

Chapter 4

Water

This chapter begins not with an epigram, but rather an epilogue. I wrote the first draft of the chapter early in 1997. Discussions in Dublin later that summer about the early history of the Malangali Water Supply Scheme (MWSS) provided the basis for some revisions. I continued to feel isolated in some of the conclusions to the chapter, and left the text sitting untouched for several months. I claim that the water project was the most successful aspect of Concern's decade in Malangali, while most Concern management regret that the organization ever involved itself in the effort. I argue that the use of the sustainability concept was detrimental to the objective of creating a functioning water system, while most everything I read continues to invoke a particular notion of sustainability as the definition of a successful aid project. Mostly, though, I remained uncomfortable because the chapter goes out on a limb by predicting the ultimate collapse of the MWSS.

When I returned to Malangali in June 1998, water was flowing out of the pipe near my house in Isimikinyi. I was glad for my neighbors that the system continued to function, and discussions supported my conclusions that the water scheme was the most notable lasting contribution from the Concern era. But what of my prognostications? Within a few weeks I was to learn, sadly, that I was right: a year and a half after the official handover, the MWSS is falling apart. My first indication of the system's problems came on a run through the woods to the south. Five miles south of Mwilavila, the disused road crosses the pipe that brings water to two remote villages. The pipe is supposed to be

buried a meter deep, but I had to alter my gait to jump over it as it emerged from the ground. A few days later women from all the households in my neighborhood scurried to the tap near my house. Because this tap is fed by a minor spur that drains from a lower than usual point on the village tank, it is usually the last to stop working when there is a general system failure. The women, having seen the water cease at the other taps – signs they knew all too well indicated a failure was imminent – knew they had better collect as much water as quickly as they could. As the dry season set in, the water began to fail frequently, causing problems for household needs and for the men who had started making bricks the moment they finished the harvest.

In late June I talked with Shija, Malangali's chief water engineer. I asked first about the pipe I had seen exposed. "This is a big problem," Shija said. "The rains were so heavy this year, many pipes were exposed. In the forest there are places where the dirt has even been washed out from beneath the pipes. There hasn't been any water to Ikangamwani and Idimuluvanu for several months." I asked what was being done to fix the problem. "We are trying to gather the money in the villages. But we need to buy new pipe, which is very expensive, so they are trying to get some money from the district government. It will be very hard work, we have to carry the pipe 11 kilometers by hand." I asked if any transport could become available to help them. "Where?" he asked. "Even my motorcycle, I no longer get an allowance for petrol. Concern is gone, they don't want to hear about our problems. Where else would we get a truck?" I replied that the water tax had increased to 1000/= (\$1.50) from 400/= (60 cents) in 1996, perhaps they could rent one. Shija laughed, asking, "Do you think we can fix the system with that money?"

Map 4.1: Malangali Water Supply Scheme Main Lines (Schematic)

Pipelines

This chapter tells the human story surrounding the pipes of the Malangali Water Supply Scheme, pipes that carry water to many thousands of people.¹ How the pipes got buried in the ground, and why they are beginning to surface and crack, involves interactions between people and ideas about development in Europe and Africa.

I examine:

- 1) the place that development programs occupy within local politics,
- 2) the interplay of the many development messages that people receive, and
- 3) the convergence and divergence of goals between Malangali residents and the development agency.

Though the Malangali Water Supply Scheme (MWSS) was not originally begun by Concern, the resources and care they put into its rehabilitation and extension make it a crowning achievement of their decade in the division. The system is not perfect, but it is one in which its creators can take justifiable pride. A reader interested in stories of “success” or “failure” of development projects can find the former in this chapter. I will tell the human story of how Africans and Europeans converged in defining both problem and

¹ Concern estimated in November 1996 that 7000 households were served. The estimate was made by the Program Coordinator (PC) in advance of the President’s visit to officially open the Malangali Water Supply Scheme. The number is artificially high. Mwilavila, the largest village on the scheme, was estimated by the PC to have 500 households in 1995. The other eight villages served probably average a maximum of 400 households each, based on my census of 4 subvillages in 3 scheme villages and mapping exercises in 6 subvillages in 3 additional villages in the division. If we accept the PC’s estimate of 5 people per household (a reasonable figure), then no more than 18,500 people are served in 3700 households. In addition, many households within most villages are completely missed by the distribution system, including at least one entire subvillage in Kingege. Even so, the number of people served is probably well above 10,000, or about one third of all the people in the 21 villages of Malangali division.

solution. Joint resources were brought to the task even when precise communication was lacking, and the goal was reached. The happy story has a sad end, however. The completion of the system marked the divergence of the harmony that created the water scheme, and may well have set the stage for its ultimate failure.

The MWSS is a project different in style from the agriculture and forestry projects of Chapters 2 and 3. All three are attempts to bring technical expertise to bear on local problems. The agricultural project (and its parallel horticulture project) relied almost exclusively on education to persuade people to modify their farming practices. The forestry project relied on education, legislation, and the distribution of the tools of forestry (usually potted seedlings) to willing individuals. By contrast, the MWSS implanted its technical component – pipes – with little education or discussion with the people involved. A “community development” (CD) component was added late in the project’s run, at the urging of John Woods, in an attempt to improve communication in anticipation of the handover. Even so, as we will see, the project never reached the “participatory” level its planners espoused. The project was successful *despite* its authoritarian structure. The success occurred because the residents were eager for the anticipated results, even if their labor was conscripted and their usual activities disrupted.

Tourism When important guests or overseas visitors come to Malangali, they are often given a tour of the MWSS. The visitors who take the tour are generally government officials, Concern personnel from elsewhere (including from Dar es Salaam and Dublin head offices), and various European guests such as people from other development agencies and family and friends of field staff. The water system is an

impressive feature of the Malangali landscape. At least one large cement tank in each of nine villages, roughly 250 taps (also called distribution points) for people to collect water, and a total of 140 kilometers of pipe now bring Ruaha river water from the intake to more than 2000 households. The physical display of the system, with accompanying descriptions of the engineering accomplishments, joins visitors in a social appreciation of development working. This social experience of the MWSS is one aspect of a technological project that has intersected with many thousand lives.

I joined the tour twice. The first time, during my second brief visit to Malangali in 1993, I was one of two official guests. The tour was led by John Woods, a dynamic engineer from Belfast with a passion for the potential social benefits of his work. After I returned for my field research period in 1995, I was aware of quite a few times when visitors were taken to see the intake. In late 1996 I accompanied a Concern visitor on his first trip to see the system. John had long since returned to Belfast, and the Irish engineer who replaced him for two years was also long gone. The tour and the project were in the capable hands of Shija, a Tanzanian engineer with the common touch. Shija and I had many conversations about both technical and social aspects of the water system, including one taped interview, and often talked about water as we shared rides to remote corners of the division. John and I talked about these aspects at some length in Dublin in 1997, drawing diagrams on scratch paper in a pub as we reminisced about mutual friends. For descriptive purposes, as discussed in the Introduction, I combine these many occasions into one narrative, a tour to the MWSS intake in 1993. Through this composite approach, I hope to engage the reader in the social experience of the development tourist

visiting Malangali² while also presenting factual information about the water system that is important to the discussion that follows.

The Land Cruiser stopped when it ran out of track at the valley bottom. John told the driver to meet us at the end of another track a few miles downstream. Getting out of the car, he addressed his visitors, myself and a young Irishwoman named Mary. “This is the intake for the water system. You see where they have built this dam? Now over here, the dam diverts a little water into this section.”

Mary asked, “It just flows into the pipe all day long like this?”

John said it should. “It silts up, so every year we have to stop the flow with this cut-off here and dredge the mud. The water usually stays off three or four days.”

I asked who did the work. He said, “That sort of work, we get people from the villages. We arrange with the village government that we should have a certain number of people on a certain day, then we send the pickup to get them and drive them here. Also for digging trenches, we get help from the villages. For laying pipe, sort of the skilled labor, we hire men as casual day labor. We’ll see some of them farther downstream. Here, let’s walk this way.” We walked along twin pipelines of solid steel.

² In *Rural Development: Putting the Last First*, Robert Chambers (1983) discusses at length the phenomenon of development tourism. He describes how official visitors are brought to rural development sites, shown the most striking infrastructure project undertakings, and whisked quickly back to the major town in four-wheel-drive vehicles. He writes, “it is through this rural development tourism, if at all, that ‘core’ (urban-based, professional, powerful) visitors see and meet those who are ‘peripheral’ (rural, uneducated, weak). The brief rural visits by ‘core’ personnel can scarcely fail to play a key part in forming their impressions and beliefs and influencing their decisions and actions.” (Chambers, 1983: 10-11) Chamber’s book is ubiquitous on the shelves of development programs that see themselves as progressive; for example, copies are available throughout the Concern system, and more than a dozen were on the shelves of Peace Corps headquarters in Dar es Salaam in 1992. Many Concern expatriate staff, and a few senior Tanzanians, have read the book and identify with Chamber’s many critiques. This awareness does not stop the Concern projects from embodying in many particulars, such as development tourism, the practices that Chambers argues help defeat the development endeavor.

