

APPENDIX-IV

IRRIGATION

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CHAPTER 1 THE IRRIGATION SUB-SECTOR IN ZAMBIA

This chapter reviews the irrigation sub-sector in Zambia. Following the salient features of the irrigation sub-sector and its government policy as well, described are organizations and institutions related to the irrigation development. This chapter also discusses constraints and opportunities in the sub-sector as well as lessons learnt from similar projects.

1.1 Salient Features and Government Policy of the Irrigation Sub-sector

The history of irrigation development in Zambia dates back to about 1964 when noticeable formal irrigated farming commences with the establishment of Nakambala Sugar Estates on the Kafue flats in Mazabuka. Prior to this a few farmers had small hetaerae under surface irrigation in 1940s. These developments were the cradle lands for commercial irrigated farming in Zambia.

As regards informal irrigation, small traditional gardens were widely cultivated in dambo areas in mainly Eastern, Western and Northwestern provinces. These traditional systems played a major role in meeting food requirements for the local population in the localities where they were practiced.

Large scale irrigated farming in the early years was heavily supported by the government, as seen in the establishment of Nakabala Sugar Estates (12,000ha) in Mazabuka, Mpongwe (1,000ha) in Ndola rural, Mukumpu (2,500ha) in Ndola rural, Ngoli and Kateshi (500ha) coffee schemes in Kasama and Kawambwa tea scheme (500ha) in Kawambwa. Last three schemes are located in part of area of this study actually. Similarly, the government developed several smallholder irrigation schemes all over the country mainly to meet local food requirements. These schemes were small with irrigated areas ranging between from 5 to 20 ha. All these schemes have since privatized or are being run by small farmers.

The small holder irrigation schemes were developed by the government of the Republic of Zambia throughout the country in the 1970s and 1980s. The schemes were set-up for a number of reasons including (i) improving the livelihood of the local peoples, (ii) increased crop production, (iii) helping displaced people, (vi) improved foreign exchange earning. The government put up massive infrastructure at great cost in these schemes such as dam, diversion weir, gravity canals and water abstraction equipment including motorized pumps. The contribution of these smallholder schemes to the local economics has been negligible.

In the study area, Lukulu North, Chinenke and Mwambezi irrigation schemes, all of them are in Northern Province, are planned or now on going to develop under Department of Agriculture. In parallel with them, Department of Resettlement is now on going to develop Lukulu South in Northern province, and seven (7) resettlement schemes in Luapula province.

Irrigated agriculture has gradually increased in the last decades, increasing from about 10,000 ha in 1980 to about 27,000 ha in 1988. Presently, about 156,000 ha have been developed so far. Irrigation development has been an integral part of the Zambia's agricultural policy since independence in 1964. It has been driven by the country's desire to attain sustainable national and household food security by reducing the country's vulnerability to the weather condition.

The recent erratic climatic condition and its effect on crop production have resulted in increased emphasis on irrigation development in fact. The country, of late year, has had to endure droughts in the rainy seasons of 2000/01, 2001/02 and 2004/05 while floods have occurred in 2005/06 and following 2006/07. The impacts of these droughts/floods have included widespread crop failure/loss. Under the circumstances, the government started making a serious attempt to develop agricultural and irrigation policy documents.

The agriculture sector has been a key role in the Fifth National Development Plan (FNDP, 2006 – 2011). In 2004, the Government of Zambia produced major policy documents aimed at transforming the agriculture sector into an engine of economic growth, development and poverty reduction: the National Agriculture Policy (NAP) covering the period 2004-2015 (MACO, 2004). The vision and policy of the NAP are reflected in the Agriculture Sector Chapter of the FNDP.

NAP is to promote development of an efficient, competitive and sustainable agriculture sector, which assures food security and increased income. It recognizes the need to strengthen and expand the emerging opportunities and to also deal with the challenges facing the agricultural sector, this policy also strives to contribute to the overall goal of the Poverty Reduction Strategy Paper (PRSP), which is to achieve poverty reduction and economic growth.

Pursuant to the agricultural policy strategy of promoting irrigation development, there actually was an urgent need for irrigation policy to transform the potential of irrigation into a reality to achieve food security, enhance income and employment generation opportunity, MACO established National Irrigation Policy (NIP, July 2005) within context of FNDP. The overall objective of the NIP is to bring into being, a well regulated and profitable irrigation sector that is attractive to both private investors and Zambia's development partners.

Through this NIP, MACO is proposing a package of interventions. The NIP proposes a strategy for full, efficient and sustainable exploitation of both surface and underground water resources, it is reported there would be over 1,740,380 MCM of underground water resources, by promoting irrigation in its various forms and targets at the different farmer types to ensure all around agriculture production of food, cash, export and industrial crops.

Following are the summarized board policy objectives:

- Mission: is to expand the production base, productivity and stability of irrigated farming systems through the use of improves and appropriate irrigation technologies and services.
- Vision: is to promote development of an efficient, competitive and sustainable agricultural sector, which ensures food security and increased income, as set out in the National Agricultural Policy (NAP).
- Objective: to promote the use of irrigation to accelerate sustainable agriculture development.
- Target group: is inclusive of smallholders, emerging commercial and large scale commercial farmers, all living in area with a high potential for irrigation.

Policy in terms of the target group including smallholders clearly states that this study is well in line with above strategy. Irrigation scheme inventory survey to be carried out under this study helps identify the areas with irrigation potential in order to increase land put under irrigation based on the existing irrigation potential. The pilot project to be carried out through the study is to add new ideas of appropriate and simple technologies to smallholder irrigation.

1.2 Institutions in Irrigation Development

There are some institutes that provide academic and technical courses in irrigation engineering as a part of general agricultural science. University of Zambia (UNZA) and Copperbelt University are two of them. Natural Resource Development College (NRDC) and Zambia Collage Agriculture (ZCA) issue a certificate and/or diploma, which are both a 3-year program.

For in-service training of government officers, there are several kind of institutes around Lusaka, namely, Chapula Center in Kalulushi giving technical course of irrigation and horticulture training, Katopola Training Center teaching agribusiness, Cooperative Collage under MACO issuing diplomat and certificate, Popota Tobacco Training Center, Zambia Institute for animal health in Mazubuka, and so on.

Apart from the institute mentioned above, Farmers Training Center (FTC) and Farmers Training Institute (FTI) have been instructing farmers in farming, marketing, and so on, which are supposed to be in each district and each province respectively.

1.3 Constraints and Opportunities in the Irrigation Sub-sector

This sub-chapter summarizes the constraints and opportunities in pursuing smallholder irrigation development in the study area. Those have been identified at a provincial/district level workshop carried out during the study kick-off workshop, based on available data, information collected by the study team, and interviews with counterpart personnel concerned.

1.3.1 Development Constraints

This sub-chapter discusses development constraints, which have been identified from literary review, field observations, and interviews to concerned government officers and farmers.

1) Limited Number of Irrigation Officers

Although irrigation development led by government, even small-scale size irrigation farming introduced by community or individual initiatives, has long been implementing in the study area, it could say that it is still a new momentum because of its abundant water resources and demand on crop cultivation in dry season under irrigation. Accordingly, officers specialized in irrigation are very few for dissemination of irrigation development. An example is the staffing of the Province TSB where there is just one professional officer specialized in irrigation, who is one of Provincial Irrigation Engineer (PIE) posting to 9 provinces in total in the country.

As a person to assist PIE, Province TSB has a staff called Water Engineer who is covering irrigation, water resources management as well as hydrology field. Though this position is supposed to be district TSB, the seat has almost fallen vacant in almost of the districts.

TSB office of district composed of some graded technical officers, namely, chief (CTO), principal (PTO), senior (STO) and junior technical officers (JTO). From CTO to STO are diplomas gradated from Natural Resources Development Collage (NRDC), which is an entry point to those managerial positions. JTO are certificated and then almost of them graduated from Zambia Collage Agriculture (ZCA). In the case of Northern province, there are 1 CTO (Mbala district), 3 PTOs (Kasama, Mbala, and Mpika district) and 1 STO (Isoka district) only. NRDC and ZCA are the ones of agricultural science institute in the country as well as University of Zambia and Copperbelt University.

The number of technical officers of TSB each district is only from one to three on average. There is no TSB staff in Chilubi district, Northern province. However, they do not necessary have the educational background in irrigation. TSB technical officers have in most cases received only general agriculture engineering.

As for CEOs, government is irregularly recruiting new staff so as to make up for vacant. In 2009, 99 CEOs in total are supposed to be employed and assigned to Northern Province. The number of CEOs, however, is still not sufficient, for example, out of 45 camps in Mansa District of Luapula Province, there are nothing but 26 CEOs. CEOs, furthermore, are not specialized in irrigation but in general

agriculture, too. Though most of them equip with background of agriculture engineering development unless they are given a specific instruction relative to irrigation from the TSB, their extension services have not always been centered on irrigation development. Through the pilot project of this study, once they are informed to identify irrigation potential areas, they are the ones who know the area best, thus they can identify. However, to realize the irrigation development even if it is small-scale, CEOs need a technical advice/assistance from the TSB. Thus staff shortage could be the major constraints in pursuing community based smallholder irrigation development.

2) Limited Operation Budget

The budget bill of TSB for the coming fiscal year which is from April to March has been formulated as activity based budget (ABB) by December of every year so far. Now, the government plans to shift the fiscal year from January to December. General extension activities of TSB which is composed of three sections of irrigation, farm power and mechanization and land husbandry, except project basis, depend on the budget of Poverty Reduction Program (PRP) and/or Recurrent Department Charge (RDC) allocated to Department of Agriculture of province and district level account respectively. DSA, MA, fuel and so forth are provided through these accounts. The budget, however, is very limited.

The budget for agriculture section of district level, namely TSB and Extension Advisory Section, in most cases ranges between ZMK500,000 to ZMK1,000,000 per month. This amount has to be divided among the said sections, namely irrigation, farm-power and mechanization and land husbandry of TSB, and extension methodology, crop production farm management of Extension Advisory Section respectively.

Upon allocating the budget among the agriculture sections including irrigation part of TSB in a District, therefore, available budget per technical section becomes quite small sum of money. This budget has to cover transportation including fuel for motorbikes and meal allowance/lodging of TSB technical officers and CEOs.

At worse, faced with the country's overall financial difficulty, the budget does not sometimes come as scheduled. With this situation, extension activities cannot be well pursued unless otherwise there is a project basis budget.

Table 1.3.1 Previous Funding to Irrigation (2002 – 2006, ZKW)

Year	2002	2003	2004	2005	2006
Approved	2,000,000,000	6,000,000,000	522,504,001	1,807,285,220	3,216,235,847
Supplementary	-	-	-	-	3,710,000,000
Total	3,000,000,000	6,000,000,000	522,504,001	1,807,285,220	6,926,235,847
Released	1,876,000,000	2,000,000,000	153,198,933	1,628,778,112	1,648,629,994
% over approved	62.5%	33.3%	29.3%	90.0%	23.8%
% over previous year	-	6.67% Up	92.3% Down	1,063% Up	1.2% Up

Data Source: MACO Headquarters, Lusaka

3) Limited Opportunity of Training

In connection with the budgetary issue mentioned above, limited opportunity of training for the TSB staff could be pointed out. Since 2001 in Northern province, only the chance, except some specific training courses managed by donors fund and/or NGOs, was a training workshop targeting all TSB staff carried out in 2007 at Nakonde Farmers Institute, which was conducted by the budget of TSB. That workshop was five days workshop giving more that 30 participants general administration of MACO, human recourses, technical aspect including irrigation, design/construction of irrigation facilities like weir, canal, topographic survey, and so on.

In Northern province, during the period of Economic Expansion in Outline Area (EEOA) and Agriculture Support Program (ASP), both of them were funded Swedish, a series of training targeting CEOs was conducted, but there is no regularly training opportunity after phasing out the ASP. At present, CEOs just come from the training institutions they graduated and learn the way for agricultural extension service by on-the-job training.

4) Limited Transportation with Fuel Allocation

TSB officers of districts in Northern and Luapula Provinces are supposed to be equipped with at least one - two pickups or four-wheel drive vehicles and a couple of government motorbikes. The staffs of TSBs, however, have been struggling to secure enough transportation for their daily activity. Some TSB office have no motorbike, therefore, they usually borrow transportation means from other sections like extension service office. In the case of TSB of Mansa district has no any vehicle, motorbike, even bicycle. Even if they have vehicle and/or motorbike, those transportation means are in poor condition in most cases due mainly to aged and lack of maintenance of these.

Very few CEOs have their own motorbike, which were a mostly provided during EEOA (Economic Extension in Outline Area) and ASP (Agriculture Support Program) period (1990s – 2008, Swedish funds). While some of CEOs are given bicycle, there are CEOs who has no transportation means to fully perform their duties. They, it may be around 30 – 40 % of CEOs as a whole, are obliged to take so long hours to reach the area/village allocated to her/him. Under this situation, efficient extension cannot be done. In the



A CEO belonging to TSB usually borrows the motorbike from extension sector to reach his coverage area because he has no transportation.

Most of the CEOs, who the Study Team contacted, indicated they do not have reliable motorbike. Where these are available, they are mostly aged, for example more than six or seven years, it makes the officers difficult to get spare parts of them, thus not be effectively and efficiently in service. Often they are off the road and maintenance costs are very high and unbearable with the limited budget.

In connection with this, fuel allocation is also serious constraint for extension services. As mentioned above, the budget for agriculture extension activities depend on a recurrent department charge (RDC) to agriculture section of district account and then the amount has to be divided among all the agriculture sections, that is to say, the budget for fuel has not been specifically appropriated in the account, but it has been as an activity basis so far. The budget for fuel, therefore, is very limited and then the amount for fuel is sometimes not allocated to CEOs despite supposed to be delivered monthly basis.

Under current situation in terms of fuel for transportation means, CEOs and TSB staff has been struggling to carry out their mandate and then this implies that extension activities cannot be efficiently done. Even if the fuel budget would be precisely itemized in the district account, it is required to operate the budget of fuel in working order.

In addition to discussion so far, it could say that the extent of coverage area makes CEO's extension activity quite difficult. DACO locates their extension staff in their areas called Camp. The CEOs have to report to DACO her/his monthly activity once a month. However, due mainly to lack of transportation means and budgetary constraint, except some regular meetings/workshops being carried out as program basis supported by donors like PLARD program in Luapula province, CEOs are faced

with a difficulty to meet together in a hall and share information in terms of agriculture with their colleagues. Some CEOs, furthermore, are stationing in quite far area from center of district and/or province so that it is difficult for them to make a quick response/communicate to a request made by TSB district office. Around 400 km² on average is allocated to a CEO as her/his coverage area, which is equivalent to 20 km * 20 km. This is not manageable size to be managed by a CEO. Even if the CEO has bicycle, even motorbike, the area to be taken care by her/him would be inevitably limited. The size of area to be taken care is not manageable for a CEO.

5) Land Tenure

Most of the land with great potential for irrigation is under customary jurisdiction. The traditional leadership is not keen to authorize the leasing of land to would be irrigation developers on title. This consequently hinders the irrigation developers to invest adequately in these areas for fear of easily being evicted from the land by the traditional leadership. Additionally, farmers cannot access financial services such as loans due to lack of surety in the form of the Title Deeds which the traditional leaders cannot readily suction.

The other issue has been the holding-on to land by a few individuals who obtained it a long time ago and thus the increasing demand and the populace is compelled to rent land from the land holders at a cost which affects their irrigation production returns.

The government is realizing that it is difficult to acquire land from the Chiefs for the purpose of establishing state schemes for allocation to farmers. It is difficult for government to invest in irrigation infrastructure in customary land without due consent of the traditional leadership.

6) Operation and Maintenance of Irrigation Facilities

In the study area, although responsibility for operation and maintenance of irrigation facilities has been left to the scheme and/or community, they are facing with difficulties to manage their facilities due mainly to both technical and financial aspects. For the schemes to be planned to introduce pump irrigation system, in particular, cost and benefit analysis should be carefully computed taking account of a rise in price of petrol.

Furthermore, there are some farmers who don't cooperate when it comes to maintain the irrigation facilities despite benefiting from the same especially in community where users association and/or maintenance committee have not been constituted.

The sense of ownership for irrigation infrastructure constructed/funded by government/donor in terms of operation and maintenance to be carried out by the scheme/community is not adequate. As the case may be result in some infrastructure being abandoned and then dilapidated.

This is, however, being addresses through the promotion of the formation of Water Users Associations and Committee to be responsible for the operation and maintenance of the irrigation facilities.

Capacity development and mobilizing on operation and maintenance issues is also inadequate amongst communities as TSB has been unable to reach out to provide the necessary training due to logistical constraints. The government would be expected to continuously train farmers for not only technical assistant but also farming management. The TSB is expected to play a part of the policy same as before, too.

7) Way-forward taking into account Development Constraints

Those development constraints discussed above give this Study a direction of: 1) facilitating smallholder irrigation development by a series of groups, called cascade approach which centers on

farmers initiative, in view of limited staff, budget as well as transportation, 2) promoting proper extension taking into account limited human resources of the government in the dissemination of smallholder irrigation schemes, 3) on top of these self-effort by the farmers should be pursued to the largest extent specially faced with government budgetary constraints, and 4) conducting continuously capacity development and mobilization on operation and maintenance of irrigation facilities through a sort of training course for not only government officers but also farmers themselves as actual users of them.

1.3.2 Development Opportunities

There are development opportunities/strengths while MACO and its province and district TSB offices as well as CEOs are facing aforementioned development constraints. In regard to them, these are abundant in natural resources particularly water resources and land resources as well, nation-wide agriculture radio program (NAIS), etc.

1) Water Resources

The study area is vested with abundant water resources in terms of perennial streams/streams, wetlands (Dambos) and lakes. These coupled with the suitable topography makes the study area very ideal for cheap affordable gravity systems of irrigation such as diversion weir, furrow, and so on. With suitable investment and topographic condition, there are some sites where are even ideal for sprinkler irrigation by gravity system without any pumping at any one stage. Water Rights acquisition, however, still remains a challenge as some farmers feel water flowing in river/stream, Damdo is a free natural resource. This is a part of challenges at the same time to disseminate community based small holder imitation.

2) Land Resource

The study area has abundant arable land most of which is customary jurisdiction. Most of this land is generally undulating plateau in nature, a topography ideal for gravity irrigation, Land acquisition from traditional for agriculture development is affordable despite the resistance by the chiefs to lease it on title.

3) Communicaiton between Province and District, and within Camp

Provincial Agriculture Coordination Office(r) (PACO) has at least one ground telephone line and also facsimile line though the facsimile is often out of order. District Agriculture Coordination Office(r) (DACO) is in almost same situation, too. Communication among the ministry's headquarters, PACO and DACO therefore is not difficult, and urgent notice can be delivered in time. Rather, this day, they including TSB staff and CEOs, communicate each other by using mobile phone.

4) Nationwide Radio Program

MACO has National Agricultural Information Services (NAIS). This organization broadcasts agricultural related information, topics, programs and on such as "Radio Farm Forum", "Farmers Notebook", "Rural Notebook", "Farm Organize", and "Television Lima Time" everyday in 7 local languages as well as English with 30 to 60 minutes each depend on the program. For example, information on when to plant and cultivate certain varieties, what and how much inputs to be prescribed, what and how much pesticide to be applied can be known nation-wide through the program. The office of NAIS is nationwide stationed with staff including some journalists. In the study area, "RADIO Mano FM" in Kasama which is community radio station broadcasts the NAIS program.

Most of the farmers nowadays have radios as seen in the field they are listening to radio programs

while farming. According to a baseline survey carried out under this Study at 6 sites, by site 63% to as high as 93% of the 180 sample farmers own radio, and it could be assumed that nearly everyone listens to the agriculture program composed NAIS.

Given this situation even in rural area, the NAIS program can easily deliver messages to the farmers in a form of extension. It is not clear but renewing battery for radio may be a constraint for some farmers to keep in touch with the program all year round. However, at least there must be people who are able to renew the battery, so that messages, information related to agriculture can still be delivered to a certain extent in a village.

This nationwide radio program could motivate the farmers who are interested in irrigation, and even ask the farmers to visit nearby TSB office/CEO personnel to have a technical assistance instead of CEOs visiting each and every village. The program can also tell an example of self-effort irrigation of how the farmers have developed the schemes with what kind of tools, materials, etc. Letting farmers know such example of self-effort scheme would have a possibility of motivating them to embark on same self-help type irrigation activities.

1.4 Lessons Learnt from Past Experiences

This sub-chapter discusses lessons learnt from similar projects supported mostly by donors, and picks up issues that have to be due considered in planning the smallholder irrigation development in this Study, then summaries the direction as way-forward.

Table 3.7.1 summaries similar projects/studies which have been carried out together with the brief hard components, lessons and relevance to this JICA Study. All the projects and studies can be said that they are dependent on outside physical intervention or even in case having the term of self-effort such as “Self-effort Communities by EC” there are provisions for foreign materials like cement, reinforcing bar, etc. As summarized in the table, dependence on outside interventions needs much longer lead-time, well-informed consensus prior to the commencement of projects. Also pointed out is that the more project brings foreign (outside) materials, the more difficulty the farmers face in operating and maintaining the projects, thereby less project sustainability.

On the contrary, the idea of “pursuing farmer’s self-effort as much as possible rather than expecting government intervention in terms of physical investment” is the key for this JICA Study. For example, designing of irrigation system envisaged in this Study shall be done in such way of not engaging any heavy equipment nor engaging local contractor in the construction. Likewise, the facilities in this JICA Study are those that can be established by using locally available materials only, which is quite different from the past experiences.

