

Centre for

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**TOWARDS REFORMING**

**THE INSTITUTIONAL AND LEGAL BASIS OF**

**THE WATER SECTOR IN ZIMBABWE :**

*Current Weaknesses, Recent  
Initiatives and Their Operational Problems*

Edited By

Calvin Nhira<sup>1</sup>

with Bill Derman<sup>2</sup>

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University of Zimbabwe

**CENTRE FOR APPLIED SOCIAL SCIENCES \***

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- A Member of IUCN - The World Conservation Union

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**CAUGHT IN THE CATCHMENT :**  
**Past, Present and Future Management of**  
**Nyanyadzi River Water**<sup>8</sup>

Alex Bolding<sup>9</sup>

**Introduction**

A catchment perspective in the management of water resources has always had a particular appeal amongst planners and engineers. Catchment, or river basins, form a geographical unit enclosing the area drained by all streams and water ways which feed a river at a particular point. It seems logical to plan and manage water use in each river basin so that upstream uses do not interfere with downstream uses and to ensure that water is used for its best purposes.

The perspective has gained favour in Zimbabwe with the announcement of the formation of the ZINWA. ZINWA is envisaged to work along catchment water management lines entailing:

- definition and implementation of a strategy for managing water resources, currently undertaken by the technical secretariat of WRMS in the DWR;
- provision of an appropriate legal, regulatory and administrative framework, as reflected in present parliamentary debates on revision of the Water Act and the erection of ZINWA;
- guidelines for intersectoral allocations;
- development of water resources in the public domain, testified by the government's commitment to build more dams.

In this paper an attempt is made to come up with workable concepts of water allocation and distribution that could inform the emergence of an appropriate legal, regulatory and administrative framework at catchment level. To do so a historical analysis is made of the emergence and operation of the present water management framework in Nyanyadzi catchment, Chimanimani district (see map). Nyanyadzi catchment covers about 800 square kilometres and stretching from east to west transects all agro-ecological regions that Zimbabwe harbours. The border of the catchment is defined by a small-holder irrigation scheme, lying at the bottom, which depends for its supplies on water captured upstream. Recent decreasing water supplies, due to upstream abstractions, drought conditions and the consequences of increased land use, have resulted in a crisis situation for Nyanyadzi irrigators.

**Developments in Nyanyadzi Catchment**

Nyanyadzi irrigation scheme was started in 1934 by government and has remained under government guidance ever since. It consists of 4 blocks

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<sup>8</sup> An earlier version of this paper was presented at the UZ/ZIMWESI "Water for Agriculture" workshop, Harare, 11-13 March 1996.

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**furrows.** Locally available materials are used to construct aqueducts, bridges and furrow lining at vulnerable places. Besides furrow irrigation, numerous gardens along the river bed are irrigated with buckets. Also a number of light pumps and gravity tubes have been put into operation to irrigate other portions of land. The scale of these irrigation undertakings varies from 0.05 hectares to 25 hectares with one to nine water users using the same abstraction point. Some furrows are also used to replenish fish ponds, provide water for dip tanks, domestic water, and drinking water for livestock. A variety of crops is grown, the main crops being: maize, wheat, tomatoes, cotton, beans, peas and various fruit trees and vegetables. From 1985 to 1993 at least 8 irrigation furrows with road access were involved in contract farming for two companies in Mutare (Lemco and Tomango). Seeds for tomatoes, beans or peas were provided by these companies as well as transport for collection of the produce. Other marketing channels are local sales and sales to schools and markets (notably in Chimanimani and Biriwiri). The remainder is used for some consumption and distribution amongst family members. Crop yields vary, but are in some cases two or three times as high as the yields achieved in Nyanyadzi irrigation scheme.

### Nyanyadzi Raids

In September 1984 the irrigation manager of Nyanyadzi irrigation scheme together with this gang of labourers and members of the Police went upstream along Nyanyadzi river and destroyed a total of 28 'illegal' furrows. His actions were motivated by a lack of water in Nyanyadzi river reaching the scheme's intake. However, after the action had taken place, the irrigation manager was reprimanded by the DA. The destroyed weirs were rebuilt within weeks to the frustration of Nyanyadzi plot holders.

More raids followed (see table). Most raids were organised during water scarcities occurring in October (first summer irrigation gift) and May (middle of beans season).

