٍ لَعَلِّي أَرْجِعُ إِلَى
النَّاسِ لَعَلَّهُمْ يَعْلَمُونَ

[Joseph] said, "You will plant for seven years consecutively; and what you harvest leave in its spikes, except a little from which you will eat.

قَالَ تَزْرَعُونَ سَبْعَ سِنِينَ دَابًّا فَمَا حَصَدْتُمْ فَذَرُوهُ فِي سُنْبُلِهِ إِلَّا
قَلِيلًا مِّمَّا تَأْكُلُونَ

Then will come after that seven difficult [years] which will consume what you saved for them, except a little from which you will store.

ثُمَّ يَأْتِي مِنْ بَعْدِ ذَلِكَ سَبْعٌ شِدَادٌ يَأْكُلْنَ مَا قَدَّمْتُمْ لَهُنَّ إِلَّا قَلِيلًا
مِّمَّا تَحْصِنُونَ

Then will come after that a year in which the people will be given rain and in which they will press [olives and grapes]."

ثُمَّ يَأْتِي مِنْ بَعْدِ ذَلِكَ عَامٌ فِيهِ يُغَاثُ النَّاسُ وَفِيهِ يَعْصِرُونَ

[Joseph] said, "Appoint me over the storehouses of the land. Indeed, I will be a knowing guardian."

قَالَ اجْعَلْنِي عَلَى خَزَائِنِ الْأَرْضِ إِنِّي حَفِيظٌ عَلِيمٌ

Section Three: From our Farms

PLAN

1. Know your farm
2. Know your soil
3. On time

PREPARE

4. Minimum tillage
5. Dig planting holes

PLANT

6. Plant seeds after first rain
7. Have a high quality of work
8. Rotate/plant with diversity

PROVIDE

9. Ongoing maintenance and care
10. Increase soil fertility

PROTECT

11. Manage pests naturally
12. Apply thick mulch
13. Remove all weeds

PRODUCE

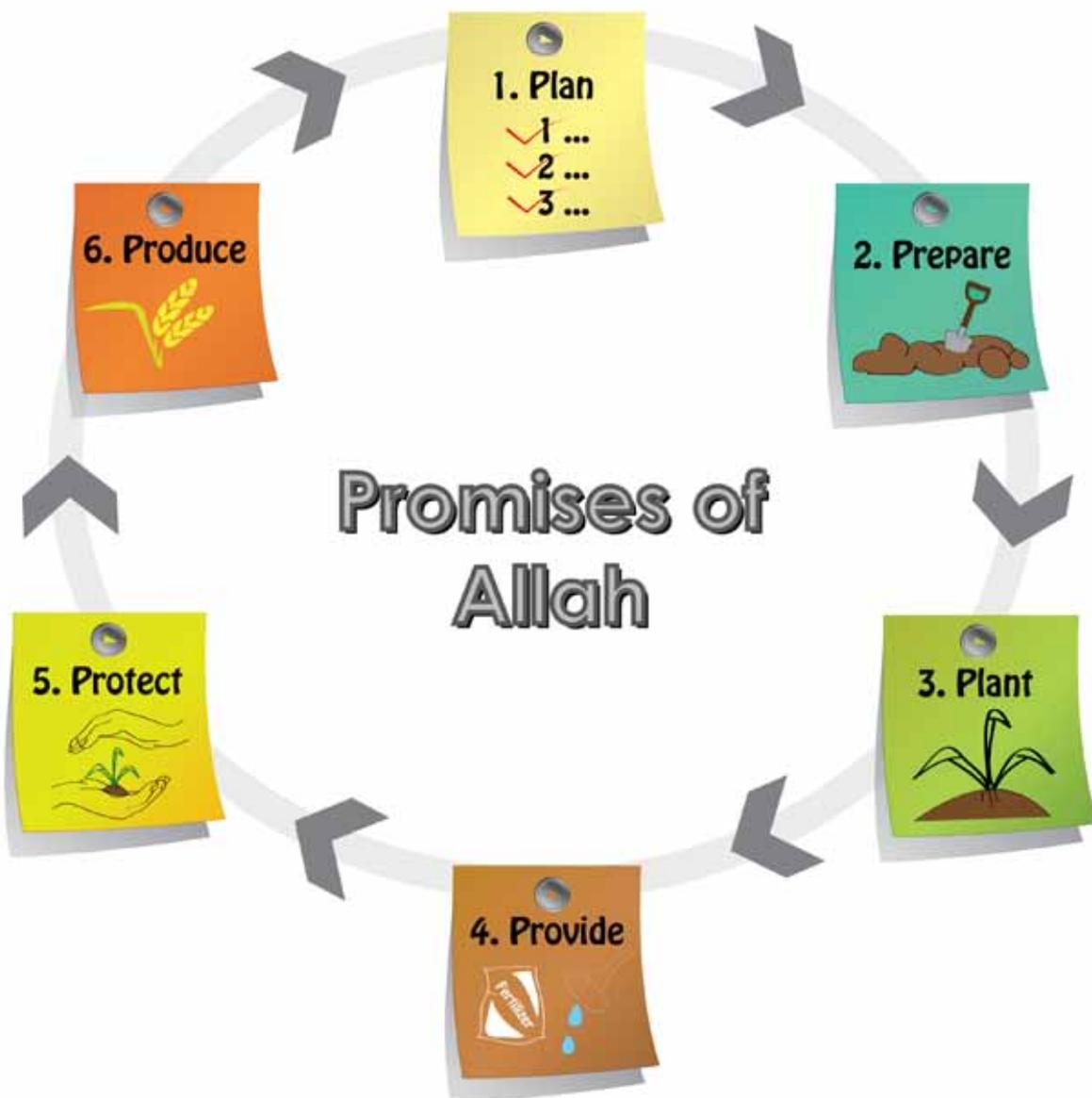
14. Do not burn
15. Minimise wastage



Introduction To Technical Information

In this section, we look at the practical details of planting crops in ways that recognises that we are no more than servants of Allah and merely stewards of His creation. These methods are part of an approach to agriculture called 'Conservation Agriculture' and have been widely adopted by various organizations including the United Nation's Food and Agriculture Organisation (FAO). Farming in this way is designed to have minimal environmental impact, while increasing yields and therefore profits.

Islamic Farming suggests that farmers follow six steps in their plant production activities. The six steps are circular – that is, the sixth step leads back to the first. There are numerous overlaps across the six steps so this is meant to be a guide of farming principles rather than a precise formula. It is important and unique to Islamic Farming that at the heart of the six steps is the Promises of Allah. These promises are the foundation that the technical information sits on.



Step 1. Plan

To plan effectively, we need to know our land. Farmers in the Islamic world have often kept special books called almanacs where they planned and recorded their farming activities. Islamic Farming suggests you get a special book

where you can write down observations of your farm and write your plan. No one knows your lands as well as you do. Here are some questions to ask that will help to know and understand your farm – record the answers in your book.

KEY MESSAGE 1: KNOW YOUR FARM

Size and Shape of Land

Q. Do you know how much land is available? It is a good idea to measure the land and to draw a map. If you don't have a measuring rope, even rough measurements will help e.g. number of paces from one corner of the land to the other.

Q. What shape is the land? What are other features of the land? Draw a map of your land and mark significant features such as buildings, trees, water source, roads, paths and so on. Once your map has been created, have a look at how much land is available for planting, and how much needs to be kept for animals and humans to live. How much cannot be farmed because of bad soil, rivers and other factors?

Slope

Q. Is the land flat or sloped? Have a look at the direction water travels when it is raining. This can also be marked on your map – so that you know where the wettest parts of the land

are and the direction that water travels. This information can help you place a water tank and irrigation system in the correct position.

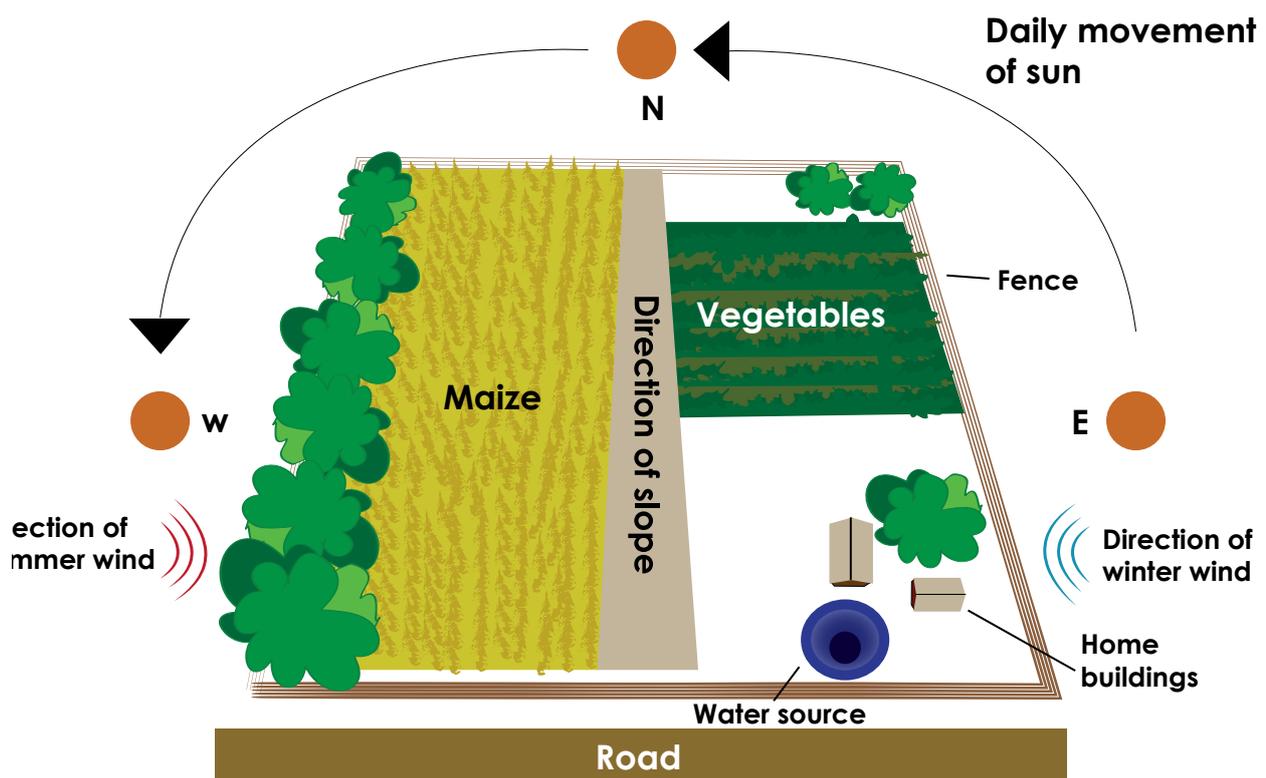
Soil

Q. What type of soil do you have? See below for information on soil testing. The type of soil you have will influence the types of crops you can plant. It is important in Islamic Farming that we consider our soil type as part of our farm planning.

