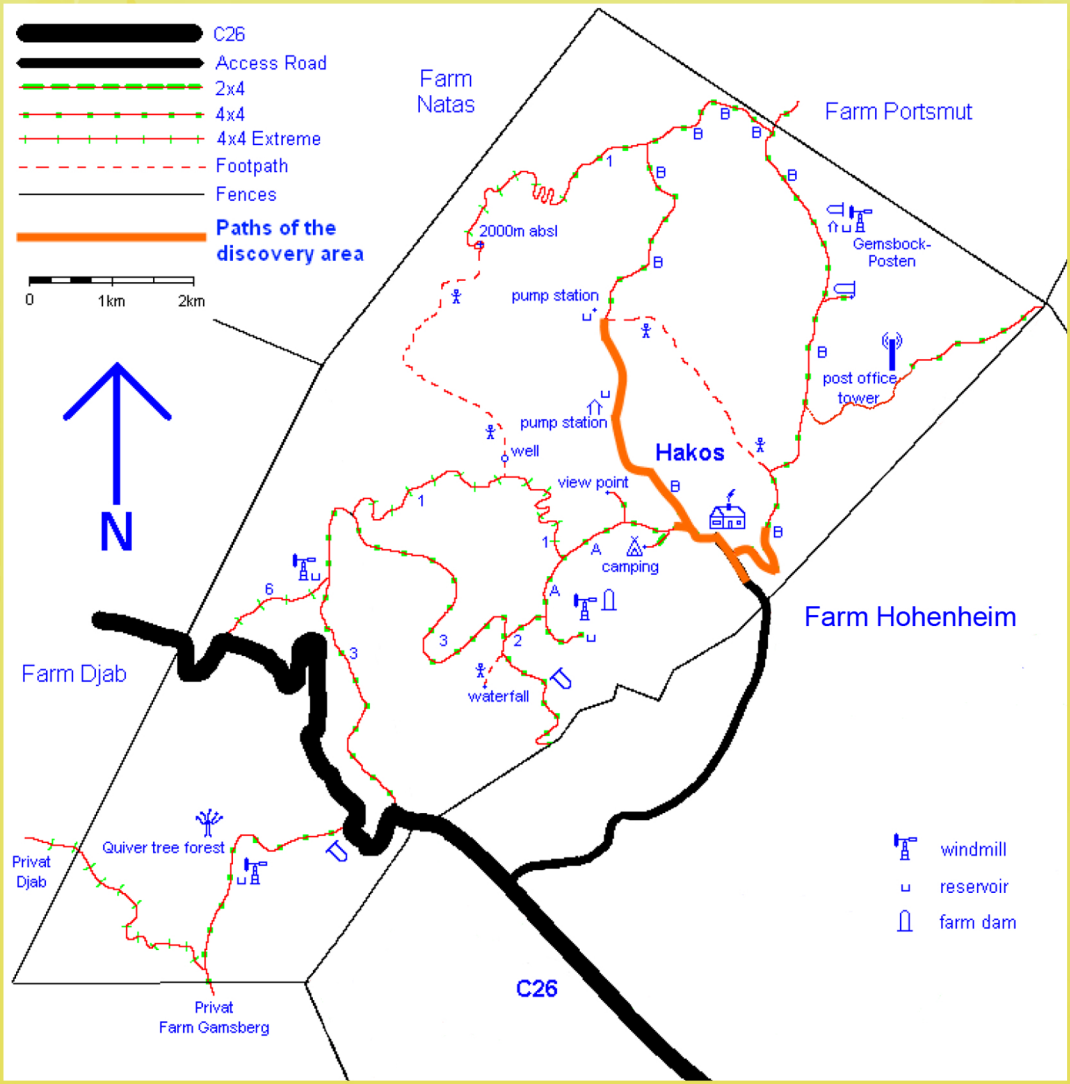
Discovery Area

HAKOS
Guest Farm

The Discovery of Independence

A farm survives
independently
in the rough savannah
of the Hakos Mountains

Farm map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Access Road
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Footpath
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Farm Natas
Farm Portsmut
Farm Djab
Farm Hohenheim
2000m absl
pump station
Gemsbock-Posten
post office tower
pump station
well
Hakos
view point
camping
waterfall
Quiver tree forest
Privat Djab
Privat Farm Gamsberg
C26
windmill
reservoir
farm dam

Themes of the Discovery Area

In your hands, you are holding the brochure for the **Discovery Area** Hakos. The Hakos farm is a great area to explore. In contrast to a usual nature trail you will not be guided from one station to the next. Instead, you can choose the order by yourself and select the stations you want to discover.

