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Research Number R8064. Raising Irrigation Productivity and Releasing Water for Inter-Sectoral Needs (RIPARWIN)

INCEPTION REPORT

January 2002

IUDD KAR - Water

**R8064 RIPARWIN
Inception Report
October 2001 to Jan 2002**

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1 Executive Summary

This document is the inception report of the DFID-KAR funded project “Raising Irrigation Productivity and Releasing Water for Intersectoral Needs” (RIPARWIN). It details progress made to date, and outlines changes envisaged for the next two years. It includes an initial literature review, but this particular output will be re-visited when a larger literature review is published with the assistance of the International Water Management Institute (IWMI). (Ref: as agreed in the email from DFID, J. Dalton, 21 Jan 2002).

The RIPARWIN project is designed to research the science of river basin management (RBM) in the Ruaha Basin, Tanzania. In doing so, it aims to assist in river basin management, providing strategy and policy advice to stakeholders, mainly in Tanzania, but also to a wider audience. In addition, RIPARWIN aims to build capacity in Tanzania of those involved in the research and management of irrigation and RBM.

The key issue that RIPARWIN faced in the inception period has been the delay in starting due to contractual matters. Although the official start date was 1st September, the contract was not issued until 18 December. Thus apart from a short field trip in June and an important planning workshop held in November 2001, all other work, such as mobilizing field researchers to Ruaha was delayed until early January 2002. This start date contrasts with original intended start date of May/June 2001 given in the first version of the proposal which originally envisaged a full 3-year programme. (The contract issued on the 17 December suggested a project duration of 31 months). With the current completion date of March 2004 still fixed, this now leaves 27 months. It is the hope of the contractor that at some future date, the possibility of an extension may be negotiated.

Delays notwithstanding, the Project has got off to a good start. The planning workshop held in November went very well, leading to an expansion of the research due to greater co-funding from IWMI. We believe that as a result of the stakeholder awareness meeting in the same week, RIPARWIN has gained a high profile within Tanzania at the outset of the project. Another key issue is that the collaboration with IWMI has been much greater than first foreseen, to the extent that the Ruaha River Basin will be treated as if it were a benchmark basin for long term research into RBM and in future may be designated as such. Also, as a result of the partnership on this project, IWMI and SUA have signed an MoU for mutual long-term co-operation. Through SWMRG, the project has also been linked to the Soil and Water Management Research Network for East and Central Africa". IWMI is one of the technical partners for SWMnet, while SWMRG is providing interim implementing the network on behalf of ASARECA.

2 Goal, Purpose and Outputs of the Project

The Goal is “Improved Availability of Water for Sustainable Food Production and Rural Development”.

The Purpose is “Benefits for poor people, the environment and other river basin stakeholders increased by application of new knowledge to the enhancement of productivity of irrigation and transference of water to meet other sectoral needs”.

The Outputs are:

1. Enhanced understanding by stakeholders of water management, competition, use and irrigation productivity under different management, climatic and seasonal scenarios & variability.
2. Enhanced understanding by stakeholders of water demands of other sectors (e.g. environment, domestic, and livestock); both net and gross demands under different management, climatic and seasonal scenarios. Special recognition taken of water needs of poor people.
3. Greater understanding by stakeholders of means and potential to transfer water between sectors on the basis of improved irrigation management and productivity, and by using other water management tools and processes. Greater understanding of impacts arising out of water transfer away from irrigation particularly on poor people.
4. Enhanced understanding by water professionals of river basin characteristics, climatic & allocation means, risks and typologies within semi-arid climates through production of a river basin management decision-aide.
5. Enhanced capacity of Tanzanian water-related researchers & professionals in irrigation and water management within a multi-sectoral environment. As a result of greater capacity for managing water, water needs for poor people recognised and planned for.

We believe these outputs generally hold, although in exploring and researching these issues, we maintain that capacity-building, the fifth output, is one of the most important objectives to the RIPARWIN project.

3 Initial Findings/Literature Review

3.1 River Basin Management and Water Allocation Literature Review

The literature to date suggests various theoretical frameworks apply to intersectoral allocation within river basin management. These frameworks will be explored in greater detail in the Literature Review Publication mentioned in the Executive Summary. However, briefly they are covered in the sections 3.1.1 to 3.1.7. A source of references is given in Appendix 1.

3.1.1 Water Management Frameworks

River basin management of inter-sectoral allocation is one manifestation of integrated water resources management (IWM) operationalised within a river basin.

“The river basin is seen as a means for developing an integrated approach. Its closed geographic boundary system permits various sectors and users in a basin to work together: agriculture, flood control, industry, settlements, and communities”. (EC, 1998)

In essence, inter-sectoral allocation attempts to share available and future water between multiple users via a mixture of processes, institutional structures, and demand and supply management tools. Frameworks in water management are not new. Mitchell (1990) describes a number of frameworks including one for river basins with six dimensions: context; legitimation; functions; structures; processes; and mechanisms. Recently, the EU has generated a multi-dimensional framework as an aid to water resources management and as an input to the EU Water Framework Directive (EC, 1998). The Strategic Approach as it is

called describes "Challenges; Guiding Principles; Programmatic; Contexts; and Application of the Strategic Approach" operationalised via "Programming, Identification, Formulation, Financing, Implementation and Evaluation." A recent conference on river basin management (Abernethy 2001) saw a raft of contributions towards the debates surrounding appropriate theoretical frameworks of basin management.

3.1.2 Drivers of re-allocation

This section explains briefly the reason why inter-sectoral allocation is required. Molden *et al* (2001a) argue that river basins go through three main stages of development; 'Development'; 'Utilisation'; and 'Allocation' each of which corresponds to increasing shortages of water and an increasing need to resolve competitive differences between water use sectors. 'Development' and 'Utilisation' represent the desire to reach a defined functional goal for water use; be it agricultural production, generation of electricity, provision of domestic water supply or restoration of in-stream flows. Intersectoral allocation is required because – or rather when – society realises that water is subject to multiple demands that together exceed available supply. Intersectoral allocation is therefore necessary to balance differing demands in ways that match available supply and ensure desirable multiple-use outcomes.

Table 1 classifies the drivers of water allocation in a number of broad ways, including both the commonly held notion that water should flow to users that generate the highest economic utility for the water used. As can be seen, other 'values' exist as well, including values associated with maintaining natural capital, alleviating poverty or resolving conflicts.

Table 1. Drivers of water re-allocation within river basins

| Factor | Explanation and definition |
|---|--|
| Basin-wide conditions | As rivers begin to close, when demand rises and or surpasses supply, decisions need to be made over where water should be best used and for what purpose. However a river basin need not be closed in order for re-allocation to be required. |
| Changing local conditions | Local water deficits in parts of a river basin can arise needing to be re-supplied. These might be riparian (close to the river) or remote. |
| Changing functional or value priorities | Humans determine changing priorities of water use. The clearest example here is of the supply for environmental needs, which in the last 10-15 years has come to be recognized as an important if not priority demand for water. |
| Higher economic utility | Often cited to be the main reason for re-allocation, water should flow to its highest value user to maximize economic utility for the river basin/nation. The classic example is of water allocation out of agriculture (a low value user), and into industry or power generation (a high value user). |
| Health and sanitation, and scalar effects | The principle that water is vital for life is often enshrined in domestic water rights which usually have the highest priority call on available water. Growing domestic demand from town and cities scale up this demand requiring rebalanced allocation. |
| Higher livelihood utility | A concept arguing that water should be safeguarded for poverty-focused livelihood purposes. A good example is 'water for irrigated agriculture'. It is based on the argument that poorer sectors cannot afford expensive water or a lack of water yet poverty results in high social externalities and costs. Linked to this is the argument that higher value sectors are better placed financially to afford more expensive water-saving or water-finding solutions. |
| Conflict resolution | A sub-class of change in priorities mentioned above, yet has special mention because of its increasing occurrence, significance and need for resolution approaches. Here lie a complex interaction of behaviour, fears and norms surrounding perceptions of demand, needs, wants, costs and benefits. |

3.1.3 Re-allocation options

The normal perception of river basin management of inter-sectoral allocation is where some degree of centralised planning, monitoring and management of water is required to reconcile upstream and downstream differences between supply and demand. However, this need not be the sole means by which water is used more in one sector compared to another. Table 2 provides a list of different ways in which water can be re-allocated and acquired - either through river basin management planning, or by more ad hoc user-driven activities.

Table 2. List of options for water re-allocation

| Option | Explanation |
|--------------------------------|--|
| Sectoral approach | Cross-user management is absent in favour of a sectoral emphasis, e.g. irrigation development in the 60's is an example of a sectoral emphasis |
| Active reallocation mode | In this re-allocation is achieved when water is actively moved out of one sector into another principally through the employment of reallocation devices |
| Passive 'capture' reallocation | Water allocation changes as a result of de-facto growth of allocation to one sector without strategic or active planning |
| Total reallocation | Water is moved completely from one sector to another |
| Partial reallocation | A proportion of water is moved out of one sector to another |
| None | Despite demand for re-allocation, none is effected |
| User-relocation | The user relocates in order to find water, thereby acquiring it. |
| Local solution | The user generates new water solutions; desalination; boreholes, reservoirs |

Water-using 'sectors' can be viewed in different ways. One common perception covers the mainstream sectors of agriculture, power, industry, domestic use and the environment. Other ways of viewing sectors relate to derived values such as amenity, navigation, rural livelihoods and crop markets, while other 'sectors' are descriptions of scalar and factorial effects e.g. domestic, village and urban sectors. One simple classification is into 'use' and 'process consumption' sectors; the latter resulting in a true loss from the hydrological system, mainly via evaporation. Note that the EU strategic approach (EC 1998) has three themes that cut across traditional 'sectors' – Basic Water Supply And Sanitation Services (BWSS) which covers marginal and poor areas in both rural and urban environments; Municipal Water And Wastewater Services (MWWS) which covers larger systems and their associated water treatment challenges; and Agricultural Water Use And Management (AWUM), which covers issues related to agricultural use of water.

