WSP for springs

Groundwater can also be available in the form of springs

Groundwater from spring is a good water source as it may be free from bacteriological contamination and often does not contain high levels of chemical pollution

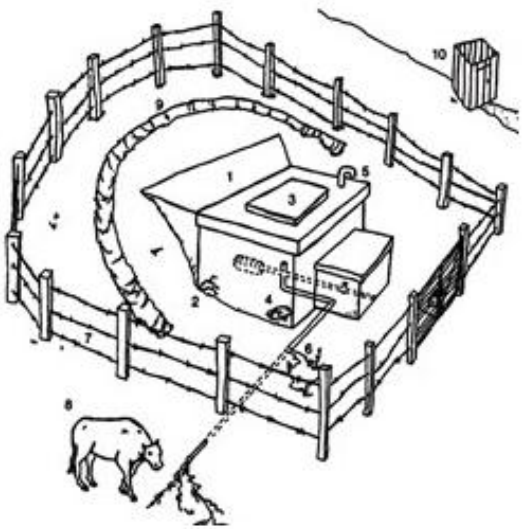
But unfortunately this is not always the case and therefore it is essential to carefully assess the situation

MetaMeta, Cowash

Risks in springs (1)

Springs can be a great source of water but also may entail important quality and quantity risks

Look for risks around and particularly above the spring that may cause bacteriological pollution such as nearby latrines or unlined ponds; also chemical pollution may occur from agricultural practice



(Source WHO, 1977)

A common problem is that springs are not well protected and may be affected or even destroyed by runoff water that is not properly drained.

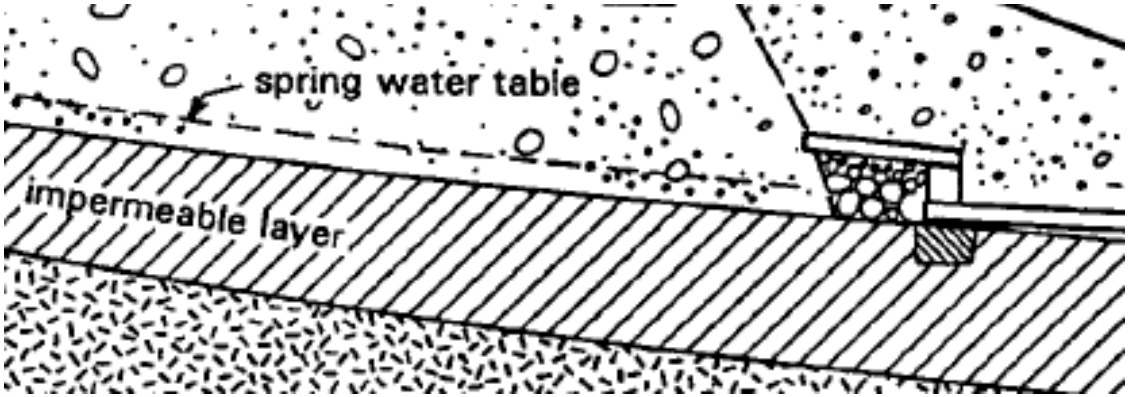
Some of these risks require simple measures, other are more difficult but remember never block the flow of a spring as it may disappear

Risks in springs (2)

Springs often are capturing shallow groundwater; hence pollution risks depend in part of depth of soil cover

The bacteriological risk may be low if the spring is connected to a confined aquifer (but chemical contamination may be an issue). Or in case of a shallow spring if no sources of contamination above the spring have been detected. One indication of problems may be odour or turbidity problems. Also you need to check with the HEW and the community they have outbreaks of diarrhoea for example at start of rainy season and whether the spring is providing sufficient water throughout the year; in case of problems water quality needs testing.

Springs may be tapping a confined aquifer or may be unconfined (shallow) as shown here



Risks in unprotected springs

- High risk of pollution because of direct runoff and contact with the water by users (people and animals)
- Possible infiltration above the spring (latrines, pools), and pollution with chemicals from agricultural practices above the spring

- Spring may reduce in flow or dry up in dry season

Mitigation actions

- Turn the spring into a protected spring; remove sources of infiltration
- Divert direct run off by making a drain above the spring
- Use the spring only for other water uses (not drinking and cooking)

Increase flow by improving infiltration in the catchment area that feeds the spring

Risks in protected springs

Protected springs may be at risk because:

- Pollution may infiltrate from latrines or cultivation above the spring or through cracks in the spring box or reservoir
- Surface runoff is not diverted and may threaten to undermine structure

- Flow may reduce in the dry season (long waiting times)

Mitigation actions:

- Remove source of pollution (latrines, agricultural practice)
- Avoid direct infiltration in spring box and reservoir and divert runoff

Improve water availability:

- Improve water infiltration in catchment area
- Enlarge or built water reservoir
- Maintain the reservoir and keep it closed to avoid mosquito breeding