Context

Q. What are your neighbours growing? You can learn from their experiences e.g. what crops are successful in your area and what crops fail?

Q. What natural features are on your land? For example, are there lots of trees that make shade and stop some plants growing? Or are there insufficient trees and you need to plant more? Is there a river or dam that can provide water?



Climate

Q. What climate does your land have? When does the rain come? Do you have frost? These are very important factors for planning your farm

Q. Are there strong winds? How can you protect your crops from the wind?

Q. Will your plants get enough sun (minimum of 5 hours per day for most vegetables)? Are there any areas that have more shade e.g. from trees or buildings?

Security

Q. Do you need fencing to protect the land? Do you need to protect your land from animals so that they do not eat your crops?

Access and Water

Q. Is the farm close to your house? Do the plants have access to water in case of drought? Can you save water from your roof or your bath and use it on some of the crops?

Q. How long does it take to get your crops to a market? How will you do this?

Materials

Q. What natural materials are available on your farm? Do you have a source of wood, rock, grass, water and so on? Using these materials will save you buying new materials

Q. What other materials will you need and how much will these materials cost?

Tools

Q. What tools do you have? Do you need to buy tools? How much do they cost? Can you share tools with neighbours and split the cost?

Purchasing

Q. How much money do you need to buy seeds and tools? Do you need to borrow money? Who are you going to borrow money from and can you find interest free loans? This is important to consider in your plan. Perhaps you need to phase your planting over a few months so you can spread the costs.

Q. Where will you get seeds and tools? Are these the best prices?

Q. Do you know how many seeds you need? Work this out using your map and the number of planting holes you will be digging (see step 2).

Sales

Q. Will you sell your crops? How much can you sell them for? Where will you sell them? Think about this carefully as it will show how much profit you can make.

Q. How are you going to record your income and expenditure? Consider getting a separate notebook for your farm expenses.

Crop rotation

Q. Have you considered rotating your crops? It is a good idea to do this. In Islamic Farming, we recommend crop rotation as it increases biodiversity, increases soil fertility, and helps with pest control.

Timing

Q. Do you have a schedule for when to start preparing your fields, when to start planting, when to anticipate harvesting? In Islamic Farming, we recommend having a schedule with these details planned. Plan your year, month by month, spreading the work across the year. Remember to include significant dates where you might have less energy available, for example Ramadan.

Structures

Q. Do you need to prepare special structures for your plants? Climbing plants such as beans and tomatoes need a structure to climb on to. This can be natural such as a maize stalk or old branches from a tree. Some farmers build a trellis with wood and wire.

In some parts of your farm you may need to irrigate young or thirsty plants. You can catch rainwater from the roofs of your buildings. You can pump water from a river or dam. Think how you can do this with little work and little money.



As part of planning and knowing our land, we should learn what type of soil we have. Soil holds the nutrients that plants eat, so the healthier the soil the healthier the crops and the healthier we are. In step 4 we will explore how to improve the soil health. Here, in the Planning stage, we will look at understanding our soil. We begin with looking at the four types of soil. As we look at this, think about what type of soil is on your land:

1. Sand large particles, lots of drain age, lots of air, good for root crops.
2. Clay – small particles, limited drainage, no air, easy to flood. Challenging for most vegetables.
3. Silt – medium particles, can form a hard crust.
4. Loam – the best soil for plants to grow. A mixture of sand, silt and clay. Holds water, but allows sufficient drainage. Full of moisture, air and nutrients.

Group exercises

The questions and instructions below offer a method that incorporates your knowledge into new techniques that will make your farm more productive, sustainable and treats the land with the respect Allah's creation deserves. Here are some exercises to learn more about your farm and your soil.

Exercise One: Soil knowledge from direct observation

Direct observation is a good way to know your soil. This involves digging a few holes across your farm. For a thorough knowledge of the soil, dig five holes across each acre. When the hole is dug, make sure that one side is a 'clean' cut

– a sheer vertical edge that clearly shows the various soil varieties. Then take note of these various indicators:

1. Soil structure and texture. Soil with a crumbly structure, like well-made bread, and soft texture is well aerated and the plant roots are able to penetrate easily.
2. Soil depth. Deep soil allows the plant roots to grow both wide and deep and access more nutrients to support good growth.
3. Soil colour. Soils rich in organic matter are darker in colour and more fertile than similar soils that are low in organic matter.
4. Soil water. Plant nutrients are taken up along with water from the soil. Therefore soil with enough water can easily supply nutrients to plants. Cropland with a high level of soil water will support strong plant-life.

Exercise Two: Soil knowledge of pH

Soil acidity is measured on a scale of 1-14, a pH level between 6 and 7.5 (slightly acidic) is best for growing most crops. This is because at this level phosphorus in the soil is able to absorb water and be taken up by the plant roots. Phosphorus is essential for all plants and is responsible for helping the plant bloom and for fruit development.

You can buy a chemical soil pH testing kit. If it is not possible to buy a kit try a simple alternative, using vinegar:

1. Scoop some soil into a container. Then pour in some vinegar, if the soil bubbles and fizzes its alkaline.
2. If there's no reaction, scoop a fresh soil sample into a second container. Add a half-cup of water and mix. Then add half a cup of baking soda. If the soil bubbles and fizzes it is highly acidic.



In Islamic Farming, we do things on time. There is order in creation, for example, we know that the sun rises every morning and sets every evening. We know the lunar cycle, created by Allah, is always 29.5 days. Allah's ways are on time, and we should follow this.

As farmers, there should always be a time of planning before we plant. Likewise, there should be an appropriate time for preparing the fields, a time for planting, a time for weeding, a time for watering, a time for eating or selling, and a time for resting. Remember this as you write your farm plan and schedule.

It is critical that our farms have clear plans before any work is carried out. We need to plan how to build our farms, what the farm needs, what our roles are, and we need to plan for both success and for difficulties. Sometimes it will feel frustrating to take time to plan. You probably just want to start planting! However, the more time you take to plan and the more detailed your plan is, the easier the farming will be.

Livestock focus

It is equally important to carefully plan your livestock activities. Many crop farmers have not considered animal production. Islamic Farming recommends an integrated approach, where farmers have both plants and livestock activities. There are several reasons for keeping animals on your farm in addition to your crops:

- Farm animals provide nutritious food in the form of meat, milk and eggs, thus contributing to a balanced and nutritious diet for the farm family.
- Animals provide useful products that can be sold to manufacturing industries such as horns, bones, hides and skins, giving extra income.
- Animals are a source of financial security and investment: in urgent cases they can be sold to raise money.
- Oxen, donkeys and horses provide draught power for farm activities and transport.
- Sheep and goats can be used to graze on range lands that are not suitable for soil cultivation.

- Animals provide manure that is rich in nutrients and makes a highly valuable natural fertiliser.
- On a farm that produces crops, animals can feed on crop remains and other waste products from harvesting, and thus contribute to recycling nutrients within the farm to feed the soil.

The Qur'an encourages us to keep livestock:

'Eat and raise your livestock. These are sufficient proofs for those who possess intelligence.'

Surah Taha- Ayat: 54

'Have they not seen that we created for them, with our own hands, livestock that they own? And we subdued them for them; some they ride, and some they eat. They derive other benefits from them, as well as drinks. Would they not be appreciative?' Surah Yasin: 71-73

Many of the questions asked for plant production can also be applied to animal production. These include:

Context

Q. What animals are your neighbours keeping? You can learn from their experiences, for example, what breeds are successful in your area?

Q. What natural features are on your land? Are there lots of trees that make shade and provide natural shelter? Or are there insufficient trees and you need to plant more? Is there a river or dam that can provide water for the animals?

Q. Do you need to build shelters?

Climate

Q. What climate does your land have? When does the rain come? Do you have frost? These are very important factors for planning your farm and keeping your animals healthy.

Q. Are there strong winds? How can you protect your animals from the wind?

Security

Q. Do you need fencing to protect the land? Do you need to protect your land from animals so that they do not eat your crops?

Access and Water

Q. Is it close to your house? Do the animals have access to water in case of drought? Can you catch water from your roof and use it for the animals?

Q. How long does it take to get your animals to a market? How will you do this?

Purchasing

Q. Where will you get your stock? Are these the best prices?

Q. How much money do you need to buy animals and their feed and medicine? Do you need to borrow money? Who are you going to borrow money from and can you find interest free loans?