Table 1.4.1 Summary of Similar Projects in comparison with JICA Study

Project(completion)	Lessons	Relevance to the JICA Study
<p>Self-help Irrigation Communities (Oct. 1992), EC</p> <p>1. Identification of self-help irrigation communities 2. Design for 17 self-help schemes</p>	<p>The study had been successfully completed with an output of three volumes of reports. However, EC has not committed the implementation. Though some schemes have been rehabilitated/ upgraded by the GOM's own effort, no lessons have been documented.</p>	<p>Concept of self-effort is very similar to the JICA study. However, still cement, reinforcing bar, ballast, etc. are designed to be used in rehabilitating/upgrading the self-effort type irrigation systems. Those materials are designed to be provided by the project and all the labors by the farmers voluntarily.</p> <p>This JICA study aims at realizing irrigation system by using only locally available materials, which is quite different from the project above.</p>
<p>Bwanje Valley Project (Dec. 1999), JAPAN</p> <p>1. Construction of headwork 2. Opening of 800 ha for paddy field</p>	<p>The leveling of 752ha for rice field was left on the GOM. The leveling was at first planned to be done by the beneficiary farmers manually. However the manual land leveling was too hard to manage for the farmers, requiring heavy equipment such as bulldozer and scraper. The cost for the equipment was not timely available by the GOM. Over-reliance on the GOM's own budget resulted in delaying project completion, thereby suspending the benefit accrued from the project.</p>	<p>The headwork, main canal, feeder canals, etc. had been constructed by the GOM funded from Japan. All the construction works had engaged a Japanese general contractor, which is a conventional irrigation development. Therefore, the Bwanje valley project is different from the irrigation schemes undertaken by this JICA study, which is to be constructed by the farmers' self-effort as its core.</p>
<p>DASPS I (Feb. 2000), DANIDA</p> <p>1. 16 dams rehabilitation planed but only 2 completed.</p>	<p>Rehabilitation of earth dams can hardly be done by farmers' self-effort due mainly to: 1) very little intensives since the rehabilitation would not usually enlarge the irrigation area, 2) heavy siltation of the reservoir which can hardly been de-silted since most of the dams do not have drain conduit (dry work impossible), 3) long duration to be required which is usually more than 1-year (hardly attracts smallholder farmers), etc.</p>	<p>Since rehabilitation of earth dam can hardly attract farmers' attention as well as nor can be done by farmers' self-effort only due to the reasons in left column, the JICA study does not put high priority on the dam rehabilitation but on the gravity irrigation system, which is the simplest irrigation system.</p>
<p>AICAF Pilot Project (Mar. 2001), AICAF, JAPAN</p> <p>1. Small scale irrigation development 2. Post harvesting facilities</p>	<p>About two-thirds of the members in five farmers' associations organized by the project did not continue the activities after the project had been completed. Also, most members of an association had gone back to their native livelihood, which is fishing, after they had realized agriculture was very much erratic corresponding to climate while fishery was stable in earning.</p>	<p>One of the reasons why they are not functioning now is insufficient lead-time and insufficient informed consent procedure. Farmers said, "A technical team came and did the project. We participated to it."</p> <p>In this JICA study, unless farmers agree to embark on the project by their own, JICA Team would rather go to neighboring sites rather than sticking to the site.</p>
<p>Small Scale Irrigation Development Study (mid 2003), ADB</p> <p>1. Identification of potential areas 2. F/S for selected 40 sites 3. D/D & bidding document preparation for selected 15 sites</p>	<p>As this study was completed in late 2003, no physical construction commenced, thereby yet no lessons.</p>	<p>Final product from the study is the detail design report together with the bidding document. This means that the project to be undertaken is to engage contractor, which is different from the self-effort irrigation schemes targeted in this JICA study.</p>

Project(completion)	Lessons	Relevance to the JICA Study
<p>Smallholder Flood Plain Development Program (to be 2005), IFAD</p> <ol style="list-style-type: none"> 1. Construc'n of model schemes (206 ha) 2. Rehab. of existing schemes (1,528 ha) 3. Rehab. of self-help schemes (302 ha) 	<p>The program has faced an increased lead-time to get participatory agreement on track. The program says that leading times of three to four years are required for more organized irrigation schemes as opposed to much shorter preparation periods for small-scale technologies such as treadle pump.</p>	<p>Irrigation projects this JICA Study undertakes are small in size most probably less than one-tenth scale of those in the program, so that much less lead-time could be enough to succeed.</p> <p>Also, most of the projects undertaken in the program are so called on IMT program; first rehabilitate the government scheme and then transfer the schemes to the farmers.</p>
<p>Smallholder Irrigation Project, ADB (to be 2005)</p> <ol style="list-style-type: none"> 1. Treadle pump (1,008 ha) 2. Motorized pump (3,265 ha) 3. Gravity irrigation (95 ha) 4. Sprinkler (284 ha) 5. Earth dam rehabilitation (6 dams) 	<p>This project was declared effective on February 1, 2000. The development stage is now to establish micro finance credit system. Therefore, no physical progress has been made except for equipment procurement as of end of 2004.</p>	<p>Gravity irrigation undertaken in the project is similar to the JICA study. However, the emphasis in the project is more or less on the treadle pump, motorized pump, and sprinkler. With regard to the equipment, this project intends to establish a credit system, through which the beneficiaries purchase the irrigation equipment.</p> <p>JICA study centers on very simple techniques, for which irrigation facilities should be constructed by using locally available materials only, not requiring such credit system.</p>
<p>Horticulture and Food Crops Development Project (to be 2005), ADB</p> <ol style="list-style-type: none"> 1. Treadle pump (1,693) 2. Motorized pumps (1,260 ha) 3. Canal & lifting pumps (1,590ha) 4. Rehab. of earth dams (25 Nr.) 5. Sprinkler irrigation system (15ha) 	<p>Procurement process had taken longer period than originally scheduled. Therefore, the project is still at the beginning stage as of end of 2004 in terms of physical intervention. No concrete lessons have yet been gained.</p>	<p>As the JICA study centers on farmers' self-effort, motorized pump and rehabilitation of earth dams have less priority. The motorized scheme requires much operation cost that most subsistence farmers cannot afford, and the rehabilitation of earth dams cannot be carried out without certain amount of government interventions such as provision of equipment.</p>
<p>Small Farms Irrigation Project (to be 2005), BADEA</p> <ol style="list-style-type: none"> 1. Development of two 800ha pumping irrigation schemes 	<p>As of end of 2004, project staff, accounting system, procurement have been done but not yet physical construction started.</p>	<p>The project is a medium pumping irrigation schemes. The planed irrigable area is 800 ha each, which is to accommodate 2,000 farmer members (0.4ha per each farmer).</p> <p>The design of the project is quite different from this JICA study that is not seeking much outside assistance to realize the system.</p>

CHAPTER 2 CURRENT SITUATION OF SMALLHOLDER IRRIGATION IN THE STUDY AREA

This chapter starts with description of topographic features and analysis of meteorological situation of the study area, and then proceeds to the overview of existing irrigation schemes. After grasping the current situation of smallholder irrigation being practiced, proceed to the discussions of development constrains and opportunities of irrigation development, which are to be considered in preparing the action plan for community based smallholder irrigation development framework. Also briefly summarized are lessons in terms of operation and maintenance of irrigation facilities gained from similar projects which have been done in the study area, which are to be incorporated in formulating plans/activities of smallholder irrigation development, too.

2.1 Topography

Zambia is on the great plateau of Central Africa, at an average altitude of 1,200 m. The lower parts of the plateau (*Dambos*) have a reliable supply of water during the dry season and this partially makes the study area to be characteristic. They are flooded in the rainy season.

The country is divided into three main topographical features such as: 1) mountains with an altitude of over 1,200m, that is to say the hill areas, 2) a plateau with an altitude ranging from 900 to 1,200 meters, that is to say the plateaus, 3) lowlands with an altitude of below 900 m (between 400 and 900 meters), that is to say the plains. Topography varies widely dependent on the location but mostly could be generalized in the above three landform area. The highest point in the study area is Mafinga Hills, on Isoka, which has an altitude of 2,164m. The lowest is Bangweulu swamp in south of Northern Province and lakes in north of Luapula, where the altitude are 1,150m and 1,100m respectively.

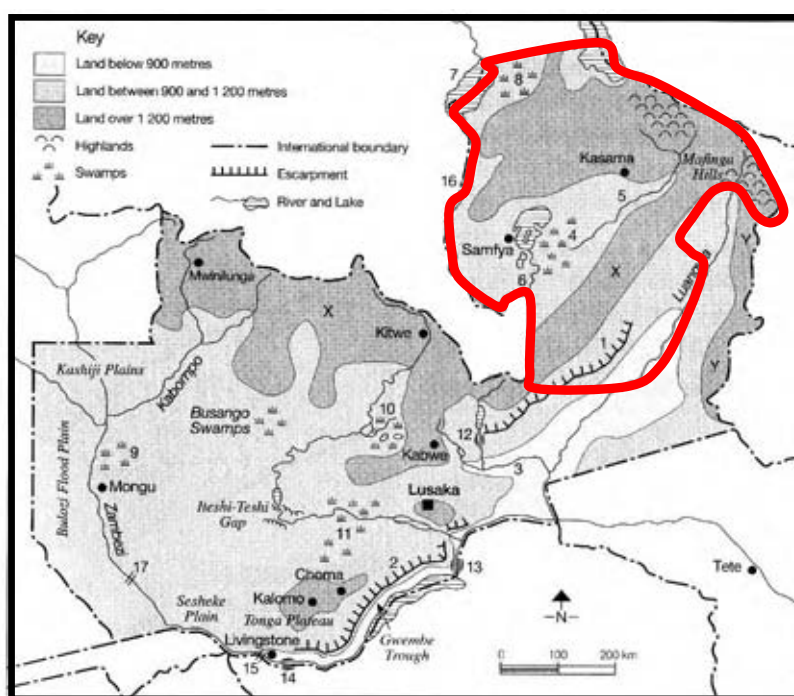


Figure 2.1.1 Relief Features of Zambia and The Study Area

Source; Geography for Zambia, T M Bwalya, M R Naidoo

Of the three landform area, the hill areas and the plateaus are dominant in the study area and then irrigation potential area can be more found in those areas of the mountains and upper to middle parts of the plateau (*Dambo*). The *dambo* is endowed with much rainfall, but due to the gentler slopes and lower altitude closed to river plain, less potential in terms of irrigation development is found. The tow landform areas, which have relatively high irrigation potential, are summarized as below:

- Hill areas, which extend northern parts of the study area and some parts of Mpika District which is located southern of the study area, rise above the plains to higher altitudes. Most of them are characterized with steep slopes, so that irrigation potential area can mostly be found at almost foot or halfway up hilly areas of those. Along the slopes of hills, also found are stream

diversion type irrigation potential.

- Plateaus are large areas of flat or gently undulating land. The valleys on the plateau vast and this landform often have *dambos*. The largest plateau covers most of center in the study area, and has an altitude of about 1,200 m.
- Part of the river plain is formed by Chambeshi and Luapula River. Along the tract of the rivers there are vast plains. The river plain areas are at altitude of 1100 – 1150 m. The Chambeshi River flows through the southern part on the study area. The river plain is another rich area but at the same time prone of floods and gravity diversion to farmland is found difficult in most case.

2.2 Climate

For a land-locked tropical country located in the south-central of Africa, Zambia has clearly separated dry and rainy season according to south-to-north movement of the Inter Tropical Convergence Zone (ITCZ) and relief rainfall as well; The year is generally divided into three seasons, namely main rainy season (warm wet season) lasting from November to April during which 95% of the annual precipitation falls, post-rainy season (cool dry season) stretching for about three months from May to July with mean temperature varying between 15 °C and 27°C , and a hot dry season prevailing from August to October with an average maximum temperature of 27°C to 32°C. Annual rainfall varies from over 1,200mm in the north to about 700mm in the central part of the country and less than 700mm in the south.

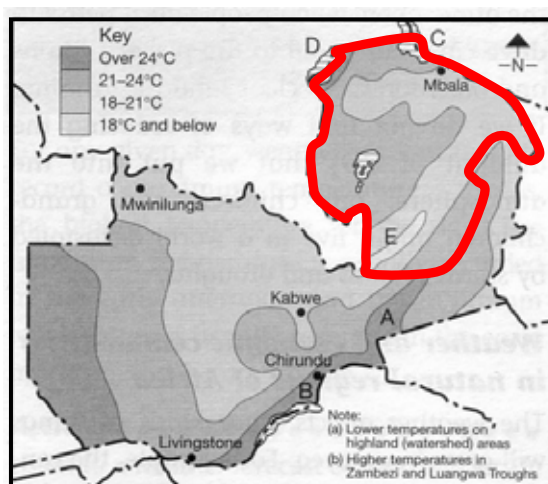


Figure 2.2.1 Mean Actual Temperature

Source: Georaphv for Zambia. T M Bwalva. M R Naidoo

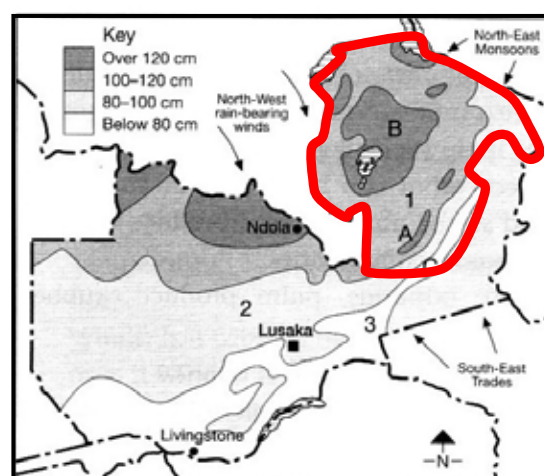


Figure 2.2.2 Annual Rainfall

Source; Geography for Zambia, T M Bwalya, M R Naidoo

The study area, Northern and Luapula provinces, belongs to Region III from agro-ecological point of view. This region is of highest rainfall in the country, varying between 1,000 to 1,500 mm, and has a growing season of about 120 to 150 days. It includes most of the study area, Copperbelt, and Northwestern Province, and some part of Central Province.

In Kasama, capital of Northern Province, temperature generally ranges between 10 and 32°C, and then minimum temperature occurs in June and July, while maximum temperature from September to November. This is the result in an arithmetical operation based on the data last 30 years from 1978 to 2008.

The observed temperature of Kasama is analyzed to detect trends in temperature change last 30 years. The mean temperature of monthly maximum ones computed for four time periods, September-October, November-December, January-February and March-April, indicate that the summer temperature is

increasing at the rate of about 0.6°C, 1.2°C, 0.3°C and 0.1°C per decades respectively, which are six to 22 times higher than the global or Southern African rate of increase of temperature. In the case of Mansa, capital of Luapula province, the summer temperature is increasing at the rate of about 1.6°C (September-October), 1.0°C (November-December), and 0.7°C (March-April) per decades respectively. Only during the period from January to February, changing rate of temperature shows a opposite tendency to go down.

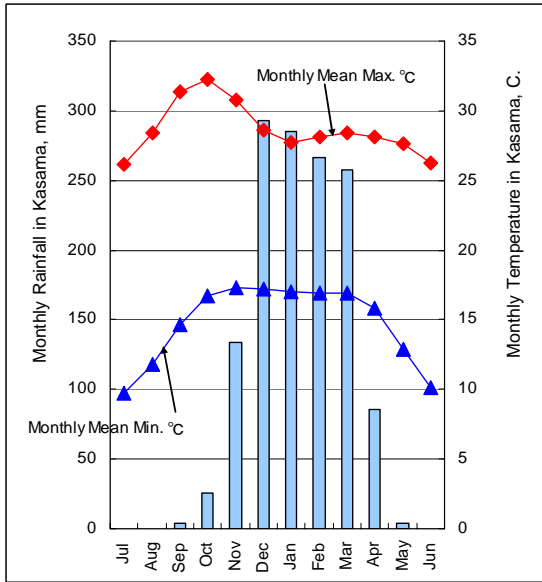


Figure 2.2.3 Climate Graph for Kasama, Northern Province
Data Source; Kasama Airport

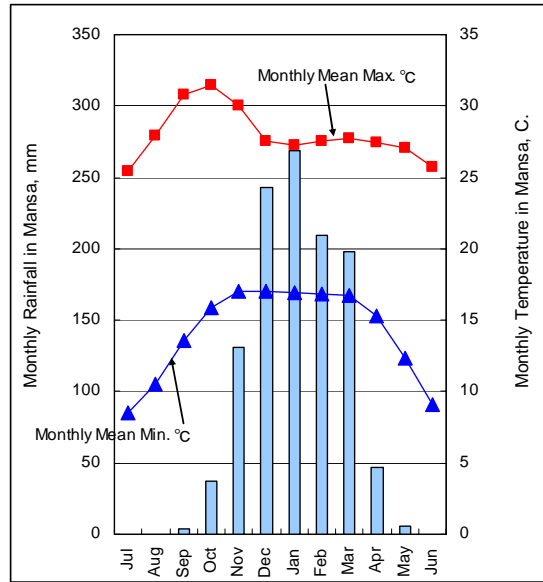


Figure 2.2.4 Climate Graph for Mansa, Luapula Province
Data Source; Mansa Airport

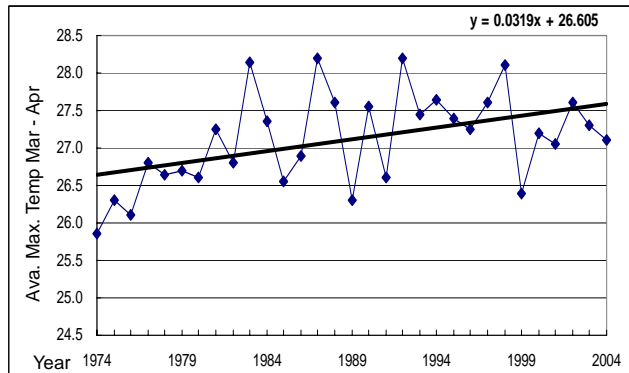
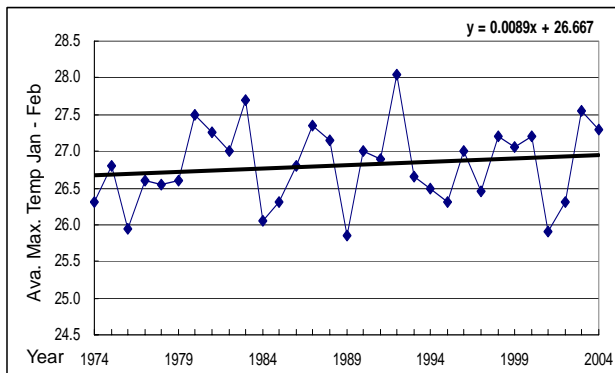
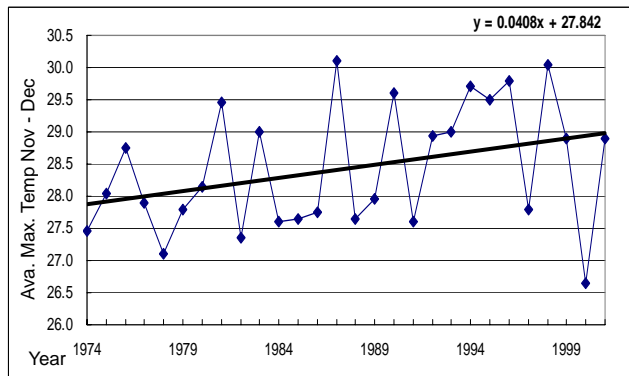
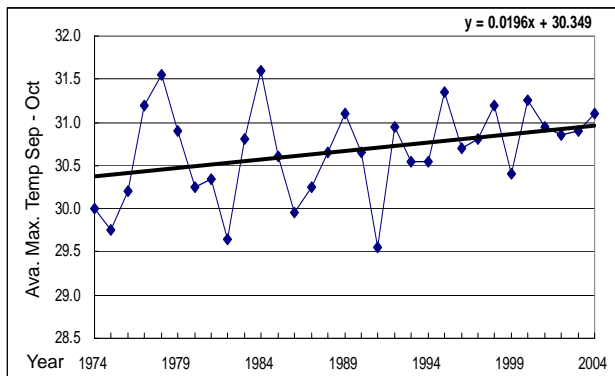


Figure 2.2.5 Temperature Trends for Kasama, Northern Province
Data Source; Kasama Airport

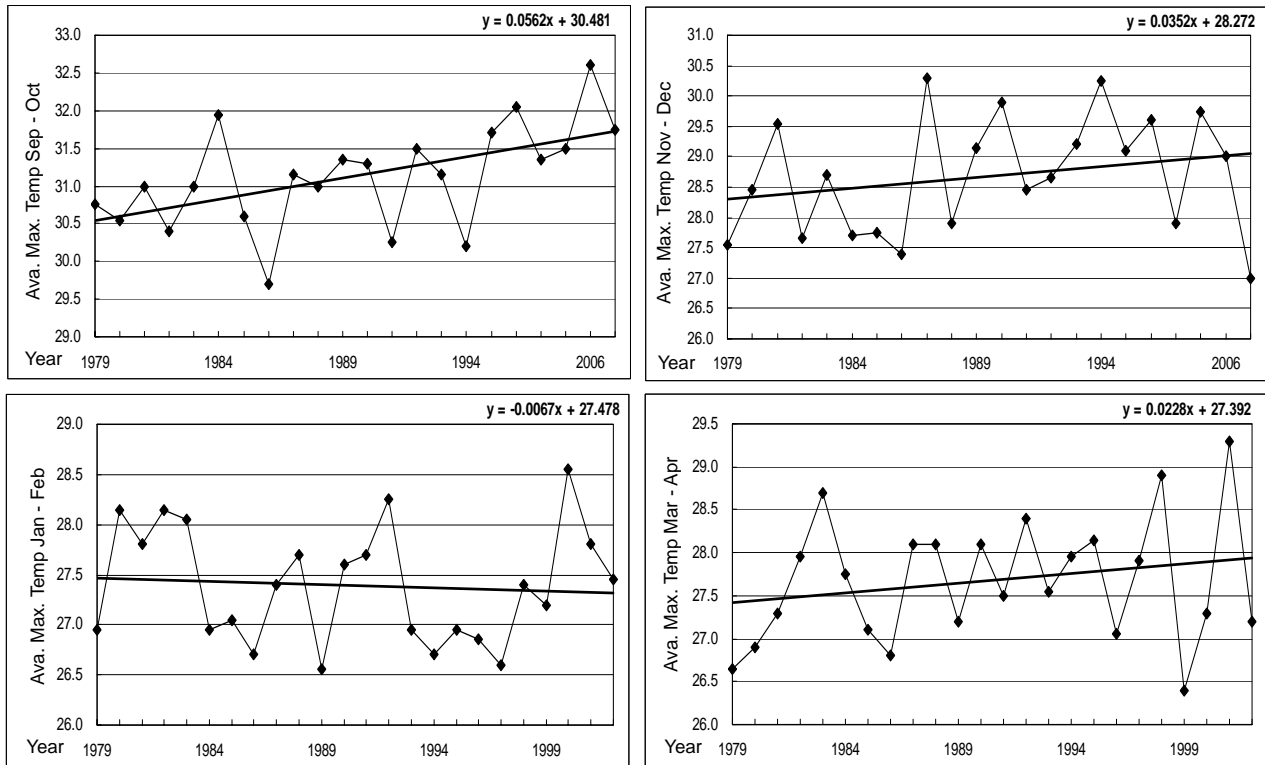


Figure 2.2.6 Temperature Trends for Mansa, Luapula Province
Data Source; Mansa Airport

Focusing on regional distribution of average annual rainfall for latest 30 years, the figures of both Northern Province (1,309mm) and Luapula Province (1,119mm) exceeds average annual rainfall as a whole of Zambia.