“How clean is the water?” Mary wanted to know.

“I wouldn’t drink from it. It’s just river water. People up there bring their cows to drink [motioning upstream], and there’s runoff from pesticides and people’s latrines. We treat the water at the Ibangi tank,³ but you should still boil it.”

“Do people boil it?”

“Sometimes,” he said, “but it still isn’t done enough.” Then he explained why there were two parallel pipelines. “That’s something new. You see how it’s different kinds of pipe? The old pipeline was laid down in the 1970s. When Concern came it was in horrible shape. Really badly laid. This gully, like this, it would cross without any support tresses. And these areas where the soil erodes, there was no protection. We had to go build all these erosion walls, and the support structures when the ground is below the pipe. What Concern did was lay the second pipeline while water was still flowing through the old one. Now we’re going back and repairing the first pipe so there’s always a backup. Bend down, you can hear water rushing through the new pipe but not the other.”

We bent on hands and knees, our ears to the pipe, and heard a sound like a distant highway. He explained, “Later on it all joins together, once we get to a little ‘break-pressure’ tank above the river.”

Mary asked him, “How do you get the water to rise above the river?”

“No, it’s all gravity,” said John. “See, the intake is back here, we’re 11 kilometers from Mwilavila, upstream. So we’re at a high point, and the river of course flows

³ The chemicals ran out and the cleaning system broke down sometime after the 1993 tour occurred.

downhill. It's pretty gradual, but it's several hundred feet."

"But the pipeline is descending along with the river."

"Right, but then it goes up again. What's important is that the outlet is lower than the source. The water will climb uphill if it is in the pipe, as long as it stays below the intake's altitude. We just have to be careful about pressure. Climb up here, I'll show you." He sprinted up to a high point where the pipe crested. "This mechanism, this is a pressure release valve. If somehow you get air in the pipes, it can block the water, like when we have to stop the water for maintenance the pipe fills with air. With these valves, you can release the air pressure. The old kind you have to do it manually. We want to go to the automatic ones, but they're more expensive."

I asked where the valves come from. "Everything comes from Europe. All the pipes and everything! I wish they could get the pipes at least from Africa, but you just can't. There's some supplier in Nairobi, but it's crappy pipes. But then if there's a screw up – we waited six months for pipes from Europe and when they showed up it was all the wrong pipes, it took another three months to get the right ones." He paused and pointed. "This is called a wash-out, it's kind of the opposite of the pressure relief valve. Now it's at the low point of a trough, it's where sand and junk can collect and block things up. So we have to come here and open the valve to wash out the sand, like this."

"How far does the system go, is it just to Mwilavila and Isimikinyi?" I asked, stumbling over the names of the two villages we visited earlier.

"No, no, it's a huge system. It's supposed to be almost 140 kilometers of pipes! It's nine villages. Up ahead, the car will take us, after these two pipes join, the line splits

again and one line goes back across the river to Tambalang'ombe and Ipilimo. You see that ridge way over there? When it's done the water is supposed to reach *over* that ridge. Then the other branch, the main branch, it goes and empties into the tank at Ibangi, that's another high point. A small line goes down to Mwilavila, it fills the tank there, and the rest goes across the valley to Kingege, then it splits again and some goes to Isimikinyi and Itengule and Ihowanza, and some is supposed to go to a couple of villages to the south. It's really huge, it'll be a miracle if it ever all works."

Mary enquired when the work will all be done. He answered, "They're saying 1995, but there's no way. Maybe 1996. Maybe. Come, follow me." He sprinted up a ravine. "Now this, this is a spring you can drink from. See, no cows out here pissing in the woods, no houses. Try this, you look hot."

After a drink, we hiked on until we came to a dozen or so African men wrestling with a pipe. John's gentle manner overcame his lack of Swahili in the eyes of the work crew, who talked about him fondly years later. Bedecked in a floppy straw hat, oversized gloves, and a nose covering to protect him from the sun that burned him to illness, he encouraged me to participate in the heavy labor. More than an hour later, wet and sweaty, the men had joined the new lengths of pipe to the old section and extended the flow several dozen more feet. On the ride back the tour stopped at the Ibangi tank, a large round cement structure where the main road crests before descending to Mwilavila.

John explained, "Now up here is where the pipeline empties from the intake into the tank." He climbed the ladder to the top of the tank and lifted the cement covering. See this float? If it rises all the way to about this high, it stops the flow from the pipe, so

the system only takes the water from the river that it needs, it's better than having it run over here."

"Kind of like a toilet," I said.

"Exactly, it's the same mechanism, only a lot more expensive. Imported, of course. Remember I told you the water to Mwilavila splits off here? Look, these two pipes are where the water goes out to the main lines. See this smaller one is higher? That's the one for Mwilavila. They have this way of taking too much water. There are a lot of private taps, all the teacher's homes have their own tap. And then Danida put in flush toilets for the school! Also cause there's a lot of private gardens, people are always using water. So what we did, by making their outlet higher, if the water level gets too low then Mwilavila gets cut off but water keeps going to the rest of the villages."

"Do they know you did that?"

"I think an early engineer just went ahead and did it. Because the system is designed to give 33 liters a day to each person along the lines, and it was never going to work the way it was. The whole thing was originally built for Mwilavila, but once the other villages were added the tank just had to be changed. Because Mwilavila is never going to just agree to cut back. It'll never work if people take too much water."

"Will it ever work?" I ask skeptically.

"Maybe. Technically it could. I hope so."

Three years later the system worked as well as John hoped. His brief contract had long since expired. He was replaced by Ben, a young Irish engineer, and at the end of Ben's two year stint the program was left in Shija's competent hands. Throughout 1996

Shija was busy putting finishing touches on the system and preparing for the day when Concern support would dry up. Most of the field research for this chapter was conducted during this final year.

Labor We can usefully contrast the forced labor aspects of the MWSS with those of the *Ujamaa* cooperative farms of the 1970s. The same people were required to give labor in each. As discussed in Chapter 2, many Malangali residents were resettled in the *Ujamaa* period from scattered homesteads to more concentrated village areas. In Nyerere's vision of African socialism, people not only lived together but farmed together on village cooperatives. Work on the cooperative farms was mandatory for each person on prescribed days of the week. Interviewees for this research resented the time they lost to the cooperative farms, and did not recall any benefit they derived from their participation. In contrast, people went willingly to dig trenches for the MWSS, once they saw that the water might actually come near their houses. Both *Ujamaa* cooperatives and the MWSS involved legislated "participation" and heavy fines for non-compliance. Yet people recounted resisting the work requirements of *Ujamaa* in ways great and subtle, while their exertions in the trenches were undertaken with good cheer.

Mandatory labor is part of the regular experience of village life in Malangali division. Despite the failures of the cooperative *Ujamaa* farms, people are still required to work together for public goals. During the post-harvest season the villages institute "development days," two or three days a week when adults are expected to work on various projects. These projects include making bricks for public buildings, constructing houses for teachers, working on bridges (this did not happen in 1996, though many

people in Tambalang'ombe were hoping funds would be forthcoming for the necessary cement), or leveling the roads made treacherous by the rains. These activities are not popular. People often use various tactics to avoid personal participation, including claims of illness, sudden business away, showing up late, or lethargic work. They do not usually object to the *premise* of the work; I only heard a few grumbles related to the excessive preparations for the President's visit. However, most only participate because of the fines they would otherwise face. In fact, wealthier individuals sometimes choose to pay the 500/= (85 cents) daily fine so they can accomplish more urgent tasks, or pay 3000/= (\$5) up front to buy out of the entire year's communal work. One task that is shared by all the villages along the MWSS is annual maintenance of the intake and main line.

Participation in such water work is part of the normal "development days" work, made different only by the Concern truck arriving at a set time to take everyone upriver.

At a meeting in Isimikinyi in October 1996, labor for the water system was a topic for much discussion. The village chairman had called a meeting of the representative committee, the *wajumbe*, to discuss pressing business, and the Concern water team arrived with their own business to bring before the group. Bwashehe, the Community Development or "CD" officer for the MWSS, arrived via motorcycle with the division's program manager for CD, Chalamila. The water engineer, Shija, arrived on his own motorcycle. The village officials and Concern personnel were seated on chairs at the front of the room. The other twenty attendees sat on benches facing the head table. Chalamila asked that his item be placed first on the agenda so that he, Bwashehe, and

Shija could leave for other business.⁴

Chairman Masura called the meeting to order. “Okay, thank you Mr. Chalamila for coming today. We are happy you have the opportunity to visit us. The respected Chalamila has come to address us about an important matter.”

