DEVELOPMENT OF A COMMUNITY BASED INTEGRATED CATCHMENT MANAGEMENT PROGRAMME IN THE MLAZI CATCHMENT:

EXECUTIVE SUMMARY

Report to the
Water Research Commission

by

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EXECUTIVE SUMMARY

This document was originally written by Dr Raymond Auerbach while Programme Coordinator of the above Programme for Farmer Support Group, University of Natal, and revised February 2000.

At the request of the Water Research Commission, it has been further extended and updated again by Dr Auerbach in order to give an overview of the achievements of the programme, and of the opportunities and constraints faced in integrated participatory catchment management.

This document therefore reflects on the main achievements of the programme to the end of the year 2000, and includes activities and achievements on the ground, capacity building within communities, staff capacity development and impact on policy nationally, provincially and locally.

The primary goal of the programme is to develop a framework for community participation in catchment management in South Africa.

Why did we start the programme?

In 1994, various residents, resource managers and researchers with an interest in the area around the Ntshongweni Dam were approached by Raymond Auerbach concerning social and environmental problems in the area. Although then Research Coordinator for Farmer Support Group, he was at the same time also a local farmer in a small subcatchment of the Sterkspruit, a tributary of the Mlazi River. With the help of seed funding from Umgeni Water, and the positive engagement of many people, information was gathered, a proposal was submitted to the Water Research Commission (WRC) and an initial Catchment Management Workshop was held in November 1994. At this point, the focus was on the Sterkspruit (or *Mncadodo* Stream), the Nthsongweni area and Dam, and the Mlazi River between Mpumalanga Township and the dam. The programme was called the Ntshongweni Catchment Management Programme (NCMP).

When WRC approved the pilot proposal for 1995 and 1996, three more staff members were appointed in addition to the coordinator (ecologist; catchment development facilitator; agriculture facilitator). Activities gathered momentum, with a remarkably positive response to the pamphlet (published in 1996) "Do you care about your catchment?" At the end of 1996, WRC agreed to double the level of support, to enable the appointment of a publicity and information officer, a craftwork facilitator, an environmental educator, an office manager, a conservancies consultant and later an upper catchment agricultural facilitator (with help from Mondi), and a conservation Officer (employed by the Umlaas Irrigation Board's Catchment Project). These eleven people have undertaken a remarkable range of activities over the past six years. Together with six Dutch students and several more South African students, they have built up a body of experience in integrated catchment management (ICM). The programme has grown from a small core of activities in one subcatchment, to a more comprehensive attempt to

bring people together throughout the Mlazi River catchment, and also influences Metropolitan Durban through staff involvement in developing an Environmental Management System based on an understanding of the importance of ICM. The name of the programme has now been changed to the Mlazi River Catchment Programme (MRCP) to reflect this more comprehensive scope. However, as a lower level of support was given to the third phase of the programme, activities could not be extended into the lower catchment, and the staff complement was reduced from ten staff members to five.

The main activities of the programme can be described under the headings water demand management research, environmental education, rural development and community capacity building, local government development and environmental monitoring. In each of these fields, a considerable number of activities were undertaken, representing technical, social and ethical aspects of catchment management.

The question arises: "After five years of WRC support for this participatory action research programme, what has been achieved?" An overview of programme activities addresses this question. Based on the programme's experience, a framework for community participation in catchment management in South Africa is discussed. A separate framework document has been published by Farmer Support Group. Two further questions are then examined: "What are the implications for future research?" and "Is integrated catchment management a useful approach in developing community participation in water resource management?"

Water demand management, rainwater harvesting and nutrient cycling - technical research

Research focussed on the effective use of water for small scale commercial agricultural production, in the context of organic farming systems research. On Bachs Fen Ecological Research Farm strategies for rainwater harvesting using wetlands, swales and mulches, and for ecological agricultural production using effective nutrient cycles in a balanced farm organism were designed, implemented and evaluated. So effective have these been that the Food and Agricultural Organisation (FAO) asked Raymond Auerbach to write a chapter in their book on rainwater harvesting (Hatibu, Editor, in press). The study was motivated by the realisation that the stabilisation of rainfed crop production in sub-Saharan Africa is a key challenge in addressing desertification on the continent, and rainwater harvesting is the most promising approach to meeting this challenge. The Department of Arts, Culture, Science and Technology has also described the Rainman Rainwater Harvesting System as an example of South African technological innovation in the book by Addison (2001). At the recent UNESCO International Conference on Integrated Drought Management: Lessons for Sub-Saharan Africa (Pretoria, September 1999), a paper and a poster were presented on integrated catchment management in the Mlazi River, and on Bachs Fen rainwater harvesting techniques, respectively.

