

Session 2: Decision-Making for the Selection and Construction of Appropriate Water Point Sanitation Facilities

Introduction

WPC with the communities have a responsibility for water point sanitation including the construction of fence and soak away pit with their own funds. However, few WPC actually have sanitary facilities such as fences and soak away pits. One of the reasons is the lack of ownership of the community and also that it is unaffordable to low income communities.

This session was developed to show that a wide range of options from very low-cost fencing and drainage facilities made of locally available materials to expensive ones requiring concrete, bricks and other purchased materials. This enables each community to make informed choices of the most appropriate, technically feasible and affordable fencing and drainage options that are suitable for own community.

Learning Objectives

By the end of this topic, participants will be able to:

1. Describe the options for type of fences
2. Describe the options for type of drainage facilities

Tool Kit

Tool kit 11: Informed Choice Booklet for Water Point Sanitation (Afridev handpump version)

Content

Options for fence type

Activity 3.3

Step 1

Facilitator asks participants to name options for different types of fence that can be constructed with locally available materials

Step 2

Facilitator summarises the discussion and presents the common types of fence

Purpose of fence

It is important to erect a good fence around the water point.

This can be done immediately after the construction of the well is finished, and should give enough space to operate the hand pump.

The advantages of fencing are that it serves to define quite clearly, for the whole community, the area of the well and it keeps animals away from the wellhead. In some cases, it may be necessary to have a gateway to keep out smaller animals such as goats and baby pigs.

The fencing can be made of suitable local materials like wood, glass, bamboo or bricks. Problems of replacement and repair can be avoided altogether, by using a living hedge as fencing (nursery and/or plant fence). Whatever type of fencing is used, it is important that access by the users is guaranteed.

Functions of a fence

To keeps animals away from water point areas for the prevention of contamination of water source by animal faeces and destruction of soak away pit by animals.

Selection of fence type

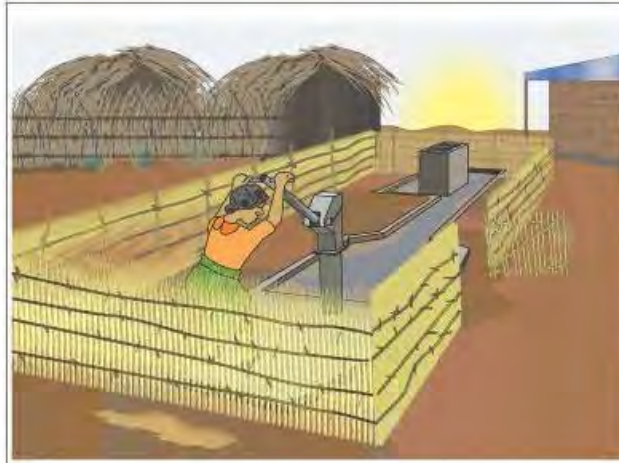
There are numerous fencing styles, materials and designs available today. The following points are helpful for choosing the fence.

1. The availability of money against the total budget for construction
2. Fence maintenance. How often will you need to repair the fence?
3. Your style and design preferences

Based on the easy provision of low cost materials in Malawi, five types of fence, as shown in Table 6, are recommended for selection by the community.

Table 1: Five types of fence

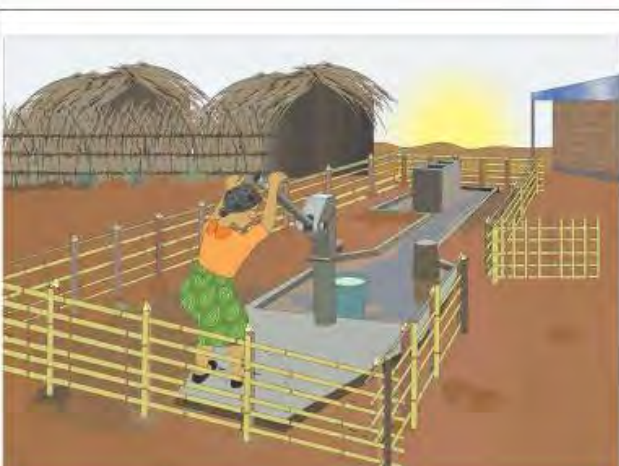
No.	Type
F1	Grass Type
F2	Timber Type
F3	Bamboo Type
F5	Brick Type
F6	Brick with Plaster Type



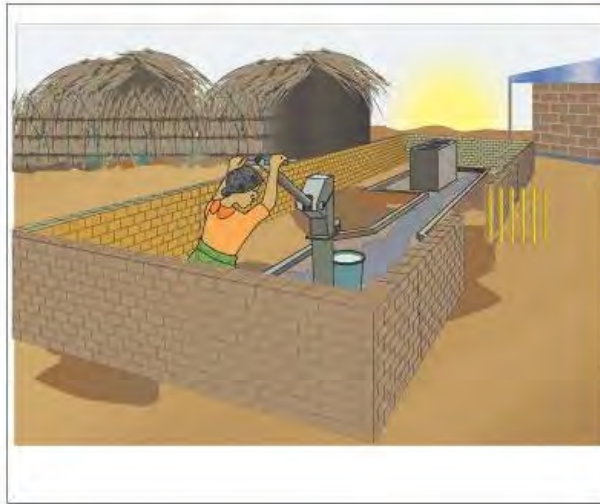
F1: Mpanda wa Tsekera	
Kuyalokosa mtengo: 21.000 MK (kwa mwaka wa Septemba 2014)	
Ubwino	Kuyipa kwake
<ul style="list-style-type: none"> 100 peresenti zipangizo zake ndi zakomola Sumawuta Sumawuta kumwaga Nalawenda mtengo Zipangizo zake zimapezeka kumwaga 	<ul style="list-style-type: none"> Simakholota ndiponso sumawuta kulonje ebala ndi ebala Nalawenda mtengo Chawo chitha Kuchya isetora Anthu atbu kuyipa
Zipangizo (Chitawoni) (L x B x H = 15m x 3m x 1.5m)	
<ul style="list-style-type: none"> Tsekera: Mitolo 27 Khoje: Mpoloto 30 Mitengo: Yakwana 10 Nsongwi: Yakwana 10 Limo: Mipakani 100 	
Zida	
<ul style="list-style-type: none"> Chikwango: Chamodzi Khasu: Lamodzi Mpeni: Lamodzi 	



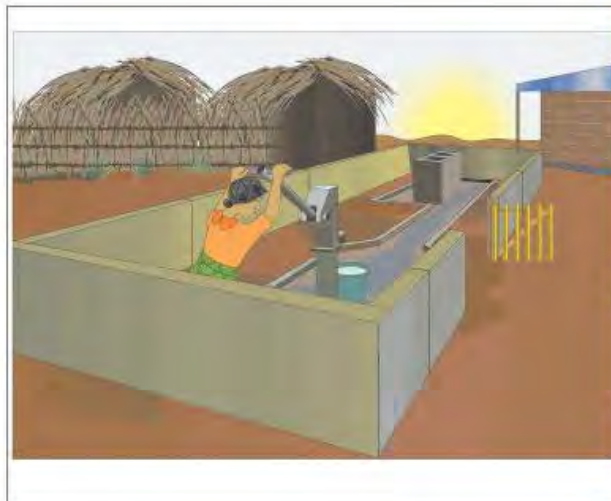
F2: Mpanda wa thabwa	
Kuyalokosa mtengo: 35.000 MK (kwa mwaka wa Septemba 2014)	
Ubwino	Kuyipa kwake
<ul style="list-style-type: none"> 100 peresenti zipangizo zake zimapezeka Sumawuta Sumawuta kumwaga Nalawenda mtengo Sumawuta kulonjezo Mutho kutha mwanekelwe 	<ul style="list-style-type: none"> Umafuna kulonje ebala ndi ebala kuti ulizwenda bwino Motabwa unathu kulwocwanga ngati amakholota mabwala Chawo chitha kulwocwanga Anthu atbu kuyipa
Zipangizo (Chitawoni) (L x B x H = 15m x 3m x 1.5m)	
<ul style="list-style-type: none"> Motabwa: Yakwana 15 Misomali: 2 Kilo Mothala atkono: Nita 	
Zida	
<ul style="list-style-type: none"> Hawala: Imodzi Chikwango: Chamodzi Khasu: Lamodzi 	



F3: Mpanda wa Nsongwi	
Kuyalokosa mtengo: 15.000 MK (kwa mwaka wa Septemba 2014)	
Ubwino	Kuyipa kwake
<ul style="list-style-type: none"> 100 peresenti zipangizo zake zimapezeka Sumawuta Sumawuta kulonjezo Zipangizo zake zimapezeka kumwaga 	<ul style="list-style-type: none"> Umafuna kulonje ebala ndi ebala kuti ulizwenda bwino Nsongwi amakholota ngati amakholota mabwala Chawo chitha kulwocwanga Anthu atbu kuyipa
Zipangizo (Chitawoni) (L x B x H = 15m x 3m x 1.5m)	
<ul style="list-style-type: none"> Nsongwi: Mipakani 40 Khoje: Mipakani 20 Limo: Mipakani 15 Mitengo: Yakwana 10 	
Zida	
<ul style="list-style-type: none"> Chikwango: Chamodzi Khasu: Lamodzi Mpeni: Lamodzi 	



F5: Mpanda wa njerwa	
Kupatikana mtengo: 75,000 MK (una mwazi wa September 2014)	
Uwazi	Kuipita kawala
<ul style="list-style-type: none"> Ndiwotimba Sumafuna kanzakoma 	<ul style="list-style-type: none"> Ndiwotimba mtengo kupasa wa ukutu, wa mabawa ndi mungu Uha kugwa ngazi sumungu wote bwazi kumama ngazi mabawa ndi amoni simunosekoma bwazi uha kugwa
Zipangaji (Chinamoni) (L x B x H = 1.5m x 1m x 1.2m)	
<ul style="list-style-type: none"> Njerwa Zakwani 1050 Simoni Mabagi 6 x 50kg Mabawa Ngazi zina Mabawa Mgazi oxiti 	
Zida	
<ul style="list-style-type: none"> Mpezi omungu 1 Uondzi Lendo 1 Inoda Wifuku 1 Inoda Sherehi 1 Inoda 	



F6: Mpanda wa njerwa ndi pulasitani	
Kupatikana mtengo: 90,000 MK (una mwazi wa September 2014)	
Uwazi	Kuipita kawala
<ul style="list-style-type: none"> Ndiwotimba Sumafuna kanzakoma 	<ul style="list-style-type: none"> Ndiwotimba mtengo kupasa wa ukutu, wa mabawa ndi mungu Uha kugwa ngazi sumungu wote bwazi kumama ngazi mabawa ndi amoni simunosekoma bwazi uha kugwa
Zipangaji (Chinamoni) (L x B x H = 1.5m x 1m x 1.2m)	
<ul style="list-style-type: none"> Njerwa Zakwani 1050 Simoni Mabagi 10 x 50kg (pulasitani) Mabawa Ngazi zina Mabawa 3 pot 	
Zida	
<ul style="list-style-type: none"> Mpezi omungu 1 Uondzi Lendo 1 Inoda Sherehi 1 Inoda Wifuku 1 Inoda 	

Options for type of drainage facilities

Activity 3.4

Step 1

Facilitator asks participants to brainstorm the options for types of drainage facilities

Step 2

Facilitator summarises the discussion and presents the common types of drainage facilities

Purpose of drainage facilities

A drainage channel can lead to a ditch or to an existing surface water drainage system, irrigation channel, cattle trough; and sometimes evapotranspiration beds (i.e. where the water is absorbed by plants).

