

# Zimbabwe's Rural Sanitation Programme

**An overview of the main events**



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# **Zimbabwe's Rural Sanitation Programme**

## **Introduction and origins of the programme**

The active phase of this programme began to build up after Zimbabwean Independence in 1980 when external donor support became available to the country. Before that time the Ministry of Health had been involved through its Environmental Health Department in the promotion of hygiene and the improvement of shallow ground water supplies and sanitation - a programme which had been building up since the later 1940's. Most of the ground work was undertaken by "Health Assistants" now known as Environmental Health Technicians. These field staff worked under District and Provincial Staff of the Environmental Health Department of the Ministry of Health and Child Welfare (MoHCW). There had been a long history of promotion of improved latrines and wells even before donor supported schemes began. Health Assistants operated at grass roots level moving through the villages they new well. Thus a knowledge of the advantages of improved water supplies and sanitation was well known throughout the rural areas before the activities related to the International Drinking Water Supply and Sanitation Decade began. This "foundation laying" period was vital to the future success of the programme - and in fact formed an important part of the overall country programme. Brick built pit latrines as well as partly protected shallow wells were already becoming more common in the rural areas in the 1960's and 1970's.

## **Early Technical development**

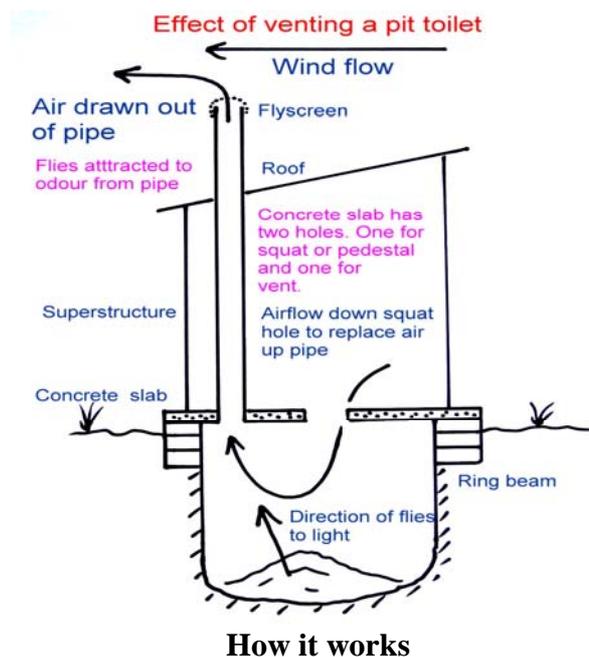
The sanitation programme always had a strong technical as well as an educational component, since health staff learned that people respond better if meaningful physical development took place rather than education alone. The Blair (VIP) latrine was designed for this programme by the Ministry of Health itself at the Blair Research Laboratory. This work started in 1973. After two years of research and development, it was first promoted by the Ministry of Health in 1975 and has been actively promoted by the Environmental Health Department ever since. Whilst the liberation war hindered the rapid promotion and uptake of the "Blair latrine" in the rural areas between 1975 and 1980, it was promoted on farms, estates, and in many rural government institutions during that period. Government staff also became familiar with the technology. In the early 1980's when peace returned to the countryside and donor support became available, a variety of lower cost options were designed, but the Ministry of Health, insistent on a longer term benefit from the programme, chose solid brick built structures which could serve a generation. Also a method of offering individual families a material incentive was developed. This method of offering an incentive helped enormously to promote the uptake of improved household and school sanitation throughout rural Zimbabwe and will be discussed in more detail later.

## **Technology**

The Blair Latrine (or VIP latrine as it is known elsewhere) controls both odours and flies by using a screened ventilation pipe in combination with a roofed superstructure which remains semi-dark within. A concrete slab, cast with holes for the vent and squat hole (or pedestal) is placed over a sealed pit which is normally lined with bricks or blocks. When air passes over a tube or vent, it draws air out of the vent and an upward air flow is created. Also if a vent pipe gets hot in the sun the warm air inside will rise. Flies are attracted to odour when they

approach a latrine and to light when they leave it. If odours from the pit come out of the pipe, most flies from outside will be attracted there. A screen fitted over the pipe prevents flies from gaining access to the pit. If the toilet structure is semi dark inside, any flies in the pit will seek the light and go up the pipe and be trapped there by the screen. The concept is simple enough and it works. Both concepts are used in Nature.

The initial research was undertaken at the Henderson Research Station, Mazowe, north of Harare. Further feedback was gained after units were placed all over the country, as interest by the MoH and the farming community spread. The results of research work were shared in the sub-region when details of the principles and design were given to specialists working in both South Africa and Botswana in the mid 1970's.



Many versions of the Blair Latrine have been developed over the years. These range from the simple and bizarre to the more conventional brick unit which became most popular in the rural programme. Both single and double compartment family units were built, most opting for the former. Schools and institutions build multi-compartment Blair Latrines which house up to ten cubicles in one single structure. Whilst the Ministry of Health have selected a specific standard of construction which uses fired bricks and between 4 - 6 bags of cement to construct, there are many variations. Very low cost models have been designed which use vent pipes made from cement and structures made of grass and mud bricks. The slab and collar remain cement, but a simple yet effective low cost VIP can use as little as a single bag of cement. On the other extreme, Blair Latrines can be upgraded to use a low volume flush toilet emptying into a septic sand and soakaway system. Methods of extending pit life have been developed by adding a second pit and channelling the contents of the first pit into the second. More recently composting versions of the Blair Latrine have been designed and built and are being actively studied and promoted inside Zimbabwe.