Taken all together, while the annual rainfall in Kasama shows a tendency to gradually increase, Mansa’s one has an inclination to decrease, according to an approximations.

Zambia has experienced an increase in drought frequency and intensity in the last 20 years. The droughts of 1991/92, 1994/95, 1997/98 and 2001/02 affected the people’s life, which lead to crop failure and the country had to resort to importation of relief maize. In Kasama, again for same period of 30 years, it receives between 920 and 1,750 mm annual rainfall observed in 1999/2000 and 1997/98 respectively. According to the data, it seems that the rainfall pattern of the study area shows a tendency to be some different from nationwide’s one. When the country was nationwide affected by drought, particularly in 1997/98, Kasama received above the average for last 30 years of

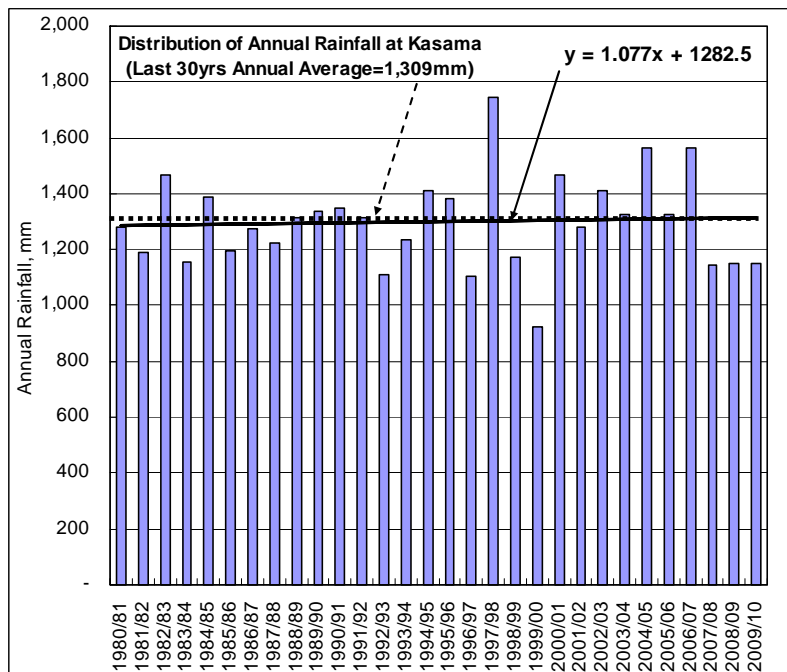


Figure 2.2.7 Annual Rainfall and Trends for Kasama
Data Source; Kasama Airport

rainfall. It could say that there were same trends in 1991/92 and 1994/95, 2001/02 as well.

The opposite was the case during 1998/99 and 2000/01 seasons, when Zambia experiences heavy rainfall that caused flooding in most parts of the country. At least in 2000/01, the amount of annual rainfall in Kasama coincided with that phenomena of heavy rainfall occurred in nationwide, which was above the average last 30 years and 10 years as well. In connection to this, the annual rainfall decreases from an average of 1,302 mm of last 30 years to an average of 1,294 mm of recent 10 years.

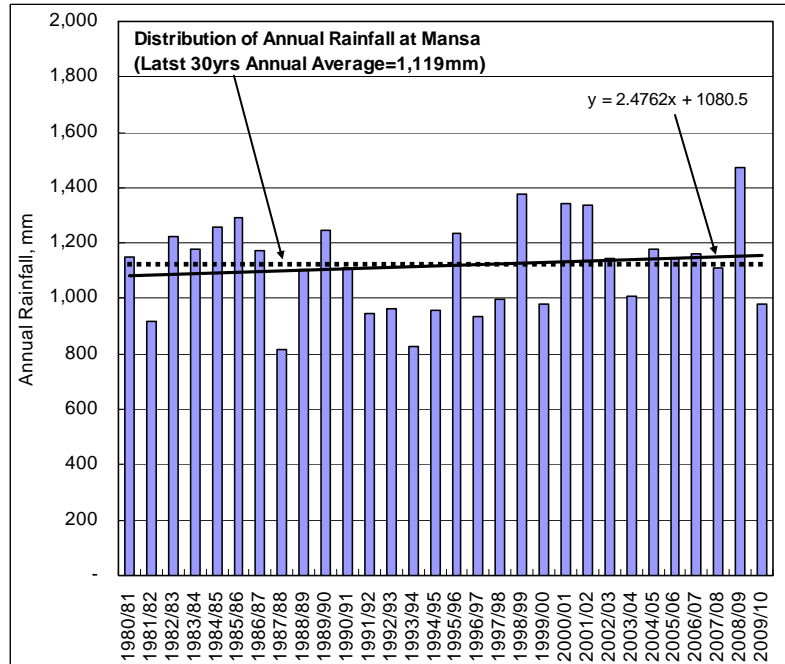


Figure 2.2.8 Annual Rainfall and Trends for Mansa
Data Source; Mansa Airport

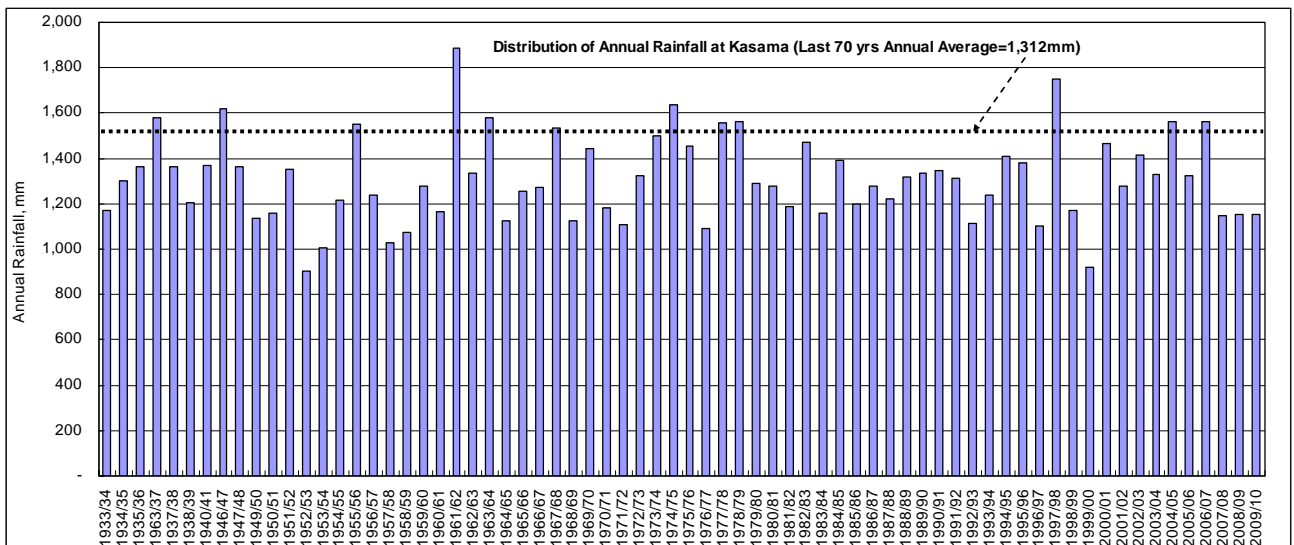


Figure 2.2.9 Annual Rainfall and Trends for Kasama for last 72yrs (Data Source; Kasama Airport)

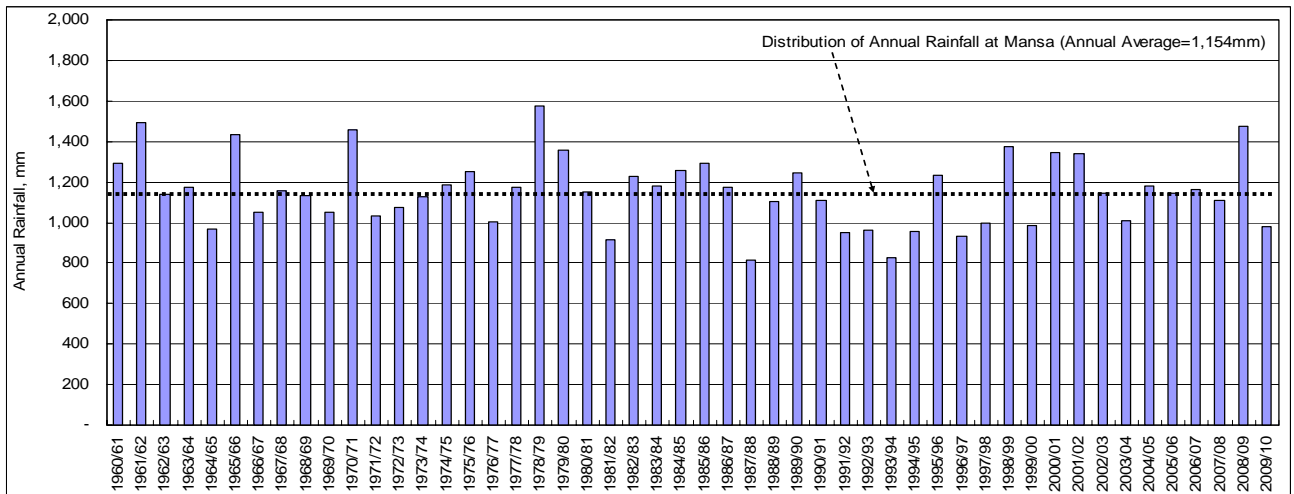


Figure 2.2.10 Annual Rainfall and Trends for Mansa for last 50 yrs (Data Source; Mansa Airport)

Landform greatly affects such climate as temperature and rainfall. The colder districts in the study area are the hill area and high plateaus such as Kasama, Mpika, both located in Northern Province. Temperature there is about 10 °C from June to July, particularly Mansa of Luapula in June falls below 10°C.

The wind which blows from south to east is called the trade winds. Many winds that bring rain come from the south and east. The landform gives effect on the rainfall. Where these winds blow across high land, they are moved upward, making the winds cool and then causing rainfall in general. Where the winds descend on the other side of the high land, the wind gets dry and thus there is little rain.

Following table summarizes mean annual temperature and annual rainfall by district. As aforementioned, mean annual temperature falls in a range of 7 °C to about 32°C throughout the study area. Annual rainfall ranges in most of the study area from 900 – 1,700 mm.

Table 2.2.1 Summary of Temperature and Rainfall by District

District	Altitude (m)	Annual Rainfall (mm)	Mean Max Temperature (°C)	Mean Min Temperature (°C)
Kasama	1,380	1,240	31.9	10.1
Mbala	1,633	1,140	28.2	10.6
Mpika	1,393	1,110	30.0	10.1
Mansa	1,178	1,050	32.6	6.8

2.3 Water Resources

1) River Flow Characteristics

In the study area, there are two main river, namely Chambeshi and Luapula Rivers running in Northern and Luapula Provinces respectively, which are both belongs to Congo River system. Monthly mean discharge, flow summary, annual runoff depth and runoff percentage, etc. at main points of these two rivers are shown in Table2.3.1.

Table 2.3.1 Flow Characteristics at Main Points along Chambeshi and Luapula Rivers

Monthly Mean Discharge (m3/s)

River	C.A. (km2)	Station (C.A. : km2)	O	N	D	J	F	M	A	M	J	J	A	S
Chambeshi	44,427	Cham. OP 34,745	40	40	75	170	307	461	471	294	155	96	68	51
Luapula	173,396	Kashiba 161,275	237	195	265	536	1068	1758	1741	1295	931	712	488	323

Flow Summary (m3/s)

River	Max.	High	Usual	Low	Drought	Min.	Ave.	Runoff Depth (mm)	Rainfall (mm)	Runoff Percentage (%)
Chambeshi	582	280	108	55	35	33	185	168	1323	12.7
Luapula	2021	1096	606	294	190	174	741	161	1167	13.8

Source: National Water Resources Master Plan, 1995 Irrigation Plan, July 2005

2) Surface Water Resources Potential

According to the said study, surface water resources potential in Zambia is estimated about 237 MCM per day in an average year and 135 MCM per day in a drought year. In terms of regional distribution of surface water resources potential, Northern and Luapula provinces have more potential, while Southern and Lusaka province have less potential.

Table 2.3.2 Surface Water Resources Potential

Basin/Province	Name of River / Province	C.A : km2	Surface Water Resources Potential (MCM/Day)	
			Average Year	Drought Year
By Basin	Chambeshi	44,427	23.9	14.3
	Luapula	173,396	54.1	38.3
By Province	Northern	147,294	<u>67.5</u>	<u>44.8</u>
	Luapula	49,594	<u>26.3</u>	<u>17.7</u>
	*Lusaka	22,094	10.9	3.7
	*Southern	85,199	5.3	1.2
	Total as a whole country	751,852	237.3	136.2
	Average as a whole country	-	<u>32.5</u>	<u>19.4</u>

Source: National Water Resources Master Plan, 1995

*Drought Year: 10-year return period

3) Groundwater Potential

Rainfall recharges storage of groundwater during rainy season so that groundwater storage could be maximized in March and April, while groundwater stored in aquifers in those months runs off into rivers during dry season. Groundwater storage would be minimized in October and November. The difference in groundwater storage between rainy and dry season is regarded as potential for utilization of underground water. With this basic understanding, it is said that 8% of annual rainfall could be groundwater potential because 8% of annual rainfall infiltrates into aquifers and runs off into rivers over the whole of Zambia.

It follows that districts having a greater total of rainfall could be expected to cultivate much groundwater potential. The values of groundwater potential shown in the table below should be considered the maximum values that could be available for groundwater development.

Table 2.3.3 Groundwater Potential

Province	Annual Rainfall (mm)	Annual Change of Groundwater Level (m)	Annual Groundwater Potential	
			Annual Recharge (%)	Total Volume (10 ⁹ m ³ /year)
Northern	1,138	2.18	<u>7.0</u>	<u>11.5</u>
Luapula	1,259	2.23	<u>6.8</u>	<u>3.9</u>
Lusaka	857	2.20	8.0	1.5
Copperbelt	1,231	2.40	6.8	2.6
Total as a whole country	-	2.10	<u>7.7</u>	<u>57.4</u>

Source: National Water Resources Master Plan, 1995

2.4 Irrigation in the Study Area

This section provides an inventory of the existing irrigation schemes in the study area focusing on area being irrigated, water source, type of irrigation system, state of irrigation facilities in place, water abstraction and application methods, crops grown, market available, level of management, potential of these schemes and the factors constraining expansion on these schemes.

2.4.1 Irrigation Type in the Study Area

Irrigated agriculture for smallholder farmers has been practiced during dry season, typically from April to November, when water sources are available from river, streams, *dambo*, groundwater, lake, and so forth. For establishment of the suitable type of irrigation systems by area or location in the study area, key factors are: 1) topographical condition, 2) farmland distribution, 3) water abstraction easiness and 4) flood condition in rainy season.

Topography in the study area, in view of irrigated agriculture, can be basically divided into four types, namely, A) mountainous area, B) transition area from mountain to upstream *dambo* area, C) upstream *dambo* area and D) middle stream *domba* area. Mountainous areas and transition areas are physically not convenient to build large scale irrigation schemes due mainly to its hilly and undulating topography, but there area great potential for small-scale gravity system depending on farmland distribution, water abstraction easiness and amount of water flowing. In contrast to them mentioned above, upstream and middle stream *dambo* areas where form wider wetland alongside river/stream can relatively establish large-scale irrigation scheme.

Figure below presents typical irrigation systems located along river/stream in the study area. They are categorized into seven irrigation types as described below:

A) Mountain Stream Diversion

This is located at the most upstream of rivers where the river slope is almost steep. Irrigation system is normally at small-scale as water flow is small. Key factors to make a plan of this type of irrigation systems are water abstraction to be easy by gravity, farmlands to be situated nearby water source, and mountain/hill slope to be gentle.

B) Stream Diversion at Transition Area between Mountain and Upstream *Dambo*

This type is located at transition area between mountain torrent area and upstream *dambo*. The slope of river/stream is still relatively steep. This irrigation system is relatively at middle size because the amount of water flowing in the river/stream is richer than the diversion point of the type (A) above. The conditions for establishment of this irrigation system are almost same as the type (A), which means that the water abstracted from river/stream can be conveyed to the farmland by gravity.

C) Stream Diversion located at Upstream *Dambo*

This is situated at upstream of *dambo* where surrounding areas are relatively hilly topography. Immediate downstream *dambo* area will also be benefited by irrigation system. Pumping devices like motorized/engine pump, treadle pump may be utilized to supplement water amount flowing in the furrow and/or to irrigate upper land where not be covered by gravity from the furrow. Bucket irrigation lifting borehole/shallow well water is also applied in this area.

D) Stream Diversion located at Middle Stream *Dambo*

Similarly to the type (C) above, river/stream diversion sites are located at river course in *dambo* area. A diversion weir will be located inside *dambo* area thus weir length becomes long to be across the *dambo*. In order to gain larger area to irrigate, it tends to be long distance of furrow because the slope

of river/stream is close to the furrow's one. For designing this irrigation system, affect of floods must be taken account. As same as the type (C), pump equipment and/or bucket could be utilized to take water from furrow or borehole/shallow well.

E) Gravity River Diversion

This type is usually built at upstream to middle stream of rivers providing relatively large-scale dams to impound river/stream water, and a gravity furrow system for water delivery. Irrigable areas will become large-scale involving large number of beneficiaries. The points to make this scale of irrigation schemes sustainable are operation and maintenance of irrigation facilities and equipment, water distribution management, and set-up and management of the water users association.

F) Surface Engine / Motorized / Treadle Pump based Irrigation including Bucket

In order to irrigate hillside from middle to downstream *dambo* area except places where can introduce gravity irrigation system, lifting water from rivers/stream would not be avoided and either engine/motorized pump or treadle pump are considered as water lifting measure. Treadle pumps will also be used at very small-scale. The capacity of pumps depends on required pump heads and irrigation service area. In addition to the water lifting devices mentioned above, bucket irrigation is practicing in such area too by using borehole and/or shallow well water.

G) Dimba Farming at *Dambo* Area

Traditional dimba farming is practiced at *dambo* areas at both middle and downstream of *dambos*. Unless it is covered by any gravity river diversion irrigation system, cropping is done by bucket or under residual moisture or just under rain-fed condition.

H) Sprinkler Irrigation Scheme

This irrigation system occupies a quite small number of scheme existing irrigation schemes in the study area. This type usually involves motorized pumps for water abstraction and pressure pipes for water delivery. Location of pumping sites must be carefully studied when water is tapped from streams/rivers especially considering floods.

