W.K. KELLOGG FOUNDATION
Grant No. P3002256

Agricultural & Life Skills Project

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Module: In-field water conservation

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Localisation documentation

September 2008

VR in Africa – for Africa – by Africa

WORLD LINKS

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In-Field water conservation i3dlo - LOCALISATION DOCUMENTATION

- For a background and history to this i3dlo, refer to Section 1 below
- If you want to get to the **technical localisation detail** of the i3dlo - go **to Sections 2 (text translation) and 3 (audio translation).**
  Please note that some of the text translation is undertaken through editing JScript files. For more on this, see Section 2.
- If you want to **brush up** on **how to localise** an Interactive3d learning object - go to Annexure 1
- To see how to embed an i3dlo into your **PowerPoint** presentation, refer to Annexure 2
- For general information on computer requirements, usage etc, refer to Annexure 3

1 In-field water conservation i3dlo - background

Funding agency W K Kellogg Foundation **(Grant No. P3002256)**

Project partners This project has two main partners, **World Links** who focus on the testing of localisation procedures, translating the material into commonly used Zimbabwean languages as well as downstream implementation through their community centre network; and **the Naledi3d Factory,** responsible for the visual content development

This i3dlo forms part of a rural development and farming skills development project that addresses the following:

- Help rural communities better understand and, therefore, be better empowered to address local issues that impact on rural development – and in this case, focusing on agricultural and other life-skills development and in a way that **modernises** local practice, without necessarily **westernising** these practices
- Demonstrate the use of VR-based learning content and especially the use of Interactive3d Learning Objects (i3dlo's) as a new, innovative visually interactive communication / learning medium in the African context
- Implement agricultural capacity building, to be achieved through focused community-based training workshops
- Transfer of skills to further "localise" Interactive3d Learning Objects

Note: an associated interactive3d learning object is also available that addresses roof-top water capture.

1.1 Rural skills - main outcomes

- Understanding the importance of capturing rain water during the rainy season
- Understanding how to irrigate during the dry season
- The importance of pot-holing
- How half-moon ridges can be effective

- Buried bottle watering
- How to make, and use clay pipes in your vegetable garden

1.2 Applicable life skills (general)

A principal project goal is to develop competence-based learning material that will help to empower rural people and to stimulate their minds in a way so that they can fill in the detail using their own local knowledge.

Thus, the learning material should (1) Inspire; (2) Stretch; (3) Develop self-confidence; in such a way that we can (4) **Modernise, without necessarily Westernising.**

1.3 Target audience & application

The i3dlo simulations developed as part of this project are directed at functionally (semi) illiterate people in rural communities who are (or plan to) working in small-holding farming activities.

The i3dlo's are suited for use as *part* of skills development workshops where they are embedded and used with other training material – where they can for example be embedded into PowerPoint presentations (see Annexure 2).

They will typically be used by farm extensions services, local community centre training staff, or as in the case of this project, directly by organisations such as World Links Zimbabwe, who are "training the trainers" as well as farmers in local, rural communities

1.4 Context

***Soil and water conservation*:** Good soil and water is very important to farming successfully. Southern Africa is, however, technically classified as a semi-arid desert region – and is moving more and more towards a permanent drought situation. Capturing water in situ, either through soaking, or through water collection can play a major role. To compound the situation, bad agricultural practices, over many years, have led to dangerous levels of soil removal. It is estimated that between 13 and 25 tonnes of soil per Ha Is being lost every year. Over time, this has obvious implications for food production and even human sustainability in the region. Soil has become the region's largest export, and soil conservation is a major priority for the SA Government. Minimising soil removal and retaining rain-water at the farm or district level is therefore crucially important.

***In-field water capture*:** The main drawback of contour ridges lies in the fact that, during seasons with lower rainfall, only crops close to the actual contour ridge get enough water whilst crops further in-filed suffer. This can be addressed via a number of simple yet effective techniques. This i3dlo shows some of these techniques to capture more run-off water during the rainy season, as well as to irrigate at low cost during the dry season. It looks at pot-holing, half-moon ridges and the use of clay pipes in vegetable gardens.

Note, there are other techniques that can also be applied, including tied ridges, tied furrows; mulching, strip cropping and mixed cropping (not addressed here).

Other relevant information resources include:

1. **Water and soil conservation with drought in mind**, Isaiah Nyagumbo and Francis T. Mugabe, Swedish Cooperative Centre Small Holder Drought Mitigation Programme, Harare, 1999
2. **A Guide for Farmers on Good Land Husbandry - Soil and Water Conservation.** Zimbabwe Farmers Union / Agritex (undated)
3.

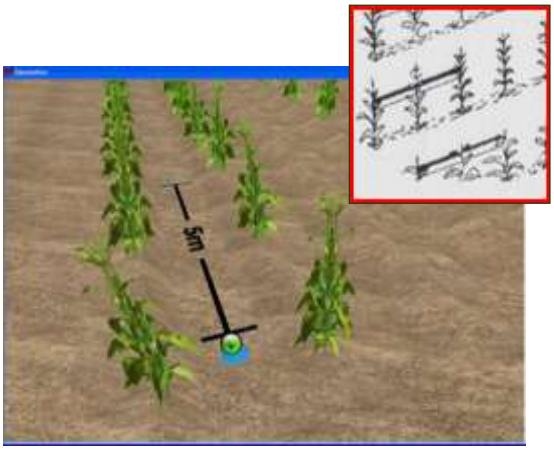
1.5 Navigation menu

After the "splash screen" clears, a drop-down "welcome" screen is displayed:

> Welcome to our "in-field water conservation" section.
>
> Let's look at four simple ways to catch more water in your fields:
> - Making pot-holes
> - Making half-moon ridges
> - Direct buried bottle watering
> - How to build and lay clay pipes in vegetable gardens

Selecting (clicking) each of the four buttons will trigger the respective sub-simulations (detailed below).+

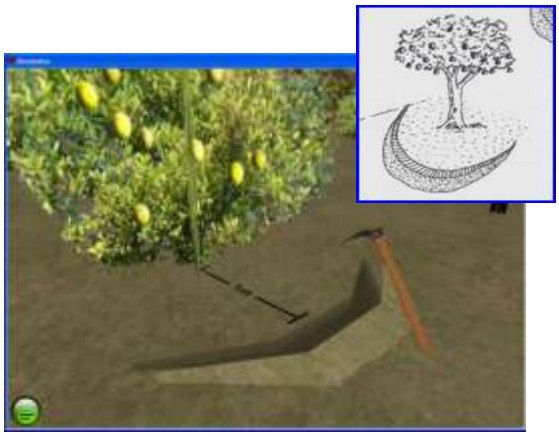
1.6 Pot-holing



This section of the i3dlo shows how a pot hole can be used to capture run-off water – a great way to let water slowly soak into the soil after it rains. Pot holes which can be constructed at any time during the growing season.

The i3dlo It shows how to create the pot holes (either using a hoe, or ox-drawn ploughing – without the mould board); and also looks at hole spacing and depth (10 to 15 cm deep and 3 metres long).

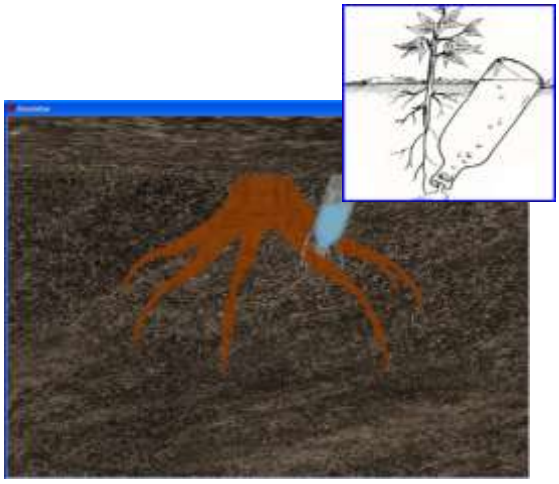
1.7 Half-moon ridges



This section of the i3dlo shows how to create half-moon ridges, in this case in a fruit tree orchard. The ridges are used to capture as much water as possible during the wet season in order to preserve moisture in the soil. Half moon ridges are useful in avoiding poor growth and inferior fruit during the dry season.

Half-moon ridges are constructed down slope of the trees using a hoe. Suggestions for dimensions are again also given.

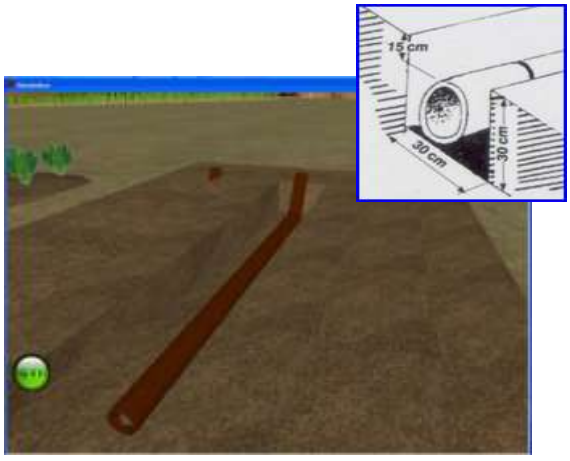
1.8 Buried bottle watering



This section shows a simple, but effective way to irrigate fruit trees during the dry season by burying inverted plastic “cool-drink” bottles close to the roots. This method is cost-effective, but also minimises wastage from evaporation. In this way, the water will seep slowly out of the bottle to water the plant directly in the root zone.

Buried bottles provide a simple but effective way to water orchard trees, but in larger areas such as vegetable patches, clay pipes can offer a more effective solution.

1.9 Clay pipes in the garden



Buried clay pipes offer a simple solution to getting water directly to the root zone and minimising losses due to evaporation. They are much more effective in larger areas such as vegetable patches / gardens and especially during the hottest part of the dry season in September / October. Much of the water poured on the surface is lost to evaporation, whilst with buried pipes; water is directly available to the plant root-zones.

This i3dlo comprises three separate elements:

- Constructing a wooden mould for the clay pipes
- Making the clay pipes themselves
- Laying the pipes in a vegetable bed

2 Text to translate

In this section, we look at the text that has been included in the i3dlo, either on buttons, used in pop-up boxes etc.

There are two places where text is contained.

1. Firstly, text appears in image files, i.e. either in .png or.jpeg files. These files are contained in the first table below. For each piece of included English text, a Photoshop PSD filename is provided (as a template) and the actual filename as well as the font used is given.

2. The second place where we place text is inside JScript files. For those of you who have never written a computer programme before here follows a serious i3dlo **Health Warning**. JScript is a computer scripting language. It tells the computer what to do – much like a recipe tells a chef how to prepare a specific dish. Now, just as the words in a recipe explain which ingredients to use and how to blend them all together, a JScript file contains detailed instructions telling the computer what to show on the screen, what sounds to make, etc. JScript uses a very specific **syntax** or way of writing out these instructions. This syntax is very, very sensitive. If you get it wrong, the i3dlo will, most likely, not run at all. Now that's a ruined dish you want to avoid!

