

# APPENDIX A: War on Hunger

## Some impacts of the DWAF Rainwater Harvesting Programme

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## Executive Summary

### Many South Africans are going hungry

Half of South Africa lives on R20 a day and 1.3 million rural households are unable to meet their daily food needs in 2006. South Africa has committed herself to the Millennium Development Goals, which among others, call on countries to “halve the number of people living with hunger by 2015.”

### An important government initiative

In this context, the Department of Water Affairs and Forestry (DWAF) is pilot testing a programme that supplies poor rural households with a private water source which they can use for any productive activity in the backyard – and most households choose family food production. Households are introduced to intensive, but affordable, production methods (organic production using run-on rainwater harvesting) and must show results to qualify for a RWH tank (or RWH dam, as most rural households prefer to call it). Records to date show that households have gained R6.46 per day from homestead food gardening in their first year, and that production intensifies and increases over time.

### Not just infrastructure!

The DWAF RWH investment is in **facilitation** of food insecure families to implement intensive production methods and then, the **building** of a 30 000 litre RWH dam in the successful household's backyard – an underground tank built with cement blocks on a concrete floor and with a sturdy childproof corrugated iron roof.

### A good state investment

In the upcoming expansion phase, the facilitation and building costs are expected to be about R25 000 per household (including VAT), which is viewed as an excellent investment, as it can be offset within the first five years by the value of household production from the RWH dam. The household asset (the RWH dam) is expected to have a life-span of at least twenty years, and

enables a household to try out and support a range of water-based productive activities at home. The Internal Rate of Return (IRR) over a 20 year period has been calculated at over 15%.

### Truly bottom up

Strikingly, this DWAF RWH subsidy was approved on account of poor rural women's cry for "War on Hunger", which was first made public at the World Summit on Sustainable Development, held in Johannesburg in 2002. In several villages they had built their own RWH dams and had shown the impacts that are possible. These women's findings were confirmed once the DWAF subsidy was approved and results started to become available from implementation of the DWAF RWH pilot programme in several villages in four provinces.

Importantly, these women are adamant that many of them do not want to 'go business', and that entrepreneurial activity should not be a requirement for participation in this DWAF RWH programme. They feel income generation should be seen as a possible positive spin-off from the programme, not a requirement, for fear that this could discourage participation by exactly the most needy and disheartened.

### Value on top of value

The 'intangible value' of the DWAF RWH investment, as experienced from the Demonstration Phase, is evident from the testimonies of many participating households, such as the following quotes:

"The confidence that from now on we can have food all the time"; "the pride and joy of eating from one's own efforts"; "the amazement that we are gaining so much more from our efforts using these intensive production approaches"; "the ability to produce without cash, because we use rubbish, natural remedies and make our own seedlings"; "improved harmony and togetherness in our family"; "being at home for our children, able to provide for them without having to leave them behind alone to do so"; "being able to gain, while we are caring for the environment by cleaning away rubbish and using it for production"; "being able to produce the whole year, instead of only in summer"; "being an example and a motivation for others"; "being able to produce in my own yard, without waiting for others"; "being able to work on it anytime of the day, because it is right here, not far away"; "we can think of so many new ideas now, like keeping fish, chickens, making jam"; "we have no time to go and collect the child grants now and anyway, we are not so desperate because now we always have some little cash, so we just let them pay the child support grant into our bank accounts, instead of wasting our time to go and wait in lines for it every month."

*"Only we can achieve the MDGs. We are the ones going hungry, not you, and so we are the ones who must beat hunger."*

*"Your role can never be to do this for us, your role is to walk the road with us and to take our hands only where we can't cope alone."*

### Water Research Commission training materials

DWAF is collaborating closely with the Water Research Commission on the development of training material for family food production, in a project called "Participatory Development of Training Material for Agricultural Water Use in Homestead Farming Systems for Improved Livelihoods".

### Support to others

Both the DWAF RWH “Guidelines” and the Water Research Commission training materials will be available to organisations who want to implement related initiatives. The intention is that municipalities or funding organisations who want to implement their own programmes, would be free to make use of the lessons learnt so far.

## WAR ON HUNGER:

### Some impacts of the DWAF Rainwater Harvesting Programme

Poor households in SA always offer ‘lack of water’ as the main reason why they don’t grow food gardens at home. The DWAF strategy is clear: **to enable poor households to grow fresh food at home, year-round, to create a constant supply of micro-nutrients at home to prevent stunting in infants and toddlers** before they reach school-going age (and thus in the years before they can start benefiting from school nutrition programmes).

The Department of Water Affairs and Forestry (DWAF) is implementing a Pilot Programme that targets “Millennium Development Goal 1a: extreme hunger”, in two main steps, namely:

- **introducing intensive home food production** (or any other home-based productive water uses) through methods of **channeling and using rainfall run-off** (*in situ* RWH).
- Then, once a household has shown commitment by successfully implementing their production system at home, **they qualify for a 30 000 litre underground rainwater tank** (RWH storage), which improves their water security and enables them to expand their production to about 100-200m<sup>2</sup> in the backyard (i.e. about 1-2% of a hectare).

In 2006, during the DWAF RWH Demonstration Phase 64 tanks were built in 26 villages in four provinces, namely Eastern Cape, Limpopo, KwaZulu-Natal and Free State.

### Does it work?

This paper on “War on Hunger” reports on the excitement of and impact on rural households who implemented their organic RWH food gardens in 2006. It also offers an analysis of the costs of this once-off government investment in ‘asset-building for the poor’, and the measured value of production achieved by participating households. It shows that the government investment is offset within five years through the value of production achieved by the food insecure household. Over a twenty year period, a direct Internal Rate of Return (IRR) of 15% on this state investment can be achieved by a poor household. On top of this, there is the economic and social value to households – and the nation – of reduced child stunting.