Chalamila began, “Thank you Mr. Chairman, and thanks to the subvillage chairs and the respected primary school headmaster.” To the assembled he called “Hello” in Kihehe.

We all answered in Kihehe, “Hello, how are you?”

In Kihehe, he answered “I am fine.” The he switched to back to Swahili. “I have come today with Mr. Bwashehe. I think you all know that Mr. Bwashehe deals with issues of water. He will explain to you why we are here.”

Introductions were exchanged, and Bwashehe addressed the group. “As you all know, the water system has never been completed here in Isimikinyi. The work stopped last year when the plastic pipes still had not yet reached several taps. We planned to finish laying the pipe last year, but unfortunately the pipe was stolen from the home where it was being stored. So we could never complete the work. Also, some of the old pipe from many years ago was laid very poorly. As we discussed in a meeting last year, the trenches for this pipe must be dug again. This pipe, in some places it is so shallow it has already come through the surface, you can see it. If we want the water to come for many years, we need to lay this pipe again. Mr. Chalamila.”

Chalamila agreed. “This is so, as we discussed last year. Now we know the work

⁴ The dialogue is a translation and reconstruction of non-verbatim notes taken in Swahili at the meeting.

that needs to be done. Mr. Shija, is the water engineering staff ready to continue this work?”

Shija took his cue. “The village collected the money to replace the stolen pipe. Now we have bought the new pipe, it is in the storage shed in Ibangi. We are ready to complete this work, even this week.”

“What do you need in order to finish the work?” Chalamila asked him.

“What we need now is for the people of this village to participate [*kushirikiana*, the same word used in relation to *Ujamaa* cooperatives] with us in digging the trenches. It is only that.”

Chalamila addressed the assembly. “Mr. Chairman, the only thing you need to complete the pipes in Isimikinyi is to dig the trenches. I know your next agenda item is, you will next be discussing the visit of the President. As you know, he will be officially opening the water system during his visit. It would be excellent if the water program in Isimikinyi could be entirely complete before the President visits. Shija, how long will the work take?”

“If all the adults participate, the work will only be two weeks.”

Chalamila continued, “Mr. Chairman, the President will arrive in a month. It is possible he will even pass through Isimikinyi. The work to finish the water will only take two weeks. The water engineer is ready. We have come to ask if the village of Isimikinyi is ready to participate.”

Chairman Masura addressed the group. “You have all heard what our guests have to say. Can we finish with the water before President Mkapa arrives? Yes, we can. I say

we can. This is work we can do. This work is our own profit for the development of our village. We will all bring our hoes every morning until the work is done. We will work strenuously, thank you Mr. Chalamila. Yes, what?"

Diana Mjane rose. "Mr. Chairman, thank you to our guests for coming today. I have just one question. Last year the people of Chanunu subvillage worked very hard to complete our section. We did not receive any help from the other people. We also worked hard in the past on the section for the central subvillages. My people have done their work for the water. I do not think my people should now be required to abandon their normal work to again go dig trenches for the water."

Masura was curt. Relations between the chairman and Mama Mjane were already barely civil because of other aspects of local politics. "This work is for the development of the village. Everybody must cooperate! We cannot have people decide helter skelter that they will sit at home because they already have water."

Diana objected, "My people are not lazy. They work very hard for village development. But I do not think they will agree to another two weeks of digging when they have already participated with effort far above the usual. I will tell them of the work, but they may not agree."

Masura then growled at a woman among the *wajumbe*. "Now what do you have to say?"

She rose. "I want to know, do the people who have private taps in their homes, will they work on this pipe too? People connected to the pipe and brought water to their homes, now they grow big gardens and get private profit selling vegetables. Other people

live too far from the main line, so they cannot bring water to their own gardens.⁵ How do we prevent some people from benefitting privately without contributing their share?”

Another member added, “They use too much water, then there is no pressure left for everyone.”

Masura proclaimed, “We are not talking about private taps today. We are talking about water for everyone. Everyone will work together.”

Bwashehe tried to calm the conversation. “It is important to discuss the private taps. There are too many taps now. Another day we should talk about this problem with the village water committee.”

Sandala, who grows tomatoes in his garden with a private tap, muttered under his breath, “This is not a problem. If we fix the water, there will be enough for everybody.”

Chalamila called for a decision. “So the village wants to start this work?”

Chairman Masura told him, “Come on Monday, the people will be ready.” To subvillage chairs, focusing especially on Diana, he said, “Monday morning your people must all arrive with their hoes. Do you understand?”

Sandala answered for all, “We understand. Monday morning, they will be ready.”

That Monday morning a couple dozen people arrived with hoes and started digging. Diana’s people refused to go. Included among those who did not show were all four of the chairman’s local wives and the Chanunu wife of his younger brother. Water to

⁵ People often confuse the “main line,” said in English, with the distribution lines. The main line brings water from the river to the tanks, and the distribution lines run from the tanks to the public tap outlets. Tapping the main line is rarely done anymore because the water program pressed cases against violators. There is currently a freeze in Isimikinyi and Mwilavila on private taps from the distribution system, but in the past it was relatively easy for someone who could afford the plastic pipe to get the water engineer’s permission to run a branch line.

Chanunu was cut off almost immediately. Diana rushed to the tank, where Shija explained that the work involved refitting her outlet from the tank and branching the pipe to the lower village from her line. An argument ensued about which outlet should be feeding the lower village. Eventually a plan was grudgingly agreed to. Diana assembled some people to do the digging around the pipe that would expedite reconnecting her subvillage. Unfortunately, a part was unavailable until the next day, so the water remained disconnected for more than 24 hours.

Meanwhile, residents of lower Isimikinyi were digging about 100 yards a day. The work was made much easier once the parts attaching the pipe to the tank were reinstalled; the water flowed down the trenches to soften the dirt and cool the laborers. The workers were mostly all grandparents, and the majority were women. I talked with a woman in a pink dress who was happy for the conversation break. We had met before, but she was not in my research area and we did not know each other well.

“Hard work!” I greeted her.

“Yes indeed, hard work. But we are making progress.”

I asked, “Where are all the young people? It is only elders digging today.”

“The young people, they are about their business,” she said. “You only must work for the development if you have a house of your own.”

“And the men, where are they?”

“Oh, there are men working. Many are up by the tank attaching the pipes. And some had business. Chairman Masura has a meeting in Mafinga, and some others are in Mwilavila planning for the President.”

“Do you have complaints about that?” I asked.

“I do not complain. The ones this work really concerns, we will tolerate it. We will persevere.”

I enquired about Diana’s subvillage. “The people of Chanunu, none are here?”

“Why should they be here?” she asked. “We are the ones without water. This job is our problem. We will hurry because now we have no water.”

“Even at night, they don’t reconnect the pipes?” I asked.

She said, “It can’t be done. Until the new trench reaches the taps, there is no water down below. If we want water again, we dig and dig.”

The trench digging in this scene is extraordinary in that people were expected to abandon all their other activities for two weeks, and that the labor could not be bought off. Martin Lugas spent time every day with his checklist of which residents were present, and rounded up any absentee who could be found. The people who showed up every day had one common characteristic: they were the ones whose water was temporarily cut off.

A woman interviewed in neighboring Kingege village had a much more negative view of the work she contributed to the MWSS. She and her neighbors were called to dig trenches many times over the years. First they helped lay the main line, then the distribution lines. One morning they showed up with their hoes to dig the extension to her neighborhood. She says that is the morning they were told the system was complete in her village, and the water would not reach near her home. “*Kazi bure*,” work for nothing, she grumbled, adding that if the day came that they could bring water to her cluster of neighbors, they would be ready with their hoes.

To ask the obvious question, what is it about piped water that is so appealing to Malangali residents? People repeated the same set of answers. First is convenience, or reduced labor. Second is that homes near taps could increase their water consumption, perhaps even starting vegetable gardens. Third is an often erroneous perception that the water from the pipes is cleaner than from streams. Fourth is the reliability of a source that keeps flowing right through the dry season.

These answers correspond closely with the rationales development agencies cite when undertaking projects such as the MWSS. Documents place emphasis on the enormous amount of time Africans, especially women, spend hauling water, and stress the health benefits of clean and plentiful water (Hannan-Andersson 1984, Drangert 1993). Development approaches vary, from boring wells to standing irrigation to piped water systems (Tschannerl 1971, Pickford 1988). They are also notoriously prone to failure. In *Watering White Elephants?*, Ole Therkildsen (1988) discusses several mammoth water schemes that collapsed in Tanzania, for reasons both technical and financial. Despite such failures, water programs remain a priority for African governments, development agencies, and the United Nations. The Concern program is noteworthy because it was effectively able to meet the goals of planners *and* of many area residents, and also because its “exit strategy” contained the seed of the program’s destruction.