   So, when editing a JScript file be **very careful** and change only what we tell you to in the second table below! First extract the JScript file using the methodology explained in Annexure 1 below. Open the JScript file in Notepad and proceed with caution by replacing the text as indicated and then save the file. Replace the old JScript file with the new one as you would any other file, by following the procedures explained in Annexure 1.

Advantages of JScript: We introduced the JScript approach for a number of reasons:

- **Word-length -** through experience and feedback, some languages require a greater number of words than the corresponding English text to convey the same meaning. This means that image templates are often not big enough to accommodate the translated text. JScript allows us to integrate a scrollbar in our text boxes which can therefore easily accommodate text and words of any length.
- **Image size -** images make for bigger files. JScript, on the other hand, is light and compact.
- **Efficiency -** finally, it's easier and faster to edit an entire i3dlo's text in one place (inside the JScript file) than to open numerous image files and painstakingly change each one.

For each text element described, a second language cell has also been included to help you to work on the new language text. *We suggest you copy this table into a separate file to work on.*

Now go on and open the JScript file. One of the first things that you will notice is that each body of text is contained inside a function, e.g. *function Welcome (Language)* and that everything inside that function is enclosed in brackets: { }. These brackets are vitally important so **don't delete them!**

You'll also notice the word "case" all over the place. This is because we're using what's called a "switch" statement. In other words, you must have a separate "case" for each language that may be specified. For example, if we wanted to add a Zulu version of the text we would add the following to the bottom of the function (**within the brackets!!!**):

```
case "Zulu":

return "E tafuleni lika uFentse kune zinhlanzi ezintathu ezithukile ngoba ziqabanga ukuthi uTedesca yisitabane.
Izinwele zika Erik ziphela kanqane kanqane. Siwine umunqintiswano womhlaba weRugby.";

break;
```

That's all you have to do to get your translated text into the file. Only one more step to go. Our JScript file sets the language to English by default. You can change this very easily to specify another language. The third row from the top contains the following text:

```
var _Default_Language = "English";
```

This is a "variable" that specifies which language to pick. For example, if you wanted to ensure that our Zulu text appeared in the simulation you would have to change the variable to:

```
var _Default_Language = "Zulu";
```

That's it. You're done! Put your edited JScript file back into your .eoz file and you're ready to go!

A few final house-keeping rules:

- to force a line break, add the following: " ## ". Please note that there is a space before and after the double hash
- to force a open line, simply add " ## ## "

Images Table:

English text	New text	filename	PSD filename	Font
In-field - catching water and simple irrigation		In-FieldS.jpg	splash_Screen_NR.psd	Arial , Bold, 12.7mm, RGB Colour Code: 0,0,0
***Note**: This is a screen that contains credits and licensing information. Because most of this information consists of names of individuals and their contact details you may not wish to translate the text. Should you prefer, however, to localise this information please see the Credits & License.psd file for details*		Credits & License.jpg	Credits & License.psd	Arial, Colour Code: 0,0,0
Pot-holing		But1.png	ButtonText.psd	Arial, Bold, 1.76mm, RGB Colour Code: 255,255,255
Half-moon ridges		But2.png	ButtonText.psd	As above
Bottle Watering		But3.png	ButtonText.psd	As above
Clay pipes in gardens		But4.png	ButtonText.psd	As above
View the components		But7[1].png	ButtonText.psd	As above
Construct the moulds		But8.png	ButtonText.psd	As above
Make clay pipes		But9.png	ButtonText.psd	As above

Laying clay pipes in a vegetable garden		But9b.png	ButtonText.psd	As above
Prepare the clay		But10.png	ButtonText.psd	As above
Soak the frame and sheet		But11.png	ButtonText.psd	As above
Mould pipe and dry		But12.png	ButtonText.psd	As above
Bake the pipe		But13.png	ButtonText.psd	As above
Dig a furrow		But14.png	ButtonText.psd	As above
Lay the pipes		But15.png	ButtonText.psd	As above
Close the furrow		But16.png	ButtonText.psd	As above
Plant vegetables		But17.png	ButtonText.psd	As above
Click here to continue		Button_Text_Continue.png	ButtonText.psd	As above
Click here to see credits		Button_Text_Credits.png	ButtonText.psd	As above
Return to previous page		Button_Text_Return.png	ButtonText.psd	As above
Bottle Watering		hbotWat.png	Popup Heading Master.psd	Arial, Bold, 1.76mm, RGB Colour Code: 0,0,0
Clay pipes in garden		hClayP.png	Popup Heading Master.psd	As above

Half-moon ridges		hHmridg.png	Popup Heading Master.psd	As above
In-field water conservation		hIn-field.png	Popup Heading Master.psd	As above
Pot-holing		hPotH.png	Popup Heading Master.psd	As above
24 hours later		24hrs[1].jpg	ButtonText.psd	Arial, Bold, 1.76mm, RGB Colour Code: 255,255,255
30 minutes later		30mins.jpg	ButtonText.psd	As above
Exit Menu		bExMenu.png	ButtonText.psd	As above

JScript Table (TextPopupFile.js):