### An unexpected way out – “in my own four corners”

“My bags were already packed”, says Mrs Ntombolundi Zitha of Upper Ngqumeya village near Keiskammahoek in the Eastern Cape. “I had reached the end of the line – I just had to find a way of providing for my ailing mother and four children. I had no idea where I would go, or what I would do, or whether there was anywhere I could find a job. My bags were already at the door when BRC came with this idea of the home food gardens with rainwater harvesting.”

*“This is for people who have nothing. One doesn’t need money to be part of this.”*

*- Ntombolundi Zitha*

Border Rural Committee (BRC) is an NGO which has for many years assisted ten villages in the area with development initiatives and to obtain compensation for losses due to the Betterment Scheme implemented in the 1950s. In 2004, BRC had initiated a process in Cata, a village across the valley from Upper Ngqumeya, to stimulate homestead food production. MaTshepo Khumbane ran 'mind mobilisation' processes and 'helicopter planning' in Cata for a week. Ever since then, BRC's Mrs Zanele Semane has carried this flame of hope with the village women. Now they are spreading it to other villages.

"This is for people who have nothing, but who want to get something from their own efforts," says Ntombolundi. "One doesn't need money to be part of this. We use natural things to grow our vegetables, like manure, and we spray with aloe for pests. We are not investing our money to buy seed and fertiliser."

Ntombolundi's neighbours share her view.

Virginia Magwanca feels that: "the great thing about this is that we don't need to depend on anybody else. We want our children to get educated, but we want to support them in this without having to go and find a job somewhere else. They need us here, at home."

This concept of "my four corners" (referring to the corner poles of her own yard) is echoed in every village where the Water for Food Movement philosophy takes root. The women delight in the freedom of becoming highly productive in her own yard, where she has full control and can stay close to her children at the same time.

*"My four corners."*

The words families use to describe their delight at being productive where the family has full control over all decisions, that they don't have to wait for anyone, and can live their life together as a family.

Men tend to agree, for various reasons: "It is good that it is in the yard, because I can still work on it late if I have to go somewhere else during the day," says Zwayise Sethinde.

*"It's double-double! Our yields are much much better and we can now produce right through the year."*

"My whole family is interested now", says his neighbour. "My wife and children are helping me now, whereas in the past I worked alone in the garden. It is exciting everyone, because we are getting so much more from our efforts. It's double-double, our yields are much much better and we can now produce right through the year, instead of summertime only."

"We want to expand this to our lands, too, so that the development of the whole area can take place. We want our children to grow up with the understanding that one needs to work for what you get," adds Themba.

*"Now we have food all the time."*

A glimpse of Ntombolundi Zitha's food garden in Upper Ngqumeya, Eastern Cape – no fertiliser has been used.



"We are getting much better produce now that we are digging deeper. We started in March 2006, and we were already eating spinach in April – in the past it would take three months before we could get anything."

"The water harvesting is important, because now we can also plant in winter, as the water is kept in the trenches, instead of just running past and away. Now we have food all the time," rejoices Ntombulundi.

"We started with seedlings from BRC, but now we don't even have to wait for someone to bring seedlings from East London, we just make our own," says Virginia.

Joyce Makhanthu, Chairperson of the Development Committee is amazed: "I am selling vegetables now and getting money for schoolfees. Later, I just know that one can even build a house with these vegetables that costs nothing!"

She is so right, because this is exactly what Theresa Molotsi in faraway Limpopo Province achieved in the early 1980s. From total desperation about how to help her hospitalised malnourished child, MaTshepo Khumbane opened Theresa's eyes to see how she could establish one of these no-cost food gardens. Step-by-step she could – firstly – save her child, then gradually expanded her garden and started selling from home, and later started buying-and-selling a range of vegetables, snacks and other consumables. Indeed, she not only expanded her house, but about ten years later she had enough cash to buy a second-hand vehicle. And her formerly malnourished son has by now studied at College!

## The plight of many

City-dwellers often find it unthinkable that, while our pulsating modern economy grows in leaps and bounds, such small interventions could be so significant for the majority of people in our country today. Yet the statistics confirm this:

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THURSDAY, JULY 13 2006

City data rises Page 2	<table style="width: 100%;"> <tr> <td>▲ All Share</td> <td>21 591.7</td> <td>+ 323.7</td> </tr> <tr> <td>▲ Top40</td> <td>19 834.2</td> <td>+ 314.6</td> </tr> <tr> <td>▼ Dow Jones (7pm)</td> <td>11 043.4</td> <td>- 91.3</td> </tr> <tr> <td>▲ FTSE-100</td> <td>5860.6</td> <td>+ 3.3</td> </tr> </table>	▲ All Share	21 591.7	+ 323.7	▲ Top40	19 834.2	+ 314.6	▼ Dow Jones (7pm)	11 043.4	- 91.3	▲ FTSE-100	5860.6	+ 3.3	<table style="width: 100%;"> <tr> <td>▼ Rand/Dollar \$</td> <td>7.1030</td> <td>- 0.0107</td> </tr> <tr> <td>▼ Rand/Pound £</td> <td>13.0177</td> <td>- 0.0886</td> </tr> <tr> <td>▼ Rand/Euro €</td> <td>9.0151</td> <td>- 0.0613</td> </tr> <tr> <td>- Prime Rate</td> <td>11.0</td> <td>Unch.</td> </tr> </table>	▼ Rand/Dollar \$	7.1030	- 0.0107	▼ Rand/Pound £	13.0177	- 0.0886	▼ Rand/Euro €	9.0151	- 0.0613	- Prime Rate	11.0	Unch.	<table style="width: 100%;"> <tr> <td>▲ Gold (London pm)</td> <td>650.0</td> <td>+ 19.25</td> </tr> <tr> <td>▲ Platinum</td> <td>1258.0</td> <td>+ 26.0</td> </tr> <tr> <td>▲ Oil (August Brent)</td> <td>74.1</td> <td>+ 0.4</td> </tr> </table>	▲ Gold (London pm)	650.0	+ 19.25	▲ Platinum	1258.0	+ 26.0	▲ Oil (August Brent)	74.1	+ 0.4
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## SHOWING ITS CARDS