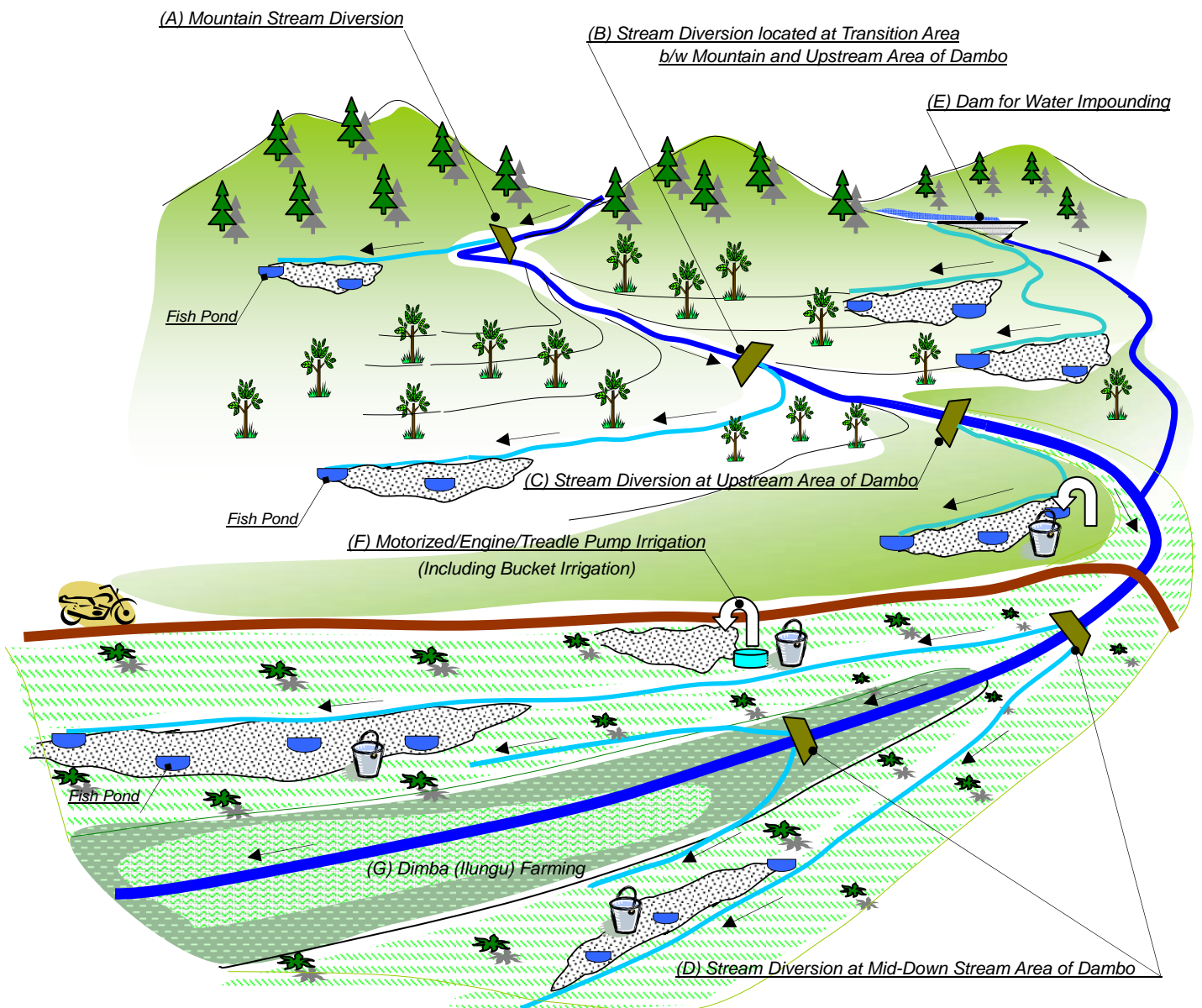
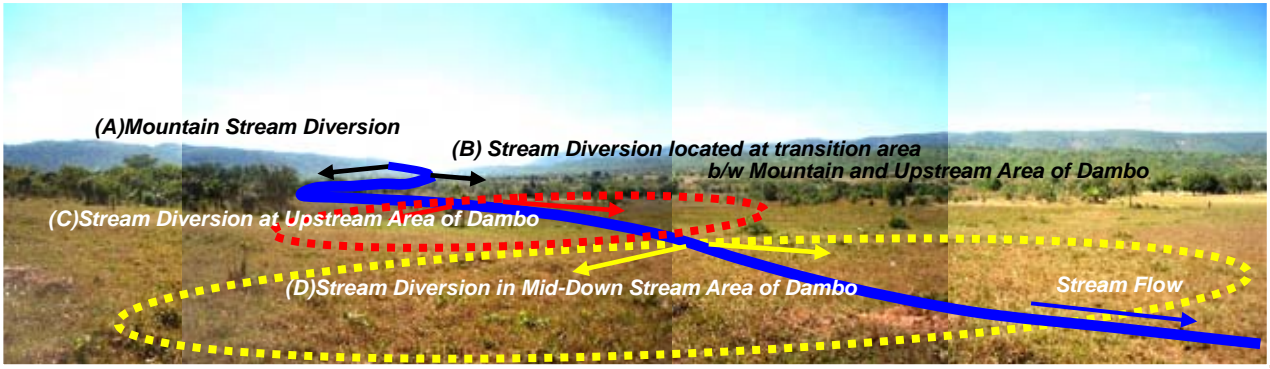


Figure 2.4.1 Typical Irrigation System in the Study Area

2.4.2 Existing Irrigation Schemes in the Study Area

The existing irrigation schemes in the study area are categorized in two types of scheme according to the irrigation facilities lay on the ground, namely, permanent irrigation scheme and temporary irrigation scheme. The former ones are equipped with permanent structure like concrete river diversion weir, dam to impound river/stream water, etc. and then the latter ones are practicing irrigated farming by using just simplified irrigation facilities like temporary weir made out of locally available material such as grass, soil, bamboo and so on or just digging a water furrow to simply withdraw river/stream water by gravity.

In order to identify and grasp current situation of existing irrigation schemes in the study area, the study carried out an inventory survey covering all over the study area. The survey make present situation of irrigation schemes in the study area with number of schemes, water source, irrigation method, natural environmental condition like soil and crop being cultivated, accessibility to markets from road condition point of view, and so forth (See Attachment-1 and 2).

1) Inventory of Existing Irrigation Schemes

Table 2.4.1 indicates the number and area of existing irrigation scheme by two provinces. From the table, following are identified:

- ◆ There is a total of 1,128 existing irrigation schemes with 2,213 of present irrigated area. They are divided into 104 sites of permanent scheme and 1,024 sites of temporary scheme involving 21,349 beneficiaries in total in two provinces.
- ◆ As for permanent irrigation scheme of 104 sites, there are 67 sites and 37 sites in Northern and Luapula province respectively. These existing permanent sites irrigates 441 ha of farm land of which 361 ha in Northern and 80 ha in Luapula province at present arriving at 5.4 ha per site and 2.2 ha per site respectively.
- ◆ Regarding the number of farmers who are involved in irrigated farming in permanent irrigation schemes is counted at 3,727 farmers; which is divided into 2,780 farmers of Northern and 947 farmers of Luapula province. From these figures, the numbers of farmers per site is estimated at 41 farmers per site of Northern and 26 farmers per site of Luapula. This is attributable to the fact that average irrigated area per site in Northern province is bigger than that of Luapula province, 4.1 ha vs. 2.2 ha.
- ◆ As per existing temporary irrigations scheme, 1,024 sites irrigate farm land of 1,772 ha giving 1.7 ha irrigated land per site in whole of the study area. There are 1,564 ha and 208 ha of present irrigated land in Northern and Luapula province respectively.
- ◆ About the farmers enjoying irrigation farming while using the temporal facilities are counted at 17,712 farmers in total with both of provinces providing 36 farmers per site in Northern and 17 farmers per site in Luapula province respectively.
- ◆ As expected of course, irrigated area per site is not big, say just 1.7 ha as the overall average for the two provinces. The irrigated area per site in Northern province is a little bigger as 1.8 ha as compared to 1.2 ha in Luapula province. A typical temporary scheme accommodates an average of 17 farmer beneficiaries; by province it is 18 members in Northern province and 15 members in Luapula province. It can be said that a typical temporary irrigation scheme accommodates about half of the members of permanent irrigation scheme.

Table 2.4.1 Number of Existing Irrigation Scheme and Area

Province		No. of Site	Present Irrigated Area		No. of Irrigators	
		(Sites)	(ha)	(ha/site)	(person)	(person/site)
Existing Permanent Scheme		104	441	4.2	3,727	36
Existing Temporary Scheme		1,024	1,772	1.7	17,712	17
Total		1,128	2,213	2.0	21,439	19
Breakdown						
Category of Scheme	Province	No. of Site	Present Irrigated Area		No. of Irrigators	
		(Sites)	(ha)	(ha/site)	(person)	(person/site)
Existing Permanent Scheme	Northern	67	361	5.4	2,780	41
Existing Temporary Scheme		850	1,564	1.8	15,144	18
Total of Northern province		917	1,925	2.1	17,924	20
Existing Permanent Scheme	Luapula	37	80	2.2	947	26
Existing Temporary Scheme		174	208	1.2	2,568	15
Total of Luapula province		211	288	1.4	3,515	17

Source: Irrigation Scheme Inventory Survey, JICA Study Team

Figure 2.4.2 shows the number of permanent irrigation schemes by district: left figure for Northern province and the right one for Luapula province. Likewise, Figure 2.4.3 indicates the irrigated area by those permanent irrigation schemes summarized by district. Figure 2.4.4 illustrates the water source of irrigation schemes by *dambo*, river/stream, spring, and shallow well (dug well), while Figure 2.4.5 identifies the irrigation methodology such as surface/furrow, pump/sprinkler, and others including dug-well, bucket irrigation, etc. From these figures, following are observed:

- ◆ As per the permanent irrigation schemes in Northern province, 90 % of them rely on river/stream water to irrigate farm land of 361 ha with 67 sites in total, while *dambo* and spring water cover only 10 % of irrigated land, 7% for *Dambo* and 3% for spring. As for irrigation system of permanent irrigation schemes, surface/furrow irrigation system irrigates 94 % of farm land while only pump and bucket irrigation covers only 6 % in total including using treadle pump.
- ◆ In contrast to Northern province, 11 % of farm land in permanent irrigation schemes are irrigated by using *dambo* water source. River/Stream water is dominantly supplying irrigation water to 78 % of farm land, even for oil palm cultivation which needs plenty of water throughout a year. Regarding irrigation system of permanent irrigation scheme, surface/furrow irrigation is a major system as same as even in Luapula province, which has been introduced in 73 % of irrigated land at present. Other irrigation system covers 27 % of irrigated land of permanent schemes, which are sprinkler system, treadle pump system, and bucket irrigation as well.
- ◆ There is 1,024 sites of temporary irrigation schemes irrigating 1,772 ha at present in Northern province and almost of them are taking river/stream water through just simplified temporary irrigation facilities, which is counted at 87% of the total number of schemes. Ratio using *dambo* and/or other water resources, only 8 % and 5 % respectively, is relatively low as same as a situation of existing permanent irrigation scheme, while 24 % of *dambo* water is utilized in Luapula province. In Luapula province, almost half of numbers of existing temporary irrigation schemes abstract river/stream water, that is 55 %..

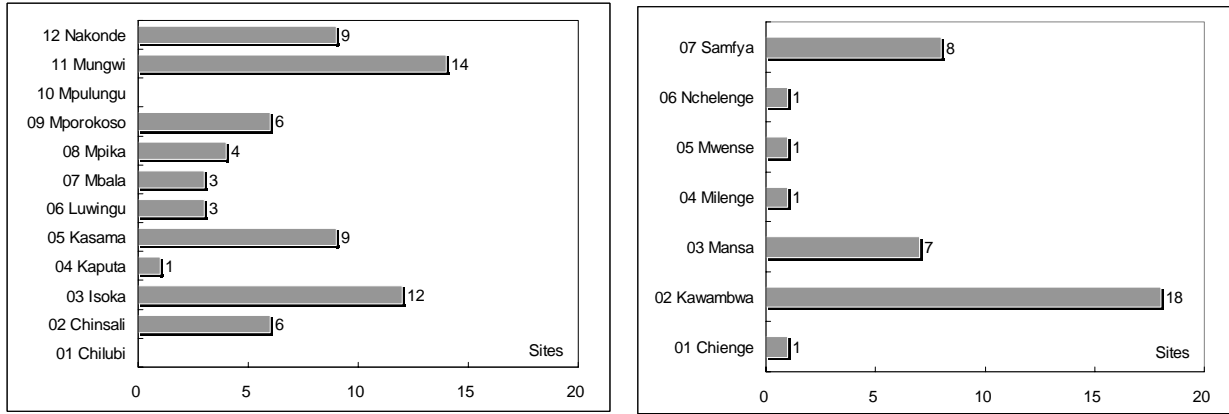


Figure 2.4.2 Number of Permanent Irrigation Schemes by District: Left (Northern), Right (Luapula)

Source: Irrigation Scheme Inventory Survey, 2009, JICA Study Team

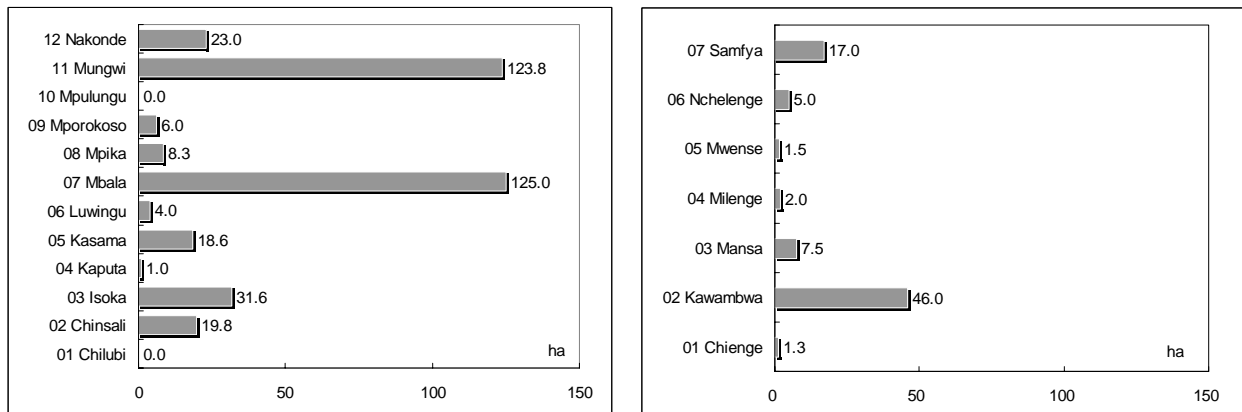


Figure 2.4.3 Areas Irrigated by Permanent Irrigation Schemes by District: Left (Northern), Right (Luapula)

Source: Irrigation Scheme Inventory Survey, 2009, JICA Study Team

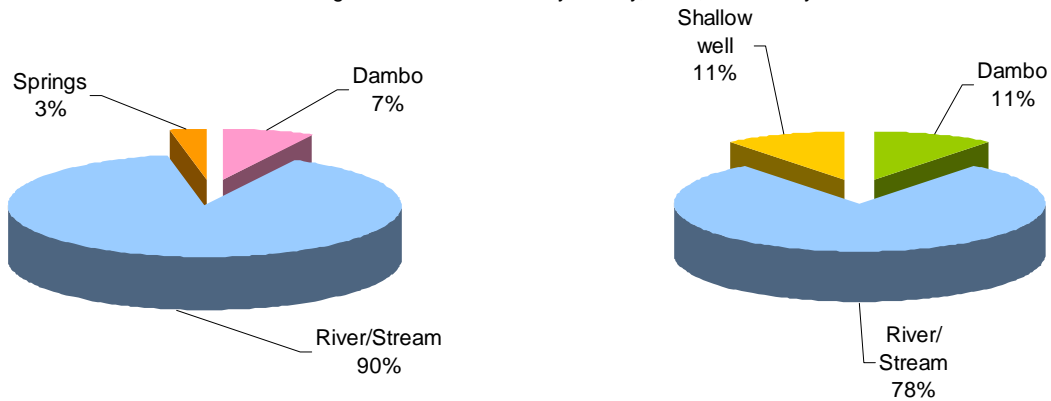


Figure 2.4.4 Water Sources for Permanent Irrigation Schemes: Left (Northern), Right (Luapula)

Source: Irrigation Scheme Inventory Survey, 2009, JICA Study Team

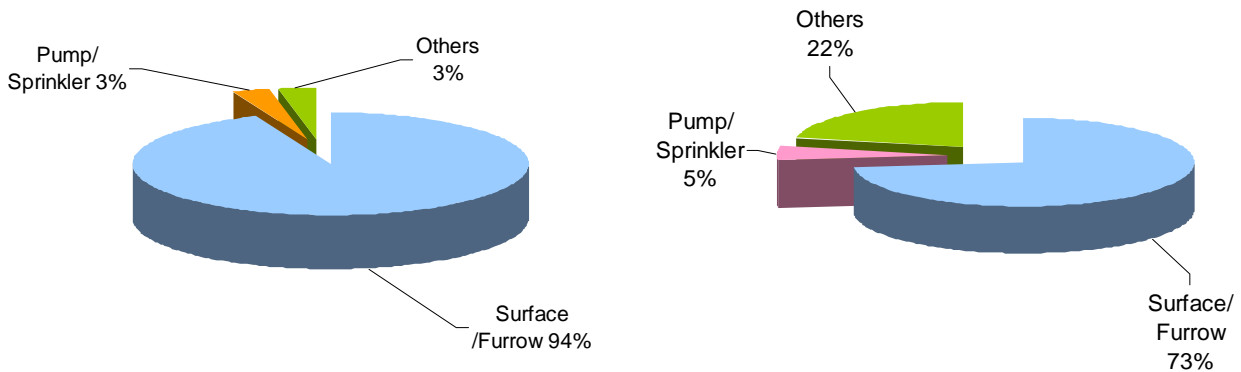


Figure 2.4.5 Irrigation Method for Permanent Irrigation Schemes: Left (Northern), Right (Luapula)

Source: Irrigation Scheme Inventory Survey, 2009, JICA Study Team

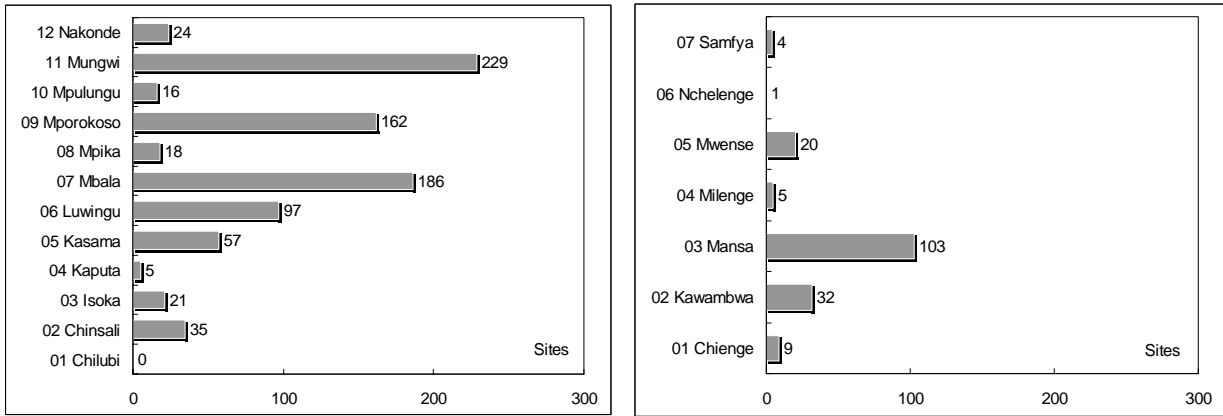


Figure 2.4.6 Number of Temporary Irrigation Schemes by District: Left (Northern), Right (Luapula)

Source: Irrigation Scheme Inventory Survey, 2009, JICA Study Team

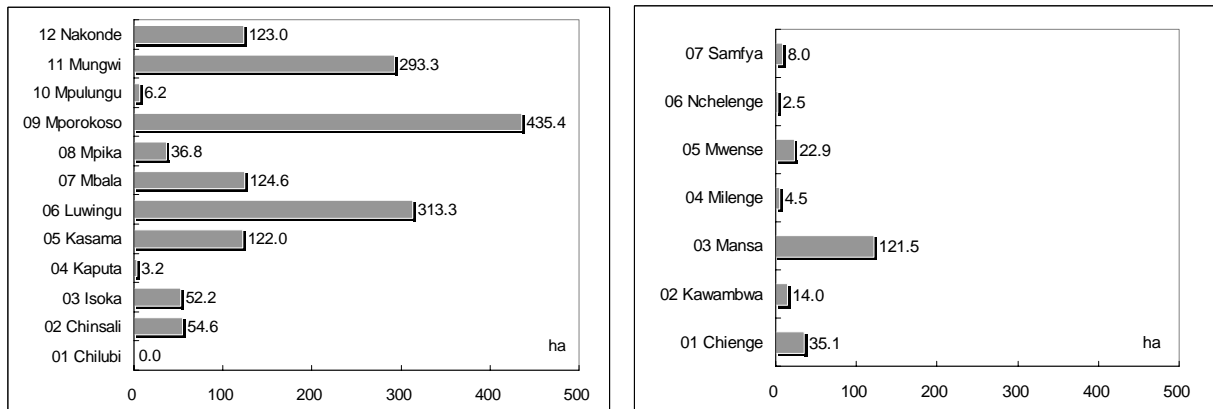


Figure 2.4.7 Areas Irrigated by Temporary Irrigation Schemes by District: Left (Northern), Right (Luapula)

Source: Irrigation Scheme Inventory Survey, 2009, JICA Study Team

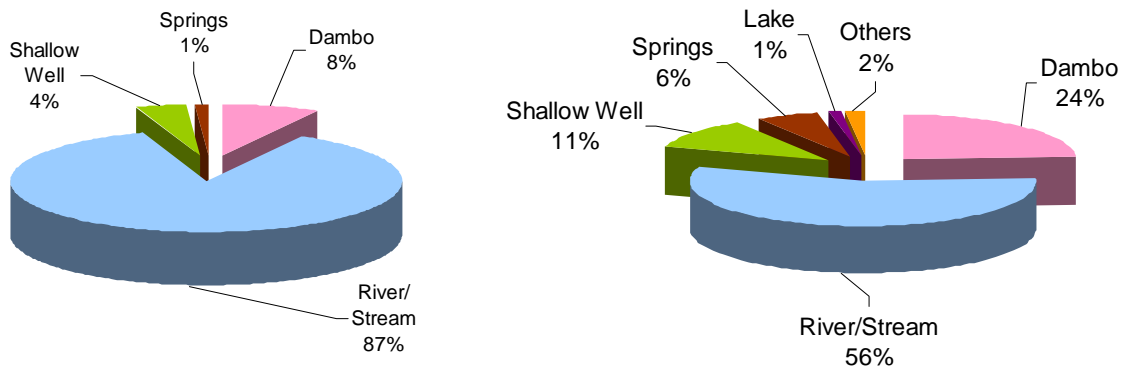


Figure 2.4.8 Water Sources for Temporary Irrigation Schemes: Left (Northern), Right (Luapula)

Source: Irrigation Scheme Inventory Survey, 2009, JICA Study Team

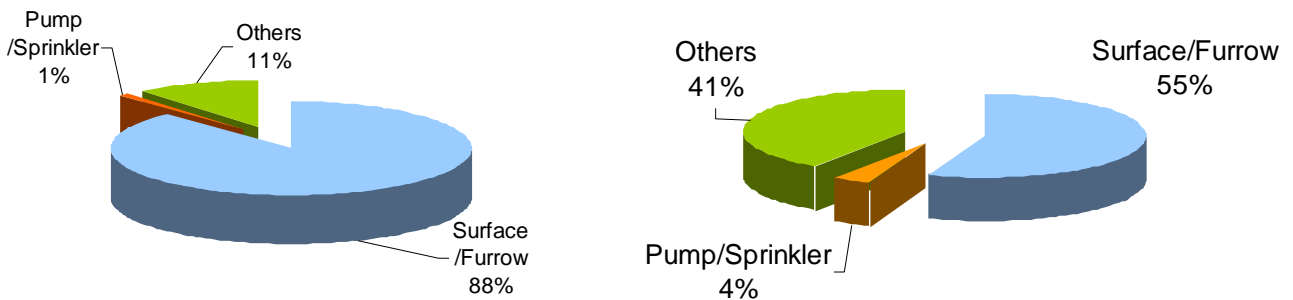


Figure 2.4.9 Irrigation Method for Temporary Irrigation Schemes: Left (Northern), Right (Luapula)

Source: Irrigation Scheme Inventory Survey, 2009, JICA Study Team

2) Soil Condition

The inventory survey investigated soil condition, namely, soil fertility, acidic problem and salinity problem, on each existing permanent irrigation scheme in the study area, too. While answering to questions concerning the irrigation inventory, the district TSBs and CEOs point out some problem of soil on the farm land. The soil fertility is indicated as the grade in a level of 'good', 'fair' and 'poor'. As for acidity problem and salinity problem are given as 'almost nil', 'a little appeared', 'fairly appeared' and 'very much appeared' by TSBs' and CEOs' experience as well as visual judgment on the field. Figure 2.4.10 indicates the results of Northern province (left) and Luapula province (right). The issues are summarized from the figures as following:

- ◆ As for soil fertility, 'good' and 'fair' occupy more than 90 % in all existing irrigation schemes. The percentage of 'good' and 'fair' in Northern province is 50 % and 47 % respectively. Likewise the percentages are 46 % in 'good' and 51 % in 'fair' in Luapula province. This means that most of the existing irrigation schemes hardly meet soil depletion on the irrigated farm.
- ◆ In general, it is said that soil in the study area tend to indicate acidity. The results of survey could back up the facts of acidity problem. In Luapula province, 'a little appeared' and 'fairly appeared' occupy 84 % of a whole, while 'almost nil' is only 16 %. Luapula province may face with acidity problem at least to some extent. On the other hand, 37 % of 'almost nil' are there in Northern province, but 'at same time 'very much appeared' occupies 13 % in total, which is not reported in Luapula province. The answer of 'very much appeared' is mostly reported in Isoka district.
- ◆ Concerning salinity issue, it could say that most of irrigation schemes hardly have salinity problem. The inventory survey reports to 77 % and 84 % of 'almost nil' in Northern and Luapula provinces respectively.