English text	New text	Function
Depending on the amount of rain that falls during the rainy season only crops close to the contour ridge will benefit and the rest of your plants may suffer.## ## How do we conserve water within the field so that we can limit or at least delay a water shortage and the wilting of crops? Well, we need to create uneven surfaces to catch whatever water is available. Those of you who have used a cultivator before will have noticed that more water soaks into the soil when you have a loose, rough soil surface that captures the water.## ## Let's look at a few ideas on how we can do this.		Welcome
We all know what a pot-hole is and how it fills up with water when it rains. Well, a pot-hole needn't always be a nuisance. We can use pot-holes in our fields to capture runoff water. This is a great way to let water slowly soak into the soil after the rain. Pot-holes are shallow holes of 10 to 15 cm deep that can be dug at any stage of the crop's growth, but remember to fill them in during really heavy rains to avoid water logging your crops!		Message2
Fruit trees rarely get much water during the dry season. This results in poor growth and inferior fruit. That's why we need to capture as much runoff water as we can during the wet season to preserve moisture in the soil. To do this we construct half moon ridges down-slope of the trees to capture runoff water from higher up. Click on the hoe to see how to construct a half moon ridge.		Message3
Most of us do not water our fruit trees during the dry season. This affects the size and quality of the fruit and means we get less money for our fruit when we sell it. However, there is an effective way of irrigating your fruit trees right through the dry season that won't cost you a lot of money! It's called drip irrigation but you won't need a lot of expensive equipment because we're going to use plain old plastic bottles. This technique supplies water directly to the		Message4

tree's roots, requires less water than other methods and minimises water wastage due to evaporation.		
Vegetables need regular watering, especially during the hottest part of the dry season during September and October. If you do not irrigate your vegetables frequently during this period they will be of a poor quality. Many of you fetch water from rivers, boreholes or wells to irrigate your vegetable patches. However, when you pour this water on the surface much of it is lost through evaporation before reaching the roots of the plants where the water is absorbed. That's why you need to pour water directly into the root zone. Although bottles are useful for watering trees in orchards, clay pipes are more efficient at watering larger areas such as vegetable patches. Clay pipes are made from the same clay soils as clay pots. The only difference is that clay pipes are not polished in order to allow them to slowly release water from their micro-pores. They are buried beneath the soil near the roots of your vegetables. The use of clay pipes generally reduces the watering of vegetable patches to only once a week instead of 3 to 4 times.		Message5

NB: Keep all symbols and punctuation marks in the same place and create a new case for each language you add!

3 Audio to translate

3.1 Narration

The narrations act as an aid to the learning process and to reinforce specific messages.

3.2 Compression data

File type : Wave (Microsoft)
Audio Format : MPEG Layer-3
Audio Attributes : 24,000 Hz, 56kBit, Stereo

3.3 Audio file content

Filename	Text
intro2.wav	"Depending on the amount of rain that falls during the rainy season only crops close to the contour ridge will benefit and the rest of your plants may suffer. How do we conserve water within the field so that we can limit or at least delay a water shortage and the wilting of crops? Well, we need to create uneven surfaces to catch whatever water is available. Those of you who have used a cultivator before will have noticed that more water soaks into the soil when you have a loose, rough soil surface that captures the water Let's have a look at a few ideas on how we can do this."
potholes_1b.wav	"We all know what a pot-hole is and how it fills up with water when it rains. Well, a pot-hole needn't always be a nuisance. We can use pot-holes in our fields to capture runoff water. This is a great way to let water slowly soak into the soil after the rain. "Pot-holes are shallow holes of 10 to 15 cm deep that can be dug at any stage of the crop's growth, but remember to fill them in during really heavy rains to avoid water logging your crops!"
potholes_2.wav	"There are two ways of making pot-holes. You can either use a hoe or a plough without a mould-board.

	Click on the hoe to see how potholes are dug". "Dig your potholes five metres apart and 10 to 15 centimetres deep".
potholes_3.wav	"Now click on the plough to see how potholes are dug using an ox-drawn or donkey-drawn plough. Remember to remove the mouldboard!"
clickHole.wav	Click on the pothole to see how it is made and spaced in the field
half-moon_1.wav	"Fruit trees rarely get much water during the dry season. This results in poor growth and inferior fruit. That's why we need to capture as much runoff water as we can during the wet season to preserve moisture in the soil. To do this we construct half moon ridges down-slope of the trees to capture runoff water from higher up. Click on the hoe to see how to construct a half moon ridge.
half-moon_2.wav	"Use your hoe approximately one metre from the trunk of the tree to scoop up the soil into a ridge in the shape of a half-moon that is approximately 30 centimetres high at the edges and 50 centimetres high in the middle. The ridge needs to be higher and wider at the centre to prevent the water from breaking through".
bottle-watering_1.wav	"Most of us do not water our fruit trees during the dry season. This affects the size and quality of the fruit and means we get less money for our fruit when we sell it. However, there is an effective way of irrigating your fruit trees right through the dry season that won't cost you a lot of money! It's called drip irrigation but you won't need a lot of expensive equipment because we're going to use plain old plastic bottles. This technique supplies water directly to the tree's roots, requires less water than other methods and minimises water wastage due to evaporation".
bottle-watering_2.wav	"You can set up your own plastic bottled irrigation system in three easy steps."
bottle-watering_3.wav	"Get a plastic bottle, preferably a two litre soda bottle. Screw the cap on real tight"
bottle-watering_4.wav	"Cut off the base of the bottle."