If there are no drainage channels nearby, the water can soak into the ground in a way that will not place the groundwater source at risk. Typically, a soak away or a soak pit is used, or alternatively a French drain (a shallow stone-filled trench).

The safe distance between the disposal point and the borehole will mainly depend on the nature of the soil, the distance between the base of the soakage system and the groundwater table, and the length of borehole casing. The performance of all systems needs to be suitable for rainy as well as dry season conditions.

Functions of a soak away pit

There are mainly three functions of soak away pit.

- a. To prevent unsightly and unhygienic condition of the water point
- b. To prevent water contamination at the point of source
- c. To prevent producing mosquito breeding sites

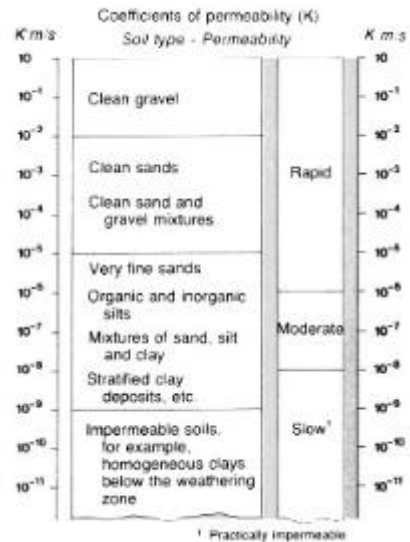
Determination of size and design of soak away pit

(1) Size

The size of the soak away is determined mainly by the volume of liquid effluents produced and local soil conditions.

Box 1 : Soil Permeability

Gravel has a higher soil permeability than clay soil. If the soil permeability is high like gravel, a small-sized pit is sufficient. On the contrary, if the soil permeability is low like clay soil, the size of the pit is required to be bigger than with gravel soil. So soil type is one of the factors to determine the size of the pit.



(2) Design of soak away pit

The pit may be filled with stones, broken bricks, etc., in which case no lining is needed, or may be lined with open-jointed masonry (often with a filing of sand or gravel between the lining and the soil to improve infiltration).

The top 0.5 m of the pit should be lined solidly, to provide firm support for the reinforced concrete cover. The cover is sometimes buried by 0.2-0.3 m of soil to keep insects out of the pit.

With large effluent flows, drainage trenches may be more economical than a soak away. Planting trees adjacent to, or over, a soak away can improve both transpiration and permeability

(3) Type of facilities for drainage purposes

As mentioned above, a soak away pit is required to be filled with stones, broken bricks, etc., however in consideration of limitation of procurement of materials and/or budget of the communities, six types of facilities for drainage purposes shown in Table 7 are recommended for selection by each community. **Type S3, S4 and S5 is most recommendable.**

Table 2: Six types of facility for drainage purposes

No.	Type
S1	Digging pit with cover
S2	Protected pit with cover
S3	Digging pit with crushed stone
S4	Protected pit with crushed stone
S5	Ground drainage channel
S6	Vegetable garden

S1: Dzenje lokumba koma Lovindikira

Kapikibwa utungo: 11,000 MK (ina mwenzi wa September 2014)

Ubwenge	Kiungo kwake
<ul style="list-style-type: none"> Sisi Lokumba utungo Sikimwaka Fubwaka (Lazafina yafwa Inkwanda bwa) 	<ul style="list-style-type: none"> Lazafina Inkwanda (Lazafina yafwa Inkwanda bwa) Mikungu zinazofika zina kufupuka na utungo

Zipangizo (Chinamoni) (U x B x H = 1m x 1m x 1m)

Zila
<ul style="list-style-type: none"> Kwasa Lokumba Chikwango/Chinandi Shwari Lokumba

S2: Dzenje lokumba koma lowaka hili ndi chovindikira

Kapikibwa utungo: 11,000 MK (ina mwenzi wa September 2014)

Ubwenge	Kiungo kwake
<ul style="list-style-type: none"> Mikungu zinazofika zina kufupuka na utungo 	<ul style="list-style-type: none"> Mikungu zina kufupuka na utungo Kufupuka na utungo Mikungu zinazofika zina kufupuka na utungo

Zipangizo (Chinamoni) (U x B x H = 1m x 1m x 1m)

Zila
<ul style="list-style-type: none"> Kwasa Lokumba Chikwango/Chinandi Shwari Lokumba

S3: Dzenje lokumba koma hili ndi miyala (Recommendable type)

Kapikibwa utungo: 11,000 MK (ina mwenzi wa September 2014)

Ubwenge	Kiungo kwake
<ul style="list-style-type: none"> Mikungu zinazofika zina kufupuka na utungo Mikungu zinazofika zina kufupuka na utungo Mikungu zinazofika zina kufupuka na utungo 	<ul style="list-style-type: none"> Lazafina Inkwanda (Lazafina yafwa Inkwanda bwa)

Zipangizo (Chinamoni) (U x B x H = 1m x 1m x 1m)

Zila
<ul style="list-style-type: none"> Kwasa Lokumba Shwari Lokumba Mikungu Lokumba

S4: Dzenje lokumba lowaka bwino hili ndi miyala (Recommendable type)

Kapikibwa utungo: 11,000 MK (ina mwenzi wa September 2014)

Ubwenge	Kiungo kwake
<ul style="list-style-type: none"> Mikungu zinazofika zina kufupuka na utungo Mikungu zinazofika zina kufupuka na utungo Mikungu zinazofika zina kufupuka na utungo 	<ul style="list-style-type: none"> Lazafina Inkwanda (Lazafina yafwa Inkwanda bwa) Dzenje Inkwanda (Lazafina yafwa Inkwanda bwa)

Zipangizo (Chinamoni) (U x B x H = 1m x 1m x 1m)

Zila
<ul style="list-style-type: none"> Kwasa Lokumba Shwari Lokumba Mikungu Lokumba

S5: Dzenje lowaka lokhala ndi chivindikiro cha konkiliti komanso ngalange zovindikira bwino (Recommendable type)

Kapikibwa utungo: 11,000 MK (ina mwenzi wa September 2014)

Ubwenge	Kiungo kwake
<ul style="list-style-type: none"> Mikungu zinazofika zina kufupuka na utungo Mikungu zinazofika zina kufupuka na utungo Mikungu zinazofika zina kufupuka na utungo 	<ul style="list-style-type: none"> Lazafina Inkwanda (Lazafina yafwa Inkwanda bwa) Lazafina Inkwanda (Lazafina yafwa Inkwanda bwa)

Zipangizo (Chinamoni) (U x B x H = 1m x 1m x 1m)

Zila
<ul style="list-style-type: none"> Kwasa Lokumba Shwari Lokumba Mikungu Lokumba

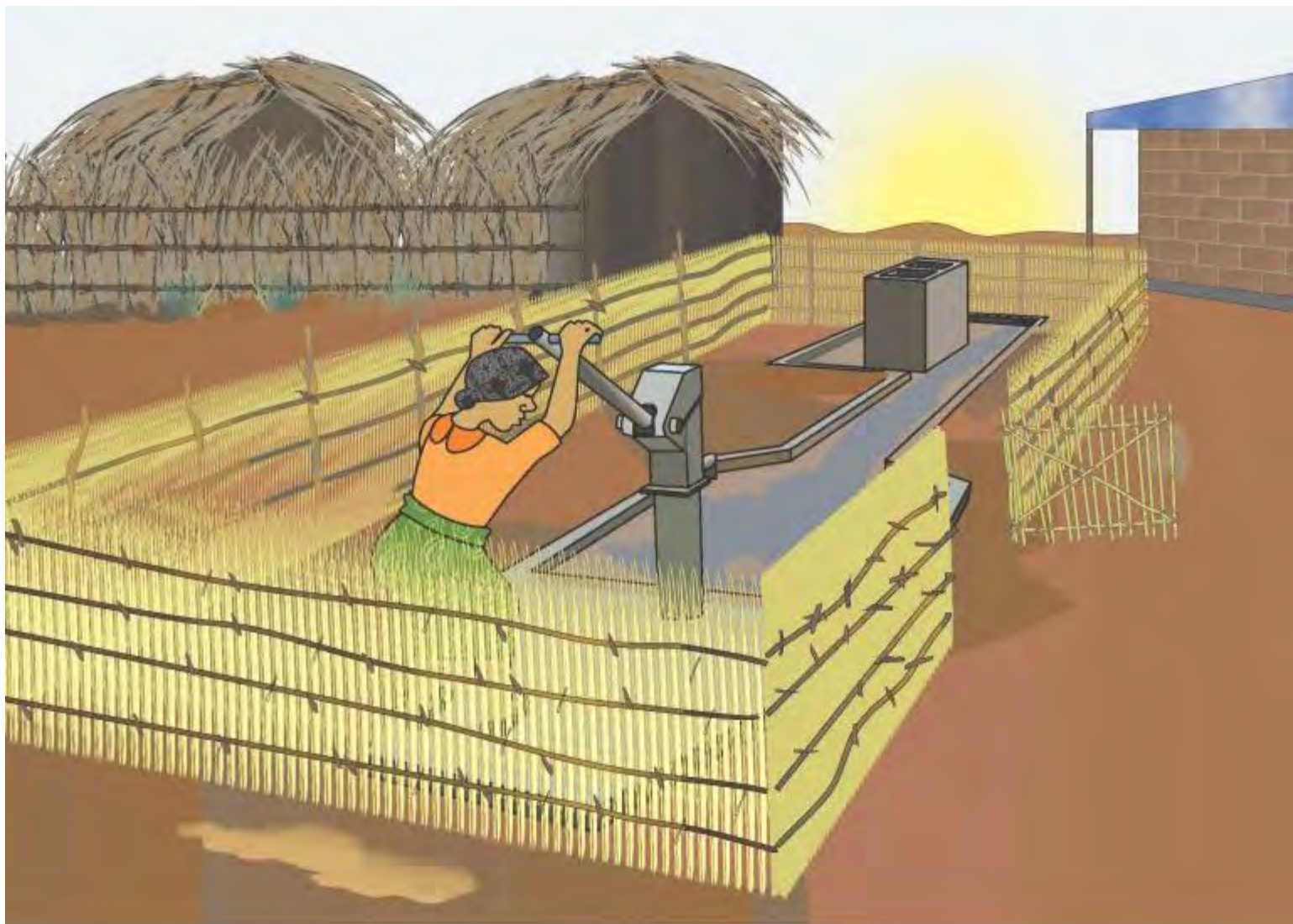
S6: Dimba

Kapikibwa utungo: 11,000 MK (ina mwenzi wa September 2014)