Also it became common practice to build a hand washing facility as part of the family latrine and also to provide a communal hand washing facility close to school multi-compartment latrines. Most family Blair VIP Latrines are also used as bathrooms. These aspects

emphasises the need for personal hygiene - a key factor to health improvement.

## Photo gallery of early Blair Latrines



Early prototype (left) used to examine the effectiveness of the vent pipe as a fly trap. Flies travelling in various directions were trapped and counted. It was important to establish how effective a screened vent pipe could be at trapping flies if the superstructure remained in semi darkness. At first doors were used, but if left open they admitted light which much reduced the efficiency of the pipe as a fly trap.

Consequently the door-less spiral superstructure was introduced and has been used ever since. It guaranteed semi darkness. Fly control was maintained with the spiral configuration, and the structure had no moving parts to fail. Later both round and square spirals were used. The initial experimental period lasted from 1973 – 73. Right: A ferro-cement spiral version with large asbestos pipe, the most common version before 1980. This was introduced in 1976. It was probably the most effective Blair Latrine ever designed. Both photos taken at Henderson Research Station where the research was carried out.



Examples of lower cost Blair Toilets built in the early 1980's. These had a relatively short life span however and the more substantial (and costly) brick built version became the standard. However much experience was gained at this time and also later in the construction of low cost VIP's.

## Photo gallery of Blair Latrines used in the rural programme



The most commonly built model was a brick built square spiral built without a door. The vent was also made of brick. Later brick built Blair Latrines were often fitted with hand washing facilities.



Large numbers of builders were trained in the programme. Also there were many variants of the standard design. Variants worked provided they used the basic principles of the established design.



Blair multi-compartment Latrines were built at large numbers of schools. 10 cubicles were built together within a single structure. Many were built with hand washing facilities.

## **Objectives and policy issues used in the programme**

During the 1980's and 1990's the government had a broad policy that every rural household should have access to improved sanitation (a Blair VIP Latrine) and also a protected primary water supply. To help clarify targets and objectives, a two phase approach to reaching acceptable service levels over a period of 20 years was agreed in the late 1980's. The aim was to achieve service level one by the year 2000 when all people in the communal lands and resettlement areas should have access to a protected primary water supply and 50% have access to at least a Blair VIP Latrine. Service level 2 was to be achieved by the year 2010 when everyone in the rural areas was expected to have access to safe drinking water from a PWS within 500 metres of the home and every household has at least a Blair (VIP) Latrine.

However it was understood that this aim would take many years to achieve, in practice, and far longer than the periods indicated above. Whilst the policy specified that the Blair (VIP) Latrine should be the technology of choice within the programme, the government census also includes non ventilated pit latrines. Currently figures for both VIP and non VIP latrines have been gathered by government staff countrywide. Up to the present time the type of latrine model supported by government or donor aid has been clearly specified in government policy - being the Blair VIP. Whether there will be any variation in this policy remains to be seen. There are many variations of the Blair VIP Latrine itself, including a range of "low cost options." However these use a high content of traditional materials and have a high maintenance requirement and reduced life span. The Ministry has never been keen to promote a technology which is temporary in nature and thus will have little impact on future generations.

Whilst private individuals could build any latrine type they wish, if they receive support through the government programme, they were expected to build a Blair Latrine conforming to fairly rigid standards of construction. Most structures were built from fired bricks and the great majority of vent pipes were also made from bricks although vent pipes made of PVC and asbestos were commercially available, although costly. Fired bricks are locally available, whereas commercially available pipes are far more expensive and in the case of PVC far less durable. Brick and asbestos are the preferred materials for the vent pipe, with non corrosive aluminium and stainless steel being essential for the fly screen. Steel screens corrode very quickly and may be rendered ineffective even after one years use. The brick chimney version, with its rough interior walls is less effective as a ventilator than smooth walled pipes, however, but it serves the purpose at a much lower cost. Several commercial versions of the latrine became available, but were not much used in the national programme - the emphasis being on the promotion of self help schemes. Some of these commercialised units were of very poor quality.

## **Marketing & promotion**

Since 1980 the government and politicians have supported the rural sanitation programme - possibly because the technology is "home grown" and popular with the users. As a result the "Blair Latrine" and all programmes associated with it receive a popular press - it is a source of national pride. As stated above, the Ministry of Health has supported an active promotion campaign for many years throughout the entire country and the offer of a material incentive has turned theory into practice for hundreds of thousands of families. The construction and

use of the Blair Latrine also forms part of both primary and secondary school curricular. Models are built and the operations of the latrine taught. Most schools have examples on their grounds – multi-compartment Blair Latrines are standard at large numbers of rural schools.