On the premises of the farm you can find **14 signs** with numbers and symbols that refer to this brochure. They mark exiting things to discover.

The symbols have the following meanings:

The farm:
A presentation of the farm history and the production of wind and solar power.

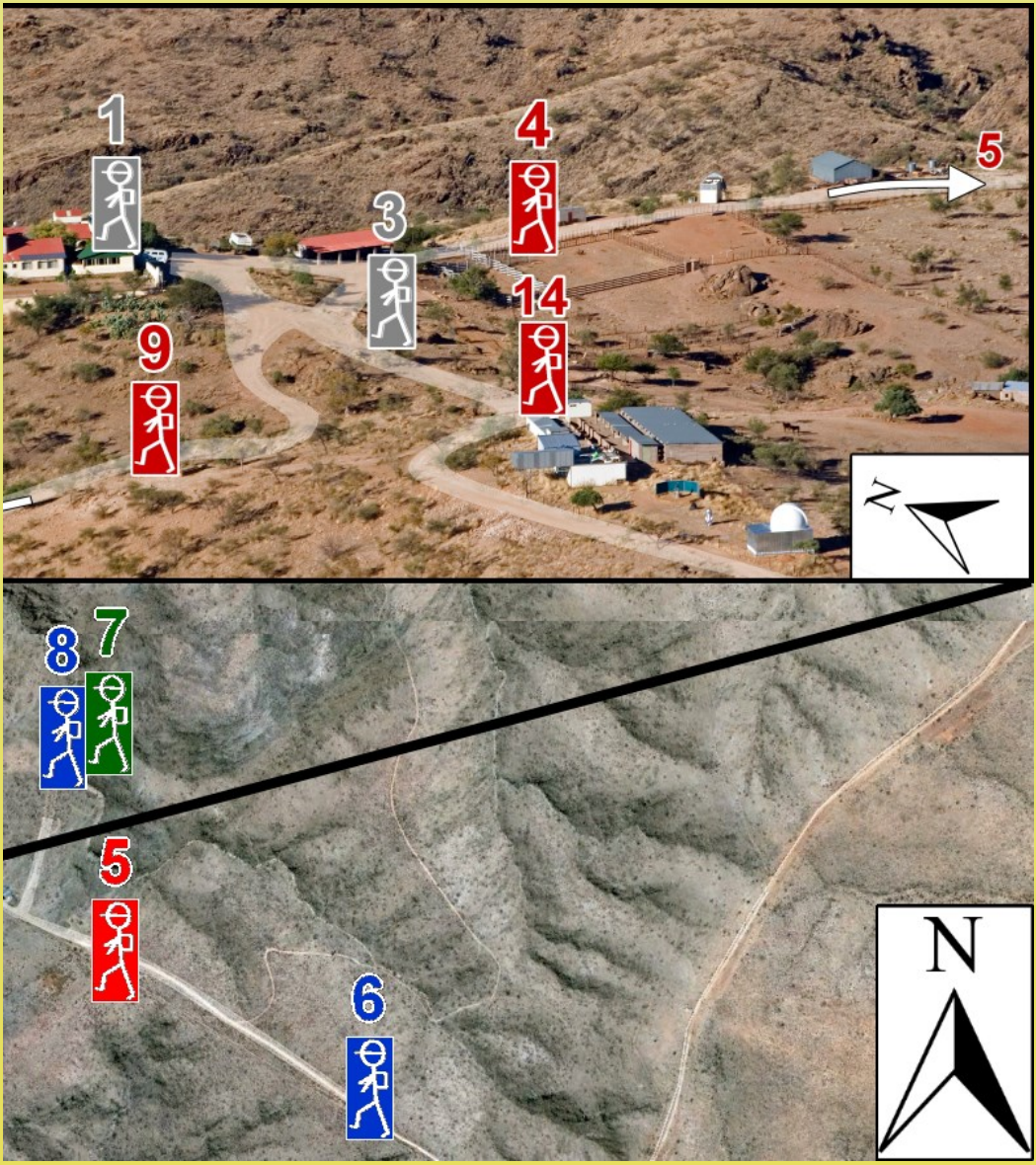
Animals:
Formerly cattle, now wild animals: They are needed and used by the farm.