Ubwenge	Kiungo kwake
<ul style="list-style-type: none"> Mikungu zinazofika zina kufupuka na utungo Mikungu zinazofika zina kufupuka na utungo Mikungu zinazofika zina kufupuka na utungo 	<ul style="list-style-type: none"> Lazafina Inkwanda (Lazafina yafwa Inkwanda bwa) Mikungu Lokumba

Zipangizo (Chinamoni) (U x B x H = 1m x 1m x 1m)

Zila
<ul style="list-style-type: none"> Kwasa Lokumba



F1: Mpanda wa Tsekera

Kuyelekeza mtengo:

21,000 MK (mwezi wa September 2014)

Ubwino	Kuyipa kwake
<ul style="list-style-type: none"> ● 100 peresenti zipangizo zake ndi zakumudzi ● Sumalemera ● Sumavuta kumanga ● Ndiwotsika mtengo ● Zipangizo zake zimapezeka kumudzi. 	<ul style="list-style-type: none"> ● Sumakhalitsa, ndiponso umafuna kukonza chaka ndi chaka ● Ndiwosalimba ● Chiswe chitha kudya tsekera ● Anthu atha kuyatsa moto

Zipangizo [Chitsanzo] (L x B x H =15m x 3m x 1.2m)

- Tsekera: Mitolo 25
- Khonje: Mipukutu 30
- Mitengo: Yokwana 10
- Nsungwi: Zokwana 10
- Linya: Mipukutu 100

Zida

- Chikwanje: Chimodzi
- Khasu: Limodzi
- Mpeni: Umodzi



F2: Mpanda wa thabwa

Kuyelekeza mtengo:

36,000 MK (M'mwezi wa September 2014)

Ubwino	Kuyipa kwake
<ul style="list-style-type: none"> ● 100 peresenti zipangizo zake zimapezeka zakumudzi ● Sumavuta kumanga ● Ndiwontsika mtengo ● Sumavuta kukonzanso ● Mutha kusitha maonekedwe 	<ul style="list-style-type: none"> ● Umafuna kukonza chaka ndi chaka kuti udziwoneka bwino ● Matabwa amatha kuwonongeka ngati sanathiridwe makhwala ● Chiswe chitha kuwononga ● Anthu atha kuyasa

Zipangizo [Chitsanzo], (L x B x H =15m x 3m x 1.2m)

- Matabwa: okwana 15
- Misomali: 2 Kilo
- Makhwala achiswe: 5lita

Zida

- Hamala: Imodzi
- Chikwanje: Chimodzi
- Khasu: Limodzi



F3: Mpanda wa Nsungwi

Kuyelekeza mtengo:

13,000 MK (M'mwezi wa September 2014)

Ubwino	Kuyipa kwake
<ul style="list-style-type: none"> • 100 peresenti zipangizo zake zimapezeka zakumudzi • Sumavuta kukonzanso • Zipangizo zake zimapezeka kumudzi. • Ndiwotsika Mtengo 	<ul style="list-style-type: none"> • Umafuna kukonza chaka ndi chaka kuti udziwoneka bwino • Nsungwi zimathakufumba ngati sizinathiridwe makhwala • Chiswe chitha kuwononga • Anthu atha kuyasa

Zipangizo [Chitsanzol] (L x B x H =15m x 3m x 1.2m)

- Nsungwi: Mapisi okwana 40
- Khonje: Mipukutu 20
- Linya: Mipukutu 15
- Mitengo: Yokwana 10

Zida

- Chikwanje: Chimodzi
- Khasu: Limodzi
- Mpeni: Umodzi



F4: Mpanda wa zomera(Maluwa)

Kuyelekeza mtengo:

70,000 MK (M'mwezi wa September 2014)

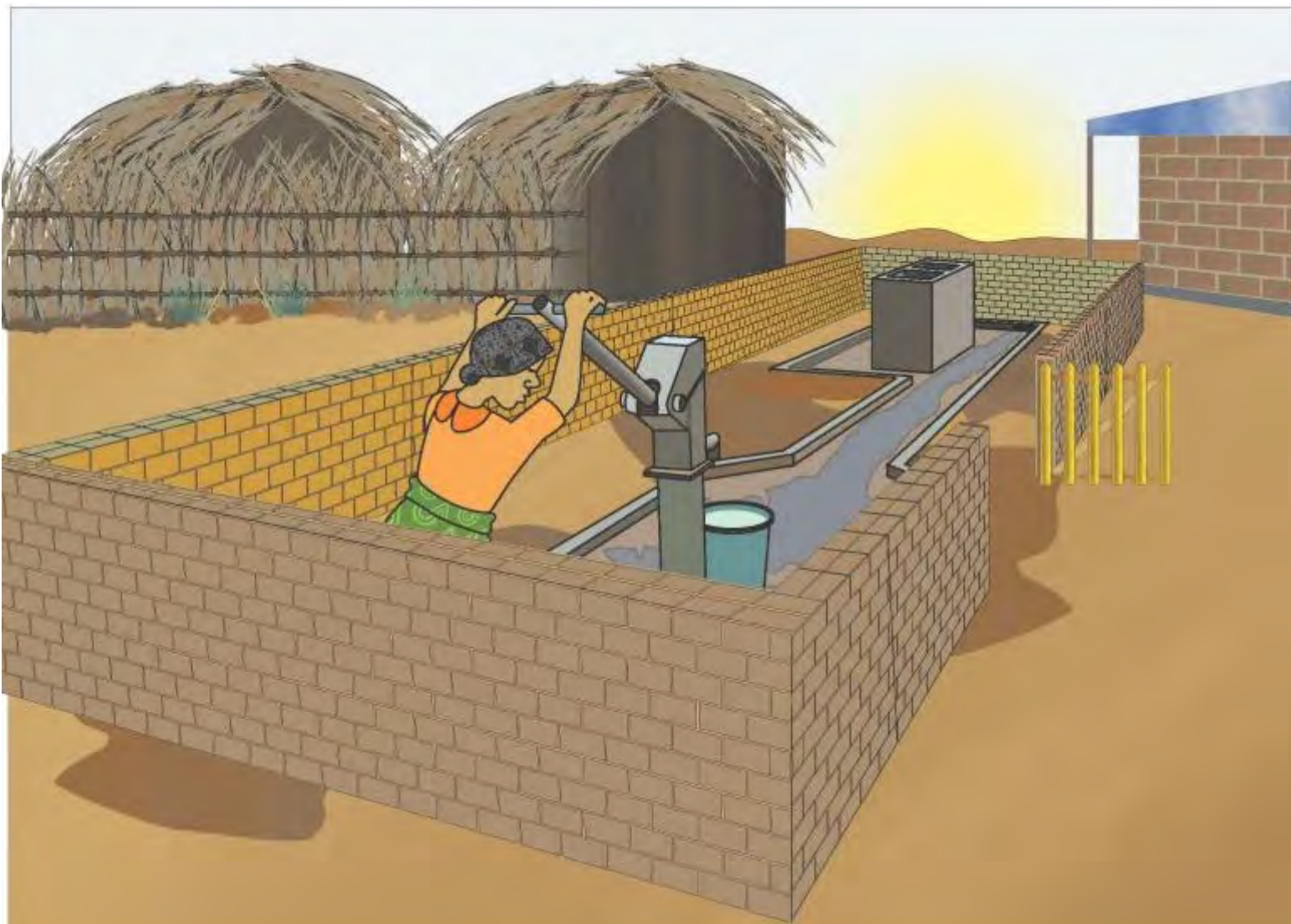
Ubwino	Kuyipa kwake
<ul style="list-style-type: none"> ● 100 peresenti zipangizo zake zimapezeka kumudzi ● Sumawononga chilengwedwe ● Utha kukhala ndi mitundu yosiyanasinya pamodzi ● Umakhala wokongola 	<ul style="list-style-type: none"> ● Umafuna kukonza chaka ndi chaka kuti udziwoneka bwino ● Kugula maluwawa m'mudzi ndikovuta chifukwa samapezeka ● Simaluwa onse amene sangadyedwe ndi chiswe

Zipangizo [Chitsanzo] (L x B x H =15m x 3m x 1.2m)

- Maluwa: Mapisi 84
- Mitengo: Mapisi 10
- Manyowa: Matumba 4 a 50kg
- Feteleza: 25kilogramu
- Misomali: 1 kilogramu

Zida

- Chikwanje: Chimodzi
- Khasu: Limodzi
- Mpeni: Umodzi



F5: Mpanda wa njerwa

Kuyelekeza mtengo:
73,000 MK (M'mwezi wa September 2014)