Having set up a research infrastructure with the potential to develop into a Discovery Learning Centre on rainwater harvesting, integrated water resource management, landcare and ecological agriculture on Bachs Fen, Dr Auerbach established the Rainman Landcare Foundation as an

independent research and training trust to carry on with the Landcare work. Trustees include Professors Frits Rijkenberg (Chairman), Charles Breen and Ben Cousins, as well as Mphoya Thobela representing Farmer Support Group. The systems set up at Bachs Fen were described in a PhD thesis (Auerbach, 1999) and in the paper (Auerbach, Goewie & Röling, 1999) and poster (Auerbach & Lorentz, 1999) presented at the Drought Conference.

In summary, the Rainman Rainwater Harvesting System uses swales (dead level contour bunds) to double the infiltration of stormwater runoff, mulches to reduce evaporation by 40% and cushion the soil against the erosive force of heavy rain, wetlands to store and purify runoff water and compost to increase the moisture holding capacity and the nutrient cycling ability of the soil. Quantification of the storage capacity of the wetlands and their effectiveness in reducing flood peaks and raising base flow levels showed that there is sufficient water made available from the one hectare wetland to irrigate over one hectare of intensive market gardens. This transforms land which would yield a few hundred Rands per hectare per year into highly productive land capable of yielding a net farm income of at least R15 000 per year. An uneconomical farm unit is thus transformed into a productive small commercial farm capable of supporting at least one family, and in practice giving employment to eight people. The farm as a discovery learning centre contributes towards the integration of integrated catchment initiatives and landcare within the province of KwaZulu-Natal. The provincial and national departments of agriculture are represented on the Board of Trustees, and have requested training for agricultural officers in landcare and water demand management. Their rainfall simulator is used as a training tool in courses, to show how rainfall on bare soil causes erosion, while mulch protects the soil.

Environmental education: school environmental action clubs and adult education

Young people look to the future, and they do not accept that things have to remain the way they are. The programme helped to inform young people about the issues, and guided them in developing school environmental policies and action plans; the emphasis was on outcomes which would improve the state of the environment and demonstrate to students that they can be part of the solution, rather than part of the problem. Agriculture & Environment, Education, Water Affairs, Health and Local Government worked together remarkably well, and annual competitions ensured that enthusiasm and activity levels remained high.

In all, twenty eight School Environmental Action Clubs have been formed, mostly in Mpumalanga Township and the surrounding rural areas (Ntshongweni, Mophela, Sankonshe). The clubs have each developed a School Environmental Policy, and are implementing Action Plans flowing out of this policy. Musa Zwane, our Environmental Education Facilitator, has started a masters study (MEd) analysing what difference these clubs are making in practice to environmental management. She is also working with Angus Burns of the Umlaas Irrigation Board, who carries out our river biomonitoring, and with Dr Chris Dickens and Mark Graham of Umgeni Water and Kim le Roux and Jim Taylor of Share-net, to adapt the biomonitoring programme so that school children can use it as a monitoring tool.

The effects of the enviroclubs are reflected in a collection of Zulu poetry written by club

members, which shows how important caring for the environment has become for some children. A poem in the collection called *Ubuhle bezihlahla* (the beauty of trees) shows this poignantly: "If my parents had only told me how important trees are in the environment, how many trees I would have planted already" the poetess comments – this child will go through life making things happen, caring for her environment. Needless to say, appropriate trees must be selected for the environment, and the programme helps mainly with indigenous varieties and with fruit trees.

Research products from the School Enviroclubs include descriptions of their establishment process, school environmental policies, action plans and progress reports for each school and will also include the MEd thesis by Musa Zwane on the development of the clubs (end 2001).

Education of adults has been through community meetings, subcatchment committee activities (which will be described in more detail later), activities and workshops of the Mpumalanga Environmental Forum, and practical work with gardeners, craftgroups and teachers. Many changes have been noted in the way Mpumalanga Township residents manage their land (especially the food gardens which have appeared on road verges), improved cooperation between schools and communities (including several community gardens established within school premises), better management of sanitation, and a cooperative approach to sanitation maintenance, inclusion of urban agriculture and catchment management on the agendas of urban planners and local authorities in Durban and significant media coverage of a range of programme activities. Education about Landfill Sites has seen the KwaNdengezi community lobbying successfully for improved water supplies when the river was polluted by leachate.

Rural development and community capacity building: small scale agriculture & craftwork

The above-mentioned activities reflect integrated community action for the environment. Helping communities to apply improved water demand management strategies in practice required a simplified version of our technical rainwater harvesting systems. Applying the lessons from Bachs Fen to community gardens and craftgroups revealed the need for participatory action research, and for a process of discovery learning. These are described in Auerbach (1999), and highlighted the importance of democratic and accountable local leadership. It was the experience of the programme that where local leaders were dedicated and accountable, it was relatively easy to help the communities to access resources. Considerable capacity exists at local level, and many synergies grew out of bringing small and large scale farmers; white, black and Indian catchment residents; corporate, industrial, private and communal landowners; men, women and children together in refreshingly new ways which helped to break out of the mould of inter-group conflict which has been the depressing norm in twentieth century South Africa.

