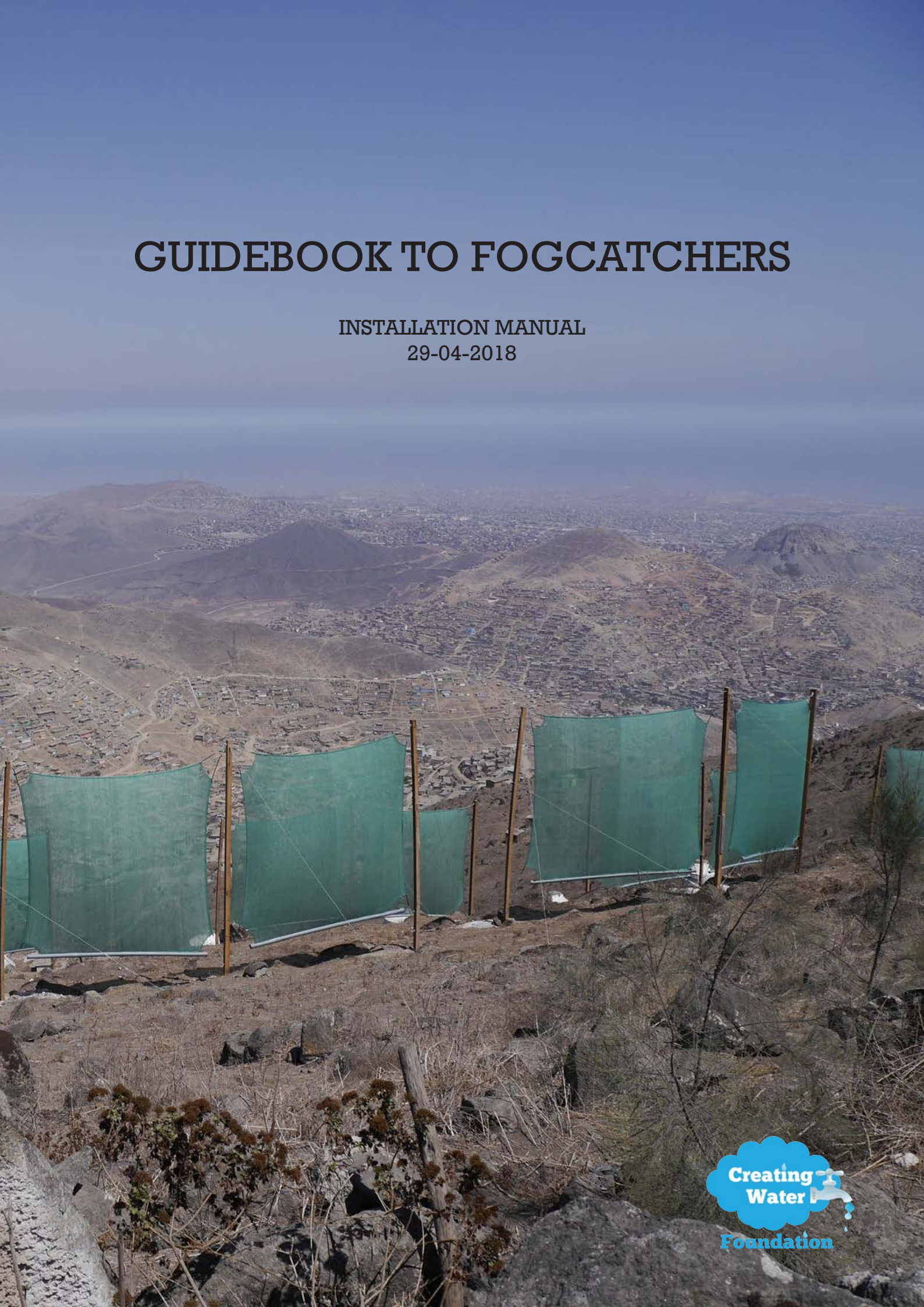
GUIDEBOOK TO FOGCATCHERS

INSTALLATION MANUAL
29-04-2018



Pre-face

The manual "Guidebook to Fogcatchers" is written by Studio Waterf'all in collaboration with the Creating Water Foundation. We, the Creating Water Foundation, want to provide the information in this manual to anyone who sees possibilities to create safe and accessible water through the use of fogcatchers.

This part of the guidebook - installation manual, provides information on the installation of fogcatchers. The conditions for fogfarming and help by setting up a project are not included in this part of the guidebook, more information is available through our website:

www.creatingwater.org

The content of this guidebook is a combination of available information from FoqQuest, Studio WaterF'all, Peruanos Sin Agua and from gained experience of the Creating Water Foundation.

An important part of the vision of the Creating Water Foundation is the relation and balance between cost, gains (safe water) and sustainability of the whole fogfarming process. The Creating Water Foundation only works with locally available materials and tries to create an effective and sustainable solution while keeping the cost low.

If you have any question, remarks, experiences or additions to this guidebook, please contact us at info@creatingwater.nl

Thank you

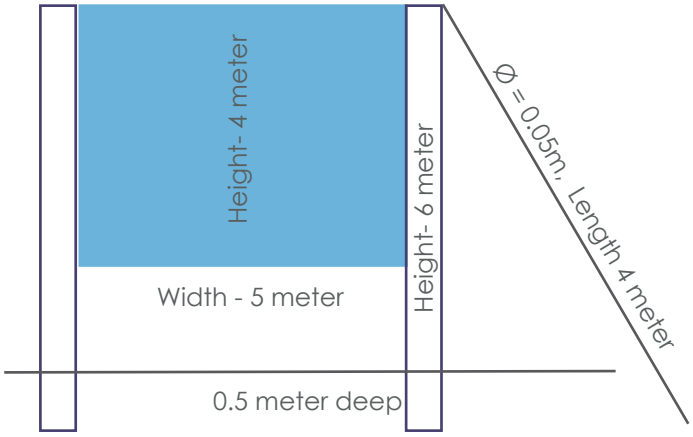
The Creating Water Team

1. Introduction

FOG CATCHER

Before we come to the material-list, we first need to decide the dimensions of the fogcatcher. The dimensions of the fog catcher are mainly determined by the sizes of the available mesh and of the main poles.

1.1 - Recommended size & Adjustments



Underneath here you find our recommended sizes for a fog catcher.

If your available materials don't match these sizes or you have other concerns, you can change the sizes to your preference. With these changes, please also change the green indicated sizes in the material list.