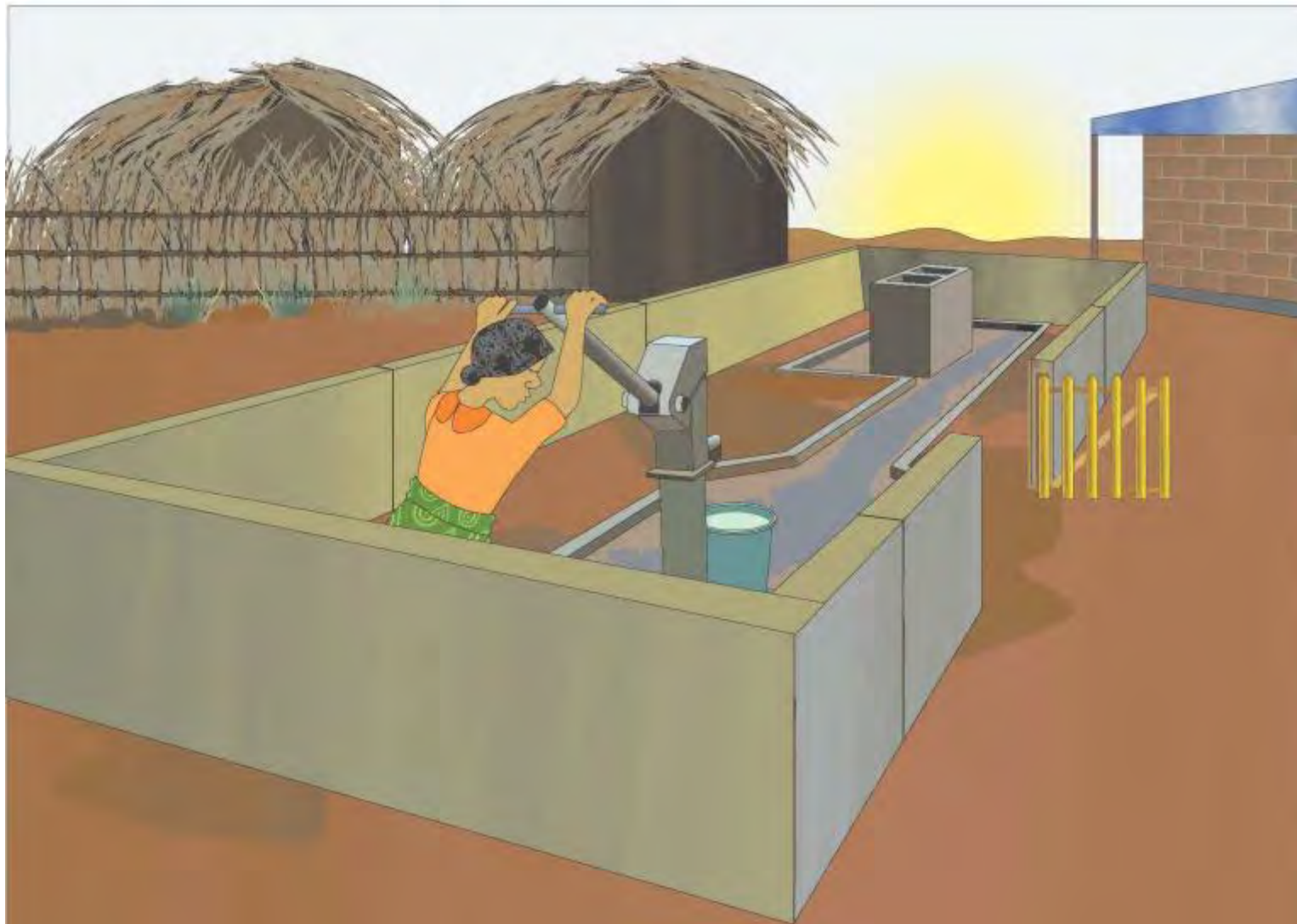
Ubwino	Kuyipa kwake
<ul style="list-style-type: none"> ● Ndiwolimba ● Sumafuna kukonzakon za 	<ul style="list-style-type: none"> ● Ndiwokwera mtengo kuposa wa udzu, wa matabwa ndi nsungwi ● Utha kugwa ngati sunamangwidwe bwino(Komanso ngati mchenga ndi simenti simunasakanize bwino utha kugwa)

**Zipangizo [Chitsanzol]
(L x B x H =15m x 3m x 1.2m)**

- Njerwa: Zokwana 1650
- Simenti: Matumba 6 a 50kg
- Mchenga: Ngolo ziwiri
- Matabwa: Mapisi awili

Zida

- Mpeni womangira: 1 Umodzi
- Levulo: 1 Imodzi
- Wilibala:1 Imodzi
- Shovelo:1 Imodzi



F6: Mpanda wa njerwa ndi pulasitala

Kuyelekeza mtengo:

90,000 MK (M'mwezi wa September 2014)

Ubwino

- Ndiwolimba
- Sumafuna konzakonza

Kuyipa kwake

- Ndwokwera mtengo kuposa wa udzu, wa matabwa ndi nsungwi
- Utha kugwa ngati sunamangwidwe bwino(Komanso ngati mchenga ndi simenti simunasakanize bwino)

Zipangizo [Chitsanzo] (L x B x H =15m x 3m x 1.2m)

- Njerwa: Zokwana 1650
- Simenti: Matumba 10 a 50kilogramu
- Mchenga: Ngolo zinayi
- Matabwa: 2 pisi

Zida

- Mpeni omangira: 1 Umodzi
- Levulo:1 Imodzi
- Shovelu:1 Imodzi
- Wilibala:1Imodzi

Kuwerengera ndalama ndi zinthu zofunika kuti mpanda umangidwe

F1: Mpanda wa Tsekera

(Mmwezi wa September 2014)

No.	Kufotokoza	Chimodzi	Kuchuluka Kwake	Mtengo wa chimodzi (MK)	Zonse pamodzi (MK)	Ndemanga
1	Tsekera	Mtolo	25	300	7,500	
2	Khonje	Mtolo	30	30	900	
3	Linya	Pisi	100	50	5,000	
4	Nsungwi	Pisi	10	80	800	
4	Mitengo	Pisi	10	50	500	
5	Aganyu	Masiku	3	1,900	5,700	
					20,400	
Ndalama zonse						
Ndalama zonse zoyelekeza					21,000	

F2: Mpanda wa Mataabwa

(Mmwezi wa September 2014)

No.	Kufotokoza	Chimodzi	Kuchuluk a Kwake	Mtengo wa chimodzi (MK)	Zonse pamodzi (MK)	Ndemanga
1	Matabwa 2*4"	Pisi	10	1,550	15,500	
2	Matabwa 2*2"	Pisi	5	1,250	6,250	
3	Misomali 5"	Kilogalamu	1	800	800	
4	Misomali 6"	kilogalamu	1	800	800	
4	Solignamu	Lita	5	500	2,500	
5	Aganyu	Masiku	5	1,900	9,500	
					35,350	
Ndalama zonse						
Ndalama zonse zoyelekeza					36,000	

F3: Mpanda wa Nsungwi

(Mmwezi wa September 2014)

No.	Kufotokozza	Chimodzi	Kuchuluka Kwake	Mtengo wa chimodzi (MK)	Zonse pamodzi (MK)	Ndemanga
1	Nsungwi	Pisi	40	50	2,000	
2	Khonje	Mtolo	20	30	600	
3	Linya	Pisi	15	50	750	
4	Mitengo	Pisi	10	500	500	
5	Aganyu	Masiku	4	1,900	7,600	
					12,850	
Ndalama zonse						
Ndalama zonse zoyelekeza					13,000	

F4: Mpanda wa Zomera(Wa Maluwa)

(Mmwezi wa September 2014)

No.	Kufotokoza	Chimodzi	Kuchuluka Kwake	Mtengo wa chimodzi (MK)	Zonse pamodzi (MK)	Ndemanga
1	Zomera	Pisi	84	200	16,800	
2	Aganyu	Masiku	5	1,900	9,500	
3	Manyowa kopositi	Kilogalamu	200	3,000	3,000	1set=MK3,000
4	Feteleza	Kilogalamu	25	4,500	4,500	1set 25=Mk4,500
5	Mpanda wa matabwa	Mpanda	1	36,000	36,000	Kuchokera ku F2
Ndalama zonse					69,800	
Ndalama zonse zoyelekeza					70,000	

F5: Mpanda wa Njerwa

(Mmwezi wa September 2014)

No.	Kufotokoza	Chimodzi	Kuchuluka Kwake	Mtengo wa chimodzi (MK)	Zonse pamodzi (MK)	Ndemanga
1	Njerwa	Pisi	1,650	4	6,600	
2	Mchenga	Matani	2	800	1,600	1 tonne = 1000kg
3	Simenti	Matumba	6	6,500	39,000	
4	Matabwa	Pisi	2	3,500	7,000	
5	Omanga	Masiku	4	3,500	14,000	
6	Aganyu	Masiku	4	1,000	4,000	
Ndalama zonse					72,200	
Ndalama zonse zoyelekeza					73,000	

F6: Mpanda wa Njerwa koma wa pulasitala

(Mmwezi wa September 2014)

No.	Kufotokoza	Chimodzi	Kuchuluka Kwake	Mtengo wa chimodzi (MK)	Zonse pamodzi (MK)	Ndemanga
1	Njerwa	Pisi	1,650	4	6,600	
2	Mchenga	Matani	1	2,500	2,500	For plaster
3	Simenti	Matumba	10	6,500	65,000	
4	Pulasitiki	Pisi	100	20	2,000	
5	Matabwa	Pisi	2	1,250	2,500	
6	Misomali	Kilogalamu	0.5	800	400	
7	Hinjesi	Peya	1	800	800	
8	Aganyu	Masiku	5	1,900	9,500	
Ndalama zonse					89,300	
Ndalama zonse zoyelekeza					90,000	

Njira zimene mungasate pomanga mipanda

F1: Mpanda wa Tsekera

No	Zoyenera kuchita	Zipangizo zofunika	Zida	Chithunzi
1	Kumbani maenje mozungulira mjigo ndi kumanga mpanda wa mitengo poyamba ngati zengo	<ul style="list-style-type: none"> ➤ Mitengo ➤ Linya, Nkhonje 	<ul style="list-style-type: none"> ➤ Chikwanje 	
2	Mangani mpanda ndi tsekera	<ul style="list-style-type: none"> ➤ Tsekera ➤ Linya/Khonje ➤ Nsungwi ➤ Mitengo 	<ul style="list-style-type: none"> ➤ Khasu 	

F2: Mpanda wa Matabwa (Mitengo)

No	Zoyenera kuchita	Zipangizo zofunika	Zida	Chithunzi
1	Kumbani maenje mozungulira mjigo ndi kumanga mpanda wa matabwa (Mitengo).	<ul style="list-style-type: none"> ➤ Mitengo ➤ Linya 	<ul style="list-style-type: none"> ➤ Chikwanje 	

F3: Mpanda wa Nsungwi

No	Zoyenera kuchita	Zipangizo zofunika	Zida	Chithunzi
1	Kumbani maenje kuzungulira mjigo	<ul style="list-style-type: none"> ➤ Mitengo ➤ Linya 	<ul style="list-style-type: none"> ➤ Chikwanje 	
2	Mangani mpoanda wa nsungwi	<ul style="list-style-type: none"> ➤ Nsungwi ➤ Linya 	<ul style="list-style-type: none"> ➤ Chikwanje 	

F4: Mpanda wa zomera (Wa Maluwa)

No	Zoyenera kuchita	Zipangizo zofunika	Zida	Chithunzi
1	Kumbani maenje ozungulira mjigo ndi kumanga mpanda wa mitengo poyamba ngati zengo	<ul style="list-style-type: none"> ➤ Zomera ➤ Linya 	<ul style="list-style-type: none"> ➤ Makasu 	
2	Kumbani maenje ndi kudzala maluwa	<ul style="list-style-type: none"> ➤ Zomera ➤ Linya 	<ul style="list-style-type: none"> ➤ Makasu 	