The gardens represent a significant contribution to improving food security, while the conservation design encourages effective use of water, and reduces the dangers of soil erosion and non-point-source water pollution with nutrients. Rainwater harvesting (wetlands and swales), water conservation (mulches and compost) and nutrient cycling through ecological

agriculture reduce the risk of crop failure in Africa's erratic rainfall areas. The craftgroups allowed women to use natural resources sustainably while generating income to contribute to rural livelihoods. Areas needing further attention are marketing (especially establishing systems for incorporating small scale farmers into the growing organic market), input supply and the availability of irrigable land for gardeners and small scale commercial farmers. As a research product, the gardens provide evidence of the possibilities of using water more effectively, given appropriate discovery learning processes, but also provide a warning that this process does not happen spontaneously.

The capacity of communities to interact with planners and lobby for services has been increased in several areas. In addition to the example quoted in the previous section regarding the KwaNdengezi Community, residents at Salem were able to negotiate with property developers for recreational facilities in the proposed adjacent low density housing development. Gardeners were able to access funds from Durban's Outer West Local Council. The Mpumalanga Environmental Forum helped to secure funding for renewing the sewerage infrastructure, and called for protection of the wetland areas, and for recreational facilities in the housing development planned for the area north of the township, and also eventually was provided with a public library.

Local government development: building platforms for natural resource management

All of the above activities were themselves platforms of various kinds. Bringing diverse groups together was often a hot process, and many angry exchanges took place. However, it is better to shout at your neighbour than to shoot him, and with patience and goodwill, channels of communication were set up which have gradually led to improved mutual understanding.

Collective management of natural resources is well underway in many parts of the catchment. The five subcatchment committees have all been functioning for some time, and it is hoped that a sixth will grow out of the Outer West Environmental Advisory Forum.

While the upper and middle catchment are reasonably clearly defined by the watershed boundaries, once the Mlazi River reaches the boundaries of the Durban Metropolitan Area, the picture becomes more complex. It seems more sensible to focus on Durban's Outer West Entity, and on the Southern Industrial Basin (which has been mobilised to deal with local air and water pollution). The Outer West has engaged with NCMP to help us develop urban agriculture, and the Advisory Forum mentioned above is a first for Durban. The initial idea of only providing for a Metro Environmental Advisory Forum was modified in the light of NCMP experience, backed up by representatives of the Wildlife and Environmental Association of South Africa and Earthlife Africa. Since most conservation activities take place at local level, and most knowledge about the environment resides there, it makes sense to group local people together at sub-catchment level, if they are to contribute practically to environmental management.

Practical examples are presented in the five boxes which follow, to give a practical indication of the range of activities which is part of "integrated catchment management":

Box 1: Conservancies

Involvement of local Conservancies (groups of landowners who come together voluntarily to care for local flora and fauna) has helped to strengthen the Outer West Environmental Advisory Forum, although it has not been given as much credibility by the Outer West Local Council as had originally been hoped. Nevertheless, the Forum has helped to prevent two roads being built through wetlands. An industrial conservancy has been started (with NCMP playing a major role), which is tackling the severe pollution problems of the Hammarsdale industrial area. Several companies are following the lead of Gelvenor Textiles, which is now ISO 9000 and 14000 registered. Kevin Holdsworth of Gelvenor chairs the Hammarsdale Industrial Conservancy, and a DANCED-funded project to minimise waste and maximise effluent recycling is underway in cooperation with the University of Natal's Pollution Research Group. Facilities in several of the factories are now made available to Mpumalanga teachers for workshops, and slowly an environmental ethic is developing in the area.

The Southern Industrial Basin area encompasses the Lower Mlazi River catchment as well as the Mhlatuzana, Mbilo and Isipingo River catchments. These form the southern part of Durban's hinterland, while the Mgeni River and associated catchments form a manageable northern hinterland. The Southern Industrial Basin Forum is currently chaired by Mr Ashwin Seetal, Deputy Regional Director of the Department of Water Affairs and Forestry. Joint planning and combined activities have been initiated between this forum and the Mlazi River Subcatchment Committees. Because of controversy surrounding the proposed expansion of industry (especially petrochemical industry), local communities are presently up in arms, and cooperation awaits a return to a more positive situation. The controversy surrounding the refusal of Environmental Health officials in Durban to support the practical implementation of the proposed environmental management system has also led to delays in further developing the proposals emanating from the public participation process held during 1998.