However the greatest marketing tool is the success of the technology itself. The technology is simple, effective and has low maintenance requirements when built correctly. The almost total absence of odour makes it very suitable as a washroom, and most rural “Blairs’ are used for this purpose. It is also a status symbol and there is much competition to complete the best and most decorated unit. Ironically the standards of construction of many Blair Latrines is higher than the house itself. This may be the beginning of a home improvement project.

The campaign has resulted in the construction of around 500 000 family Blair VIP latrines since its inception, including a few thousand multi-compartment school latrines in the national programme and many tens of thousands more in the commercial sector. Clearly this has been a result of a mixture of sound technology plus practical marketing and the offer of financial support.

### **Training & capacity building**

The rural sanitation programme provided many sectors of the public and private sector with training opportunities of one sort or another. Environmental Health Technicians were taught building and construction/installation techniques by central research and development institutions such as the Blair Institute and also by NGO’s such as the Mvuramanzi Trust. These skills were passed on to rural builders during on site training courses, which were practiced regularly all over the country and provided free of charge to the consumers. Such courses and the refresher courses which follow them ensured some form of quality control in constructional techniques. A series of well illustrated builder training manuals have also been produced and widely circulated which details every step of the construction of the various types of Blair VIP latrine. The sanitation programme alone has led to the expansion of building skills widely throughout the country with many thousands of builders were trained annually during this period - the Mvuramanzi Trust alone had trained over 1500 builders by 1997. Many new builders pass through a brief apprenticeship with the “Blair Latrine” and then pass on to building larger structures. In addition staff of the rural district councils become familiar both with physical techniques of construction and health related issues. As stated earlier, latrine construction and the functions of the “Blair VIP” also form part of both the primary and secondary school curricula. The value of a vent pipe and a fly screen is common knowledge throughout the land.

### **Institutional arrangements in the national rural sanitation programme (1998)**

The National Rural Water Supply and Sanitation programme is managed through government and is overseen by the National Action Committee who has representatives from all those ministries who are active in the programme. This includes the ministries of Local Government and National Housing, the District Development Fund and the Department of Water Resources which now fall under the Ministry of Rural Development and Water Resources and the Ministry of Health and Child Welfare (1998). The National Coordination Unit, working within the Ministry of Local Government, coordinates all major activities

within the sector and collects records of donor involvement, funding channels and annual achievements. It also debates on important issues like sustainability and cost recovery. In practice however, the rural sanitation projects are always supervised by the Ministry of Health on the ground, with the Rural District Council being responsible for the procurement of hardware like cement. Zimbabwe is undergoing a widespread decentralisation programme, where the Rural District Councils are taking far more responsibility for development and financing in their own districts. The rural water supply and sanitation programme is intimately linked to this decentralisation policy. In 1992 the government together with key donors, NGO's and other resource persons prepared a "Vision 2000" - a blueprint for how the decade may function in the future, with active and self organised communities working with effective Rural District Councils, supported by Central Government supporting such areas as national planning, policy formulation, technical assistance and training, research and information exchange. The increased involvement of NGO's was encouraged. Vision 2000 encouraged the use of capital originating from a mix of Central Government allocations and local revenues, with recurrent costs being raised locally.

### **Project funding and cost sharing**

After 1980 a great deal of donor support was provided to assist government in the expansion of its rural sanitation programme & much of the initial support was passed through the Ministry of Health directly. Later on most funding was channelled from the donors through a series of larger integrated projects which were processed through the Ministry of Local Government. Rural District Councils and the Ministry of Health both receiving funding through Local Government or directly depending on the financing arrangement.

During the 1990's the government of Zimbabwe was engaged in a decentralisation programme in which the Rural District Councils played a much larger part in planning and financing development projects within their respective districts. Funding from a number of donor agencies now passes directly through the rural district council and these include latrine building projects. In addition much financial support was processed directly through a number of NGO's operating in the sector.

### **Cost sharing**

In the Zimbabwe programme it has been accepted that some material support in the form of hardware will be provided to families who are willing to make considerable investments themselves in the construction of their own latrine. This is usually in the form of cement, reinforcing wire and a fly screen for the VIP latrine. The value of the material assistance varies considerably, with some NGO's offering far more than the governments recommendation, whilst other NGO's offer less. This method has resulted in a high demand for assistance by rural communities. The family or school provides labour, bricks, and sand and pays a builder who is trained by an NGO's or by government staff. The value of the material assistance amounts to about 35% of the total cost of each unit, being the cost of 4 or 5 bags of cement (Z\$80 per bag - 1998) and reinforcing wire. The following costs were calculated in 1998. Note that after 2000, the value of the Zimbabwe dollar began to depreciate considerably. In 1998 one US\$ would buy Z\$17. In 2005 one US\$ would buy around Z\$75 000. The costs of cement, labour, bricks and other hardware skyrocketed out of all proportion after 2003. These new costs will be discussed in a later report dealing with the

programme between 2001 and 2005.