3) Crops Cultivated

Under these conditions mentioned above, several kinds of crops are cultivated on the farm under irrigation. In line with looking over the current situation on permanent irrigation schemes, the inventory carried out a survey to grasp kinds of crops being cultivated in the study area. Figure 3.6.11 shows the results of crop survey. From the figure, following are identified:

- ◆ Dominant crops being cultivated in both Northern and Luapula province are tomatoes and cabbage in almost of half the number of permanent irrigation schemes. Tomatoes cultivation occupies 54% and 51% of the permanent irrigation scheme in two provinces respectively, while cabbage growing shares as much as 68% in Luapula province and 48% in Northern province.
- ◆ These two kinds of crops mentioned above are followed by rape, maize, and onion which account for from 30 percent to 50 percent of all the permanent irrigation schemes. Although the number of the scheme is very few (9% of all the scheme), fruit tree like banana, citrus are also cultivated in some districts especially in Nakonde, Isoka district of Northern province. Other crops are of course grown, but the percentage of them is just an one digit except sugarcane, Chinese cabbage, Irish potatoes and carrot of Luapula province which occupy around 10% of the scheme.
- ◆ Palm oil tree is cultivated in Luapula while it is not reported in Northern province. From kinds of crop point of view, Luapula might be characterized by its growing oil palm. With support from the Government, Luapula province has recently been promoting oil palm cultivation. In fact, around 40,000 seeds of exotic kind came to hand from República de Costa Rica in March of this year, and then they have been brought into farm institutes to pre-germinate them as preparation for selling them to farmers. Actually, the oil palm requires irrigation water throughout a year. It could be said that introduction of proper irrigation system is demanded on here.

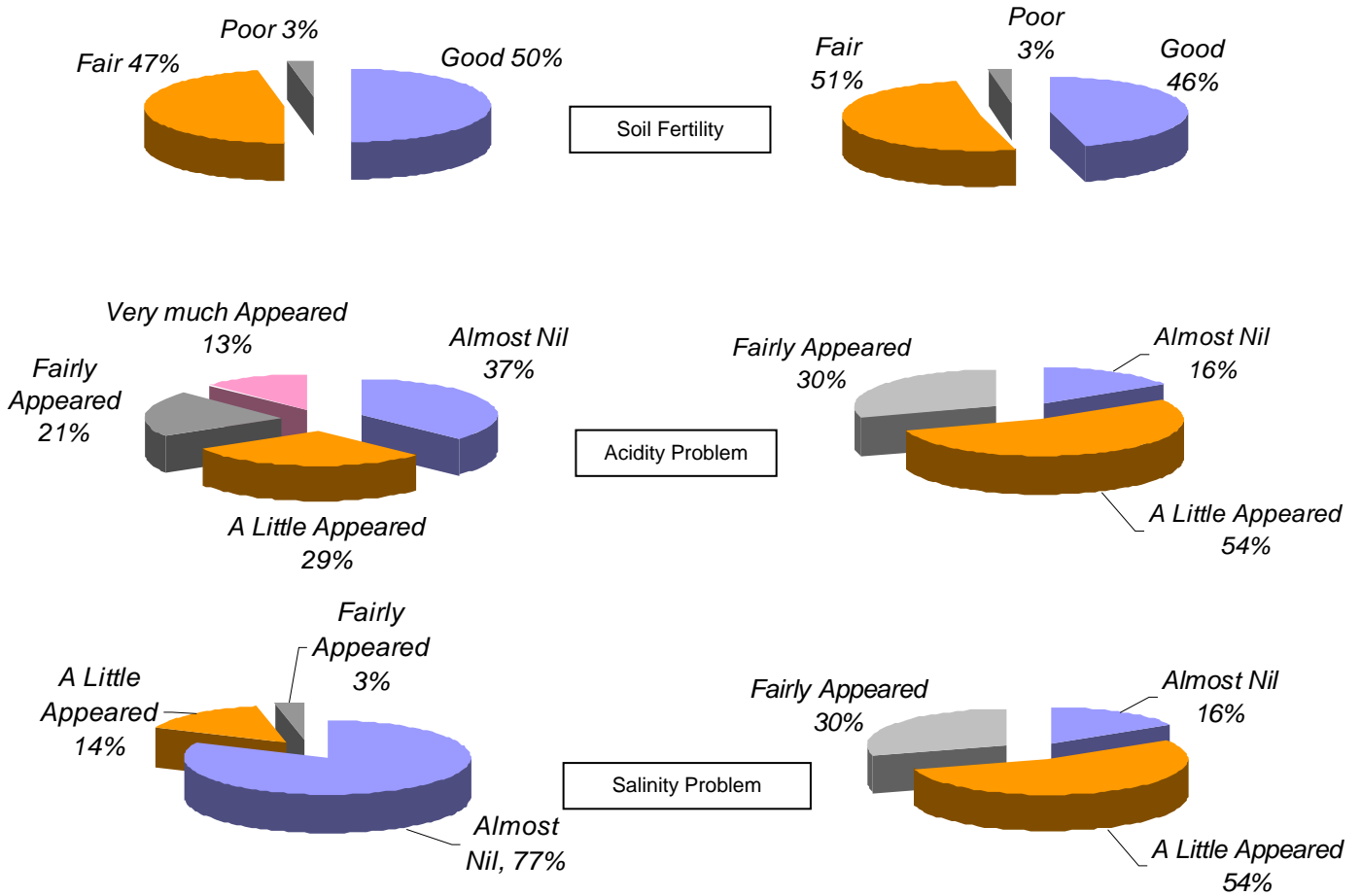


Figure 2.4.10 Soil Condition of Existing Irrigation Schemes: Left (Northern), Right (Luapula)

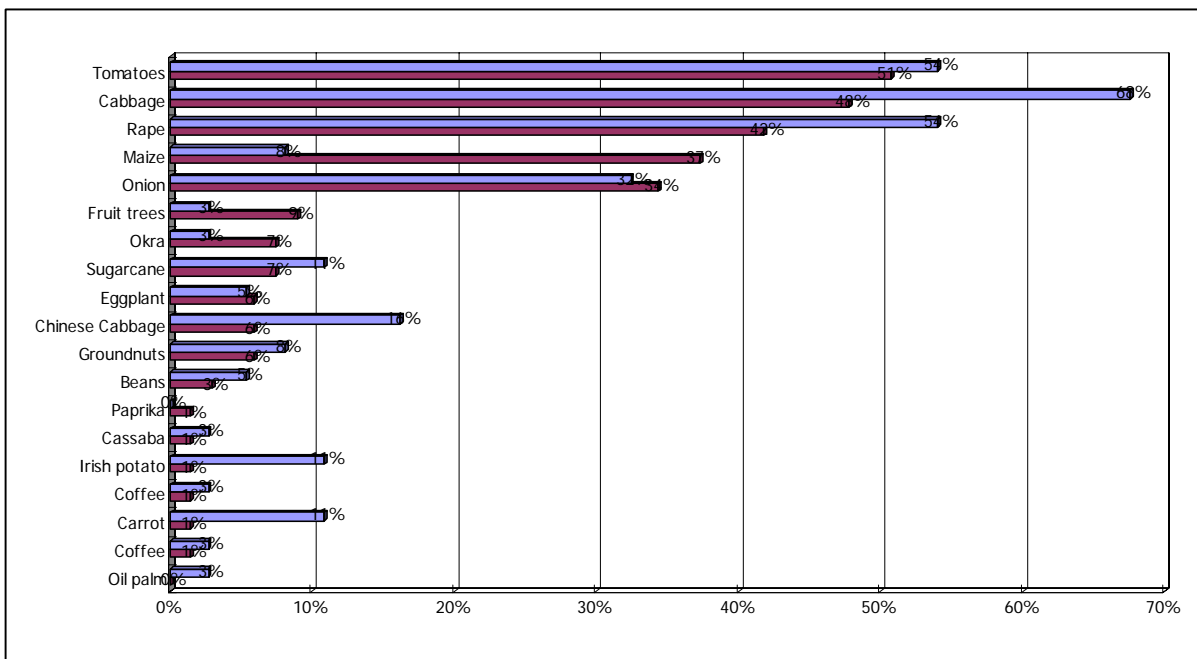


Figure 2.4.11 Crops being cultivated in the Existing Permanent Irrigation Schemes

4) Fish Pond Use of Irrigation Water

In the Study area, there are fish ponds established either independently or combined with irrigation system. Table 2.4.2 shows the number of existing irrigation schemes dealing with fish pond. It can be observed that sizable number of existing irrigation schemes are already providing water to fish ponds; as for permanent irrigation schemes, 35 schemes out of 67 in Northern province and 20 schemes out of 37 in Luapula province, as per temporary irrigation schemes, 308 schemes out of 850 in Northern province and 128 temporary irrigation schemes out of 174 in Luapula province are operating fish cultivation to aim at increasing cash income as well as improvement of malnutrition.

Table 2.4.2 The Number of Irrigation Scheme with Fish Pond

Province	Permanent Irrigation Scheme			Temporary Irrigation Scheme			Total		
	No. of Site	With Fish Pond	Ratio	No. of Site	With Fish Pond	Ratio	No. of Site	With Fish Pond	Ratio
Northern	67	35	53%	850	308	36%	917	343	37%
Luapula	37	20	32%	174	128	78%	211	148	70%
Total	104	55	46%	1,024	436	42%	1,128	491	44%

Source: Inventory Survey by JICA Study Team

2.4.3 Current Utilization of Irrigable Land

Table 2.4.3 and Table 2.4.4 show present situation in terms of utilization of irrigable land as well as the numbers of beneficiaries in existing permanent scheme, existing temporary scheme and proposed/identified scheme in the study area. From the table, following are identified:

- ◆ In general, the rate of operation in terms of actual area being irrigated is still low against potential irrigable area. In the permanent irrigation scheme of both provinces, they are irrigating only 12 % of potential irrigable area. Likewise, just 36 % of irrigable land is utilized in the temporary irrigation schemes of two provinces. There are still some rooms to let potentiality function.
- ◆ In line with existing irrigation scheme categorized in permanent scheme and temporary ones, the inventory survey reports that 129 of proposed/Identified irrigation schemes have been listed up by district TSB office and CEOs as well. These 129 schemes divided into 86 sites in Northern and 43 sites in Luapula province, and the schemes have already been starting practicing irrigated agriculture with some area estimated 395 ha of farm land.
- ◆ Same as existing irrigation schemes, the proposed/Identified irrigation schemes have still much potential area for irrigated agriculture. Estimated potential irrigable area is 1,333 ha which is equivalent to around 3 times of present irrigated area.

Table 2.4.3 Utilization of Irrigable Land, and Numbers of Farmer (Irrigation category basis)

Province		Nos of Site (Sites)	Present Irrigated Area (Ha) (Ha/site)		Potential Irrigable Area (Ha) (Ha/site)		Present I.A / Potential I.A (%)	Nos of Irrigators at present or expected (person) (person/site)	
Existing Permanent Scheme		104	441	4.2	3,536	34.0	12%	3,727	36
Existing Temporary Scheme		1,024	1,772	1.7	4,922	4.8	36%	17,712	17
Proposed/Identified Scheme		129	395	3.1	1,333	10.3	30%	6,011	47
Total		1,257	2,608	2.1	9,791	7.8	27%	27,450	22
Breakdown									
Category of Irrigation Scheme	Province	Nos of Site (Sites)	Present Irrigated Area (Ha) (Ha/site)		Potential Irrigable Area (Ha) (Ha/site)		Present I.A / Potential I.A (%)	Nos of Irrigators at present or expected (person) (person/site)	
-Existing Permanent Scheme	Northern	67	361	5.4	3,169	47.3	11%	2,780	41
-Existing Temporary Scheme		850	1,564	1.8	4,321	5.1	36%	15,144	18
-Proposed/Identified Scheme		86	259	3.0	990	11.5	26%	4,483	52
Total		1,003	2,184	2.2	8,480	8.5	26%	22,407	22
-Existing Permanent Scheme	Luapula	37	80	2.2	367	9.9	22%	947	26
-Existing Temporary Scheme		174	208	1.2	601	3.5	35%	2,568	15
-Proposed/Identified Scheme		43	136	3.2	343	8.0	40%	1,528	36
Total		254	424	1.7	1,311	5.2	32%	5,043	20

Table 2.4.4 Utilization of Irrigable Land, and Numbers of Farmer (by Province)

Province		Nos of Site (Sites)	Present Irrigated Area (Ha) (Ha/site)		Potential Irrigable Area (Ha) (Ha/site)		Present I.A / Potential I.A (%)	Nos of Irrigators at present or expected (person) (person/site)	
Northern		1,003	2,184	2.2	8,480	8.5	26%	22,407	22
Luapula		254	424	1.7	1,311	5.2	32%	5,043	20
Total		1,257	2,608	2.1	9,791	7.8	27%	27,450	22
Breakdown									
Province	Category of Irrigation Scheme	Nos of Site (Sites)	Present Irrigated Area (Ha) (Ha/site)		Potential Irrigable Area (Ha) (Ha/site)		Present I.A / Potential I.A (%)	Nos of Irrigators at present or expected (person) (person/site)	
Northern	-Existing Permanent Scheme	67	361	5.4	3,169	47.3	11%	2,780	41
	-Existing Temporary Scheme	850	1,564	1.8	4,321	5.1	36%	15,144	18
	-Proposed/Identified Scheme	86	259	3.0	990	11.5	26%	4,483	52
Total		1,003	2,184	2.2	8,480	8.5	26%	22,407	22
Luapula	-Existing Permanent Scheme	37	80	2.2	367	9.9	22%	947	26
	-Existing Temporary Scheme	174	208	1.2	601	3.5	35%	2,568	15
	-Proposed/Identified Scheme	43	136	3.2	343	8.0	40%	1,528	36
Total		254	424	1.7	1,311	5.2	32%	5,043	20

2.4.4 Designing and Construction in Irrigation Schemes

It is said that development of irrigation schemes in the study area is divided into two periods. As the first decade, the small holder irrigation schemes were developed by the government of the Republic of Zambia throughout the country in the 1970s and 1980s. The schemes were set-up for a number of reasons including (i) improving the livelihood of the local peoples, (ii) increased crop production, (iii) helping displaced people, (vi) improved foreign exchange earning. The government put up massive infrastructure at great cost in these schemes such as dam, diversion weir, gravity canals and water abstraction equipment including motorized pumps. Even in the study area, the irrigation schemes were established in that decade as so to mainly promote coffee growing.

The second decades of establishment of irrigation schemes concentrated in Y2000 or thereabouts with donor funded program like RIF (Rural Investment Fund, WB), JSPRF (Justice and Solidarity for Poverty Reduction Fund, Catholic Fund). Those irrigation schemes are equipped with permanent structures like concrete/masonry diversion weir, earth/concrete dam reservoir and pump system as well. according to the inventory survey done by the study team in 2009, there are 104 existing permanent irrigation schemes in the study area.



Of late years, many permanent concrete diversion weirs were constructed as a part of government program. (June 2009, Mungwi District)

At that time, the government played a roll as technical assistant to farmers through TSB staff of Provincial and District. The TSBs carried out design of irrigation facilities like dam, diversion weir, canal etc., alignment of canal with pegging, supervision on weir construction and so on. There were major parts of the government roll. TSB concerned had responsibility of those rolls. Donor fund brought local contractor to the project sites with material and construction equipment necessary like cement, iron bars, wheelbarrow and so forth.

On the other hand, the farmers contributed their labor such as transporting material, smashing stones, collection of local available material, and so on. In a case of RIF, the project requested to the farmers to contribute 25 % of whole the cost of the project.



Community based or individual small-scale irrigation schemes were established since 1940s in the earliest. In most cases, locally available material are used for making of river diversion weir as a temporarily facility. Right: Temporal weir, Left: furrow led to irrigated area. (May 2009, Mungwi District)

Apart from such movements led by the government in two periods, small-scale irrigation schemes were community based or privately constructed in most cases, which have temporary diversion weirs

made out of locally available material and/or are just withdrawing irrigation water from river/stream or *dambo*. As mentioned in the previous chapter discussing the inventory survey, there are 1,024 temporary irrigation schemes of 850 sites and 174 sites in Northern and Luapula province relatively. These irrigation sites are managed by users group or individual including his/her relatives. There are some schemes in the study area which have been practicing since 1940s in the earliest.

2.4.5 Operation and Maintenance in Irrigation Schemes

In order to grasp farmer's activity in terms of operation and maintenance for irrigation facilities, the study investigated current situation of some existing irrigation schemes having permanent irrigation facilities such as concrete diversion weir, dam reservoir for gravity irrigation system and pump irrigation system as well.

As mentioned above, construction of permanent irrigation facilities were intensively carried out from late 1990s to early 2000s as a part of the government program brought some donor funds. At a lapse of about 10 years, the farmers in most cases of existing irrigation schemes are facing with some issues/problems on operation and maintenance works of their irrigation facilities constructed at that time from technical and financial aspects.

Issues/problems revealed through the investigation concerning operation and maintenance are summarized as follows;

Maintenance Works:

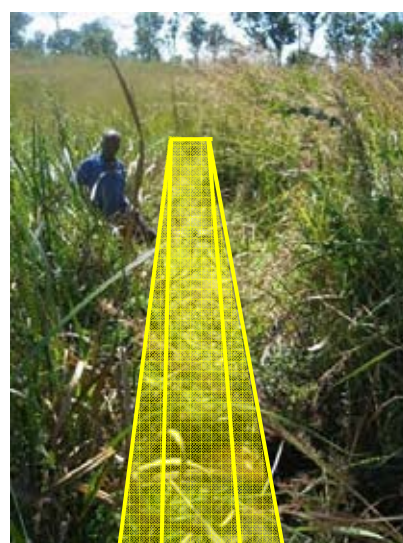
In most of the existing irrigation schemes, clearing, mowing weeds, de-silting are listed as major items of maintenance works in/around the concrete weir and the furrow and then the farmers regularly carry out those works through contributing their own labors. It seems that such kinds of maintenance works are technically easier for the farmers, even from financial aspect.

Mending Works:

In comparison with the tasks mentioned above, however, it seems that carrying out mending works of facilities are relatively difficult for the farmers due to both technical and financial reasons under the present circumstances which the farmers were placed.

There is a site which the farmers gave up to practice irrigation farming due to serious damage on the concrete diversion weir constructed under RIF or other program. The project completed its weir construction works including canal alignment in 1997 and then the facilities handed over to the farmers group. The concrete weir, however, had gradually taken on an aspect like seepage underneath the weir, sinking the weir body because of muddy foundation on the construction site of weir, and so on. The farmers had been coping with that problem by mainly using soil/grasses, which means that there is a difficulty for them to purchase even a little amount of cement, to plug the holes causing seepage, but the weir was abandoned at long last and the farmers gave up to practice irrigation farming since 2007, which was ten years after the weir was constructed.

