18 CHANGING THE WATER PARADIGM FOR POVERTY REDUCTION, ZIMBABWE

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Summary

At independence in 1980, the new government inherited a highly skewed economy with the majority of the population living on racially demarcated subsistence farming areas known as 'communal areas'. In rural water and sanitation programmes, the focus was on clean water for household use. It was anticipated that improved health would indirectly contribute to reduced poverty through higher levels of agricultural productivity. In fact, as a result of many factors, poverty in the communal areas increased markedly in both extent and depth, reaching alarming levels during the 1990s.

The mainstream government water programmes have been based on community boreholes or deep wells. Although some are used to water vegetable gardens, there has never been more than a passing interest in providing water for productive uses. Instead, under the responsibility of a different ministry, the approach has been to build capital-intensive formal irrigation schemes, with water supplied from dams. By 1999 the total number of beneficiaries of these formal irrigation schemes were no more than 20,000 households, or 2% of the total number in the communal areas.

An alternative strategy, conceived by a government research agency, and subsequently developed and promoted by NGOs and horticultural export companies, is based on shallow family-owned wells. This has two aspects:

- The 'upgraded family well' concept was developed to provide a robust, affordable technology with assured sustainability. This is achieved through a low cost design, family ownership and commitment to the technology, and proximity to the homestead ensuring high usage of water both for domestic use and for vegetable gardening for home consumption.
- Tackling poverty head-on requires extending this concept to using shallow wells to produce high value crops for export to Europe or for remunerative domestic markets. Field experience has shown that communal households can make returns comparable with their counterparts in the formal irrigation schemes, especially if they are able to use a simple pump (such as a rope-and-washer pump) to enable them to water a much bigger area than would be possible with a windlass and bucket alone.

Since February 2000, 'fast track' land reform and perverse macro-economic policies have exacerbated the economic crisis in Zimbabwe, while failing to address the needs of the great majority of communal area households. Adopting innovative water polices that are relevant to tackling widespread poverty, and not simply improving the lot of a privileged few on absurdly expensive formal irrigation schemes, is now more imperative than ever.

18.1 Background - two decades of emphasis on clean water for health

Following the liberation struggle which led to the independence of Zimbabwe in 1980, clean water and sanitation for rural communities was one of the priorities of the new government. Independence coincided with the launch of the United Nations International Decade for Drinking Water and Sanitation (1980-1990), and Zimbabwe was able to tap significant international support for its efforts. An inter-ministerial National Action Committee for Water and Sanitation, chaired by the Ministry of Local Government, was established and successfully managed a programme to implement an integrated project approach involving rural communities and employing robust indigenous technologies. At independence, only 38% of households living in the so-called 'communal areas' had access to safe water. By the time of the Central Statistics Office 1995/96 Income Consumption and Expenditure Survey, 59% of communal households had access to safe water (CSO, 1998, Table 3.2.3).

Relatively high levels of access to safe water and corresponding, though more modest, progress in sanitation justify the widely held perception that the Zimbabwe programme was amongst the most successful national rural water supply and sanitation programmes internationally. However, this relative success has been accompanied by economic decline both at the household and the national level,

throwing considerable doubt on the sustainability of the achievements. By 1995, a national poverty survey classified 88% of communal people as being poor, with female-headed households having higher prevalence of poverty (CSO, 1998, Table E3.3 and pg 41). Since that time, poverty has increased in both extent and depth due to the overall collapse of the economy.

At the national level, budgetary allocations for the maintenance of rural water infrastructure have been cut dramatically in real terms. Drawing on international trends in rural water supply and sanitation thinking, the official rationale for such cuts has been to talk of community-based maintenance (CBM) as being the solution but, besides a variety of practical problems with CBM in a Zimbabwe context, the requirement for communities to assume responsibility for maintenance comes at a time when their resources are more than ever stretched.

It is somewhat ironical that the rural water and sanitation programme, which was itself supposed to lead to lower poverty in rural areas, should be threatened by worsening poverty. The intended mechanism for tackling poverty was an indirect one, through contributing to improved health. In the present circumstances, with rural communities being faced with failed national development and increasingly dependent on their own resources, the situation cries out for rural poverty to be tackled directly at its roots. This can be achieved by shifting the emphasis in rural water from safe supplies for household needs to productive water to enable families to increase their generation of cash income.