Concern did not undertake the MWSS of its own accord. By all accounts, the agency sought to work in Malangali division in the mid 1980s because it deemed itself suited to instigate forestry, and then agricultural, work in the area. The water program pre-existed the agency, but it was in dire disrepair. Government representatives

petitioned Concern to look at the problem, and gradually the agency began to be involved in the system's rehabilitation. One staffer says, in addition to altruism, "an additional big reason for MWSS was to provide some visible evidence of progress, improve our credibility." The agency's engagement started with a little engineering advice and escalated to an £850,000 sterling (roughly \$1.5 million) endeavor that took many years to complete. Some employees think Concern got in far over their heads and should not soon repeat this kind of project. Officials at the Dublin head office told me they found the project a disaster of unsustainability.

I disagree. Interviewees and survey respondents repeated over and over how beneficial they find the MWSS. Even those who live closer to a stream than a tap often get their water from the tap because it is much easier to haul their full buckets *downhill* than up from the valley bottom. Concern research conducted by Juliet Dickey and Bwashehe (1995) found women had no theoretical objection to paying an annual water fee, and my subsequent research confirms their findings. What people lacked was resources and expertise. Concern was able to provide both. It was the application of these two factors toward a universally agreeable solution that enabled the success of the MWSS.

Put another way, the major obstacle between Malangali residents and an effective piped water system was £850,000. Not quite a million and a half dollars proved enough to buy all the expertise and equipment necessary to complete the system to all nine villages. Concern acted effectively as the conduit, providing important institutional services at the same time. Especially important was their steadfast accounting and their goal orientation.

Concern was well aware of how quickly money can evaporate from development budgets. Corruption, a real problem in dealings with certain government administrators, is only part of the problem. Excessive costs associated with bringing expatriate advisors, high equipment and shipping costs, dealings with tax officials, and extreme costs if emergencies occur in remote locations, all add on to the expenses of such programs.⁶ Concern has an accounting staff, always headed by an expatriate, that analyzes every budget item. Justification is required for every expenditure, and particular attention is paid to accomplishing tasks in the most cost-effective manner. While the agency has peculiarities that lead to curious excesses and curious frugalities, by and large the accounting system keeps the organization within reasonable limits. The MWSS did encounter cost overruns – in addition to a sharp rise in fuel prices, there were equipment problems, system redesigns, and some overly optimistic initial forecasts. However, the water program had to justify each new expenditure and seek approval for each annual budget. The system was effective in ensuring that the £850,000 that was eventually necessary was consistently employed in the development of the water system.

Concern's institutional goal orientation was also essential in completing the MWSS. The organization's first flirtation with the water program was a disaster: they provided support for a government water engineer who was highly unpopular and,

⁶ Although all equipment associated with such projects is supposed to be tax free, customs officials in Tanzania have notoriously sticky fingers. Administrators of one program told me that they routinely order their new vehicles equipped with nice cassette decks that must remain with the customs agent in order to expedite port clearance. Another program reports regularly ordering 10% more than is needed of any particular item so that some can be left as a gratuity. The customs and tax agent in Iringa town is notoriously corrupt, refusing to release postal packages from abroad unless he receives a substantial cash reward; Iringa merchants confide that he defrauds the government of import revenue on a daily basis.

according to local accounts, extremely lazy. Many government employees thrive on a sinecure where they draw a salary without strict oversight, and soon find themselves getting away with precious little work. The engineer in question was apparently such a man. He was replaced with a series of expatriate and Tanzanian engineers who were much more devoted to the task of completing the water system. Here a structural feature of some aid programs produced a tangible result. Concern expatriate personnel are assigned to field locations for only brief periods of a few months to a few years. They undertake their work because they want to help solve problems in impoverished areas, and they want to leave their mark. Juliet, who worked for Concern in another location, best expressed a common sentiment. "I see so much, so many problems, and I am barely able to help. First it took a long time to get to know the people and the place. By the time you settle in and finally can get something accomplished, it is time to leave. I don't want to go home and see nothing has changed. Then what am I doing here? Then it's all just a big waste. I learn a lot, but Concern wastes all that money on me and it wastes everybody's time in the villages. I want to leave something behind."⁷ When she was sent home early on account of illness, she was most upset by thinking of the things she was leaving partly done. John Woods had a shorter contract and a similar desire to make his time in Africa worthwhile to the people he came to aid. (He subsequently designed an innovative program where he collects old hand tools from Irish residents who have migrated to power equipment, and sends them to Africa where they can once again be put to productive use.) I have enormous personal admiration for John, Juliet, and others who

⁷ Paraphrased from notes. Other conversations remain off the record by agreement.

put everything they had into their work in places like Malangali. While some work that such expatriates attempted may not have had the results they intended, for many reasons discussed in this dissertation, the fact of the energy and dedication they brought to their jobs undoubtedly catalyzed a lot of work that might otherwise have floundered. In the water program it was the presence of intent expatriates that spurred a qualified but less motivated staff to accomplish an extraordinary engineering feat.

Concern's engineering staff not only motivated local activity, they also took it upon themselves to make the best use of the money the program made available to them. John Woods personally priced and tested pipes in Europe and Nairobi in 1993 before coming to the conclusion (disappointing to him) that the best value supplies came from overseas. Finbar Quigley's 1987 quest for pipes only brought him to Ireland, but there he was able to use manufacturers' sympathy for Concern to get tenders that he knew were good value. (Note well the difference between this story of suppliers cutting a charitable discount and the many reports of financial abuse in the aid industry! Quigley's suppliers would have been inspired by the various impulses discussed in Chapter 6, the antithesis of the greed discussed by Hancock (1989), Maren (1997) and others.) Quigley then walked the budget through Concern and the EU, which gave 50% co-financing, before his time in Malangali ended.

Institutional oversight and motivated personnel are not enough to guarantee the fulfillment of a project's goals. The agriculture and forestry projects had both these features, but neither saw results comparable to the MWSS. We will look at the additional factors that led to the success of the water program – the reasons that local residents were

eager to accept and support it. Then we will look to the ways these local attributes diverged from those of the program in the waning months of the MWSS.

Thirst

The water situation in Malangali without piping is difficult for residents. Water flows in the river valleys for most months of the year, but can dry up in many places during October and November. Springs exist farther up many hillsides, but also dry up during these months. Most people do not choose to build houses near the valley bottoms, however. This may be because people find more farming opportunities on the higher, flatter parts of the hills. Ridge tops were also often chosen for *Ujamaa* resettlement areas in 1974-5. The long trek for water for many women is no less onerous because it is such a cliché of writings about the non-wealthy world. Making access to water easier for people in areas like Malangali has been voiced as a priority by the Tanzanian government, international organizations, and residents for many years. Water has always been a nagging issue, with enough available year round to support the population, but at a substantial hassle in the driest months. Two scenes highlight the difficulties people face when no water is flowing through the pipes:

I was with several Concern extension agents visiting Sadani, the neighboring division, on a three day study trip for the WIS. We wanted to compare Malangali with a neighboring division that had no Concern or other major development program activity for the past decade. Mtindo and I were led on a walking tour by the Village Executive Officer (VEO), a friendly older man. After leaving the primary school, Mtindo said, "I'm thirsty. Where do people collect water here?"

The VEO told us, "It's nearby, just that way." When Mtindo asked to see it, the VEO agreed, "Yes, let's go. There isn't much water now, because it did not rain enough this year. The women take a long time there."

Mtindo asked if our host ever collected water himself. The VEO laughed. "Me? I have too much other work to concern myself with collecting water. But there are enough young people, if my wife needs help. The spring is in this ravine. Be careful here, the rock can break away when you step on it."

When we descended about 15 feet we found several women and older children sitting in a line. They all had twenty liter buckets or smaller plastic jugs that held 5 or 10 liters. One woman was washing clothes in a bucket she had already filled. Several shirts and *kanga* cloths were drying on rocks in the hot sun. One woman was standing with a bucket resting underneath a small pipe coming out of the hillside.

After introductions, I asked a woman if she had been waiting long. She replied, "It is not so long. Maybe an hour? There are not so many people here this morning. Soon it is almost my turn."

I asked about the water. "Is it clean to drink, must you boil it?"

"It is clean," she said. "We drink it just like it is. It is better earlier in the year."

"Is this the only spring for the village?"

"Oh no, this is the one that is closest to our home. There is one closer, but it has already dried up."