Lastly, it is worth mentioning that re-allocation occurs either sequentially or synchronously. In the former case, water moves sequentially from one user to another in both location and time. An example is where water first supplies irrigated agriculture before moving downstream to supply a wetland. In the synchronous case, different user-sectors come together, accessing water at the same time and place. An example of this is found where domestic use is sourced from irrigation canals that also supply growing crops.

3.1.4 Re-allocation devices

Table 5 describes the six key devices by which water is moved from one user to another. In a theoretical sense they do not easily classify alongside each other, as implied in this table. For example, several authors (e.g. Carruthers and Morrison, 1996) will argue that only three main tools (or devices) exist; hierarchical (or governmental command and control); community-based and market-based. Nonetheless, from a user-perspective, intermingled between these and relatively indistinguishable from them are two other 'tools'; firstly the use of technology that may nor may not effect objectives of the first three devices; and secondly, the use of

information and education to alter norms, behaviours and beliefs regarding water use. A sixth water allocation device, attributable to nature, is proposed, one that may be very important when river basins are 'closed'. In other words, the hydrological cycle can meet and surpass the challenge of human re-allocation when river basins are temporarily 'opened' during wet weather. During these times, water meets re-allocation needs via surface or subsurface flow.

Table 5. Six key reallocation devices of altering division of water between users

| Device | Definition | Examples and classifications | Demand mgt | Supply mgt |
|------------------------|---|--|---|--|
| Command & control | Water rights, usually specified by a water agency or held by the Government; sometimes accompanied by information & education | Formalized, de jure, communicated. Poorly formalized, probably not known by the users. Lifetime or permanent. Fixed or temporary. Priority. | Water rights can be reduced to help enforce lower demand | Water rights can be increased to allow greater supply |
| Community management | Local users decide on water sharing agreements, formal and informal agreements, de facto arrangements | Formally agreed and accordant with institutional support. Also, chaotic, spontaneous and without local legitimate support | Communities and or individuals can introduce means to save water by various means | Communities and or individuals can decide to increase supply |
| Economic, "the market" | Financial value of and payment for water affects its allocation | Centralised markets, decentralized markets (user to user purchases), fixed prices versus unfixed | Pricing of water encourages users to make marginal utility decisions | Pricing of water incorrectly can encourage greater use of water |
| Technological | Man-made interventions affect its storage & movement in turn affects allocation | Dams/reservoirs. Pipe and pumps. Intakes and other control gates. Canals and other channels. Aquifer recharge. | Savings via different technologies e.g. <ul style="list-style-type: none"> - reuse - water cleaning - micro placement - leak prevention | Supplies can be secured principally by reservoirs and boreholes |
| Information/ education | Influencing public and private beliefs about water use | Education/advocacy can raise profile of nature of water use, and can influence investment decisions | Promoting behaviour regarding frequency and amount of water use can reduce water demand | Promoting greater use of water beneficial for sanitation |
| Natural/ "Do Nothing" | Movement, volume and quality of water through hydrological cycle causes water to be allocated | Location and seasonality of rainfall. Location, command, variability and quality of river flow. Location, size, depth, release characteristics and quality of aquifer, Location, volume and quality of lakes & surface storage | Changes in the hydrological cycle can create drought situations enforcing lower demand physically. Also lessons are learnt in droughts on saving water effectively. | Increased rainfall brings greater river flow, supply and aquifer recharge. |

3.1.5 Boundaries in river basin management

River basin management commonly coincides with the hydrological boundaries of the catchment. Table 7 explains that this need not always be the case. For example a trans-basin perspective is required if water is utilised from a neighbouring basin to solve water shortages. Constraining water allocation within one whole basin might be termed a unit-basin approach, while concentrating in only one sub-catchment can be labelled accordingly. Defining rapid transitional boundaries (for example created by a large reservoir) or hydronomic zones (c.f. Molden et al, 2001b) within a basin or sub-catchment leads to a modular way in which basin properties and utilisation activities are delineated and defined.

It is the choice of basin 'form' compared against what is required that gives further insights as to the 'correctness' of the approach, as implied in Table 8. While the ticked cells represent the optimal choice of management boundary, grey cells depict sub-optimal selection of management boundary when compared to the desired model. Clearly, some analysis is required to determine optimal boundaries required, and the costs, political and economic, of achieving that.

Table 7. Boundaries of river basin management in relation to catchment boundaries

| Boundary | Description |
|------------------------|---|
| Trans-basin (national) | Allocation of water utilizes more than one river basin; either via transboundary water transfer or by borehole extraction of a deep aquifer |
| Unit-basin | The hydrological boundaries of the river basin is the unit of management. Inter-sectoral allocation utilizes the whole basin as both source and demand. Thus some transfer of water between sub-catchments is envisaged. |
| Sub-catchment | Inter-sectoral allocation has major emphasis within sub-catchments of a river basin. Natural geographic watershed provide the boundary to these sub-catchments |
| Modular | Within a sub-catchment or river basin, specific locations demark upstream/downstream boundaries defining the end of one basin and the beginning of another. These locations can be natural (e.g. a wetland) or man-made (e.g. a reservoir). |
| Zones | Less difficult to isolate geographically, are hydronomic Zones labelled Natural Recapture; Regulated Recapture; Final Use; Stagnation; Water Source and Environmentally Sensitive (see Molden <i>et al</i> , 2001b). |
| Political unit | A political boundary (e.g. region or district) is used as the unit of management; this may cut across river basins or only be part of a river basin. |

Table 8. Suitability of fit of selected model to requisite model within river basin boundaries

| Desirable approach ↓ | Actual selected model to meet optimum management of water → | | | | | |
|-------------------------|---|------------|---------------|---------|----------------|--------|
| | Trans-basin | Unit-basin | Sub-catchment | Modular | Political unit | Zoning |
| Trans-basin | ✓ | | | | | |
| Unit-basin | | ✓ | | | | |
| Sub-catchment | | | ✓ | | | |
| Modular | | | | ✓ | | |
| Political unit | | | | | ✓ | |
| Zoning | | | | | | ✓ |

N.B. Grey cells represent sub-optimal choice of water management boundaries in relation to RBM.

3.1.6 Classification of strategic approach in utilization of devices

It is probably fair to say that no single reallocation device can be used in isolation, neither do all the devices work efficiently in any given situation. Table 9 presents various ways in which the devices can be strategically formulated in relation to each other, the river basin and

stakeholders involved. Although the 'Low-strategy' column appears to show device formulation in a negative light, this is not necessarily the case; indeed sometimes a lack of a strategy may indeed be the right strategic approach.

Table 9. Strategic approaches to utilisation of reallocation devices

| Strategic formulation | Hi-strategy | Low-strategy |
|--|---|--|
| <i>Combination.</i> Emphasis on or use of more than one reallocation device in any one location. | Combination approach; mixing various devices. | Mono-strategic approach; emphasizing few devices. |
| <i>Coherence.</i> Fit of device with each other within level of scale. | Accordant; devices support each other. | Discordant; devices counter-act or undermine each other. |
| <i>Elegance.</i> Choice and formulation of devices designed to effect cost effective leverage. | Effective; devices attempt to promote appropriate intersectoral allocation. | Ineffective; devices chosen do not result in inter-sectoral allocation or are over-elaborate. |
| <i>Seasonality.</i> Strategic approach accommodates seasonal change. | Seasonal differentiation; seasonal changes in water supply are incorporated | Aseasonal approach; no or little account is made of seasonal fluctuations in water supply. |
| <i>Stationarity.</i> Fit of strategic approach to longer-term supply and demand or contextual change | Flexible; strategies are pro-actively reviewed and changed. | Inflexible, passive; subject to change only after severe tests of existing framework. |
| <i>Diversity.</i> Application of devices across the basin in relation to basin geography | Situationally diverse; if necessary, fits changing character of the basin | Reliance on few devices basin-wide. |
| <i>Structure.</i> Applicable devices work at different scales of the basin relevant to those different scales. | Structured; strategy is devised to fit up and down in scale in the river basin. | Unstructured; devices not applied to correct scale of river basin and do not support each other in scalar sense. |
| <i>Institutionality.</i> Devices suit the institutions managing/ surrounding them. | Appropriate; devices suit and well understood by institutions, society, individuals | Inappropriate; devices relatively unknown by institutions, society and individuals. |
| <i>Coverage.</i> Devices applied to all forms of water use. | Extensive; devices consider all forms of water use. | Partial; devices apply to selected forms of water use. |

3.1.7 Institutional framework

The frameworks above briefly address the rationale, context, strategy and tools of reallocation. Yet because of the complex, large and public nature of river basins, their management will occur via multi-dimensional institutional processes. The devices in Table 5 relate to that point – thus omitted from the table is wholly private control of river basins which negates the need for the four of the six devices. The RIPARWIN team has yet to define a framework for river basin institutional design, although a recent paper by van Hofwegen (2001) suggests one representation in which he takes a 'process' approach of "present situation; formulation of ideal situation; formulation of interventions to bring about ideal situation; and monitoring of interventions and impacts" (p 141).