bottle-watering_5.wav	“Heat up a piece of thin wire in your cooking fire”
bottle-watering_6.wav	“Pierce 8 to 12 holes in the top and neck of the bottle”
bottle-watering_7.wav	“Remove the cap from the bottle”
bottle-watering_8.wav	“Dig a hole close to the tree trunk and put the bottle into the hole upside down so that its open bottom is almost level with the surface soil. The water will seep out of the bottle slowly to water the plant directly at the roots”
clay_pipes.wav	“Vegetables need regular watering, especially during the hottest part of the dry season during September and October. If you do not irrigate your vegetables frequently during this period they will be of a poor quality. Many of you fetch water from rivers, boreholes or wells to irrigate your vegetable patches. However, when you pour this water on the surface much of it is lost through evaporation before reaching the roots of the plants where the water is absorbed. That’s why you need to pour water directly into the root zone. Although bottles are useful for watering trees in orchards, clay pipes are more efficient at watering larger areas such as vegetable patches. Clay pipes are made from the same clay soil as clay pots. The only difference is that clay pipes are not polished in order to allow them to release water from their micro-pores. They are buried beneath the soil near the roots of your vegetables. The use of clay pipes generally reduces the watering of vegetable patches to only once a week instead of 3 to 4 times”.
clay_components.wav	First I’m going to show you how to make the moulds for your pipes. You’re going to need
pvcPipe.wav	a 110mm by 300mm PVC pipe
showPVC2.wav	and a wall thickness of approximately two millimetres. Ask your supplier for Class 4 PVC pipe if it’s available. If not, then purchase what you can
ShowMortar.wav	a 75mm by 350mm split pole

uNail.wav	a u-nail
short_Timber.wav	saw two timber sections to a length of 300mm
long_Timber.wav	and two sections to a length of 380mm respectively
plastic_sheet.wav	and some plastic sheeting
cutPVC.wav	Step 1: Cut the PVC pipe to a length of 30 centimetres and cut an opening length-wise down the pipe.
Moulds_Steps.wav	There are four steps in this process
clay_pipes_build_3.wav	Step 2: Make a wooden mortar from a split pole with a diameter of 75 mm and 30 centimetres in length. Hammer a u-nail into one end to serve as a handle.
clay_pipes_build_4.wav	Step 3: Construct a wooden frame to shape your clay, using your square profile wood. We're going to have to do some maths to calculate the size of the frame first. The inside length of your frame must be equal to the circumference of your PVC pipe because the clay will first be compacted into your frame and then shaped onto the mortar using your PVC pipe. The circumference is equal to the diameter of 110mm, multiplied by 3.14, which equals 345,4mm. The inside length of your frame should, therefore, be approximately 345mm. The inside width of your frame should equal the length of the PVC pipe, that is, 300mm. To get these dimensions saw two timber sections to a length of 300mm and two sections to a length of 380mm respectively. Nail these pieces together as shown.
clay_pipes_build_5.wav	Step 4: Check the size of your plastic sheet. It should be the same as the inside measurement of your wooden frame to prevent clay from sticking to your PVC pipe
clay_pipes_make_1.wav	Now we're going to make the pipes in four easy steps:
clay_pipes_make_2a.wav	Step 1: Get clay from the nearest termite mound. Work on an average of approximately 1 to 1.5 shovel loads of clay per pipe. Place the clay in a tub of water. As a rule of thumb use 2 parts water to 1 part dry clay. Mix the two up REALLY well.

clay_pipes_make_2b.wav	Let it settle for 30 minutes and mix again, then let it settle for 30 minutes and mix once more. You want to get the water to break up the clay particles as much as possible.
soakSheetAndFrame.wav	Step 2: Soak the plastic sheath and wooden frame in water.
FrameOnTop.wav	Place the frame on top of the plastic sheet and pack the clay inside the frame making sure that it is compact and smooth.
Make_step3.wav	Step 3: Remove the frame.
Make_step3b.wav	Pick up the sheet with clay and wrap the clay around the mortar.
Make_step3c.wav	Place the PVC pipe around the clay and push the open ends together to compact the joint.
Make_step3d.wav	Roll the entire set lightly on a level surface to compact the clay.
Make_step3e.wav	Cut away the excess clay as straight as you can. Remove the mortar and the plastic sheet
Make_step3f.wav	and leave the clay pipe to dry in an upright position in the shade. Repeat this process for as many pipes as your need. Remember to cut some pipes at an angle of approximately 30 degrees. These will be fitted at the end that sticks up out of the ground.
clay_pipes_make_5.wav	Step 4: After drying, bake the clay pipes in a 30 cm deep pit by placing burning tree barks on top of the pipes. We carry out the firing process in a pit to eliminate the effect of wind.
clay_pipes_lay_1.wav	I've shown you how to make your clay pipes. Now I'm going to show you how we prepare a vegetable patch with clay pipes underneath. There are four steps in this process:
clay_pipes_lay_2.wav	Step 1: Dig a furrow approximately 20 to 30 cm deep and 30 cm wide. Clay pipes should lie shallower in sandy soils than in clay soils because the water moves up less.
clay_pipes_lay_3.wav	Step 2: Lay the pipes end to end in the furrow making sure that they are as close together as possible.

L_Step2a.wav	The pipe at the far end should be closed with a stone or a piece of wood.
L_Step2b.wav	Now take the angled pipes that you made earlier and fit them at the other end so that the last pipe sticks up out of the ground at an angle. Water will be poured in through this open end.
L_Step2ab.wav	Don't worry about the open joints between the pipes. Water will seep through these joints into the soil as well.
close_last_Pipe.wav	The pipe at the far end should be closed with a stone or a piece of wood
clay_pipes_lay_4wav	Step 3: Close the furrow carefully so that you don't move the pipes or disturb their alignment.
clay_pipes_lay_5.wav	Step 4: Plant two rows of vegetables, one on either side of the buried clay pipes. Use normal surface irrigation for the first two weeks to get the roots established, then start watering the through the pipes.