Box 2: Mpumalanga Environmental Forum and school Enviroclubs

Next-door Mpumalanga Township is a severely under-resourced area, where the first library (for 150 000 people) is currently under construction. As mentioned under environmental education, many of the 28 school environmental action clubs which have been started are in Mpumalanga Township. Teachers from these clubs, together with youth leaders, councillors and representatives from other interest groups, have been brought together to form the Mpumalanga Environmental Forum, which forms a platform for environmental issues, and represents Mpumalanga residents on the Advisory Forum to address local development issues. Teachers, representatives of the departments of Health, Education and Agriculture, a KwaZulu Nature Conservation Services representative, Outer West officials and MRP staff sit on a coordinating committee which runs an annual competition for the school environmental clubs, and brings in resources from various sources to support community involvement in sound environmental management.

When compared with Cape Metro Council's rapid progress in establishing a Catchment Management Department (with nine professional staff members), in addition to their Environmental Management department (with 24 staff), Durban's staff of four in the environmental section are understandably hard-pressed. These bottle-necks will need to be addressed if sound environmental management is to be introduced in the Durban Metropolitan Area, and the new Mlazi River Catchment Programme (MRCP) plan contributes to this process. The many platforms which programme helped to establish represent a diverse contribution to nation building and the development of local government in the province. Integrated catchment management, by virtue of its unifying approach, emphasises what neighbouring communities have in common, rather than their differences. Given the ravages of *Apartheid*, this approach is an important step in creating a feeling of solidarity among diverse community members, based on care for the environment, on Landcare and on promoting effective use of water through River Health action programmes.

Environmental monitoring: newsletter, biomonitoring, community monitoring & activism

Environmental monitoring activities include a wide range of initiatives involving many people and organisations. The regular publication of the Mlazi River Catchment News has helped to establish the identity of the Mlazi River Catchment as a natural management unit. The newsletter reports on the activities of gardens, craftwork groups, conservancies, companies, school enviroclubs and individuals. It appears three times a year. The first issue in February helps to kick off the school enviroclub programme, and reports on the rainy season. The second issue appears in July; it gives news about activities which are underway and reports on the start of the dry season. The last issue of the year comes out in November after the opening rains, and reviews the year's activities. The newsletter allows for use of both stick and carrot: pollution incidents and poor land management are featured in the newsletter, but activities which address problems are also featured. Often industries which have caused environmental problems have

been featured in the newsletter, and have subsequently addressed the problems reported on. Subsequent issues have then acknowledged their actions.

Box 3: A management plan for LTA Quarry

An example of this is the LTA Quarry, which caused severe pollution of the Sterkspruit as a result of soil suspended in stormwater runoff. The soil was affecting the breeding of fish in the Ntshongweni Dam, and after several visits to the quarry had produced little action, the matter was featured in the newsletter and reported to the Department of Water Affairs and Forestry. An inspection resulted in the quarry being instructed to engage an environmental consultant to design an environmental management programme, much of which has subsequently been implemented. A follow-up article in the newsletter praised the quarry for its conservation activities, giving the hard-pressed quarry manager ammunition to show his head office after which his conservation budget was increased.

The river biomonitoring programme is run by NCMP (now MRP) together with the Umlaas Irrigation Board and Umgeni Water. It is a pilot programme for KwaZulu-Natal of the National River Health initiative. The river is monitored three times a year, using 22 sites. Benthic invertebrates are collected, and an index allocated using the South African Scoring System (SASS 4) and an assessment of habitat. This monitoring programme has enabled us to evaluate the impact of activities ranging from agricultural pollution at Baynesfield to drum recycling at Summerveld to accidents on the N3 highway at Peacevale to the activities of the Shongweni Landfill Site. The regular appearance of biomonitoring maps in the Mlazi River Catchment News allows people to relate the various incidents which they hear of to long term effects on river health. As scientists develop user-friendly versions of SASS 4, such as the "mini-sass" which is currently being developed, these are being introduced to schools and communities.

Communities are thus provided with tools which they can use to learn about their river, helping them to manage it effectively. The combination of publicity (positive and negative), scientific monitoring and community monitoring is leading to a better informed public. Farmers in Baynesfield were very concerned when nitrate levels reflected in Umgeni's monitoring shot up; they worked with Umlaas Irrigation Board and MRP staff to deal with the problem in a very responsible way, and several innovative approaches to dealing with dairy and piggery effluent have been developed as a result. Baynesfield farmers reported the planting of trees in a watercourse, and when this was brought to the attention of the forestry company concerned, the trees were immediately removed. The impounding of cattle has been reduced (although stray cattle are still a problem, since some cattle owners adhere to the negotiated agreements, and others do not). Arson has also been reduced, and access for wood gathering has been negotiated. Crime in the Killarney Valley/ Mophela area has reduced since the inception of the subcatchment committee, according to local residents.