Water and river basin present particular threats and risks to the ways in which institutions operate as they attempt to compensate for imperfect market mechanisms for allocating water (Hodge and Adams, 1997). Examples are drought; pollution; imperfect information; the dispersed nature of the actors; transaction losses of water between users; finance, skills and time resource constraints; and contextual change and enabling conditions such as decentralisation. Various stakeholder types (e.g. users, advisers, regulators) relate to each other in a number of ways; either via ownership, formal and informal rights and responsibility, by participatory routes and by varying degrees of historical legacy. The

process of institutional analysis is also important, resulting in strengthening or reform. It is this meta-institutional design, which Molden *et al* (2001a) argues is basin-specific, that is so important to the success and sustainability of reallocation of water in river basins.

3.2 Activities to Date

June/July 2001. Although the contract was still being evaluated at this time, an important site visit was held to review progress of the proposed canal closure programme established by SMUWC so that RIPARWIN could link into this for research purposes. It was during this visit that the field programme in Usangu was elaborated, plus a visit was made to MATII, the host partner of our field office (Ministry of Agriculture Training Institute at Igurusi) and planning discussions were held between SWMRG and ODG. This field trip went very well.

November 2001. Two important events were scheduled within one week. The first was the RIPARWIN Planning Workshop in Mbeya where partners from IWMI, SUA and ODG came together to familiarise themselves with the main issues in the Ruaha Basin and to formulate the research programme. This went well, enabling the formulation of major research topics allocated to SUA Research Associates.

The second event in that week was the stakeholder awareness-raising workshop. This was attended by representatives from various ministries and stakeholder groups. The attendance list is given in Table 10. Although this lasted only one day, it helped publicise the framework and objectives of RIPARWIN and in turn received excellent feedback on this.

December 2001. The key event was the participation by RIPARWIN at the WWF Tanzania workshop in Mbeya to assist in the planning of the WWF Ruaha Basin Project which intends to ensure compensation flows in Ruaha River. The presence of RIPARWIN, and its ability to provide an understanding into the processes affecting water allocation was positively noted by WWF Tanzania, although the programme of this project has not yet been fully specified. Other activities during this month included elaborating the terms of reference for the research associates to be based at SWMRG.

January 2002. Following the arrival of the contract in the middle of December, researchers were mobilized to Usangu. A field office was established in Igurusi. Several members of SWMRG travelled to South Africa for training in WEAP modelling.

Table 10. Participants at the Stakeholders Workshop 16th November 2001, SUA, Morogoro, Tanzania

| S/N | NAME | ORGANISATION/ INSTITUTION | ADDRESS |
|-----|------------------------|--|--|
| 1. | Matovelo, J.M Prof | Ag. Director for Research and Post Graduate Studies. Sokoine university of Agriculture (SUA) | P.O.Box 3000, Morogoro Email: matovelo@suanet.ac.tz |
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| 5. | Bashar, K.E. Dr | Professor Water Resources Engineering University of Dar es Salaam | |
| 6. | Conway, Declan | ODG-University of East Anglia | Email: d.conway@uea.ac.uk |
| 7. | Dukuduku, Jerome K.Mr | Water Resources Division Ministry of Water and Livestock Development | P.O.Box 35066, Dar es Salaam Email: dwr-maji@intafrica.com |
| 8. | Futakamba, M Eng | Ministry of Agriculture & Food Security | P.O. Box 9192, Dar es Salaam Email: asps.irrigation@cats-net.com |
| 9. | Hatibu, Nuhu. Prof | Team Leader SWMRG Sokoine University of Agriculture (SUA) | P.O.BOX 3003, Morogoro Email: nhatibu@suanet.ac.tz |
| 10. | Issae, A.E.R. Eng | Madibira Smallholder Agric. Development Project | P.O. Box 78, Mafinga Email: aerissae@hotmail.com |
| 11. | Kadoghoho, J.M. Mr | Mtibwa Sugar Estates Limited | P.O. Box 42 Mtibwa |
| 12. | Kaihula, S.A. Mr | Wildlife Division | P.O. Box 1994, Dar es Salaam Email: wildlife-division@twiga.com |
| 13. | Kaita, M | Wildlife Division (M.N.R.T.) | P.O. Box 1994 Dar es Salaam Email: wildlife-division@twiga.com |
| 14. | Kasanga, W.B. Mr | Rufiji Basin Water Office | P.O. Box 1798, Iringa Email: rufijibasin@hotmail.com |
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Table 10 cont. Participants at the Stakeholders Workshop 16th November 2001, SUA

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| 29. | Mdemu, M. V. Mr | Soil Water Management Research Group, SUA | P.O. Box 3003, Morogoro Email: Mak_mdemu@yahoo.co.uk |
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| 34. | Mkumbo, E.N.K. Eng | Tanzania Electric Supply Company Limited (TANESCO) | P.O.Box 9024, Dar es Salaam Email: tanesco_psm@twiga.com |
| 35. | Mlambiti, M.E Prof. | Sokoine University of Agriculture (SUA) | P.O.Box 3007, Morogoro Email: mlambiti@suanet.ac.tz |
| 36. | Mrema, J.P. Dr | Sokoine University of Agriculture (SUA) | P.O.Box 3008, Morogoro Email: mrema@suanet.ac.tz |
| 37. | Msangi, Abedi A.S.K. Mr | Soil Water Management Research Group (SWMRG) | P.O.Box 3003, Morogoro Email: abeidm@yahoo.co.uk |
| 38. | Ndonde M. J | Mbeya Zonal Irrigation Unit | P.O.Box 3575, Mbeya Tel: (025)2503485 |
| 39. | Ngatunga, E.L. Dr | Ministry of Agriculture | P.O.Box 2066, Dar es Salaam Email: elngatunga@hotmail.com |
| 40. | Pyuzza, Nelson D. Dr. | Tanzania Meteorological Agency. | P.O. Box 3056, Dar es Salaam Email: met@meteo-tz.org |
| 41. | Rajabu, Kossa R. Mr | Soil Water Management Research Group (SWMRG) | P.O.Box 3003, Morogoro Email: krajabu@yahoo.com |
| 42. | Ruhangisa, A.G. Eng | Zonal Irrigation Office | P.O. Box 515, Morogoro |
| 43. | Rwambazi J.M. Mr | SMUWC | P.O.Box 238, Rujewa, Mbeya Email: smuwc@twiga.com |
| 44. | Rwehumbiza, F.B.R Dr. | Sokoine University of Agriculture (SUA) | P.O.BOX 3008, SUA Email: rmbiza@suanet.ac.tz |
| 45. | Sadiki, Hamza | Ministry of Water & Livestock Development | P.O Box 35066, Dar es Salaam Email: rbmproject@raha.com |
| 46. | Sally, Hilmy. Dr | International Water Management Institute (IWMI) | Private Bag X 813, 0127 Silverton, Pretoria, RSA. Email: h.sally@cgiar.org |
| 47. | Shayo-Ngowi A.J. Dr | Sokoine University of Agriculture | P.O. Box 3008, Morogoro Email: shayongowi@suanet.ac.tz |
| 48. | Tarimo, Andrew Dr | Sokoine University of Agriculture (SUA) | P.O.Box 3000, Morogoro Email: tarimo@suanet.ac.tz |
| 49. | Tumbo, Siza Dr | Sokoine University of Agriculture | P.O.Box 3000, Morogoro |
| 50. | Uisso, J.M. Mr | Kapunga Rice Project | P.O. Box 45, Chimala, Mbeya |
| 51. | van Koppen, Barbara. Dr | International Water Management Institute (IWMI) | PBag X 813 Silverton 0127, South Africa Email: b.vankoppen@cgiar.org |
| 52. | Zoutewelle, Peter | MAFS/ASPS - DANIDA | P.O. Box 9171, Dar es Salaam Email: irrigation.asps@cats-net.com |

3.3 Poverty and/or Gender Analysis

At this stage RIPARWIN a number of comments may be made on gender and poverty. The first is that gender issues are significant in the Ruaha Basin with water benefits generally accruing to male farmers who tend to have access to irrigated rice. Women tend to farm rainfed maize. RIPARWIN will be aware of this when engaging with farmer research, capacity-building and pro-poor policy advice.

Poverty issues are also prevalent in two main ways. Firstly, water-related poverty exists at the local scale, where water is short due to upstream abstraction. Imbalances in equality of access to water has led to conflict, and this is a major focus of RIPARWIN which has decided to work in the Mkoji Sub-Catchment of the Ruaha, a place commonly experiencing water shortages.

Secondly, a pro-poor water focus exists at the basin and national scale when debating the criteria by which water is divided between competing sectors. Thus, a pro-poor livelihoods focus is counter to the prevailing theory suggests that water should flow to the sector generating highest economic benefit. The tension between these two exists in Ruaha. On the one hand, upstream development of irrigation provides livelihoods and food security to poor farmers, but on the other hand more water flowing to Mtera/Kidatu HEP stations generates greater economic output per cubic-metre of water utilised. These issues will be tackled by RIPARWIN in its river-basin decision-aide and by facilitating debate among stakeholders.