Water supply:
Supplying the farm with water is a great challenge.

Plants:
Plant life is not only a food resource, but also a big risk factor for humans.

If a sign contains two symbols, there is something to discover for each theme.

Stations of the Discovery Area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Hiking at Hakos

Water is essential. Before you leave, make sure that you have enough water (at least 1 liter per person) and **sunscreen** packed. Also make sure to take along a small snack. **Solid shoes** are highly recommended.

If possible, the best time to go on a hike is in the **morning hours**. At this time the chances to meet a Zebra are highest. Additionally you can avoid the midday heat.

Please note that the ways are largely not marked. Remember the way you took and use the big farm house as a landmark for **orientation**. If you don't have a compass, the sun can be used to orient yourself. But be careful: at noon the sun in Namibia is in the North.

If you have a **GPS** device you can track the signpost coordinates given on the station pages in this brochure.

And now enjoy your exploration!

Stations and contents

1 From the first explorers to today's guest farmers

The colonization of the Khomas-Highlands started in 1884 during the German colonial administration.

The colonial administration started by distributing the good pasturage, for example Hohenheim, the farm neighboring Hakos. After all the good land was distributed they started to privatize the inferior.

The first farmer

In 1938 Heinz Gruber purchased the premises of Hakos from the South African administration. For health reasons he left cold and damp Germany for the warm and dry climate in South West Africa. After founding the Farm Hakos he had to start out by exploring the area and setting up the infrastructure (Fig. 1). The land had previously only been used as a pasture in emergencies.

Figure 1: The farm's hut 70 years ago stood at the same place the farmhouse stands today. Source: Hakos-Archive.

Imagine standing where you are now 70 years ago. Where would you sleep tonight?

The Descendents

Arend Brink Sr. took over the farm from Heinz Gruber. He kept cattle until his son tried breeding pigs (station 14). In 1984 the current farmers, the family Straube, purchased Hakos to use it as emergency pasture for Hohenheim (Fig. 2).

And today?

Even before the purchase of the farm Walter Straube had planned to change it into a guest farm. Cattle farming was given up after the owner change. In 1988 the first guests visited Hakos.

In the past 80 years the farmers left a lot of traces that can be discovered today. These show that the farm can only exist if it is self-sufficient.

Figure 2: The current hosts: Waltraud, Friedhelm and Walter (from left). Picture: J. Merkle.

2 Does the power for the farm come out of nowhere?

Energy is all around us. Look around. Do you recognize where energy is used to generate electric power? A combination of wind and solar power generators produce almost all the electricity required for the the farm (Fig. 3). The energy is saved by a computer-operated battery system. Therefore you can still use the sockets with 230 Volts of alternating current by night or during still air.

Figure 3: Windmills and solar panels at Hakos. Picture: J. Heinzmann.

And where does the warm water for the showers come from? Certainly you have discovered the solar heaters on the roof (Fig. 4).

Our sun – a source of energy

To have warm water it is no longer necessary to transport fossil fuels from Windhoek to Hakos. And the petroleum driven freezer is long past its due date.

The local energy production saves resources and money. Furthermore it is a contribution in the fight against global warming.

Figure 4: The sun's radiation heats up the water in the solar heaters. Picture: J. Heinzmann.

3 A farm on the farm

The farm workers and their families live in the colored houses next to the farmhouse (Fig. 5). They keep chicken, goats and horses. They grow vegetables in their own watered gardens. Dogs and cats keep the farm clear of parasites.

With the first discoverers

The Werft, as the worker's settlement is called, exists since the founding of the farm. Initial corrugated-iron huts have been replaced with stone huts. Today the workers and their families have own toilettes, showers and wash basins. So far they do not have electricity. Therefore at night they often sit (and sing) around a fire or with candle light, like the pioneers once did.

Figure 5: Worker's settlement (Werft). The IAS observatory can be seen in the backround (see Station 14). Picture: R. Glawion.

100km to the next city

The children of the workers need to go to school to Rehoboth when they turn 6 (Fig. 6). Since the way is too far to commute daily they sleep at relatives' houses or in a kind of boarding school. The children have vacation three times a year. Then they are picked up together with the children from the neighboring farm Natas. The farmers of Hakos and Natas take turns picking up the children.

The workers often use their horses to go on a trip. Since horses do not need petrol and expensive maintenance they are the cheapest way to travel in Namibia.

