

# The Man Who Farms WATER

by Brad Lancaster



While traveling through Southern Africa this past summer I heard of a man who was farming water. I set out to find him without much of an idea of where I was going. Soon I was packed in a colorful old bus roaring through the southern countryside of Zimbabwe at about 30 miles per hour. The scenery was beautiful with rolling hills of yellow grass upon red earth and small thickets of twisting, sometimes umbrella-like trees. I faded in and out of sleep until nine hours later we were in Zimbabwe's driest region. We crested a pass of low lying semi-desert vegetation to see below us a vast highveld prairie of undulating hills covered with dry grass and often capped with barren outcroppings of granite. Trees were sparse. I was reminded of the open grasslands of southeastern Arizona. In fact, all was covered by a wonderful expanse of clear blue sky as one would see in the arid southwest. The bus crept down into the dry grassland and stopped in the small rural town of Zvishavane. This was the area where the water farmer lived, but as the sun was setting I walked off to find a spot to lay my sleeping bag and went to sleep.

In the morning I hitched a ride with the local director of CARE International. She took me to a row of single-story houses. One of these was the simple office of the Zvishavane Water Resources Project (ZWRP). There on the porch, reading the Bible, sat the water farmer.

As my ride came to a stop he sprung up with a huge smile and warm greetings. Here at last was Mr. Zephania Phiri Maseko. When he learned of how far I had traveled he burst into a wonderful laugh. He told me that lately visitors from all over the globe seemed to be pouring in almost daily. Nonetheless, each one is an unexpected surprise.

In the landrover bouncing over worn and eroded dirt roads towards his farm Mr. Phiri was talking, laughing and gesturing—endless streams of poetic analogies and stories. The best story of all was his own.

In 1964 he was fired from his job on the railway for being politically active against the White Rhodesian government. He was told by the government that he would never work again in any position.

Having to support a family of eight, Mr. Phiri turned to the only two things he had, a 3-hectare family landholding and the Bible. He didn't just use the Bible for spiritual guidance or inspiration, he also used it as a gardening manual. Reading Genesis he saw that everything Adam and Eve needed was provided by the Garden of Eden. "So," thought Mr. Phiri, "I must create my own Garden of Eden." Yet Mr. Phiri also realized that Adam and Eve had the Tigris and Euphrates rivers in their region, but he didn't even have an ephemeral creek. "So," thought Mr. Phiri, "I must also create my own rivers." He has done both.

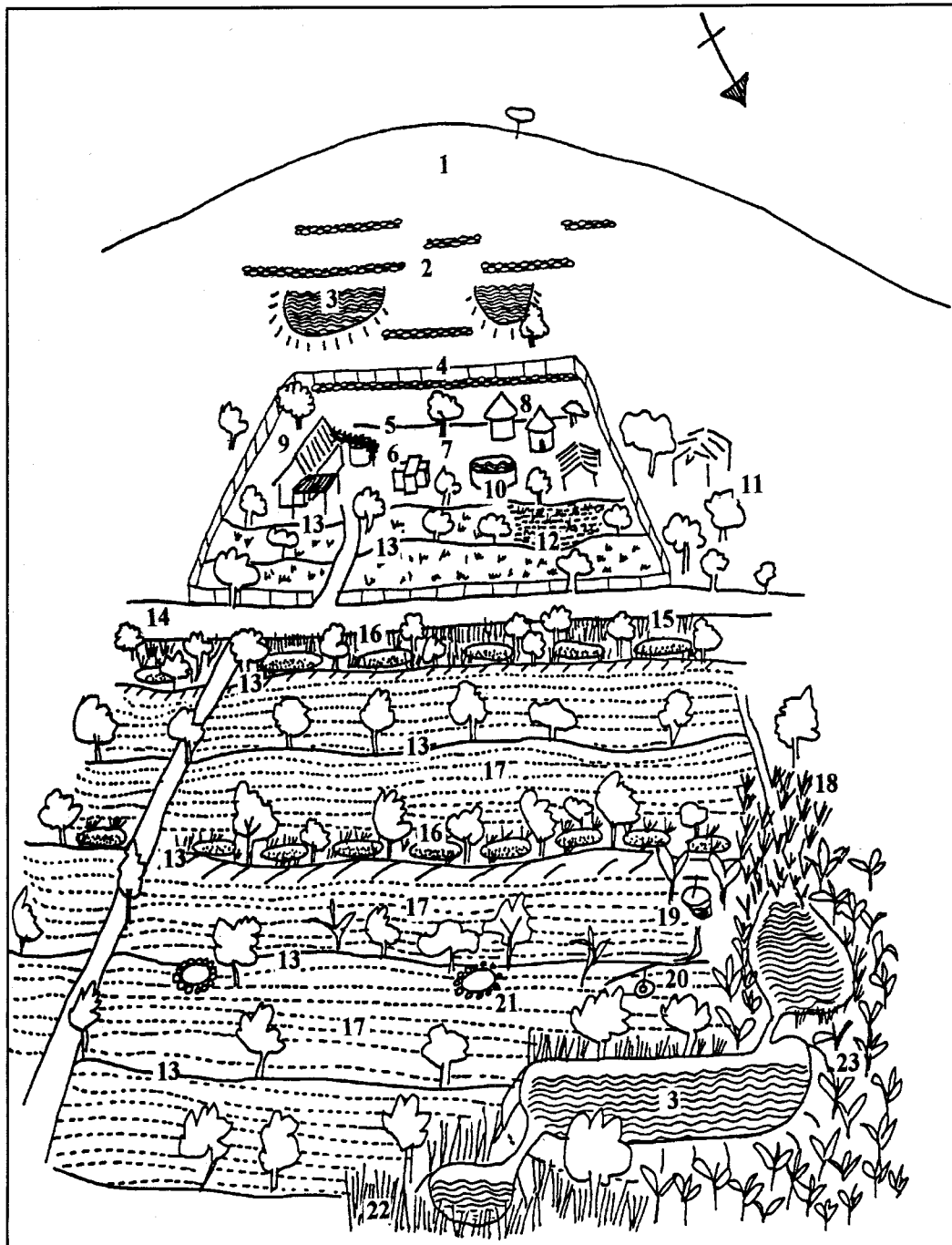
His farm is on the slope of a hill facing north-northeast (remember this is in the Southern Hemisphere). The top of the hill is a large exposed granite dome from which storm runoff once freely flowed. The average annual rainfall is 570 mm (just over 22 inches). However, as Mr. Phiri points out, this is an average based on extremes. Many years are drought years when the land is lucky to receive 12 inches of rain.