The furrows running in existing irrigation schemes in the study area are in almost same situation as well as the weir. As is often the case with unlined furrow, almost of unlined furrows in the study



A weir abandoned being covered over with grasses.
(June 2009, Luwing District)

area have leakage/seepage problem along its distance. Even lined furrow, it is usually made by masonry, same issues often happen, which is caused by breakage of lining due partially to poor quality of construction. The farmers have been struggling to reduce water leakage by using locally available material again here same as weir mending.



Left: In the case of unlined furrow, the more the length of furrow is longer, the more water leakage becomes much. Right: The farmers try to repair damaged portion in the furrow by using locally available material like soil, stones, and etc. except cement due to financial reason. The maintenance works should be carefully carried out to find signs of damages in advance. (June 2009, Mungwi District)

At Muwambazi irrigation scheme in Mbala district, Northern province, the farmers has been cramming plenty of soil into the holes along the distance of unlined furrow so as to plug the rat holes appearing at bottom and wall of the furrow and avoid the water leakage. They are spending their time and labor to cope with water leakage from the furrow. The maintenance and repair works are carried out once per week in a season from May to November. This measure by using soil scrapped off from ground, however, has been causing environmental issue. The soil used for prevention of water leakage deposits layer of mud in the stream so that turbid water flows out downstream of the river basin as well as land degradation.



Unlined furrow requires much repair works to avoid water leakage/seepage. In order to plug the holes in the furrow, plenty of soils scrapped of from the ground are used and then downstream of the river is disturbed by the soils flowing out through the holes. (June 2009, Mbala District)

Repair of pump equipment, furthermore, is probably quite difficult for ordinal farmers due mainly to technical and financial issues. Even if it may afford for the farmers to perchance some spare parts of pump equipment, they don't know how to fix and/or how to repair them in many cases. It seems that almost of such programs didn't train the farmers before handling over pump machine to the farmers. Furthermore, arising in price of fuel makes the farmers difficult constantly operate the pump irrigation system to get profit from it this day. Molowani pump irrigation site in Kasama district, Northern province, is not fully operated as compared to original plan due partially to lack of knowledge of pump

repair and depletion of water resource for lifting as well. The concrete reservoir to store lifted water has not been functioned any longer.



A pump irrigation site suspended its operation in 2002 due to deficit of water volume to be lifted up and lack of knowledge to repair pump equipment.
Left: Engine pump provided in 1997, Right: Water tank not utilized any longer (June 2009, Kasama District)

Operation and Water Control

As for operation of irrigation facilities, water control at the diversion weir is a serious issue for the farmers. The structure of weir makes the farmers difficult to properly control the inflow of water to be withdrawn into the furrow because almost of the weirs are not equipped with water control device like control gate. Although it exposes to farmers themselves to danger, they are obliged to put stones and some other local available material in the outlet of the weir so as to intake proper amount of irrigation water.

While there are such sites, some sites equipping stop-log of timber board are there and then the farmers are properly operating the water by using it.

The farmers in the study area practice rotational irrigation to evenly share very much limited water on farm level, particularly during the peak irrigation period.



A permanent weir without any water control devices like a gate. The users put stones at the outlet of the weir as to operate amount of water flowing into the furrow. (June 2009, Mungwi District)



A permanent weir equipped with stop-log gate of timber board. The farmers operate the gate to adjust water volume for meeting water requirement on the irrigated field, (June 2009, Chinsali District)

According to the field surveys which have been carried out in both Luapula and Northern provinces so far, almost all the existing irrigation schemes are not equipped with water control gates at the place withdrawing stream water regardless of the scheme size as mentioned above. A full amount of stream water withdrawn by a simple structure, therefore, runs into the canal with no limitation against capacity of the canal. Under this circumstance, it is suspected that flood may occur on the field, particularly in rainy season. In order to avoid flood in the field, farmers control the water near/in the field by blocking the off-take along the canal or the entrance of ridge in field, as long as results of interview survey are taken into consideration. However, it may need more detailed investigation in the rainy season to see what is actually happening in the field in terms of water control and flood.



In order to protect the farm plots from flood, entrance of the ridge is blocked by soil, grasses, and so on (circles on the photo).

Farmers Organization:

It could say that little understanding of facility maintenance among the farmers is an issue, too. It seems there are some people hardly aware of the importance of maintenance works they have to do. Actually, some leaders of the community or members of maintenance committee express their dissatisfaction about nonparticipation in the maintenance works of people who are supposed to do their responsibility.

On the occasion of handing over the irrigation facilities constructed under donor's fund to the farmers, the project was supposed to issue some certificates to the farmers group, which must state responsibility for operation and maintenance to be carried out by the farmers. There are, however, some sites (farmers) which didn't exchange such kind of document between the government and the farmers. There are some farmers who don't know even the existence of the papers, too. This may partially be one of the causes of farmer's behavior in terms of participation in maintenance works.

Proprietary Rights:

As for the proprietary right of the facilities, on the other hand, the farmers are sure that the said right belongs to them. As mentioned in the preceding paragraph, the proprietary rights of irrigation facilities were transferred to the scheme/farmers together with responsibility for operation and maintenance of their properties after completion of construction period. It seems, however, that there is a gap of understanding concerning rights and duties in regard to irrigation facilities the farmers are dealing with.

Water Rights:


Another issue on the schemes is water rights, which fall under the jurisdiction of the Department of Water Affairs of the Provincial Water Office. At present, the department calls for all the irrigation schemes to obtain the said rights. Regardless of the size of irrigated area or amount of water withdrawn, those who abstract water from any water resources are required to gain water rights. It costs ZMK 5,000 to have a complete set of application forms and then needs another cost for renewing the right yearly by annual. It is said that it costs ZMK 150,000 or some more. The application forms are requesting some technical advice which should be stated by TSB concerned, like sketches, dimensions of the irrigation schemes, and so forth.

Regarding the water right, the situations that have been made so far vary widely on scheme by scheme. Some of the schemes have already gained the right, some of them are under applying or some of the farmers are not aware of this. In time to come, the water right should be cleared so as to avoid water conflict among the users of it, which would be expected to share for not only agriculture/irrigation but also domestic/industrial usage.



As an issue which was observed through field survey, apart from issues on operation and maintenance mentioned above, there are pump irrigation sites where is not appropriately operated as planned because of inadequate plan/design from engineering aspect such as lack of capacity of pump to lift the water enough up to water reservoir, inadequate selection of pump sets, etc. This doesn't attribute farmers who were expected as beneficiaries of the project, but resulted from planner or designer of facilities who lacked attitude to do it. Pump irrigation system should be carefully planned and designed by an expert in it.

Table 2.4.7 and Table 2.4.8 summaries current situation of operation and maintenance and dimensions on surveyed existing irrigation schemes in Northern province as of July, 2009.

Table 2.4.5 Current Situation of Operation and Maintenance in Existing Irrigation Schemes




District /Camp /Name of Scheme	Outline, Current Situation of the Scheme	Operation & Maintenance being carried out
Mungwi /Chyonya /Shangila Cooperative	<ul style="list-style-type: none"> - Irrigation system of the scheme is gravity system operated by earth dam with furrow. - The scheme was established back to 1980s for coffee growers. - Number of members is 55 irrigators at present. - From 1994 to 1998, Government brought material for coffee cultivation such as seed, chemical, sprayer, etc. under LINTCO Program. - By that time, the name of scheme was Chonya Coffee Growers. - After that, the farmers loss their interesting to grow coffee because of suspending of the Government support and difficulty to find the market for coffee. - In 1997, members of the scheme requested to Government (MACO) to construct reservoir and then RIF (Rural Investment Fund) were applied. - RIF supplied material for dam construction except labors and local available material such as bricks, stones, sand, etc., which can be collected by farmers. - MACO (TSB) played a roll as supervision of dam construction and surveying furrow alignment. - The members contributed their labor, local available material, and so forth based on the procedure of RIF. - Member fee of the scheme is set up at 25,000 kw/year.  <p style="text-align: center;"><u>Chyonya Dam Embankment</u></p>	<ul style="list-style-type: none"> - The scheme forms maintenance committee and then the committee makes annual action plan. - Major items of maintenance works for furrow are cleaning, de-silting, mowing etc., which are supposed to be carried out twice a year from March to September every season. - There are some parts leaking water (Seepage) along the furrow due to non-lined. - In addition to seepage, the bed slope of furrow is not proper because excavation work of the furrow was done by farmers only without any supervision. - As for dam facilities, clearing, cutting grass are items of maintenance works being done so far once per season from April to May. - Some rehabilitation works like masonry work to protect outlet of the dam from soil erosion is irregularly being done. - All the members are expected to participate in that maintenance works. - The scheme members say that it is difficult to continuously rehabilitate wrong parts because of technical and financial reasons. - They need technical support to make the bed slope correct and financial support to purchase some material like cement for rehabilitation of the dam. - As for operation of water distribution, farmers are struggling to control water at dam because the dam isn't equipped with any water control devices like a gate. - They, therefore, put some stones in the outlet of the dam to control the amount of water flowing into the main furrow. - In recent years, Due to low water level in the dam, there is often time when irrigation water doesn't flow into the furrow due to low water level in the dam, especially from September to October. - The proprietary rights of those irrigation facilities belong to the farmers, but there is no official documentation exchanging between the Government and the farmers, which states responsibility of operation and maintenance of irrigation facilities.
Mungwi /Chyonya /Daudi Mulusa Irrigation Scheme	<ul style="list-style-type: none"> - Irrigation system of the scheme is gravity system operated by concrete river diversion weir with furrow. - The scheme introduced concrete river diversion weir in 2000 under RIF program. - The water flowing down into the furrow is used for not only irrigation but also family use like cooking, washing, etc. - 10 irrigators are enjoying with 1.5 ha of present irrigated area. - Potential area could be estimated at 15 ha. 	<ul style="list-style-type: none"> - The scheme forms maintenance committee and then the committee formulates annual maintenance action plan. - Major items of maintenance works are clearing, mowing, de-silting, etc., which are carried out twice a year in April and September. - Although all of the users are expected to participate in the maintenance works, some villagers who are using water for family use don't attend the works. - As a part of maintenance works, they have some parts to be repaired along the furrow causing water leakage by holes. - The irrigators have a plan to rehabilitate them, but the plan has been delayed due mainly to financial issue. - As for operation of water distribution, TSB trained the farmers water control to share properly water


District /Camp /Name of Scheme	Outline, Current Situation of the Scheme	Operation & Maintenance being carried out
		<p>among them.</p> <ul style="list-style-type: none"> - When it happens a heavy rainfall, they operate wooden stop-logs placed at the weir as spillway to avoid over flowing into the furrow. - In addition to the way mentioned above, the inlets of each plot are closed to prevent the plots from floods/inundation on the field level.
<p>Mungwi /Ngulula /Ngulula Farmers Group</p>	<ul style="list-style-type: none"> - Irrigation system of the scheme is gravity system operated by concrete river diversion weir with furrow. - The scheme started abstracting stream water for irrigation farming back in 1952 by using sand bags. - In 1987, a catholic donor (Baptist) funded to construct masonry diversion weir to the scheme. - In 2001, the furrow was lined by RIF program. - Present irrigated area is estimated at 10 – 12 ha with 3.5 km of furrow. - Potential irrigable area is supposed to be 25 ha. - Currently, condition of the weir is good, but the furrow is in bad condition due to parts of side seepage.  <p><i>Intake structure (No water control devices)</i></p>  <p><i>Canal wall broken is left as it is.</i></p>	<ul style="list-style-type: none"> - The maintenance committee composed of 12 members sits to make action plan together with fish farmers club called TUTEMWANE FISH FARMER CLUB. - They set up maintenance plan and then inform ordinal farmers of the details of plan. - Items of maintenance are cleaning, slashing grasses, removing vegetation, de-silting, scratch of moss plant, and so on. - April and September are the time for maintenance. - All the farmers are supposed to participate in the maintenance works, but some of them who are not aware of benefit from irrigation farming are not coming to the works. - Once they tried to repair the furrow by using cements which were bought by the farmers, but they couldn't manage it due to lack of knowledge of technique to do it. - On the other hand, through JSPRF (Justice and Solidarity for Poverty Reduction Fund) program some of the farmers got techniques for rehabilitation of the furrow. - Based on the experiences, it may be said that the farmers has ability to maintain and repair the irrigation facilities in greater or lesser degrees if they were trained. - There is, however, financial problem as always. - Under supervision by TSB, there is a plan to introduce water delivery gate at division box for proper water distribution, but the plan has been delayed. - While Gates have already fabricated by PS office, other necessary material like cement has not yet prepared by JSPRFT. - This situation may say that the farmers tend to wait for support from outside because of lack of financial ability. - As for operation of water delivery, they block the inlet of weir to control water volume flowing into the furrow by using stones and rocks. The farmers feel it dangerous to pile stones up. - The proprietary rights of irrigation facilities existed belong to the farmers, but there is no official documentation to be exchanged between the Government and the farmers because the scheme was developed in old days. - The scheme has already got a receipt of water right

District /Camp /Name of Scheme	Outline, Current Situation of the Scheme	Operation & Maintenance being carried out
		<p>in 2007 and then they are waiting for certificate. The cost for application of water right is ZMK 5,000, and renewal cost is about ZMK 150,000 per year..</p>
<p>Mungwi /Ngulula /Tikondane Irrigation Scheme</p>	<ul style="list-style-type: none"> - Irrigation system of the scheme is gravity system operated by concrete river diversion weir with furrow. - In 2000 the scheme was approved as one of RIF program by MACO, TSB. - Concrete diversion weir was constructed on Chiba River at that time. - Dominant crops under irrigation are Cabbage, Irish potatoes, Rape, Ground nuts, Green maize, Tomatoes, Beans, and so forth. - In rainy season, the farmers grow Maize, Cassava, Rape, Tomatoes, Sorghum, Soya beans, etc. 	<ul style="list-style-type: none"> - This scheme forms maintenance committee, too. - The information in terms of maintenance works is brought by the committee to ordinal farmers. - Major maintenance items are cleaning, de-silting of the weir and the furrow. - Maintenance works are done once per year in June. - As a part of maintenance, the farmers plan rehabilitation works to damaged parts along the furrow including lining but it has been delayed due mainly to lack of technical and financial difficulty same as other sites. - The farmers doesn't have any devices on the weir to control water flow. - The scheme has not got water right yet.
<p>Mungwi /Misamfu /Muwashe Irrigation Scheme</p>	<ul style="list-style-type: none"> - Irrigation system of the scheme is gravity system operated by concrete river diversion weir with furrow. - This irrigation scheme has been practicing irrigation farming since 1980s. - By the Government technical and Donor's financial supports (JSPRF), a concrete weir was introduced at the scheme. - In 2008, the Government contributed technical assistant like selection of canal alignment, supervision of construction, and so on. - JSPRF funded to purchase constriction material such as cement, iron bars, etc. and equipments like wheelbarrow. - The farmers of scheme contributed their casual labor like excavation work of furrow. - Although 50 farmers are expected to be benefited, only few members are enjoying irrigation farming because the furrow passes muddy place causing water leakage from the furrow. - Irrigated are is currently estimated at about 8 ha. <div style="text-align: center;">  </div> <p style="text-align: center;"><i>Concrete Diversion Weir constructed in 2008</i></p>	<ul style="list-style-type: none"> - Maintenance works of this scheme are limited to the furrow for the time being because of the weir is still new. - Major items on maintenance are cleaning, de-silting, and re-shaping. - The farmers carry out those works twice a year in April (or May) and September (or October) under management of maintenance committee which composed of 8 members. - In connection with maintenance, they are struggling to seepage caused by non-lined furrow. - The farmers eagerly expect to receive technical assistant for re-alignment of the furrow to make irrigation water flow properly and for protection of seepage. - CEO told the farmers that the proprietary rights belong to the scheme, and then the farmers should take care of their properties. <div style="text-align: center;">  </div> <p style="text-align: center;"><i>Lined furrow (20m), Un-lined parts still being expanded</i></p>
<p>Kasama /Chitambi /Chawamire Pump Irrigation Scheme</p>	<ul style="list-style-type: none"> - Irrigation system of the scheme relies on <u>pump system</u>. - The scheme was originally started as vegetable grower group. 	<ul style="list-style-type: none"> - The pumps are not fully utilized as compared to original plan because water resource has been decreasing since 2002. - Even maintenance of pump, it may be affordable to

District /Camp /Name of Scheme	Outline, Current Situation of the Scheme	Operation & Maintenance being carried out
	<ul style="list-style-type: none"> - After establishment, their activity was not so functioning well for certain years. - In 1996, the scheme re-started its farming with 50 members. - Following the year, the scheme was accepted to apply RIF and then they got 2 portable pumps, some pipes and hose, constructed water tank and reservoir. - Its pump irrigation practice, however, was suspended in 2002 due to deficit of water volume lifting up by the pumps. 	<ul style="list-style-type: none"> purchase some spare parts for pump equipment, but quite difficult for them to fix it. - It seems that the farmers received pump machinery without any training in terms of maintenance/repair on pump mechanics. - A rise in price of fuel, which is almost three times compared with 2002 as of now, is considered as a reason of insufficient operation of the pumps, too. - Price of fuel in 2002: ZMK 2,000 – 3,000 - Price of fuel as of now: ZMK 6,800 - 7,000 - It seems that the pump irrigation system is quite difficult to be profitable. - Cost and Benefit analysis should be carried out when they re-start their pump irrigation in future.
Mbala /Luchacha /Mwambazi Irrigation Scheme	<ul style="list-style-type: none"> - Irrigation system of the scheme is gravity system operated by masonry river diversion weir with furrow. - The scheme started irrigation farming back to 1981 as a new site by their own initiative. - The furrow covers 3 villages, which are Kele, Chitema, and Pili. - There are 4 fish ponds in the irrigation area, but no any others out of scheme area. - A lots of loose rocks piled up on the diversion site allows leakage of water withdrawn. - The furrow has many mouse holes causing leakage of water. - These conditions are disturbance to get larger irrigable area. 	<ul style="list-style-type: none"> - In order to plug the mouse holes along the furrow, the farmers cram soil into the hole. - They are spending their time and labor to cope with water leakage from the furrow. The maintenance and repair works are carried out once per week in a season from May to November. - This measure by using soil scraped off from ground has been causing environmental issue. - The soil used for prevention of water leakage deposits layer of mud in the stream so that turbid water flows out downstream of the river basin as well as land degradation.
Mbala /Mbala Center /Chinenke Irrigation Scheme	<ul style="list-style-type: none"> - Irrigation system of the scheme is gravity system operated direct abstraction of water flowing under surface. - The scheme was established in 1979 by farmers' initiative. - After that, the scheme was invested in from 2000 to 2003 and 2009 under RIF and the government investment respectively. The latter was about ZMK 600 million KW - At that time, the government distributed construction material like cement, equipment lime wheelbarrow and skilled labor. - The farmers contributed their labor for excavation of canal, crashing stones, etc. as volunteer. - At present, government has a plan to carry out canal lining construction in 2009. <div> <p><u>Lined furrow of Chinenke irrigation scheme</u></p> </div>	<ul style="list-style-type: none"> - Major maintenance items are mowing grasses, de-silting of the furrows, which carried out quarterly, June, September and December. - At the site of water source, seepage from the furrow is avoided by using sandbags. - Once, the farmers repaired damaged portion of the furrow by using their capital for purchasing some packets of cement. - Water users' fee is ZMK 20,000/person/3months. - While the farmers think of themselves that they are able to manage easy repair works, they need technical assistant and financial support from TSB and government respectively. - The farmers eagerly want to hold a training course to get know-how for operation and especially maintenance. <div> <p><u>A simple gates to properly distribute the irrigation water</u></p> </div>

District /Camp /Name of Scheme	Outline, Current Situation of the Scheme	Operation & Maintenance being carried out
Luwingu /Muchinka /Muchinka Irrigation Scheme	<ul style="list-style-type: none"> - Irrigation system of the scheme is gravity system operated through masonry river diversion weir with furrow. - The scheme started irrigation farming back to 1997 when RIF was introduced. - They have suspended irrigation farming because of plenty of water leakage from the concrete weir since 2007. - Although there were 35 beneficiaries at that time, the number is decreasing by 25 beneficiaries. - Dominant crops grown under irrigation are Tomatoes, Onion, Cabbage, Rape, Maize, Sugar Cane, etc. - Dominant crops grown under rainfed are Maize, Sugar cane, Beans, Ground nuts, Potatoes, etc. - While there is a fish pond in the irrigation area, no any others out of scheme area.  <p style="text-align: center;"><u>The concrete weir is no longer used.</u></p>	<ul style="list-style-type: none"> - Since 2007, after they have suspended operation of their irrigation scheme, maintenance works have not been carried out at all. - The farmers said that they need a training to carry properly out repair and maintenance works. RIF didn't give them any training for repair and /or maintenance. - The farmers are thinking that water leakage underneath the weir may be caused by a lack of quality of construction done by a local contractor. - They recognize that proprietary right of the irrigation facilities on the field belong to them. - On the other hand, the farmers didn't know that all the irrigation schemes are asked to get water right. - They think that profit from irrigation is less than their expectation.  <p style="text-align: center;"><u>The furrow is covered with grasses, too.</u></p>
Luwingu /Mufili /Lufubu Resettlement Scheme	<ul style="list-style-type: none"> - Irrigation system of the scheme is gravity system operated through masonry river diversion weir with furrow. - The scheme was established in 1980s and then the existing irrigation facilities were constructed in 1997 under RIF. - The intake structure directly withdraws dambo water into the furrow - There are two furrows which are lined furrow carried out under RIF and unlined one respectively. - Current irrigated area is 1.5 ha with cultivation of Rape, Tomatoes, Cabbage, Onion, Irish potatoes, Chinese cabbage, etc. under irrigation. - Dominant crop under rainfed are Maze, Cassava, Ground nuts, beans and so on. - There are 96 irrigators (settlers) in the scheme. 	<ul style="list-style-type: none"> - While there are maintenance items for the furrow like clearing, mowing and etc. which are carried out twice a year (August and mid. April), the farmers don't take care of the weir because the weir is located in dambo where makes people get in their way by its inundation throughout a year. - Although the weir has big cracks, the farmers have left them as they stand. - They don't have any technical know-how in terms of concrete work like repair of concrete diversion weir same as the one they have. - The farmers have financial problem, too. Although the farmers have got profit from irrigation than their expectation, purchasing cement is still not affordable for them. - They practice rotational use of irrigation water so as to evenly use the water especially in peak irrigation season.
Chinsali /Lukaeshi /Ilonfiu Farmers Group	<ul style="list-style-type: none"> - Irrigation system of the scheme is gravity system operated through masonry river diversion weir with furrow. - The structures were constructed in 2001 under RIF. - The furrow is lined with 20m of distance, rest is unlined. - The number of irrigator is 15 members. - Dominant crops grown under irrigation are Tomatoes, Onion, Cabbage, Rape, Banana, etc. 	<ul style="list-style-type: none"> - When the study team visited, the masonry diversion weir and the furrow were maintained well. - The farmers carry out maintenance once a year under the guidance of the maintenance committee. - There is no serious damage on the facilities so far. - The weir has stop-log gate of wooden board to control water to be taken.