Sales

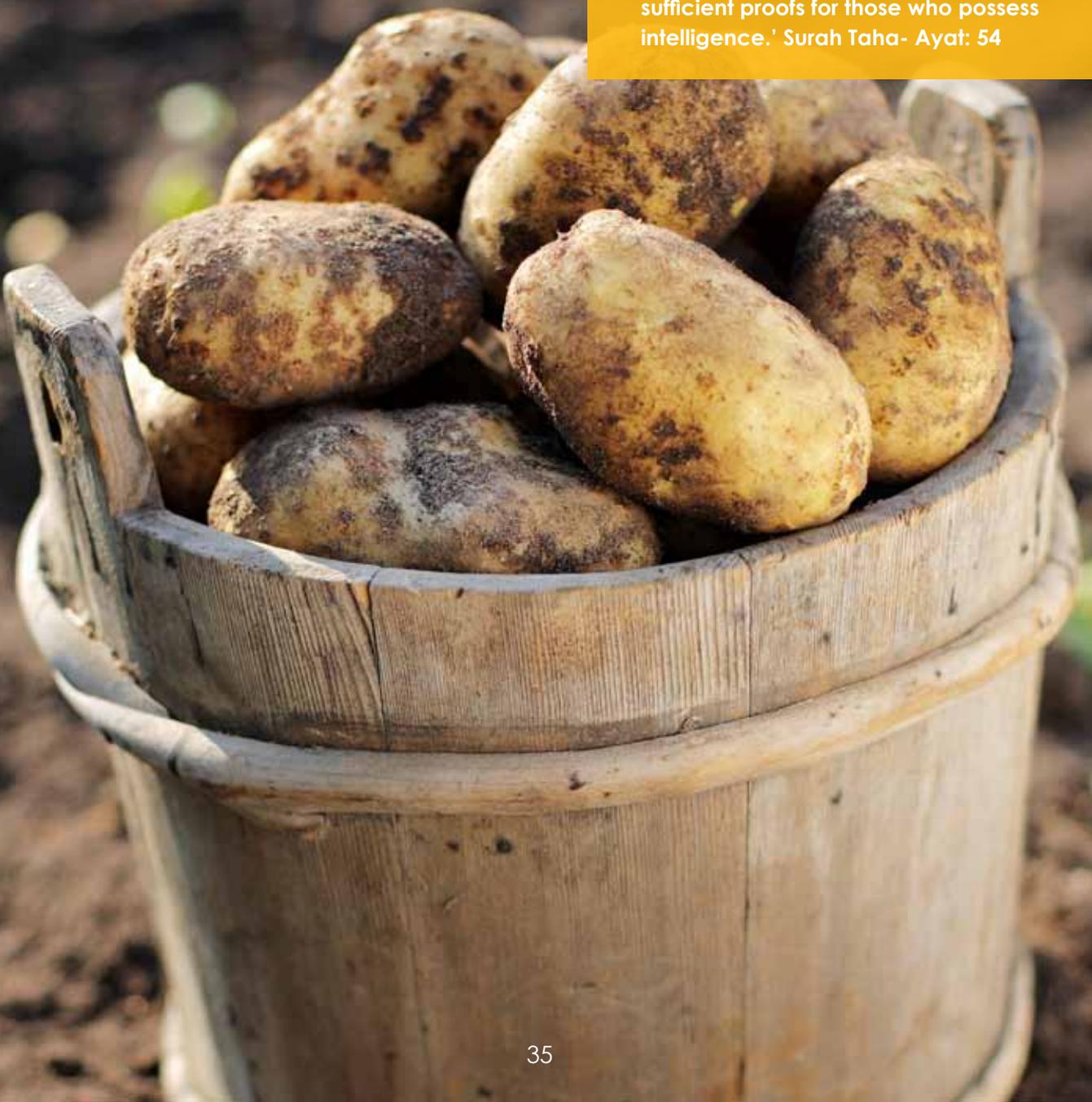
Q. Will you sell your animals and animal products? How much can you sell them for? Where will you sell them? Think about this carefully as it will show how much profit you can make.

Q. How are you going to record your income and expenditure? Consider getting a separate notebook for your farm expenses.

Timing

Q. Do you have a schedule for when to start breeding, weaning, and so on? How often will you check the animal health? Plan a calendar so you know what to expect each month.

'Eat and raise your livestock. These are sufficient proofs for those who possess intelligence.' Surah Taha- Ayat: 54



Step 2. Prepare

After creating your plan, it is important to prepare everything you need before the planting begins. This might be obvious, but it is easy to forget some items that are needed. Planning and preparing properly will make sure the work is easier. If you have everything you need ready and available, the work will flow smoothly.

Tools And Equipment

Make sure you have all the tools you need to run your farm. To practice Islamic Farming, you will need a hoe, compost or manure, seed, measuring cups, measuring sticks, and a terrene rope (string with markers such as

bottle tops). You will probably also need a spade, fork and hand tools. Keep a check list of your tools in the farm almanac. And remember to clean your tools – this helps stop the spread of diseases and also makes the tools last longer.

Remove Weeds And Rocks

As part of your initial preparation, remove all weeds from the field. This is a very important part of Islamic Farming and will be looked at in more detail in step 5. For rocks and stones, anything larger than your thumbnail should be removed. Smaller stones are fine as they can help with drainage.

KEY MESSAGE 4: MINIMUM TILLAGE

What makes Islamic Farming so powerful in terms of sustaining higher yields is the emphasis on minimum tillage. This is radically different from traditional farming methods that use a plough to till the Earth. Minimum tillage, also known as 'zero tillage' aims to minimise soil disturbance.

Hole digging has many benefits. These can be summarised as:

1. Improves soil structure
2. Improves soil water holding capacity
3. Improves soil biology and therefore fertility
4. Reduces erosion
5. Reduces effort in the long run
6. Reduces cost – Input costs halved & tractor costs reduced by one third
7. Roots and organisms bind soil & prevent slumping downwards & across the slope (prevents large scale erosion).

When land has not been tilled for many years, the biological and microbial organisms that live in the soil – from insects and creatures such as earthworms, fungi and bacteria – do the work of breaking down organic matter and incorporating it into the soil. This increases soil fertility, leading to healthier plants, and improves its structure, enables moisture to be better absorbed.

That's why in Islamic Farming we do not practice mechanical tillage; instead, we aim to minimise disturbance to the soil by digging precise holes at exactly the place where we will plant the seed. The FAO estimates that farmers can save between 30% and 40% of their time by not tilling the soil. In Islamic Farming, the time saved on tilling is spent digging the planting holes.

KEY MESSAGE 5: DIG PLANTING HOLES

In Islamic Farming, we recommend using a system of 'planting holes', where each hole contains the right amount of nutrients to feed the plants that will grow from that

hole. This minimises soil disturbance and can increase yields dramatically. It is a better way to care for Allah's creation as well as enjoying better yields and more nutritious food.

The pictures below illustrate how hole planting works. Here is a step-by-step guide to the method.

Follow these three steps:

1. Layout and digging of holes

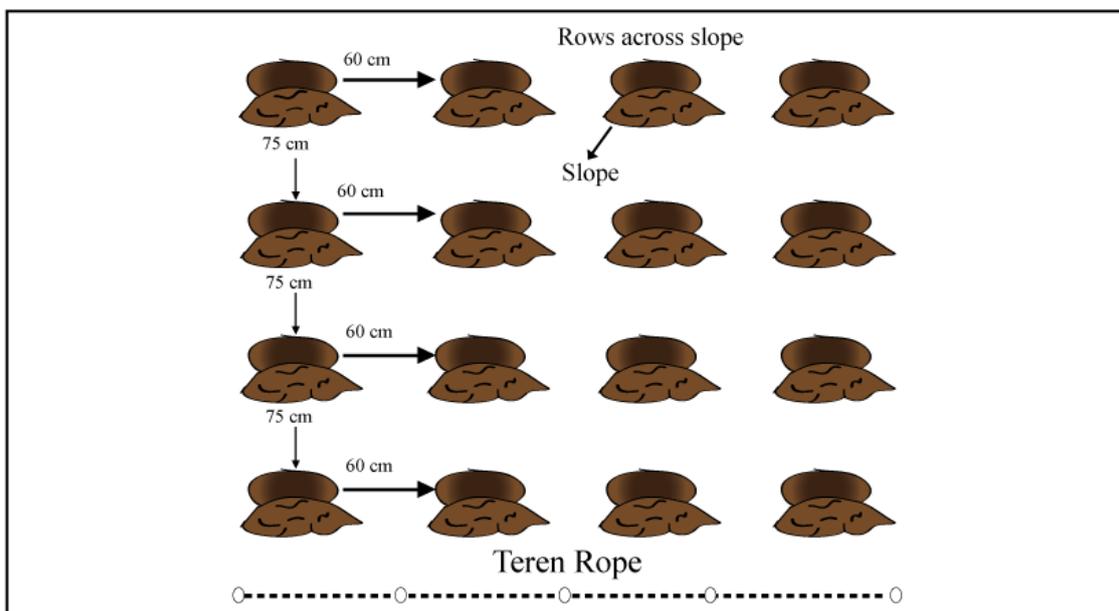
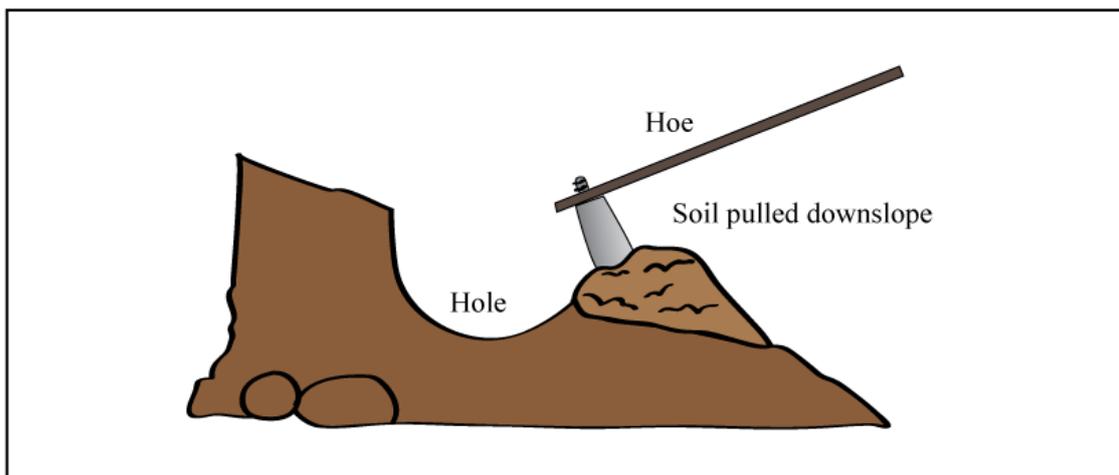
- Prepare to dig holes along the contour (across the slope). This is so that surface water enters holes and feeds the plants.
- Prepare your terrene (spacing) rope for the right crop. For maize – spacing is 60cm along the row and 75cm between rows. The spaces can be marked with paint or bottle tops attached to the rope as markers.
- Dig each hole at the position of each marker along the rope.
- The holes should be the width of the hoe and the depth of the hole (approximately 30x30x30cm).
- Make sure the soil goes down the slope, forming a mound that will act like a dam wall after rains.

2. Add manure or compost

- In the bottom of each hole, apply approximately one tin of animal manure or two tins of well-rotted compost.
- Spread the manure evenly across the base of the hole.
- If you have acidic soils, also add lime to the hole to help decrease acidity.

3. Cover and wait

- Cover the manure and lime with a little soil, making sure that the required seed planting depth remains (this is 5cm for maize).
- Now wait until the first proper rainfall. After these three steps, the hole digging preparation is complete. You can now rest and wait for the rains, or carry on with other work on the farm such as gathering mulch for step 4.



Livestock focus:

Preparing your livestock includes selecting healthy animals that will benefit the farm and provide a good return on your investment. Be careful to select the right animals for your land. You should not have more animals than the land can support.

Farmers should rear and breed only animals they can manage well. Native animal breeds are usually best as they are adapted to local conditions, easier to manage and increase the chance of successful breeding. Animals that are not suited to local conditions can be at high risk of diseases and poorer productive value.