Risks in springs with piped distribution

Springs may also be connected to a piped system which for examples takes the water to one or more tapstands. I such cases additional risks may apply related to the pipes and the tap stand

Tap stand connected to spring

- Pipes may leak and loose water hence occasional checking for water loss is needed. It may also imply a risk of contamination if pipes are not continuous under pressure
- Taps may be leaking

Mitigation:

- Ensure that pipes are well protected and are checked for leakage
- Repair pipes and taps as needed
- Ensure that pipes are under pressure
- Test water quality and if needed advice on household water treatment

Short and long term water security

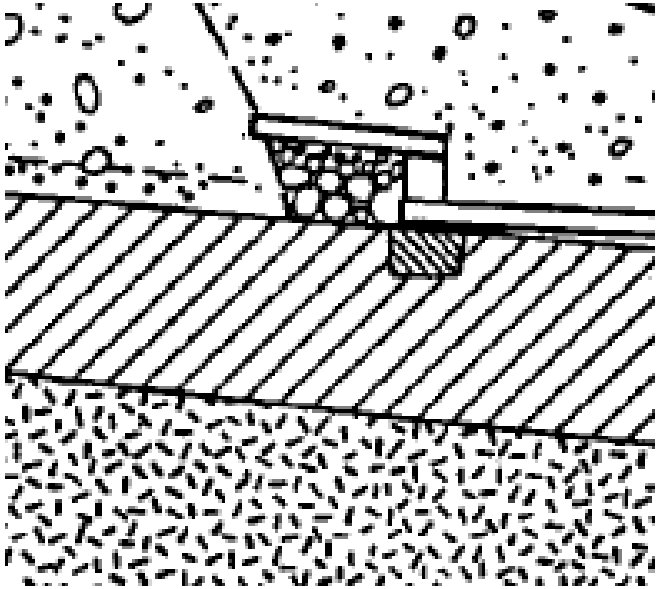
Water in springs is rainwater that has infiltrated into the ground either close by (above the spring) but may also happen at larger distance (confined spring). Water infiltration may change due to lower rainfall, but particularly as a results of changes in the catchment area, which also may affect water quality. An indication of problems may be the lower discharge of springs in the dry season.

Mitigation:

Requires catchment management and improvement which may require joint action of different actors and may affect people with land above the spring

Woredas and Water Bureaus need to explore changes in catchments

Key elements of springs



The water table from were water is captured and the (earth covered) spring box

The reservoir which needs an overflow that is lower than the spring outlet to avoid blocking the flow of the spring

Both structures need to be watertight and need to be protected by diverting the surface flow to avoid that the structures are washed away

Basic community water supply data

Registering community water supply data as shown in the poster: wells and pumps is the first step of the CWSAP; It is also essential to have a good map of the situation.

Location of springs may be a special problem as they may be far away for some households. This may imply that it needs to be checked if tapstands can be connected to the spring or if other water sources need to be developed to keep distance to water source reasonable

Assessment: Protected springs

System 1	Protected spring with reservoir
Details	Constructed in 1995 E.C (government fund); spring box, pipe and reservoir with one tap which is located quite high in the reservoir
Technical quality of system	Lacks maintenance (cracks in concrete; damaged cover, leaking tap, no proper diversion of runoff; no drainage of water collection area (muddy) and no fence; reservoir has mud deposit.
Water quantity	Spring is delivering 1 l/s Users have to wait on average over 30 minutes to fetch water
Water quality	Good taste, no odour; no turbidity; no sign of fluorosis; sanitary inspection showed a risk as spring box, reservoir and manhole cover are cracked; also a risk exist during collection, transport and storage; HEW indicates high incidence of diarrhoea at start of rainy season
Continuity	System open to users; in dry season waiting times increases due to lower discharge and more users.
Cost	People do not pay for water

Short and long term water actions

	Technical interventions	Actor	Before
1	Contract mason to repair spring box and reservoirs and improve drainage of spill water	WASHCO[a]	May 8
2	Organize repair of fence (with user support) and of cleaning and disinfection of the reservoir	WASHCO	May 8
3	Repair tap	WASHCO	May 8
4	Check discharge and waiting time and discuss options for catchment improvement with Woreda Water Desk	WASHCO	May 8
5	Explore option to test bacteriological water quality	WASHCO	May 8
a	First step is for the community to elect the WASHCO (which may comprise of several members of the voluntary group that was formed		May 1

Short and long term water actions

	Other interventions	Actor	Before
1	Formally establish a WASHCO	Kebele leaders	May 1
2	Inform users of current risk and advice them about safe water handling and household water treatment (chlorine, solar disinfection)	HEW	May 1
3	Make an analysis of O&M and repair cost and establish a tariff (with support Woreda Desk)	WASHCO	May 8
4	Establish maintenance and monitoring system seeking support from Woreda Desk, (simple reporting format)	WASHCO	May 8
4	Review reporting by caretaker	WASHCO	July 1
5	Report to community on income and expenditures	WASHCO	Sept 1