District /Camp /Name of Scheme	Outline, Current Situation of the Scheme	Operation & Maintenance being carried out
	 <p style="text-align: center;"><i>Intake and Wooden Stop-log</i></p>	 <p style="text-align: center;"><i>Diversion Weir</i></p>
Chinsali /Nkura /Milenge (Ilondora)	<ul style="list-style-type: none"> - Irrigation system of the scheme is gravity system operated through masonry dam reservoir with furrow. - The structures were constructed from 1999 to 2000 under RIF so as to promote coffee growing. - The scheme, however, is not fully operating due to several reasons like poor organization of the farmers, unsuitable kind of soil for coffee growing, - Although 100 HHs were supposed to be beneficiaries as original plan, only 3 persons are using reserved water for gardening at present. - Instead of irrigation use, the Department of Fishery plans to use the dam for fish culture. - The furrow dug on left bank of the area is completely abandoned at present because the side wall is eroded due to sandy soil. - The dam structure has no any damages so far. - Although the dam was supposed to be equipped with water control devices like gate, pipe, and so on, the local contractor didn't introduce them, 	<ul style="list-style-type: none"> - It seems that there are several issues/problems at the site due to particulars - The scheme is hardly functioning. - The farmers maintain the dam 3 times a year in July, August and October. - Major items of maintenance works are clearing, mowing, leakage repair in the furrow, etc. - The farmers intend to re-start of operation of the dam and then expand the irrigated area, but they don't know technical know-how for extension of the furrow, especially technique to cross a road. - Regarding this point, the farmers haven't called TSB for assistance yet.  <p style="text-align: center;"><i>The dam constructed in 2000 under RIF</i></p>
Isoka /Isoka Central /Kawandama irrigation scheme	<ul style="list-style-type: none"> - Irrigation system of the scheme is gravity system operated through masonry dam reservoir with furrow. - The construction of the dam structure was carried out twice for recent 10 years. - The previous dam construction was implemented in 2000. - This dam was destroyed after a couple of years from the construction of it. It might be defect in the construction of it. - The second one as new was constructed in 2007 under JSPRF, - Present irrigated area is about 5 ha and then potential is estimated at 20 ha. - Dominant crops under irrigation are Rape, Cabbage, Orange, Lemon, Coffee, Tomatoes, etc. - Dominant crops under rainfed are maize, ground 	<ul style="list-style-type: none"> - When the study team visited, the outlet of weir was closed for maintenance of the furrow. - Major items of maintenance works are cleaning, slashing, crack repair of the furrow, which are irregularly carried out when needs arise during the season from May to September. - Regarding the dam, only slashing is irregularly implemented. - Maintenance committee has been formed. - When the old dam was destroyed, the farmers couldn't manage anything due mainly to financial issue. - When cracks in the furrow appear, the members repair them. - They use sandbags for mending of the cracks because it is not affordable for them to purchase cement. Cracks in the furrow are still there.

District /Camp /Name of Scheme	Outline, Current Situation of the Scheme	Operation & Maintenance being carried out
	<p>nuts, beans, Irish potatoes, sweet potatoes.</p>  <p style="text-align: center;"><u>Lined furrow</u></p>	<ul style="list-style-type: none"> - The amount of irrigation water taken from the dam is controlled by using piece of slide gate (Timber boards). - In rainy season, the outlet of dam led to the furrow is closed so as to avoid flood on the field. The inlet of field is closed, too. - However, rainfall pouring directly into the furrow causes overtopping from the furrow. - In order to prevent the field flood in rainy season, TSB is promoting to plant Vetiva grass both side of the furrow.
Isoka /Isoka Central /Malale	<ul style="list-style-type: none"> - Irrigation system of the scheme is gravity system operated through concrete diversion weir with furrow. - The structures were constructed from 1999 to 2001 under RIF. - Out of 4km of the furrow, almost of the distance has lined. 	<ul style="list-style-type: none"> - Although plenty of cracks were found on the weir in 2004, no repair works has been carried out so far. - In addition to the issue of weir, a lot of silting can be seen in the furrow. - It was expected to be 30 irrigators at the beginning time of the project, but there are less than 10 at present. - The farmers abandoned the scheme because of a malfunction of facilities caused by inappropriate maintenance and then shifted to other places. - No one is taking care of the irrigation facilities in this day.
Isoka /Isoka central /Liwelikasya irrigation scheme	<ul style="list-style-type: none"> - Irrigation system of the scheme is gravity system operated through concrete diversion weir with furrow. - The weir was constructed from 1999 to 2000 under RIF. - The scheme has a longest class of furrow of 3.0 km. Out of 3 km, 2 km of distance has been lined so far. 	<ul style="list-style-type: none"> - The weir is silted, but it has not been cleared because they are negligent of maintenance works. - The farmers give attention to the furrow only and then they hardly mind to maintain the weir because the maintenance committee doesn't function well.
Isoka /Isoka central /Mpando	<ul style="list-style-type: none"> - Irrigation system of the scheme is gravity system operated through concrete diversion weir with furrow. - The weir was constructed in 1997 under RIF. - The furrow was lined in 2007 under JSPRF. - They were trained a know-how of economical expansion in rural area, which was promoted Swedish fund, especially civil construction method, farm management, costing and pricing of coffee, nursery of coffee and orange and so forth. - The member fee of irrigation group is ZMK 5,000 person/year. 	<ul style="list-style-type: none"> - The weir has no serious problem so far. - The farmers have repaired cracked portions of the furrow by using cement, which were contributed by themselves. (ZMK 150,000 in total) - During maintenance period, the outlet of weir is closed by using wooden board. - The farmers practice rotational irrigation to evenly share very much limited water on farm level, particularly during the peak irrigation period.
Kaputa /Kaputa central /Talwakalumo	<ul style="list-style-type: none"> - Irrigation system of the scheme relies on <u>pump system</u>. - In 1998, the water tank made out of concrete to store lifted water by potable pump and pipes were installed under RIF. - In 2005, pump house, diesel pump and sprinkler sets were introduced under USAID fund. - Farm land belongs to government resettlement scheme under Office Vice President, Department of Resettlement. - At the beginning time, the irrigation system was 	<ul style="list-style-type: none"> - According to the situation on site, it seems that the farmers are not keen on maintenance of their equipment. - The potable pump, water tank and the furrow are not in use any longer. - The diesel pump has been maintained by mechanic hired by the farmers when need arises. Wage is ZMK 100,000 per time of maintenance, which is paid by the farmers. - The farmers are burdened with rise in price of fuel to operate the pump at present, too.




District /Camp /Name of Scheme	Outline, Current Situation of the Scheme	Operation & Maintenance being carried out
	<p>planned as pump with gravity system.</p> <ul style="list-style-type: none"> - Lifted water stored in the water tank once was going to distribute to the farm land through the furrow by gravity. - It was, however, not fully functioned because lack of capacity of the pump installed. - At present, sprinkler sets are directly connected to the diesel pump. It is, however, not effectively functioning because this gives the pump over load to operate sprinklers. - Even sprinkler sets have an issue which is shortage of equipment to be attached them. <div style="display: flex; justify-content: space-around;">  </div> <p style="text-align: center;"><i>Pump equipment and house</i></p>	<ul style="list-style-type: none"> - Under current situation, some farmers introduced treadle pump, but almost of remained are obliged to do bucket irrigation. <div style="display: flex; justify-content: space-around;">  </div> <p style="text-align: center;"><i>Water tank, not in use at present</i></p> <div style="display: flex; justify-content: space-around;">  </div> <p style="text-align: center;"><i>Farmers introduced treadle pump.</i></p>

Table 2.4.6 Dimension of Existing Irrigation Schemes surveyed on Operation and Maintenance

District	Camp	Scheme	Facility	Fund	Year Implemented	Present Irrigated Area (ha)	Planned Irrigable Area (ha)	Number of Beneficiaries	Project Cost at the Year Implemented (ZMK Mill)
Munguwi	Chonya	Shangila Cooperative	Earth dam	RIF	2001	10	100	52	32
Munguwi	Chonya	Daudi Mulusa Irrigation Scheme	Concrete weir	RIF	2000	10	125	25	32
Munguwi	Ngulula	Ngulula Farmers Group	Lined furrow	RIF	2000	90	180	50	136
Munguwi	Ngulula	Tikondane Irrigation Scheme	Concrete weir	RIF	2001	10	35	25	30
Munguwi	Misamfu	Muwasha Irrigation Scheme	Concrete weir	JSPRF	2008	6	150	40	63
Kasama	Chitambi	Chawamina Pump Irrigation Scheme	Pump	RIF	1999	0.25		15	37
Mbala	Mbala Center	Chinenke Irrigation Scheme	Lined furrow	RIF	2000	17	150	350	574
Luwingu	Muchinka	Muchinka Irrigation Scheme	Concrete weir	RIF	2009	2 lima	35	20	17
Luwingu	Mufili	Lufubu Resettlement Scheme	Concrete weir	RIF	1995	2	12	24	7
Chinsali	Lukaleshi	Ilonfiu Farmers Group	Concrete weir	RIF	2000	30	60	15	109.6
Chinsali	Nkura	Milenge	Earth dam	RIF	2001	1 lima	100	100	85
Isoka	Isoka Center	Kawandama Irrigation Scheme	Concrete weir	JSPRF	2001	25	50	100	86.2
Isoka	Isoka Center	Malale	Concrete weir	RIF	1998	Abandoned	10	0	—
Isoka	Isoka Center	Liwelikasya Irrigation Scheme	Concrete weir	RIF	2001	15	30	40	102
Isoka	Isoka Center	Mpando	Concrete weir	RIF	2007	10	20	60	50
Kaputa	Kaputa Center	Talwatalumo	Pump	RIF, USAID	1996	2	25	20	1.1

CHAPTER 3 SMALLHOLDER IRRIGATION DEVELOPMENT PLANNING

Developing smallholder irrigation exclusively depends on the natural resource that is water. Needs for irrigation from the farmers therefore do not always meet the commencement of smallholder irrigation project. Potential in terms of stream flow as well as topographic condition, whether gravity diversion is feasible or not with the farmer's self-effort, should be examined as the first step. Including the confirmation of the potential as well as the feasibility, what the next steps are for developing smallholder irrigation schemes are given of the following:

3.1 Stream Flow

Stream flow is almost entirely corresponding to rainfall. Upon the onset of rainfall, stream flow starts increasing, and then as rainy season comes to the end the flow starts retarding. Throughout the dry season, almost all the streams continue reducing the flow and in some cases dry up. Discharge record is not available for those relatively small streams undertaken in this Study. Given this situation, following can be given as an idea of how the stream potential is assessed;

Visit the potential diversion site and observe the flow with the concerned farmers and ask them "if this stream dries up on the course of dry season or continues flowing until the next rainy season". If the answer is "dries up", abandon the site and move next potential site. If the stream is perennial; ask the farmers "how much flow will decrease towards the end of dry season". They may answer "the flow reduces to less than half or less than one-third as compared to the flow at the beginning of the dry season".

Try to measure the stream flow. There are two methods as elaborated in PART II "Process Description Manuals, 12. Discharge Measurement". They are 1) float measurement and 2) V-notch or rectangular notch measurement. Notch measurement usually gives accurate results, while float measurement is convenient if the stream is considerably big.

It is noted that the flow measured at the beginning of dry season does not directly entail the possible irrigable area as the flow reduces towards the end of dry season. Therefore stream flow measured at this stage should be taken as reference only. Critical issue is how much water decreases towards the end of dry season. Though farmers may inform the reduction to about half or about one third, there is a tendency to always underestimate the retarding ratio, which inevitably causes abandoning of part of the irrigation service area toward the end of dry season.

With this above in mind, it is recommended that at least at first year the development should not be ambitious or rather start with relatively small area. It is suggested that in any case no more than half of the potential area shall be developed even if the flow looks very constant, and in case that certain flow retarding is expected, the development at the first year should be limited to less than one-fifth to even one-tenth of the potential area.

Under above arrangement, some farmer members may claim that they cannot be benefited in the first year. However, with land sharing to be introduced, this claim can be ameliorated. Most of the irrigable land may belong to only handful number of land owners, so that almost all the schemes are encouraged to introduce land sharing arrangement, by which each and every member is given say half lima, and upon the harvest, the land is returned to the original owners for rainy season agriculture. In case that the land is virgin and newly opened for irrigation purpose, the village headman concerned is expected to discharge the leading role of distributing the land to members as equally as possible.

This Study deals with both simple (temporary) and permanent structures, and does recommend step-wise development. The step-wise development from simple scheme to permanent scheme can avoid over-investment in putting up expensive concrete and/or wet-masonry structure. Under this

arrangement, farmers are firstly supposed to put up simple scheme and sometime after they have practiced irrigation with the simple structure they are to improve the structure to permanent one.

It means during the irrigation practice with the simple scheme, they and the extension officers, BEOs/CEOs, can know how much the maximum irrigable area can be with the stream even by the low flow taking place at the end of dry season. From this viewpoint, this Study maintains the step-wise development whereby over-designing of permanent structure and also over-investment can be avoided.

3.2 Diversion Site for Gravity Irrigation

Gravity irrigation system starts with diversion weir. Potential diversion sites being blessed with perennial flow, the depth should not be very deep; preferably limited to 2m according to experiences. Good sites can very often be found at villagers' footpath which crosses a perennial stream and also at just upstream of natural drops (small fall).

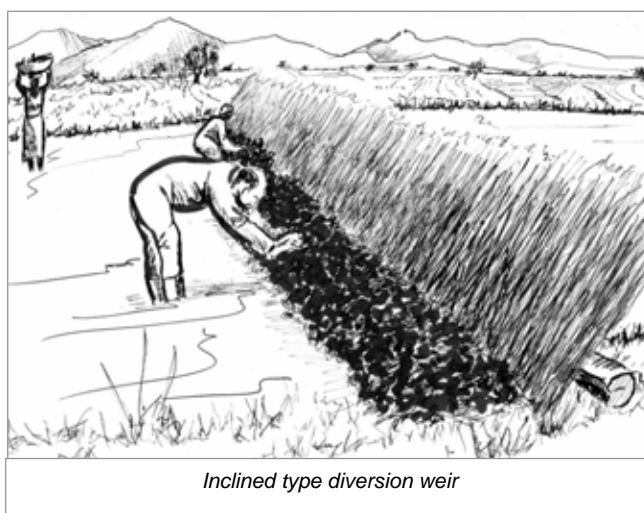
Footpaths usually traverse streams at a shallower place, forming a topographic condition of easily diverting and getting water onto the farms nearby downstream. Just upstream of natural drops (small fall) could easily lead the water into canal by gravity thanks to the elevation difference.

3.3 Development of Simple Diversion Structures

As for simple diversion structures made out of locally available materials, this Study presents following 4 types of diversion structure (for detail, refer to the Part II Process Description Manuals). In the field, however, it is not limited to just four types depending upon farmers' and extension officers' innovative ideas. In any cases, important point is to believe that diversion weirs can be constructed by using such locally available materials as wooden log, bamboo, grasses, soils, etc., and can raise the water level across even over a 20 meter width stream and as high as 1.5 meter depth.

- ✓ Inclined type diversion weir
- ✓ Single-line diversion weir
- ✓ Double-line diversion weir
- ✓ Trigonal prop supported diversion weir

In case of narrow stream, constructing diversion weir is very easy: namely, 1) put a horizontal member (wooden log) astride the both banks preferably supported by a wooden prop from behind, 2) place vertical members, on the horizontal member, of bamboos, twigs, and reed inclined to the downstream, 3) put grasses on the vertical members and then clay soil thereon. This process can be the simplest way of putting up temporary diversion weir for irrigation purpose. In fact, it takes only half a day to maximum 2 days to complete such diversion weir depending upon the width and the depth of the stream.



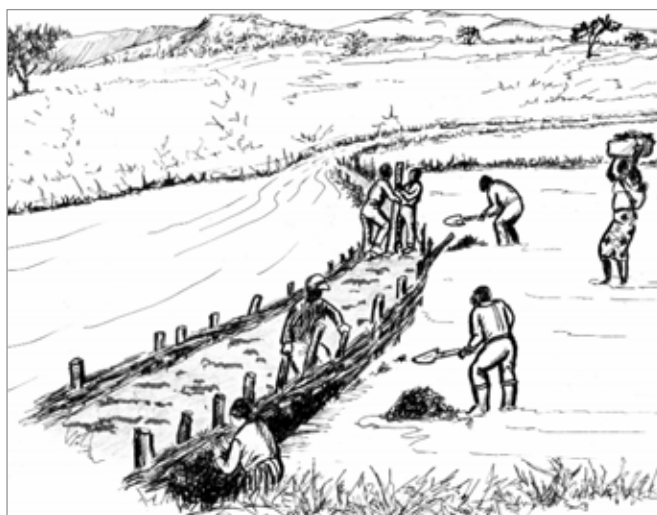
In case of wide stream, there are mainly two ways of constructing a diversion weir depending on the foundation condition: i.e. soil or rock. At soil foundation, we should; 1) drive wooden logs into the foundation across the stream preferably 30 – 50 cm interval, 2) put grasses alternately through the logs like weaving the logs, and then 3) patch clay soils upstream on the woven wall. This is called

single-line weir, which is very simple and can fit in *dambo* areas. For the construction, on condition that all the necessary materials have been well prepared in advance, it takes only half a day to maximum 2 days.

If leakage through the weir body needs to be minimized, one may make another line just downstream from the first line preferably 70 cm to 150 cm apart. Then clay soil is placed in between the two lines and compacted by footing/treadling. This double-line weir can also work as footpath for villagers. In some cases, beneficiaries may wish to use the simple double-line weir as permanent one. If the width of the weir is more than 1.0 m, there is high possibility that most parts of the weir body can remain over a rainy season. In fact, some parts would be washed away by flood. Every year, they have to mend the flushed parts or otherwise spillway structure may be introduced.

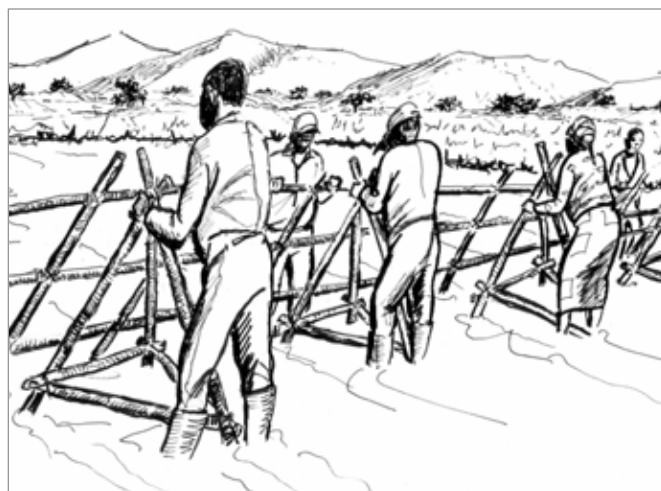


Single-line diversion weir



Double-line diversion weir

At rock foundation, wooden poles cannot be driven into the foundation. There should be some self-stand structures, which can support the weir body against water pressure. An idea is to put up trigonal props across the stream where the weir is to be established. By step we should; 1) prepare trigonal prop stand structures which support the weir body from behind across the stream, 2) put horizontal members of twig or bamboo in front of the props preferably every 30 – 50 cm interval in vertical, 3) put vertical members of twig, bamboo and reed on the horizontal members, and 4) put grasses and then clay soils thereon.



Trigonal prop supported diversion weir

3.4 Development of Permanent Diversion Structure

Permanent structure can hardly be constructed in deep *dambo* areas. In *dambo* areas, there is always a thick organic sedimentation accumulated, most of which are not consolidated yet. The foundation would therefore start sinking by the weight of the structure as exemplified in the photo right. The example shows as much as about 20cm settlement, opening a way for leakage in the beneath of the weir.



Blocks of the weir body slid down at contraction joints due to settlement of the foundation.

In fact, as the contraction joint between the concrete blocks slid down, much leakage underneath the weir body did not take place.

Otherwise leakage underneath the weir body could have stopped the weir from functioning. Therefore, this Study recommends NOT to construct permanent structure in deep *dambo* areas, and recommends to construct permanent structures on a relatively hard foundation, preferably on rock foundation.