Choose animals that look healthy and alert. Important factors to look for include clean and healthy skin and hair. Avoid animals that have a lot of dung caught in the hair or feathers at their backside. The eyes should be open and alert, not heavy and sleepy. Look for good muscle growth and avoid thin weak animals. Also check the feet of animals – avoid animals with infected feet. Healthy animals will give you better service for a longer time and they are worth paying more for.

To save money, it is a good idea to breed your own animals. Islamic Farming suggests breeding your own replacements. This is responsible stewardship of Allah's creation. When you are selecting animals to breed from, spend time considering whether the animal has the following features.

The animal:

- Can cope well with your farm environment.
- Has fewer problems with illnesses and parasites than others.
- Has good feeding behaviour, including the fodder from your farm.
- Does not lose a lot of weight during the dry season or during phases of high production.
- Does not get easily nervous or stressed.

Rules for breeding

- Use healthy animals that produce well using locally produced feed.
- Animals should mate naturally.
- Select breeding males carefully. Males not suitable for breeding need to be slaughtered, sold or castrated.
- Exchange breeding males regularly to avoid inbreeding. In general, avoid animals mating with their own offspring. (Inbreeding makes it more likely that an animal will inherit undesirable genes and traits.)
- When artificially inseminating cattle, choose semen from bulls of adapted breeds with good health traits and with complete health information available.



Step 3. Plant

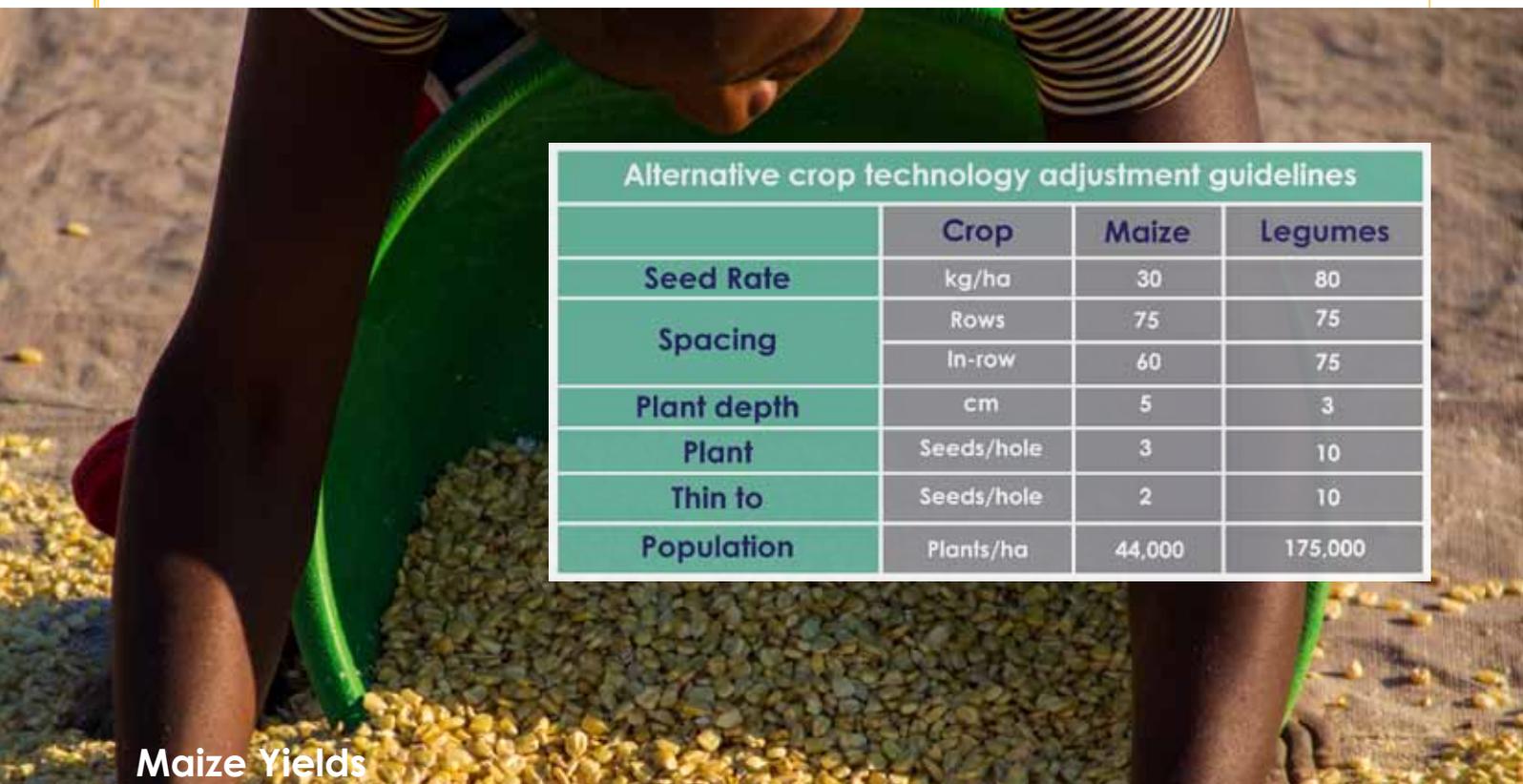
The hard work of preparing the ground is now over. The planting is actually quite easy and it is also very exciting and fun. Soon food will be growing everywhere! Here are instructions on how to plant into the holes.

KEY MESSAGE 6: PLANT SEEDS AFTER FIRST RAIN

The approach of Islamic Farming is to delay planting our seeds until after the first good rains. That means that all your holes should be dug before the rains come. Then, within two days of the rain, plant your seeds.

Here is an example step by step guide for planting maize, sorghum and soybeans:

1. Plant 3 seeds in each hole for maize and 1 for sorghum and soybeans.
2. Plant seeds in straight lines across the row, with roughly equal distances apart from each other.
3. Depth:
 - a. Maize seeds should be planted at approximately 5cm deep. This is roughly the length of a matchbox.
 - b. Sorghum and soybean seeds should be planted at approximately 2cm deep. This is roughly the thickness (height) of a matchbox.
4. After placing seeds in the hole, carefully cover with soil and pat down gently (the back of the hoe is a good tool for this). Make sure no grass or vegetation is on top of the seeds – the seeds should be covered by soil only.
5. Level the surrounding surface.
6. Apply mulch. See step 4 for more on this.



Maize Yields

By following the hole digging instructions for maize, each hectare of land should have 22,000 holes. After thinning maize to two plants per hole, farmers can expect growth of 44,000 plants/ha. Maize might have an average

of 2 cobs per plant, so yield estimates should be for 88,000 maize cobs per hectare. Use this information to help anticipate yield, food supply, and potential income through sales.

KEY MESSAGE 7: HAVE A HIGH QUALITY OF WORK

An important message of Islamic Farming is that our farms should reflect our taqwa and the order and glory of Allah's creation. We can do this by having a high quality of work at every stage of farming. When we prepare our holes, they should be in beautiful straight lines. They should all be the same depth and width, and have the appearance of neatness and order.

Likewise, when planting, we should be diligent in planting the right number of seeds in each hole, in a straight line, equally spaced. Covering each hole neatly will make our farms look neat and tidy. After planting, our farms should continue to be beautiful and ordered – we do this by removing all weeds, ensuring a thick mulch cover, and keeping the farm tidy by packing away tools safely.

KEY MESSAGE 8: ROTATE AND PLANT WITH DIVERSITY

In Islamic Farming we suggest rotating what crops are planted each season. This makes sure that no single nutrient in the ground is used up, ensuring increased soil fertility. Rotation also diversifies the nutrient intake of our families as we eat a broader range of crops.

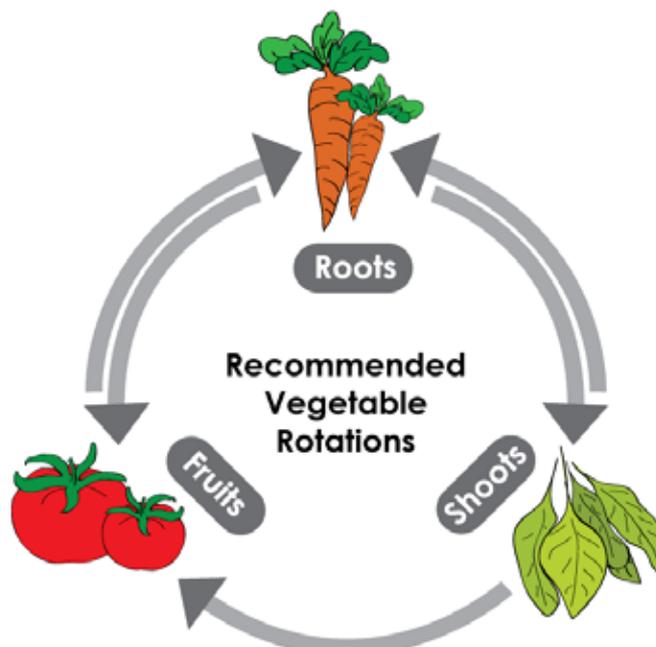
Furthermore, rotating our crops is hugely significant in terms of natural pest control. Changing the crop breaks the cycle of infections and pests. An example of this is rotating tomatoes with carrots helps to stop the pest known as Tomato Fly.

Legumes are one of the most important crops to include in your rotation plan. Legumes are a family of crops that increase soil fertility by capturing nitrogen in the air and depositing it in the soil. This is called nitrogen-fixing. It is an easy and cheap way to increase soil fertility. Legumes include beans, peas, soybeans, and groundnuts.

In Islamic Farming we recommend always growing legumes in a portion of your farm. For example, have 1/3 of your farm as legumes each season, and after harvest, plant your main crop where the legumes were. For example, you may have 1/3 as beans and 2/3 of the farm as maize.

For vegetables, Islamic Farming recommends the following system of rotation, using three families of plants:

1. Roots – carrots, turnip, potatoes etc. We eat the root. They grow underground and use relatively few nutrients.
2. Shoots – spinach, lettuce, cabbage. We eat the shoot (leaves). These plants are in the middle category, with medium height and using more nutrients than roots but fewer nutrients than fruits.
3. Fruits – tomato, pumpkin, peppers etc. We eat the fruit (flesh). These plants make large, often colourful 'fruit' and require the most nutrients.



With this framework in mind, we should design our vegetable rotation carefully. It is important to follow high-nutrient demanding vegetables with less-demanding vegetables.

In short, follow these steps:

- replace roots with either shoots or fruits.
- replace shoots with either roots or fruits.
- replace fruits with roots only.