F5: Mpanda wa Njerwa

No	Zoyenera kuchita	Zipangizo zofunika	Zida	Chithunzi
1	Kumbani maziko momwe muzadutse chipupa cha mpanda m'mbali mwa mjigo	<ul style="list-style-type: none"> ➤ Mitengo ➤ Linya 	<ul style="list-style-type: none"> ➤ Makasu ➤ Shovelolo 	
2	Mangani mpanda wa njerwa	<ul style="list-style-type: none"> ➤ Njerwa ➤ Simenti ➤ Mchenga 	<ul style="list-style-type: none"> ➤ Shovelolo ➤ Makasu 	

F6: Mpanda wa njerwa komanso wa pulasitala

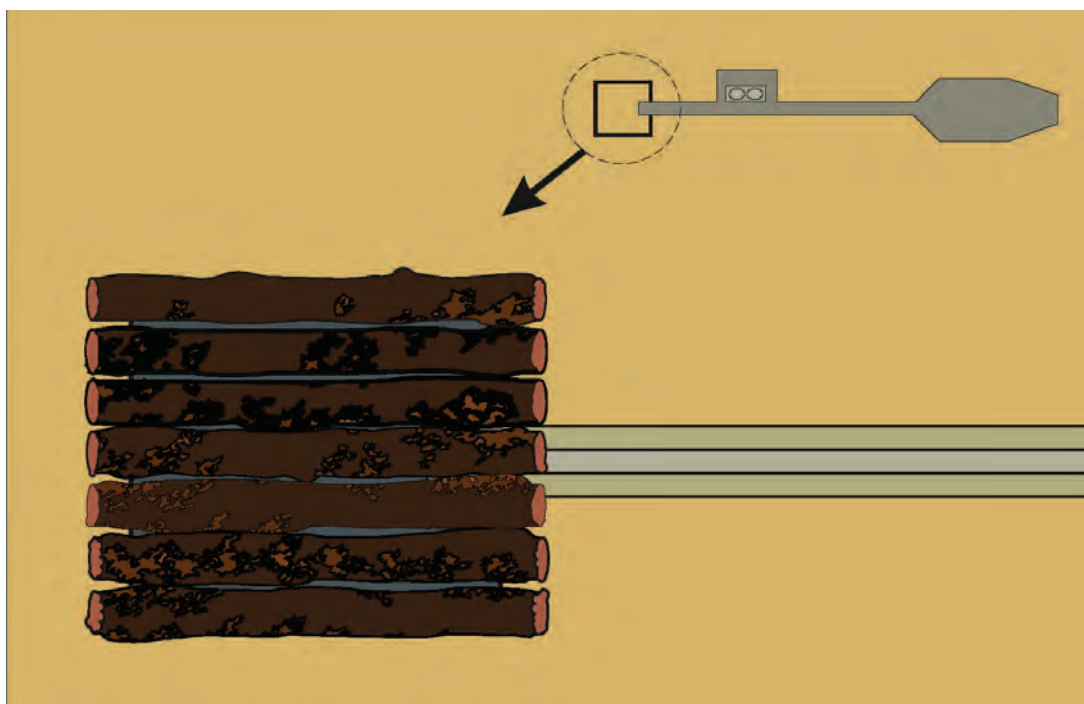
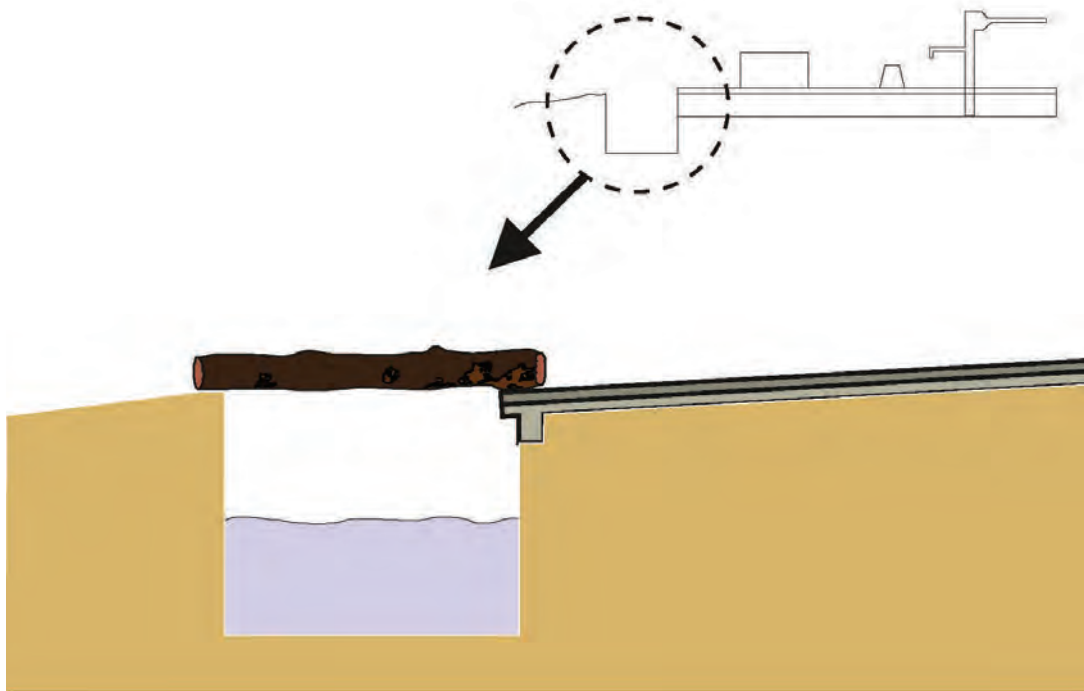
No	Zoyenera kuchita	Zipangizo zofunika	Zida	Chithunzi
1	Kumbani maziko momwe muzadutse chipupa cha mpanda mbali ya mjigo	<ul style="list-style-type: none"> ➤ Mitengo ➤ Linya 	<ul style="list-style-type: none"> ➤ Makasu ➤ Shovelolo 	
2	Mangani mpanda wa njerwa	<ul style="list-style-type: none"> ➤ Njerwa ➤ Simenti ➤ Mchenga 	<ul style="list-style-type: none"> ➤ Shovelolo ➤ Makasu 	

No	Zoyenera kuchita	Zipangizo zofunika	Zida	Chithunzi
3	Mangani mpanda wa njerwa	<ul style="list-style-type: none"> ➤ Njerwa ➤ Simenti ➤ Mchenga 	<ul style="list-style-type: none"> ➤ Shovelo ➤ Makasu 	

S1: Dzenje lokumba losawaka koma Lovindikira

Kuyelekeza mtengo: 11,000 MK (M'mwezi wa September 2014)

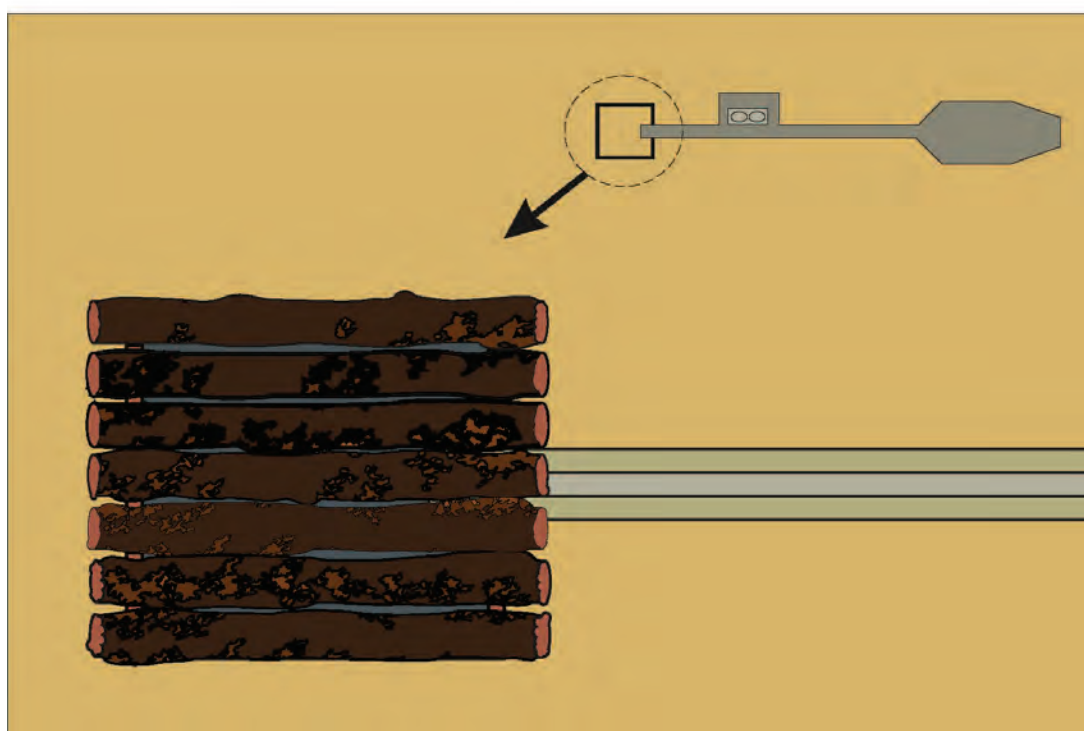
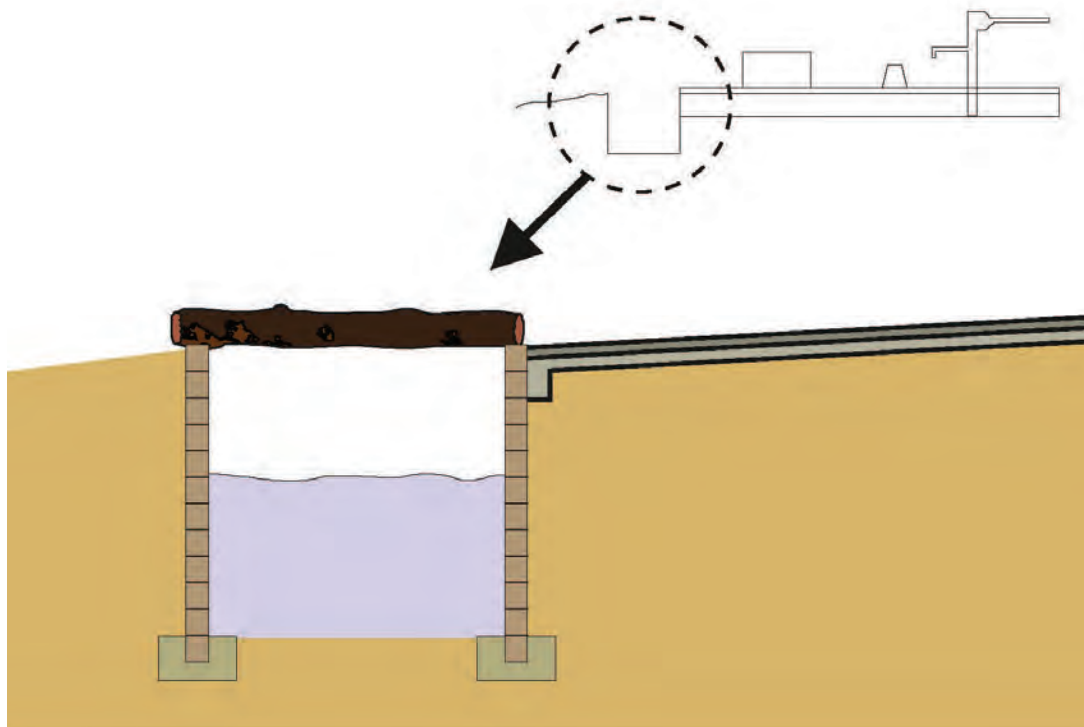
Ubwino	Kuyipa kwake
<ul style="list-style-type: none">• Ndi lotsika mtengo• Silimavuta kukumba (Limafuna anthu kukumba basi)	<ul style="list-style-type: none">• Limasakha dothi (Lingakumbidwe komwe dothi lake ndilolimba)• Mitengo simalimba itha kudyedwa ndi chiswe
Zipangizo [Chitsanzo] (L x B x H = 1m x 1m x 1m)	Zida
<ul style="list-style-type: none">• Mitengo: Yokwana 8	<ul style="list-style-type: none">• Khasu: Limodzi• Chikwanje: Chimodzi• Shovelu: Imodzi