**Shared costs of 5 cement bag material assistance** (figures calculated in 1998)  
(Note: figures for post 2000 increase dramatically in terms of Zimbabwe dollars)

Material assistance Z\$ offered by donors through the MoHCW

5 bags cement @ Z\$80	\$400
Fly screen	\$5
Plain wire	\$35
<b>Total</b>	<b>\$440</b>

Families input (Z\$):

Cost builder	\$350
Bricks (1500)	\$450
Sand & stone(value)	\$50
Pit digging	\$100
<b>Total</b>	<b>\$950</b>

**Total cost latrine \$1390                      Proportion by household approx 68.34%**

#### **Shared costs of 4 bag material assistance**

Material assistance Z\$

4 bags cement @ Z\$80	\$320
fly screen	\$5
plain wire	\$35
<b>Total</b>	<b>\$360</b>

Families input (Z\$):

Cost builder	\$350
Bricks (1500)	\$450
Sand & stone(value)	\$50
Pit digging	\$100
<b>Total</b>	<b>\$950</b>

**Total cost latrine \$1310                      Proportion by household approx 72.5%**

#### **Reducing material input substantially**

In more recent years efforts have been made to reduce the subsidy level to less than half of the original amount with the families providing more and the donors or ministry less. With good promotion this approach has been very successful. The Mvuramanzi Trust for instance provides a material subsidy of 3 bags of cement plus fly screen worth Z\$245 (US\$14) for a family unit and no other support apart from the training of builders. This material support

provides the family with sufficient incentive to provide all the other labour and materials need to finish the unit. The end result is a high quality brick built latrine which can serve a family for 10-12 years, before pit emptying or construction of a new unit is required. Once the latrine pit is full, materials, such as bricks and slabs can be recovered. By any standards this is good return for the investment. Over the years the users have become aware that pit life can be extended by using the unit to deposit excreta only, rather than excreta and garbage. Formerly the pit was a dumping ground for a wide range of unwanted garbage – including rags, plastic, bottles etc. These make emptying difficult and pit filling more rapid. The promotion of garbage pits as part of the MoHCW’s programme has helped to extend the life of the pit.

Shared costs of 3 bag material assistance of the 4 bag model (Mvuramanzi Trust)

Material assistance Z\$

3 bags cement @ Z\$80	\$240
fly screen	\$5
<b>Total</b>	<b>\$245 (US\$14.4)</b>

Families input (Z\$):

Cost builder	\$350
Bricks (1500)	\$450
cement (1 bag)	\$80 (note often 2 bags are provided by family)
Sand & stone(value)	\$50
Pit digging	\$100
plain wire	\$35
<b>Total</b>	<b>\$1065</b>

**Total cost latrine      \$1310                      Proportion by household approx 81.29%**

This is clearly the only direction in which the Zimbabwe model of funding can move in the future if the programme is to become more sustainable. However as the costs of labour and materials increased in the new millennium, far fewer families were able to contribute to these costs.

South Africa and Botswana use much higher subsidy levels for VIP latrines and the inputs are not entirely material. In South Africa the recommended R700 (1998) subsidy amounted to over 80% of the total cost of a single unit. By 2004, this subsidy had doubled. In Botswana the subsidy of around P1650 (1994 prices) amounts to about 70% of the cost. Countries like Mozambique and Malawi on the other hand, use much lower levels of material assistance for non ventilated pit latrines (including SanPlats), where several squatting slabs can be made from a single bag of cement. The provision of slabs alone however, does not necessarily lead to a high uptake of latrines. An educational backup encouraging people to build is also required. The method of supporting the programme is country specific with labour and material costs levels varying considerably in the sub-region. Technologically what suits one country may not suit another for many reasons. The differences in approach in neighbouring countries like South Africa and Mozambique, for instance, are huge. The simple and low cost

sanitary platform (SanPlat) system, for instance, is very popular in countries like Mozambique and Malawi, where households are unable to afford the higher input of VIP latrines built in other parts of Southern Africa.

Because so many Blair Latrines were being constructed in the rural areas of Zimbabwe, a great deal of money and skills circulated directly as a result of the programme during this period (mostly during the 1990's). Local industry and private business were encouraged in the rural areas. Similar concepts of promotion have been used in an "upgraded Family Well Programme, which assists families to improve their own backyard well. Once again material assistance is given, but the family itself pays the major component and employs a trained builder to undertake the construction. This was a very successful programme, where donors inputs are minimal compared to other methods of funding rural water projects. By 1998 about 30 000 upgraded family wells had been built with the potential for at least another 100 000 more. This is because the family sees development in its backyard as an investment worthy of its own support, whether this be a family latrine or an improved family well. After 2001 however, even this programme slowed down, like the sanitation programme.

### **Monitoring and evaluation**

Progress is monitored yearly through the Governments Annual Review of the Rural Water supply and Sanitation Programme. About one third of rural folk now have a VIP latrine built within a government programme. However the important statistic remained, that two thirds of the rural population still relied on the traditional pit latrine made from brick or poles and grass. Many still used the bush for defecation.

### **Annual outputs**

Annual outputs have varied greatly from year to year since the main rural sanitation programme began. An estimated 5000 Blair VIP Latrines were built between 1980 and 1983, with the following numbers being recorded after that period: 1984 (12 594), 1985 (17 305), 1986 (28 758), 1987 (47 088), 1998 (33 821), 1989 (25 886), 1990 (26 621), 1991 ( 10 689), 1992 ( 15 000 estimate), 1993 (9 000 estimate), 1994 (13 000 estimate ), 1995 (26 000), 1996 (22 500), 1997 (20 000), 1998 (20 000 estimate), 1999, 2000, 2001, 2002 (data still required), 2003 (6999), 2004 (6844), 2005 (5140).