Companion (friendship) planting

Another aspect of vegetable planting is an approach called 'companion planting'. Like humans, some plants are friends and others are enemies. Your planting plan should mix plants that are friends. This form of 'intercropping' has a large number of benefits:

- a.** Enhances flavour – certain 'friends' can stimulate flavour in other plants, making your plants more popular at the market.
- b.** Spreading risk – diversification of vegetables spreads the risk in case of damage from pests or drought.
- c.** Height management – different heights can benefit the farm by providing groundcover, a natural climbing trellis, and shade for shade-loving varieties.
- d.** Nitrogen fixing – legumes (beans, peas), as described above.
- e.** Positive hosting – some plants attract beneficial insects such as ladybirds and centipedes. These insects eat the pests that attack other plants.
- f.** Pest control – other plants repels pests naturally, usually because they have a strong smell.
- g.** Shelter – some plants are good friends as they provide a windbreak.
- h.** Trap cropping – these plants are placed on the outside of the vegetable area. They attract pests to them, so that the pests do not go to the vegetables.
- i.** Pattern disruption – diversity of friends will confuse pests. Pests like to go for easy targets that all have the same look, smell, height etc.
- j.** Disease prevention – rotating crops stops the build-up of soil diseases and pests.

Islamic Farming recommends planting different crops between your main crops. Choose beneficial 'friends' or companions that will have a beneficial impact on your main crop.

Here are some popular examples:

The South American 'Three Nations'

This is a three-crop intercropping system common in South America. It works very well for maize farmers. Farmers should plant their maize seeds into the holes as described above. After the maize stalk has appeared from the ground, farmers should plant two bean seeds alongside each hole (not in the hole). The beans will grow and use the maize stalks as a trellis. At the same time as planting the bean seeds, farmers should also plant a cucurbit (pumpkin/squash/butternut) seed. This can be planted as one seed between four maize holes. The cucurbit family of plants have large leaves that will cover the ground, providing shade and a living mulch. The tall maize plants will provide shade to the cucurbit leaves that suffer in too much sun.

Other examples

- Cabbage is friends with aromatic herbs, bush beans, beets, celery, marigold, nasturtium, onions, and potato. Note, it does not like to be planted close to strawberries and tomatoes.
- Maize is friends with beans, cucumber, geranium, melons, peas, potato, pumpkin, squash, and sunflower. It does not like to be planted with celery or tomato.
- Potatoes are friends with beans, cabbage, eggplant, lettuce, maize, marigold, and onion. Do not plant with cucumber, pumpkin, radish, sunflower, squash, or tomato.
- Pumpkin and Squash can be planted with beans, maize, mint, nasturtium, and onion. Do not plant with potatoes.
- Tomatoes grow well with basil, carrot, celery, garlic, onions, marigold, mint, nasturtium, and peas. It does not grow well with cabbage, maize, or potato.

Step 4. Provide

Having planted our fields, it is important that we keep a watchful eye on the healthy growth of our plants. Islamic Farming requires constant

vigilance and stewardship throughout the growing season. This again shows your taqwa and tawakkul and presents beautiful healthy crops.

KEY MESSAGE 9: ONGOING MAINTENANCE AND CARE

It is critically important to provide nutrients to our crops, making sure they have enough food to grow strong and healthy. Remember that pests look for weak plants, so when providing nutrients to our crops we are also limiting pest damage.

Like humans, baby plants require more help and care. As they grow older they are stronger and able to survive with less care. This is important to remember as you look after your plants – give more attention to the plants when they are young.

When the plants have started to appear from the ground, there are some further steps to take in Islamic Farming. With maize, all three seeds may germinate and you will have three young shoots sticking out of the ground. Remove the weakest shoot. This is called thinning. If there are three equally-healthy shoots, remove the middle of the three.

We need to thin our maize fields to an average

of two plants per hole. That means if only one seed germinates, then keep three shoots growing in the adjacent hole.

Later in the growing period, when the plants are knee height, Islamic Farming recommends that you 'top dress' with manure. This means applying nutrients to the surface at each planting hole. Note, it is important to have at least 10cm distance from the stems, otherwise the nutrients can burn the plants. Apply a tin of manure or compost on the upside of the hole.

Later still, when the plants are about to tassle (form the grass-like head), add another tin of manure or compost.

The final action of ongoing maintenance and care is called 'topping'. This is when the plants are fully mature – you should break off the plant above the cobs of maize. Place this broken part of the plant on the floor as mulch. The purpose of topping is to speed the process of drying and maturing the maize cobs.



A critically important aspect of managing our farms as an Islamic duty is to constantly increase our soil fertility. The depletion of our soil's fertility is regarded as one of the biggest obstacles to our agricultural development. Reasons for the depletion include overgrazing, deforestation, mono-cropping and slash and burn practices.

Islamic farming shows how to effectively manage your soil's fertility by considering the interaction between each of the individual components that impact upon it: water, pests, weeds, crops and livestock. Fundamental to this system of soil management is a belief that Allah gave to us a green and fertile land that has been corrupted by exploitation, poor farming methods and the over-use of chemicals.

Islamic farming takes a long-term approach to soil fertility. By following these principles, your soil will get better every year. Each season you can expect better harvests. Your inputs will eventually get less and your yields will get more. Better soil will hold more water and nutrients to feed your plants. Here are some methods for improving your soil health in order to provide sufficient food for your crops:

Composting

This is very important for any farm. It is a way to reuse your waste to make food for your new plants. Compost is created as bacteria break-down old plants and other materials, converting them into nutrients that can be used by the plants. This compost can then be placed in each planting hole if no manure is available.

Compost is full of nutrients and microorganisms that increase soil fertility. The microorganisms also improve soil structure, thus improving drainage, water retention, reducing the risk of erosion and flooding.

Step by step guide to aerobic composting

1. Aerobic composting – is fast composting. It needs lots of air and can be ready in 3 months. Compare anaerobic composting, which is slow. It does not need air and can be ready in 12 months or more.

2. Composting is like cooking food for your crops. Like cooking human food, for compost

you also need a pot, a mixture of ingredients, water, and heat.

3. The pot should be a container that lets air into the compost, otherwise there won't be any heat. Suitable containers could be wire frames or boxes made of old planks. The pot should be placed in the shade, as it is important that the pot does not dry out. A tall compost 'pot' is better than a wide one. Note – it is possible to make compost without a pot.

4. Before 'cooking' you will need to prepare a mixture of wet and dry ingredients.

5. Wet ingredients include fresh plants, vegetables and kitchen scraps, fresh grass, teabags, eggshells, seaweed, manure, and other green waste such as leaves. These ingredients are full of nitrogen.

6. Dry ingredients include dry grass, dry leaves, small sticks, shredded newspaper or cardboard. These ingredients are full of carbon.

7. Do not include any meat or animal products because it attracts rats. Do not place alliums (any onion-family crops) or citrus (orange peels, because too acidic). Do not put in any plastic or glass, or any shiny/glossy paper. Also, try and avoid any plants with seeds, e.g. old tomatoes, grass flowers, etc.

8. To 'cook' the compost, we are going to place the ingredients in layers, like making the Italian pasta called lasagne!

a. Prepare the base of the pot by breaking/loosening the ground with a spade.

b. Place the first layer – this should be a loose pile of sticks and twigs, forming a frame for the other ingredients to sit on, allowing air to move underneath.

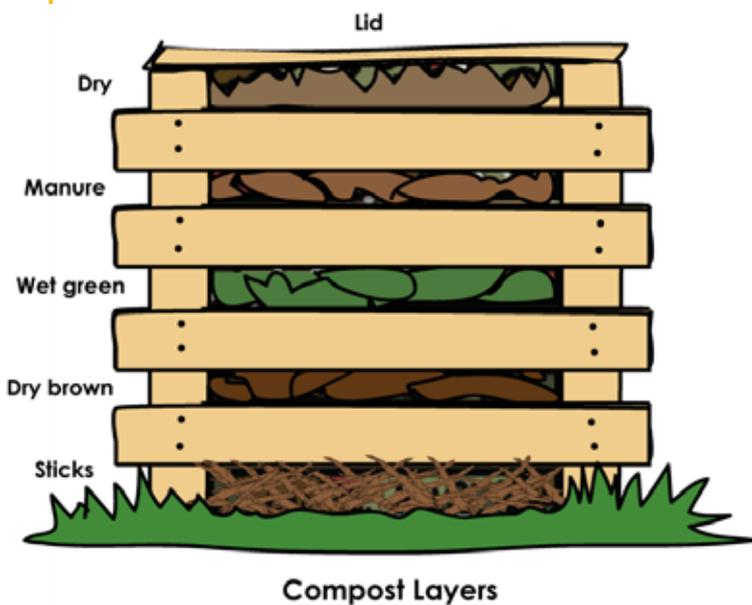
c. Place the second layer – this should be dry and mainly brown ingredients

d. Place the third layer – this should be wet and mainly green ingredients.

e. Now add some manure, which gives the compost heat. Also add water to keep the compost moist.

f. Keep adding layers of dry, wet, and manure until all the ingredients are used up, or your pot is full. Each layer should be approximately 20cm deep. You are aiming for 50% wet and 50% dry when complete.

9. Now add a lid for your compost pot. This could be wood or old carpet/blanket. The lid keeps moisture in the compost pile as well as stopping too much rain saturating the compost.



You are now finished preparing the food for your crops! It is starting to 'cook' and the bacteria are breaking down the dry and wet ingredients. These aerobic bacteria can work very fast. You can tell if they are working if the compost is hot. Place a stick into the compost pile and leave for a minute. Take it out and feel the temperature – it should be hot. If the stick is cold, then the bacteria needs more air and maybe water.

Add air to the compost by turning it over with a fork. This is like 'stirring' porridge. When you stir the compost, see how the green and brown are becoming one dark colour. This is a good sign. Add water when you stir if the compost looks dry.

When the compost is all one colour and a soft texture without a smell, it is ready to go on your fields. This should take approximately three to four months.

Islamic farming recommends a well-planned composting system that has multiple compost 'pots' cooking at the same time. Depending on the size of your farm and how many ingredients are available, start a new compost 'meal' every two months. This means that you will have six 'meals' a year for your crops and there will

always be two compost pots cooking at any one time.

Manure and herbal teas

Give your plants a quick nutrient boost by making 'tea' from manure or nutrient-rich herbs. Take the manure ingredients and stew them in a barrel of water for two days. Any manure is fine, although be cautious with horse and donkey manure which are quite acidic. Herbal teas can be made from comfrey, borage, nettles, and seaweed. Use roughly 1kg of leaves to 10litres water, stew them for at least two weeks.