Height of your fog catcher
Most fog catchers have a 4 meter high mesh. Keep in mind, the poles should be longer

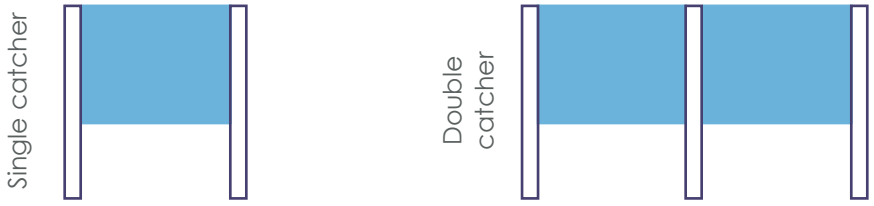
Length of the fog catcher
We would recommend making it 5 meter. This length is long enough to ensure a big fog catching surface, but still small enough to keep the construction simple.

1.2 - Poles

The poles should be 2 meter higher than the height of the mesh. This because 50 cm of the pole is located underneath the ground, the mesh starts 1 meter above the ground, and in the top you also want 50cm extra length to make sure you have enough space to tighten the mesh. If the poles are not available in the right length, consider having a less high mesh.

1.3 Single or Double

Making a double or a single catcher is different in the amount of materials you need. In the single catcher you only use two poles. While in a double catcher you will need three poles, were one pole is shared between two catchers. Two material list are added, you can choose which one is most applicable.



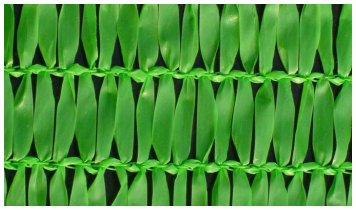
1.4 - Mesh

Using the right mesh is very important for the effectiveness of the fogcatcher. Fogcatchers work best with a UV-resistant PP or PE Raschel mesh with a shade percentage between 30% and 60%. Raschel mesh consists of flat vessels (1mm in width) that are woven in V shapes. This mesh is applied in two layers and forms a 3D structure that is able to collect to most water out of the fog
These meshes are used as shade net for architectural purposes. Best chance to buy such meshes is at a bigger agricultural shops.

When it is not possible to obtain such a mesh an alternative mesh of 30-60% shade can be chosen. Take into account that the water yield may be 50% less than when applying the Raschel mesh.

Please note

- *The mesh is folded double so for a 4m x 5m pilot catcher you need a 4m x 10m mesh.*


1.5 - Required Tools

Check if you have all the required tools:

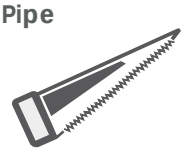
Mesh


Thread

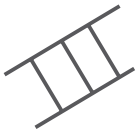

Knife/Scissors


Needle

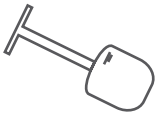
Pipe

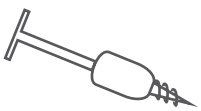

Saw


Glue/Kit


Ladder

Poles

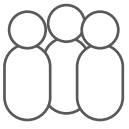

Shovel /


Ground drill /


Pickaxe

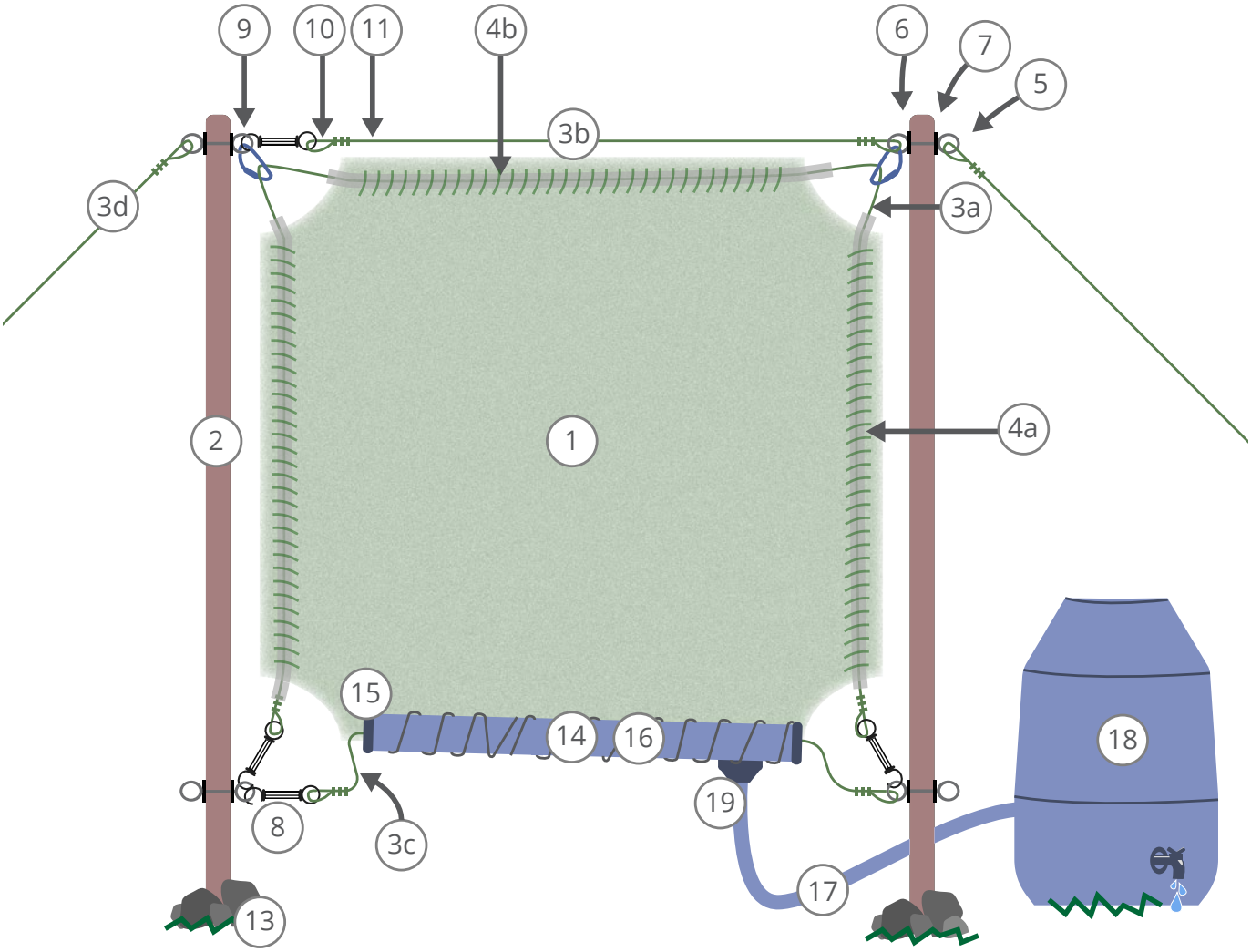
Other


Wrench


Man-power


Wood/Iron drill (M12)