When he began it was very difficult to successfully grow crops let alone make a profit due to the frequent droughts and zero equipment or capital for irrigation from groundwater. He spent time observing what would happen when it did rain. In small depressions and upslope of rocks and plants the soil moisture would linger longer than in areas where sheet flow went unchecked. Thus began his self education in rainwater harvesting and his work. Over a period of 30 years he has created a sustainable system that provides all his water needs from rainfall alone.

"You start catchment upstream and heal the young before the old/deep gullies downstream," says Mr. Phiri. Beginning at the top of the watershed he built unmortared stone walls at random intervals on contour. Acting much like gabions, these walls slow the flow of storm runoff as the water moves through the spaces between the stones. This makes the water running off the granite dome more manageable as it is directed to unlined reservoirs, which like everything else were built with nothing more than hand tools and the sweat of Mr. Phiri and his two wives. The larger of the two reser-

## KEY

1. Granite dome
2. Unmortared stone walls
3. Reservoir
4. Fence with unmortared stone wall
5. Swale/terrace
6. Outdoor wash basin
7. Chickens and turkeys run freely in courtyard
8. Traditional round houses with thatched roofs
9. Main house with vine-covered cistern and ramada
10. Open ferrocement cistern
11. Kraal—cattle and goats
12. Courtyard garden
13. Swale
14. Dirt road
15. Thatch grass and thick vegetation
16. Fruition pit in large swale
17. Crops
18. Dense grasses
19. Well with hand pump
20. Donkey pump
21. Open unmortared wells
22. Reeds and sugar cane
23. Dense banana grove



*Illustration by Silvia Rayces from a drawing by Brad Lancaster*

voirs Mr. Phiri calls his immigration center. "It is here that I welcome the water to my farm and then direct it to where it will live in the soil," laughed Mr. Phiri.

"The soil," he explains, "is like a tin. The tin should hold all water. Gullies and erosion are like holes in the tin which allow water and organic matter to escape. These must be plugged."

Mr. Phiri's "immigration center" is also a water gauge, for he knows that if it fills three times in a season enough rain will have infiltrated into the groundwater to last for two years.

The smaller reservoir directs water via a culvert to an above ground ferrocement cistern which feeds his courtyard in dry spells. He also has a ferrocement cistern, shaded by a lush granadilla creeper, collecting water from his roof. Aside

from these two cisterns all other water harvesting structures on the farm aim to infiltrate the water into the soil as soon as possible. Near the home is an outdoor wash basin from which all greywater is drained to a covered, unmortared, stone-lined, underground cistern where the water quickly infiltrates.

From the top of the watershed to the bottom there are numerous water harvesting structures such as check dam walls, gabions, terraces, swales, and fruition pits.

The government had put in large swales many years ago throughout the region, but they had put them just off contour so that they'd stop sheet flow erosion and carry the storm runoff to a central drainage. The erosion problem was solved, but all the lands were being robbed of their water. So Mr. Phiri dug large "fruition pits" about 10' x 6' x 4' in the basins

## *"Slowly implement these projects and as you begin to rhyme with nature soon other lives will start to rhyme with yours."*

of all his swales. When it rains the pits fill with water and the overflow runs into the next pit and so on up to his property line. Long after the rain, water remains in the fruition pits percolating into the soil. Around the pits thatch grasses are grown for erosion control, building, and sale.