Livestock

Another way to increase soil fertility is to introduce livestock on to the fields after harvest. Animals are great producers of manure, which is an excellent source of natural fertiliser for the soil, and their bedding can also be added as a soil improver and mulch. They will also help to trample and break up the crop residue.

Commercial fertiliser

It is an important aspect of Islamic farming not to use artificial chemical inputs. We do not see artificial chemicals in creation. It is these inputs that have corrupted the soils, often damaging soil organisms and water. Instead, you can look for commercial organic fertilisers such as seed oil cakes, pelleted chicken manure, brewery by-products, fruit peels, coffee and rice husks, wood shavings and wood/charcoal ash.

Soil amendments for pH

If the pH level of your soil is overly alkaline or acidic, it may be necessary to use soil amendments such as agricultural lime or wood ash. If it is alkaline add pine needles, or horse and donkey manure.

"Eat [therefrom] and pasture your livestock. Indeed, in that are signs for those of intelligence." Taha: 54

"He said, "This is a she-camel. For her is a [time of] drink, and for you is a [time of] drink, [each] on a known day. And do not touch her with harm, lest you be seized by the punishment of a terrible day."

Ash- Shu-ara: 155-156

Livestock Focus

It is important that we look after the livestock that Allah blesses us with. As we provide the care and resources that our animals require, we will be following Allah's commands.

Food and Water

It is very important that our animals have the right quantity and quality of food and water. Animal feed does not need to be a major expense and it is possible to produce most of the animal feed you will need on your farm. It is important to ensure that there is enough land for animals to graze and enough space to grow feed, including appropriately storing feed so that it is available during the dry season. Storing feed reduces costs and ensures appropriate feeding during all seasons.

Islamic farming does not support the use of growth promoters or hormones as feed supplements. We believe this shows disrespect to Allah's creation.

Giving animals growth hormones, so that they grow very fast, can cause pain and suffering to animals. Instead, with appropriate living conditions, planning and a good diet, your livestock should be healthy and productive.

Fodder for ruminants can be produced from grass or leguminous plants that are grown as cover crops within perennial crops or on soil erosion control bands, from hedges, shrubs and shade and support trees. Crop residues are an additional source of fodder. But the most natural and efficient way to feed ruminants is usually by pasture grazing.

Good pasture management is important to Islamic farming. When managing your livestock, ensure that they do not overgraze. Move the animals regularly to allow the plants to recover and to avoid soil erosion. This is sustainable

pasture management and care for Allah's creation.

Shelter

As with food and water, we must provide sufficient shelter for our animals. Housing will not be necessary for all animals on all farms. If it is needed on your farm, then housing should provide protection from predators, heat, rain and theft and allow for as much flexible movement as possible. If housing is not necessary, provide shade and shelter to animals on the pasture.

In order to care for your animals in a way that respects Allah's creation, we advocate keeping your animals in an environment where they are offered the opportunity to perform their natural behaviour and way of living. This shows respect to your animal, keeps them healthy and increases productivity and quality. All animals were created with organs and features that suit the environment in which they belong and give each species individual attributes. These distinct features were decided upon by Allah and cannot be changed, and should be respected. It is important, therefore, to provide species-specific environments.

For example, ruminants have a very special digestive system enabling them to feed on and metabolize great amounts of roughage. In fact, if they don't get enough roughage in their diets, they become sick. Their limbs are made for quite long walks, so it is important to provide them with enough space to roam, or else your animals are likely to suffer. The same is true for horses and donkeys, whose limbs are even more specialised. Their need to walk, trot and gallop is even greater. It is, therefore, important to understand the distinct features of each species and provide an environment appropriate to their needs.



“Eat [therefrom] and pasture your livestock. Indeed, in that are signs for those of intelligence.” Taha: 54

“He said, “This is a she-camel. For her is a [time of] drink, and for you is a [time of] drink, [each] on a known day. And do not touch her with harm, lest you be seized by the punishment of a terrible day.”

Ash- Shu-ara: 155-156

All animals need enough space – enough “to stand up, lie down, turn around, groom themselves and stretch their limbs” – as well as access to daylight, shelter from harsh conditions and food and water. Islamic farming supports the concept of the Five Freedoms, developed in the mid-1960s as being consistent with caring for Allah's creation:

1. Freedom from hunger and thirst – by ready access to fresh water and a diet to maintain full health and vigour.
2. Freedom from discomfort – by providing an appropriate environment including shelter and a comfortable resting area.
3. Freedom from pain, injury or disease – by prevention or rapid diagnosis and treatment.
4. Freedom to express normal behaviour – by providing sufficient space, proper facilities and company of the animal's own kind.
5. Freedom from fear and distress – by ensuring conditions and treatment that avoid mental suffering.

Overcrowding and unnatural living conditions causes stress for animals and may also result in the spread of disease. Therefore to prevent disease and to treat animals with respect, animals should be provided with adequate space, fresh air and natural light, dry and natural bedding material as well as clean water and clean feeding troughs. The housing should allow for easy removal of bedding material and excrement (which, of course, should be used for compost).

Finally, let us remember to provide care and attention to our animals, by watching them carefully. We should know where our animals are and keep regular stock checks. Keep a regular check of your animals' health and numbers, if they are pregnant or sick, and keep this information in your farm's almanac.



Step 5. Protect

As mentioned above, the Islamic farming approach requires constant monitoring and care of our crops throughout the growing period. Farming continues to be hard work even after preparing and planting the crops. This section focuses on how we can provide

protection to our crops.

Using the principles and examples that we see occurring naturally in Allah's creation, here are some methods for natural protection and pest control.

KEY MESSAGE 11: MANAGE PESTS NATURALLY

Unfortunately, the reality is that there will always be pests looking for food on our farms. Fortunately there is something we can do about these pests, in fact, we believe Allah has given us everything we need to manage our farms and we can find it freely in nature.

Islamic farming discourages the use of pesticides. Pesticides hold the risk of contaminating and poisoning during storage and application. Pesticides destroy beneficial organisms as well as the pests. Even natural pesticides such as pyrethrum, derris or tobacco, and oils can have negative effects on beneficial insects. Pesticides can also lose efficiency, if the application of the substance is not regulated and pests develop resistance. Pesticides also can damage farmers' health.

Instead of relying on pesticides we advocate an approach that:

- Requires minimal extra cost.
- Is easy to prepare and apply.
- Is safe to handle.
- Is effective under local conditions.
- Has minimal or no negative effect on other organisms, on water, soil, air and agricultural products.

This approach has been called Integrated Pest Management (IPM) and farmers all around the world are employing it. For us as Muslims, it emphasises the value of all of Allah's creation and that killing and poisoning pests should be a last resort. Before we learn how to get rid of pests, we need to identify what type of pest we have.

Identifying pests

Insect damage is easy to identify: leaves with holes or missing parts are damage caused

by caterpillars or weevils; curled leaves are the result of aphids sucking sap; damaged or rotten fruit are common after being eaten by larvae of fruit flies; withering plants can also be caused by larvae of noctuids or stem borer and branches or trunks with holes may be the result of an attack by wood-eating insects.

Mites are very small and cannot be seen with the naked eye. When a plant is infested, both the plant and leaves will turn a yellowish shade of colour.

Nematodes are also very small and are not easily observed by the naked eye. Nematodes mostly attack plant roots, resulting in yellowish plants that wither and die. They cause carrots to form unusual shapes.

Mammals such as elephants, monkeys or voles, and birds such as sparrows, starlings and crows can damage crops.

Fungi cause the great majority of infectious plant diseases. They are responsible for most cases of spotting, cankering, blighting, wilting, scabbing and rotting on different plant parts. Fungi can cause parts of plants or the entire plant to wither and die.

Bacterial infections result in the breakdown of the cell walls of plants, so that the plant starts to rot. Damaged plant tissue or the blocking of water uptake causes early death of the plant, and overgrowth of plant tissue causes tumours.

Viruses mostly cause leaves and other green plant parts to change in colour. Light green or yellow patches of various shades, shapes and sizes appear in the affected leaves resulting in a general reduction in the growth and vigour of the plant.

Islamic farming recommends three steps of Integrated Pest Management. Each step builds on the foundation of the previous step and if step one and two are done sufficiently, there will be no resort to go to step three.

1. Soil and crop management

This is the most important place to begin. Healthier soil and healthier crops means fewer diseases and pests. Pests are essentially predators and will go to the weakest prey, so stronger crops are less likely to be attacked. Islamic farming encourages the continuous improvement of soil fertility, as described above.

Farmers should choose cultivars that are tolerant or resistant to the prevalent pests and diseases, and grow well under local conditions. Furthermore, using disease- and pest-free plant materials avoids the introduction of new pests and diseases to the field.

2. Habitat management

It is important to promote natural pest and disease-control mechanisms. Pest and disease pathogens have natural enemies such as ladybirds and certain bird species. Natural enemies can be enhanced around and within the crop fields by, for example, planting hedges of indigenous plant species around fields to attract natural enemies.

Another habitat management activity is to allow flowering plant species to grow within crops, so as to provide nectar and pollen for natural enemies such as ladybirds, hoverflies and parasitoids.

An organic approach to pest management recommends 'pest confusion'. We have already discussed this above in the section

on 'Companion Planting'. Essentially, the approach is to confuse pests with a diversity of colours, shapes, textures and materials. A good example is to hang old CDs or tin foil in the farm so as to reflect light and scare away pests.

Cats and birds of prey are useful for hunting vermin such as rats and mice. Encourage these birds by building a bird house and keep a cat as a pet. Allow small non-dangerous snakes on the farm as they also hunt vermin.

Lastly, pests and diseases can be reduced by improving field hygiene. This can be done through timely weeding, destroying or proper disposal of infected plants and by disinfecting tools regularly, especially after using them within infected plants.

3. Direct control

In situations of heavy infestations or very destructive pests and diseases, the following direct measures may be necessary to prevent economic crop losses. These will only be effective if the practices in the steps 1 and 2 were well applied.

Farmers can use home-made insecticides and fungicides of biological or mineral origin such as plant extracts, plant oils, mineral oil, copper and sulphur are used to control specific pests and diseases. Make these 'teas' with strong-smelling plants such as African marigold, onions, garlic, and chillies. Add a little soap to make bubbles and then spray on the plants.

Another spray can be made from the crushed bodies of the insects that you can catch. Pulp the caterpillars and snails, for example, and leave their remains as a strong-smelling warning for any relatives that come along!



Mulch is also known as 'Nature's blanket'. It is a layer of organic material that covers the soil, like we see occurring naturally in the wilderness. Natural mulch can be made of leaves, bark, old plants, or straw. The application of mulch should be as thick as possible.