Pincel/Chisel/Saw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3c
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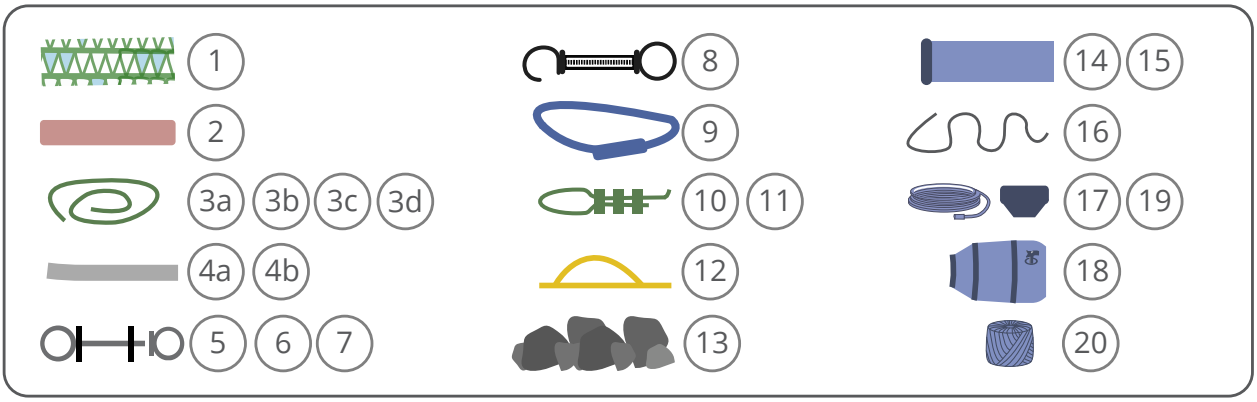
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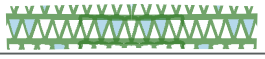
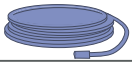
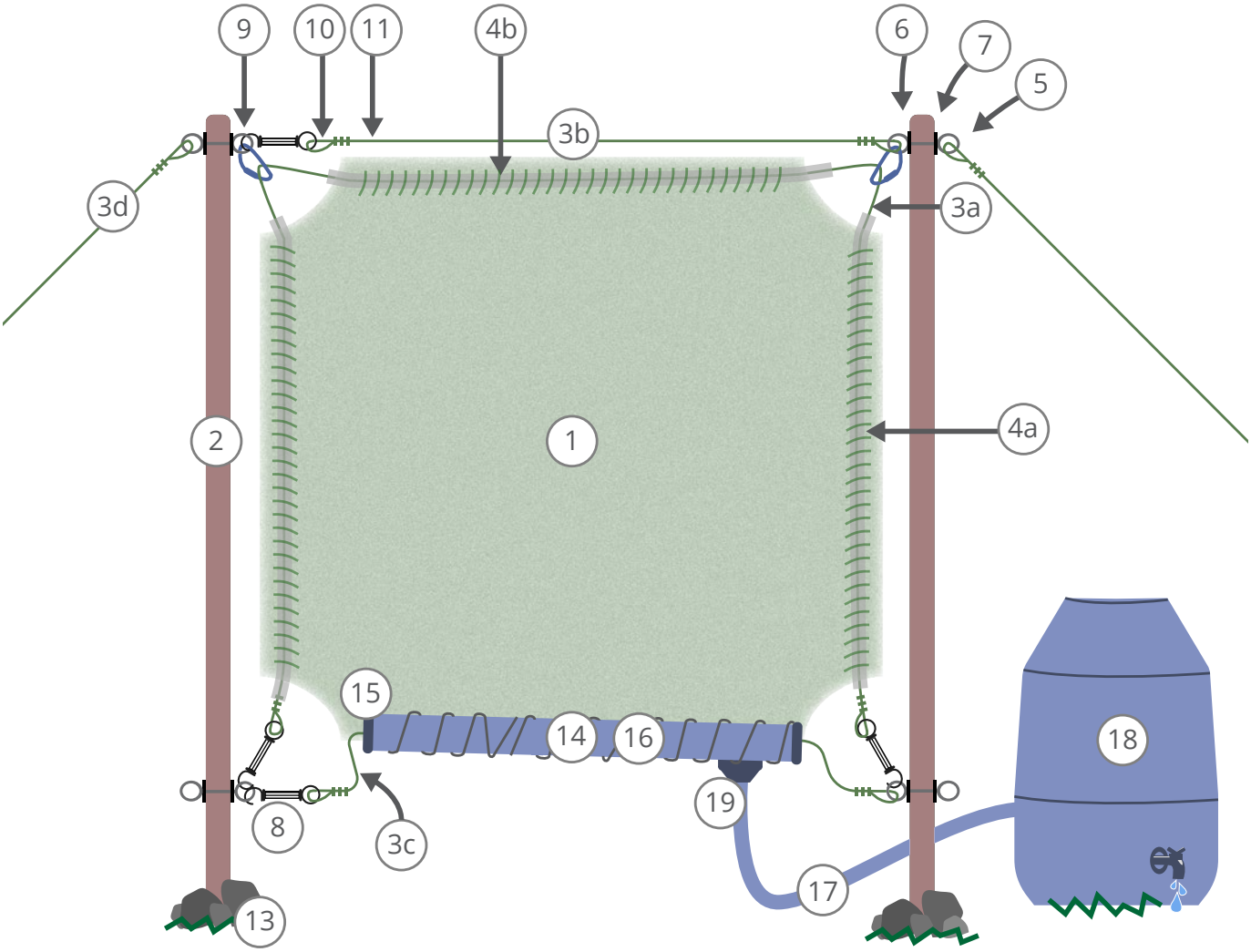
CHECK - MATERIAL LIST (SINGLE)