The establishment of the local Working for Water campaign saw cooperation between black, white and corporate landowners, and resulted in commitment from Mondi Forests to withdraw

all plantings 30 m from wetlands and water courses. The programme was so effective in bringing together neighbouring communities that it received follow-up funding to continue with some alien control after most other programmes had stopped. A joint evaluation of work at Hope Farm was held in February, organised by Angus Burns. Representatives from Agriculture, Working for Water, Umlaas Irrigation Board and Farmer Support Group workshopped ways of encouraging Working for Water activities to be better integrated into sustainable development initiatives. Many are worried that Working for Water starts activities and is unable to complete their planned programme because of the intermittent nature of poverty relief funding.

Communities around Ntshongweni have since been involved with planners in looking for ways of managing aliens and improving the productive use of agricultural land, and this has led to a Land Affairs backed programme to develop agriculture in the area. However, in spite of recommendations that land adjacent to the river should be used, it appears that the poorest, driest areas will be developed, and a dam built in an unsuitable area.

Box 4: Conflicts of interest between the community and the Department of Water Affairs

Such inappropriate development has led to several instances of community activism. Sometimes this is the only way to respond to incidents which threaten the environment. However, it puts MRCP in a difficult position; on the one hand, we are seen by the community as people committed to conservation, with scientific resources which are meant to protect local ecosystems. On the other hand, assisting communities to voice their concerns has led to staff being accused of manipulating the communities, or of unscientifically adding to community hysteria. On several occasions, the programme has come into direct conflict with the Department of Water Affairs and Forestry, notably concerning issues related to the Shongweni Landfill Site. The Programme Coordinator warned at the first site meeting leading to the formation of the Monitoring Committee that the leachate tank and contaminated stormwater dam were too small. Subsequent letters to the department were dismissed as ill-informed.

The dam has overflowed on several occasions, and even the new larger leachate tank and stormwater dam have overflowed. A case of negligence is currently pending against Enviroserv. Biomonitoring revealed significant long term impacts on river health, but Water Affairs head office officials have consistently refused to discuss biomonitoring results at monitoring committee meetings. When Enviroserv accused the Programme Coordinator of bias and refused to attend monitoring committee meetings while he was chair, the department allowed them to do this, and appointed a neutral facilitator in his place. Such acrimony does occur from time to time, but it is important that legitimate community concerns find powerful platforms where they are taken seriously. The department still insists, however, that designing stormwater dams for a one day, one-in-fifty-year rainfall event is adequate, even though both prediction and experience show that five day rainfall events are not unusual.

The MRCP has acted as a rallying point for local environmental issues. Although not always appreciated by authorities, the programme has achieved a reputation as responsibly pro-environment in the eyes of many officials.

Box 5: Local Property Development issues

Development of the sugarcane area around the landfill site by Moreland was another issue which caused apprehension among local communities. A process of negotiation was facilitated by the programme, and resulted in black and white communities gaining agreement from Moreland that any future planning for the development would involve local representatives, and that the local community would be consulted on the choice of consultant before any environmental impact assessment was carried out. Compromise between maximising profit and minimising environmental impact was agreed to, with some important concessions being made by developers concerning the management of the areas around sensitive stream margins, and the preservation of the now rare tall grassveld biome. There is an opportunity to use this development as a prototype eco-village and it is hoped that Moreland will take up this challenge.

Box 6: Mlazi Catchment meeting

On 30 November, representatives from the upper Mlazi, and from the Southern Industrial Basin Forum (Lower Mlazi, Mhlatuzane, Mbilo and Sipingo catchments) met to discuss integrated management of the four catchments. The key to success is the engagement of local communities through a process of platform building: bringing diverse groups of neighbours together, helping them to see that there are several points of view, working through a process of joint vision building and planning, and then devising and managing strategies for collective resource management. Farmers, craftswomen, foresters, industrialists, township residents, smallholders, conservationists, resource managers all have their own ideas about what is important, but increasingly they realise that sustainable resource management requires them to work together. Farmer Support Group has ten years of experience in bringing people together, using Participatory Action Research methods.

Having started many gardens, craftgroups, school enviroclubs and subcatchment committees, our focus has shifted from initiation of activities to platform building. Institutions of local government in the new South Africa are where democracy stands or falls. Promoting accountability, equity, capacity building and efficient use of resources can now take place on the basis of what the community have said they would like to establish, and what the three levels of government have declared to be their policy framework.

Overview of NCMP achievements.

Practical achievements are discussed in Chapters 5, 6, 7 & 8 of Auerbach (1999). An updated summary is presented in Figure 1, showing a steady increase in field activities. These will be

handed over to the appropriate authorities during the current phase of the MRP.