S2: Dzenje lokumba koma lowaka lili ndi chovindikira cha mitengo

Kuyelekeza mtengo: 15,000 MK (M'mwezi wa September 2014)

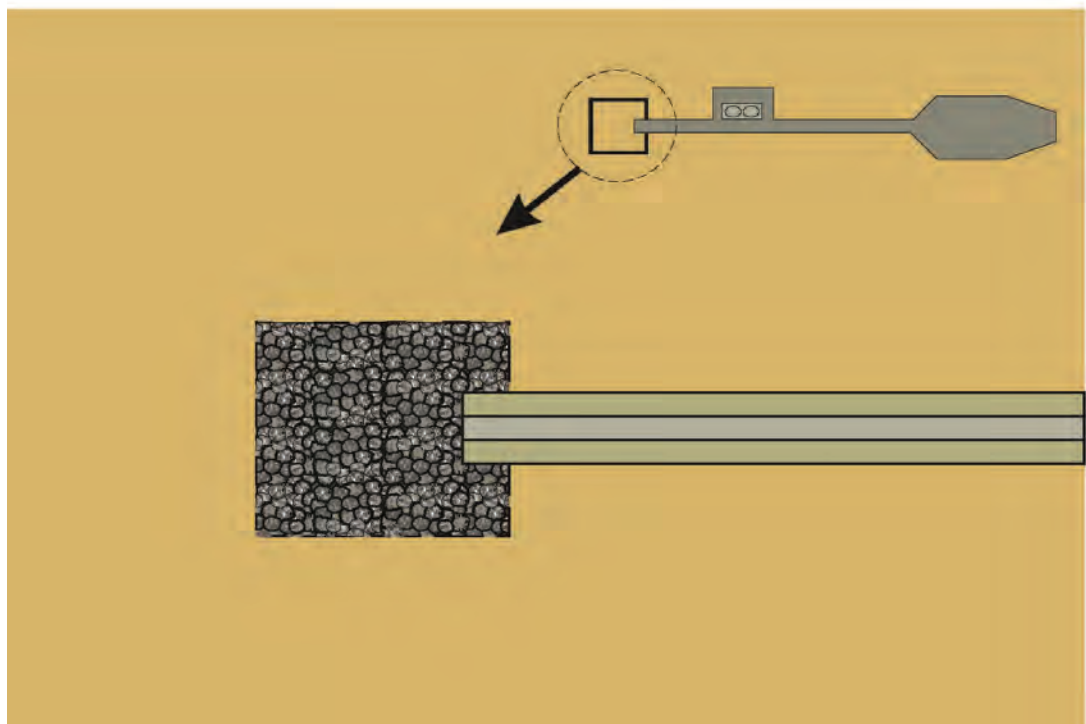
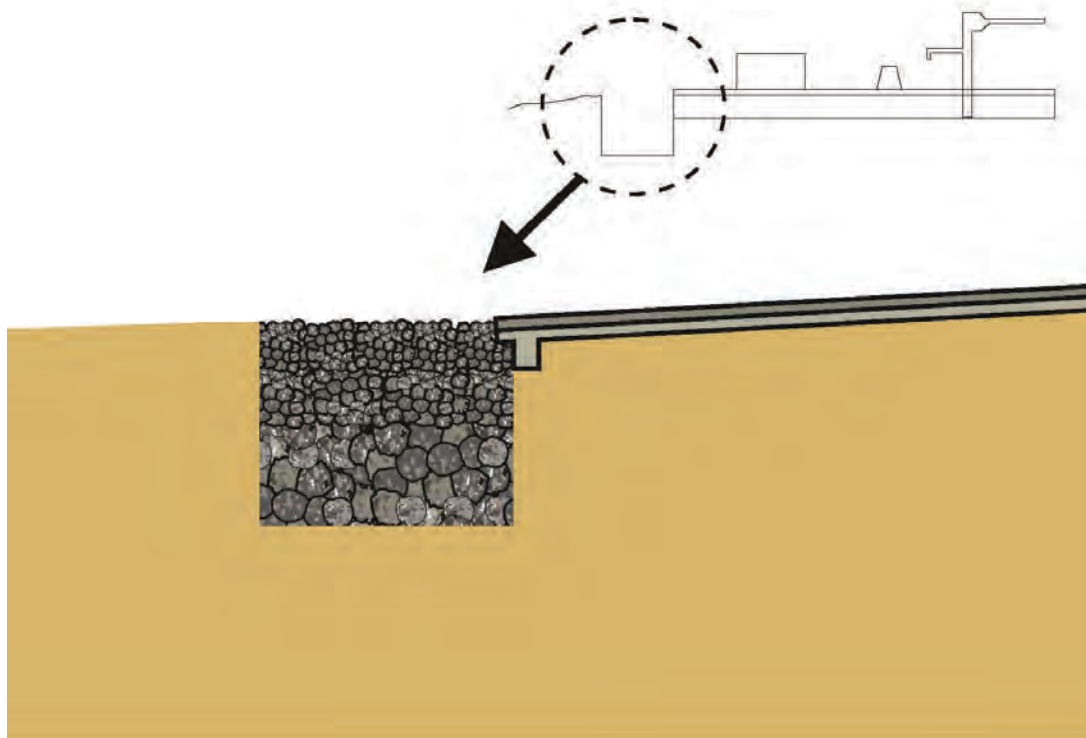
Ubwino	Kuyipa kwake
<ul style="list-style-type: none">• Ndilolimba kusiyana ndi losawaka	<ul style="list-style-type: none">• Mitengo simakhalitsa komanso itha kudyedwa ndi chiswe• Simungakumbe dzenje lalitali kutengera dothi
Zipangizo [Chitsanzo] (L x B x H = 1m x 1m x 1m)	Zida
<ul style="list-style-type: none">• Njerwa: Zokwana 100• Mitengo: Yokwana 10• Simenti: Theka la Thumba	<ul style="list-style-type: none">• Khasu: Limodzi• Chikwanje: Chimodzi• Shovelu: Imodzi



S3: Dzenje lokumba koma lili ndi miyala (Recommendable type)

Kuyelekeza mtengo: 10,000 MK (M'mwezi wa September 2014)

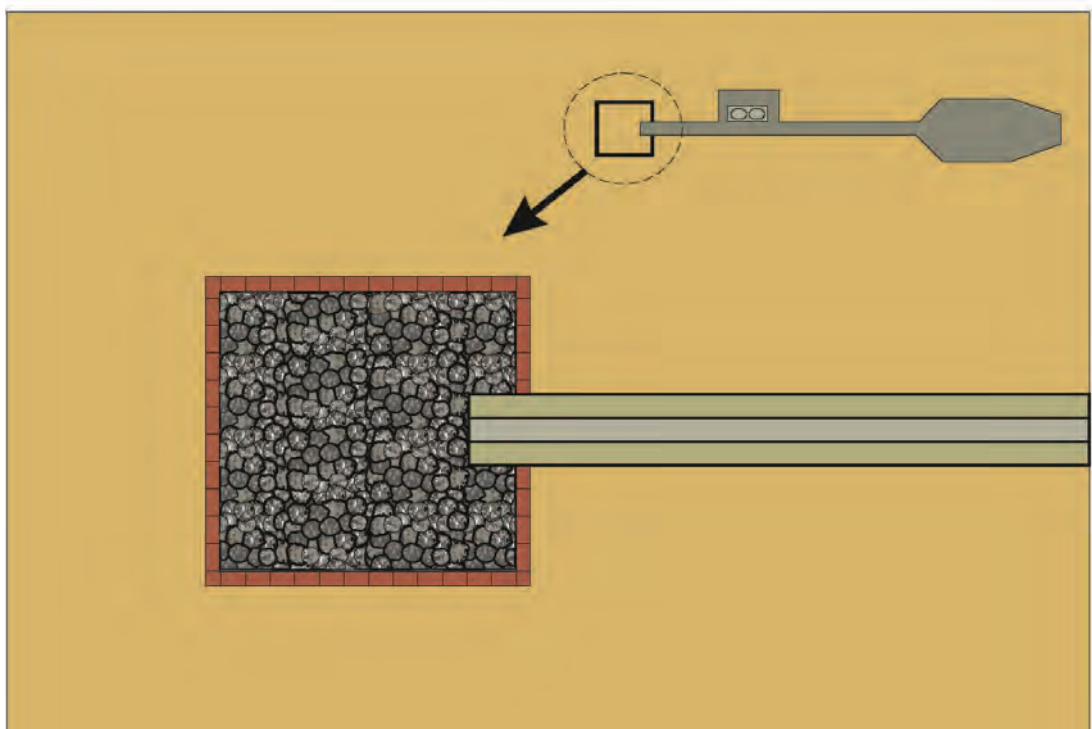
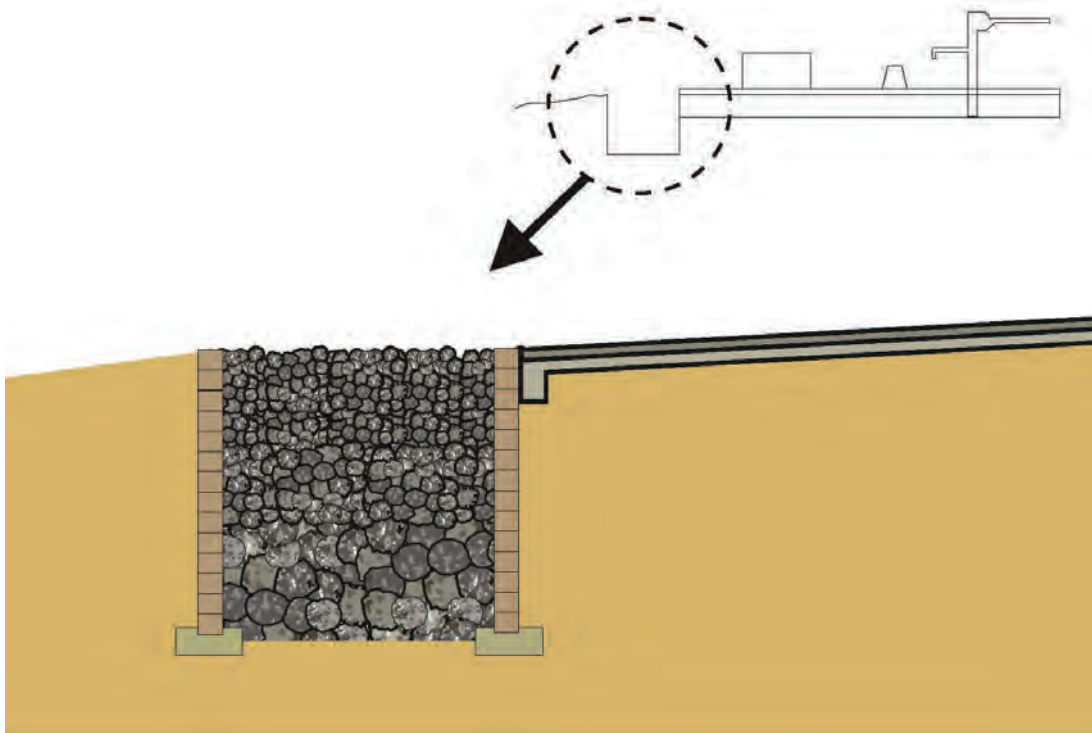
Ubwino	Kuyipa kwake
<ul style="list-style-type: none"> • Mutha kukumba mulimonse kaya mwa folokona kapena mozungulira • Silimavuta kumanga (Limafuna anthu kukumba basi) • Mtundu uwu umapezekapezeka 	<ul style="list-style-type: none"> • Limafuna kukonza pafupi pafupi
Zipangizo [Chitsanzo] (L x B x H = 1m x 1m x 1m)	Zida
<ul style="list-style-type: none"> • Miyala: Mawilibala Anayi 	<ul style="list-style-type: none"> • Khasu: Limodzi • Shovel: Imodzi • Wilibala: Imodzi