FOG CATCHER

Material List - Single Catcher

Nr		Dimensions (cm)	Amount single catcher	Image	Step
1	Mesh	405 x 1010 (H x W)	1		1
2	Poles	200+400= 600 Ø wood = >10, Ø steel = >7	2		3
3a	Steel cable	(2x400)+500+300 = 1600, Ø= 0.5	1		1
3b	Steel cable	110+500 = 610, Ø= 0.5	1		3
3c	Steel cable	200+500 = 700, Ø= 0.5	1		5
3d	Steel cable	200, Ø= 0.5	4		2
3e	Steel cable	2x400 = 800, Ø= 0.5	4		3
4a	Flexible hose	400	2		1
4b	Flexible hose	500	2		1
5	Eye nuts:	M10	4		3
6	Eye bolts:	M10	4		3
7	Washers	M10	8		3
8	Turnbuckle	20	8		3,4,5
9	Carabiner	7	2		5
10	Cable thimble	For a Ø= 0.5 cable	18		1,2,3,5
11	Cable clamp	For a Ø= 0.5 cable	66		1,2,3,5
12	Anchor objects	>30	4		2
13	Stones	Fill in the hole	6		2,4
14	Rain pipe	500, Ø= 0.8-0.14	1		5
15	Rain pipe cover	Ø= 0.8-0.14	2		5
16	Iron wire	200	1		5
17	Water hose	800	1		5
18	Water barrel	>1000 liter	1		5
19	Funnel	Ø= >7	1		5
20	Nylon wire	>6000	1		1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3c
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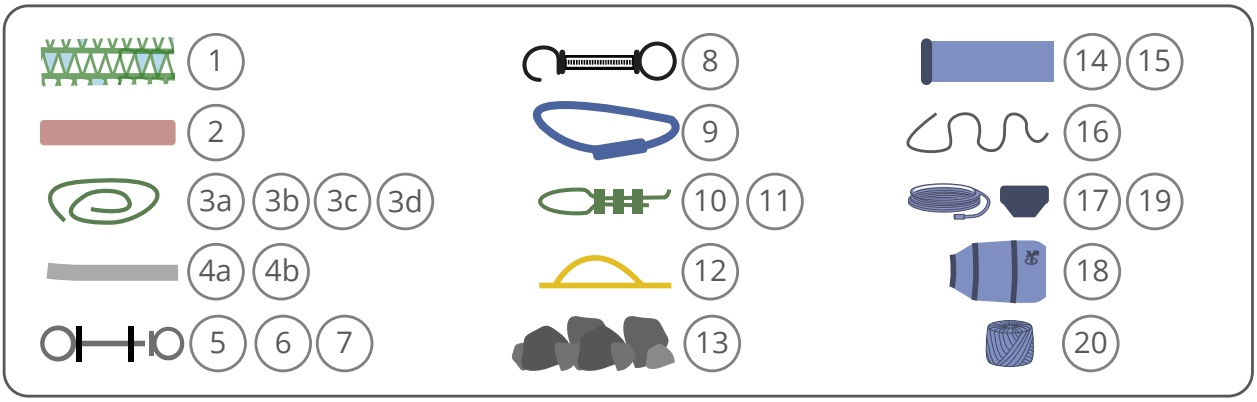
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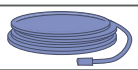
CHECK - MATERIAL LIST (DOUBLE)

FOG CATCHER

Material List - Double Catcher

Nr		Dimensions (cm)	Amount double catcher	Image	Step
1	Mesh	405 x 1010 (hxw)	2		1
2	Poles	200+400= 600 Ø wood = 10, Ø steel = 5	3		3
3a	Steel cable	(2x400)+500+300 = 1600, Ø= 0.5	2		1
3b	Steel cable	110+500 = 610, Ø= 0.5	2		3
3c	Steel cable	200+500 = 700, Ø= 0.5	2		5
3d	Steel cable	200, Ø= 0.5	6		2
3e	Steel cable	2x400 = 800, Ø= 0.5	6		3
4a	Flexible hose	400	4		1
4b	Flexible hose	500	4		1
5	Eye nuts:	M10	6		3
6	Eye bolts:	M10	6		3
7	Washers	M10	12		3
8	Turnbuckle	M10	14		3,4,5
9	Carabiner	20	4		5
10	Cable thimble	For a Ø= 0.5 cable	30		1,2,3,5
11	Cable clamp	For a Ø= 0.5 cable	108		1,2,3,5
12	Anchor objects	>30	6		2
13	Stones	Fill in the hole	9		2,4
14	Rain pipe	500, Ø= 0.8-0.14	2		5
15	Rain pipe cover	Ø= 0.8-0.14	4		5
16	Iron wire	200	2		5
17	Water hose	800	2		5
18	Water barrel	>1000 liter	1		5
19	Funnel	Ø= >7	2		5
20	Nylon wire	>6000	2		1

STEP 1 - PREPARING THE NET

CATCHER - STEP 1

Tools

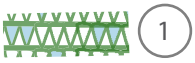
Thread

Needle

Knife/Scissors

Pincers/Iron saw

Materials

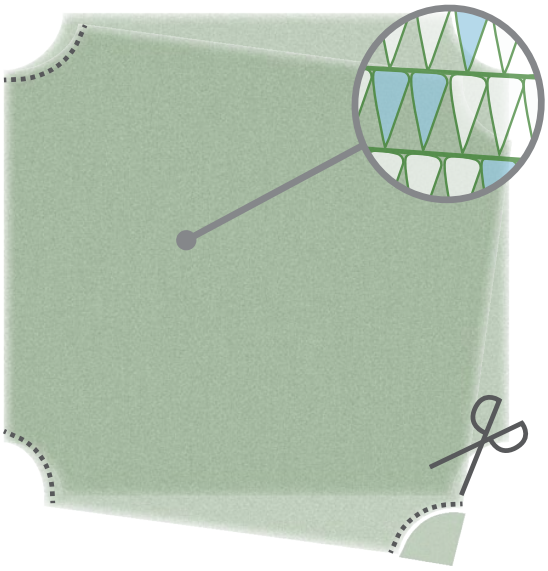


1 Mesh

1 Steel Cable

2x2 Flexible hoses

2 Cable Thimbles & 6 Cable Clamps

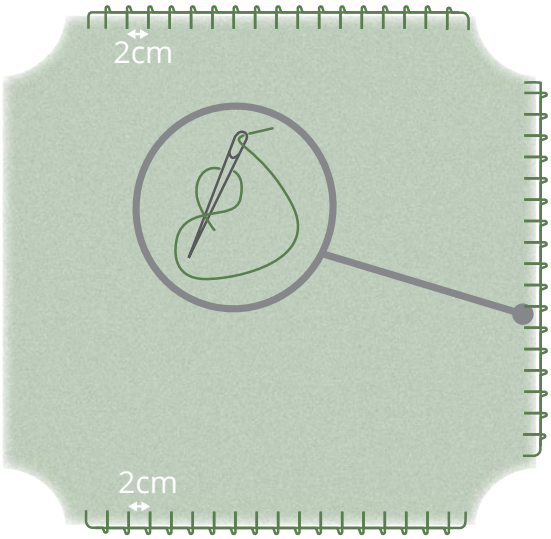


Fold the net over its centrefold, creating a double layered mesh.

