BushProof SARL

INNOVATIVE SOLUTIONS FOR DIFFICULT ENVIRONMENTS

ON-SITE TECHNICAL TRAINING IN WATER & SANITATION INFRASTRUCTURE

"This training was unquestionably one of the most useful I have ever attended. It combined a very strong theoretical grounding with numerous practical exercises that ensured that participants were able to know how water and sanitation solutions are both developed and implemented. It was intensive, information-rich and supported by extensive documentation including manuals, policies and research findings. The key to the success of the training was the fact that the trainers were both highly experienced in the field, and that they were passionate about the subject."

- Save the Children participant, September 2013

OVERVIEW

After having run several trainings in other countries (e.g. South Sudan and Kenya), BushProof has now decided to offer its technical training on site, in preference to Madagascar. The reasons are that it allows our training to be more tailored to specific contexts, allows the cost per participant to drop, and ends up being more efficient in terms of carbon emissions and our environmental impact. We have over 30 sessions to choose from, but for all of them our focus remains largely on water & sanitation infrastructure and technical design.

PRACTICAL SESSIONS

We always try to promote learning through a range of both practical and theoretical sessions. Practicals include getting outside to build things, as well as design calculations in the classroom. Examples of practical sessions include the following:

- Manual drilling & jetting;
- Coagulation & chlorination jar tests;
- Biosand filter construction;
- Household water treatment demonstrations;
- Field topographical surveying;
- Water testing;
- Various practical calculations as part of theoretical sessions, including well design, pumping test, pipe design (pumping & gravity) septic tank design, groundwater contamination risk, and rainwater catchment.

As always, participants at a BushProof-run training are expected to get involved with all practical sessions – so prepare to get dirty!

THEORETICAL SESSIONS

Our style of training tends to be fairly intense, where we give as much information as we can during the time available. Our focus is on technical design issues for problematic (and neglected) areas in water & sanitation projects. As much as we can, we link theory to field experiences of the facilitators.

TEACHER-STUDENT RATIO

We suggest not having more than 20 participants per course, which still allows individual feedback and tuition.

LANGUAGE

Most of our training materials are in English, but since the BushProof course facilitators speak French they can help francophone participants to understand any technical terms.

“At the beginning, I thought the content of this course was a bit too technical for me. However, I’ve gradually digested it and learned quite a lot that I could not have imagined initially. This learning is definitely going to help to increase the effectiveness of my work.”