Mtindo said to me, "The water is so slow! That woman has not even filled her bucket, but it was already half full when we got here." I suggested we time how long it

took to fill a bucket and the girl who was next on line agreed to let us clock her filling a five-liter jug.

In the background I overheard two women talking. “Why are they asking so many questions about the water? Who are they?” asked one.

“I don’t know,” the other answered. She posited, “Maybe they are planning to develop the water.”

The girl at the source told us her bucket was full, and gave some to Mtindo to drink. The flow rate was about 45 seconds per liter, which meant that a twenty liter bucket would take 15 minutes. I asked one of the women, “How many buckets do you fill in a day? Just this one?”

“No,” she said, “we need three or four. Sometimes it takes a long time because you have to wait for other people. So we take turns throughout the day.”

A few days later I visited women near the end of a MWSS distribution line in Isimikinyi. I took a twenty liter plastic bucket and offered to help water their garden. On each of three trips to the tap, it took a mere minute and a quarter to fill the bucket, or one twelfth the time as in Sadani. A benefit of the MWSS for Malangali women, as demonstrated by this comparison, was a substantial time savings.

Another scene further exemplifies the role the MWSS plays in people’s lives. A few days before a wedding in Isimikinyi, a party was planned for the women to brew the *togwa*, the non-alcoholic maize and millet beverage that is preferred in this Lutheran village. I met Helena, a young woman recently home from the tea plantations, as she climbed a shortcut from the creekbed.

I asked, "Sister, why are you carrying water up the hill?"

She set down the 44 pound bucket she was carrying on her head. "There is no water today in the pipes. They are cleaning at the intake."

"Sorry for the extra work. But you don't live on this side of the village, where are you going?"

Helena told me, "I am with the women, we are brewing *togwa* for Kevin's wedding. Can you hear them singing?"

Women's distant voices mingled with the wind. "Oh yes, I hear their song. You are carrying water for the *togwa*?"

She replied, "Yes, we are all going to the creek to get water today. The grain has already sprouted, today is the day when we must make the drink. We are making two drums, that is 400 liters."

"Will the water come back on before the wedding?" I asked.

"Now they are saying not until Monday or Tuesday."

"So all the cooking, everything, all the water you must carry up from the stream?"

"Yes," she said, "we will be making many trips. Then we have to get water to use at home. To the bride's father's house it is only one kilometer. But it is very far to the groom's adopted father's house, there in Mgeluka. For the groom's party there, maybe they will not brew so much *togwa*".

"There will be two parties after the wedding? I won't eat breakfast Saturday!" I exclaimed, and we both laughed.

The water did not come back on before the wedding. Despite the inconvenience,

the women of Isimikinyi managed to prepare two consecutive feasts for Saturday afternoon. Kevin and Gloria exchanged vows at the Lutheran church. They were serenaded from the church to Mr. Njota's house, where the first reception was held beneath a canopy of new thatch. After the cutting of the cake and the first meal, the couple were escorted to Joseph Ndandala's new house. In the speeches that preceded the second feast, appreciation was expressed for the women's great labor in a difficult situation.

The women in the previous scene, in Sadani, experienced typical water collection regimens for this ecological zone. Water is available throughout the dry season, but it is often inconvenient and arduous to collect. In more arid zones people dig wells into the sands of the dry river beds, but only small pits were necessary in other parts of Sadani and in the days before the Isimikinyi wedding. Some parts of Tanzania are so dry they are unfit for year-round habitation, but this zone has at least a 75,000 year history of settled occupation.⁸ During the rainy months springs flow near most homes, the creeks are full, and many people collect rain off of their roofs. As nearby sources dry out, people must seek out further (and often dirtier) sources that they know will be available. Collecting water is variably a pleasure (for women such as Fredi Sandala's wives whose tap within their domestic courtyard is a constant symbol of prestige), a chore, or a hassle. The more of a hassle it is, the less is consumed.

Another day when the water in the MWSS was again not flowing, I met an elder

⁸ The Isimila stone age excavation site is within a day's bike ride of all Sadani and Malangali. No direct evidence exists of *continuous* occupation, nor has research ascertained climatic stability. However, these equatorial lower reaches of the highlands are likely to have had greater environmental stability through the ice ages than did more polar regions.

man as I climbed the path to Kingege. He held an old bar of soap in one hand. "It's a hot day today!" he greeted me. "I've got to go bathe at the river."

"You don't bathe at home?" I asked him. "Your wife says she brings you bath water."

"Yes she does, with the pipe right there near the house. But today there is no water. She won't carry bath water all the way from the river, will she?"

The elder in this scene lives next to a tap where I had recently interviewed two young men specifically about water. While we were conducting the interview, children from the next household made repeated trips to the tap. The smallest child filled a one liter bucket, while the largest boy had a 10 liter jug and his older sister was filling a twenty liter (44 pound) bucket. I asked the oldest girl why they were making so many trips. "We are bringing water to the garden," she said shyly. "My father is just planting a vegetable garden." Her mother was not collecting water, she said, because she was busy doing laundry. "We are bringing her water, too." Does her mother ever collect her own water? Yes, if she needs it while the children are in school, but usually they collect water before school and in the afternoons.

The young men I was interviewing both collect their own water as well. The younger one gets water to tend his trees, especially the fruit trees he planted while still in school. The older one has built his own little house near his parents. He has an old wheelbarrow that he uses to cart home his full jugs from the tap. He has a small garden, a little plot of trees, and is attempting to be self-sufficient. While he still eats his mother's food, he does his own laundry and carries his own bath water or goes to the creek.

Married men will not involve themselves with collecting water if at all possible; their bathing buckets are left in the washroom for them, their clothes cleaned and laundered, their drinking water handed to them by a woman or child. The young men's fathers were not known to fetch water except when they were making bricks for construction – and even then a woman or youth was usually recruited to keep a big oil drum filled. These youth did not feel belittled by the water they collected, but nor did they plan to fetch it for the rest of their lives. They looked forward to getting married, after which they would enjoy the privileges of adult men.

Just as men expect they will not carry water once married, women expect they will always bear responsibility for making sure it is present in the home. My own domestic assistant felt chastised for dereliction of duties the first time I fetched my own water, and always tried to keep enough buckets filled to prevent me from being seen making a trip to the tap. Little girls practice carrying water home on their heads from the moment they are old enough to walk to the source. (It takes some time before they learn to balance headloads, during which they can spend a lot of time drenched.) By the time they are adults, girls would not conceive of a day that does not involve fetching water.

Whether water comes from river, spring, or tap, few people boil it before drinking. Health officials have for many years stressed boiling. People are exhorted to do so on radio programs, on posters in the schools and village offices, and by village health workers who weigh infants every month. Some individuals can explain the scientific ideas of disease and bacteria that form the basis of the push to boil. Some always boil their drinking water,

especially educated people such as teachers and extension workers.⁹ Most people, however, choose not to boil despite being aware of the message. They point out that they have been drinking the local water all their lives without any problems they can attribute to water-borne illness.¹⁰ They point to the extra time involved in sterilizing drinking water. And there are three additional factors related to Concern program activities.

First, the message to boil water was never given priority by Concern. In all of the public interaction the water program had, discussions of sterilization were mentioned only briefly if at all. This may be because project staff knew most people would disregard the message anyway. It is also because the main project focus was on getting the system working. The boiling message reached most people through sources disconnected from the water project, such as radio and health personnel. Although the water engineers knew the river intake was exposed to human and cattle effluent, people often said that because the MWSS brings “clean water” there is no need to boil.

Second, some people, including members of the Kingege village water committee, the “VWC”, explained that the water was cleaned at the Ibangi tank. When the chemical treatment system broke a few years ago, Concern decided to let the cleaning lapse. The organization made the decision that continuous treatment was too

⁹ In thinking through the households where clean water was always on hand, I recall an association with experiences of serious disease. If my memory is accurate, these households would have taken the health message to heart after a serious encounter with a medical doctor. My fieldnotes do not include evidence to document this contention, so it is probable nobody directly mentioned such a connection to me.

¹⁰ The tendency to over-diagnose illnesses as malaria, which everybody knows comes from mosquitoes, probably contributes to this perception.

complicated and costly to be “sustainable.”¹¹ Somehow news of the change did not make it out to the villages, probably because the people within the institution who made the decision were focusing on engineering and fiscal issues.