Make sure the vessels are oriented vertically.

Cut the mesh to the right size (405 x 1010).

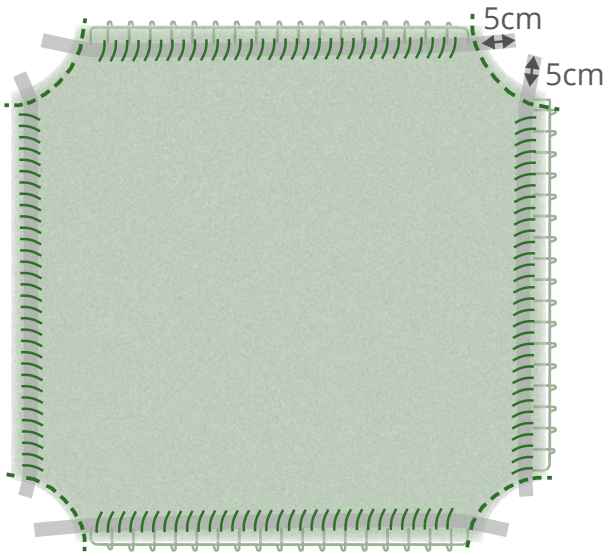
Cut out the corners at 30 cm from the corner.



Sew the folded edges using the Feston stitch.

Stitches should be applied at least every 2 centimetre.

CATCHER - STEP 1

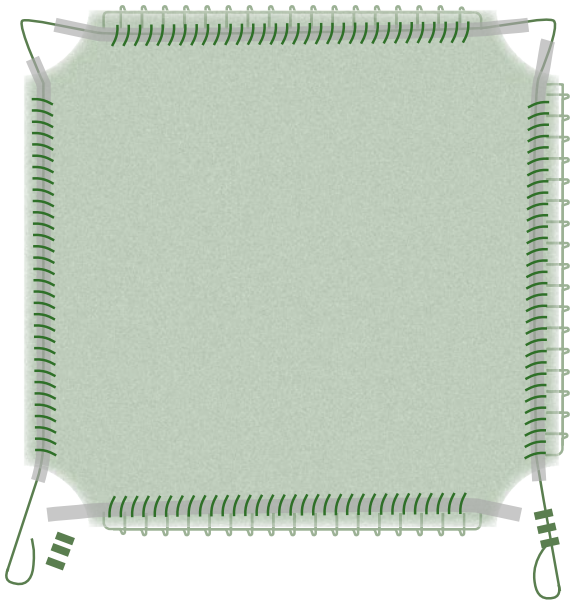


Fit the flexible hoses into all sides of the net.

Sew the hoses onto the mesh.

When the hoses are in place, close the corners by sewing them together.

The hoses protect the mesh from the 'sharp' steel cables.



Cut the steel cable to the right size (1600cm).

Slide the steel cable trough the flexible hoses.

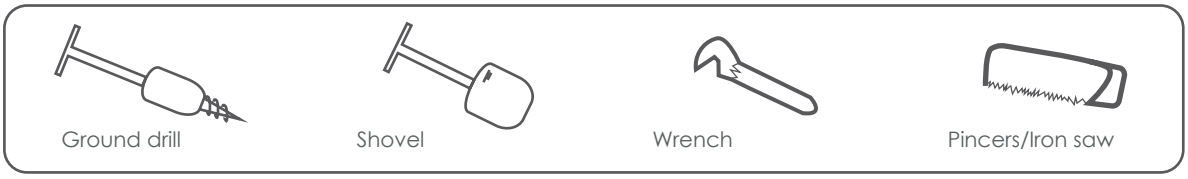
Make a cable loop on both ends of the cable. by folding the cable around the thimble. Then use three cable clamps to secure the cable around the thimble.

Make sure to have the short cable end on the round side of the cable clamp.

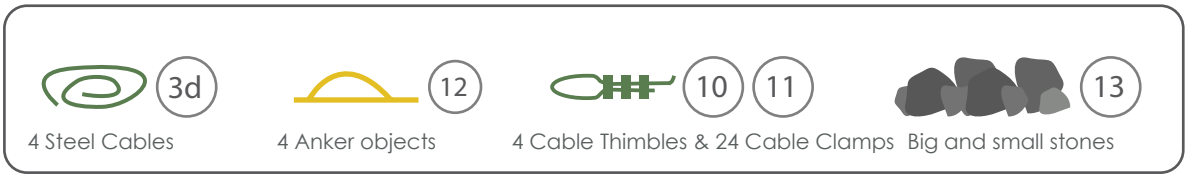
STEP 2 - PREPARING THE GROUND

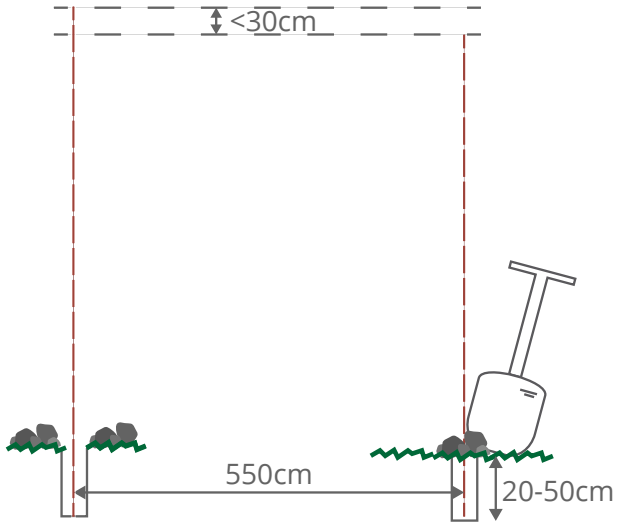
CATCHER - STEP 2

Tools



Materials

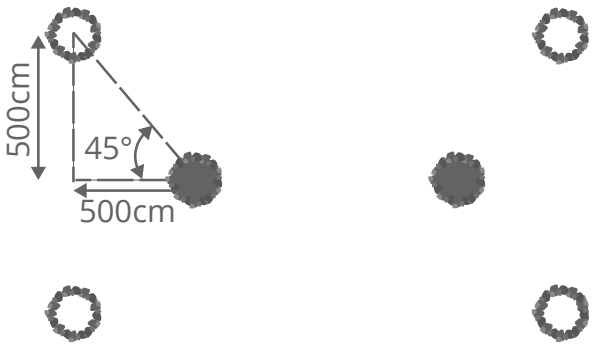




Dig the two 50cm deep holes for the poles with 550 cm between the holes, measuring from the centerpoint of the hole.