S4: Dzenje lokumba lowaka bwino lili ndi miyala (Recommendable type)

Kuyelekeza mtengo: 22,000 MK (M'mwezi wa September 2014)

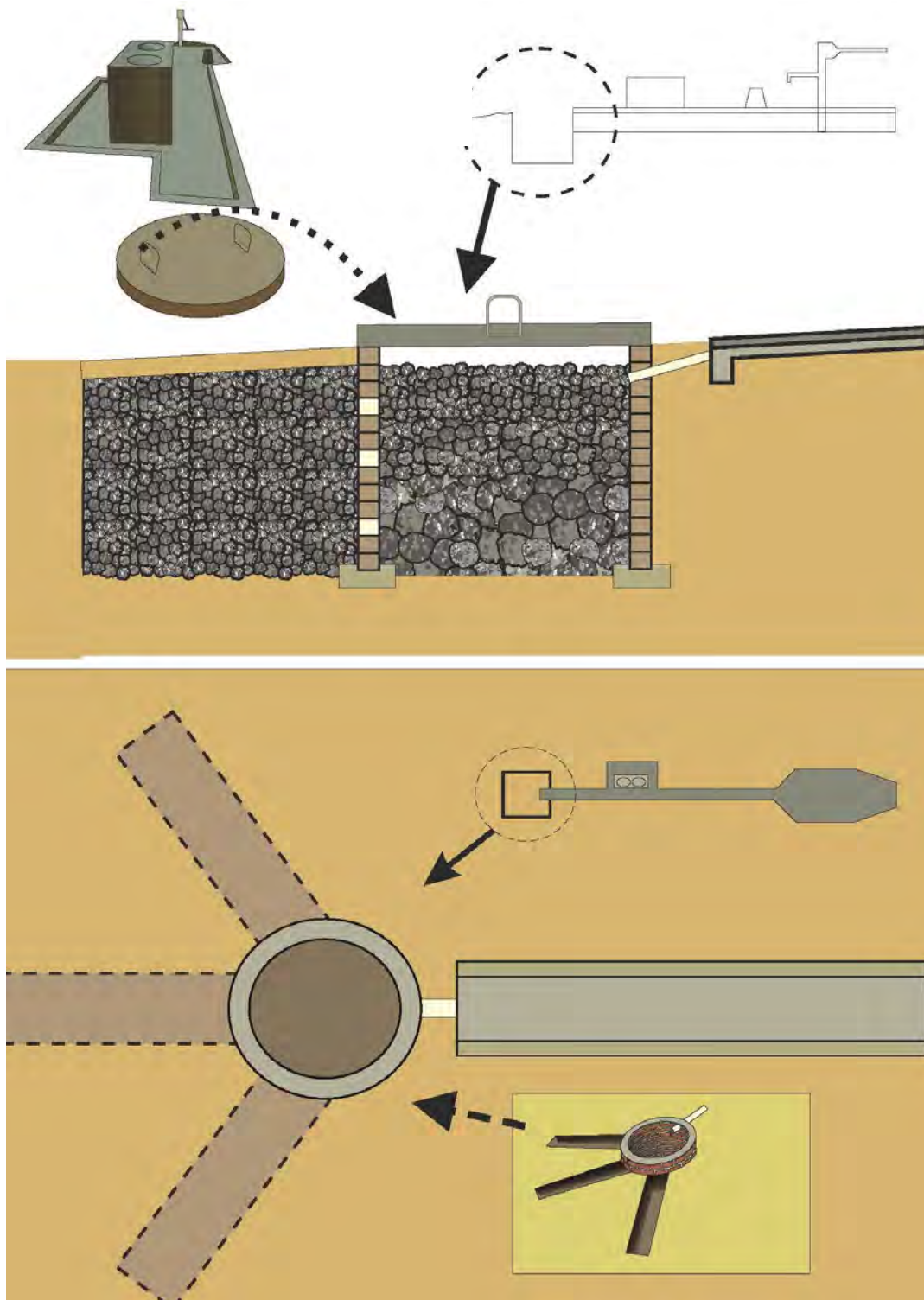
Ubwino	Kuyipa Kwake
<ul style="list-style-type: none"> ● Mutha kukumba mulimonse kaya mwa folokona kapena mozungulira ● Ndilolimba ● Mtundu uwu umapezekapezeka 	<ul style="list-style-type: none"> ● Limafuna kukonza pafupi pafupi ● Dzenje lake ndilokwera mtengo kuposa S1 ndi S3
Zipangizo [Chitsanzo] (L x B x H = 1m x 1m x 1m)	Zida
<ul style="list-style-type: none"> ● Njerwa: Zokwana 100 ● Simenti: Theka Thumba ● Mchenja: Theka la Tani ● Miyala: Theka la Tani 	<ul style="list-style-type: none"> ● Mpeni womangira: Umodzi ● Wilimbala: Imodzi ● Shovel: Imodzi ● Khasu: Limodzi



S5: Dzenje lowaka lokhala ndi chivindikoro cha konkiliti komanso ngalande zovindikira bwino (Recommendable type)

Kuyelekeza mtengo: 89,000 MK (M'mwezi wa September 2014)

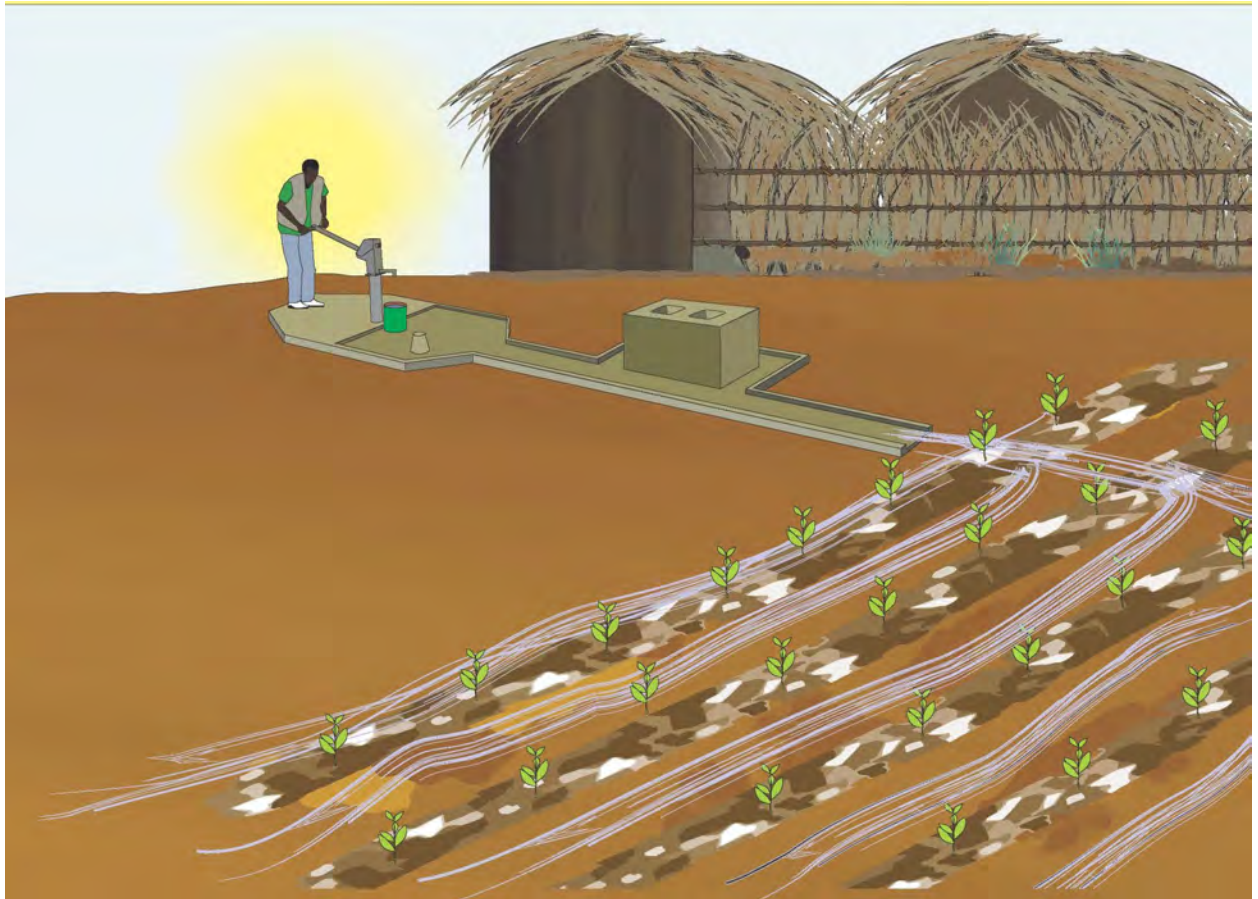
Ubwino	Kuyipa kwake
<ul style="list-style-type: none"> ● Silimawononga chilengedwe ● Ndilolimba ● Limawoneka bwino kwambiri 	<ul style="list-style-type: none"> ● Limafuna ndalama zambiri ● Limafuna malo ambiri
Zipangizo [Chitsanzo] (L x B x H = 1m x 1m x 1m)	Zida
<ul style="list-style-type: none"> ● Njerwa: Zokwana 150 ● Simenti: Mabagi 6 a 50 kilogramu ● Mchenga: Ngolo ziwiri (1000kgs) ● Miyala: Ngolo Ziwiri (100kgs) ● Zitsulo: Chimodzi ndi paipi 	<ul style="list-style-type: none"> ● Mpeni womangira: Umodzi ● Wilimbala: Imodzi