Third, boiling water requires burning wood. Even when firewood is plentiful, collecting enough to sterilize a household’s daily needs is a substantial chore. For many women the hassle is augmented by local scarcity or forest use prohibitions. Most of the woodland within an easy walk of Isimikinyi has been proscribed from collection of even dead dry wood. Other villages are also establishing forest reserves at the instigation of Concern. While conserving wood is an oft-repeated message of the forestry program, women do so not because they are told to but because they do not have the time to do otherwise. Already they make daily trips to the forests to collect headloads of wood during the dry season so they have enough cooking fuel set aside for the farming season. It is not uncommon in some households to boil water in anticipation of a special visitor (such as a successful relative coming from Dar-es-Salaam), or for a sick family member. When the urgent need has passed, however, families often stop boiling their water because their concerns for firewood are more pressing.

Water and firewood are both factors in another government extension message, “*nyumba bora*” (improved housing). While traditional Hehe and Bena structures can last many years with only simple mud construction, houses made of fired bricks can last a century or more. The government has made *nyumba bora* a national campaign, although

¹¹ This decision was made before the main fieldwork period, so I do not know whether the Iringa office decided in consultation with Malangali staff or by fiat.

explanations about the advantages often fall flat. The push for neat brick houses may be a form of state simplification as discussed by Scott (1998), an administrator's perception of how to make village life more civilized. It is also now a goal of many Malangali residents; a sign of wealth for local men, a symbol of permanence for prodigal sons building in their birth villages, and a fashionable statement of modernism (*kisasa*, also translatable as "nowness.") Making bricks requires abundant water near a good source of clay (which is a prominent local soil type) and a large stock of firewood to bisque the bricks. Usually people make bricks near the river bottoms, which necessitates hauling the heavy bricks uphill to the construction site. As a result of the MWSS, men can often make bricks from clay right next to their building sites. This proximity enables more men to build with bricks and allows larger brick structures. Brick construction also makes possible longer-term building projects, since thousands of bricks can be fired in one dry season in anticipation of two or three years of building. A market for bricks now exists, both for building grave coverings and for small construction projects. This market is in keeping with one of the development goals of Concern and the government, income generation. Yet it runs in conflict with two other goals, those of water and woodland conservation. The next scene shows some of these conflicts.

Usiku was a father of three in his thirties working as a Concern security guard. On the status of his Concern position he ran for the chairmanship of Isimikinyi in 1992, but lost a close election to Mr. Masura. He lived with his wife in a three-sided compound he started building before marriage. He fired a few thousand bricks in November 1995, before the rains, and began building the fourth side of his compound out of these bricks once the

harvest was in. In September I approached him about buying some of his extra bricks for a project of my own. We negotiated a price of 15/= each (3 cents) for his leftover large bricks, about three times the size of the standard bricks used in the U.S. When in October I stopped to admire his finished house segment, his wife told me the bricks were no longer available. That evening I found Usiku at his guardpost. I queried, "Mama Ester said you cannot sell your bricks anymore?"

"That's right," he said, "I cannot sell them."

"She said you had trouble because of selling some?"

He murmured affirmation. "I had to pay a fine. They said I was making an illegal business. I was profiting from using the firewood and the people's water, these things are for personal use only, they say. So I'll keep the rest of the bricks and start rebuilding the old parts of the house."

"I thought you were going to sell your bricks to me?"

"I beg forgiveness, someone needed bricks for a grave," he answered. "Just 200, and they paid 30/= (5 cents) each."

I said goodnight to Usiku. On the way home I passed the house of Mtindo, the ward forestry officer. He called me inside, and soon his wife had served us a dinner of *ugali* and beans. As we ate, I mentioned Usiku's fine.

"Yes, Usiku had to pay a fine, 3000/= (\$5)" replied Mtindo.

I asked, "Because he sold bricks for profit?"

"No, that's not it. Because he cut wood carelessly. He cut right in the forest reserve, then used that wood to burn bricks!"

“Last year?”

“Last year, but when he sold the bricks for money, then someone got jealous and reported him. So we had to fine him.”

The discussion with Mtindo clarified the issue of Usiku’s fine, though it adds ambiguity to the present discussion. Was the fine because of profiteering from public water and woodland resources, as Usiku was telling people, or an event in a private feud, or because he illegally poached firewood? While the events were ambiguous, I place the scene in this chapter, not that about trees, because Usiku *claims* his trouble involved the water program. Other people in Isimikinyi later recounted the story as a violation of water and forestry rules, a retelling based on Usiku’s bitter recollections in the home-brew clubs. The lesson they recounted was that they should either avoid businesses that use too much water or wood, or conduct such business discretely.

Conflicts involving individual use of the MWSS and multiple development goals were ongoing throughout the field research period. One simmered beneath the surface in the Isimikinyi village meeting depicted earlier. Fredi Sandala is a man who diverted his main farming interests from cash-cropping maize to cash-cropping tomatoes. His efforts growing vegetables were encouraged by regular visits from the Concern horticulture program. His house is close to the Isimikinyi tank and he somehow finagled permission to extend a private water line right into his compound. (Several people in Isimikinyi have private taps, but permission for new private lines has been routinely denied at least since 1993.) With this water he grows tomatoes and other vegetables year round. Sandala is particularly visible when he waters his garden by hose near the junction of three paths,

once the dried corn stalks are chopped down to reveal his greenery after most other farming activity has ceased. Attention is also called to him if the truck comes to cart his tomatoes to Dar-es-Salaam, though those tomatoes are largely rain-fed. While he therefore draws especially pointed barbs, he is far from alone in raising vegetables for sale with the MWSS water.

The relationship between vegetable gardens and the MWSS became apparent during the Wider Impact Study (WIS) research on which I collaborated with Concern. For the WIS we employed several standard Participatory Rural Appraisal (PRA) techniques popular with development organizations, including “transect walks” for making observations while walking an arbitrary line through a village, and mapping exercises with small groups. (I did not participate directly in the mapping.) The transect walk I took with two Concern extension workers/ WIS researchers was my introduction to Kingege village, which borders Isimikinyi. Since our mission was to notice Concern impacts, we paid attention to both vegetable gardens and water taps. Though it now seems obvious, we were all surprised to see that the only houses that had gardens were those near taps. A few weeks later Bwashehe and I spent a day tooling around Kingege on his little motorcycle. We went from one tap to the next, and made a few excursions to households far from any tap. Again we noted the high correlation between taps and gardens. Taps were placed either because a critical mass of households were clustered together or because a maximum of 400 meters between taps was reached. In the thinly populated villages of Malangali division, placement was usually based on the latter. One tap we visited that day was at least 150 meters from the nearest house, though the main water source for

several. Not ten meters below the tap someone had enclosed a substantial vegetable garden. Another house was built quite close to a tap – on the wife’s father’s land, breaking custom in favor of proximity to water. The young woman was soon discussing how much she earned from the various fruit trees growing in the tap run-off, explaining the household expenses she could cover with a nice papaya. Many other gardeners sell or trade their produce, which is a welcome source of petty cash in the lean dry months.

These observations prompted the WIS research assistants to make notes about the locations of gardens and taps when they conducted their mapping exercises. They also noted which households had “contact farmers” for the Concern horticulture or agriculture projects, and ranked households for wealth on a scale of one to three. We expected to see a demonstrable correlation between contact farmers’ households and those with gardens, and thought we might find that wealthier households tended to have gardens. (Statistical correlation would be meaningless because sample size in Kingege was small and the data messy. No distinction could be made on the maps between agriculture and horticulture contact farmers because respondents used the same term, *mkulima mlengwa*, for both, and we had no proportional scale to measure distance from houses to taps and to gardens.) The visual rendering on the maps, though, showed no discernible correlation between contact farmers and people with gardens. Those households in the middle and wealthier categories did appear more likely to have gardens, corresponding to a couple of anecdotes the researches gathered of individuals who had made enough profit from gardening to move out of the ranks of the poorest. The maps bore out the observation that households near taps had gardens much more often than those far away. The farther households with

gardens included the young man with the wheelbarrow discussed earlier, who had been employed in the Concern horticulture program nursery. The few other houses in this category grew their gardens at the valley bottom with simple irrigation from the creek. On the other hand, about half the households near taps had gardens, with new ones being planted throughout the dry season. For development planners, the conclusion may be surprising: the years of work Concern put into teaching Kingege residents horticulture techniques, trying various vegetable crops, and visiting the selected households (10 of “the poorest of the poor” in each village each year) catalyzed a thriving small garden economy. But the people participating in this economy are not necessarily those with direct connection to the organization’s educational efforts. Those without easy access to water quickly gave up the endeavor, while many near taps who had no formal involvement with the project incorporated its lessons diligently.