Here are the benefits of farming with mulch:

- a.** Limits evaporation – mulch keeps water in the soil by as much as 40%!
- b.** Limits runoff and increases infiltration. Thick mulch can improve infiltration by over 80%, meaning more water gets to the plant roots.
- c.** Limits sheet erosion – if your farm is on a slope, the mulch stops soil loss by protecting the soil from heavy and fast moving rain. Research has shown that thick mulch can decrease soil run off from 30 tonnes/ha to just 0.6 tonnes/ha, an enormous saving.
- d.** Limits impact erosion – the mulch insulates the soil from being compacted or broken up by heavy rains.
- e.** Insulation – the mulch keeps the soil warm in cold weather and cool in hot weather, protecting your plants and moderating the temperature.
- f.** Stops weeds – without light, no seeds can come up to the surface. This means it is good for stopping weeds (important – mulch should not be placed on your vegetable seeds until they are a few cm high).
- g.** Better root system – because of the other benefits of mulching, such as moderating soil temperature, plants have a better root system, which is closer to the rich nutrients of the upper levels of soil. This means that the plant can put

more energy into crop growth and less into root growth to access nutrients.

- h.** Improved yields – the better root system means better yields. And it also means stable yields when there are seasons of drought or heavy rain.
- i.** Breaks down as layer of compost – the mulch acts as a layer of compost that decays and enriches the soil. This is better than burning the plants, which loses lots of nutrients.
- j.** Attracts worms and beneficial soil flora and fauna – these insects and microorganisms love the dark and moist layer of mulch and will live there.
- k.** Repels snails – crunchy mulch is uncomfortable for snails and slugs. Use small leaves or crushed egg shells or sea shells for a very crunchy surface.

Tough and woody mulch materials such as straw or old stalks decompose slowly and therefore cover the soil for longer time than fresh and green materials. A mixture of woody and fresh materials is recommended as it minimises possible nitrogen deficiencies in the crop. Note, plant material infected with viral and fungal diseases should not be used as mulch, instead it should be burned.

The best source for mulch is to leave all crop residues in the field, where they serve as soil cover and organic manure. After the growing season is over and most land is opened for common grazing, it is important that a minimum of 30% ground cover is maintained, as this will ensure longer-term protection from wind and water.



Weeds compete with our crops for critical resources. This includes water, nutrients, and light. In, it is Islamic farming's imperative that all weeds are removed from our croplands. It is particularly important to remove weeds when they are small. If the weeds are allowed to grow and mature, they will be harder to remove as they have longer roots. Furthermore, the older the weeds, the more nutrients they would have taken that could potentially have gone to our crops.

If you leave weeds even longer, they will go to flower and produce seeds. This means a new generation of weeds will be planted and your workload will increase exponentially. One weed can produce thousands of seeds, meaning one day weeding could save you several years work! One pigweed plant, for example, produces 600,000 seeds

Where possible, use your hands for weeding. Alternatively, use the hoe for weeding. Hoe just below surface so as to cut off the roots. Do this with all weeds except for creeping grasses such as kikuyu and buffalo which can keep growing underground even if you cannot see them.

Use the weeds that you have pulled out of

the ground as mulch. Either apply directly to the field you are working, or keep them aside for a new field that requires mulch. However, if the weeds have matured and have flowers and seeds, then they are not suitable for mulch and should be burned. This is because you will actually be sowing the seeds and there will be even more weeding to do!

Livestock focus

Part of caring for Allah's creation is to protect our animals from sickness. The best form of healthcare for animals as for humans and plants is prevention. Preventing an illness is better than treating an illness. It is better as it maximises productivity, avoids suffering, and saves money.

Healthy animals require good food that is nutritious. This has been discussed above. As you provide good quality food and shelter, you are protecting your animals from disease.

If and when your animals do get sick, it is important that you act quickly. A quick response will prevent the disease getting worse and increase the chance of the animal surviving. Regular checks of your animals will allow you to respond quickly when disease is observed.



Step 6. Produce

This is the final stage and completes the cycle of farming. This is one of the most exciting stages of farming – where you can eat and sell your produce and enjoy the fruit of your hard work! There are three activities that we can do in this stage:

Harvest

Each crop has different techniques for harvesting. It is important to be gentle with the plants to avoid damaging them. If you are selling the crops, pick them as close as possible to the time they go to market. You want them to look and taste as fresh as possible to the customer. If possible, pick on the morning of the day they go to market. If they are not going to market, it is still valuable to be careful with the crops so that they do not spoil and can be stored in best possible condition.

- For roots, brush off any dirt and keep the leaves on unless the customer has asked you to cut the leaves off.
- For shoots, it is unlikely they need washing unless you have used poisons which need to be washed off. Remove any leaves that have turned bad or been eaten by pests.
- For fruits, wash them and check for any insects.

- Choose packaging and storage that is appropriate for the crops, for example, you might want to keep spinach upright in a container with water so the plants can continue to drink.

Selling

This is a big topic and is not going to be covered in this version of the Islamic farming manual. Remember to get to market as early as possible and remember to always cover your costs.

Seed collection

Keep some of your strongest or fast-growing plants in the ground and let them flower. Then let the flowers die and the seeds dry. Carefully collect the seeds and store them in a dry container ready for planting the next season. This takes time. It is worth it as it saves a lot of money on seeds and lets you selectively choose from the best plants, improving your crops every year.

At the same time as harvesting our produce, we still need to be good stewards of Allah's creation. Even in the off season, there is work to be done. We need to make sure our farms give praise to Allah all year round. They should always look clean and tidy and free of weeds.

KEY MESSAGE 14: DO NOT BURN

After harvesting the food part of the crop, such as maize or sorghum, you are left with long stalks. These are a great resource and in Islamic farming we do not burn them. They are a gift from Allah and should be incorporated back into the life of our farm.

These stalks will form part of next season's mulch cover. They are full of nutrients that can decompose back into the soil and improve the yield of next year's crop. To do this, stand on the base of the stem and push down so that the stalk falls between the rows. It is good that the roots stay in the soil, as these provide food for soil

microorganisms, improve soil stability and limit erosion.

Burning the crops is not an option in Islamic farming. Burning is a waste of a precious resource – it adds a small amount of nutrients for a short period. Mulching last year's crop, however, provides a large amount of nutrients over a long period. Some farmers burn to limit weeds, but mulching also helps reduce weeds.

By breaking the stalk, you are also breaking the life-cycle of the maize stalk borer, a serious pest for maize farmers. There are always natural solutions to our challenges, Allah has provided them all.



Conservation agriculture in Uganda



Fitting water bottles to drip feed plants -
Islamic Farming, Uganda

KEY MESSAGE 15: MINIMISE WASTAGE

A final message from Islamic farming in terms of plant management is that we need to minimise wastage on our farms. Allah has given us abundant resources and we should not be wasteful. This is why we do not burn crop residues – it would be wasting.

Similarly, we do not want to waste water and that is why we should apply thick mulch and capture rainwater from our roofs. We also do not want to waste the time that Allah has given to us. We should take action and not be lazy. We should be on time with our planning and with our preparing of holes, with planting, providing and protecting. Time is a precious resource that we should not waste.

We should also be good stewards of the crops we have been given, using the harvest for the best purpose. After feeding our families, we should not waste the best prices at the market, so we should get there early and get the best price we can.

Livestock Focus

When the animal is mature, you can either sell the animal or slaughter it for consumption and/or sale as meat. Remember that Allah has given every part of the animal to us and we can benefit not just from the meat. Use the animal skin and the animal bones. The bones can be dried on the fire and then ground into powder. The powder can be added to compost as it will be full of nutrients.

Your animals will also produce offspring. Islamic farming recommends keeping a percentage of the offspring in order to increase the number of animals and the wealth of your farm. Remember, however, not to keep more than you can afford to feed and shelter.

Allah has given us abundant resources and we should not be wasteful. This is why we do not burn crop residues – it would be wasting.



Agroforestry

Growing trees and shrubs in the fields where you grow your crops, and around the edges and borders of cropland, is called agroforestry. Islamic farming suggests all farmers introduce tree planting on their land, as there are a long list of benefits that can be expected.

In the past, trees would have been cut down to make space for crops and pastureland. This has had a hugely detrimental effect on the environment, causing soil erosion, loss of wildlife, and increased carbon dioxide levels, leading to climate change. Agroforestry is part of caring for creation, and copying what we see in creation. There are nearly always trees in nature and they are a very important part of the natural landscape.

Agroforestry emphasises the integration of trees with the rest of the farming activities. Trees can benefit both plant and animal production. Trees can also generate extra revenue for you as farmers. This chapter is a short explanation of the benefits of trees to farms as well as two examples of good trees for the East African climate.

Sadaqah Jariyah (صدقة جارية) Sadaqah Jariyah means '**continuous alms or charity**'. A continuous charity is a form of charity that remains active and provides everlasting rewards for as long as people benefit from your good deeds, even after your death. Planting trees is one way in which we can obtain sadaqah jariyah, according to the following hadith:

Anas reported that the Prophet said, "If a Muslim plants a tree or sows seeds, and then a bird, or a person or an animal eats from it, it is regarded as a charitable gift (sadaqah) for him." Bukhari

Another hadith emphasises the importance of trees to the Prophet (pbuh): Anas (May Allah be pleased with him) reported that the Prophet (peace and blessings be upon him) said, "If the Hour (the day of Resurrection) is about to be established and one of you was holding a palm shoot, let him take advantage of even one second before the Hour is established to plant it." Al-Albani

Benefits of trees on farms

Shade – trees provide shade for humans and animals. In dry areas, this is greatly needed. Some vegetable and fruit crops, like lettuce or strawberries, do not like too much sun, so planting them in the shade of trees is beneficial. Likewise, placing your water storage in the shade of trees will decrease the loss of water to evaporation.

Wind protection – trees can help protect your crops from strong winds. We recommend planting a row of trees along the edge of your farm where the wind comes from. Plant different varieties of trees to block the wind at different heights. Animals also benefit from the wind protection given by trees.

Fencing – small trees can be cut into hedges and provide natural fencing for your farm. Choose trees with thorns to stop animals breaking into your fields of crops. Pruning hedge rows gives you a sustainable source of wood for use as mulch, for building materials, or for firewood.

Biodiversity – the hedges and trees provide a home for beneficial wildlife. Birds of prey will sit in the trees and catch pests such as mice and rats. Bees may make honey in the trees, giving you a further source of income and nutrition. Biodiversity is always an aim in Islamic farming as it replicates what we see in Allah's creation.