Annexure 1: How to localise i3dLO's – a summary

Arguably, the most powerful feature of *Interactive3d Learning Objects* is their translatability into many other languages. This feature means that the knowledge encapsulated within each I3dLO can cross language barriers and be shared with a global community at the click of a button. Audio and text components can easily be translated into other languages by exploiting the so-called "ZIP" compression functionality built into .EOZ files. This is how it's done.

The Basics:

All the information needed to run an i3dLO such as text files, audio files, etc, can be found inside the compressed .EOZ file. In principal, you need to replace the graphic and audio files in the EOZ in order to change the text and audio components of the I3dLO to a new language.

This is actually very easy to do if you follow these steps:

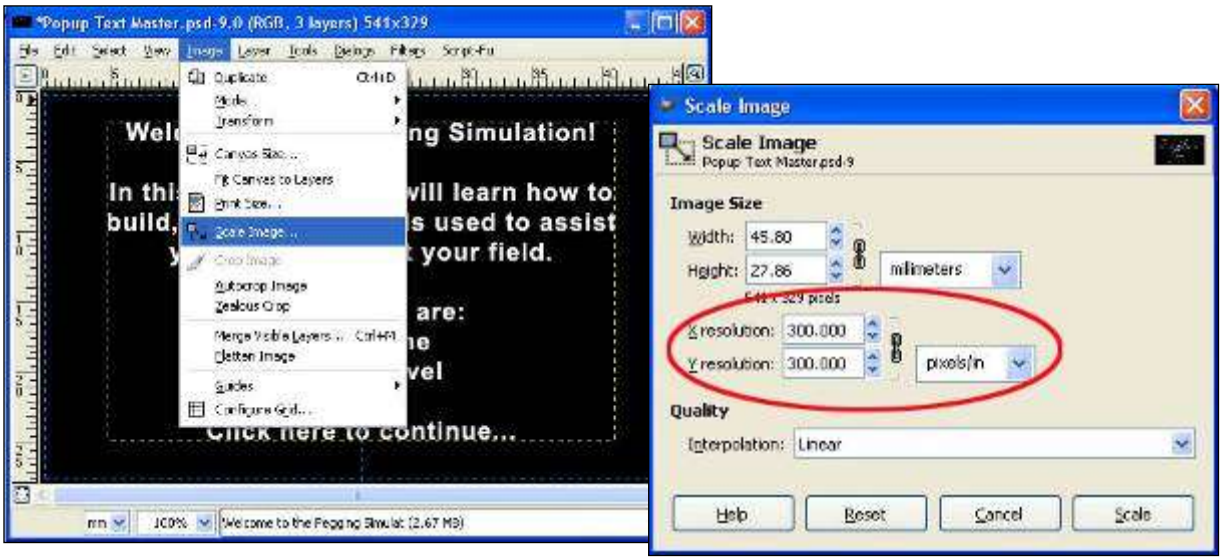
1. You've probably worked with compressed .ZIP files before. Well, an EOZ file is basically the same – you just need to unzip it! We recommend that you use WinRAR to do this as it is NOT case sensitive, unlike WinZIP which IS Case-sensitive (trust us on this one, you'll thank us later!). WinRAR is a shareware program that can be downloaded at http://www.win-rar.com so go get it if you haven't already.
2. Right, now you have got WinRAR at the ready, you're raring to go. Not so fast. First you need to something very important. Save a backup copy to work on (we never work on original files!). Now open the file with WinRAR by right-clicking on the file, choose "Open With" and select WinRAR. You may have to click on "Choose Program …" and then select WinRAR from the list or browse to its location to get it to open your file if it's not already associated with .EOZ files. Hey presto, the inner secrets of your I3dLO are revealed!

Replacing Text Textures:

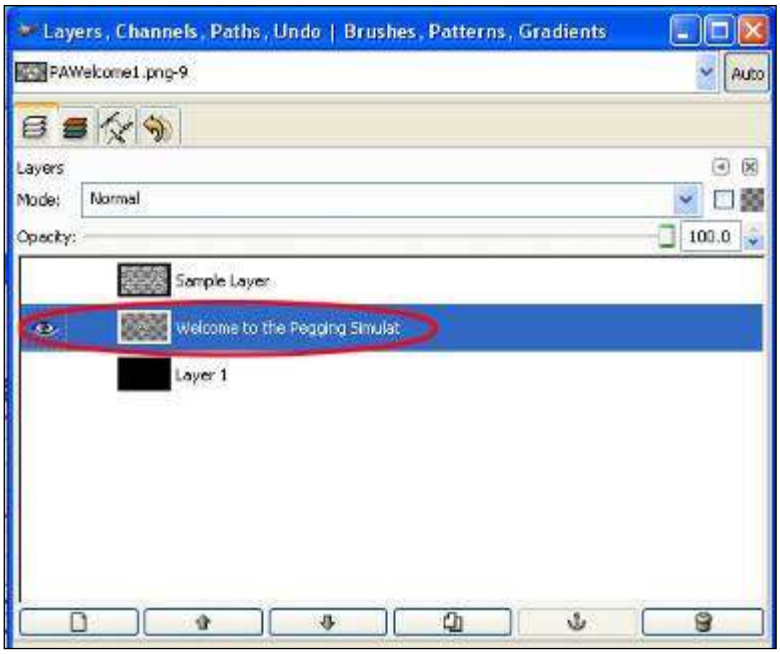
OK. Now that you've opened the .ZIP file with WinRAR you're probably thinking, wow, there's a lot of stuff in here. You'll probably see about half a dozen types of files. Don't panic. We're only interested in a couple. We'll take it step by step - starting with text replacement.