Edcon praised for debtors book disclosure

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## Half of SA survives on R20 a day

THABANG MOKOPANE

household expenditure of R839 billion, according to the Reserve Bank's 2004 household expenditure report

those households in rural areas and 990 000 in urban areas were unable to meet their debt food intake

music systems, 106 187 had electric hotplates, 101 241 had refrigerators and 80 464 had TV/radio

being subsidised by the government a year, while 80 percent of houses had been electrified since 1992

relatively common, particularly for poorer households. Sixteen percent of all households

"Half of SA survives on R20 a day" reads the headline in the "BusinessReport" of Thursday, July 13 2006. "Despite the low level of income, collectively, these households generated R129 billion of the economy's household expenditure in 2004", reports financial research group Eighty20. "That spending represented 15% of the economy's total household expenditure of R839 billion, according to Reserve Bank's 2004 household expenditure report."

The seemingly small efforts of these almost invisible poor households are important to us as a country through their sheer numbers.

"The analysis showed that 60 percent of the 5.2 million households where individuals were living on less than R20 a day, were in rural areas. It showed that 1.3 million of those households in rural areas



were unable to meet their daily food needs," although "seven million children receive child support grants and 10 million South Africans receive social grants."

The seemingly small efforts of these households are also important because of the direct and immediate way in which it improves their access to food and thus, control over their own lives.

Clearly, Ntombolundi's desperation is the desperation of many other families in the rural areas.

Further, the research showed that "a total of 15 million, or 36% of children in the country live with both parents, and the rest live with one parent or without any." The families from Upper Ngqumeya are giving voice to the desire of millions of families across the country who wish to be together, so that they can provide a safe haven and a home for their children to grow up cared for, disciplined and loved – ready for a full productive life.

Small wonder then, that one meets with so much enthusiasm in villages like Cata and Upper Ngqumeya, who have discovered that, through this seemingly small thing, they can take control of and improve their lives.

### **"War on Hunger" – The evolution of a bottom-up policy**

The former Minister of Water Affairs and Forestry, Mrs Buyelwa Sonjica's decision to approve the DWAF subsidy programme for homestead rainwater tanks, was based on evidence of their impact on the poor from villages like Athol and Strydkraal in Limpopo Province.

Women in both these villages initiated their own rainwater harvesting (RWH) tanks after similar "mind mobilisation" processes as those run in Cata and Jane Furse by MaTshepo Khumbane. Many of these women have similar stories to Ntombolundi's and Theresa's – stories of hopelessness and gloom turned to determination and joy.



*"We have buried the hunger"* were the famous words of Emily Masha and her husband.

Their garden overflowed with food while newspaper headlines rang: **"worst drought in 100 years"** on 19 January 2004, in Sekhukhune, Limpopo.



Margret Nyalungu and Martha Tsila from Athol, Bushbuckridge, making "War on Hunger" with peanuts for

**"War on Hunger"** was the message of the women from Athol, Strydkraal and other villages, when they formed the hub of the 'African Village' in the WaterDome during the World Summit on Sustainable Development in Johannesburg in 2002. Undeterred by her own illiteracy, Margret Nyalungu of Athol village delivered a striking presentation in one of the conference sessions at the

WaterDome, making the point that rural people could do so many things for themselves, if they were not hampered by bureaucrats, technocrats and politicians, who seem to believe they can do nothing on their own. She and the other women from Athol displayed a video – which they had recorded themselves on a borrowed video-camera – of a concrete weir that they themselves had built to dam the water in a river for irrigation. Since then, 116 women in Athol have also each built their own homestead rainwater tanks in their yards for their food gardens and a further 300 families are keen to start.

As DWAF officials and politicians played their role at the WSSD in Johannesburg to help formulate the Millennium Development Goals, these rural women's message about "War on Hunger" was speaking into the minds of the likes of Kofi Annan, the Prince of Orange, presidents, ministers and officials of countries from all over the world.

And indeed everybody's efforts paid off: Millennium Development Goal 1 says: "To halve the number of people living with hunger by 2015."

South Africa was one of 189 countries to sign her commitment to the MDGs. The Department of Water Affairs and Forestry is now working hard to play its part in putting this promise into action in water supply and sanitation (MDG2), but for MDG1, it is helping rural people's "War on Hunger" through the DWAF Rainwater Harvesting Programme.

"Only we can achieve the MDGs", according to these grassroots women. "We are the ones going hungry, not you, and so we are the ones who must beat hunger. Your role can never be to do this for us, your role is to walk the road with us and to take our hands only where we can't cope alone."

*"Only we can achieve the MDGs. We are the ones going hungry, not you, and so we are the ones who must beat hunger."*

*"Your role can never be to do this for us, your role is to walk the road with us and to take our hands only where we can't cope alone."*

The Department heard them, and is now "taking their hands" by providing poor households with the high capital cost element – the large rainwater tanks – for the homestead production system. But the whole system entails a lot more – all of which is developed and operated by the household themselves.

The DWAF subsidy is not only for food production, but for 'any productive uses by the poor', such as making cement-blocks, water for someone wanting to do people's hair, water for processing and selling things, water for raising small livestock, fish or any other homestead economic or productive activity.