By putting 'productive water first', households and communities with increasing incomes would be better placed to take care of their safe water and sanitation needs, thereby allaying concerns about the lack of sustainability of past rural water supply and sanitation programmes. The potential of this approach is illustrated by the description of a very successful communal farming family given in Box 1.

Box 1 Productive Water For Communal Households

Located in a communal area 50 km north of Murehwa, Mr Tendai Chinamo has a farm of approximately 2.5 ha, all of which is in productive use. The farm is in an area with a high water table, and he has several water sources which are used for productive purposes, including two rope-and-washer pumps as well as open wells, with watering via buckets. For domestic use, the family also has a properly protected upgraded family well. The farm is cultivated by himself, his wife and three sons.

Mr Chinamo is an outgrower for one of the horticultural export companies. At the time his farm was visited, he was growing sweetcorn, babycorn, butternut, fine beans and hot chillies for export to Europe (mangetout is another export crop grown at other times of the year). The family was also producing maize, basic vegetables and fruit (mangoes, watermelons and bananas) for home consumption and sales within the local area or in Mbare Musika (the main fruit and vegetable market in Harare). In addition, they are growing high value crops, such as garlic, for the Harare market.

While the Chinamo family shows what can be done in a communal setting, for the great majority of communal farmers life remains a question of eking out subsistence and remaining dependent on remittances from family members employed in the urban areas, other countries in southern Africa or abroad. Nationally, the highest levels of poverty are to be found in the communal areas. One of the key articulated policy goals of the incumbent government is to achieve 'fast track' resettlement of communal farmers on what was previously commercial farmland. However, even the most ambitious targets set for this programme would leave more than three quarters of households living in the communal areas and in practice, with many of the farms being allocated to party apparatchik and urban dwellers, it would appear that a much higher proportion of communal farmers has failed to benefit.

Addressing poverty in the communal areas, particularly when the focus of the state is elsewhere, requires strategies which will enable individual households to access opportunities to work their way out of poverty without having first to be recipients of enormous capital and recurrent subsidies. Providing water for production via simple, sustainable technologies and coupling this with opportunities to produce and market high value crops holds enormous potential. This model has been successful so far mainly in respect of perishable products and hence production for export that is reasonably close to Harare International Airport. However, there is a range of less perishable high value crops, such as paprika, chillies and granadillas (passion fruit) which could be successfully grown and marketed from communal areas in more remote parts of Zimbabwe - and of other countries in Africa.

18.2 Variety of rural water supply programmes

18.2.1 Mainstream government programmes

Over the last two decades, the government's rural water programme has been based on supplying water from underground sources, with “bushpumps” being the dominant technology for raising water. According

to the survey referred to above, at least two thirds of the rural population with access to clean water were obtaining water from bushpumps fitted to boreholes and deep wells. On the sanitation side, the internationally recognised Blair ventilated improved privy was the technology of choice.

The focus in the mainstream programme was almost exclusively on improving health through providing safe water and adequate sanitation for rural communities. Where boreholes were found to be sufficiently productive, the planting of vegetable gardens would be encouraged, but the emphasis was on products for home consumption, better nutrition being a further contribution to improved health status. There was never any attempt within the rural water supply and sanitation programme to identify the water requirements of rural communities other than for primary use. Productive water provision was the responsibility of other agencies and ministries, notably the Department of Agricultural and Technical Services [AGRITEX] located in the Ministry of Lands and Agriculture.

In terms of productive water, AGRITEX's approach was to provide formal irrigation schemes for groups of small-holder farmers (referred to as “plotholders”). The schemes have typically involved building dams and providing flood or sprinkler irrigation technologies, the latter often involving large recurrent subsidies to pay for the pumping of water. By 1999, the communal population was around 5.8 million or about 970,000 households. The total number of families on plotholder irrigation schemes amounted to about 20,000, or just 2% of the total at that time.

Despite this tiny proportion of beneficiaries, the high level of government extension effort and direct subsidies might be considered justified if the plotholder irrigation schemes had proved themselves to be unambiguously viable and successful for the farmers involved. Unfortunately, while there are some schemes which have been clearly successful, significant levels of income from irrigation have certainly not been the case for the majority of plotholders. So much effort and attention has gone into relatively high technology formal irrigation schemes that, for many of the politicians and bureaucrats involved, the relevance of such schemes seems to have become an article of faith rather than an object of continuous scrutiny and economic analysis.