1. You'll see that there are a number of .PNG files inside the file. These contain the actual text that is used in the i3dLO. These are the files that you need to replace with your new, translated versions. But please don't edit the .PNG files directly. You can download a set of Adobe Photoshop™ .PSD files from the website (see the Photoshop resource folder) that can be used as templates to generate your own, translated content. They are precisely sized to ensure that the text fits the way it should. These Photoshop "templates" are listed next to the relevant .PNG files in tables below together with the fonts, font sizes and font colours you'll be using.
2. Go ahead and open the .PSD file and type your own translated text in. If you have Photoshop then the process of editing the text layer contained within a .PSD file is a simple process. You can purchase a simpler and cheaper download version called "Photoshop Elements" from Adobe.com for approximately USD 100.
3. What? Do I hear screams and a gnashing of teeth: "How do I open .PSD files if I don't have Adobe Photoshop™?" Relax, take a deep breath and then download a secret weapon from the Web called "GIMP" from http://www.gimp.org/. With GIMP you can do photo retouching, image composition, image authoring, open .PSD files and, what's more, it is open source and therefore, free!

4. OK, that was the good news. Now for some bad news. GIMP won't actually allow you to edit the .PSD file's text layer itself because it turns it into a raster image as opposed to editable vector-based text. This means that you can only use the text layer as a guide for the correct placement of your new text. The table below gives you all the font information that you need. However, before you start, you must make sure that GIMP is using the correct resolution otherwise you'll never get the font size right. The settings will obviously vary from project to project. For Pegging out with the A-Frame you must set GIMP's resolution to 300 pixels per inch. Click on "Image" then "Scale Image" to get to the right window. Make sure that the X and Y resolutions are set to 300! Check out the screen shots below.



5. **There is one important thing to keep in mind when you are editing the layers.** You only want your new text layer to be visible. Make sure, therefore, that only this layer is visible in your layers palette. Look for the "eye" icon next to the text layer. See the screenshot below.



6. When you're done, save the new file as a .PNG file. Now, this next bit is very important: You must save your new .PNG file using EXACTLY the same file name as the original file otherwise the .EOZ file won't recognise it and it simply won't load into the simulation – don't use the .PSD file name and don't say we didn't warn you!
7. When you're ready simply drag the new file from Windows Explorer into the open WinRAR window to replace the old file. That's that! Or is it? Nope, not quite but almost. Your .ZIP file will, to be frank, do just that. Zip, nada, nothing.

You have to rename the simulation file extension back to .EOZ again to be able to run your i3dLO in the EON Viewer. Now you're done.

Replacing Audio files:

1. Now you'll have noticed a several other files inside the .EOZ file that have a .WAV extension. At this point all the experts among you will, no doubt, stretch and yawn with a "been there, done that expression" on your faces. Just bear with me as we run through some more basics. All the I3dLO's that you download from the website contain WAV files recorded at 44kHz, in 16 bit and stereo, with MPEG layer 3 compression. This gives good quality audio with a low file size and is our audio standard for I3dLO's. For a more detailed discussion about audio files take a look at the August 2006 "*News and Views" which* contains a great article about recording audio clips.
2. By now you should be familiar with the procedure for "un-zipping" .EOZ files. If you're still not comfortable with this, have another look at the steps outlined above and try it out a few times. Practice makes perfect, after all.
3. Once you've finished recording your audio clip you have to save it back to the original file in WinRAR. We must stress again at this point how important this step is. Save your new .WAV file using EXACTLY the same file name as the original file otherwise the .EOZ file will not be able to pick it up when the simulation is run, *capiche?*

Annexure 2: Linking i3dlo's to PowerPoint

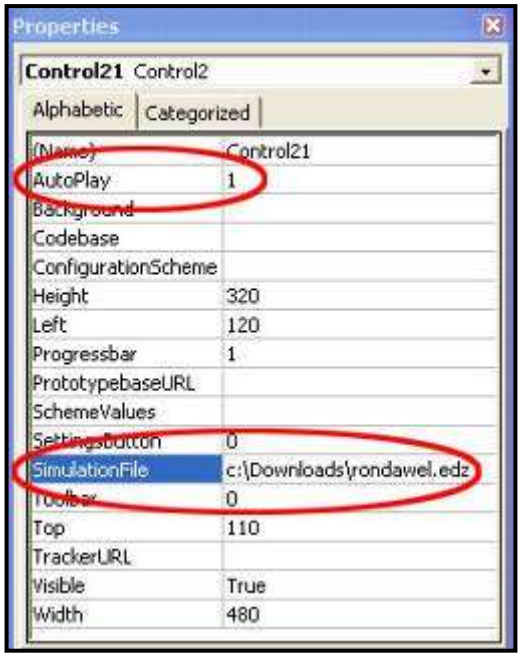
You can also use your simulations in PowerPoint presentations. It's easy to set up and all you have to do is the following:

1. Open PowerPoint, move to the slide where you want to inset the simulation
2. Click on *Insert* / *Object*.
3. Select *Create New* and *EonX 4.0.1* (note, the version number is likely to be higher) & click *OK*.