However, most households opt for food production in the first place when they have access to more water – this was shown some years ago by a study by AWARD in 12 villages in Bushbuckridge.

Water is DWAF's business, as is sanitation and forestry. The Department is looking critically at how it can ensure that people have access to water for their livelihoods, whatever they choose to do, whether it is agriculture, industry or a variety of enterprises. DWAF is especially seeking ways to respond to poor people's needs for water to help them out of poverty. Therefore, where poor people themselves are taking such initiatives as these, DWAF is keen to respond.

Through the rainwater tanks, a household obtains a longterm asset that can help it pursue a range of water-based activities, which may change over time. Often the types of initiatives people initiate could benefit from partnerships with sister Departments, like Agriculture and Health. DWAF also

collaborates closely with local government to ensure synergies. In addition to its own programmes, DWAF is also committed to support initiatives of its sister departments, e.g. by trying to ensure that water allocations are available to their initiatives. This is an important focus of the Water Allocation Reform Programme.

In DWAF initiatives, such as the Rainwater Harvesting Programme, the Department seeks to maximise the sustainability of household efforts in several ways, for instance:

- by following proper development approaches, which avoid undermining the household control and ownership of their home-based initiative and their rainwater harvesting tank (thus heeding the call that “you can never do it for us”);
- by making sure that households have realistic expectations of what they can achieve with their rainwater harvesting dams, to avoid disappointment;
- by helping to make sure households have access to sufficient information and training for the enterprise they have chosen;
- by promoting household practices which does not depend on ongoing external support – a good example is to grow vegetables cheaply with organic waste and own seedlings; and
- by facilitating and encouraging the formation of ‘mutual-care groups’ among participating households in a village, such as the Water for Food group in Upper Ngqumeya or the ‘learning groups’ in Umbumbulu in KwaZulu-Natal.

An important characteristic of these ‘mutual-care groups’, is that there is no economic inter-dependence between the participants – this helps avoid the conflicts which are so common in group-projects.

“The moment money comes into it, we start fighting amongst ourselves,” according to the Charter of the Water for Food Movement, as developed and adopted by Lesotho women. So often, everything can start falling apart because of such fights.

Therefore, instead of ‘projects’, these ‘mutual-care groups’ are social groups – friends and neighbours who share ideas, motivate one another and take care of each other and of needy cases in their village as and when these needs arise.

This gives effect to some of the most important cornerstones of the Water for Food Movement philosophy – mutual care and motivation, while avoiding fights over money by enabling everyone’s own efforts and rewards to remain a household matter in ‘my four corners’.

These ‘mutual-care groups’ give effect to some of the most important cornerstones of the Water for Food Movement philosophy:

- mutual care and motivation, while avoiding fights over money by enabling everyone’s own efforts and rewards to remain a household matter in ‘my four corners’.

*–Water for Food Movement*

## **The cost and value of the DWAF intervention**

It is Government’s duty to its citizens and its taxpayers to ensure that its investments are justified and that its interventions are worthwhile. It needs to make sure that the money may not perhaps have been spent more usefully on something else to achieve the desired outcome.

In the case of the Rainwater Harvesting Programme, DWAF’s objective is to contribute the achievement of Millenium Development Goal 1: To halve the number of people living with hunger by 2015. Looking at the statistics reported above, this means halving the 1.3 million households in South Africa’s rural areas who are “currently unable to meet their daily food needs”.



MDG1 is also about halving the number of people living on less than USD1 per day, but income generation is not the primary objective of the DWAF Rainwater Harvesting Programme.

*"Some of us don't want to 'go business'. Don't push us where we don't want to go. You don't know our circumstances, you don't live our lives. We will decide the road, you can walk next to us, but not ahead of us. This is our war, we must be able to fight it our own way. Don't take over, you don't know better than we do what we need."*

Government – including DWAF – have a number of programmes targeting income generation, but with this Rainwater Harvesting Programme DWAF is responding uniquely to the rural women's "War on Hunger" in the first instance. Should they start making money, like Joyce in Ngqumeya and Theresa in Jane Furse, this is viewed as a very positive spin-off, providing the family with a ratchet-up out of the food-insecurity bracket.

However, keeping the focus of the Rainwater Harvesting Programme on the "War on Hunger" is critically important for a large number of these rural women who are currently daunted by the

idea of having to "go business". "Don't push us where we don't want to go. You don't know our circumstances, you don't live our lives. We will decide the road, you can walk next to us, but not ahead of us. This is our war, we must be able to fight it our own way. Don't take over."

This creates an interesting dilemma for DWAF. How does one calculate (and report on) the value of the investment if the outcome is not measurable in money terms? This goes beyond the familiar challenge in South Africa, of: "how does one put a value on the 'soft issues'?", to "how does one value improved health and well-being and decreased anxiety?"

### *Millennium Development Goal MDG-1:*

*"To halve the number of people living with hunger by 2015"*

In South Africa, this means halving the 1.3 million households in our rural areas who are "currently unable to meet their daily food needs" (2006).

The key indicators used by the United Nations to measure progress on MDG1, revolve around malnutrition of children under five years of age (U5 malnutrition), and steps taken to address this problem. U5 stunting is a particularly severe problem in

South Africa, where a disturbing 25% of our children are physically and mentally underdeveloped – and thus permanently damaged – through insufficient vitamins, minerals and protein in these early childhood years.

As a result of this damage, "malnourished children have low life-long earning capacity, and are thus likely to have malnourished children themselves." Thus this ghastly cycle continues from one generation to the next. U5 nutrition is thus, by proxy, a good indicator of the general nutritional status of the household as a whole and even tells us something about the prospects for the next generation.