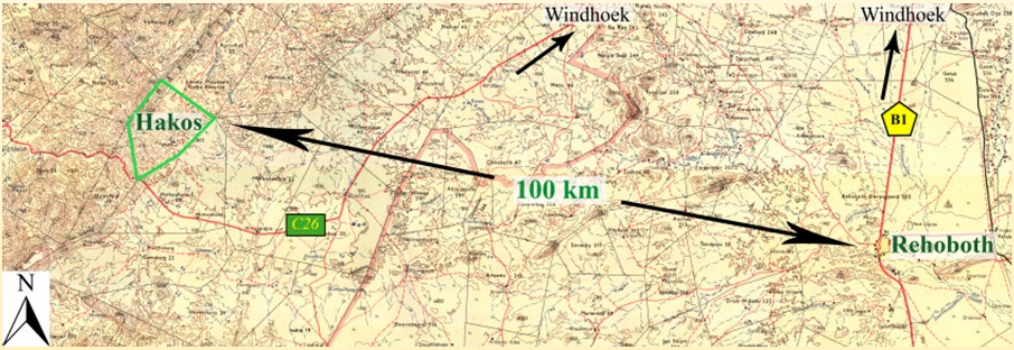

Figure 6: The distance between Hakos and the nearest city.

4 The farm needs a Kraal for cattle and horses

This is the farm's pride and joy, the Kraal. This is not a misspelling, in southern Africa a Kraal is a livestock pen in the midst of a settlement. The Zulu, a South African ethnic tribe, used to construct huts around them.

Features of the Kraal

The wider paddock in front of you gradually tapers to a narrow corridor. This walkway is enclosed by high, sturdy fences made of metal, as opposed to wooden fences on other farms (Fig. 7). Here the animals can only walk in single file. This enables the farmers to inspect the animals, perform hygiene procedures or split the herd, for example to load animals up over a ramp.

One Kraal for every farm

Sparse rainfall and little vegetation limit the extent to which animals can graze. That is why famers on the dry Namibian landside have to own large ranges to be able to provide enough food for the animals and thus operate cost efficiently. A profitable Ranch has to span an area of over 5,000 ha. Hakos is 6,800 ha large. This equals 68 square kilometers or roughly 8000 soccer fields.

Since all of the farms are very big, they can only share farming facilities, e. g. the Kraal, to a certain extent. This is why every farm needs its own Kraal. Since cattle farming has been given up on Hakos, today the only purpose for the Kraal is breaking in new horses.

Figure 7: Walkway on the Hohenheim farm. Walter Straube with a branding iron. Picture: R. Glawion.

5 A remnant of rotational grazing

Until 1984 the loading ramp in front of you was regularly used to load up cattle into trucks. The cattle on Hakos grazed of the farmlands according to a special type of cattle farming: rotational grazing.

In tropical and subtropical regions rotational grazing is one of the few economically and ecologically sustainable forms of animal husbandry. The farm is divided into smaller pastures separated by fences, called kamps (Fig. 8).

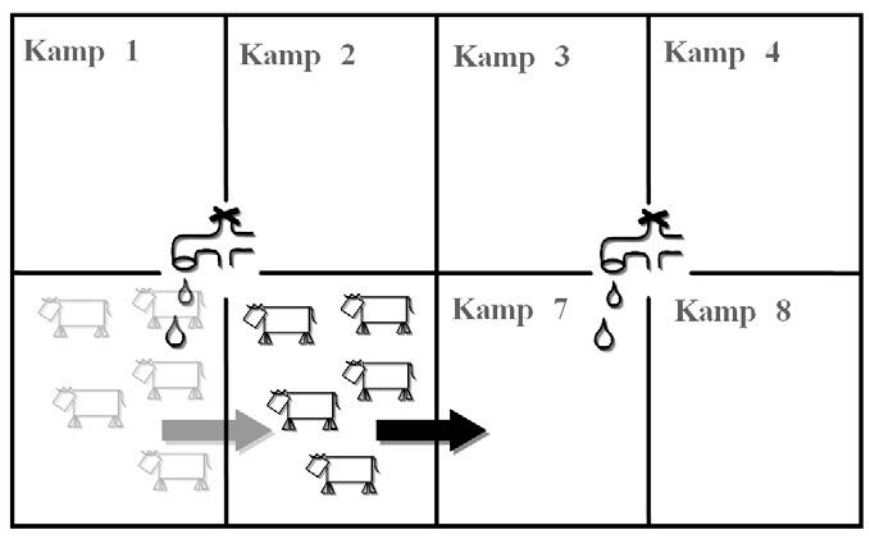

Figure 8: Diagram depicting the principle of rotational grazing. Graphic: J. Heinzmann.