4 Project Planning

4.1 Implications of Initial Findings

Initial findings and developments indicate that the RIPARWIN project continues to be timely and topical within the Ruaha Basin, Tanzania and Sub-Saharan Africa, and has application to the wider environment of water management in situations of multi-sectoral water use. In particular, with the declaration by the Prime Minister Mr Frederick Sumaye, in March 2001, to the Rio+10 Summit in London that the river has year-round flow by 2010, the Ruaha remains a high priority for Tanzania. This is also exemplified by on-going activities of the World Bank funded RBMSIIP project and its development of a project-offshoot to implement local user sub-catchment resource management in the Pangani Basin. RIPARWIN's work in the Mkoji sub-catchment will be similar, and should provide opportunities for collaboration. In addition in Tanzania, the Agricultural Development Strategy Paper and Rural Development Strategy Paper both stress the relevance of irrigation in providing livelihoods.

Further afield in Sub-Saharan Africa, shortages of water due to drought in Kenya in recent years have also highlighted the need of water resource planning in that country. In South Africa and other SADC countries the pre-eminence of water within the rural economy is demonstrated by a number of new initiatives, many of which are being followed and supported by the new South African office of IWMI, the establishment of which is itself an indication of the growing importance of water management in the region.

The November 2001 planning workshop in Mbeya with RIPARWIN partners revealed the extent and relevancy of the researchable issues present in the Ruaha Basin. Recognising this,

IWMI have utilised funds to expand the number of Research Associates attached to RIPARWIN, and therefore the scope of the overall programme. The coverage of RIPARWIN is covered in more detail in Sections 4.2 to 4.4.

The on-going regional interest in river basin management provides a strong rationale to the long-term presence of RIPARWIN, as implied by its two-year programme. However, one implication is, that to take full advantage of the momentum created by the project within this time frame, an extension might be sought from DFID after March 2004.

4.2 Review of Project Purpose and Outputs

Table 11 provides the Output to Purpose Review form, used to examine progress to date. The salient feature of this table is that progress of field research has been minimal because of aforementioned contractual delay. Apart from this progress has been good. The RIPARWIN partners have been able to formulate the research programme, draw the attention of national stakeholders to the aims of RIPARWIN and, with IWMI's assistance, expand the research programme. These are indicators of success achieved since October 2001.

| Table 11. OUTPUT TO PURPOSE SUMMARY REPORT | | | | |
|--|--|---|---|----------------|
| Title: RIPARWIN | | Country: Tanzania | | MISCODE: R8064 |
| Report No. Inception | Date: Jan 2002 | Project start date: October 2001 Project end date: March 2004 | Stage of project: Inception stage | |
| Project Framework | | | | |
| Goal statement: Improved Availability of Water for Sustainable Food Production and Rural Development | | | | |
| Purpose statement: Benefits for poor people, the environment and other river basin stakeholders increased by application of new knowledge to the enhancement of productivity of irrigation and transference of water to meet other sectoral needs. | | | | |
| Outputs: | OVis | Progress: | Recommendation/actions: | Rating |
| 1. Enhanced understanding of water needs and management of irrigation. | a) By 2004, more open, widespread and use of appropriate analyses of farmer irrigation management by user, policy and research stakeholders b) By 2004, chosen irrigation productivity and related indicators described and explained for the years of the study. | Field research is just beginning. Understandings of complexity of surface irrigation gained from SMUWC were put to stakeholders at RIPARWIN and WWF Ruaha planning workshops. | Field researchers are now being mobilised | |
| 2. Enhanced understanding of water needs and management of other sectors. | By 2004, user, policy and research stakeholders have improved understanding of other sector water demand from other sectors in river basins. | Field research is just beginning. IWMI has added to the research the facility to look in detail at other sector needs, including wetlands and pro-poor livelihood needs. | Field researchers are now being mobilised | |
| 3. Enhanced understanding of means of intersectoral allocation. | By 2004, a) by-laws being created by farmers in selected irrigation systems to improve water management. b) Flexible strategies being developed by RBWO/RBMSIIP. c) Monitoring of impacts, particularly on poor people, as a result of moving water out of irrigation. | Field research is just beginning. Discussions with RBWO sub-office in Rujewa indicate excellent understanding of need to be flexible with water rights so they match local needs and assist in effecting re-allocation. | Field researchers are now being mobilised | |
| 4. Enhanced understanding by water professionals of river basin characteristics, climate & allocation means, risks and typologies within semi-arid climates through production of a river basin management decision-aid. | By 2004, river basin management decision-aid and risk assessment analyses completed, and used by water professionals in Tanzania. | Planning discussions held among RIPARWIN. RBWO's D.A. needs were reviewed – their intention to pursue a decision-aid has been dropped, hence RIPARWIN fulfils an important need. First WEAP training of SWMRG RA Rajabu and Faculty member (Philbert) has already been completed in South Africa by IWMI. | As a result of planning discussions, the WEAP model is being considered as a platform for the DA, but wide consultation within Tanzania, particularly RBWO is expected as to scope and content of the DA. | |
| 5. Enhanced capacity of Tanzanian water-related researchers & professionals in irrigation and water management within a multi-sectoral environment. | By 2004, written proposals and outputs of water researchers and professionals in Tanzania reflect improved understanding of water resources allocation and irrigation productivity, plus water needs for poor people recognised in this. | Stakeholder awareness workshop was held in November 2001 to explain intended outcomes, process and current understanding. Seven Research Associates working for SWMRG. Dissemination strategy has been formulated. | Although capacity-building for SWMRG will be a very important goal; collaborative capacity-building with stakeholder organisations is also a key aim of RIPARWIN. | |
| 6. UnEx | NA | NA | NA | |

| Table 11. Cont. OUTPUT TO PURPOSE SUMMARY REPORT | | | |
|---|---|---|---|
| Title: RIPARWIN | | Country: Tanzania | |
| Report No. Inception | Date: Jan 2002 | Project start date: October 2001 Project end date: March 2004 | Stage of project: Inception stage |
| Purpose (from above): Benefits for poor people, the environment and other river basin stakeholders increased by application of new knowledge to the enhancement of productivity of irrigation and transference of water to meet other sectoral needs. | OVis a) By 2004, savings of irrigation water where possible, re-allocation of this water to other sectors, maintenance or enhancement of rice production from the Usungu area to at least average of 1995-2000. b) Measurement of impacts of water allocation on irrigated sector, particularly poor people. c) By Jan 2002, dissemination strategy outlined. | Progress: a) Dry season canal closure programme initiated by SMUWC being observed by RIPARWIN. Other initiatives in the area being monitored. b) No progress so far on measurement of impacts of water allocation due to delays in mobilisation. c) Dissemination strategy reviewed and presented in this document. | Recommendation/actions: Mobilise field researchers and commence research. |

4.3 Description of Project Methodology for Remainder of Project

Changes to the project methodology are given below – these arise from the delayed January 2002 start date for fieldwork and from the expanded programme due to IWMI co-funding.

4.3.1 Revised logical framework

The alterations to the log-frame from that submitted in the contract reflect timing changes and one additional output. The increased capacity of the project as a result of additional RA's being recruited does not affect the log-frame explicitly, instead they assure the success of delivery of the existing outputs and activities. The key changes in timing of activities are given in Table 12. The new dates proposed reflect a shift backwards of about 2 to 4 month for most activities.

Table 12. Summary of changes to completion of activities

| No. | Activity | Original date | New date being proposed |
|-----|---|---|---|
| 1. | Dissemination strategy produced. | Jan 2002 | Jan 2002 |
| 2. | Literature review of inter-sectoral allocation. | Jan 2002 | Brief lit review in Inception Rep. Expanded draft July 2002 |
| 3. | Excel-based, schematic & conceptual models and explanations of multi-sectoral water use and allocation under conditions of variable water supply in Ruaha river basin. | Nov 2002 Draft Dec 2003 Near complete | March 2003 Draft Jan 2004 Near complete |
| 4. | River basin decision-aide. Generic methodology & decision-aide for assessing opportunities to enhance irrigation productivity and move water from irrigation to other sectors within river basins with associated risks acknowledged. | July 2002, 1 st draft Nov 2003 Near complete | Dec 02, 1 st Draft Jan 2004 Near complete |
| 5. | Provision of reports, advice leaflets, analyses and communications to assist processes of policy discussion and institutional arrangements regarding water management practices. | On-going | On-going |
| 6. | Training sessions, workshops & meetings with users, research and policy stakeholders in Tanzania. | Dec 01 – 1 st workshop Aug 02 – Farmers workshop Jan/Feb 04 Conference | Dec 01 – 1 st workshop Oct 02 – Farmers workshop Feb 04 Conference |
| 7. | Journal articles and Website hosted for exposure of this work | By March 2004 3-6 articles By July 2002 website produced | By March 2004 3-6 articles By Dec 2002 website produced |
| 8. | Register basin with UNESCO HELP programme | New output | By Sept 02 |

A new, eighth activity – the registration of the basin research with HELP - should be completed by September 2002.