From the year 2000, there has been a sharp change in the policies of the Zimbabwe government, with a 'fast track' land reform process being introduced immediately after the government-sponsored constitution was rejected in a national referendum in February 2000. There is no disagreement in any quarter that a more equitable distribution of prime agricultural land was necessary in Zimbabwe, but the fact that a concerted effort to address the land issue was only made two decades after independence calls into question whether the timing did not have more do with the rise of a strong opposition party capable of bringing a halt to the uninterrupted hold on power of President Mugabe and his Zanu-PF party than real concern about the plight of the poor in the communal areas.

The 'fast track' land reform has been carried out in a way that has been highly destructive in economic terms and partisan and patronage-based in its allocation of the land, a large proportion of the farms being given to party functionaries and urban dwellers rather than to deserving households from the overcrowded communal areas. Even the most bullish government estimates of the number of beneficiaries do not claim that more than 250,000 families will be resettled: more sceptical estimates go down as low as one tenth that number by the start of the 2002/2003 agricultural season. This implies, against what would have been by now around 1 million households in the communal areas, that from 2003 there will still be at least 750,000 households living in the communal areas and probably many more. A further influx of people to those areas is likely as the farmworkers displaced from the former commercial farms, and numbering an estimated 380,000 people, try to find somewhere to eke out a living.

The destructive aspects of the fast track land reform have been greatly exacerbated by perverse macro-economic policies which have led *inter alia* to three successive years of declining GDP (on official figures and projections minus 4.2% in 2000, minus 7.3% in 2001 and minus 11.1% in 2002), chronic shortages of foreign currency, massive arrears on foreign payments and a rapid rise in inflation (taking annual headline inflation in August of each year, inflation has risen from 54% in 2000, to 76% in 2001 and 135% in 2002). The development challenges Zimbabwe faces in the midst of this crisis are far more daunting than they have ever been before. Adopting innovative water policies that are relevant to tackling widespread poverty, and not simply improving the lot of a privileged few on expensive formal irrigation schemes, is now more imperative than ever.

18.2.2 Alternative models

The problems, now so evident in the national water and sanitation programme, were anticipated in the early 1990s by staff of the government's health research unit (the Blair Research Laboratory). Solutions were sought which would be both less expensive in terms of initial investment costs and give a very high

degree of assurance on sustainability over the long run. The most successful option that was developed at Blair, and subsequently tried and tested by the same team working outside of government as an NGO (the Mvuramanzi Trust) is the upgraded family well.

The basis for the development of the upgraded family well was the observation that the key to the success of Zimbabwe's sanitation programme lay in the Blair latrine being owned and maintained by the individual household, rather than by the community at large. The water supply counterpart that was developed is a simple upgrading of the traditional family well, in widespread use throughout Zimbabwe. The well is lined (often deepened at the same time) and a simple headworks constructed consisting of supports for a windlass, a cover and drainage to remove spilled water. The use of the well to water a vegetable garden or fruit trees close to the homestead, thereby assisting in improving the nutrition of the family, was also a key element of the upgraded family well concept.

Nearly a decade of experience with over 35,000 family wells installed by the Mvuramanzi Trust, has shown that:

- an upgraded family well is widely accepted and appreciated by households - once introduced into an area, the majority of households seek to build their own improved well;
- households are willing to bear much of the initial capital cost (around 80%), which both gives confidence of their commitment to the technology and allows public or donor finance to be spread over a much larger number of households;
- maintenance requirements are minimal (some structural repairs may be necessary from time to time, plus periodic replacement of bearings for the windlass, which are pieces of old car tyres, and of the chain and bucket for drawing the water);
- the context is thus one in which there can be a high level of confidence about sustainability.

One of the reasons for national-level hesitancy, in supporting upgraded family wells, was the assertion that this technology would have only limited application in parts of the country with high water tables and good rainfall. In practice, Mvuramanzi has assisted families to successfully upgrade wells in districts in every province of the country, including notoriously dry or supposedly poor groundwater areas such Bulilimamangwe, Beitbridge, Binga and Guruve. During times of drought, upgraded family wells are certainly more likely to dry up than boreholes, but experience in the 1991/92 and 1994/95 severe droughts showed that boreholes frequently dry up too. People may then be forced to resort to unprotected sources of water.

