

## Sustainable Development Film Script

Development in semi-arid Africa is a huge challenge. The climate makes growing enough food to survive very difficult – never mind making improvements in incomes and health.

In this film we will explore how farmers can develop – and how they can make this development sustainable.

### So what is sustainable development?

The most commonly cited definition comes from the Brundtland Report. This says that 'sustainable development is development that meets the need of the present without compromising the ability of future generations to meet their own needs'

The natural and human environment are often considered as an after-thought to development. However, to enable development for present generations let alone future ones, that is, to achieve sustainable development in semi-arid Africa, you have to conserve the natural environment FIRST in order to enable development to happen.

**Simon Maddrell, Co-founder Excellent development** - *'Conventional thinking is that development has to be controlled & inhibited because of damage to the environment. Whereas in semi-arid Africa the situation is completely different. It's only through conserving soil and water and through conserving trees that communities can develop.'*

In this film we are going to look development and what makes it sustainable using the work of Excellent Development with farmers in semi-arid Kenya as an example.

Excellent Development support communities in Africa to create development through conservation by digging terraces, building sand dams and planting trees – all of which help to transform semi-arid environments.

This results in improved water supplies, food production, incomes and health for farmers in Africa.

These are the development priorities for communities here, water and food – A local, clean water supply and growing more food to both eat and sell, leading to better incomes and health.

Interestingly, when farmers talk about their next priority after water and food – they don't say "incomes" – they say "school fees"! Parents are very committed to giving their kids an education – and the children themselves just **love** going to school.

I wonder if you feel the same?

### So what are the obstacles to development in semi-arid Africa?

50% of the communities Excellent Development work with are subsistence farmers and **depend entirely on their land for their food and livelihoods**. Subsistence farming means you grow what you eat then sell only if you have something left over. There are few other opportunities to earn incomes in rural areas.

However, the other 50% do have a family member employed in a local town or city sending money home once a month. That income is only a supplement which is used for basic necessities such as salt, sugar, soap and paraffin but it is still essential for these farmers to produce enough food to eat and

as the population grows, there is more pressure on the land to produce.

The semi-arid climate makes farming here hard - Surprisingly, the amount of rain in semi-arid areas is quite high - annual rainfall **can** be as much as Manchester at 1,200 mm, but it falls in only 15-20 days of the year – rather than what seems like every day in Manchester!

After the long dry season the earth is as hard as concrete. Consequently when the rains come, most of the water hits the land and, rather than sinking in, runs off the surface, taking the fertile topsoil with it.

The water continues to flow away over the dry riverbeds ending up in the Indian Ocean. Water points dry up so farmers have to go as far as 10 km to find water in the dry season taking anything from 4 to 8 hours a day. In periods of drought that can be as far as 20km taking up to 12 hours each day. Imagine what it would be like if you had to collect water before and after school – and can you imagine your parents walking 20km every day?

### Joshua Silu Mukusya, Co-founder, Excellent

**Development** – *That was the hardest thing I ever experienced in my childhood because I often spilled the water and it had run out by the time I got home, so I was caned. Other than that, rope went over my head and there is a line, you can see it on my head, from carrying the gourd.'*

**Rhoda, Farmer** - *'thirty years back we used to live a very bad life because we used to go a long long way to collect water. We used only to have one meal per day because we used to go very early in the morning to fetch water and make lunch only and go for water in the evening' – 'And even sometimes we would go and fetch water during night hours. Yes, sometimes people used to sleep in rivers waiting for water, queuing for water. I'm telling you the truth'*

In 2007 The Stern Review investigated the economic impact of global climate change and concluded that the poor in developing nations will be hit the hardest by global warming in particular those in semi-arid Africa.

Extreme weather fluctuations are predicted to increase in size and frequency. Periods of drought will cause soil temperatures to rise worsening the problems of water availability and soil erosion. Equally extremely heavy rains will cause flooding, washing away soil and seeds. Both weather extremes increase the risk of famine and starvation in the region.

### Questions

- How is the challenge of sustainable development different in semi-arid Africa?
- What are the 3 obstacles to development?
- What effect does climate change have?

- End part 1 -

We've seen how the dependence on land makes the climate critical to development. The semi-arid conditions and the worsening situation caused by global warming make this more difficult.

So how can farmers overcome the obstacles to development? Farmers can lessen the impact of the climate through soil and

water conservation – terracing land, building dams and planting trees.

These three initiatives create a virtuous circle in the battle to conserve soil and water. The terracing of the land helps to keep more soil and water in the farms; sand dams keep water in the seasonal valleys for people, animals and nurseries. Dams enable tree nurseries to be set up so that more soil and water can be conserved by planting trees in farms.