With the Water Act not being administered properly and the Nyanyadzi irrigators organising in-effective upstream raids a deadlock emerged in water scarcity situations. The DA acted twice as a mediator (1988 & 1991) in the conflict, facilitating the emergence of a water sharing arrangement between upstream and downstream water users. The arrangement was that for one week upstream irrigators would use the water, and let the water flow to Nyanyadzi scheme the following week. However, this arrangement remained a temporary one and only applied to upstream water users along Nyanyadzi river (excluding those in the remote upper catchment and along the tributaries of Nyanyadzi river) and the Nyanyadzi scheme irrigators. Somehow this arrangement has not resulted in a permanent legitimate institutional arrangement that is recognized by all stakeholders, as testified by the 1994 raid.

## Strategies

The case of the upstream raids in the Nyanyadzi river catchment shows that despite the lack of a single responsible body for catchment water management in times of water scarcity a form of catchment water management has emerged that involves almost all stakeholders in the area. This form of collective action only takes place at a certain optimum water scarcity in the river (cf. Wade, 1988). In times of extreme drought all people in the valley suffer from water shortage and in times of abundant water supply all stakeholders benefit without bothering each other.

The occurrence of interventions like upstream raids and institution of water sharing arrangements points at the failure of the present water administration to regulate water abstraction from public streams within the present legal framework. The very fact that DWR is not represented on the ground and the apparent lack of political back-up required to enforce water rights and the associated water distribution principles in times of water scarcity, has led to a situation where local stakeholders take the law in their own hands. The unique coalition of actors, directly involved in the enforcement of a certain water distribution pattern by means of a raid, is a feeble and temporary one that transcends borders of institutional jurisdiction and political commitments. The upstream raids and their consequences are the outcome of struggle in which the various actors apply different strategies.

The irrigators invariably put pressure on Agritex extension workers to supply the services required (be it water for block C or technical assistance for informal furrows). Furthermore, they mobilise their political administrative network to pursue their interests at a political level (block C irrigators mobilise their councillor, headman and at a certain stage even the governor; informal irrigators brandish their councillors after each closing exercise and appeal to the DA). Nyanyadzi irrigators do so on their own account and through their own organisations (Irrigation Management Committee, ZFU).

Agritex commits itself to agricultural advancement of its clientele. In the case of upstream extension workers this has led them to promote informal irrigators, who seem to make up an important part of their daily clientele. In the case of Nyanyadzi irrigation scheme it has led to a position where local Agritex staff feel responsible (and are also held responsible by irrigators) to provide solutions for water shortage in the scheme. The extension workers in the scheme play a crucial role, in organising the raids, as they know how to do it from earlier experiences. Furthermore, because Agritex has personnel on the ground that can be harassed by irrigators, it is forced to take the initiative for organising raids, whereas other institutions (notably DWR and NRB) can retreat to the safe world of papers and models, unaffected by too many problems, contradictions and pressures on the ground. Crossing their institutional boundary, Agritex staff have developed a strategy that facilitates the mobilisation of the necessary actors (NRB, councillors, police, back up of Agritex district office).

Finally, the councillors and DA are the most unpredictable in their behaviour. Councillors have to account for their actions to their constituency, which is either in favour of the raids (Nyanyadzi) or rather against it (upstream wards). The DA played a crucial role in the settlement of a water sharing arrangement in the late eighties. The DA is the most important mediator in the conflict and seems to act on behalf of the general interest and hence his support for the plight of the informal irrigators.

### **Discussion: Legal, Regulatory and Administrative Considerations**

With the case of Nyanyadzi catchment in mind it seems appropriate to reflect on some of the future building blocks of ZINWA. I do so by discussing a number of legal, regulatory and administrative features that bear relevance to the Nyanyadzi situation.

#### ***Illegitimate Legalities***

The Nyanyadzi case shows that the present framework, however 'legal' it may be, is not considered legitimate by the large majority of water users (cf. Magadzire, 1995:6). There are a number of basic principles which render the Water Act, and its counterpart the Natural Resources Act, not legitimate in the eyes of many smallholder irrigators:

- (a) The need to have title deeds (land ownership) has for a long time worked as an exclusive clause. Communal and resettlement farmers do not hold title deeds. In order to apply for a water right mediation has to be sought from the DA in Chimanimani. This has given many aspiring irrigators an underprivileged position compared to their commercial farming counterparts. During the colonial days this clause prohibited African farmers from acquiring water rights. This in turn has resulted in a situation where indigenous irrigators with long-standing historical claims to water are considered by administrative organs to be informal and illegal. Furthermore, the principle of 'first-come-first-served' has been twisted into a principle where people that were able to apply first have first priority. The first Water Act of 1917 wrongly assumed a tabula rasa approach. First, there was the Act and then there were ~~the water~~ users. In the case of Nyanyadzi that is actually not appropriate, since a number of furrows had been constructed before the formulation of the Act.
- (b) The Water Act stems from a Roman-Dutch origin. It is based on an appropriative principle of granting water rights as opposed to the English doctrine of riparian granting of water rights (Matinenga, 1995). The appropriative principle postulates that a person using water is allowed to do so, not because of the sheer fact that he/she owns land along or traversed by a public stream, but because he/she makes 'appropriate' (beneficial) use of the water. Most indigenous irrigators act on the basis of a riparian perspective in which public water which flows through their land can be used by the person cultivating that land. This represents obviously a more 'holistic' view of natural resources than the rather

monodisciplinary view reflected in the Water Act (and in many more of Zimbabwe's Acts).