According to a May 2006 UNICEF report, South Africa is not progressing, but in fact presently losing ground on MDG1. The problem is severe and urgent.

U5 nutrition is thus, by proxy, a good indicator of the general nutritional status of the household as a whole and even tells us something about the prospects for the next generation.

The DWAF Rainwater Harvesting Programme requires from implementers that “there should be evidence of a process of targeting to ensure that this grant would contribute to the achievement of the MDGs,” but in reality, a method has not yet been developed on how to adequately measure the contribution.

From stories like those quoted above, the DWAF Rainwater Harvesting Programme is clearly making considerable impact on intangible matters, as evident from listening to poor people’s voices.

However, in the absence of money-based parameters to account for these ‘soft issues’, some figures are presented below of the value of production achieved by Water for Food households at Cata in the past year.

These figures are presented with reluctance, for fear that even reporting these figures would result in us regressing to a consideration of the ‘money-outputs’ of the programme only, which would again push our thinking and debates away from the “War on Hunger” objective, towards the more familiar (but later-phase) subject of income generation.

The following figures come from records kept by Water for Food households in Cata, for eight months from mid-2005. BRC summarised the results as follows:

<b>Cata Water for Food households</b> <b>Value of production over 8 months from mid-2005</b>					
<b>Title</b>	<b>First name</b>	<b>Surname</b>	<b>Sales of produce</b>	<b>Value of produce consumed or donated</b>	<b>Total value of produce</b>
Ms	Sisiwe	Kiba	R 705.00	R 363.00	R 1,068.00
Ms	Nothemba	Languva	R 2,492.50	R 623.50	R 3,116.00
Mr	Zolani	Luti	R 963.00	R 120.00	R 1,083.00
Mr	Pumzile	Mboso	R 1,435.00	R 775.00	R 2,210.00
Ms	Nobuntu	Ntshutsha	R 484.00	R 987.00	R 1,471.00
Mr	Mzwamadoda	Pama	R 965.50	R 302.25	R 1,267.75
Ms	Nomzi	Sampempe	R 1,091.50	R 343.00	R 1,434.50
Ms	Boniswa	Tontsi	R 746.00	R 441.00	R 1,187.00
Mr	Mawethu	Tontsi	R 1,329.00	R 217.00	R 1,546.00
Ms	Noluthando	Vakata	R 885.00	R 232.50	R 1,117.50
			<b>R 11,096.50</b>	<b>R 4,404.25</b>	<b>R 15,500.75</b>

Source: BRC internal report: Summary of records kept by Water for Food households, Cata.

These records apply to the eight months from mid-2005. The equivalent value of this household production would be an average of R2325.11 per year, R193.76 per month or R6.46 per day.

Some remarks need to be made about these figures:

- Firstly, R6.46 per day seems trivial, but only until we compare it with the statement that “half of SA survives on R20 a day”.
- Secondly, it is sobering to consider that these households would not have had access even to the portion shown as ‘produce consumed’ without this intervention, simply because they would not have had cash to purchase these vegetables instead. Thus, without this no-cost production approach which enabled them to ‘get something for nothing’, there would have been no pathway out of malnutrition and stunting for pre-schoolers. It is internationally accepted that mothers’ continuous access to own produce is one of the most direct strategies to achieve adequate child nutrition.

- Thirdly, this produce came from the first seasons of production, with only a portion of the home food garden established. Mrs Khumbane's records show that her production per trench improves year-on-year as the trenches mature, and she advocates a 'five-year food security plan' to households, meaning that the number of trenches are gradually increased over a five-year period.

	<b>Value of household production, if garden is expanded annually by the same number of trenches as developed in the first year</b>	<b>Value of household production, if garden is expanded annually by half the number of trenches as developed in the first year</b>
Year 1	R 2,325.11	R 2,325.11
Year 2	R 4,650.23	R 3,487.67
Year 3	R 6,975.34	R 4,650.23
Year 4	R 9,300.45	R 5,812.78
Year 5	R 11,625.56	R 6,975.34
<b>Total value: (first five years)</b>	<b>R 34,876.69</b>	<b>R 23,251.13</b>
Average per year: (first five years)	R 6,975.34	R 4,650.23

Results from a 2002 study by the International Water Management Institute confirm this gradual increase in yield and overall output. MaTshepo Khumbane's winter production alone (i.e. not counting summer production when fruit adds significantly to the overall output), yielded a metric tonne of vegetables in her backyard food trenches totalling 222m<sup>2</sup> (i.e. a miniscule two-hundredths {or 2%} of a hectare). Because of the intensive production, some of her crops yielded three times the average yield typically achieved by top commercial farmers. Significantly, the year 2002 was MaTshepo's fifth year of production since settling at this home.

<b>MaTshepo Khumbane, Cullinan Food grown in Winter 2002</b>			
<b>food grown</b>	<b>land (sq. m)</b>	<b>food (kg)</b>	<b>months of daily portions for 6 people</b>
Beetroot	30	126	7
Broccoli	23	57	2
Cabbage	12	96	8
Carrots	12	50	4
Cauliflower	10	69	4
Lettuce	20	64	2
Onion	50	350	65 (5.4 years)
Peas	43	65	5
Spinash	14	42	2
Other	8	34	-
<b>222 sq.m</b>		<b>953 kg</b>	
<b>(=2% of a hectare)</b>		<b>(=approx 1 tonne of veg)</b>	

Source: International Water Management Institute

RWH garden, used both in winter and summer, could thus comfortably produce R8000 per year worth of vegetables. This figure compares well with the projections based on the Cata figures above.

The number of months that a family of six people would be able to each eat a portion of the crops produced in this winter season (provided these could be stored safely), is shown in the last column.