The **first step is the terracing of land** to create flat fields so that water and soil is conserved.

Terracing can reduce the amount of water running-off the land from 45% to just 5% - a remarkable increase in the water kept in the farms. Terracing also reduces soil losses by an amazing 97% - terracing alone greatly increases the amount of food farmers can produce.

In drylands this is hard work! Farmers work together in a self-help group to help each other to terrace their land. This makes it easier as it would take one person a full day to dig just 10 metres!

**Charles, Farmer** - *'Last season we learnt a lot because some few people who had terraces in their shambas in the area - we saw them harvesting and that is why we are putting a lot of effort in every members shamba so that we can harvest. And we are sure that if we get same same rains that we get most of the seasons we shall harvest if we have terraces in every shamba'*

Having increased the amount of soil and water retained in the farms, the second initiative is to conserve more water in the seasonal riverbeds. This is done with **sand dams**, ingenious structures with no visible water..

A sand dam isn't **made** of sand! It actually **retains** sand behind a concrete wall built across a seasonal river bed during the dry season. They are designed with spillways and wings to keep the river flowing as before. The rains are heavy and fast so it needs to be strong.

The dam captures the water when it rains – going back up stream up to 1 km.

However there is soil suspended in the water – the sand in the soil sinks and the lighter silt is taken downstream by the overflowing water.

The wet sand builds up behind the dam – filling it completely after 1-3 seasons.

**Alison** – *'So one thing's been puzzling me. When I think of a dam, I think of water, but where is all this water? Thankfully Joshua is here to answer that question. Joshua, I know this is a sand dam but where on earth's the water?'*

**Joshua** - *'We are standing on water. Under this sand where we are now, we are standing on water. I say it is 60% sand, 40% water.'*

**Alison** – *'We've just walked for 5 minutes over all of this sand that has collected behind this dam. Now it's estimated that 10 million litres of water is captured beneath this sand, that means that little ones like Milika here have plenty of water nearby, and it's clean.'*

The water is then collected traditionally by scooping a hole in the sand – clean water that saves up to 12 hours a day for mostly women and children.

This water is cleaner too because it's protected under the sand from insects and animals.

**Muendo, Farmer** - *'Before Excellent we were walking 20km from here to Athi River. Once you go and fetch water from there you have to stay for the whole day or 2 days before you get water because you find jerry cans are put in a queue for fetching water. Now we can also dig water from the sand dam'*

**Trees are the third initiative** in the effort to conserve water and soil. The water from the dams also enable tree nurseries to be set up in the dry season so that they are ready to plant when the rain comes greatly increasing their chances of survival.

Trees help retain water in the farm, they act as a wind break and the roots hold the soil together. Nitrogen fixing trees also help to fertilise the soil – all of which increase crop yields.

**Charles** - *'there are some of the trees that we plant or to be planted in the shamba and those trees can help us to maintain the moisture in the soil because as the tree grows the roots are growing and these roots of most of the trees they are roots that help to lighten the soil. The soil will breathe and these trees when they grow up the leaves fall down, these leaves are fertilisers and we can use them'*

But trees do much much more...when the trees grow, farmers can take branches for fuel. Wood provides 95% of energy needs in rural Kenya. Wood is also used for building materials – saving them having to use valuable cash.

Farmers also grow trees that yield delicious fruit to eat or sell like papaya, mangos, bananas or passion fruit,– which kids love! The result of all this hard work is a marked improvement in the environment – but hey don't just take my word for it!

**Prof. Mugambi, University of Nairobi** - *'The microclimate has changed a great deal because of the following reasons, first of all trees have been planted and normally this area would have acacia and grass but the community here over the last 25 years has planted lots of trees. This has meant there is more precipitation because of arresting the clouds, there is much more dew now and also the birds and insects and the wind are bringing more seeds here. So over the last the last 25 years this climatic zone has shifted from fairly semi-arid zone 5 geographically to zone 3. Rain water harvesting and planting trees if it were spread it would achieve a great deal in contributing to the reversal of global warming.'*

So, how does this address the priorities of communities we looked at earlier? Water supply is improved enormously with sand dams.

Families save enough time to work more on their farms or to go to school.