Academic achievements include 4 MScs and a PhD, as well as assistance with an Honours Degree, a BTech, two Diplomas and a Certificate in Rural Resource Management. Staff are currently consolidating their action research, and reflecting on their work through three masters degree studies (and two advanced diplomas leading to masters) on aspects of catchment management. The three masters studies (due to be completed in 2001) are on environmental education, on biomonitoring and on establishing subcatchment committees. The two diplomas are on community development and on tourism.

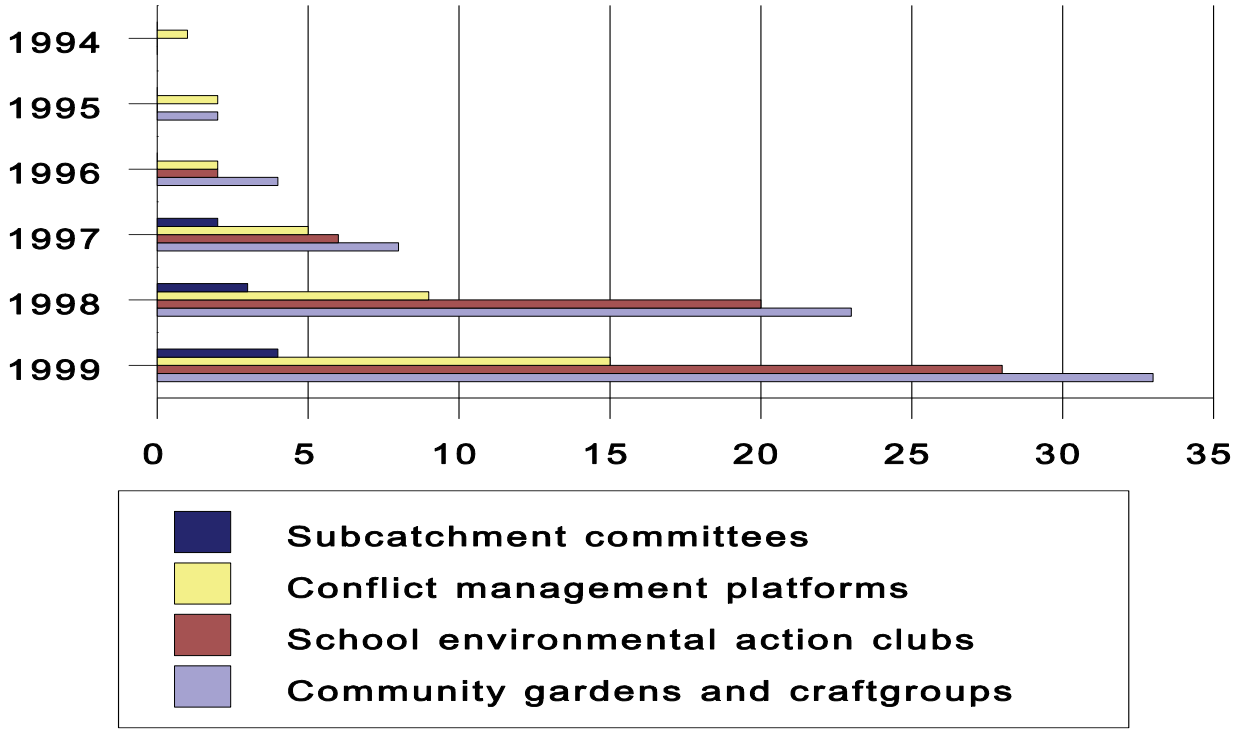

Figure 1: Ntshongweni Catchment Management Programme Activities (cumulative)
What did WRC support for this participatory action research programme achieve?

In summary, the following main activities are underway:
Ecological research farm and river biomonitoring programme established
Community gardens: Established 21; in the process, 3; total 24; number of members 462.
Craftgroups: Established 9; number of members 81.
School Enviroclubs: Established 23; in the process 5; total 28; number of members about 600.
Conflict resolution platforms: Established 15. Transformed into subcatchment committees 5.
The programme as a whole has developed from exploratory analysis in the pilot phase, to three years of interaction and platform building in the consolidation phase. The next phase requires institutionalisation, where collective planning and management take place. This evolution is

represented in Figure 2.