The variety of vegetables grown is highly important to a balanced, nutritious diet that would help address the stunting among children in South Africa.

A large component of the production which is not contained in these figures, are the greens which were fed to the pigs and the chickens (an approximate further 500 kg) and the large variety of herbs used for medicinal purposes for the family and animals.

Part of this winter production was R2000 worth of onions from a 50m<sup>2</sup> portion of the garden – enough to purchase half a year's maize meal for a family of six. Through simple extrapolation, a mature 100m<sup>2</sup>

**For the sake of this analysis, a conservative R5 000 per year value of production would thus seem reasonable. Ignoring the intangible benefits then, how does the money-value aspect of the household output compare to the cost of the DWAF Rainwater Harvesting Programme intervention?**

Results of the DWAF RWH Demonstration Phase, November 2005 – July 2006, and subsequent analysis and planning for expansion, has shown that the total cost of delivering a homestead rainwater tank of 30 000 litres, plus the associated facilitation and training to establish household production, 'mutual-care' groups, etc., is not expected to exceed about R23 000 (incl VAT) during the expansion and roll-out phases.

<b>DWAF "War on Hunger" investment (per household)</b>	
Material and labour per 30 000 liter rainwater tank <i>(i.e. underground tank size equivalent to six large 5 000 liter plastic tanks, which provides sufficient water for 100 sq m. RWH garden, cultivated winter and summer)</i>	R 13,000.00
Facilitation, sustainability inputs, HH training, HH production establishment; 'mutual-care group' establishment; coordination with local authorities; construction management; project implementation management; etc.	R 7,000.00
<b>Total (excl VAT)</b>	<b>R 20,000.00</b>
VAT @14%	R 2,800.00
<b>TOTAL DWAF INVESTMENT PER HOUSEHOLD (VAT inclusive)</b>	<b>R 22,800.00</b>

At ±R25 000 VAT inclusive, this would mean that the value of production (not counting the intangible benefits), could off-set the cost of the DWAF intervention in less than five years. The rainwater tank has an expected life-span of at least twenty years, and would thus remain as a long-term asset to the current and future family members, long after the value of production has off-set the government investment in the household production system.

The rainwater tank has an expected life-span of at least twenty years, and would thus remain as a long-term asset to the current and future family members, long after the value of household production has off-set

## **What is intensive Family Food Production and Rainwater Harvesting?**

The "Intensive Family Food Production and Rainwater Harvesting" approach presents an opportunity to harvest some 220,000 litres of water from ground surface runoff each year to produce food in home gardens throughout the whole year. Garden sizes of 100 to 200m<sup>2</sup> can be supported at each homestead with measured yields of 1.8 tonnes per year of low cost and immediately accessible food. This approach promoted by DWAF has shown widespread success nationally and has sustainable and measureable impact on homestead food security and variety, cash-income and poverty. The "Intensive Family Food Production and Rainwater Harvesting" approach targets the very root of poverty by effectly addressing widely prevalent hunger and especially child malnutrition.

On average in South Africa, only 6% of the total annual rainfall reaches the rivers – this is called Mean Annual Runoff (MAR). The aim of rainwater harvesting is to make better use of the other "94% of rainfall" for food production, targeting the most vulnerable and poor households. 'Water harvesting' is a slightly broader definition and means 'rainwater harvesting' plus 'grey water recycling'.

**Definition of Rainwater Harvesting:** Rainwater harvesting is the collection and concentration of runoff water for productive purposes. It is also defined as all the methodologies of concentrating, diverting, collecting, storing,

utilizing and managing runoff for productive uses. Water can be collected from roofs and ground surfaces for domestic uses, stock and crop watering. To overcome the unpredictability and unreliability of rainfall in our part of the world, rainwater harvesting strategies propose to 'slow down, catch, store and use' every drop that can be used. Most of the rainwater is channelled and stored directly in the soil of the vegetable beds, while some can be stored in tanks and/or other containers for later use.

Rainwater harvesting strategies propose to  
**'slow down, catch, store and use'**  
every drop that can be used.

**Grey water** is the end product of domestic activities (bathing, washing dishes and clothes and cleaning) and this water is available throughout the year. After domestic activities, it is collected into a drum. Ash is added to separate out the soap, and the cleaned water is then scooped out when it is needed for irrigation of the food crops in the garden. This water is not suitable for drinking or animal watering.

**Stormwater runoff collection** applies to water running off roads, pathways, roofs and the veld during a rainstorm and is an important source of water, seldom stored locally. This can be diverted and stored in tanks or dams. In villages this water often poses a threat because it runs fast, causes erosion and damages fences, roads and houses. Surface runoff can be diverted directly into the cropped area (called 'run-on' RWH) or into storage tanks or 'dams'. Only small trenches and furrows are needed to control and divert the flow. During this process, the deep-trenched beds are irrigated directly and surplus water is diverted into tanks for irrigation in the dry months.

Photos showing home-food production based on this approach are shown overleaf. Many of these were taken at households adjacent to collapsed irrigation schemes who have participated in food production initiatives targeting nutritional insecurity and hunger.

Success is partly linked to the deep-trench intensive gardening approach, grey water re-use and the rainwater harvesting methods. Importantly, underground storage of approximately 30 000 litres is required to support production through the 3 to 4 month winter period. Gardens and tanks are within the homestead boundary and therefore wholly controlled by one family, avoiding the complexity of communal ventures.

## Victory in the first battle – Demonstration Phase outcomes



Where it all starts – MaTshepo Khumbane inspiring deep trenching at Potshini. KZN



Intensive trench beds just 8 weeks after planting. Ma Tonisi, Keiskammahoek



The sequence of these photos is deliberate: intensive Family Food Production is started without a RWH dam. The first beds are watered with recycled domestic water, and by channeling rainfall run-off in furrows, straight to the planting trenches. Significant production can be achieved in this way.