A certain number of animals are grazed at a kamp for a short amount of time only, e. g. 14 days. After this period the animals change the kamp following a rotation principle, so that the grass of the first kamp can regenerate. Ideally watering places are located at the corners so that they can be shared by several kamps. (Fig. 9)

The advantages of this principle are that the roots of perennial grasses are spared, selective browsing is prohibited and bush encroachment is limited (for more on bush encroachment, see station 12).

Figure 9: Pasture with a disused watering place. The windmill operates a water pump. Picture: J. Heinzmann.

In 1984 Walter Straube bought the farm to use it as pasture for emergencies as well as a guest farm for the neighboring farm Hohenheim. To operate Hakos as a cattle ranch was and is not cost efficient. Cattle are still kept at Hohenheim today, since the terrain is better suited for grazing.

A plant for the future

Behind the loading ramp Hoodia are grown, plants similar to cactuses. A drug alleviating hunger and thirst is obtained from them. The plants are adapted to the climatic conditions at Hakos and can be grown in an ecologically sustainable way. For 10 years Hoodia have been gaining in importance for the pharmaceutical industry. Could cultivating Hoodia be a new source of income for Hakos? Could this lead to a new plantation?

6 A water tower in the dry savannah

Do you see the signs on the round water containers? What could they be useful for?

Imagine you are farmer on Hakos. You just got up and wanted to make a cup of coffee. But there is no water coming from the tap. A view out of the window is enough to show you that the water tower is empty.

A brilliant but simple construct

The lower sign on the water container is connected to a floating object in the tank. It swims on the water's surface like cork. If the lower sign is right next to the top one, the water tank is full. If the lower sign is located at the top of the tank water has to be refilled (Fig. 10). Due to this easy construction a lot of work is saved.

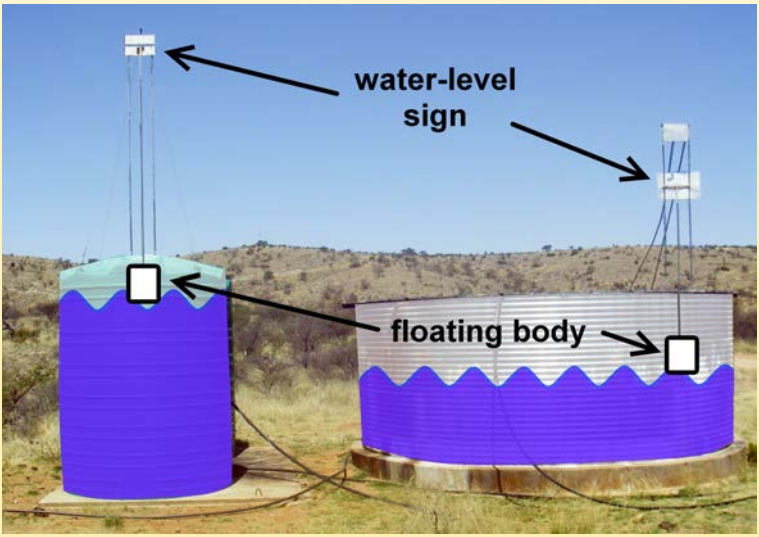

Figure 10: Hakos water tower. Picture: J. Heinzmann.

23°14'51.1"S
16°21'16.0"E

Hakos is not connected to the public water network of Namibia. The public water network has never reached rural Namibian areas. The farm supplies itself with water and manages to always have running water (see station 10 and 11).

Take a quick glance at the buildings of the farm. Get an overview of the different areas of the farm (Fig. 11).