4. An empty selection dialogue box will now appear on your screen. Right-click on the selection. Click on *Properties* and complete the following fields:

Autoplay: **1**

Simulation File: The **path** to your simulation file (NB: Check your file extensions – If you're using *EON Distribution Files* the file extension will be.*edz* & *if* you're using *EON Studio Documents* the extension will be.*eoz*.



5. When you now view your slide show, the EON simulation will automatically run when you move to the PowerPoint slide that you have linked to the simulation.

Annexure 3: General information

Simulation Viewer - installation

I3dlo's have been developed and are normally distributed as separate files (they will have either an .EOZ or .EDZ file extension). You will need to install the EON Viewer to run these simulations. If you haven't already installed the latest viewer, or don't have a latest copy, it can be found at www.naledi3d.com **(select the "i3dlo home" button / downloads**, the link is at the top of the page). The latest version (September 2008 is 6.0.0).

There is no installation process for i3dlo files. Once they have been copied to your hard drive, they can be run by simply double-clicking on the file name; or you could consider placing a short-cut on your Windows desktop, or for example, embed relevant i3dlo's into your PowerPoint presentations (see Annexure 2 for more on this).

Computer specifications

It is important to keep in mind that VR simulations require PC's with a "good" graphics card and sizeable memory. The terms "good" and "sizable" can be defined along the lines of the following hardware configuration, which would be our PC of choice:

Intel Pentium IV or AMD Athlon CPU (2GHz or better)
256 MB RAM (512 MB RAM preferred)
At least 250 MB spare hard drive disk space for installation – some of the i3dlo's can be as big as 20Mb (or more) each
Sound card and stereo speakers, CDROM
Monitor capable of 1024 x 768 or better
AGP or PCI-E Graphics card with at least 128Mb of dedicated memory onboard (256Mb preferred) (NVidia GeForce cards are recommended.)
3-button mouse and Windows XP

I3dlo simulations have been known to run on smaller computers, such as notebooks with the Intel graphics chipset (for example, with 128Mb shared memory); and World Links in Harare have even run some smaller simulations on older Pentium III computers. However, it is the nature of "real-time" interactive graphics programmes that the better the graphics card / chipset combination, the more dedicated graphics memory and PC memory available, the better the simulation will run.

Typical symptoms of using a computer that is "low" on specifications is that the simulation take longer to load; are "jerky" when moving around; or some of the textures may not render properly.

Mouse usage

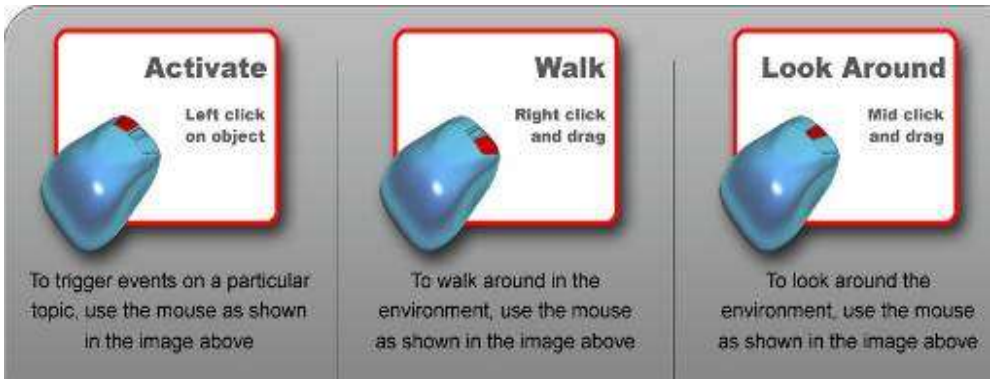
Depending on which i3dlo is being used, a computer mouse can be used in varying ways to control movement around the simulation. Firstly, as in most software applications, the user uses the mouse to move the cursor and mouse clicks to make selections from displayed menu items, or to click to move the i3dlo forward when dialog boxes are displayed.

However, because the i3dlo is based on Virtual Reality (VR) and interactive 3D worlds, the mouse can also be used (sometimes this option is intentionally "turned off') to move around the 3D world.

This is usually achieved by holding the left –button in and sliding the mouse slowly forward to move forward, or left / right to turn (depending on which direction you want to go). This navigation control is quite intuitive and normally only take a few seconds of practice to get used to the idea, and to also get used to co-ordinating the speed of the mouse movement with the actual speed of movement within the simulation.

Similarly, the right mouse button can often be used to move vertically (up or down) in the simulation; and a combination of the left button and the keyboard key to change the angle of view (again these options may have been intentionally turned off).

The middle mouse button may also be used change the angle of view.



Finally, there may be some cases where the left / right buttons may have been intentionally swapped. A little trial and error will help you to determine what mouse controls result in which movements in a particular i3dlo.

Troubleshooting

In this section, we look at some common problems that may arise when working with interactive simulations.

1. Simulations don't run smoothly

By their nature, VR allow you to move around the 3D simulation in real time. While this is one of the more powerful features of Virtual Reality, it also means that the quality of the "screen re-rendering" is dependent on the amount of memory (both dedicated graphics and computer memory) and the system CPU that is available. If the simulation is not running smoothly it is likely that your computer is below specification (for that particular i3dlo). In marginal cases, you could try to reduce the load on the PC by closing as many other applications as possible.

2. Audio

Rarely, the sound option may become disabled. To check click on *Tools* on the **EON Viewer Menu Bar** (right). Select *EON Configuration* from the drop-down menu and click on *Wave Sound*. The Wave Sound Properties menu will appear. Make sure that the *Sound Off* box is **unchecked**!