- Unicef participant, September 2016

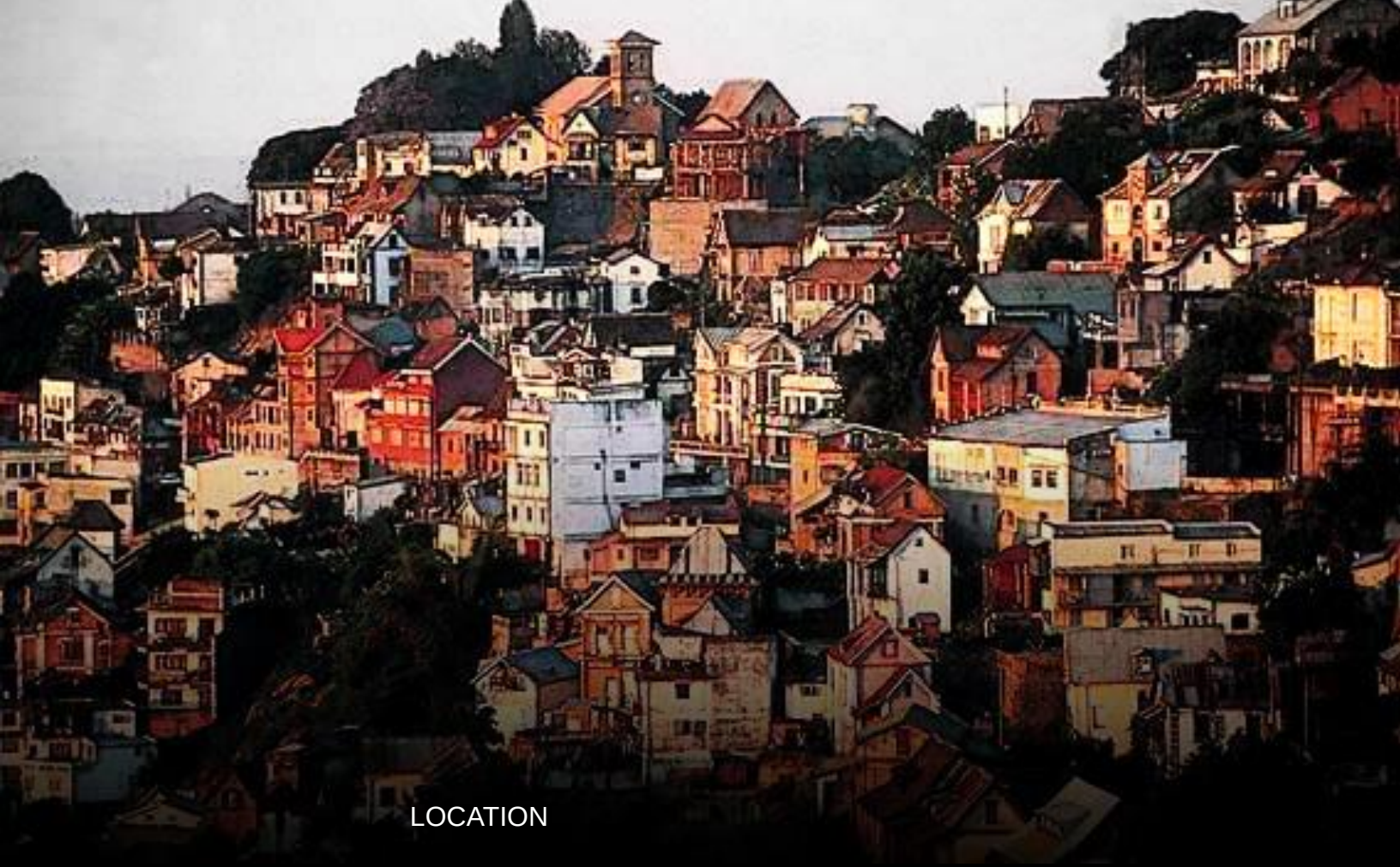
SUBJECTS WE TEACH ON

We have 35 possible sessions that we can incorporate in any tailor-made training – these are outlined below. Note that some sessions will require certain materials and conditions to exist on site. We can advise what is possible based on your context and learning requirements, in order to create a context-specific training schedule.

DAY	TIME	SUBJECT	DETAILS
Water sources, groundwater & drilling			
1	1.5 hours	Field hydrogeology	How groundwater works – overview of aquifer types, technical terms related to hydrogeology, relevance of geology.
2	1.5 hours	Shallow groundwater sources	Overview of shallow groundwater sources, including manual drilling, hand-dug wells, riverbed wells, infiltration wells, infiltration galleries, sub-surface dams.
3	1.5 hours	Hand dug wells	Overview of hand dug well construction using in-situ lining with curved blocks and cutting ring for caissoning.
4	1.5 hours	Spring protection	Spring protection techniques & construction guidelines.
5	2.5 hours	Rainwater collection	Rainwater collection system, guttering & storage tank options. **Practical**: design of rainwater catchment for a specific building.
6	1.5 hours	Drilling 1: options	Overview of machine drilling options.
7	2 hours	Drilling 2: Water well design	Overview of technical borehole installation methods used in rotary mud flush drilling, including: screens & slot size, borehole logs, what to supervise in contracted boreholes. **Practical calculation**: velocity across a screen.
8	1.5 hours	Drilling 3: Pumping test theory	Explanation of pumping test theory and types of test.
9	Variable – at least 3 hours	Drilling 4: Pumping test practical	**Practical**: Step-drawdown pumping test on a local borehole.
10	1.5 hours	Drilling 5: Pumping test review	**Practical calculation**: analysis & interpretation of field pumping test data.
11	4 hours	Drilling 6: Manual drilling	**Practical**: manual drilling of shallow borehole including: gravel pack sieve analysis, annulus calculation, gravel pack sieving, screen & gravel pack installation, well development.
12	1.5 hours	Drilling 7: Jetting	**Practical**: manual jetting of shallow borehole in sandy sediments (where these sediments exist with shallow water table). Includes manufacture of screens.

Environmental health, assessments & data collection			
13	1.5 hours	Environmental health	Introduction to environmental health in context, overview of WASH-related diseases, and interventions to prevent transmission.
14	1.5 hours	Needs & standards in water & sanitation	Introduction to Sphere Standards & indicators in WASH programming, and meeting the needs of users including marginalized groups.
15	1.5 hours	Water & sanitation assessments	Needs assessment methodologies, including checklists, sanitary surveys, village mapping.
16	2.5 hours	GPS data collection & analysis	Overview of how to use a GPS including uploading & downloading data, saving kml files, tracking mode, interpretation of raw data. Google Earth & GPS data - different modes for coordinates, using polygons, ruler tool. **Practical**: collecting & saving data, retrieving data, downloading Google Earth, adding points to Google Earth.
17	Variable – at least 3 hours	Topographical surveying	**Practical**: topographical measurement using Abney level & laser methods.
Water quality, testing & treatment			
18	1.5 hours	Water quality testing 1	Water quality standards - when to test, what is most important to test for, core & secondary tests. **Practical**: going over chemical & bacteriological testing kits.
19	2 hours	Water quality testing 2: Bacteriological testing practical	**Practical**: collecting samples, carrying out membrane filtration & incubation of samples using Delagua kits (including sample from SODIS demonstration).
20	2.5 hours	Water treatment 1: Coagulation, flocculation & sedimentation	Product types & effectiveness, calculating 1% alum solution. **Practicals**: making 1% alum solution & doing jar test, natural coagulants (*Moringa*).
21	2 hours	Water treatment 2: Chlorination	Product types & effectiveness, calculating 1% chlorine solution. **Practical:** making 1% solution & doing jar test.
22	2 hours	Water treatment 3: Water supply, storage, treatment & distribution	Overview of water provision from source to point of use, including details on water sources, treatment, transport, storage & distribution.
23	At least 3.5 hours	Water treatment 4: Bulk surface water treatment	**Practical**: treating water from a surface water source in bulk, based on coagulation & chlorination jar tests. Includes setting up the kit (pump intake, chemical dosing mechanisms, tank & tapstands) and treating water so that it arrives at the tapstand (where suitable equipment exists on site, alongside a suitable raw water source).
24	2 hours	Water treatment 5: Household biosand filter	Introduction to the biosand filter. **Practical**: construction & operation of biosand filter.
25	0.5 hours	Water treatment 6: Household biosand filter	**Practical**: removing biosand filter mould of a cast filter, introduction to curing of concrete.
26	2 hours	Water treatment 7: Household Water Treatment	Rationale for promoting household water treatment, review of pros & cons of household vs bulk treatment, overview of selected technologies. **Practical**: demonstration of ceramic filter, SODIS, household chlorination, PuR / WaterMaker, solar distillation, biosand filter.
27	1.5 hours	Water treatment 8: Water treatment for specific chemicals	Treatment methods for removal of taste, colour, iron, manganese, fluoride & arsenic.