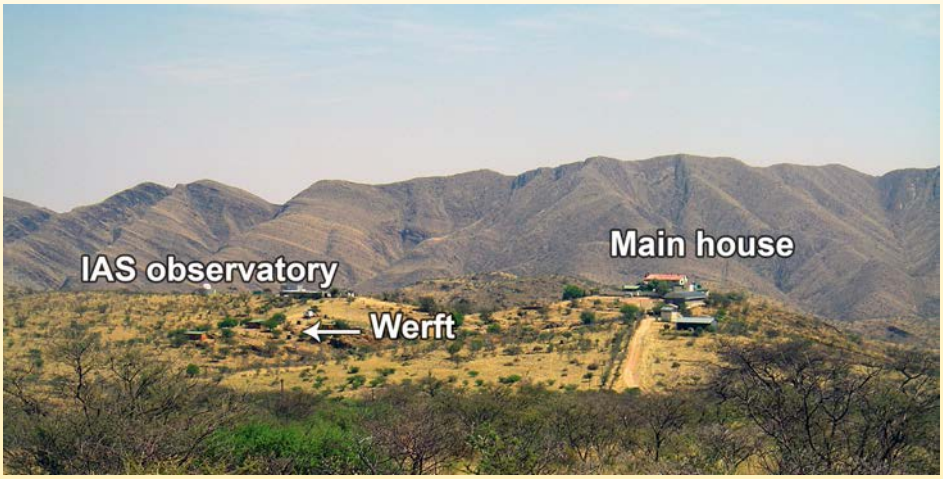

Figure 11: Buildings of the Hakos farm. Picture: J. Heinzmann.

7 Grass fires – a danger for humans, animals and the farm

They are ignited by lightning and spread out as fast as thunder. During the dry period in 2007 the vegetation was as dry as tinder. Due to flying sparks caused by an angle grinder a grass brand was started at Hakos. The savannah was burning and smoldering for days. There was no fire department to help.

Figure 12: The burning inferno at night, close to the mail tower. Picture: J. Ohlert.

Fearing for their houses the farmers and neighboring farmers had to help themselves. They started a counter fire. Luckily the fire did not damage the buildings of the farm. If the buildings had burned down the basis for life on Hakos would have been destroyed (Fig. 12 and Fig. 14).

Take a look around. What does the burned savannah (Fig. 13) look like today? The vegetation shows an impressing ability to regenerate quickly. Especially grasses have an advantage over the bushes (see station 12 „bush encroachment“).

Figure 13: Charred remains around the Rivier after the grass fire in September 2007. Picture: R. Glawion.

Figure 14: The seat of fire dangerously close to the farm buildings. Picture: J. Ohlert.

8 Drilling 120 m deep – and finding only sewage water

On Hakos the average rainfall is 267 mm per year. In contrast 3000 mm would evaporate if water would be stored in the open. In other terms 3000 liters or 21 bath tubs per square meter would evaporate. Hence the rain water cannot cover the water requirements of Hakos. Since the farm has no access to the public water network a different solution to get water is the access to ground water.

Stone as far as the drill can reach

To exploit a new source of ground water a hole is drilled into the ground (Fig. 15). Water bearing gaps are cut and feed water into the drilling hole. For a long time Hakos supplied itself with only one well. If this went dry it would mean the end of the farm. Therefore it was very important to find a new source of water.

Figure 15: Drilling the new well. Picture: R. Glawion.

Everything seemed great at first, when a water vein was found after drilling through 120 m of stony soil (Fig. 16). The fact that the water from the new well could not be used as drinking water led to a big disappointment. The nitrate concentration of the water is too high, therefore it cannot be used as drinking water for humans.

Figure 16: Water, finally! But not quite a cause for celebration. Picture: R. Glawion.

But not only humans need to drink water. Plants and animals can tolerate higher nitrate concentrations and are thankful consumers of this water.

9 Wild animals at the zebra watering place

The watering place in front of you contains the water coming from the new well (station 8) (Fig. 17). The watering place is named after the zebras that come close to the farm house in the dry season. The best time to observe them is in the early morning.

Figure 17: Horses at the zebra watering place. Picture: J. Heinzmann.

Hakos: a paradise for animals

Many different animals live on the farm. You can encounter antelopes like Oryx or Big Kudu on the farm. At least one group of mountain baboons hangs around the farm. Big cats such as leopards or cheetahs sometimes visit to the farm premises but they are seldom seen.

Delicious wild animals

The hosts regularly hunt wild animals for dinner at the farm house. The advantages are: The meat is fresh, has a high quality and is cheap. Additionally you save the time to go shopping in Windhoek. Some go as far as saying: “The Kudu tonight is organic meat”.

The families of the workers also get to enjoy the meat. Next to their salary they get meat rations on a regular basis.

10 The farm's own water guidance system

23°14'81.7"S
16°21'49.2"E

The pasture fence in front of you now is used in a new way. It used to divide the big farm area into small pastures called kamps. Nowadays it serves as a part of the farm's own water guidance system (see station 5, page 16).