Food – Fruit trees can be grown as part of the farm. This fruit will add diversity and nutrition to your diet. Poor quality fruit can be given to animals or composted.

Income – Mature trees can be carefully pruned and the wood sold to carpenters. Seedlings that grow next to trees can be transplanted into bags and sold to other farms wanting to invest in agroforestry. Excess fruit can be sold to generate further revenue.

Agroforestry

Examples of trees

In Allah's creation, nature has local varieties which are 'indigenous' to that area. Islamic farming therefore recommends finding local indigenous varieties for planting on your farm. These trees are suited to the local conditions and need minimal maintenance.

Acacia trees are excellent trees for agroforestry in East Africa. Some varieties, such as *Faidherbia albida*, shed nitrogen-rich leaves just before the growing season. This increases soil fertility around the trees. In addition, the lack of leaves allows sunlight through to crops benefiting from the rain beneath the trees. Studies show that fields planted with *Faidherbia albida* produce higher crop yields.

Imported varieties can require a lot of maintenance and can be very aggressive or invasive, stealing water and nutrients from other trees

and plants. However, we recommend one foreign species of tree, Moringa. These trees are originally from Asia and are low maintenance and non-invasive. They are therefore ideal for the East African environment and have a large number of benefits in addition to those mentioned above.

Moringa leaves are full of nutrients. One gram of dried leaves, for example, has four times as much calcium as compared to a gram of dried milk. The leaves can be cooked like cabbage, giving the tree the nickname 'Cabbage Tree'. The leaves are also rich in vitamins, with seven times more Vitamin C than oranges and four times more Vitamin A than carrots.

Another remarkable fact about the Moringa tree is that the seeds can be used for water purification. Dried seeds can be crushed into a powder and added to dirty water, then left for an hour to work. 50g of powder can treat a litre of water.



Beekeeping

There has been a recent global phenomenon; the unexplainable collapse of honey-bee colonies. A decline of colonies has been noted in Europe, the US, China and most recently Egypt has reported a decline. Experts believe a number of factors may now be combining to hit bee colonies around the world; ranging from a decline in flowering plants and the use of damaging insecticides added to the worldwide spread of pests and air pollution.

Farmers are being urged to plant key flowering plants near crop producing fields and farmers should avoid the use of harmful chemicals. Out of the 100 crop species that provide 90% of the world's food, over 70% is pollinated by bees, thus emphasising the importance of the honey bee for the production of crops and the environment. The collapse of bees holds serious consequence, it threatens global food security. Einstein once said "if the bee disappears from the Earth, man would have no more than four years to live.

No more bees, no more pollination, no more man!" Bees in the Quran:

In the Quran there is a chapter entitled "The Bee." Within the chapter, two verses cover the essence of the honeybee.

In ALLAH's beautiful system, the flowers and the bees are dependent on each other. The colour and smell of the flower is not for man, although we can and should enjoy it. It is to attract the bees to ensure the flower's survival. And if the flower didn't produce nectar and pollen, the bee would not survive.

Both the Holy Qur'an and Hadith refer to honey as a healer of disease.

It is important for farmers to keep bee hives near their crop fields, as they ensure protection of the environment and survival of the crops. Therefore in doing so they are helping the environment and are keeping in line with Islamic teachings

And your Lord inspired the bee: build homes in mountains and trees, and in (the hives) they build for you. Then eat from all the fruits, following the design of your Lord, precisely. From their bellies comes a drink of different colours, wherein there is healing for the people. This should be (sufficient) proof for people who reflect". An Nahl verse 68-69



The Prophet (PBUH) said: 'Honey is a remedy for every illness and the Qur'an is a remedy for all illness of the mind, therefore I recommend to you both remedies, the Qur'an and honey.'- Bukhari

Conclusion

In conclusion, please remember that the aim of Islamic farming is to redress the balance and encourage you to remember that we have to rid poverty and hunger from Africa through sustainable agricultural practices. Faith and action go hand in hand to return the rizq to the people of Africa.

وَضَرَبَ اللَّهُ مَثَلًا قَرْيَةً كَانَتْ آمِنَةً مُطْمَئِنَّةً يَأْتِيهَا رِزْقُهَا رَغَدًا مِنْ كُلِّ مَكَانٍ فَكَفَرَتْ بِأَنْعَمِ اللَّهِ فَأَذَاقَهَا اللَّهُ لِبَاسَ الْجُوعِ وَالْخَوْفِ بِمَا كَانُوا يَصْنَعُونَ

“And Allah presents an example: a city which was safe and secure, its provision coming to it in abundance from every location, but it denied the favors of Allah . So Allah made it taste the envelopment of hunger and fear for what they had been doing.” An-Naḥl: 112



وَلَوْ أَنَّ أَهْلَ الْقُرَىٰ آمَنُوا وَاتَّقَوْا لَفَتَحْنَا عَلَيْهِم بَرَكَاتٍ مِنَ السَّمَاءِ وَالْأَرْضِ وَلَكِن كَذَّبُوا فَأَخَذْنَاهُمْ بِمَا كَانُوا يَكْسِبُونَ

“And if only the people of the cities had believed and feared Allah , We would have opened upon them blessings from the heaven and the earth; but they denied [the messengers], so We seized them for what they were earning.” Al-A'raaf: 96



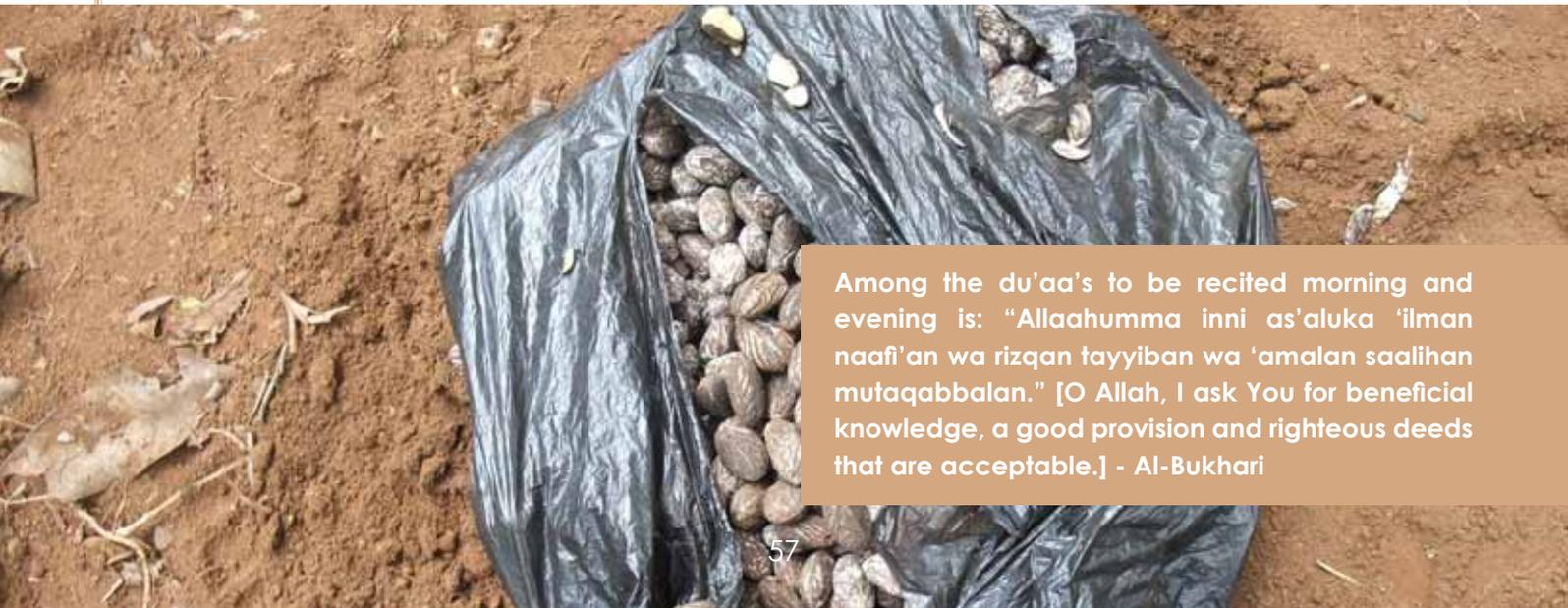
Based on historical Islamic agricultural practices and the new understanding within conservation agriculture, Islamic farming realises that the focus in Africa has to be on soil preparation, diversification of crops, crop rotation, equitable land use and livestock rearing.

Sir Gordon Conway's doubly green revolution is perhaps achievable if Islamic farming is followed. It will be both highly productive and sustainable with “a pattern of equitable growth that lasts from generation to generation and ensures we do not undermine the

environmental and resource base on which agriculture depends”.

Finally Islam urges us to make du'aa' (prayers) seeking self subsistence (i.e., independence of means). It was narrated in Sahih Muslim that the Prophet (pbuh) said in his du'aa':

“Allaahumma inni as'aluka al-hudaa wa'l-tuqaa wa'l-afaafa wa'l-ghinaa.” [O Allah I ask You for guidance, piety, integrity and independence of means.] - Muslim



Among the du'aa's to be recited morning and evening is: “Allaahumma inni as'aluka 'ilman naafi'an wa rizqan tayyiban wa 'amalan saalihan mutaqaabalan.” [O Allah, I ask You for beneficial knowledge, a good provision and righteous deeds that are acceptable.] - Al-Bukhari



KEYS

1: KNOW YOUR FARM

2: KNOW YOUR SOIL

3: ON TIME

4: MINIMUM TILLAGE

5: DIG PLANTING HOLES

6: PLANT SEEDS AFTER FIRST RAIN

7: HAVE A HIGH QUALITY OF WORK

8: ROTATE AND PLANT WITH DIVERSITY

9: ONGOING MAINTENANCE AND CARE

10: INCREASE SOIL FERTILITY

11: MANAGE PESTS NATURALLY

12: APPLY THICK MULCH

13: REMOVE ALL WEEDS

14: DO NOT BURN

15: MINIMISE WASTAGE



Photo credit

- Page 2 – Bill Zimmerman (maize cobs)
- Page 6 – Jeff Knezovich (tomatoes and onions)
- Page 17 – African Renewal (Sudanese sorghum farmer)
- Page 18 - Peter Casier (Bucket of produce)
- Page 33 – John Appiah-Duffel (maize cobs)
- Page 39 - Alex Berger (harvesting maize)
- Page 56 – V. Atakos, CGIAR Climate (bee hives)

Islamic Farming

A Toolkit for Conservation Agriculture