The economic solution would be to promote family wells as the mainstream technology for water provision to households, with strategically located deep wells or boreholes being provided to cater for severe droughts. Such a strategy would enable existing resources to be used to achieve the goal of clean water for all far more rapidly than with the present strategy of integrated projects centred on boreholes as the basis of water provision for communities.

Concerns have also been raised about the quality of water from family wells. Upgrading and protecting family wells results in a marked improvement in water quality and health benefits can be assured, if family well programmes are backed by effective health and hygiene education. Furthermore, many different studies have shown that the *quantity* of water used is a more important determinant of the health benefits of improved water supplies than the *quality* of water itself. Upgraded family wells, being located adjacent to homesteads, result in much higher levels of water use than is the case when water has to be carried from a communal borehole. Proximity also encourages the use of water for vegetable and fruit production both for home consumption and for marketing, thereby generating a cash income.

Going beyond Zimbabwe to Africa as a whole, once the view is adopted that the provision of water and sanitation should be seen not just as an objective in its own right, but as part of a strategy to tackle poverty in rural areas, family wells have a particularly central role to play in respect of this wider objective. The alternative, equitable productive water model that is elabourated later in this paper extends the notion of a kitchen garden watered from the upgraded family well. It changes the emphasis from water for domestic purposes with a garden as an ancillary objective to giving primary attention to the productive possibilities of shallow wells and the associated income generation potential if access to markets for high value horticultural crops can be assured. Much can be achieved with a bucket and windlass, but the addition of a simple water lifting device, such as a rope-and-washer pump, greatly enlarges the area which a family can comfortably water, hence raising income earning potential often to levels comparable with incomes on conventional, formal irrigation schemes[1].

[1] Further discussion of upgraded family wells is available in Robinson (2002).

18.3 Poverty reduction through productive water

Rural households face a number of constraints in increasing their incomes, lack of access to sufficient water being just one of them. They often have difficulty in procuring inputs such as high quality seed, fertiliser and chemicals; they may lack the knowledge to make the best use of such inputs; finally, they have difficulty in marketing their produce to best advantage. For plotholders on formal irrigation schemes, government has assisted farmers to overcome two of these constraints - the provision of water and extension advice to assist in the growing of the crops. The fundamental question of the choice of crops to be grown, as well as the securing of inputs and the problems of marketing the produce, have largely been left to the plotholders.

The frequent lack of viability of conventional irrigation schemes is often directly attributable to plotholders, growing low value subsistence crops, rather than the sort of high value commodities which could generate margins, commensurate with the capital investment and recurrent subsidies poured into these schemes. This observation is being turned on its head in devising options for individual farmers with access only to water from wells: by concentrating on producing high value commodities, even farmers with limited water and hence irrigable hectarage can still generate incomes which are comparable with their counterparts in the formal schemes.

In the Zimbabwe case, rather than NGOs, the crucial intermediaries in the first instance have been private marketing companies such as Hortico, Olivine, Selby and Shona Products. Perhaps the most successful communal area smallholder scheme is run by Hortico, a company formed initially to export to European markets horticultural produce derived from the large-scale commercial farming sector. Seeking to expand and diversify its production base, Hortico initially approached groups on some of AGRITEX's formal schemes, but had mixed experience with these plotholders. Not only was the water supply and hence continuity of production frequently disrupted, but there were disputes about the grading of produce and sharing of the incomes. Hortico then moved into developing a system of working with individual communal families. For reasons of ownership and commitment (analogous to the success factors identified for Blair latrines and upgraded family wells), working with individual households has proved a very successful strategy for Hortico.