In the earlier part of the programme figures for latrine construction were derived from all programmes supervised by the MoHCW. After 1991 records were transferred from MoHCW to the National Coordination Unit, which concentrated more on figures resulting from its integrated projects and often discounted figures resulting from NGO's inputs. However by the later 1990's there was a closer collaboration between central government and the NGO's which resulted in less under reporting. The jump from 1994 to 1995/96/97 may have been the result of more complete data collection, rather than an increase in output.

An estimated 40 000 units built on commercial farms and estates, which do not enter the National Rural Sanitation Programme statistics, must be added to this total figure of some 333 262 family units built in government programme by 1998. With a rural population of 6 million increasing at an estimated 180 000 a year (growth rate of 3% p.a), there was a need to build at least 30 000 units per annum for increased population alone. During the 1990's the NAC recommended that some 80 000 units should be built per year to achieve the final goal by the year 2020. In 1989 the number of rural people served by Blair VIP Latrines was

estimated at 1.86million people (31%). An inventory undertaken with UNICEF support during 2004 revealed the total number of family Blair latrines built at 422 378 serving an estimated 2.1million people. The coverage had been reduced to 24%, as a result of population increase and other factors. During the period 2003 to 2005, 18, 983 family latrines were built.

### **Health educational aspects**

One of the aims of all national water and sanitation programmes is to improve the health of the nation. In the rural areas this means that the water and sanitation programme fits in with a broader programme of Primary Health Care. Good health education leads to improvements in personal hygiene which in turn leads to better health. It is a matter of behavioural change not just the use of an improved facilities alone. However behaviour patterns are more likely to change for the good if the facilities are available which make such changes possible. Thus a combination of the practical and the theory go hand in hand. For instance to promote regular hand washing practice without any prospect of a suitable hand washing facility being available is not likely to achieve the end result. Hand washing is a vital component of this process. Many Blair Latrines have hand washing facilities built into them. The careful storage and use of water, the disposal of garbage and the cleanliness of the home itself are crucial areas of the primary health care programme which relate to environmental sanitation.

Health education programmes have been very actively carried out in Zimbabwe for many decades. In the past they consisted of Health Assistants moving about the villages and discussing issues relating to hygiene and the benefits of improved sanitation and water. In more recent years the participatory methods of health education (PHAST using SARAR methodologies) have been used far more widely and successfully - many related to the rural water supply and sanitation programme. This more modern approach has brought with it the introduction and use of carefully produced health educational literature, flip charts, and other materials and methods which involve the community more deeply in the process. The individuals self esteem and resourcefulness is used to the full in such techniques. Health clubs have also been introduced in some parts of the country - where theatre is often used to portray importance health related matters in a way which individuals can relate to. The positive influence on the successful outcome of community and family participation is clearly seen in such programmes. In a few areas there has been success using the PHAST technique of weaning families of toilet subsidies altogether.

An interesting example has been the introduction of a widespread family well upgrading programme, based on the methods used in the family latrine programme where families receive material support to assist them to upgrade their own family well. For many years rural communities had been served by a hand pump supply, and this method still forms the “backbone” of the rural water supply. However in recent years the government has accepted the use of “upgraded family wells” which provide good water at family level. They use the age old windlass, rather than any conventional hand pump. This method arose out of traditional practice, and is very popular with the users and has been accepted by the various government departments including the Ministry of Health. 3 bags of cement, a windlass and a tin lid are provided, but the family must dig the well, line it with fired bricks, provide other materials and pay a trained builder - their input amounting to about two thirds of the total. It is a cheaper method of providing and maintaining improved water supplies than any other method known in Zimbabwe. That is provided the water table is within reach. Many parts of the country rely on tapping water from deep aquifers, where the hardy Bush Pump must be

used on boreholes. It is a case where there is common agreement that a low cost alternative has merit and has won through popular support.

### **Problem areas**

#### **Sustainability**

Whilst there are many positive aspects of Zimbabwe rural sanitation programme, there are also several problem areas which need to be addressed. There was a high level of funding from outside the country during the most active phase and much of the programmes success was based on this donor support. An era of donor dependency had already arrived in the country by the late 1990's. This had a very negative impact on the will to be self sufficient, both by governments and families alike. The steps being taken to reduce material subsidy levels were attempts to wean families away from the big donor inputs and rely more on themselves. The concept of PHAST (Participatory Hygiene and Sanitation Transformation) had already been successful in a few areas of weaning families off the subsidies altogether. But the reliance on donor support remained and still does. The truth lies in the fact that the brick built Blair Latrine is too expensive for most rural families to build themselves, particularly where other more important priorities (like the procurement of food) take precedence. As costs rose dramatically after 2003, far fewer rural families could afford the cement, bricks and labour. The programme, successful as it may have been with so many families being served, was not sustainable. During the 3 year period 2003 – 5 only 19 000 Blair Latrines were built, a rate which was far below that required to maintain the coverage.