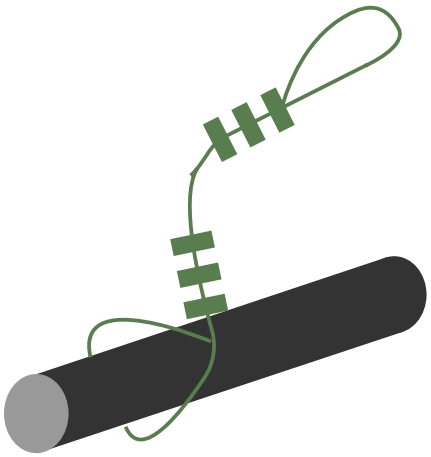
The two poles should have a maximum height difference of 30 cm.

When the ground surface is very uneven this difference could be compensated by digging one hole deeper than the other. The minimal depth for pole holes is 20 cm.



Dig 4 pits of 50 cm deep and 50 cm diameter for the anchors, as illustrated in the image.

CATCHER - STEP 2

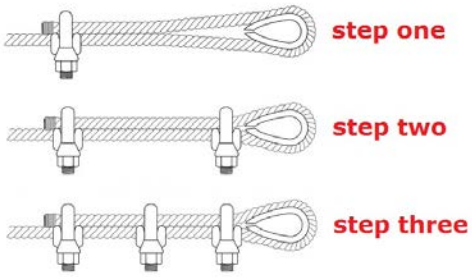


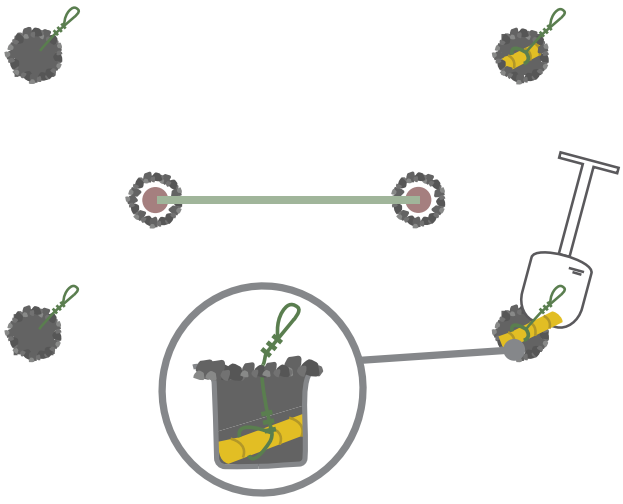
Cut the 4 steel cables to the right size (200cm)

Attach the 4 steel cables (the anchor cables) to the 4 anchor objects making use of three cable clamps. Several object can serve as an anchor object, it's needs to be firm and durable. Examples: strong piece of wood, metal pipe, a arge stone, or a plastic bottle filled with sand..

Make a cable loop at the other ends of the anchor cables.

how to make a cable loop:



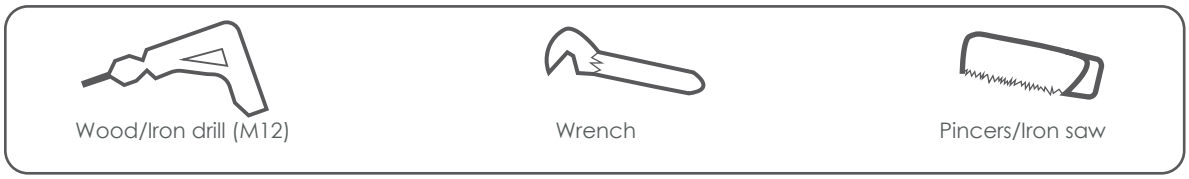


Place the anchor objects in the pits you made and bury them with big and small stones and fill it using sand.