4.3.2 Work Plan

The main changes envisaged for the remainder of the project are a result of the January 2002 start date for fieldwork mobilisation and of the new deadlines suggested in Table 12, above. This revised work programme is given in Tables 14 to 16.

4.3.3 Location of Work

Following discussions at the planning workshop in Mbeya, several changes were made to the location of the work. These are given in Table 17 under the seven research topics. For example, the institutional analysis of water sharing between irrigation intakes will now take place in the Mkoji Sub-catchment where significant conflict and conflict mediation is found rather than in the Kimani sub-catchment. Also, several of the researchers will be addressing water management issues across the whole of the river basin and will not be tied to one particular place.

4.4 Review of Project Team, Partners/Collaborators and Responsibilities

For ODG staff (Lankford, Conway, Ellis) no major change has been made to the staff involved or their responsibilities.

For IWMI, additional members have been drawn into supporting the project than originally envisaged in the proposal. This is mostly as a result of IWMI's own funding of their support. As well as Hervé Levite, Doug Merrey, Barbara van Koppen and Hilmy Sally are now involved. Other specialists from the South African office are assisting in various training matters. In addition, IWMI-HQ is being kept apprised of the project.

For SUA, field research feeding into the RIPARWIN outputs will be met by 7 research associates (RA's) supervised and supported by the RIPARWIN team, which includes staff from Sokoine, IWMI and UEA. Table 17 gives the brief outline of each of the RA topics, their location and key partner organisations. These have been expanded into fuller terms of reference, available from the RIPARWIN project if required.

Table 18 explains the relationship between the Research Associate's main topic responsibility and the project log frame outputs. The log-frame outputs take precedence over the individual research topics - though it is understood that there will be no conflicts of interest.

As a result of the expansion of this work by IWMI all but three RA's are currently being recruited from within East Africa. Their CV's can be submitted in the next progress report if required. The CV's of the three RA's already recruited (Magayane, Mdemu, Rajabu) are given in the DFID proposal submitted in August of last year.

Additional staff from SUA will also be involved in providing focussed support for the project. (CV's can be provided if necessary.)

- Dr. Filbert Rwehumbiza - Modelling
- Dr. Siza Tumbo, SWMRG, Project Data Management
- Staff from the Department of Agric. Economic
- Staff from the Faculty of Law as well as the IDS – University of Dar es Salaam
- Dr. Boniface Mbilinyi Wetlands and Swamps Studies

Table 13. The revised log-frame for RIPARWIN

| Narrative summary | Measurable indicators | Means of verification | Important assumptions |
|--|---|---|--|
| Goal: (F1): As defined in 1.c) Improved Availability of Water for Sustainable Food Production and Rural Development | (5 lines) (F1): By 2004, analyses of water management activities, policies and measures related to rice productivity and outputs from other water-using sectors in selected case study areas. | (5 lines) (F1): Strategy reports of key institutions (local and national) Analyses of rice production and importation for Tanzania. | No input required. |
| Purpose: As defined in 1.b) (10 lines) Benefits for poor people, the environment and other river basin stakeholders increased by application of new knowledge to the enhancement of productivity of irrigation and transference of water to meet other sectoral needs. | (10 lines) a) By 2004, savings of irrigation water where possible, re-allocation of this water to other sectors, maintenance or enhancement of rice production from the Usangu area to at least average of 1995-2000. b) Measurement of impacts of water allocation on irrigated sector, particularly poor people. c) By Jan 2002, dissemination strategy outlined. | (10 lines) a) Analyses of Mbarali District rice and other district/stakeholder production figures and RBWO river flows downstream for given climatic conditions, analysis of sectoral needs met b) Research in command areas of irrigated systems of impacts. Research in other sectors of impacts of water allocation. c) A dissemination strategy planned and made available in inception report | (Purpose to goal) F1): (10 lines) Effective dissemination of results to target communities and institutions Policy environment encourages a more careful management of water between multiple users |
| Outputs: 1. Enhanced understanding by stakeholders of water management, competition, use and irrigation productivity under different management, climatic and seasonal scenarios & variability. 2. Enhanced understanding by stakeholders of water demands of other sectors (e.g. environment, domestic, and livestock); both net and gross demands under different management, climatic and seasonal scenarios. Special recognition taken of water needs of poor people. 3. Greater understanding by stakeholders of means and potential to transfer water between sectors on the basis of improved irrigation management and productivity, and by using other water management tools and processes. Greater understanding of impacts arising out of water transfer away from irrigation particularly on poor people. 4. Enhanced understanding by water professionals of river basin characteristics, climatic & allocation means, risks and typologies within semi-arid climates through production of a river basin management decision-aide. 5. Enhanced capacity of Tanzanian water-related researchers & professionals in irrigation and water management within a multi-sectoral environment. As a result of greater capacity for managing water, water needs for poor people recognised and planned for. | 1. a) By 2004, more open, widespread and use of appropriate analyses of farmer irrigation management by user, policy and research stakeholders b) By 2004, chosen irrigation productivity and related indicators described and explained for the years of the study. 2. By 2004, user, policy and research stakeholders have improved understanding of other sector water demand from other sectors in river basins. 3. By 2004, a) by-laws being created by farmers in selected irrigation systems to improve water management. b) Flexible strategies being developed by RBWO/RBMSIIP. c) Monitoring of impacts, particularly on poor people, as a result of moving water out of irrigation. 4. By 2004, river basin management decision-aide and risk assessment analyses completed, and used by water professionals in Tanzania 5. By 2004, written proposals and outputs of water researchers and professionals in Tanzania reflect improved understanding of water resources allocation and irrigation productivity, plus water needs for poor people recognised in this. | 1. a) Reports on irrigation management and terms used at local and national scales. b) Analyses and measurements of water flows, rice production and economic benefits. 2. Reports of water demand from other water-using sectors produced by collaborating organisations 3. Records of research proposals, meetings, working policy statements. Records of the Usangu Environmental Management Plan meetings and final document. Records of the SRMP and DANIDA's ASPS community engagement. Analysis of records of RBMSIIP and RBWO meetings and policy documents. 4. Reports of RIPARWIN outputs on decision-aide, briefing notes, meetings schedules, papers, website 5. Reports of researchers and professionals in Tanzania reviewed and analysed | (Output to purpose) Conditions in Tanzania encourage professionals in Tanzania to accept and build upon findings that address the balance of multi-sectoral needs and provide for inter-disciplinary methods of intervening in irrigation water management. These conditions are affected by other donor agencies, projects and programmes that address water resources. Although this project can address these other viewpoints, it does not have control over their direction. |

Table 13. The revised log-frame for RIPARWIN (cont)

| | | | |
|---|--|--|---|
| Activities: 1. Dissemination strategy produced. 2. Literature review of inter-sectoral allocation. 3. Excel-based, schematic & conceptual models and explanations of multi-sectoral water use and allocation under conditions of variable water supply in Ruaha river basin. 4. River basin decision-aide. Generic methodology & decision-aide for assessing opportunities to enhance irrigation productivity and move water from irrigation to other sectors within river basins with associated risks acknowledged. 5. Provision of reports, advice leaflets, analyses and communications to assist processes of policy discussion and institutional arrangements regarding water management practices. 6. Training sessions, workshops & meetings with user, research and policy stakeholders in Tanzania. 7. Journal articles and website hosted for international exposure of this work 8. Register basin with UNESCO HELP programme | 1. By Jan 2002, draft dissemination strategy produced, to be continually modified during the project. 2. By July 2002, expanded literature review completed. By Jan 2004, verifiable models tested with field results. Explanation of processes and results of Excel/other software models. Understanding of processes at work and their implications agreed with local stakeholders. 4. By Dec 02, 1st draft completed, By Jan 2004 generic methodology published in report. Agreed reports with recommendations and software for decision-making 5. On-going, generation of information regarding water management 6. By December 2001 1st workshop completed. By Oct 02, 2nd workshop completed. By February 04, 3rd workshop (conference) completed. Agenda and minutes of meetings, training leaflets, evaluation forms of training 7. By 2004, between 3 and 6 journal articles and research output, By Dec 2002 website produced for further updating. 9. By Sept 02, registered with HELP | 1. Reports produced by researchers 2. Reports produced by researchers. 3. Reports available of excel and other models 4. Reports available of decision-aide and methodology 5. Reports available of, and containing, dissemination materials 6. Reports and evaluations available of meetings 7. Journal articles produced. Website can be visited 8. HELP registration documentation | (Activity to output) Fieldwork proceeds smoothly. Costs, e.g. fuel and transport remain within tolerable limits. Staff remain available for fieldwork when required. Climatic conditions (sufficient rain) provide good opportunities for research of surface water. Climatic and other data made available for study The Project Sustainable Management of the Usangu Wetlands and its Catchment (SMUWC) is extended or given a second phase as this provides important dissemination routes and instigates activities which promote water management and require researching. |
| Inputs (Detailed work plan and bar chart in Annex 1.1) - Lankford, Hatibu, Mahoo: Initial planning meetings & inception period, dissemination planning - Ellis: livelihoods input - Purchase of equipment (computers and vehicles) & mobilisation of field research - Seven SUA staff: Field work to examine demand for water from different sectors and perspectives - Lankford and Gillingham: training and workshops - Conway and CEH: Analysis of climatic & hydrological record & risk assessment - Lankford, Conway and CEH: Verification of releases with current hydrological record - Analyses of rice production for chosen years - Lankford, Levite and other IWMI researchers: Various inputs and validation of models with IWMI and wider dissemination in Tanzania, Sub-Saharan Africa and other river basin initiatives | Performance Budget | | |