- (c) The over-riding principle in the Water Act is state ownership of water. This stipulation is widely challenged by a majority of water users that claim that water is owned by no-one. It is given by God, owned by God and it is there to be utilized by any-one.
- (d) The focus on absolute quantities of water as reflected in the issuing of definite water volumes does not pay respect to the variable, unpredictable behaviour of public streams. Particularly in water scarcity situations the Act is paralyzed by this fixation on absolute water quantities. The principle of 'appropriate' beneficial use of water is actually violated by insistence on the 'first apply, first serve' principle. In Nyanyadzi for instance, especially in water scarcity situations, it is more beneficial to use the little available water upstream than to bring it all the way downstream. Time-based rotations of water turns lead in such situations to more beneficial and equitable water utilization than does adherence to fixed water quantities on the basis of priority dates. van der Zaag (1996) also observes that the over-riding principle of water distribution applied in times of scarcity by both formal and informal irrigators is 'to give each other a chance' (or in other words "a share").

### ***Regulatory Irregularities***

The Nyanyadzi case clearly demonstrates the lack of an appropriate monitoring apparatus or authority to regulate water use in case of water scarcities. The Water Court and river inspector are literally too far away to play any meaningful role in regulating water use. The water administration has at no particular moment in time been able to cope with the developments at the water front. The committed water right volume covers not even half of the actually abstracted water amounts. In such a situation it becomes difficult, if not impossible, to implement the Act's regulatory framework. The fact that the 'first come, first serve' principle has never been fully implemented has led to a situation where local stakeholders have tried to come up with their own regulatory systems (i.e. upstream raids, water sharing arrangements).

Furthermore, one wonders whether the present technical infrastructure for water monitoring is very suitable. The automatic gauges in Nyanyadzi catchment are all of the 'weir' type. This renders them very susceptible to siltation. Flumes would probably have given more reliable data on water flows. The records are sent to Harare (DWR Hydrological branch). This implies that they are not available to the local water users. What's more the measuring infrastructure is such that most local stakeholders do not understand them. People on the ground do not know how to 'read' the flow through a V notch or flume, or how to interpret the (locked up) automatic recorder charts. This means that the present monitoring infrastructure is not transparent for local stakeholders. The whole system has been designed in such a way that only technocrats in Harare and Mutare, that are office-bound, can monitor the system. But they are hardly in a position to regulate the actual situation on the ground. One can wonder what purpose it serves to insist on construction of measuring devices, if no one can



ground knows how to interpret these structures and, as a consequence, can not even inform the knowledgeable persons in Mutare or Harare in order to enable them to act and regulate.