The RWH dam comes later, and helps:

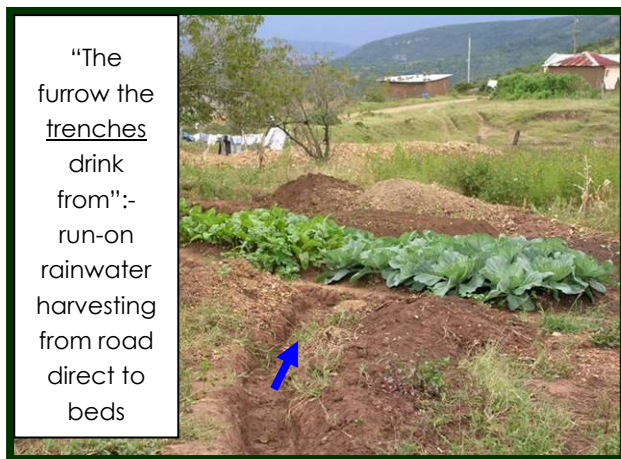
- by providing water during dry spells in summer,
- by making winter production possible, and
- by enabling households to plant larger areas (up to 100-200m<sup>2</sup>, which is about 2% of a hectare) of intensive high value production.



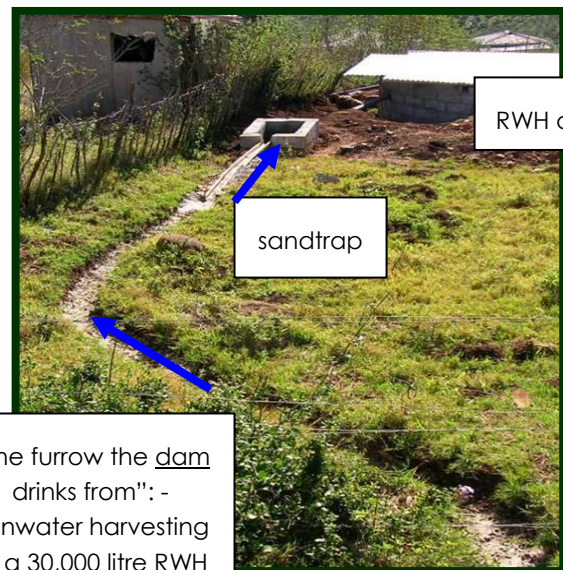
Run-off to fill many trenches and RWH dams – from a 20 minute downpour!



Preparation of 1m deep trench with old tins, maize stalks and manure.



"The furrow the trenches drink from":- run-on rainwater harvesting from road direct to beds



RWH dam

sandtrap

"The furrow the dam drinks from":- rainwater harvesting to a 30,000 litre RWH dam, via a sandtrap



Hard work, done with pride and determination: Digging to 'bury the hunger'



Mr Maphumulo's RWH dam ready for a roof, December 2005. Umbumbulu. KZN





Underground RWH dam in the backyard, safely roofed so that no child can fall in



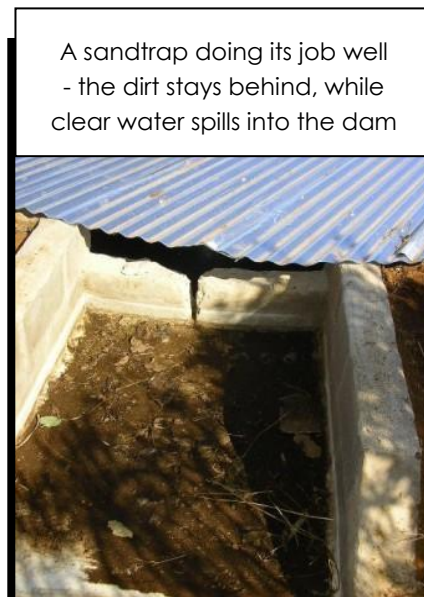
RWH dam - full of water!  
The trap door in the roof must keep children out, yet provide access to clean out the tank.



Underground RWH dam.  
Note interesting sunken roof which catches water falling onto its own roof



Drums, gutters and an innovative catchpit



A sandtrap doing its job well  
- the dirt stays behind, while clear water spills into the dam



Tshilidzi Mathobo, DWAF Manager of the RWH Programme, vigorously testing a treadle pump! May 2006.



Creativity! Home-made gutter in Limpopo

## Key lessons learnt in the Demonstration Phase

Some selected key lessons learnt during the Demonstration Phase were as follows:

### **Production first!**

It has been demonstrated that it is indeed possible to establish gardens or other production first, before the RWH dams are supplied. We have seen that this leads to rapid uptake of intensive production practices, and the realisation that a lot of food can be grown with run-on water and grey water recycling. The RWH dam then plays its proper role, namely to save crops during mid-summer droughts, and to make winter production possible.



High production from intensive mixed plantings of cabbage, beetroot and onions in trench bed.

### **Go and look for the poor!**

Development opportunities are ALWAYS more easily taken up by the better off in any village or society, while the poorest families are often withdrawn from society to the extent that they don't hear about opportunities, don't think they would be able to do what it takes, or in some cases are shunned from participation because everyone thinks they are lazy.

This DWAF RWH initiative is specifically targeted at the 'households unable to meet their daily food needs', therefore a focussed effort is required to overcome these very real difficulties. At the same time, it has proved to be important not to exclude slightly better-off families, especially those that are committed and active gardeners.

### **Ensure moral support and recognition from local leadership!**

The need for involvement of local leadership goes well beyond compliance with 'cooperative governance' requirements. Local leadership needs to understand the significance of the efforts of these poorer households. Without the leadership's outspoken recognition of poor households' efforts and achievements, early successes often dwindle and things just settle back into old familiar patterns.