PROJECT TITLE *Raising irrigation productivity and releasing water for inter-sectoral needs (RIPARWIN)*

Table 14. Changes to work plan YEAR OF ACTIVITY (01/02)

| ACTIVITY | MONTH | | | | | | | | | | | |
|---|-------|---|-----|---|---|---|---|---|---|---|---|---|
| | A | M | J | J | A | S | O | N | D | J | F | M |
| Lankford – inception period, finalise contract, visit Tanzania, first planning meeting with Tanzanian partners, discuss dissemination | | | (X) | | | X | X | X | X | | | |
| Lankford & others – literature review of inter-sectoral allocation & needs (UK based). Livelihood considerations (Ellis). | | | | | | | | | X | X | X | X |
| Hatibu/Mahoo – purchase of equipment and research support | | | | | | | | | | X | X | X |
| Lankford/Hatibu/IWMI – submission of inception report including dissemination strategy | | | | | | | | | | X | | |
| Lankford – other trips to support research direction 1 st with Levite & Conway & capacity-building workshop | | | (X) | | | | | X | | | | X |
| Researchers - pilot case studies, identification - assisted by Magayane | | | | | | | | | | X | X | X |
| Researchers – start main research – 2001/2002 wet season | | | | | | | | | | X | X | X |
| Other researchers @ Mkoji and Kapunga, plus environmental & domestic demand sites | | | | | | | | | | X | X | X |
| Conway research planning - site visit and data needs | | | | | | | | X | | | | |
| D. Merrey & IWMI staff 1 st input | | | | | | | | X | | | | |
| Lankford – initial support visit to Usangu | | | | | | | | | | | | X |

| OVERSEAS TRAVEL | DURATION (DAYS) | | | | | | | | | | | |
|----------------------------------|-----------------|--|----|--|--|--|--|---|----|--|--|----|
| By Bruce Lankford To Tanzania | | | 18 | | | | | | 23 | | | 15 |
| By Declan Conway To Tanzania | | | | | | | | 8 | | | | |
| By IWMI To Tanzania | | | | | | | | 8 | | | | |
| By Hatibu (cancelled) To UK | | | | | | | | | | | | |

PROJECT TITLE *Raising irrigation productivity and releasing water for inter-sectoral needs (RIPARWIN)*

Table 15. YEAR OF ACTIVITY (02/03)
02/03

| ACTIVITY | MONTH | | | | | | | | | | | |
|---|-------|---|---|---|---|---|---|---|---|---|---|---|
| | A | M | J | J | A | S | O | N | D | J | F | M |
| Lankford – field visits, field-based training with selected staff | | | | X | X | | X | | | | X | |
| Lankford & others – literature review of inter-sectoral allocation & needs (UK based). | X | X | X | | | | | | | | | |
| Gillingham – visit to Tanzania, farmers workshop and professionals training | | | | | | | X | | | | | |
| ODG/SUA/IWMI – first draft of Excel and schematic models of irrigation water use/allocation | | | | | | | | | | X | X | X |
| ODG/SUA/IWMI – first draft of River Basin Mgt decision-aid | | | | | X | X | X | X | X | | | |
| ODG/SUA/IWMI – quart. reporting | X | | | X | | | X | | | X | | |
| ODG/SUA/IWMI – progress rep. | | | | | | X | | | | | | |
| Conway - main hydrological analyses and risk assessment | | | | X | X | | | | | | | |
| Register basin with HELP | | | | | X | X | | | | | | |
| IWMI input and link with their work. Initial validation of RIPARWIN outputs. | | | | | X | X | X | | | | | |
| Researchers on research activity in field, with breaks for meetings, leave, other duties, report writing, etc | X | X | X | X | X | X | X | X | X | X | X | X |
| CEH/RBWO – calibration & measurement of river flows to determine scale of water releases | | | | | | | | | X | | | |

| OVERSEAS TRAVEL | DURATION (DAYS) | | | | | | | | | | | |
|----------------------------------|-----------------|---|---|----|---|---|----|---|---|---|----|---|
| ACTIVITY | A | M | J | J | A | S | O | N | D | J | F | M |
| By Bruce Lankford To Tanzania | | | | 24 | | | 16 | | | | 14 | |
| By IWMI To Tanzania | | | | 12 | | | | | | | | |
| By Gillingham To Tanzania | | | | | | | 8 | | | | | |

PROJECT TITLE *Raising irrigation productivity and releasing water for inter-sectoral needs (RIPARWIN)*

Table 16 YEAR OF ACTIVITY (03/04)

03/04

| ACTIVITY | MONTH | | | | | | | | | | | |
|---|-------|---|---|---|---|---|---|---|---|---|---|---|
| | A | M | J | J | A | S | O | N | D | J | F | M |
| Lankford – field visits, meetings, training | | | | X | | | X | | | X | X | |
| Completion of river basin management decision-aide | | | | | | | | X | X | X | | |
| (Completion of Excel and schematic models of irrigation water use/allocation) | | | | | | | | X | X | | | |
| SUA analysis of rice production for chosen years | | X | X | | | | | | | | | |
| SUA organisation of conference | | | | | | | | | X | X | X | |
| Final conference – river basin and irrigation perspectives | | | | | | | | | | | X | |
| Website – production/completion | | | X | X | | | | X | X | X | | X |
| Researchers field work, with breaks for leave/meetings, report writing, & other departmental duties | X | X | X | X | X | X | X | X | X | X | X | |
| SUA/ODG/IWMI - final report | | | | | | | | | X | X | X | X |
| IWMI– final validation input to main report & website, and attendance at final workshop | | | | | | | | | X | X | X | X |
| Conway – hydrological analysis and input to final report and attendance at workshop | | | | | | | | | X | X | | |
| SUA/ODG/IWMI - final report | | | | | | | | | X | X | X | X |
| SUA/ODG/IWMI – finalise dissemination of results/findings | | | | | | | | | | | X | X |

| OVERSEAS TRAVEL | DURATION (DAYS) | | | | | | | | | | | | |
|---|-----------------|--|--|----|--|--|----|--|----|--|----|----|--|
| By Bruce Lankford To Tanzania | | | | 18 | | | 20 | | | | 12 | 12 | |
| By Magayane To UK/Other European Country | | | | | | | | | | | | 15 | |
| By Hatibu/Mahoo To UK | | | | | | | | | 10 | | | | |
| By IWMI To Tanzania | | | | | | | | | | | | 8 | |
| By Conway To Tanzania | | | | | | | | | | | | 8 | |

Table 17. Summary of SUA Research Associates and topics working under RIPARWIN

| Research Associate Subject title → | RBM Decision Aide (and Hydrological Analysis) | Evaluation of Livelihoods and Economic Benefits of Water Utilisation in The Great Ruaha | Productivity of Water in Irrigation Systems | Institutional Framework for Improvement of Water Management in Agriculture and Other Uses (IFWM) | Evaluation of Institutional Legal Framework for River Basin Management in Tanzania. | Assessment of Hydrological & Production Roles of Wetlands & Swamps in the Usungu Plains | Examination of Irrigation Productivity Paradigms |
|---------------------------------------|--|---|--|--|---|---|---|
| Number | 1 | 2 | 3 | 4 | 5 | 6 | 7th |
| Topics in brief | Modelling, cost-benefit analysis, decision-aide for planning; WEAP modelling; Usungu model improvement | Economic/ livelihood benefits of water; rice marketing & importation; power generation; pro-poor benefits/costs | On-going research, combining with others, and examining effects of canal closure programmes. | Institutional analysis of small-scale systems, and sub-catchment division of water. | Basin wide analysis of institutions and decision-making of river basin planning and allocation; feed into decision-aide | Analysis of roles of wetlands; environmental water needs, hydrological modelling and monitoring | Testing of classical and IWMI paradigms of irrigation efficiency and productivity |
| Funding | RIPARWIN/IWMI | RIPARWIN/IWMI | RIPARWIN/IWMI | New-IWMI | New-IWMI | New-IWMI | RIPARWIN |
| Recruited yet? | Yes | No | Yes | No | No | No | Yes |
| Name of researcher | Kosa Rajabu | Reubens Kadigi | Makarius Mdemu | Charles Sokile | Donald Anthony | Japhet Kashaigili | Machibya Magayane |
| Location & key partner institutions | Dar, Morogoro, Usungu, RBWO | Ruaha basin wide, Dar, Morogoro, RBWO, IANESCO | Kapunga, NAFCO, MAFS | Mkoji-subcatchment Local institutions. MATIL, MAFS | Ruaha-wide, Dar, Iringa, Moro, RBWO, MOW, RUBADA, etc | Ruaha-wide, Ihefu swamp, Ruaha Nat Park | Kapunga NAFCO, MAFS |

Table 18. Interactions between SUA Research Associates and RIPARWIN Log frame outputs

| Research Subject no. → | 1 | 2 | 3 | 4 | 5 | 6 | 7th |
|--|----|----|----|----|----|----|-----|
| 1. Water needs and management of irrigation | x | x | XX | XX | x | | XX |
| 2. Water needs and management of other sectors | x | XX | x | x | x | XX | x |
| 3. Means of intersectoral allocation | x | x | x | XX | XX | x | x |
| 4. Enhanced capacity via a decision-aide | XX | x | x | x | x | x | x |
| 5. Capacity-building | XX | XX | XX | XX | XX | XX | XX |

Key: 'XX' – major involvement/responsibility, 'x' – some involvement and cross-fertilisation of ideas, Blank – no involvement envisaged

5 Monitoring, Evaluation and Uptake Strategy

5.1 Description of Activity, Output and Impact Indicators

5.1.1 Output indicators

1. By 2004, more open, widespread and use of appropriate analyses of farmer irrigation management by user, policy and research stakeholders b) By 2004, chosen irrigation productivity and related indicators described and explained for the years of the study.
2. By 2004, user, policy and research stakeholders have improved understanding of other sector water demand from other sectors in river basins.
3. By 2004, a) by-laws being created by farmers in selected irrigation systems to improve water management. b) Flexible strategies being developed by RBWO/RBMSIIP. c) Monitoring of impacts, particularly on poor people, as a result of moving water out of irrigation.
4. By 2004, river basin management decision-aide and risk assessment analyses completed, and used by water professionals in Tanzania
5. By 2004, written proposals and outputs of water researchers and professionals in Tanzania reflect improved understanding of water resources allocation and irrigation productivity, plus water needs for poor people recognised in this.