#### **Low percentage served**

By 1989 only about one third of the rural population had access to the Blair Latrine in Zimbabwe, despite nearly two decades of generous donor support and the involvement of a highly competent and enthusiastic group of civil servants and staff working for NGO's. Even during the most active phase, the rate of construction of Blair VIP latrines was insufficient to keep up with increases in population which was set at 3% per annum. It was estimated that 30 000 units were required each year to provide for the increased population alone. The annual national output usually fell well below this figure. Whilst there was a migration pattern from the rural to the urban and peri-urban areas and the effects of the AIDS pandemic were being felt, the need for greater numbers of acceptable latrines still remained in the rural areas. By 2004 the national coverage for Blair Latrines had been reduced to 24% (Nation Inventory, UNICEF 2005). In the new millennium, annual outputs were also falling with the number of family latrines being built being 6999 (2003), 6844 (2004) and 5140 (2005). This meant that every year the percentage coverage was falling, not rising.

#### **Standards of construction**

The standards of construction of the Blair VIP latrine are generally high, but cutting costs by saving or diverting cement elsewhere and using weak cement mixes was not uncommon. Often cement was wasted by making the superstructure attractive, whilst using far too little on the important pit lining. Pit lining is very important when heavy brick structures are used. Poor brick lining can lead to premature collapse.

Unusual climatic conditions like the cyclone Eline, where large numbers of Blair Latrines

collapsed, revealed a tendency to cut corners on parts of the structure which could not be seen – ie the pit structure. This reveals that cement that should have been used to strengthen the pit, was actually used to either adorn the superstructure with plaster or for other purposes – an unwise move in the long run. Also a slightly enhanced cement subsidy was used to make double structures, which often made components of the final structure weak and vulnerable at times of heavy rain and storm. Also it became increasingly apparent that some cement provided for the construction of the latrine was diverted for other use. Cement is a valuable commodity and strict supervision is required to ensure that it is used solely for the latrine only. Cutting bags of cement, especially in the substructure (pit) eventually leads to failure and collapse, particularly when the structure is heavy.

### **Fly screens**

Fly control is lost without a durable fly screen fitted to the vent. Many fly screens used in the programme did not conform to the recommended materials of aluminium or stainless steel and many fitted screens had a life span which was far shorter than the pit life. Plain steel screens rust quickly in the corrosive gases that travel up the pipe. Some latrines vents were not fitted with screens at all. There have been problems distributing stocks of suitable fly screen, which were held by the MoHCW. The ministry was once donated large numbers of rolls of aluminium fly screen (originating in China) to the provinces. Initially this was cut up into 30cm squares and delivered to the provinces. Later rolls of screen were sent uncut. What proportion of this material found its way to the toilet is unknown.

### **Use of natural resources**

The use of fired bricks has also come under criticism. These invariably used wood as fuel for firing. Other methods of making bricks with cement have been tried and are expensive in terms of increased cement and therefore in terms of value of the material assistance. Lower cost methods which have been designed and do not use fired bricks are less acceptable to government because they are less stable. The fact remains that many structures built in the rural areas like houses, schools and nearly all other buildings are constructed from fired bricks. The use of fired bricks is a strong culture in Zimbabwe. The proportion used to build Blair VIP Latrines is small compared to the total number of bricks used in other projects. The concept of harvesting wood in an environmentally acceptable way, rather than chopping down trees, was examined. The concept of promoting tree planting (in woodlots or in other ways) as part of the programme was once discussed. Interestingly one of the later ecological latrines, known as the Arborloo, uses the concept of recycling nutrients from excreta to grow trees in filled pits.

### **Pit filling rates**

The Blair VIP is a pit latrine and pit latrines fill up in time. The earliest Blair Latrine's were built with large pits 1.5 metres in diameter and 3m deep (volume 5.3cu.m). However many of these units eventually collapsed because the pit was only partly lined with cement plaster and not fully lined with bricks. The standard "5 bag" brick Blair Latrine had a pit diameter of 1.3m and pit depth of 3m (volume 3.98cu.m). In the lower cost (4 bag) brick Blair toilet, there was a saving in cost by reducing pit diameter to 1.1m. With a 3metre deep pit this unit had a volume of 2.85cu.m. These successive reductions in pit volume also reduced the working life. Also household garbage added to pits reduces pit filling time. The use of

separate garbage pits has therefore been encouraged. If pit life is important, as it should be, the larger the pit the better. Current thinking encourages more emphasis on extending the operational life by increasing pit volume, rather than beautifying the superstructure, which can be upgraded during the life of the unit.

### **Estimated pit life for Blair Latrines**

A filling rate of 0.05cu.m. (50 litres) per person per year has been used here to make estimations. Urine volume is reduced by leaching away through the pit base.

	Pit diam	Pit depth	Pit vol.	Pit life (5 persons)
Blair Privy to 1980	1.5m	3m	5.3cu.m	21 years
5 bag Blair Latrine	1.3m	3m	3.98cu.m.	16 years
4 bag Blair Latrine	1.1m	3m	2.85cu.m.	11 years

These figures reveal that pit volume and therefore pit life can be almost doubled by increasing pit diameter from 1.1 to 1.5 metres. Also the area of the pit base for urine seepage is increased by 1.86 times. This does not necessarily mean that the latrine slab must be larger, heavier and more costly. Using a corbelling technique it is possible to fit a 1.2m diameter concrete slab (using 15 litres of cement) to a 1.5m diameter pit which is corbelled (reduced diameter by stepped brickwork). A fully lined 3m deep pit and slab would utilize less than 3 bags of cement. The type of structure and pipe could be optional. Tidy and effective structures can be made in traditional materials and vent pipes can even be home made. The advantages are clear. It makes sense to put the investment in the pit and have superstructures which are upgradeable. It also makes sense to divert garbage to garbage pits rather than throw waste items down the pit.