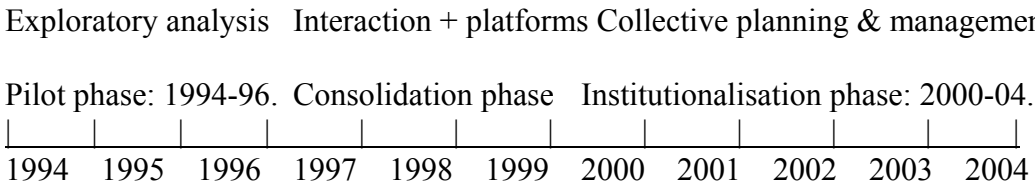

Figure 2: Time-line for Mlazi River catchment management development

Institutionalisation has three aspects: firstly, activities need to be handed over to the Department of Agriculture and Environment, Education, Health, etc. Secondly, local subcatchment committees will not be adequately supported in the proposed Catchments Management Agency for the massive Mvoti to Mzimkhulu Water Management Area (WMA). Rather, these groups should become Local Landcare Groups. As such, they will receive some support from the Department of Agriculture and Environment (KZN), and may still network with other groups in the WMA. Finally, the development of the WMA itself is important for the development of strategic management plans for all of the catchments which it includes. This process is unlikely to involve local input other than brief consultative processes.

Staff capacity building

Staff who have left the programme have been profoundly influenced by their experiences, and two are still intimately involved in local catchment management. Jenny Dean (ex conservation consultant) still chairs the Summerveld Conservancy, and advises many businesses and farmers on the planting of indigenous trees. She has started her own business around these activities. Raymond Auerbach (formerly programme coordinator) directs the Rainman Landcare Foundation, and runs an ecological research farm and a consulting business. His PhD was a product of the programme, as was Barry Patrick'□ MSc. Mr Patrick (ecologist) is still involved in environmental work as a consultant and Normah Zondo (communications officer) is helping the University of Natal to communicate with scholars about university education. Thami Mthembu (agricultural facilitator) now works for the Durban Metro water authority, having completed a Short Course and Certificate in Agriculture/ Rural Development. Angus Burns is still employed by the Mlazi Water Users Association (formerly the Umlaas Irrigation Board), and still helps MRCP with river biomonitoring. He is working towards his MSc on Biomonitoring.

Sifiso Ntinga is working on his Advanced Postgraduate Diploma in Adult Basic Education, and has been able to take over the coordination of the programme. Musa Zwane is working on her MEd on Enviroclubs, Sakhile Ngcobo on a Masters in Rural Development Systems. Zenzele Gumede is studying Tourism and Development and Lynn Stefano is working on a Diploma in Rural Development Facilitation. The young team has become a highly competent team.

Linkages with other projects and the "postage stamp" syndrome

Staff are involved with Steering Committees or commentary on the following projects: Sand

River, Kat River, Lotus River, Okhombe, Mbongolwane, Mkhuze, Centre for Environment and Development, Centre for Rural Development Systems, the Natal University Bachelor of Education degree programme (Environmental Education), and university external examinations.

Impact on the largest stakeholders

Mondi Forests have developed and partially implemented a conservation plan, a fire plan and a weed control plan for Maybole Estate. They have also used Mr Ngcobo extensively to improve relationships between their plantation staff and neighbouring communities. Mr Ngcobo recently helped to show the Minister of Water Affairs and Forestry what initiatives Mondi has started with communities in the Drakensberg area. He has also used participatory rural appraisals to identify problems and find solutions for several communities adjacent to Mondi plantations.

The Durban Metropolitan Council, and in particular the Outer West Entity of Durban, have become interested in Urban Agriculture and in Catchment Management through a range of activities and studies, many of which included FSG staff. Outer West funding was channelled through FSG. Joint activities with the Christian Social Action group CMA, Conserve and Msinsi Holdings have resulted in many proposals being included in Health and Community Development budgets. Staff contributed to the development of the Durban Environmental Management System and the Durban Metropolitan Open Space System Plan (DMOSS).

Umgeni Water has worked with us on Water Education, using many of the School Enviroclubs as venues for Water Week activities. Angus Burns and Barry Patrick have also helped Umgeni with development and demonstration of the River Biomonitoring approach, and Mr Burns and Dr Auerbach serve on the KZN River Health Provincial Implementation Team, chaired by Dr Chris Dickens of Umgeni Water. Eiman Karar (Catchment Management, Umgeni) set up for Dr Auerbach to present an outline of the project to the Water Institute of South Africa.

The Department of Water Affairs and Forestry have interacted with the programme at a number of levels. Mr Haroon Karodia (Director of Catchment Management, Pretoria) and Mr Ashwin Seetal (Deputy Regional Director KZN) and their teams have been very positively engaged in following and supporting the activities of MRCP, and using these to test ideas about how catchment fora can be involved in policy formulation and strategic planning. DWAF inspection staff (such as Mr Lin Gravelet-Blondin and Mr Charles Joubert) have worked closely with us on identifying and tackling water quality problems. Some of the staff involved in landfill sites have been less positive about MRCP's contribution, and have been resistant to the idea that the public has a right to information, and that opportunities should be created for community groups to express their concerns, and to discuss a range of approaches to assessing water quality. The Department of Agriculture (national and KZN) have been intimately involved with community gardens and are supportive of local Landcare groups.