5.1.2 Activity indicators (reflecting proposed changes to the log frame)

1. By Jan 2002, draft dissemination strategy produced, to be continually modified during the project.
2. By July 2002, expanded literature review completed.
3. By March 2003 draft model completed. By Jan 2004, verifiable models tested with field results. Explanation of processes and results of Excel/other software models. Understanding of processes at work and their implications agreed with local stakeholders.
4. By Dec 02, 1st draft completed. By Jan 2004 generic methodology published in report. Agreed reports with recommendations and software for decision-making
5. On-going, generation of information regarding water management
6. By December 2001 1st workshop completed. By August 02, 2nd workshop completed. By February 04, 3rd workshop (conference) completed.
7. By 2004, between 3 and 6 journal articles and research output. By Dec 2002 website produced for further updating.
8. By Sept 02, river basin is registered with HELP programme (UNESCO).

5.2 Dissemination and Uptake Strategy

This section gives the key components of the strategy for disseminating knowledge - which in many respects can be seen resulting in 'capacity-building' - either of research planning, research activity, analysis or of policy communication and policy change as a result of knowledge dissemination. From the very outset, RIPARWIN was set up to target and effect capacity-building. This is one of the log-frame outputs. This will happen using a strategic approach, matching method to information to institutions and people.

5.2.1 Methods/means of capacity-building and knowledge dissemination

The following list describes the main pathways by which capacity-building can be conducted, and should be read alongside the framework given in Table 19 which explains the selection of the pathway against the partner organisation. Each has its own objective and relative advantages.

1. '*Active research*'. Selected persons within an organisation plan, conduct and analyse the research are doing the research. This can happen via a salaried long-term post, or via commissioned consultancy-type research both of which may be used by RIPARWIN.
2. '*Collaborative research*'. Here, individuals within an organisation assist with the research collaboratively, but do not take prime responsibility for the research. Thus, personnel are involved in and sanction the research.
3. '*Assisted research*'. Person(s) within organisation provide information, access and opinions which becomes researchable material.
4. '*Active training*'. An excellent method of capacity building is to identify person(s) within an organisation to actually do the training of others.
5. '*Collaborative training*'. Normally a number of persons within an organisation will contribute and help draw up training programme.
6. '*Training*'. Persons within organisations will be selected to receive training; e.g. GIS, Excel, etc. etc.
7. '*Advisory Panel*'. RIPARWIN has decided to select persons representative of key organisations who will be asked to 'steer' the research, thus understanding its objectives, methods and constraints.
8. '*Meetings/seminars*'. Such events are useful to discuss, brainstorm and understand new ideas and strategic solutions. Sometimes this can happen via a 'project champion', someone who is chosen to visit or meet with key stakeholders to promote policy-relevant findings of the project.
9. '*Workshops*' and '*field trips*'. Day-long or longer events to gather together interest groups are particularly useful to fully explore and exchange views on an issue in depth. Field trips are important when first-hand observations are needed to promote a more focussed or informed debate. RIPARWIN has already held two workshops, and will hold more as outlined in the log-frame.
10. '*Information sheets*' and '*policy briefs*'. RIPARWIN will generate short documents to assist in imparting results, information and focussed policy advice. The emphasis is on easy-to-digest information.
11. '*Reports*'. Where necessary, for both DFID and other partner organisations, RIPARWIN will provide detailed analysis of issues and findings. This also provides capacity-building for the authors involved in writing clear and concise material.
12. '*Journal articles*'. These provide high quality, refereed articles principally for the international community. It is envisaged that approximately 3 to 6 of these will be generated by the project.
13. '*Newspaper articles and advertisements*'. This pathway is designed specifically to raise public awareness on an issue. (This was felt by SMUWC to be a necessary step in a debate on environmental changes in Usangu to counter some highly entrenched views). RIPARWIN may use this path.
14. '*Website*'. A website ensures ready access to RIPARWIN information as well as on the process of research. This is particularly useful for Tanzanian and international researchers and policy-makers, and to cross-reference other relevant websites.
15. '*Equipment provision*'. Occasionally, RIPARWIN will provide equipment to remove a constraint within an organisation – aside from SUA, this will principally apply to MATII.

16. *'Conference'*. A conference provides a high-profile arena to allow stakeholders to give and hear viewpoints, arguments and understandings on a variety of related issues. For the final RIPARWIN conference, participants will be welcomed from various Tanzanian, East African and international organisations.
17. *'Video'*. This method is used to both capture information for later dissection, but moreover to provide - by strong visual means – messages, voices and opinions, or scientific information, to selected stakeholder groups. This method was felt by SMUWC to be highly effective in “talking to policy-makers”.
18. *'Email'*. Email is used to discuss views, raise and clarify issues and provide information.

5.2.2 Topics of dissemination

The subject material for dissemination will depend very much on the institution involved, their perceived needs and on-going needs analysis - the latter partly determining the level of detail required. Likely topics will be productivity measurement, balancing and achieving intersectoral needs, analyses of water policy, farmer participation in design and community management of irrigation, conflict mediation, as well as providing transferable skills in water management (e.g. Excel). Guidance will be given on how the findings may be used in policy-making.

5.2.3 Stakeholder institutions involved in water resources management

For each institution involved in water resources management, a range of pathways can be selected for use in capacity-building. An initial attempt is given in Table 19.

Soil Water Management Research Group, Sokoine University of Agriculture

To date, research of irrigation and river basin management in Tanzania has had a low profile and impact. With the project RIPARWIN, SWMRG will be able to add to its expertise of rainwater harvesting, research of irrigation and intersectoral allocation of water. Funds from both RIPARWIN and IMWI will enable seven research associates to be employed on different aspects of river basin management and irrigation. Three to four members of faculty staff will support them. This experience will enable SWMRG to give and promote advice on irrigation and water resources management and policy via the GOT and donor agencies.

Mbarali District Council

Mbarali District is the key district in the Usangu Basin. The District Subject Matter Specialist on will also be working on a short-term basis on RIPARWIN on local issues. He is a key ‘irrigation’ person in the area, addressing a number of conflict resolution issues. As well as being involved in some of the research, it is likely that he will be funded to attend a short course on water management. Field visits and information communication will also be utilised. In addition, RIPARWIN will also take up the role of water technical adviser to the Usangu Planning Committee, which has major representation from Mbarali District Council. Therefore knowledge on water resources issues will allow Mbarali Council to undertake appropriate planning of Usangu irrigation, whilst recognising multi-use and multi-stakeholder interests.

Ministry of Water and Livestock Development (MWLD)

RIPARWIN will co-ordinate with various institutions that have their main origin within the MWLD.

RBWO. The Rufiji Basin Water Office has an important role within Usangu Basin management. There are two offices; one in Iringa and one sub-office at Rujewa. Their main

responsibilities are the management of water rights, the monitoring of flows and overall river basin planning. RIPARWIN will build upon the good relations established by SMUWC; dissemination will primarily happen through meetings, information sheets, email and field trips. Increased capacity will assist RBWO in continuing to review and develop river basin management within the Ruaha Basin.

RBMSIIP. To a lesser extent, RIPARWIN will also work alongside the RBMSIIP project via meetings and information sheets. It is also possible that training sessions on river basin management and productivity measurement may be utilised to examine more closely the theoretical framework that underpins the RBMSIIP project - particularly the argument that if irrigation efficiency can be raised then intersectoral allocation of water to meet downstream needs will follow.