The terracing and trees already increase food production and with all the extra time saved by having local water and fuel wood farmers can concentrate on developing their farms to increase food production even more –

Zero-grazing simply means feeding and watering animals in a pen

**Rhoda** - *'When I keep my animals in my cowshed, I just do a circle thing, all the manure comes to my shamba stuffs go back to my animals so it's one way of rotating whatever I have'*

**Rhoda** - *'So many people in the last few years or many years were told not to intercrop by the government people and I do this against the government will, and the funny thing is that when they come to see my shamba they always get surprised at what I am doing because my yield seems to be more better than the people who doesn't intercrop.'*

Excellent Development also enable farmers to grow a wider range of traditional food crops. Seeds are provided for demonstration plots which are tended by each community group, enabling them to produce seeds to distribute amongst the farmers.

Crops like sorghum, pearl millet, finger millet, pigeon peas and cow peas reduce the risk of failed harvests – particularly as they are species more suited to dryer climates.

With all this extra production, farmers can save some seeds in seed banks. Drought, flooding or variable rains can all cause crops to fail but if this is the case farmers can take seeds to plant, as long as they promise to return double the seeds when they harvest. This secure source of seeds protects against crop failures and lack of cash to buy seeds creating food security.

Having achieved improvements in their first two priorities of water and food, farmers are able to focus on incomes for school fees and ensuring better health for their families

Farmers who are able to grow vegetables and trees can improve nutrition and incomes - the same goes for milk from improved goats and honey from bees! The clean water from sand dams also has a dramatic affect on health.

Water from the dams allows people to grow nutritious fruit, trees and vegetables like tomatoes and greens. This has a beneficial impact on health, as you'll know from being told to eat your greens all the time!

**Muendo** - *'I had no any plan of planting anything like tomatoes, because thinking of planting tomatoes without a sand dam, it was a daydream. But when Excellent Development came and showed the sites and we constructed that sand dam is when my mind started waking up. First time I planted 140 plants, that one we ate around here. The community were coming to buy some more of them. Next time I planted 350 but last one that's when I got something, 2800 kenyan shillings- whereby I used to take the tomatoes to school, where my child is schooling, and there it is counted as money because that tomato is cooked at school'*

Communities in the dryer, less fertile areas can only afford goats. Farmers can participate in a programme to improve their goat breeds – breeding their goats with Toggenberg goats to eventually quadruple milk yields

Others learn to keep bees – More milk and honey are great for health and can be sold locally for an income.

A child dies every 15 seconds from diseases associated with a lack of safe drinking water, inadequate sanitation and poor hygiene.

1.8 million people a year in Africa die of something as simple as diarrhoea – 90% of those are children below the age of 5.

Sand dams make a dramatic difference to this. The water is filtered by the sand making it cleaner so that cases of diarrhoea have reduced by 95% in some areas. Typhoid is also reduced by sand dams because people don't need to collect water from dirty rivers.

Infected mosquitoes biting humans causes Malaria – the world's biggest killer. Mosquitoes breed in open water but because water is stored below the sand in these dams – mosquitoes can't breed there.

**Joshua** - *'In Meka it was one area where we had seen people die. Everybody thought they had aids, but it was because they took that water from the river which was flooded with all sorts of diseases. After making those dams we hardly hear of people dying.'*

So now you've seen how farmers in Africa improve water supplies and food production – enabling them to improve the health of their families and earn incomes to pay school fees.

So to recap... farmers address their priorities of water, food and incomes firstly by conserving soil and water through digging terraces, building sand dams and planting trees. The improvements gained and the time saved – enable them to focus on increasing food production further to provide incomes and improve health.

## Questions

- What are the three main ways farmers conserve soil and water?
- Name 5 of the ways farmers improve food production.
- How are health and incomes improved?

- End part 2 -

## So is this sustainable development?

We have already discussed the importance of conservation in semi-arid Africa and how this creates development.

We have also shown how farmers dig terraces, build sand dams and plant trees to conserve soil and water

– and how this enables them to meet their priorities of water, food and incomes. We'll now look at some factors in the human environment that help or hinder sustainable development.

You may be familiar with the term top-down development whereby activities are defined and implemented by governments and large agencies without involving communities in either decision-making or implementation.

This contrasts with the bottom-up approach where communities define their own priorities and are actively involved in implementation – ensuring community ownership.

**Joshua** – *I wouldn't say they have done good or bad but I went through a lot of frustration because what people wanted to see happen was not the policy of that charity, so I was frustrated. I am able now to be in charity now that says listen to the people, rather than do what the experts say.*

**Prof. Mugambi** – *The local community itself must be involved, they must themselves identify the needs they want to meet,*

*the problems they want to solve. What we need to do is accompany them in solving their own problems but not create our own problems and try to go and solve them on their behalf. I think that eradication of poverty cannot be done when people create problems and solve them in other peoples' areas.*

Excellent Development have a 'bottom-up' philosophy and approach. The start-point is a COMMUNITY and THEIR defined problems and priorities. The community are organised into a self-help group – meaning they contribute significantly to their own benefits. For example, they terrace the land for free and contribute half the cost of sand dams.