The disgruntled people aiming barbs at Sandala in Isimikinyi were not opposed to the idea of vegetable gardens, nor to the notion of profiting from them. Their annoyance was rather that they were not lucky enough to have the easy water that would permit them also to grow gardens. Water was a bonus that fell to some people through no apparent right of wealth, service, or prestige. Women in much of the village still had to walk as many as 400 meters to carry home their household water needs, yet the Sandala wives had so much surplus water their husband could pipe it all over his yard. While some women have to resort to wild leaves for the green vegetable before the rains break,¹²

¹² In December 1995 one Kingege child died and three others suffered when their mother cooked a tree’s leaves that she had not realized had passed into their annual poisonous phase.

families such as the Sandalas grow enough fresh greens to sell from their neighbor's stand in Mwilavila. However, few could make complaints against Sandala personally because, in addition to their many kin and friendship interlinkages, the family was generous with occasional small gifts of vegetables. People are used to dealing with the tough breaks of rural Tanzanian life, but this is one that continues to rankle many. The problem is also intractable given current conditions. Those who benefit from the gardens their water access allows will not agree to cut back on their use. Resources to expand the system so more people can grow gardens are not available now that Concern has withdrawn. Most people would prefer the latter, but barring that will continue to grumble about the former.

The tension between engineers and horticulturists is reflected as far away as Dublin. Despite the full knowledge of the Dublin-based Overseas personnel about the conflicts between pipe-layers and vegetable growers, the Marketing department buries the tension. In a 1996 newsletter, an extremely prominent caption below a photo of a water tap reads, "The provision of a supply of fresh clean water reduces the incidence of disease and enables villagers to grow vegetables beside their homes and keep small animals successfully. It also leaves free time for money earning activities that would otherwise be spent collecting water, often several kilometers outside the village " (Concern 1996: 3).

Mr. Shija the water engineer, who remains in Malangali on government payroll, wishes he did not have to involve himself in the controversy. He is popular among the people along the MWSS, and has heard their desires for more water distribution points closer to more people's homes. He explains that acceding to these desires would be impossible. Even were people to finance their own taps and extensions from the

distribution system, he must oppose such projects. First, he says, the pipeline from the intake was only designed to carry 33 liters per person per day to the villages. While the flow is usually more than that today, projected population growth will reach system capacity in 2010. Second, during the driest years the river can barely provide enough water for the pipes to carry even current demands in the weeks before the rains. Since vegetable gardens require more water the hotter it gets, extending the system for more gardens would push demand beyond the system's capacity in the critical dry months. Shija's main priority is providing enough water for basic household needs. From his vantage as he scoots around 140 kilometers of pipeline trying to plug leaks and meet the MWSS promises, even the current gardens are a drain on the system.

Flow

Shija does not explain how his project arrived at its 33 liter per person target, and I have seen no documentation justifying this. The Tanzanian government had two main numerical criteria for water schemes: 400 meters maximum between water points, and 30 liters per person per day.¹³ When Danida (Danish Aid) re-drafted the regional water master plan (RWMP) for Iringa starting in 1979,

[The] planners arrived at [a] 25 liters criterion on the basis of an extensive field survey of household water consumption patterns (BRALUP/ CDR 1982, ch. 8). It clearly showed that the 30 liters criterion could be safely reduced... [T]hese results were presented at several meetings with the Ministry. Its representatives objected to the proposed reductions. Nevertheless, the consultants wrote the reductions into the RWMPs because they were based on extensive surveys and would result in cost savings... Delays resulted, until donor adherence to the 25 liters criterion

¹³ The following discussion draws heavily on Therkildsen 1988, in which chapter 8 is devoted specifically to the Danish water programs in Iringa, Mbeya, and Ruvuma regions.

prevailed. (Therkildsen 1988: 140-1)

I am unsure of the details that led Danida to back-burner the MWSS after drafting the master plans. Concern became involved in 1986, a year after they began their forestry program. They had already successfully completed two small irrigation projects in nearby Njombe, so they and the government were soon in mutual agreement that Concern could become involved in rehabilitating the Malangali water supply. The first Concern engineer, Finbar Quigley, used the Danida Master Plan as the basis for his surveying and his work; he remembers using 25 liters/ day as his design criterion.¹⁴ Somewhere in the process, apparently after Quigley's tenure, Danida was out-trumped and the government found in Concern a donor willing to aim at a more ambitious technical goal for Malangali. Each number – 25 liters, 30, and the eventual 33 – was bandied about based on “scientific” evaluation of human needs. The humans themselves are peripheral. Those who live in areas completed by Danida will be expected to make due with 25 liters if and when their supply scheme works, while Malangali residents are expected to adjust their consumption patterns to within slightly higher limits. Noteworthy is how the numbers take on a life of their own, subject to hot political debate at an international level and power plays between donor and recipient. In Therkildsen's description, Danida's Danish consulting firm considered cost and technology one of the three main factors for determining system construction, along with demonstrable need and village acceptance. A smaller human consumption number meant a smaller system, which meant the goal of

¹⁴ The information about the early days of the Concern water project comes mostly from an interview with Quigley in Dublin in 1997. He currently works as an engineer with the Dublin Electricity Supply Board.

providing water for rural Tanzanians could be said to have been met for less money. In the event of Tanzania's apparent victory in finding a donor willing to pay for a higher capacity system in Malangali, the calculations based on the 33 liter figure also had international repercussions. Europeans were mobilized in Dublin, London, and Brussels to fund the project (for which taxes were collected from all EU member countries), send supplies, and recruit personnel. Malangali residents were hired or conscripted to provide the labor for the larger system, and political debates and personal jealousies ensued from subsequent decisions. Much of this would have happened had the original government figure or the Danida figure prevailed, of course, but on a different scale and with somewhat different consequences.

Sustainability Another series of decisions made outside of Malangali is one that may lead to the ultimate collapse of the system. Today the unifying theme of these decisions is known as "sustainability," though during the pre-Concern days of Tanzanian water planning this term had not yet entered the vocabulary.¹⁵ The planners Therkildsen researched referred to "operation and maintenance," with the ampersandic acronym O & M. "To [Iringa's Danida] planners¹⁶ it was clear that the Tanzanian approach to O & M

¹⁵ This is not a small point. Therkildsen's comprehensive discussion of water development projects throughout Tanzania in the 1980s is the result of his research while based in Iringa from 1980 to 1983. His book, published in 1988, is itself an excellent historical document. Though he has no index, his comprehensive bibliography contains references discussing all the key concepts related to planning and development in Tanzania. The last included references are dated 1986. The word "participation", which has followed a similarly slippery descent into vacuous overuse, appears in the titles of his sources dating back to 1971, with increasing frequency from 1978. "Sustainability" does not appear in the title of a single citation. A similar phenomenon occurs throughout the body of the book. However, sustainability is mentioned as such twice in the second paragraph of the preface, and appears again in the introductory and concluding chapters – clearly the last to be written. Thus we can date the ascendance of the term sustainability, now ubiquitous in development literature, to about 1986.

¹⁶ "The initial negotiations in 1979 about the RWMP preparations illustrate very well the particular donor-recipient relationship typical of the Tanzanian water sector." Danida invited five consultancy companies, three

was in need of major changes” (Therkildsen 1988: 142). Along with a devolution in administrative focus from regional to district level, Danida devised two major principles. First, ownership – and therefore O & M responsibility – would fall to the villages instead of district or larger government authorities, and second, villages should contribute in cash or kind to O & M.

[T]ranslation of the principles into practice has caused considerable problems... There are no past Tanzanian experiences based on such principles to analyze. [Knowledge about the effects and applicability] are hampered by lack of data and by the complexity of the technical, economic, organizational, and political issues involved... [The proposed principles]... constitute a clear break with the previous Tanzanian policy of water as a free public service. Not surprisingly, therefore, very little actual field experience with the village-based O & M system had been gained by the end of 1985, despite five years’ implementation and a substantial effort at planning. (Therkildsen 1988: 143)

The O & M plans designed by Danida consultants became the basis for the efforts of the MWSS. Though Concern employees of the mid 1990s assert that sustainability policies grew out of the organization’s own experience, my interviews with early expatriate staff trace the blueprint for these activities directly to Danida’s master plans. Chief among these efforts are the push for area residents to finance O & M through monetary and labor contributions, and pseudo-democratic Village Water Committees (VWCs) of three men and three women (Therkildsen 1988: 144-5). Thousands of area residents are now compelled to pay annual water taxes (called “contributions” in both English and Swahili documents and in discussion among residents). Hundreds of people have been involved

Danish and two Swedish, to submit tenders for the RWMPs. In the end, after active Danish lobbying, the contract went to the Danish consortium despite strong Tanzanian objections. Therkildsen quotes a high-ranking Tanzanian official as saying, “They were pushed down our throats.” African bids, of course, were not considered (Therkildsen 1988: 128).

in some capacity with the VWCs. Dozens attended training seminars for the VWCs. Many people were hired over the years to implement these ideas in Malangali, including African Community Development staff, as well as European “volunteers.” Of all the people with whom I spoke, only Quigley noted matter-of-factly, “the idea of the VWCs also came from Danida.” Nobody else can trace any of this activity to the theorizing about how an African village water system *should* work on the part of a team of Danish engineering and planning consultants¹⁷ – and even Quigley took little note of the VWC theory, since he was primarily involved in the design, procurement, and laying of pipes. The plans were modified over the years and now bear substantial impact of the subsequent Concern personnel who wrestled with their implementation. While the seeds of the “sustainability” features were sown by the Danes, they were nurtured by Concern. Like high-yielding hybrid maize that cannot perpetuate itself, what Malangali residents reap in years to come will fall well short of the planners’ ideal.