Scientific merit

The Steering Committee asked for an indication of recognition of scientific merit of the programme. Perhaps the most important results have been that the Department of Arts, Culture, Science and Technology have acknowledged that the Rainman Rainwater harvesting System is a

South African technological innovation by including a description of it in their book "The Hidden Edge" by Graeme Addison (2001). Dr Auerbach has been asked to contribute to international journals on agricultural ethics, and to an agro-eco-systems journal.

Dr Auerbach was invited to give the Keynote Address at the National Landcare Workshop. It is interesting that the Department of Agriculture is more positive about the applicability of the systems developed than the Department of Water Affairs and Forestry. The failure of DWAF to engage with results is illustrated by the fact that when the Landcare programme was allocated funds for poverty relief from DWAF, they asked whether these funds could be used to support training in rainwater harvesting and other aspects of water demand management. They were told that the funds could only be used for invasive alien plant eradication.

A framework for community participation in catchment management in South Africa?

The programme's scientific report (p.147, Auerbach, 1999) goes as far as characterising an ecologically sound prototype community garden. The process of making visible the state of the catchment is described in Chapters 7 and 8, together with education and platform building in the context of discovery learning. A framework for community participation in the integrated management of any catchment must draw on building cooperation at subcatchment level. This is a key lesson from the last six years of work. Ecologically sound land use evolves out of an understanding of the impacts of unsound land use on catchment ecosystems. Thus a vital part of improving land use must be centred around making visible the effects of human activities (both positive and negative). The critical steps in establishing community participation in ICM are:

1 Set up networks at subcatchment level, to exchange information and to manage conflict; this process needs careful facilitation.

2 Provide examples of good practice in a way which helps local people to discover for themselves that this is better than what they do - they will only change their management practices if they are convinced that the new practices are more beneficial to them than the old ones.

3 Make visible the problems of the catchment and the systems of the catchment, thus building a sense of catchment identity.

4 Monitor the river qualitatively and quantitatively, involving locals in the process.

5 Through supporting joint activities, help conflict management to evolve into collective resource management.

While such a five-step plan may seem to be simple common sense, it appears that authorities are often tempted to start with large structures, rather than starting with local networks. The result is that the existing capacity at local level is often not appreciated, and local involvement comes too late for a sense of ownership to develop. Local people need to feel that they are in charge of the

process of local development, otherwise they often oppose what they see as external bullying from people who do not really know the area. Once local people have become involved, it is often quite remarkable how much energy and expertise becomes available on a voluntary basis. People naturally care about their area, and if they can be helped to manage conflict, significant synergies can begin to operate. This is important in building a unified South Africa, given our history of separation: the river can act as a unifying force, reflecting a healing in society.

What are the implications for future research?

While DWAF is reluctant to acknowledge relevance and scientific merit of this approach to water demand management, WRC appears to accept that communities should be involved in catchment management and improving land use. However, in spite of good support from all WRC staff on the Steering Committee, when WRC was approached for further support in 2000/1 in evaluating the effectiveness of Participatory Action Research, some people at WRC had told Mr Ntinga that what we are doing is not research. The technical aspects of MRCP were accepted as relevant research, and assessing how people were applying the techniques was seen by WRC Research managers as vitally important. However, funding for Phase 3 of the programme was cut short in such a way that the work could not be expanded throughout the catchment. Linkages between community problem identification, community capacity building, water demand management and development of local Landcare Groups could therefore not be further developed. Until the process of implementing community-developed plans is seen as legitimate action research, community participation in catchment management will remain a superficial, politically-correct policy objective.

Is integrated catchment management a useful approach in developing community participation in water resource management?

We conclude that integrated catchment management can be a useful approach, as has been shown by high levels of participation in the project throughout. However, we must reluctantly conclude that integrated water resources management as envisaged by the Water Act is **not** a useful approach in developing community participation in water resource management. Catchment Management Agencies operate at Water Management Area level, and community participation will not be effective at such a broad level.

What is useful is to have local (subcatchment level) groups working together to manage natural resources collectively. This Landcare perspective can contribute to water resource management if and only if the departments of agriculture and water affairs work together, agriculture at local, or microcatchment level and water affairs at catchment and WMA level.

Since this appears highly unlikely to happen, integrated water resources management is likely to remain a water affairs "empire" which operates mainly at provincial and national levels by decree. The capacity on the ground which the provincial departments of agriculture undoubtedly have is likely to remain ineffective because of the lack of appropriate funding for anything except short term poverty relief. If a highly trained corps of Landcare Specialists could develop within the departments of agriculture, joining forces with trained local Landcare Facilitators, a farmer led National Landcare Movement could develop, to the benefit of future South Africans.