Working at present with about 3,000 communal households, Hortico has a network of small depots, each located within an area of around 200 farmers, with the depots feeding one of two main packhouses, from which the produce is sent ready packed and labelled directly to supermarket shelves in the UK. The crops produced include sweetcorn, babycorn, mangetout, fine beans, butternut and hot chillies. Hortico addresses all of the constraints the farmer faces (except water availability) in a systematic fashion: it invites farmers to produce crops which have high margins, it provides packages of all the inputs required for a specified production area (carefully weighed quantities of seed, fertilisers and crop chemicals), it trains local extension staff to assist the farmer in producing the crop, it provides on-the-spot grading and payment when the crop is brought to the local collection centre, and completes the cycle with provision of transport, packaging and exporting. The areas specified for production vary by crop, but are small (300 to 600 square metres). Farmers are initially allowed only to produce one crop at a time: the inputs are actually a loan and there has to be confidence about the farmer's commitment and ability before the level of loan is increased.

The remaining major constraint is water. If a household can only water using buckets from a well, a plot of 300 square metres (0.03 ha) can be managed (at a watering rate of 25 mm per week) but double this size is difficult. However, the addition of a simple rope and washer pump effectively increases watering capacity from 0.1 l per second to around 1 l per second. This makes it possible to water an area of at least 2,400 square metres (0.24 ha), 8 times the area that can be managed with buckets. Well organised, hard-working farmers (such as the Chinamo family described in the Box) irrigate even larger areas.

Pumping is not unduly arduous from a rope-and-washer pump, while the initial cost is only about US$100 [2]. The materials used are all readily available and farmers for whom this technology is providing additional income will ensure that it is kept in working condition. Over the last few years, the rope-and-washer pump has been proven by a number of NGOs and it is the costing for this pump which is used in the comparison made in the next section between investing in a formal irrigation scheme with a small number of beneficiaries and the alternative of a simple technology benefiting a much larger number of households. The rope-and-washer pump is by no means the only technology available, however. Other

[2] Severe macro-economic distortions have created a huge and growing gap between the official exchange rate (Z$55 to the US$) and the parallel market rate (as of end September 2002, in excess of Z$700 to the US$). As mentioned in the text, inflation is also rising rapidly (135% on an annual basis in August 2002) making Z$-denominated prices very unstable. Converting costings made in Z$ into US$ equivalent is therefore problematic. The US$ pump costs assumed in this paper are probably on the high side.

hand-driven options include sand abstraction pumps, being deployed in the sandy rivers of Matabeleland, and treadle pumps, together will externally powered pumps (photovoltaics and small petrol or diesel pumps).

In respect of treadle pumps, for example, there are at least three companies in Zimbabwe manufacturing localised versions of a pump which is very widely used in other countries (such as Bangladesh, Kenya, Malawi and Zambia). The treadle pump in Zimbabwe is more expensive than a rope-and-washer pump (including piping, about one and a half times the price), but has the advantage that it can pump water into a reservoir above the pump level for gravity feed or via a hosepipe directly to the field.

Although the potential of horticultural export markets has been emphasised above, there are also remunerative opportunities in the domestic market, particularly for exotic crops such as garlic, mushrooms and asparagus but also for more conventional vegetables and fruit previously supplied to domestic markets by the large-scale commercial farms. The importance in designing income enhancement strategies of starting at the market and working back to the production and input requirements has been recognised and supported by a number of donor-funded initiatives in Zimbabwe, including at present a Dutch NGO "Crop Enterprise Support Project" and a USAID promoted project called LEAD ["Linkages for the Economic Advancement of the Disadvantaged"]. These projects are opening new opportunities for communal production and marketing of paprika, chillies, granadilla and black-eyed peas. Mvuramanzi in collabouration with LEAD is initiating a three year project to provide at least 10,000 low cost pumps plus drip irrigation equipment, together with agricultural and marketing assistance, with a special focus on women farmers.

As yet, there have not been any detailed studies on the returns which communal farmers are able to achieve from horticultural production. It is quite clear, however, that farmers producing only the traditional basic food items for local or domestic markets struggle to make any sort of significant returns for their efforts. Although farmers attaining low yields may only achieve similar returns (equivalent say to around $500 per ha), efficient farmers producing exotic crops for the domestic market and/or for export to Europe should be able to achieve returns of $2,500 per ha per annum or more. For a farmer limited to watering with buckets (0.03 ha), cash income from export crops would be restricted to very low levels of $15 to $75 per annum, whereas the addition of a pump (0.24 ha) could raise household returns to between $120 and $600 per annum.