S6: Dimba

Kuyelekeza mtengo: 0 MK la Dimba koma 21,000 MK ya mpanda wa Tsekera(M'mwezi wa September 2014)

Ubwino	Kuyipa kwake
<ul style="list-style-type: none">● Silimawononga chilengedwe● Silimafuna ndalama● Silimavuta kumanga komanso kusamalira	<ul style="list-style-type: none">● Limafuna malo akulu.● Mbeu zimafuna mankhwala
Zipangizo [Chitsanzo] (L x B x H = 1m x 1m x 1m)	Zida
<ul style="list-style-type: none">● Feteleza: 10 kilogramu● Mbeu: 1 kilogramu	<ul style="list-style-type: none">● Khasu: Liomdzi



Kuwerengera ndalama ndi zinthu zofunika kuti maenje akumbidwe

S1: Dzenje lokumba losawaka koma lokhala ndi chivindikiro (Mmwezi wa September 2014)

No.	Kufotokoza	Chimodzi	Kuchuluka Kwake	Mtengo wa chimodzi (MK)	Zonse pamodzi (MK)	Ndemanga
1	Mitengo	Pisi	10	200	2,000	
2	Aganyu	Masiku	2	1900	3,800	
3	PVC 110mm pipe 6m mulitali	Pisi	1	4500	4,500	
Ndalama zonse					10,300	
Ndalama zonse zoyelekeza					11,000	

S2: Dzenje lokumba lowaka lili ndi chivindikiro (Mmwezi wa September 2014)

No.	Kufotokoza	Chimodzi	Kuchuluka Kwake	Mtengo wa chimodzi (MK)	Zonse pamodzi (MK)	Ndemanga
1	Njerwa	Pisi	100	4	400	
2	Simenti	Thumba	0.3	3,000	3,000	1Bag=50kg
3	Mchenga	Matani	0.5	2,000	1,000	1tonne=1000kg
4	Mitengo	pisi	10	200	2,000	
5	Paipi(PVC)110mm 6m mulitali	pisi	1	4,500	4,500	
6	Aganyu	Masiku	2	1,900	3,800	
Ndalama zonse					14,700	
Ndalama zonse zoyelekeza					15,000	

S3: Dzenje lokumba koma lili ndi miyala (Mmwezi wa September 2014)

No.	Kufotokoza	Chimodzi	Kuchuluka Kwake	Mtengo wa chimodzi (MK)	Zonse pamodzi (MK)	Ndemanga
1	Aganyu	Masiku	2	1,900	3,800	
2	Paipi(PVC) 110mm 6m mutali	mm	1	4,500	4,500	
3	Miyala	Mawilibala	0.5	2,000	1,000	
Ndalama zonse					9,300	
Ndalama zonse zoyelekeza					10,000	

S4: Dzenje lokumba lowaka lili ndi chivindikiro cha mitengo (Mmwezi wa September 2014)

No.	Kufotokoza	Chimodzi	Kuchuluka Kwake	Mtengo wa chimodzi (MK)	Zonse pamodzi (MK)	Ndemanga
1	Njerwa	Pisi	100	4	400	
2	Simenti	Matumba	1	6,500	6,500	1bag= 50kg
3	Mchenga	Matani	0.5	2,000	1,000	
4	Miyala	Matani	1	5,000	5,000	1 tonne=1000kgs
5	Paipi(PVC)110mm 6m mulitali	Pisi	1	4,500	4,500	
6	Aganyu	Masiku	2	1,900	3,800	
Ndalama zonse					21,200	
Ndalama zonse zoyelekeza					22,000	

S5: Dzenje lokumba lowaka lili ndi chivindikiro

(Mmwezi wa September 2014)

No.	Kufotokoza	Chimodzi	Kuchuluka Kwake	Mtengo wa chimodzi (MK)	Zonse pamodzi (MK)	Ndemanga
1	Njerwa	Pisi	150	4	600	
2	Simenti	Matumba	6	6,500	39,000	1bag= 50kg
3	Mchenga	Matumba	1	5,000	2,000	
4	Miyala	Matani	1	5,000	5,000	1 tonne=1000kgs
5	Paipi(PVC)110 6m mulitali	Pisi	1	4,500	4,500	
6	Chitsulo cha Y10	Pisi	1	2,850	2,850	
7	Aganyu	Masiku	4	1,900	7,600	
8	Ngalande yoyamba Miyala	Matani	1	5,000	5,000	
9	Pepala ngalande zonse zitatu	Mita	100	100	10,000	
10	Ngalande yachiwiri miyala	Matani	1	5,000	5,000	
11	Ngalande yachitatu Miyala	Matani	1	5,000	5,000	1 tonne= 1000kgs
12	Mayendedwe	Maulendo	4	500	2,000	1trip= 500kg

No.	Kufotokoza	Chimodzi	Kuchuluka Kwake	Mtengo wa chimodzi (MK)	Zonse pamodzi (MK)	Ndemanga
Ndalama zonse					88,550	
Ndalama zonse zoyelekeza					89,000	

S6: Dzenje la mtundu wokhala ndi Dimba

(Mmwezi wa September 2014)


No.	Kufotokonza	Chimodzi	Kuchuluka Kwake	Mtengo wa chimodzi (MK)	Zonse pamodzi (MK)	Ndemanga
1	Mpanda wa tsekera	1	1	21,200	21,200	F1
Ndalama zonse					21,200	
Ndalama zonse zoyelekeza					22,000	

Njira Zomangira maenje otaikiramo madzi


S1: Dzenje lokumba koma lovindikira

No	Zoyenera kuchita	Zipangizo zofunika	Zida	Chithunzi
1	Kumbani dzenje mwa folokona	➤	<ul style="list-style-type: none"> ➤ Makasu ➤ Shovelu 	
2	Vindikirani ndi mitengo mutadula bwino.	➤ Mitengo	<ul style="list-style-type: none"> ➤ Chohekera ➤ Chikwanje 	

S2: Dzenje lokumba koma lowaka lili ndi chivindikiro

No	Zoyenera kuchita	Zipangizo zofunika	Zida	Chithunzi
1	Kumbani dzenje ndi kuwaka ndi njerwa	<ul style="list-style-type: none"> ➤ Njerwa ➤ Simenti ➤ Mchenga 	<ul style="list-style-type: none"> ➤ Makasu ➤ Shovelu 	
2	Vindikirani ndi mitengo	➤ Mitengo	<ul style="list-style-type: none"> ➤ Chohekera ➤ Chikwanje 	







S3: Dzenje lokumba koma lili ndi miyala




No	Zoyenera kuchita	Zipangizo zofunika	Zida	Chithunzi
1	Kumbani dzenje ndi kuyikamo miyala kutalika kumatengera mtundu wa dothi	➤ Miyala	<ul style="list-style-type: none"> ➤ Khasu ➤ Shovelu 	

S4: Dzenje lokumba lowaka bwino lili ndi miyala

No	Zoyenera kuchita	Zipangizo zofunika	Zida	Chithunzi
1	Kumbani dzenje ndi kuwaka mbali ndi njerwa	<ul style="list-style-type: none"> ➤ Miyala ➤ Simenti ➤ Mchenga ➤ Njerwa 	<ul style="list-style-type: none"> ➤ Makasu ➤ Shovelolo 	

S5: Dzenje lowaka lokhala ndi chivindikiro cha konkiliti komanso ngalande zovindikira bwino

No	Zoyenera kuchita	Zipangizo zofunika	Zida	Chithunzi
1	Poyamba yesani momwe mudutse ngalande	<ul style="list-style-type: none"> ➤ Tepi 	<ul style="list-style-type: none"> ➤ Khasu ➤ Shovelolo 	
2	Poyamba kumbani dzenje ndi kuwaka ndi njerwa	<ul style="list-style-type: none"> ➤ Miyala ➤ Simenti ➤ Mchenga ➤ Njerwa ➤ Waya ➤ Pepala 	<ul style="list-style-type: none"> ➤ Makasu ➤ Shovelolo 	 
3	Kumbani ngalande yoyamba	<ul style="list-style-type: none"> ➤ Miyala ➤ Pepala 	<ul style="list-style-type: none"> ➤ Makasu ➤ Shovelolo 	
4	Kumbani ngalande yachiwiri	<ul style="list-style-type: none"> ➤ Miyala ➤ Pepala 	<ul style="list-style-type: none"> ➤ Makasu ➤ Shovelolo 	
5	Kumbani ngalande yachitatu	<ul style="list-style-type: none"> ➤ Miyala ➤ Pepala 	<ul style="list-style-type: none"> ➤ Makasu ➤ Shovelolo 	

No	Zoyenera kuchita	Zipangizo zofunika	Zida	Chithunzi
				
6	Mangani Chivindikiro cha simenti	<ul style="list-style-type: none"> ➤ Waya ➤ Simenti ➤ Miyala 	<ul style="list-style-type: none"> ➤ Khasu ➤ Shovelu 	 

S6: Dimba

No	Zoyenera kuchita	Zipangizo zofunika	Zida	Chithunzi
1	Pangani ma bedi ndi kudzala mbeu pogwiritsa ntchito madzi otaikira pa mjigo	<ul style="list-style-type: none"> ➤ Tsekera ➤ Mbeu ➤ Zitini 	<ul style="list-style-type: none"> ➤ Makasu 	 