**Simon** – *'Excellent Development was born out of a model developed by Africans for Africans. All it does is to help that model be transferred & replicated thru other parts of Kenya and hopefully other parts of Africa as well.'*

To further understand the philosophy and approach – let's hear what the people involved with Excellent Development have to say...

**Joshua** – *'Excellent Development in the few years it has existed, we have been able to talk to communities according to their needs. They explain to us what they want to see happen and then we are enabling them to get where they want to go. Just giving them the knowledge that they need, enabling them to do what they think is going to help them'*

**Simon** *'One of the things about Excellent Development's work is that it requires a tremendous amount of community engagement. It isn't just about a programme to go & build a latrine here, to build a dam here, to provide a goat here, it's about getting under the skin of a community, working with them, understanding what their priorities are, understanding how they want to move forward and how they want to do it... end with – that's the only way to do it'*

**Joanne** *'I like the way that they work with the community to do it and it's not just some people coming over and doing what they think needs to be done. It was started over here and it's a lot to do with the community as opposed to individuals ideas of what should happen.'*

**Simon** – *One of the strengths on EDs work is that we don't work with communities in isolation from each other, because we are a charity that works on the basis of listening to the people and acting upon that, actually the people themselves are the biggest power and the biggest enabler of development. So to enable the people to work together we bring the people together. So one community will go and visit another. Representatives of communities will all come together in a meeting and what they do is to discuss their problems, they see that one community is a little further ahead than the other, and that gives them motivation. Someone has ideas of particular solutions, they see a particular solution working like intercropping, like napier grass, like the planting of trees – they see that working and they get encouraged by their own people telling them and explaining to them how they've moved forward. So, the power isn't coming from outside and giving people solutions, the power is absolutely in helping people to help each other.*

**James, Farmer** – *A few years ago I was doing nothing, I was seated bottomly, sitting on my bottom without doing nothing but when they came they gave me a good idea. That's why you see I'm doing the work and now I am ready to do it because I have that experience. And I'm proud of my job.*

Another common problem with sustainability is the **technology used**. Development projects sometimes use technology that cannot be designed, improved and controlled by local people. The technology often depends on imported materials and skills the communities don't have, making the solution hard to sustain.

Africa is indeed littered with broken water pumps that could not be repaired once the development agencies had left. Let's look at what some experts say about these issues:

**Prof. Mugambi** – *The dam behind us here was first constructed in 1985. The community here did not want to break the law so they went to the district engineer's office and they asked for plan and they were given plans. When they came here they discussed it, every detail and they modified it to suit their needs, for example the spillway had been at the edge because that's the way most dams are constructed. The community said no, if we do that the rain water will come and wash away the dam – they put it just exactly at the centre of the river – where the river normally is. And they also discussed the mix – they wanted gravel mixed with sand – they said no they are going to use materials available there- the boulders themselves are going to become part of the reinforcement. A few years ago I was here with that engineer who is now teaching at one of our universities. He confirmed that they were right and the experts were wrong.'*

When considering the technology the communities use – it is clear how simple, but effective, terracing and Sand Dams are. They are made entirely using local design skills and labour. All of the materials for sand dams are locally available with most of them taken directly from the river bed in which they are built.

**Simon** *'The beauty of sand dams is that you are creating springs, you're not utilising springs so the sand dam will add water to the community and in actual fact what's even more beautiful about them is that they're built from the river itself so the water is collected - the sand that's collected in the river is used to build the dam, the stones are broken off by the community so with your little bit of addition of some cement and steel actually they are creating water for themselves out of the river itself'*

So this sums up Excellent Development's approach to sustainable development and the final words go to one of the farmers we work with...

**Muendo** - *'There is a saying that says - Better to train a child to catch fish than to give him a fish. So by saying that I mean The skills we are getting now from EXD are more important than the help that we can be given because you can give us 1 million and that million, it will end up you know, in a month, and then you'll find there that there's nothing. Then we stand where we stay and we start stretching our hands again to borrow. But when our mind is filled with a skill then we will do for ourselves.'*

## Questions

- Name the three factors in the human environment that Excellent believe are vital for sustainable development.
- Would this type of development work with a top-down approach?
- Do you believe the Excellent model is sustainable?