Table 19. Dissemination Strategy of RIPARWIN capacity building and knowledge outputs

| Key organisation | Their role in Ruaha & Tanzania water mgt | Principal means of capacity building | Objective of RIPARWIN capacity building | Secondary means of RIPARWIN capacity building | Monitoring |
|-----------------------------------|---|--|---|---|--|
| SUA (SWMRG) | Policy advice; Programme reviews; Research/Consultancy; Information & dissemination | 7 RA's + 4 staff, active research & training | To build a research centre with expertise in water mgt, able to influence policy | Website; Report writing; Model writing; arranging research, meetings, conference | Publication of reports |
| IWMI, ODG | Policy advice on RBM and smallholder irrigation | Shared supervision and analysis of SUA research | To deepen science of river basin management by comparative analysis | Reports, meetings; website; visits, training | Records of meetings held |
| MOWL RBM(SIIP) RBWO | Water policy review; RBM Water rights; usage & monitoring in Ruaha | Decision-aide, assisted research; training | To build a RBM decision-aide that suits stakeholders and is owned by them; To assist in sub-catchment mgt | Regular meetings; website; Information sheets and reports; Conference; email | Records of collaborative research conducted |
| MAFS | Irrigation support; Irrigation policy; Irrigation monitoring | Meetings, steering committee; seminars; reports; | Identify policy needs and meet those needs in focussed way | Training on measurement of irrig productivity, information sheets & policy briefs; conference; email. | Records of dissemination articles sent out. |
| DFID, Tanzania DFID, UK | Poverty Reduction - via water resources development | Focussed policy information sheets/briefs | To provide policy advice on poverty reduction via smallholder irrigation | Meetings; website; email. | Records of dissemination articles sent out. |
| Mbarali District | Planning via Usangu Planning Com.; Conflict resolution | Collaborative research via Rogers Masha. Training. | To assist District in irrigation planning | Advice via Usangu Planning comm. Responding to requests | Records of papers published |
| SHARDI | National research and policy influence | Possibly one member of staff as RA | To introduce SHARDI to irrigation so they may further influence national policy. | Meetings; conference | Report on final conference |
| MATII Igurusi | Training of farmers & technicians | Working alongside, collaborative training | To pilot test new ideas of facilitating farmer understanding of irrigation mgt | Information sheets; reports; equipment provision | Audit-trail and records of email discussions |
| Local water users | water use, mgt, institutions | Assisted research, video, farmers workshop | To pilot test new ideas of facilitating farmer understanding of irrigation mgt | - | |
| NAFCO | Farm mgt, large users of water in Usangu | Collaborative research (e.g. trials of technologies) | To assist in rice productivity gains, water management and farmer organisation | Meetings, information sheets | |
| WWF Tanzania DANIDA wetlands IUCN | River basin management; Wetlands; Rufiji basin mgt | Steering committee and meetings/seminars | To provide advice on RBM and irrigation to improve understanding of issues | Conference; email. | |
| TANESCO Ruaha Nat.Park RUBADA | Power generation and wildlife mgt, influence on water policy | Meetings/seminar Assisted research | To influence their understanding of balance between RBM and local solutions to enhance water security | Information sheets, email. | |
| WREP, UDSM | Hydrology research Usangu Basin Model (UBM) | Collaborative research with decision-aide | To assist in USDM understanding of water management in Usangu | Conference; email. | |
| Zonal Irrigation Office, Mbeya | Irrigation interventions and design work | Assisted research, field trips, workshops | To assist in improving understanding of farmers/irrigation interventions | | |
| International community | Learning from case studies to develop/deepen RBM | Via IWMI website Via RIPARWIN website | To provide findings in clear accessible formats to assist in comparative analysis and generic policy advice | International journal articles | |
| SMUWC project | Finishes in March 2002 | | Provide advice in final stage of SMUWC | Responding to info requests | |
| JET, Newspapers | Public awareness & knowledge | Via information sheets, attendance at meetings | To assist in creating & enhancing public knowledge on key issues | Website | |

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Ministry of Agriculture and Food Security (MOFS); Irrigation Departments and Programmes

The project will work closely with three "irrigation improvement" programmes; the World Bank (loan) funded Smallholder Irrigation Improvement Component of RBMSIIP (SIIC), DANIDA-Assisted Agricultural Sector Programme Support and JICA-Assisted Irrigation Master Plan. All of these have offices within the Ministry of Agriculture in Dar es Salaam. In addition, RIPARWIN will work alongside the Zonal Irrigation Office in Mbeya, and with MATII in Igurusi. This collaboration will be addressed in two separate ways, dependent on their prime interest in irrigation, discussed below.

Central planning and policy regarding irrigation support

The programmes have recently developed a strong interest in the question of optimal irrigation intervention - asking how best to support and develop smallholder irrigation? RIPARWIN has already had several meetings with their staff to discuss how best to work together on this. RIPARWIN's dissemination strategy will focus on supporting and stimulating this debate. Methods will probably include meetings and seminars, policy briefs, and, specifically, commentary on the National Irrigation Master Plan.

Departmental and staff interests in water management and productivity

The second way in which RIPARWIN will target knowledge rests on interests within MAFS and Zonal Irrigation Offices on irrigation water management, irrigation productivity and productivity measurement. In the planning of RIPARWIN, various stakeholders expressed interests in methods of assessing irrigation efficiency and productivity (for example in December 2001, some measurements were taken in Usangu by staff seconded to SIIC). In addition, RIPARWIN believes there is a need to include staff from the Zonal Irrigation Office, SHARDI and MATII in water management research activities. The objective of these field trips and workshops will be to increase knowledge on participatory water management in complex closed river sub-catchments. It is possible that support from DANIDA will be made available to the RIPARWIN project to aid this, as well as some monitoring points of water use and control.

Local water users, farmers, NAFCO

RIPARWIN will be operating in two areas in the Ruaha Basin - the Kapunga Water System (KWS) and the Mkoji sub-catchment. In these places, our research staff will work alongside farmers to research their management of water and associated institutional arrangements. Our research will use video interviews to be used later in compiling an anthology of viewpoints on water needs, expectations and opinions. A farmer's irrigation productivity workshop will be organised with MATII on farmer understanding of productivity and to help train personnel in novel methods farmer-to-farmer mediation of water competition management. Researchers will also work alongside NAFCO staff to further explore ways in which rice productivity may be enhanced. Depending on resources, another workshop will discuss and disseminate results at the local level. It is hoped that these dissemination efforts will generate sufficient lessons for generic advice to be provided to other programmes that work with farmers on water and irrigation such as is being explored by RBMSIIP in the Pangani Basin.

WWF Tanzania

WWF Tanzania with support from WWF UK and DFID, is about to start a long-term Ruaha project in the area with the aim of restoring flows in the Ruaha River. Following a meeting with WWF Tanzania in November 2001 and at a workshop in December 2001, it was agreed that RIPARWIN can usefully support them on the water management side, which may be under-represented in their team. Main methods of dissemination will be via workshops,

seminars, requests for information, information sheets and email. RIPARWIN will therefore provide much needed continuity in the area on the subject of hydrology and water management.

TANESCO, Ruaha National Park, RUBADA

Both TANESCO and Ruaha National Park are downstream users of Ruaha water. Until recently TANESCO maintained that irrigation dried up the Ruaha which in turn reduced the recharge of their reservoirs. SMUWC and WREP have worked hard to demonstrate that this cause and effect is unlikely and that other factors were to blame. RIPARWIN can continue to ensure that this message is promoted via meetings, assisted research and information sheets and reports.

The Ruaha National Park will be important stakeholders and may be involved with assisting the research to examine their ecological water needs and mitigation options. RIPARWIN may be able to assist in their eventual planning of local solutions to water shortages.

RUBADA - Rufiji Basin Development Authority – is a semi-governmental organisation that has some authority to examine overall development within the Rufiji Basin, but is constrained by a lack of core-funding at the moment. Compared with RBWO, it has less relevance for RIPARWIN.

DFID

DFID Tanzania has an interest in irrigation and water resources management because of their primary focus on the Poverty Reduction Strategy Process, the Rural Development Strategy and the Agricultural Sector Development Strategy which comment on the role of irrigation and water resources development. Findings will be shared via the dissemination of reports and policy advice sheets to DFID. Occasional meetings with DFID personnel are also envisaged. DFID UK has a growing interest in water resources management. The dissemination of reports, policy briefs and journal articles apply here.

International stakeholders

The researchers will target an international audience by publishing in water and development journals and by constructing a website. This will be done with the advice of IWMI. This international exposure will have benefits for researchers in Tanzania. Results will also be disseminated through IWMI's communications program, including its website, mailing list (recently enhanced for Africa) and via participation in the "Global Dialogue on Water, Food and Environment" and the associated "Comprehensive Assessment of Water Management in Agriculture", which IWMI leads. In addition, the river basin will be registered with the UNESCO funded HELP programme.

SMUWC

RIPARWIN will work alongside the SMUWC project, which is in its final stages. This is because SMUWC has built up a number of relationships with local stakeholders.

5.2.4 Other considerations and dissemination topics

General public opinion is another dissemination target. RIPARWIN has already collected a few newspaper articles which commonly represent irrigation as being grossly inefficient. This is a narrative that does not accurately reflect findings to date. RIPARWIN may target public opinion through the use of newspaper articles and advertisements, (as SMUWC found it necessary to).

A river basin management conference will be organised near the end of the project to disseminate findings to national and regional researchers and policy-makers and to further stimulate debate on the priorities for water use in the Ruaha Basin. The conference may be divided into two main categories into which topics may fall - one is river basin management and intersectoral allocation, the other is smallholder irrigation.

Video will be used - both as a research and facilitation tool with farmers, but also via the production of an edited tape to present alternative viewpoints on irrigation, productivity, water management, multi-sectoral use and river basin management. SMUWC has shown that this is a highly effective means of informing people's viewpoints on a matter.

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