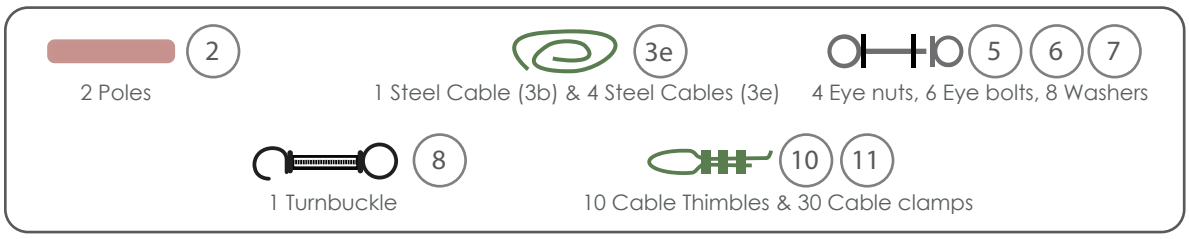
STEP 3 - PREPARIG THE POLES

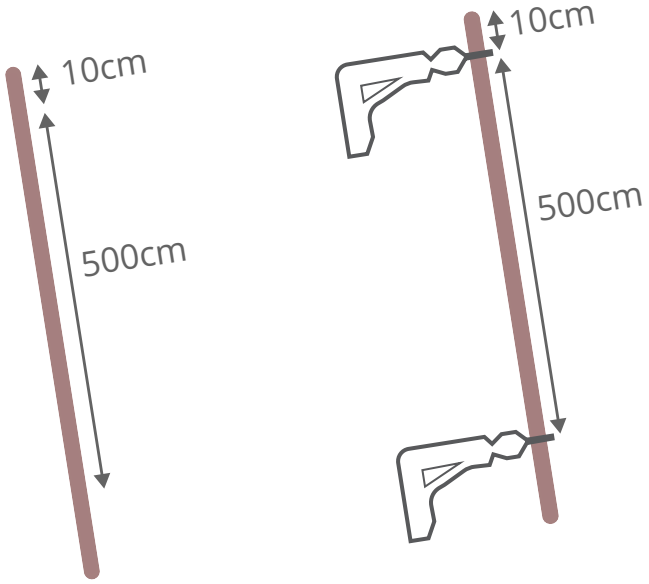
CATCHER - STEP 3

Tools



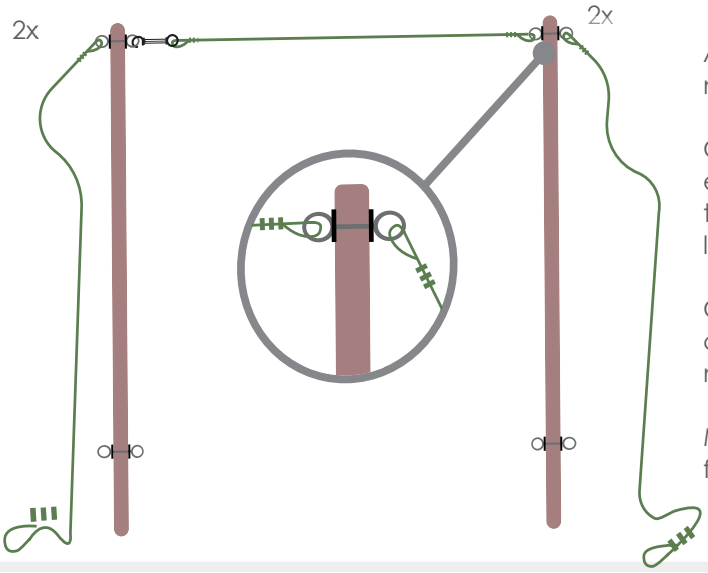
Materials





Drill in both poles a hole 10 cm under the top of the pole. Drill in both poles a hole 500 cm under the upper hole.

Cut the 4 steel cables to the right size (610 cm and 4x 800cm).



Attach an eye bolt, two washers and an eye nut to all the holes in the pole.

Connect the 6 meter steel cable to the upper eye bolts (between the poles), making use of two cable loops and 1 turnbuckle. The final length of the cable should be 550 cm.

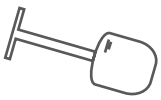
Connect two 800 cm steel cables (the fixation cables) to both eye nuts (outside of the poles) making use of a cable loop.

Make a cable loop at the loose end of the fixation cables that come from the poles.

STEP 4 - PLACING THE POLES & NET

CATCHER - STEP 4

Tools



Shovel

Wrench

Materials

8

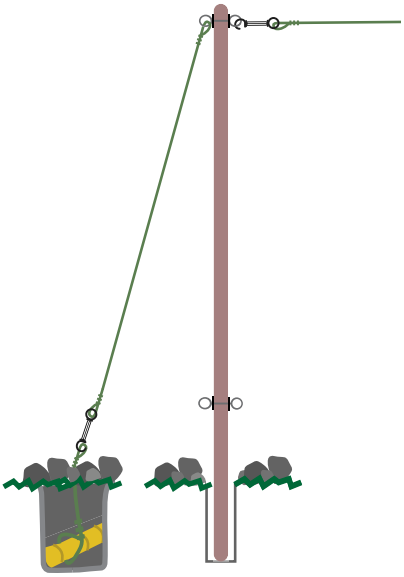
4 Turnbuckles

9

2 Carabiners

13

Big and Small stones

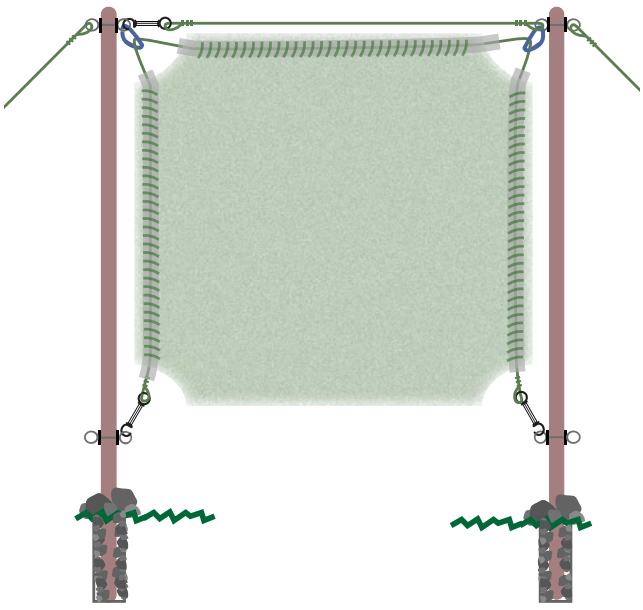


Place the poles in the holes, make sure that they're parallel. The distance between the poles should be the same for the lower and the upper side of the poles (a maximum of 10cm difference is allowed).

Fill the remaining space of the holes around the poles, first by using big stones, after that smaller stones and finally with sand, so that the poles are fixated.

Connect the cable loops of each anchor cable and the corresponding fixation cable with a turnbuckle.

Open the cable clamps of the cable loops and pull the anchor cables as tight as possible. Retighten the cable clamps. Use the turnbuckles to apply the final tension to the anchor cables.



Take the prepared net and use two carabiners to connect the upside of the net tot the two upper eye bolts

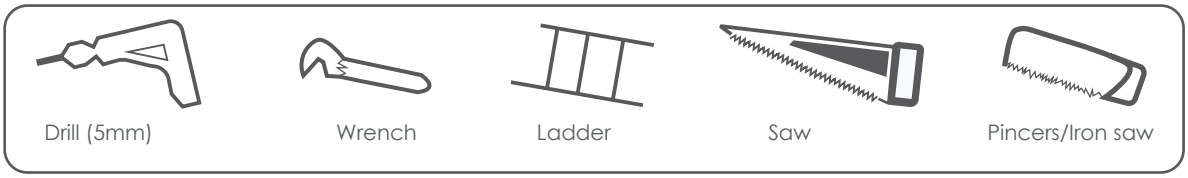
Safety note: watch out when climbing up the poles. Secure a ladder to one of the poles and have someone gaurd the ladder.

Connect the cable loops of the net to the lower eye bolts using a turnbuckle on both sides.