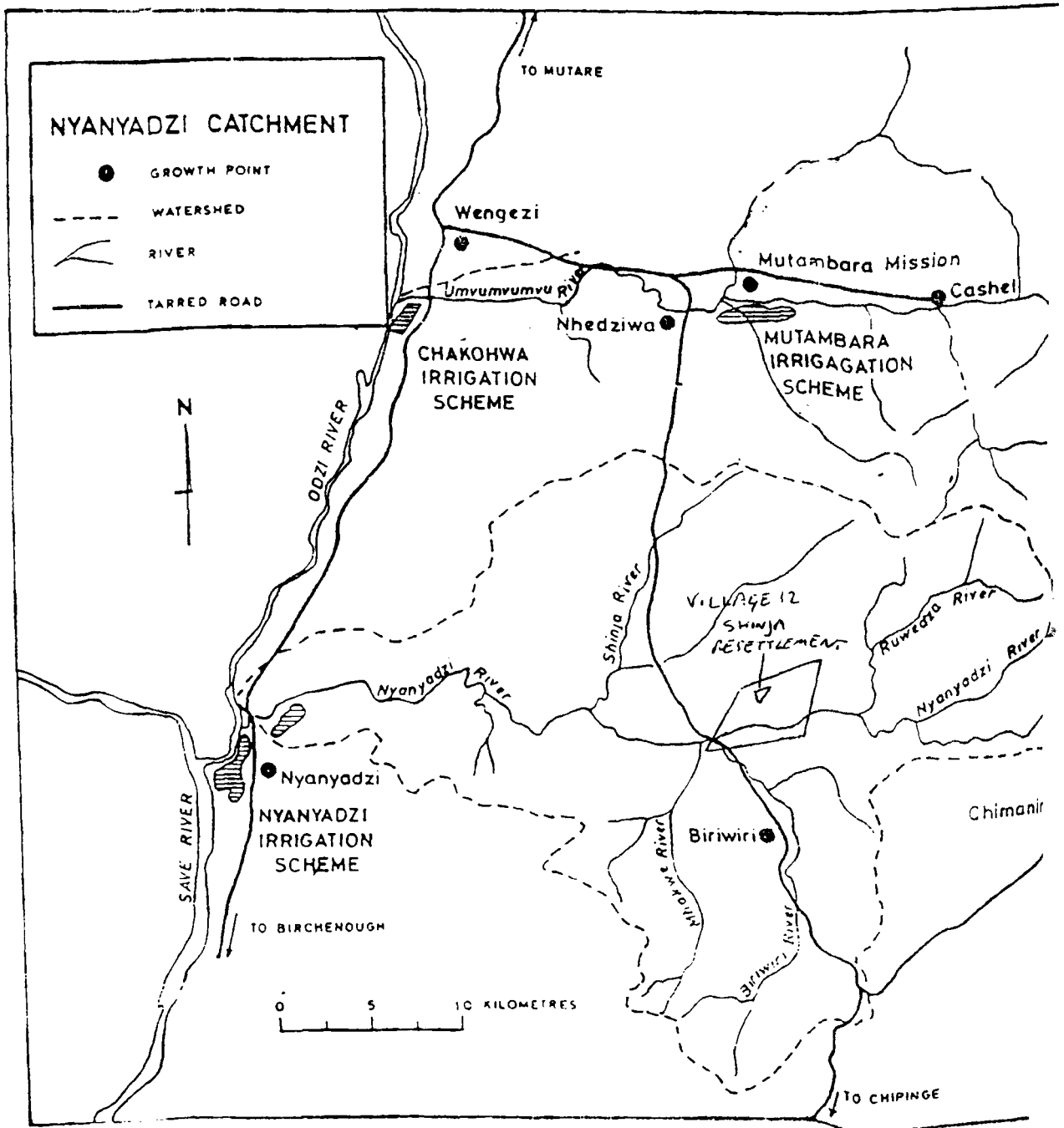
### **Administrative Anomalies**

As noted above, the water administration has never been able to fully penetrate the water front. To make matters worse, a number of options provided by the Water Act have never been tried to turn things for the better (see also Chatora, 1995). Judge Matinenga observes that the Act provides for institution of outline plans determining distribution of water resources over different sectors overriding decisions made by the Water Court (Matinenga, 1995:33). However, the provision has not been implemented to date. Another relevant case is the power of the minister to reserve amounts of public water for future use in dams. Nyanyadzi scheme irrigators could have benefited greatly from this measure. They could also have benefited from the Minister's right to declare Nyanyadzi a public water scarcity area, in which case all water rights are suspended and new water distribution arrangements can be instituted. van der Zaag (1996) points at the possibility of erecting Irrigation Companies, in which a number of informal irrigators could have organised themselves and agree on their own sharing principle of water.

Finally, the evaluation of 'beneficial' water use, engrained in the appropriative doctrine, has resulted in certain administrative 'fixations':

- (a) There is the assumption that informal irrigators (irrigators that do not operate in government controlled situations) are wasteful water users. This assumption can not be proven on the ground. Seepage water from informal, earthen furrows normally flows back to the river to the benefit of downstream water users. It is also questionable whether seepage rates in informal furrows are as high as the rate in the unlined, 'formal', irrigation canal for Nyanyadzi scheme;
- (b) The prohibition to cultivate within 30 metres of the stream bank for reasons of its erosive effects is being challenged by recent research on sustainable use of vleis (Mharapara *et al.*, 1995). This implies that in some cases stream bank cultivation in the form of irrigated gardens can be beneficially exploited without negative effects in terms of river siltation and decreased water holding capacity;
- (c) The assumption that farmer-managed irrigation furrows are unproductive is also disproved by the high yields and commercial orientation of some informal irrigators;
- (d) Lastly the multi-purpose use of water by informal irrigators is not appreciated in Agritex agricultural reports that have to be produced in acquiring water rights. The latter only evaluate benefits in terms of agricultural crop production.