### **Ensure commitment to the concept by the whole family!**

One of the outcomes of the initiative, is to encourage family unity in sharing the burden for food security. Furthermore, failure to involve the whole family has caused implementation delays, for instance when decisions kept on being changed about where to dig the RWH dam in the yard.

### **No "one-type fits all"!**

One of the aims of the Demonstration Phase was to test many types of construction and materials and to select the most suitable for full-scale rollout of the DWAF RWH Programme. However, the cost of building materials and other conditions vary so dramatically from place to place, that some variety in the choice of tank-type is necessary. For instance, the cost of cement blocks varied between R2.50 to R8.90 per block! In areas where there is no good sand and stone, concrete structures become hideously expensive. Some homes are so remote and inaccessible, that all materials have to be carried on donkeys up steep hills. Often these households are the ones who most desperately need such a close-by water source to fight malnutrition. In these cases, the use of light-weight materials like geo-fabric and bitumen, or plastic lining may work out cheaper.

These and many other lessons learnt are now being captured in a document called: "DWAF Programme Guidelines for Intensive Family Food Production and Rainwater Harvesting." These guidelines will be used for further implementation of the DWAF RWH Programme, and will also be made available to other organisations and funders interested in implementing similar initiatives.

## Weaponry for the 'War on Hunger' – planning for expansion

The challenge that follows the Demonstration Phase, is to expand the DWAF RWH programme in two ways:

- Firstly, in the 26 Demonstration villages, to expand from the 3-5 demonstration households to a further 50-150 per village (depending on demand/number of interested households), and with the assistance of the pilot-implementing agents (called Pilot-ALEs).
- Secondly, to expand to new villages and new ALEs, to test the transfer of the lessons learnt in the Demonstration Phase to new participants and partners.

The implementation of both these expansion activities can commence as soon as the current moratorium on financial assistance under section 61 and 62 of the National Water Act (Act 36 of 1998) had been lifted.

Activities now required to prepare for this, include, among others, the following:

- Development of guidelines and training material for participating households, facilitators, builders and registered implementing agents (RIAs);
- A planned national workshop to disseminate lessons learnt, solicit comment from stakeholders and stimulate the interest of potential new implementing agents;
- Recieval and adjudication of new proposals for expansion;
- Development of monitoring and evaluation procedures and capacity; and
- Refinement of DWAF internal programme management and financial procedures to enable the smooth running of programme implementation.

A key aspect of preparation for expansion is the development of best practice in the structuring of implementation teams to achieve the range of facilitation, training and construction outputs involved in:

- mobilising and training poor households for production; and
- efficiently managing the construction of large numbers of small infrastructure.

## Missing weapons in the armoury

The DWAF RWH Programme currently provides for facilitation and training to introduce RWH and establish household production, and the supply of a RWH dam (or tank) of 30 000 liter capacity.

There is a real need to consider the following further aspects to enhance the value of the RWH dams for households participating in the DWAF RWH programme:

- water treatment – the supply of a cheap, robust water treatment technology which would enable the household to treat water from their RWH dam to make it safe to drink. Many different homestead-sized technologies for rural households are available globally, and some have been tested in South Africa.
- pumping – cheap, easy-to-use and easy-to-maintain pumps like treadle pumps, hip pumps and some handpumps



A treadle pump saves lots of time to water crops, so that more can be grown.



would make it easier for families to get the water out of the RWH dam. The easier it is to draw water, the less time it takes, and thus, the more food they can grow.

- fencing – child safety is the key priority in the DWAF RWH programme, therefore no RWH dam (tank) is supplied without a sturdy roof. Fencing of the dam is not acceptable to the Department as an alternative safety precaution against children and animals falling in and drowning. However, fencing of the food garden itself is not a luxury, but an essential element of the production system. In most villages, animals and chickens roam free and there are few things as disheartening to a family as finding their hard-earned food finished off by such animals.



No fence? Protecting seedlings from goats and chickens with thorn branches. Until the temptation lures them even through these prickly deterrents... August 2006.

## RWH and intensive family food production: “What it is” and “what it’s not”

<i><b>What it's <u>not</u></b></i>	<i><b>What it <u>is</u></b></i>
<i>It's <u>not</u> just a homestead RWH dam-building project</i>	<i>It is a systematic programme to kick-start affordable but intensive home food growing, followed by the building of a RWH dam in the poor family's backyard</i>
<i>It's <u>not</u> “the answer” for every poor household in South Africa</i>	<i>It is an important option for many of SA's 1.3 million households who are “unable to meet their daily food needs” in 2006</i>
<i>It's <u>not</u> a ‘money-spinner’ or a ‘lucrative full-time career’ at home</i>	<i>It brings stability into the household by removing a lot of the daily anxiety about where the next meal will come from</i>
<i>It's often <u>not</u> attractive to people who are already meeting their food needs easily through other means</i>	<i>“This is for people who have nothing and want to get something from their own efforts” and “You don't need money to be part of this”</i>
<i>It's not a couple of scraggly cabbages in the backyard</i>	<i>It is intensive production on small areas. “My whole family is interested now, because we get so much more for our efforts”</i>
<i>The RWH dam is not <u>social infrastructure</u>, like ‘building them another house’</i>	<i>The RWH dam supplied by DWAF is <u>productive infrastructure</u> which enables the household to produce things year in-year out for twenty years or more</i>
<i>The RWH dam water is <u>not</u> clean enough to drink, because the dam catches surface run-off</i>	<i>The RWH dam water is meant for productive use and is good for drinking only if it is boiled or treated</i>