Pipe & pump design			
28	3 hours	Gravity flow water systems	Overview of gravity systems. **Practical calculation**: how to design a simple gravity flow system.
29	1.5 hours	System curves: Water flow in pumped pipe systems	Hydraulic theory, pipe friction tables & system curves. **Practical calculation**: how much water flow to expect in a pumped system with various elevations and for various pipe types, sizes & lengths.
30	2.5 hours	Motor pump types & pump choice	Different pump options, including solar pumping. **Practical calculation**: choosing a pump based on pump efficiency and power requirements that fits system curve from practical.
Sanitation			
31	2 hours	Sanitation 1: overview	Sanitation options for emergency & medium term settings including Sphere Standards, factors affecting the technical choice, importance of allocation & user preferences, pit sizing, cleaning. **Practical calculation**: groundwater contamination risk.
32	1 hour	Sanitation 2: septic tanks	Overview of septic tanks. **Practical calculation**: septic tank design.
33	2 hours	Sanitation 3: slab construction practical	**Practical**: latrine slab construction of standard concrete reinforced and dome slabs.
Group work			
34	At least 5 hours	Group work 1: Gravity & pumping design	**Practical**: using topographical data to design a gravity & pumped water system, including storage & treatment requirements. Reporting of results during a feedback session.
35	At least 5 hours	Group work 2: Emergency water & sanitation scenario	**Practical**: using a scenario (based on a real example) to identify a solution for water & sanitation in a refugee camp setting, based on what was taught during the previous days.



LOCATION

We are able to run training at any location, security permitting. Where security is an issue, we will work with you to find alternative nearby locations that could be an option for our training.

VENUE

A suitable venue needs to have space for both the class-based activities, as well as practical sessions.

The classroom needs to have enough desk space for participants to work on without being cramped, should have a projector and back-up power supply, and should be well ventilated. Additional breakout rooms will be needed for some practical calculation exercises.

For practicals, what is needed from a venue will vary. But in general, we find that a good venue is one with a good amount of outdoor space for activities like drilling or making concrete slabs, and where the owners/managers of the venue are sympathetic the potential mess resulting from practical sessions.

PREPARATION & MATERIALS

In order to be able to run a training outside Madagascar, BushProof needs strong logistical support to prepare all items required in advance, from travel arrangements through to finding a venue and sourcing all materials needed for the practicals. Note that without strong support, we are not able to deliver a suitable training.

HOW TO ARRANGE A TRAINING

The first step is to get in touch with us via the contact details below. We can then organize a conference call to discuss your requirements and context.

RESOURCES FOR PARTICIPANTS

Participants will receive a USB key with a wealth of expertise in the form of open source documents, articles and books. A certificate will be presented to participants on completion of the training.

COURSE FEES AND DURATION

On-site trainings typically last for between 6 and 10 days. For training over 6 days, we would suggest one day of rest in between. The cost available on request, and may vary depending on the context and what is required by way of preparation from our side.

ENVIRONMENTAL IMPACT & CARBON EMISSIONS

We want to be responsible for the carbon emissions associated with travel to and from our training events. We do this by balancing our calculated emissions through a tree-planting initiative where we pay for a number of trees to be planted which are enough to absorb the carbon we produce in getting to the training site. Not only that, we go a step further and double the donation so that our training can end up being carbon negative. There is a cost to doing this, which we will be part of our invoiced costs. Please get in touch with us to find out more.

CONTACT DETAILS

Telephone: +44 (7814) 788 846 (UK)
+261 (33) 11 997 56 (Madagascar - French)
+261 (33) 05 244 92 (Madagascar - English)
Email: training@bushproof.com

Graphic design: Luke John Paul Barrett