There are also methods of extending the life of the pit by adding additional pits and allowing the contents to flow over. But these methods have not been used a great deal and are unhealthy and tedious. The mini pit emptying tanker has also been tested by the Ministry of Health, although what value this may have in the rural programme is unclear. The seed of the concept of the reuse of human waste has now been sown in Zimbabwe through the promotion of ecological sanitation, and this may provide some answers for the future.

### **National programme does not serve all**

Whilst large numbers of rural people were both willing and able to participate in construction programmes, the poorest members of the community were unable to meet the expected input for government run programmes, and were therefore left out. This did not stop un-served families building whatever they liked outside the programme and many simple latrines, falling well short of governments standards were built. It is very probable that this number is rising steeply. There are possibilities to upgrade existing pit latrines, much as simple wells can be upgraded to something that is more hygienic and acceptable to government. What ever the case, the poorest of the poor remained un-served by this programme. Even during the main programme, there remained a need to identify the poor and put in place ways of assisting them. This was never attempted in earlier programmes, and remains a very pressing need for the future, as the proportion of poor Zimbabweans increases with time.

Also the programme did not address the needs of over 1.5 million rural people living on commercial farms and commercial estates. Since these were privately owned, they did not

form part of the National Rural Water Supply and Sanitation programme, and statistics were never gathered by the National Action Committee. However there was a Farm Worker Programme funded through the MoHCW and also NGO's like Save the Children's Fund, UK. Whilst many farmers and estate owners improved the conditions for their workers considerably, very large numbers of labourers and their families still lived with very poor services, and the Farm Worker programme attempted to addressing this problem. Subsequent events in Zimbabwe have added to the plight of the Farm Worker community.

Even in the main urban centres, there is much pressure on existing sewage systems which barely cope with increased inflow due to the never ending migration of people away from the rural into the urban and peri-urban fringes. Ironically those people living in the rural areas and served with the twin assets of Blair Latrine and Upgraded Family Well were far better off than those living in cramped peri-urban settlements with failing communal taps and overburdened flush sanitation systems which frequently malfunctioned due to water shortage or lack of maintenance of the sewage system. With space, the Blair Latrine and the Upgraded Family Well can be placed far enough apart to avoid the domestic water supply being polluted. This may not be the case in densely populated peri-urban or urban settlements. Where shallow wells are placed close to deeper pit latrines in densely populated settlements, the pollution of underground water is almost certain. Problems of water contamination can be avoided by piping in treated water from elsewhere, or by families treating or purifying their own drinking water in kitchen filters or purifiers. This subject deserves far more attention.

### **Some lessons learned**

The national rural sanitation programme grew out of a much smaller home based programme promoted by the Ministry of Health to improve the uptake of improved latrines and protected water supplies as a means of cutting potential pathways of disease. After 1980, the offer of donor assistance allowed this early programme to expand considerably. Over half a million improved family toilets (VIPs) were built and also large numbers of multi-compartment units were built at schools. The programme was based on the "home grown" Blair VIP Latrine.

Several facts stand out clearly. The programme was an impressive success with as many as 3 million people being served at the family level. It revealed that the provision of a material incentive could have a strong motivating effect which encouraged families to spend more of their own money on building latrines. It also proved that with government support, even rural sanitation programmes could gain much prestige. Also that a long term health education component, had helped prime people, in readiness for the larger programme. Also at this time in the country's history, the euphoria created in a newly independent state gave zest to this new programme. These were all positive aspects.

Yet, even with large amounts of donor money and skilled manpower available, only about one third of the rural population ever gained access to improved sanitation over a 20 year period. This left two thirds un-served by the programme, using unimproved pit latrines or no latrines at all. During the period 2000 – 2005, the percentage coverage had been reduced from a third (33%) to a quarter (24%). This was the result of a much slower rate of implementation, population increases and the abandonment of latrines with pits filled to capacity. The programme also revealed the considerable dependency on donor assistance – very few Blair Latrines were built without the foreign support.

After 2000 costs began to increase significantly and people started to suffer from the constraints imposed by a weakened economy and poor harvests etc. Family priorities began to change, particularly in the rural areas, where there were food shortages. Many of the most skilled government staff had vacated their posts for more lucrative jobs. Some NGO's were shifting their aid to other countries. Perhaps also the initial euphoria had burned itself out.