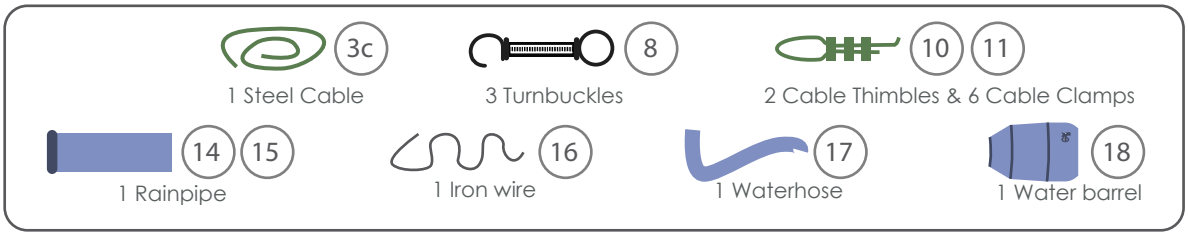
STEP 5 - INSTALLATION

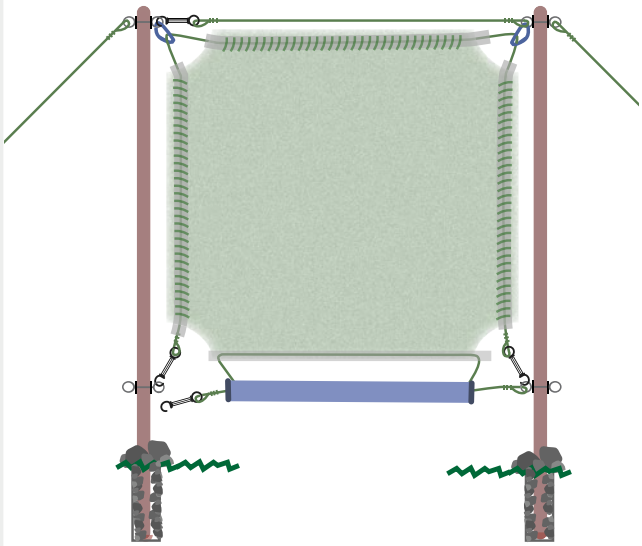
CATCHER - STEP 5

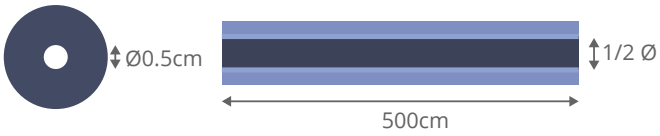
Tools



Materials



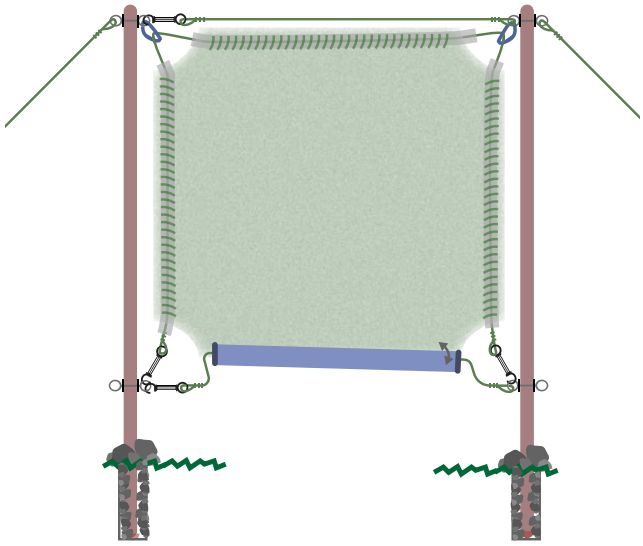




Cut a 5 meter long slot into the rain pipe, the slot should have a width of about ½ of the pipe diameter.

Drill a 5 mm hole in the centre of the rain pipe covers.

Attach the rain pipe covers to the rain pipe.



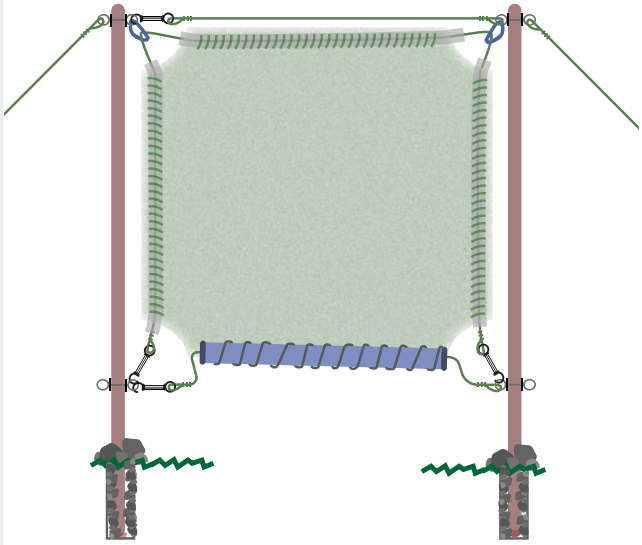
Cut the steel cables to the right size (700cm).

Pull the steel cable through the rain pipe covers, through the rain pipe and through the flexible hoses in the mesh.

Make a cable loop on both sides and connect the cable loops to the lower eye bolts too, using a turnbuckle.

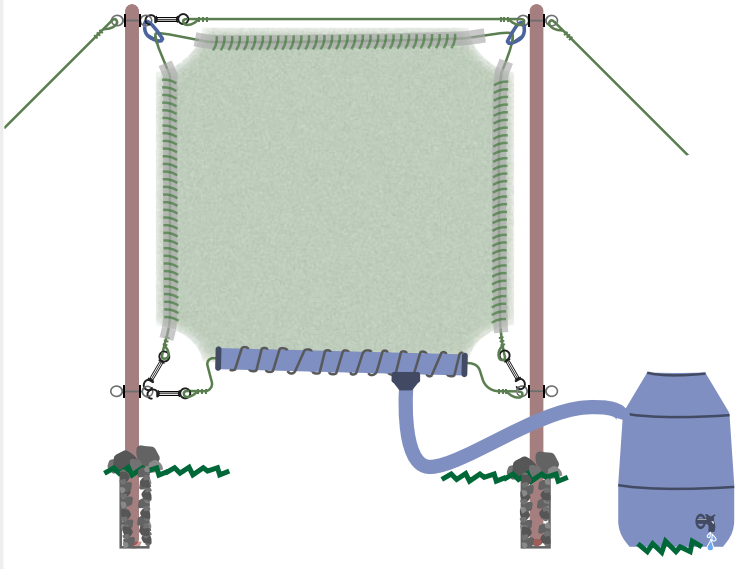
Adjust the cable loops in such a way that there is tension in all the cables. Use the turnbuckles to apply the final tension to the anchor cables.

CATCHER - STEP 5



Use the iron wire to secure the rain pipe to the mesh.

Make sure one end of the rain pipe is about 5 cm lower than the other end.



Make a hole in the lower end of the rain pipe.

Tie a funnel underneath the rain pipe using iron wire and/or glue. The glue needs to dry for a couple of hours before use.

Connect the funnel to a hose and lead it to a tank, located at a lower point. The fogcatcher is now ready to use.

On the next page is a picture of a finished fogcachter installed by the Creating Water Foundation.


FarPlast