Compared to iron tubes the water pipes out of plastic last almost 10 years longer in the difficult climatic conditions. Iron pipes rust after only 20 years. And if a Kudu of horse should damage the pipe when jumping over it the leak can be detected from far away due to a water fountain (Fig. 18).

Figure 18: Damaged pasture fence. Picture: J. Heinzmann.

11 A location reveals differences

23°13'32.8"S
16°21'17.1"E

The farm's drinking water is pumped from a well at 229 m altitude up to the water tower (Fig. 19). To prevent the pressure in the pipes from becoming too high, the intermediate pump house you are standing in front of now was built.

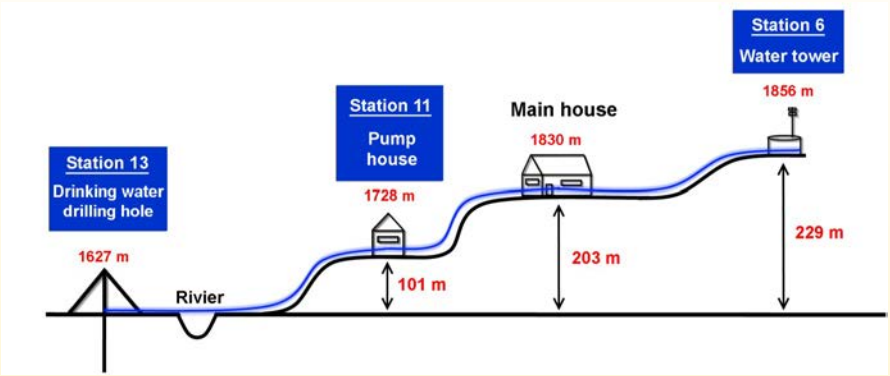

Figure 19: Differences of altitude on Hakos. Graphic: J. Heinzmann.

Until 2012 the drinking water was produced from the well using a diesel powered pump. But fuel is becoming increasingly expensive and has to be transported over from Windhoek. That is why solar powered pumps are gradually being installed at all of the farm's wells (Fig. 20).

Figure 20: Solar panels for the electric pump at the new well. Picture: J. Heinzmann.

12 Useless thicket due to bush encroachment

Bush encroachment is a danger to sustainable cattle farming. This describes an extensive proliferation of bushes, e. g. *Acacia mellifera* (in front of you, also Fig. 21). The vegetation makes part of the farm inaccessible to large livestock and thus worthless to the farmers. If bush encroachment gets out of control, the farm is ruined.

What are the causes?

Bush encroachment can have several causes. How these correlate has not yet been conclusively resolved by scientists. Possible causes are:

1) **Overgrazing** can repress the growth of grasses. As a consequence bushes can further spread.

2) **Fires**, that affect bushes more than grasses, are often subdued by humans. If fires do occur, they often lack the power to damage bushes because grass (the fuel) has been grazed off by livestock.

3) **Large wild animals,** like elephants, that trample down bushes are **missing**. There aren't enough Antelopes, who like to eat the foliage off the bushes.

4) The **Acacia itself** does not only spread through seeds, but also by sprouting small shoots out of stumps.

Additionally the Acacia's branches have a special characteristic. Take a close look at them.

Figure 21: *Acacia mellifera*. Picture: J. Heinzmann.

The hook-shaped thorns on the branches protect the Acacia from being eaten.

13 Only one well for the whole farm

This well is currently the only source of drinking water for Hakos. Several attempts were made to drill a new well, but met only limited success. A closer look at the geology of the area shows us why it is so hard to find a water vein.

History of the subsurface

About 750 million years ago a gigantic arm of the ocean, the Damara sea spread over the where you are standing today (Fig. 22).