There was also debate about whether a single technological solution was the best for such a diverse population, ranging from the well established rural elite to the desperately poor. The programme actually served the better off, who could afford their contribution. The national programme never embraced the concept of choice. The question was posed - would it have been wiser to have doubled the coverage at half the cost per unit, by using a range of alternative methods of improving the pit latrine. With a specialised unit, special training was required by skilled people. Pits had to be dug by paid labour, bricks laid by paid builders. The concept of "do it yourself" in your own back yard, never entered the vocabulary of this programme, although outside the programme people were still building simple pit latrines. Clearly and in hindsight a more flexible approach might have produced a more meaningful end result, particularly if some improved pit latrine technologies were easily replicated in the back yard at low cost by the families themselves.

The big question is - what comes next? Would a second latrine be built in the absence of donor support? If it was a Blair Latrine, the answer is almost certainly no – the cost is too high for the greater percentage of the rural population in modern Zimbabwe. Doubtless some of the better off families would build another Blair, but these are likely to be in a minority group. But there is a long history of latrine use in Zimbabwe and families have built their own simple pit latrines in the past and are continuing to do so. Most families, even the poorest, can resort to building some form of simple pit toilet. But most of these simpler units retain the old problems of odour, fly breeding and collapse. The challenge is clearly to make latrines simpler and cheaper to construct and to embrace the concept of upgradeability. And to use other methods which control the problems of odour and fly breeding. This points the way to an ecological approach to sanitation.

Clearly, second time around, things must change. Lessons must be learned from the older programme, but the facts must be faced square on. A new set of circumstances presents itself in the new millennium and in the Zimbabwe of the present. These are rather different from the challenges of the past. There must be a choice of technology and levels of material assistance must be lower. The technical range of options must include improved pit latrines (including the BVIP) and other technologies which are safe, pose little health threat and also control odours and flies. At the lower end of the range suitable latrine technology must be affordable to the poor and replicable with little or no donor assistance. The concept of upgradeability from simpler options to more sophisticated ones must lie at the foundation of a new strategy, so that the door is open for improvement.

In 2010, the Government of Zimbabwe revised its national policy opening up the door for a new era of development with the acceptance a unit called the upgradeable BVIP. In this concept a pit is lined with bricks and is capped with a concrete slab. This process uses a single bag of Portland cement. The concrete slab is designed in such a way that it can be fitted with both a brick or tubular vent pipe, The family itself then chooses the type of structure it wishes to mount over the pit. This can range from an unventilated simple pit toilet to a fully ventilated brick built BVIP. A huge range of options is available. These options are

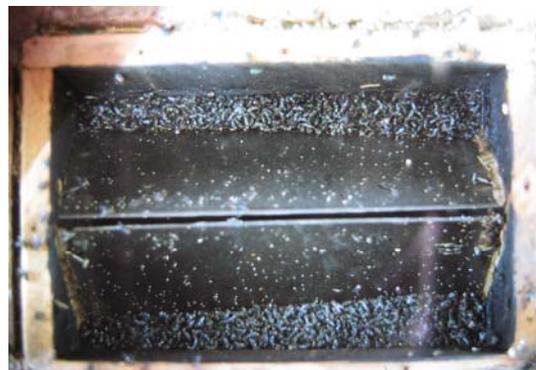
currently being evaluated. Fortunately a great deal of ground work has already been undertaken in this area and is available for use in future programs. Each country has its own lessons to learn and its own methods to follow. What works for one country may not work in the next. Even in Southern Africa there are considerable differences in the ways that rural sanitation programs are run and financed, and what is found acceptable or not. There is no universal answer to solving the global problem. In the end each country must resolve its own problems in the best way it is able.

# The Blair Latrine

## A photo-gallery of experiences



**Early experimental structure and fly trap**



**Experimental vent pipe with fly trapping window. Fly trap with flies.**

## More early designs



Early structures at Henderson



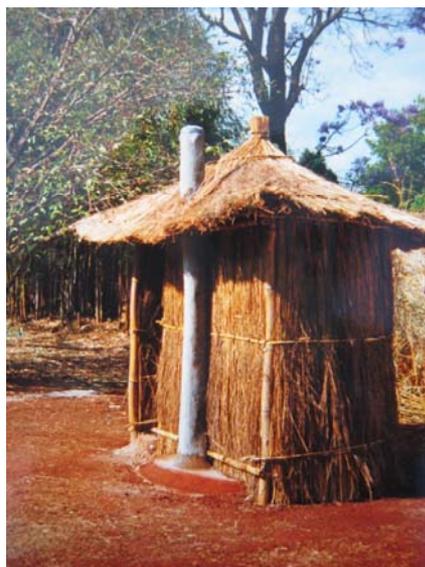
The first Blair “privy” of all!



Ferrocement structures – big pipes!

# Low cost

Not all Blair Latrines are made with bricks



# *Disasters*

*Progress comes at a cost!*



## The school



The Blair formed part of the school curriculum

# Oddities



*Lizard in search of flies! Its biological!*



*Fire in the loo! Yes everything was tried!*



*Camouflage and light weight!*

# Decoration



# Builders at work



*Over half million Blair Toilets have been built in Zimbabwe*

*LONG LIFE – 30 years on and still used!*



On the left a classic Blair Latrine built at Henderson Research Station in 1976.  
On the right the same unit is still in use on the wide pit (1.5m) in 2006.



The same dates apply to this unit nearby  
**LARGE PITS EXTEND LIFE – IT IS WORTH INVESTING IN A LARGE PIT**