While the planners talked among themselves about the logic behind VWCs and water contributions, as far as I can tell nobody actually consulted village residents about their ideas on sustaining the water system. (Woods and Dickey both actively sought local comment, but the parameters of their reports required them to focus their findings toward modifications of the planners’ original principles.) Everybody was in agreement about the

¹⁷ Perhaps this characterization is not entirely fair, for the Danish consultants would themselves have been products of a time in which idealistic theories of African villages continued to be espoused by then-President Nyerere. Nyerere’s statements were taken extremely seriously not only by his own government, but also by the Scandinavian countries that gave generously to support his notions of African socialism (Rugamamu 1997). “Village democracy must operate from the beginning; there is no alternative if this system is to succeed,” asserted Nyerere (1968: 135), and many Scandinavian funders saw no reason other than to embrace his presumed expertise. Unfortunately, short of tracing down the original consultants via Copenhagen, this point must remain mere speculation.

importance of not letting the system collapse, as they had been in agreement about constructing the system in the first place.¹⁸ The history of how the O & M aspects of the water project were conceived, however, left all the actors in peculiar positions. All were players in a drama, but none were familiar with the script. The script was sketched out by the Danish consultants in 1979, augmented in 1981,¹⁹ and by 1988 included the assessment of a Welsh consultant that “the running costs of these gravity feed systems are virtually nil” (Wardle 1988: 23) and “should require minimal maintenance” (p. 60).

Decline

As the actors improvised their roles, they kept being called back toward the Danida master plan. In normal cultural activities the actors have a reserve of history and experience on which to draw when they confront new situations. In Kevin and Gloria’s wedding, for example, all of us knew the basic scheme of events and were prepared to adjust our behavior accordingly. In the quest for a sustainable water system, however, the backgrounds from which the players approached the situation did not prepare them to play their roles as the plan writers thought they would. This chapter concludes with a discussion of the approaches Malangali residents and other players have taken toward their parts in the drama.

First we look briefly at the engineering staff of the MWSS. As engineers they performed brilliantly. Yet in the master plan they were also supposed to bear responsibility

¹⁸ I began this research with the hypothesis that local rain authorities would display at least subtle opposition to the MWSS. This was patently not the case among the many spiritual specialists with whom I conversed, although rainmakers were influential in forestry issues as mentioned on page 175.

¹⁹ A “national workshop” held in Dar es Salaam in 1981 laid out many of the assumptions that would underlie the plans for Malangali, including notions of “participation,” taxation (“contributions”), and village water committees (BRALUP/ CDR 1982). Almost all workshop participants were from northern Europe.

for implementing the VWC and taxation elements of the scheme. John Woods was one who recognized this problem and wrote a report advocating Concern hire specialists in interacting with rural residents for the “community development” component. What John never did was question the basis of the script that called for these activities. It is unlikely that he would have. I say this not because he was an engineer but because he was a university-trained individual schooled in a particular mode of thought such as that of the RWMP. We learn to accept the expertise of those who seem to have more familiarity with a subject than we do ourselves. I suggest that the RWMP and the project that grew out of it came to be understood as such an authoritative work. By the 1990s its logic seemed infallible not only to the European and Tanzanian engineers like Woods and Shija, but also to the government and agency bureaucrats whose offices inherited project oversight.

The O & M plan did not need to make sense to the CD personnel brought in to rescue it. Bwashehe and Chalamila never questioned their water-related activities in our dozens of private conversations. They explained that their jobs were to implement whatever policies they were told to promote. Over time they both came to accept the goals implicitly, because of the authoritative logic of the ideas. But other actors, such as the village government officials responsible for collecting the water levies, did their jobs as required even though they had serious problems with the intended plans.

Finally, there were the residents along the MWSS, whose part always added dramatic tension to the plans. Theirs’ was the big if: If they performed as they ought, then the scheme would be sustainable; If they could not play their roles properly, then the

MWSS would collapse in on itself. As development programs moved away from the bricks-and-mortar approaches of the 1970s and early 80s toward the “sustainability” movement of the past decade, the test of whether the scheme could stand on its own took on paramount importance over the engineering criterion of achieving a workable system. The only problem was, the people of Malangali did not turn to that page of the script. To every person I talked with about the system, including all 250 survey respondents, the important goal of the MWSS was having working pipes in the ground. Few if any agreed with the premise that they bore responsibility for keeping the water flowing.

Malangali residents alternately cited the water scheme as the work of Concern and/or the government and/or Danida – usually the first. Survey respondents were happy with the program if the water came near their house, saying things like, “It was Concern that gave the service of bringing water,” and, “The service is great, that of the water.” Another says, “because Concern’s time has finished, we ask that the government should come again.” In Chapter 7 I discuss how legitimacy in governance is accorded to those who can produce the conditions for minimal prosperity. Here I suggest that, as in the United States, Ireland, and most industrialized nations, water services are seen as the proper provenance of the government (or government-regulated utility companies). Average Danish citizens would be flabbergasted were they told they had to dig trenches, boil their water, and wait days or even months if their service was cut off. While Malangali residents do not have a history of free, accessible government water, they do have long experience with government promises and procedures. They were promised water and they played their parts with hard labor. What happens if the system is

abandoned? “Then we will walk to the river again.” “We are hoping the government will find another organization to continue the water.” “The water is very good.” “The water helps a lot.”

The new regional coordinator for Concern disagreed vigorously with my preliminary conclusions about the water program in a conversation we had in December 1996. I was arguing that the reason that Concern got involved in the MWSS was that area residents did not have the resources to build the system themselves, and that they still do not have the resources for anything beyond basic maintenance. He countered that the program “should” be able to stand on its own. Other places have managed to sustain their own water programs, he said, while conceding that most water programs do not involve 140 kilometers of pipe. Concern cannot afford to remain permanently in Malangali, Tim argued, because then it will be unable to undertake useful new projects elsewhere.

Tim is right, of course, agreeing to help with a particular problem in a particular area should not bind a program like Concern in perpetuity. I suggest, however, that the way Concern went about withdrawing was more geared toward a theory of sustainability than to actual evaluation of local conditions. All the administrators agreed that the VWCs were not yet up to the task of managing the system, but as Tim said, “They’re going to have to.” Why? The organization could have promoted an alternative view of sustainability, one in which the government oversaw what policy and polity agree are government services. For example, in the WIS report I suggested the organization could plan for annual training seminars to make sure people are always available with the plumbing skills to maintain the pipes. They could sponsor water engineering degree

programs to a few local secondary school graduates in exchange for a government commitment that people with equivalent training always be assigned to the area. They could arrange with district government to leave a vehicle in Malangali that would be used for the heavy hauling of pipes and cement. Instead, Concern aimed toward a model of a simple African village where a little group effort and 50 pence a year water tax would suffice to maintain an £850,000 project. Concern was aware that the premise was weak, but insisted on planning as though it were supportable. The people along the MWSS understood much better the difficulty of the O & M task that was descending upon them. Ironically, all parties expressed one final element of agreement: if no further support was available from the government or outside parties, the system as it was in 1996 would soon collapse.

The story of the MWSS leads to a larger conclusion about the conceptual schema in which development organizations operate. Concern found their experience with water supply to be expensive, frustrating, messy, and not neatly resolvable. Other organizations have similarly learned that schemes to supply water quickly become muddy. When choosing among the many ongoing gaping causes toward which money and effort might be directed, the lessons that funding agencies like Concern choose to heed caution against embarking on rural water projects, rather than teaching how such projects might be better managed to meet the needs and desires of a thirsty clientele. Today in Tanzania (where I pen these words), in village after village, women struggle to carry unclean water long distances for their families, with no signs that the national policy of water for all is ever likely to become a funding priority in this era of imposed African governmental austerity.

In subsequent chapters, I extend this conclusion, demonstrating that the clientele of development projects are in fact not “the poorest of the poor” in rural Africa, but rather the theorists, donors, and designers of international aid programs. While agencies such as Concern move on to newer trends in development design, such as the currently vogue microlending schemes, the people in inconvenient and impoverished places are left, quite literally, high and dry.