These income figures are still modest, but in contemporary Zimbabwe represent a significant opportunity to generate cash income for rural households, comparable with income opportunities in conventional irrigation schemes. In a recent major study of 10 formal irrigation schemes, half had annual average incomes per farmer of less than $420 (using an average 1997/98 season exchange rate of Z$14.4/US$). The best scheme had an average income per farmer of $4,200 per annum (Tawonezi & Mudima, 2000).

18.4 Comparative economics of alternative water strategies

In 1998, the government of Zimbabwe announced a policy of expanding irrigation through building two medium sized dams per district per annum, with associated small-scale irrigation schemes. In practice budgetary constraints and the pre-occupation (from February 2000) with 'fast-track' land reform have limited the implementation of this policy, but it provides an interesting reference point for comparing this relatively high-technology approach to irrigation with a much more equity-oriented solution, based on simple technologies.

The medium-sized dam plus irrigation scheme option has been costed on a unit basis at around $3.6 million for a 400 ha scheme benefiting 400 families, that is a capital cost of $9,000 per family with 95% of this ($8,550) being financed by some form of subsidy (see unit costs in Table 1). Plotholders' domestic water needs would typically need to be met by additional investments. By comparison, the unit cost of an upgraded family well and 0.03 ha homestead garden would be around $100 per family, with only 20% ($20) being subsidised. The costs of the upgraded well met by the family are the digging and lining, payment of the builder and provision of sand and bricks. The external inputs are 3 bags of cement, a windlass and a tin lid.

The addition of a simple water lifting device, such as a rope and washer pump, would require a capital outlay of about another $100, with 80% this time being subsidised (or else extended as a loan to the recipient) bringing the total investment cost per family for an irrigable area of about 0.24 ha to $200. The costings are somewhat notional, because in practice families might have an upgraded well for domestic purposes and have a different well or wells for production purposes. If the productive well(s) also need

lining, the cost would be considerably higher than quoted. On the other hand, if there is readily available ground water or the pump is fitted to the upgraded well, the additional cost could be kept below $100.

As regards returns, within the income range discussed in the previous section a conservative figure of $700 per ha has been assumed. This can be interpreted as a mix between some successful and some less successful endeavours on domestic and export markets, with the potential for good farmers to increase average income considerably ($2,500 per ha would be an attainable target). For the formal schemes, it is assumed that the farmers increase productivity every year by 6%, so that average returns by the end of the 22 year planning horizon (which includes 2 years of construction) exceed $2,000 per ha. The formal schemes not only have 95% of the capital costs subsidised, they also have a recurrent subsidy of $250 per ha. To generate Table 2, it is assumed that the external capital and recurrent subsidy inputs are used, in the alternative scheme, to finance the external component of upgraded family wells or upgraded wells plus rope-and-washer pumps.

The result of the capital costs per household of the equitable option being only 1-2% of the formal scheme is that the number of beneficiaries of the equitable water strategy (including one pump per family) grows to 56,000 by the end of the planning horizon. Although by then average returns for each of the 400 plotholders in the formal scheme are much higher than those assumed for the equitable strategy ($2,118 as compared with $168 p.a.), the total income from the formal scheme is only $0.8 million as compared with $9.4 million in aggregate for the equitable strategy. Although difficult to quantify, it is evident that a large proportion of the equitable scheme participants would be women, whereas the AGRITEX schemes typically have men registered as the official plotholders, even if much of the work is in fact done by the unacknowledged women.

Table 1 Medium sized dam & smallholder irrigation vs. upgraded family well & rope-&-washer pump - unit costs

Unit costs	Scenario	Capital costs per household			Irrig area
US$		Beneficiary	Govt/donor	Total	(ha/hh)
Medium sized dam +	Capital subsidy	450	8,550	9,000	1
400 ha irrigation scheme	Recurrent subsidy		245	245	1
Upgraded family well +	Modest capital subsidy	80	20	100	0.03
homestead garden	+ rope & washer pump	100	100	200	0.24
Ratios (capital costs per	FW: Dam & formal irrig	18%	0.2%	1%	3%
beneficiary household)	FW+R&W:Dam & formal irrig	22%	1%	2%	24%

Notes: Returns $700 per hectare, rising at 6% p.a. on formal schemes. Access to horticulural exports could significantly increase returns. Labour not costed.