Map and Tables



Nyanyadzi River Catchment

**Overview of upstream raids and years of water shortage at Nyanyadzi**

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<b>year</b>	<b>water shortage</b>	<b>upstream raids</b>	<b>river falling dry</b>
1983	yes	no	no
1984	yes	yes	no
1985	no	no	no
1996	no	no	no
1987	yes	yes	no
1988	yes	yes	no
1989	no	no	no
1990	no	no	no
1991	yes	yes	August
1992	yes	no	January
1993	no	no	no
1994	yes	yes	May
1995	yes	no	March

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Source: Interviews; Hydrological records (E119), DWRD.

covering a total of 414 hectares under irrigation. Only block C is fully dependent for its water supply on Nyanyadzi river, the other blocks (A,B and D) having access to an additional (pumped) water supply from Odzi river. The scheme is irrigated through an open canal system with a night storage dam to even out intermittent flows.

Over the past decade Nyanyadzi irrigation scheme has been confronted with two pressing problems that acquired a more threatening character with the passage of time. One problem is of seasonal water shortages that is related to a changing character of the river run-off. This results in water shortage in the dry season, particularly in block C. The second problem concerns the heavy siltation of the weir and main canal resulting in siltation of the night storage dam, whose storage capacity decreases as a consequence. This problem poses a heavy demand on the scheme's maintenance capacity and causes decreasing water availability in the whole scheme.

Both problems bear a relationship with developments upstream in the valley. The river flow seems to be characterized by a decreasing base flow and ever higher flood peaks in the rainy season. This phenomenon is normally attributed to a decreasing water retaining capacity upstream caused by deforestation and expanding cultivation of land on hills without proper plant cover. Another contributing factor is the negative rainfall trend in the high veld, which results also in less run-off. The second problem of siltation is normally associated with increasing erosion upstream caused by either streambed cultivation and cultivation of steep hillsides without proper protection measures like contour ridges.

The scheme's water problems are further compounded by an unlined main canal, which loses over 50% of water supply due to seepage, and the expansion of water abstraction upstream by means of farmer-initiated irrigation furrows.

Spread across Nyanyadzi catchment are more than one hundred small furrows that tap water from the Nyanyadzi river and its tributaries. Most of these furrows have been constructed and are managed by indigenous irrigators. Their emergence seems to be based on an indigenous irrigation tradition complemented by missionaries and some white settlers during the first half of the century. After the establishment of official irrigation schemes, run by government in the 1930s, the indigenous furrows were considered 'illegal' by colonial authorities. Despite being ignored from then on (testified by their 'informal' status), their number increased dramatically after independence with vacated white farms and furrows becoming available to indigenous farmers; the absence of a powerful state bureaucracy controlling land and water use in the first years after independence (see Alexander, 1993:183); and the drought conditions of the late eighties and nineties forcing communal and resettlement farmers to resort to irrigated agriculture and gardening along the riverbeds to satisfy basic food requirements (see Bolding *et al.*, 1996).

Most furrows have a simple infrastructural set-up with temporary stone weirs diverting water from the river and earthen furrows to convey the water to the fields. In most cases, the flow of water under gravity is used as a means to level

### Some Characteristics for Farmer Initiated Furrows Along Nyanyadzi River (1)

sector (2)	no. of furrows (3)	area (ha) (4)	water users (5)	water right (6)	measurement device (7)
LSCF	> 9	> 73	> 6	5	>3
CL	> 10	> 51	> 10	1	1
RA	> 30	> 67	> 43	14	6
<b>Totals</b>	<b>&gt; 49</b>	<b>&gt; 191</b>	<b>&gt; 59</b>	<b>20</b>	<b>&gt; 10</b>

Source: Aerial photographs, 1986; Bolding's observations (1994-95); Water right data supplied by DWRD, Harare in March 1995.

#### Legend:

- (1) These data only concern farmer-initiated irrigation furrows along Nyanyadzi river itself. If we added the data for the tributaries to the Nyanyadzi river, we end up with at least 100 furrows.
- (2) LSCF = Large Scale Commercial Farms  
CL = Communal lands at the downstream end of the river  
RA = Resettlement area
- (3) Mind that gardens, irrigated by hand; pumping schemes; and piped schemes have not been included. Not all furrows are in operation.
- (4) This area is estimated on the basis of aerial photographs. Not all of it is irrigated in one single year. Command areas vary from 0.5 ha to 25 ha.
- (5) The number of water users along one furrow varies from 1 to 5.
- (6) Some water rights cover four in one and other water rights only deal with one plot out of five along the same furrow.
- (7) Only v notches were observed. Most of them were not equipped with gauges, without which the flow in volumes cannot be calculated.