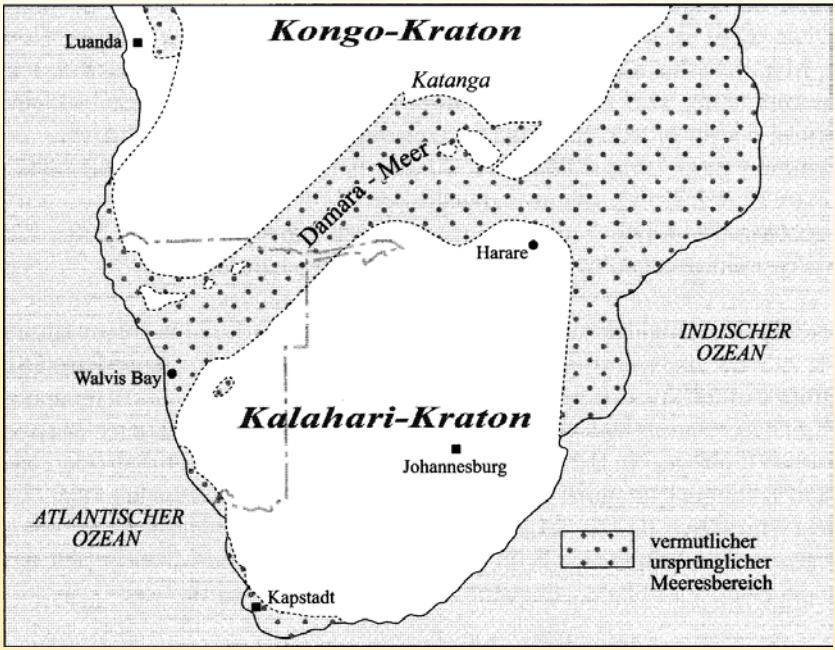

Figure 22: The Damara sea. Source: GRÜNERT 2008, S. 22.

This arm separated two former continents, the Kongo- and Kalahari-Kraton. Sediments from both continents were deposited in the ocean in between.

These sediments were layered horizontally like a sandwich. In the following millions of years (until about 460 million years ago) both continents moved towards each other like two bumper cars, this lead to the material between the continents being squeezed. The sediments of the former Damara sea were folded and pushed upward.

Formation of the rocks

Compaction under high pressure and high temperatures led to the formation of “quartzite rock” out of sand, “gneiss” and “granite conglomerates” or “mica-schist” out of clayey-sandy sediments. The formerly horizontally layered sediments were folded, corrugated and overturned and today form the Hakos mountains. These rocks can easily be found on the Hakos grounds: “quartzite rock” can be identified by their white milky appearance, “gneiss” by the light/dark banding, “mica-schist” by its sparkling in the sun.

Water veins in the bedrock

The folding of the Hakos mountains shifted the layers of rock containing water, usually situated in between impervious layers, in such a way, that it is nearly impossible today to predetermine where water can be found in the subsurface.

Reading tips:

Schneider, Gabi (2008): The roadside geology of Namibia. 2. Edition. Berlin/Stuttgart: Gebrüder Borntraeger.

Grünert, NICOLE (2008): Namibias faszinierende Geologie – Ein Reisehandbuch. 6. Auflage. Göttingen: Klaus Hess Verlag.

14 From the porcine flop to the observatory

“I’ll become independent from the rain”. Cattle graze on the pastures grass. And grass only grows, if it has rained. The former owner of Hakos, Arend Brink jr., changed from cattle farming to pig farming. The pig stables stand proof of this fiasco (Fig. 23). Pig farming may be independent from widespread vegetation as animal food, but pigs require large quantities of fodder. The former owner had to travel to Windhoek every other day to buy the food. The commuting was so costly, that the pig farming, as well as the farm in general, was soon given up.

The insight is: The farm has to be largely independent.

Today the grounds of the former pigsty are used by the “Internationale Amateursternwarte e.V.” (IAS) for astronomical Research (www.ias-observatory.org).

Figure 23: Former pigsty, today used as an observatory, from above in 2007. Picture: S. Messner.

Look back towards the main farmhouse. Can you spot what all has changed in the last 50-60 years (Fig. 24)?

Figure 24: The main farm house, about 1955. Picture: Hakos-Archive.

Acknowledgements

The information describing the discovery area is based largely on interviews with Walter J. Straube, Waltraud Eppelmann and Friedhelm Hund conducted in 2011. I want to thank the people of Hakos for providing their time, materials from the archives and pictures. Further pictures were provided by Rainer Glawion, Stephan Messner, Johanna Merkle and Johannes Ohlert who I also want to thank.

Julius Heinzmann

Further information can be found at www.hakos-astrofarm.com or by approaching the hosts.

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Thank you for being an explorer at Hakos. Hopefully you enjoyed the experience. Hakos would be glad to have you back.

Imprint

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Arbeitsgruppe Landschaftsinterpretation

Institut für Physische Geographie

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http://www.geographie.uni-freiburg.de/de/forschungsschwerpunkte/forschungsschwerpunkte-nki

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