With the equitable option having 140 times as many beneficiaries (with a high proportion of women) and 59 times the net income (as reflected in the net present value calculations), there would seem to be no justification at all for choosing the conventional route. There are also no environmental contrary indications - rope-and-washer pumps do not pose any threat of the water table being suppressed. Yet prejudices in favour of high technology solutions, and spurious notions of equity (exemplified, by 'two dams per district', irrespective of relative hydrological and agronomic suitability in different parts of the country) remain entrenched in the policy positions of the incumbent government.

18.5 Lessons & recommendations for addressing poverty

The traditional health-oriented water and sanitation programmes, of which Zimbabwe's is supposedly one of the most successful examples, do not in themselves contribute to rural poverty reduction and can in fact be progressively undermined by economic failure at the national level. Any serious concern with issues of poverty, equity and improved gender equality must lead to a paradigm shift which emphasises access to productive water and investment resources being used to provide opportunities for the largest number of beneficiaries.

Table 2 Medium sized dam & smallholder irrigation vs. upgraded family well & rope-&-washer pump – programme

Programme costs	Scenario	Capital	Recurr-ent	Number of Beneficiaries			NPV @ 5%	Beneficiary Income ($ million)		
US $		Cost	Cost	Year 1	Year 6	Year 22	($)	Year 1	Year 6	Year 22
Medium sized dam + 400 ha irrigation scheme	Capital & recurrent subsidies	$3.6 m	$100,000 p.a.	0	400	400	$1.4	--	$0.3	$0.8
Upgraded family well + homestead garden	Modest capital subsidy	$0.25 m p.a.	--	93,195	199,979	279,979	$36.1	$2.0	$4.2	$5.9
	+ rope & washer pump	$0.25 m p.a.	--	18,639	39,996	55,996	$84.6	$3.1	$6.7	$9.4
Ratios	FW: Dam & formal irrigattion			--	500	700	25	--	12.6	6.9
	FW+R&W:Dam & formal irrigation			--	100	140	59		20.1	11.1

Note: NPV (net present value) calculations give summary time preference valuation over 22 year time horizon of income stream less capital costs plus residual value.

This can be achieved by focussing on inexpensive, sustainable water technologies, but access to productive water is necessary, not sufficient for poverty reduction. Rural small-scale farmers face a number of constraints, which all need to be addressed. The starting point should be to identify remunerative markets. It is the possibility of accessing such markets which should then define the crops to be grown and hence the inputs, technical knowledge and skills and access to water which need to be provided.

What has previously been the mainstay of government support to the small-scale farmer - extension advice to support production - remains important, but the production aspect seems the easiest to solve in practice. With tailored extension inputs from locally recruited extension agents (with much lower academic qualifications than fully trained extension officers employed by the state), rural households have shown themselves quite capable of growing specialised horticultural crops for export to Europe. Similar levels of returns have been achieved through identifying and growing exotic crops for the domestic market.

The replicability of the Zimbabwe model elsewhere in Africa depends on farmers having access to water and to the marketing channels which ultimately deliver horticultural produce to high paying markets, both domestically or for export. The particular advantage in Zimbabwe's case has been the existence of a marketing network which was originally established to channel horticultural exports from the commercial farming sector to destinations in Europe, and subsequently of donor-sponsored programmes to develop corresponding local market opportunities. Other countries in Africa with less well-developed links could attempt to foster activity in this area. The European market is enormous and has all sorts of niche production opportunities for specialised crops or to produce crops at particular times when there are shortages from other sources of supply. There is also considerable untapped potential domestically: tourist facilities, for example, provide opportunities to market high value fruit, vegetables, herbs etc.in remote parts of each country as well as the main city centres.

In summary, the 'productive water' focus comes down to a recommendation that there be less emphasis in national water sector programmes on clean water and more on water for enhancing incomes. Households with higher incomes will be well placed to contribute to community maintenance of pumps and thereby remove concerns about the sustainability of the earlier health-driven rural water supply and sanitation programmes. Such concerns are anyway too narrow: water and sanitation were being provided not as a goal in themselves but as a contribution to reducing poverty. Now that responsible governments and donors evaluate every intervention first and foremost in terms of its contribution to poverty reduction, if it is more effective to attack poverty at its roots by switching to an emphasis on 'productive water first', this is surely a change which should win universal support.

18.6 References

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