Many thriving fruit trees have also been planted by Mr. Phiri along the swales to provide food, shade, and wind breaks. They're watered strictly by rain and the rising groundwater in the soil. As Mr. Phiri explains, "I am digging fruition pits and swales to plant the water so that it can germinate elsewhere."

"I have then taught the trees my system," continues Mr. Phiri. "They understand it and my language. I put them here and tell them, 'Look the water is there. Now, go and get it.'" No basin and berm for holding and denying water is put around them, but rather roots are encouraged to stretch out and find water.

A diverse mix of open pollinated crops such as squash, corn, peppers, eggplant, reeds for baskets, tomatoes, lettuce, spinach, peas, garlic, onion, beans, granadilla, mango, guava, and paw paws, along with such indigenous crops and trees as matobve, muchakata, munyii, and mutamba are planted between the swales. This diversity gives him food security for if some crops fail due to drought, disease, or pests others will survive. The use of open pollinated varieties enables Mr. Phiri to collect, select, and use his own seed from one year to the next.

Nitrogen fixing plants abound. The pidgeon pea is one example, and is also used for fodder and mulch. Mr. Phiri has found that fertilized soils don't take and/or hold water well. As he says, "You apply fertilizer one year, but not the next and the plants die. Apply manure and nitrogen-fixing plants once and the plants continue to do well year after year. Fertilized soil is bitter."

The food and fruit Mr. Phiri produces is anything but bitter. He's been generous in his abundance, giving away trees to anyone who wants them. Unfortunately, as Mr. Phiri points out, the majority of the trees he gives away die when people do not implement rainwater harvesting techniques before planting. He propagates his trees in old rice and grain bags near one of three open wells near the bottom of his property. Mr. Phiri describes the open wells with another analogy. "Water is like blood—it is always attracted to the wound. Gullies are wounds. Blood goes to the wound to coagulate and heal it. It does this with gabions and swales where the gully is filled with fertile soil." With this knowledge Mr. Phiri dug his three wells at the bottom of his land knowing the water harvested throughout his land would seep into the soil and make its way to the wounds below.

The soil is his catchment tank. In times of drought his neighbors' wells go dry (even those that are deeper than Mr. Phiri's) yet Mr. Phiri's wells always have water "into which I can dip my fingers," for he is putting far more water into the soil.

Except for one well, which is lined with a hand pump for household water use, the others are all open and lined with unmortared stone. "These wells," explains Phiri, "are those of an unselfish man. The water comes and goes as it pleases, for you see, in my land it is everywhere."

In times of severe drought Mr. Phiri will draw from these wells to water annuals in nearby fields. He uses a donkey pump, also known as an Egyptian Shaduf, which is simply a hand pump that uses an old tractor tire to pump the water. A crank opens and closes a bladder (the tire) like an accordion, creating the needed suction. A lush natural wetland lies below the wells at the lowest point of Mr. Phiri's property. Here, Mr. Phiri practices aquaculture in a series of three reservoirs. As the smaller two dry up the fish are harvested or relocated to the largest. It is also here that Mr. Phiri densely grows bananas! Dry lands all around him, yet here on Mr. Phiri's farm is a thick forest of bananas! Sugarcane, reeds, and grasses such as elephant grass are also grown on and leading up to the banks to hold the soil. His livestock benefits from the dense grasses, grown to sift the water as it enters the reservoirs. This prime fodder is reserved for his cows when in calf.

When Mr. Phiri began he was forced to appear in court three times for violating laws that prohibited cultivation in wetlands. These were laws that had been around since colonial times. Finally, on his third court appearance he was able to convince the magistrate to come see his farm. Upon seeing Mr. Phiri's work the magistrate was so impressed that he dropped all charges on the spot.

Within the soil of the farm lie the Tigris and Euphrates rivers; the reservoirs are where they surface. The cycle of Mr. Phiri's Garden of Eden, starting to be noticed after 30 years of obscurity and sometimes scorn, continues to grow. Of the last three decades Mr. Phiri says, "Sure, it's a slow process, but that's LIFE. Slowly implement these projects and as you begin to rhyme with nature soon other lives will start to rhyme with yours." He and the NGO he created, the Zvishavane Water Resources Project, are spreading his techniques. He has influenced CARE International in his region to the point that, rather than giving away food, they now implement Mr. Phiri's methods so that people can grow their own food.

He has also gone to schools where the teachers were striking due to lack of water and the harsh conditions in dusty, wind-scraped classrooms. He taught the teachers and students how to harvest the rainfall, and together they've turned the schools into lush gardens and now have no reason to strike. "Remember children are our flowers," says Mr. Phiri, "give them water and they will grow and bloom."

*Mr. Phiri's project is very much at the grassroots level (a big reason why it works), yet the Zvishavane Water Resources Project is always in need of funds. If you'd like to help write to Mr. Zephania Phiri Maseko, ZWRP, PO Box 118, Zvishavane, Zimbabwe.*