3.4.1 Type of the Permanent Diversion Structure

This Study presents total 3 types of permanent diversion structures; namely, 1) wet-masonry wall type weir supported by buttresses, 2) concrete wall type weir supported by buttresses, and 3) wet-masonry gravity type weir. To minimize the cement volume, the first 2 structures are designed by having buttress, prop type supports. With the buttress, the body itself can stand as vertical wall-like one thereby reducing cement volume. As the height of the wall becomes taller, wall-type weir would have difficulty of standing against water pressure. Also sliding along the contact between the foundation and the weir body might place take place. In such case, more stable structure should be introduced, e.g. gravity type wet-masonry weir. Following are the standard recommendation of the types in accordance with the height:

Table 3.4.1 Recommended Type of Permanent Weir with Relevant Height

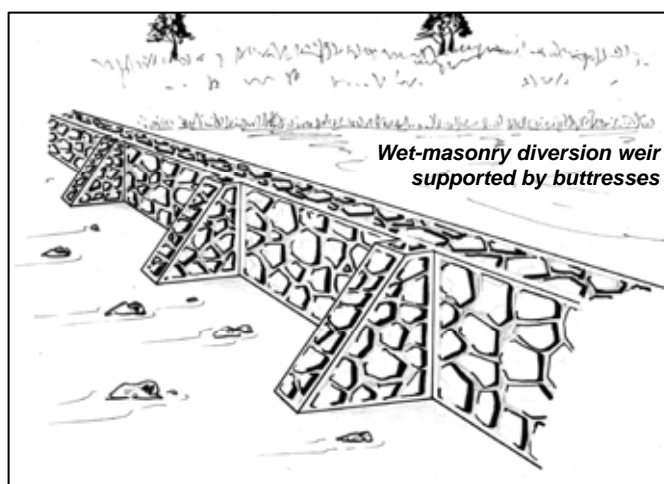
Height	Type to be Selected	Remarks
$H \leq 1.5$ m	Wet-masonry wall type	
$1.5 < H \leq 2.0$ m	Wet-masonry/Concrete wall type	According to the site condition either type be applied.
$2.0 < H \leq 3.0$ m	Concrete wall type	No more than 3.0m height shall be tried.
$2.0 < H \leq 5.0$ m	Wet-masonry gravity type	1) No more than 5 m height shall be tried under direct force account construction. 2) Between 2 – 3 m of height, either type be applied according to the site condition, e.g. in case that there are lots of stones, this type can be applied.

Note: the height (H) in the table shall not include the height of basement., Source: JICA Study Team

1) Wet-masonry Wall Type Weir

Wet masonry weir is made of stones/ rocks with cement mortar. Wet-masonry weir is not much familiar in Zambia but it can apply to upland streams where stable foundation, e.g. rock foundation, can be found. Cement mortar is applied in this structure, but farmers may try clay-mortar as the first step constructing temporary weir. Thereafter, they may move to the cement mortar wet-masonry weir, which is permanent.

In applying this permanent weir, meandering of the stream should be well observed. Under any possibility for the stream to meander, no this kind of permanent weir should be constructed. From this point of view as well, farmers can try temporary weir made out of stones/rocks with clay-mortar where possible. Sometime after they have observed the diversion situation, they may move to the permanent one. No more than 2 m height shall be tried for this type of masonry wall type structure, and preferably the height shall be limited less than 1.5m (excluding the thickness of foundation basement).



2) Concrete Wall Type Weir

Concrete made weir functions almost same way as those of cement-mortar masonry weir. This, however, is much higher in construction cost and needs skilled labor or at least qualified technical assistance in mixing, placing and curing concrete. Placing concrete requires formwork, which also needs skilled carpenters. Therefore this Study recommends this type of weir only in sites where wet-masonry weir can hardly be constructed.

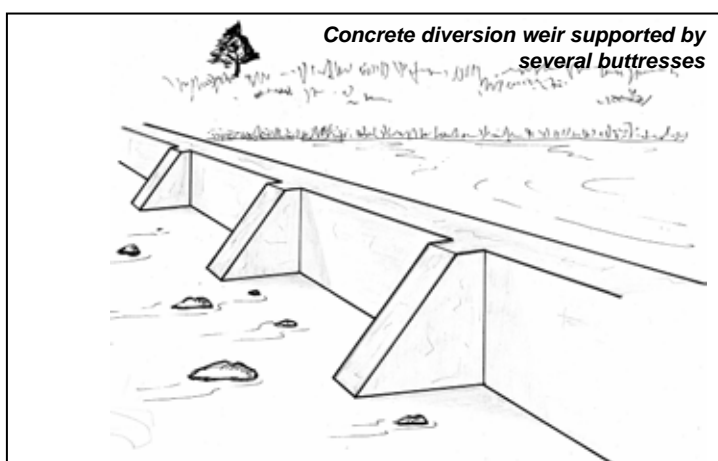
If a diversion weir requires more than 1.5m - 2m height, it is considered that wet-masonry type weir becomes difficult to stand against water pressure unless otherwise well supported by continuous buttress from the behind (in this case, the cross section of the weir becomes gravity self-standing type weir even against water pressure). With this situation, following are recommended:

Weir height;

Less than 1.5 – 2.0 m: Wet-masonry weir supported by several buttresses,

More than 1.5 – 2.0 m: Concrete wall weir supported by several buttresses (however the height not more than 3.0m in any case)

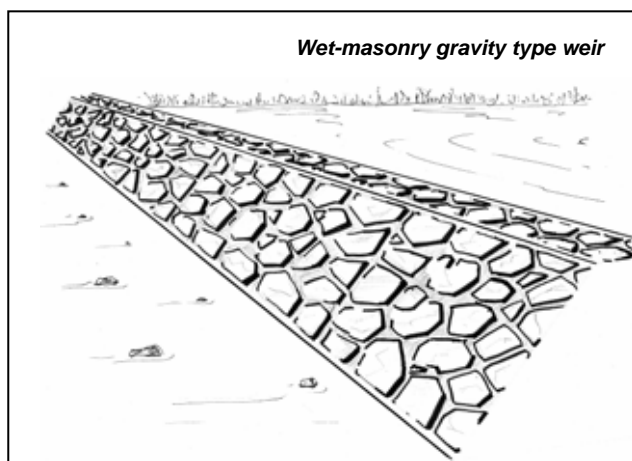
In case that the height is between 1.5 m and 2.0m, the type can be selected according to the site condition; namely, where there are lots of stones and cobbles available and also where there is a solid foundation, wet-masonry weir may be selected otherwise concrete weir should be selected. It is also remarked that without irrigation/civil engineer at site, no weir more than 1.5 m above the ground level should be constructed due to high risk of accident.



3) Wet-masonry Gravity Type Weir

In case height of wall becomes more than 3.0 m, there could be a difficulty for wall type weir to stand

water pressure even if the body is constructed with concrete. Even if the wall itself can put up with the pressure, the foundation may not be able to stand to seal the water because contact line between the wall base and the foundation is not long due to the nature of the wall type structure. Therefore, this Study does not recommend to construct wall type weir in case of the height being more than 3.0m, and in such case gravity type weir should be introduced instead.



Since gravity type weir requires mass volume of stuff in the body, wet-masonry structure should firstly be considered. Wet-masonry structure can be cheaper than that of concrete made ones. Likewise, if there are lots of stones at the site, this gravity type wet-masonry weir can be tried instead of concrete wall type even in case that the wall height is less than 3.0 m.

Since the construction modality proposed under smallholder irrigation is of direct force account, no civil contractor is to be engaged in the construction. It means all the construction works are to be undertaken by hired skilled labors supervised by district TSB/provincial TSB and unskilled labors who are the beneficiary farmers. In this arrangement of construction, there could be a high risk of accidents in putting up a diversion structure more than 5m height even if it is a gravity type wall. Therefore, this Study recommends that no diversion structure whose height is more than 5m should be tried.

3.4.2 Design of the Permanent Diversion Structure

To design a diversion structure, forces on the wall shall be examined and well undertaken¹. The forces on the wall may be a combination of hydraulic and the body weight of the structure as well as resistance force. The magnitude of hydraulic force depends on the density and the depth of the retained materials (mostly it is water). The force will act at the centre of gravity of the pressure distribution diagram. The pressure is zero at the water surface and will increase linearly as the depth of water increases.

The weight of the structure should be sufficient to counteract the tensile stress caused by total lateral load of the water. The weight of the wall depends on the materials used for construction. The force due to its weight passes through the centre of gravity for the structure. This centre depends on its shape. The resisting force due to sliding depends on the weight of the structure and the type of the soil of which foundation is build. The product of the 2 factors will give a resisting force.

1) Stability of the Structure

Diversion structure should be stable against all the expected forces above-mentioned. The horizontal pressure of the water is the most consideration when dealing with water diversion structure. The higher the structure is, the higher the hydraulic force is. This pressure distribution diagram is in a triangular shape and therefore the centre of gravity is at one-third its height, thus 1/3 of height.

The middle-third law is usually employed to check the stability. This middle-third law rule may be simplified as; for a diversion structure to be stable against tension, the resultant force on the wall as a result of stored water should fall within the middle third of the base. One may consider a horizontal thrust force P through the centre of gravity of the structure. The weight W also acts through the centre

¹ Referred to a guideline employed in Zambia, e.g. Design of Water retaining Walls

of gravity to the ground. The resultant of these 2 forces is R directed to the base as well. For a stable structure, R should pass through middle third of the width of the base of the structure.

In addition to the middle-third law to be obeyed, the total active horizontal force should not exceed the total horizontal resistance in order for the structure not to slide. The factor obtained in dividing the total horizontal resistance by the total horizontal active force should be at least two. However, there may be a difficulty of estimating the resistance since it depends on the contact condition between the base and the foundation. In case that the foundation is formed of soil rock, there is not problem in this sliding. However, should the foundation be formed of soft soil, at first such soil shall be removed out and then basement of the structure shall be buried in enough depth, so that the sliding would not take place.

2) Foundation

Foundation is the lowest part of the structure. The purpose of the foundation is to support the weight of the structure, and transmitting the weight of the structure, both live and dead weight to the sub-soil. The depth of foundation of the weir is very important, and it should ensure safer transfer of weight of the weir into the foundation thereby ensuring its stability.

The depth should be determined upon examination of the sub-soil condition. Therefore, inspection pits should be dug or otherwise auger boring should be done every 3 – 5 meter along the weir axis. We should always check for stable base preferably rock. Hard sub-surface soil can also be accepted. The depth of the stable foundation determines the excavation depth for the core trench part of weir. If no proper foundation exists, a change in the design for the basement of weir would be necessary. In this case, foundation on soft soil may have to be designed with a concrete apron.

3) Construction

Materials for the diversion structure can be burnt bricks, stones and concrete. Clay burnt bricks may be used for the construction of the diversion structure. However it should be built of sufficient wall width. In using the burnt bricks, we should always ensure recommended thickness of the structure to avoid internal wall failure. It is also assumed that no super-imposed loads are carried. On the other hand, stone masonry and concrete are the most preferred materials for the construction of diversion weirs.

As for the wet-masonry structure, the recommended mortar ratio should never be weaker than 1:4 (cement to sand). The actual quantities of materials are best estimated in situ. Ruble-stone masonry is the most common type of masonry for diversion weir. This includes stones shaped roughly or properly selected in order to easy construction. Care should be taken to fill air voids in the body. For the sake of estimation, this type of masonry is 35% mortar and 65% stone of the volume of the structure (mixing ratio for mortar is 1:4). In case bricks are used instead of stones, it can be estimated that the total volume of brick masonry is approximately 25% mortar and 75% bricks.

Materials for concrete weirs are mainly stones, aggregates, water, cement and sand. Though concrete mixing ratio depends on the type of structure to be established, a suitable mix of concrete is 1 part cement by volume to 2 parts sand and 4 parts stones (1:2:4=cement: sand: aggregates²). Thus the quantities required per cubic meter of concrete are 0.25 m³ cement, 0.5 m³ sand 1.0 m³ stones. Concrete should not be allowed to dry out quickly since this causes shrinkage, cracking and thus loss of strength. It should be cured for at least 1 week thus kept moisture by covering with wet-sack, wet grasses, etc.

² In case of concrete used in gravity type diversion structure, a weaker mixing ration can be applied, e.g. 1 part cement: 3 parts of sand and 6 parts of aggregates by volume (Source: Design of Water Retaining Walls).

3.4.3 Typical BOQ and Construction Cost of the Permanent Diversion Structure

Taking into account aforementioned discussions, following are the typical designs of diversion structure, and those BOQs (bill of quantities) and the construction cost; Table 3.1.2 shows those of wet-masonry wall type weir, Table 3.1.3 is for concrete wall type weir and the Table 3.1.4 is for wet-masonry gravity type:

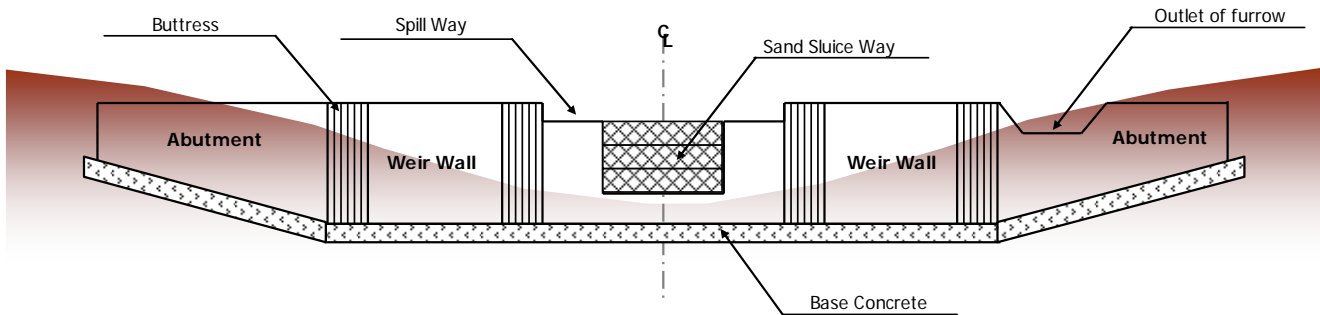
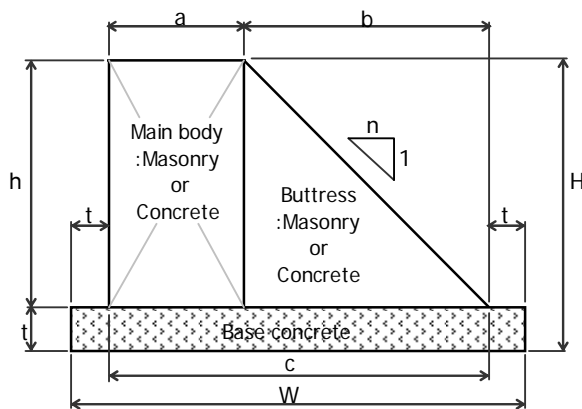


Figure 3.4.1 Typical Longitudinal Section of Diversion Weirs (applied regardless of the 3 types)



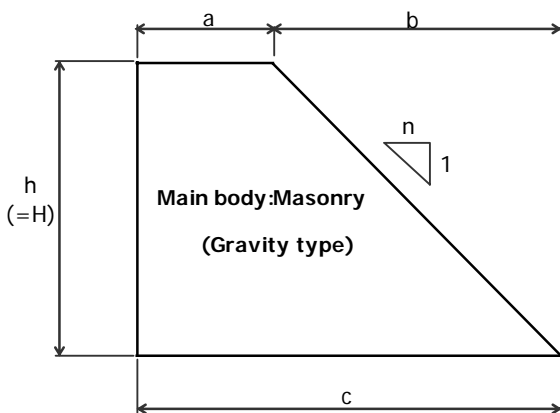
Dimensions of Wet-masonry Wall Type Weir

h	a	b	c	n	t	W	H
m	m	m	m	1:n	m	m	m
1.0	0.5	1.0	1.5	1.0	0.5	2.5	1.5
1.5	0.5	1.5	2.0	1.0	0.5	3.0	2.0
2.0	0.5	2.0	2.5	1.0	0.5	3.5	2.5

Dimensions of Concrete Wall Type Weir

h	a	b	c	n	t	W	H
m	m	m	m	1:n	m	m	m
1.5	0.40	1.5	1.9	1.0	0.40	2.7	1.9
2.0	0.45	2.0	2.5	1.0	0.45	3.4	2.5
2.5	0.50	2.5	3.0	1.0	0.50	4.0	3.0
3.0	0.60	3.0	3.6	1.0	0.60	4.8	3.6

Figure 3.4.2 Typical Cross Section of Wall Type Weir



Dimensions of Wet-masonry Gravity Type Weir

h (=H)	a	b	c	n	t	W	H
m	m	m	m	1:n	m	m	m
2.0	0.40	1.4	1.8	0.7	-	-	-
2.5	0.45	1.8	2.3	0.7	-	-	-
3.0	0.60	2.1	2.7	0.7	-	-	-
3.5	0.70	2.5	3.2	0.7	-	-	-
4.0	0.80	2.8	3.6	0.7	-	-	-
4.5	0.90	3.2	4.1	0.7	-	-	-
5.0	1.00	3.6	4.6	0.7	-	-	-

Figure 3.4.3 Typical Cross Section of Gravity Type Weir

Table 3.4.2 Typical BOQ and Construction Cost of Wet-masonry Wall Type Weir

Dimension		Volume of Masonry and Concrete			Construction Cost			
Height m	Length m	Masonry m ³	Concrete m ³	Total m ³	Materials MZK	Labor MZK	Engineering Services K	Total MZK
1.0	5.0	2.5	6.3	8.8	7,594,000	884,000	6,980,000	15,458,000
1.0	10.0	5.0	12.5	17.5	13,770,000	1,760,000	9,032,000	24,562,000
1.0	15.0	7.5	18.8	26.3	20,198,000	2,644,000	11,084,000	33,926,000
1.0	20.0	10.0	25.0	35.0	26,633,000	3,500,000	12,908,000	43,041,000
1.0	25.0	12.9	31.3	44.2	33,690,000	4,436,000	15,772,000	53,898,000
1.0	30.0	15.4	37.5	52.9	39,816,000	5,300,000	17,596,000	62,712,000
1.0	35.0	17.9	43.8	61.7	46,548,000	6,176,000	19,648,000	72,372,000
1.0	40.0	20.4	50.0	70.4	53,306,000	7,060,000	22,284,000	82,650,000
1.0	45.0	22.9	56.3	79.2	59,744,000	7,936,000	24,336,000	92,016,000
1.0	50.0	25.4	62.5	87.9	66,337,000	8,800,000	26,160,000	101,297,000
1.5	5.0	4.1	7.5	11.6	9,419,000	1,168,000	7,664,000	18,251,000
1.5	10.0	8.1	15.0	23.1	17,513,000	2,336,000	10,400,000	30,249,000
1.5	15.0	12.2	22.5	34.7	25,846,000	3,476,000	12,908,000	42,230,000
1.5	20.0	16.3	30.0	46.3	33,939,000	4,644,000	15,644,000	54,227,000
1.5	25.0	21.3	37.5	58.8	43,161,000	5,884,000	18,964,000	68,009,000
1.5	30.0	25.3	45.0	70.3	51,964,000	7,052,000	21,700,000	80,716,000
1.5	35.0	29.4	52.5	81.9	59,508,000	8,192,000	24,208,000	91,908,000
1.5	40.0	33.4	60.0	93.4	68,473,000	9,360,000	27,528,000	105,361,000
1.5	45.0	37.5	67.5	105.0	76,722,000	10,500,000	30,036,000	117,258,000
1.5	50.0	41.6	75.0	116.6	85,076,000	11,668,000	32,772,000	129,516,000
2.0	5.0	5.8	8.8	14.6	11,210,000	1,468,000	8,348,000	21,026,000
2.0	10.0	11.7	17.5	29.2	21,243,000	2,936,000	11,768,000	35,947,000
2.0	15.0	17.5	26.3	43.8	31,480,000	4,384,000	14,960,000	50,824,000
2.0	20.0	23.3	35.0	58.3	41,486,000	5,852,000	18,380,000	65,718,000
2.0	25.0	30.8	43.8	74.6	52,980,000	7,468,000	22,612,000	83,060,000
2.0	30.0	36.7	52.5	89.2	63,288,000	8,936,000	26,032,000	98,256,000
2.0	35.0	42.5	61.3	103.8	73,864,000	10,384,000	29,224,000	113,472,000
2.0	40.0	48.3	70.0	118.3	84,343,000	11,852,000	33,228,000	129,423,000
2.0	45.0	54.2	78.8	132.9	95,062,000	13,300,000	36,420,000	144,782,000
2.0	50.0	60.0	87.5	147.5	105,556,000	14,760,000	39,840,000	160,156,000

Source: JICA Study Team

Table 3.4.3 Typical BOQ and Construction Cost of Concrete Wall Type Weir

Dimension		Volume of Concrete m ³			Construction Cost			
Height m	Length m	Wall and Buttress	Foundat'n	Total	Materials MZK	Labor MZK	Engineering Services K	Total MZK
1.5	5.0	3.3	5.4	8.7	12,432,000	2,672,000	8,120,000	23,224,000
1.5	10.0	6.5	10.8	17.3	23,280,000	5,316,000	11,312,000	39,908,000
1.5	15.0	9.8	16.2	26.0	34,697,000	7,960,000	14,504,000	57,161,000
1.5	20.0	13.0	21.6	34.6	45,702,000	10,632,000	17,468,000	73,802,000
1.5	25.0	17.0	27.0	44.0	58,725,000	13,496,000	21,472,000	93,693,000
1.5	30.0	20.3	32.4	52.7	70,303,000	16,160,000	24,664,000	111,127,000
1.5	35.0	23.5	37.8	61.3	81,666,000	18,812,000	27,856,000	128,334,000
1.5	40.0	26.8	43.2	70.0	93,403,000	21,456,000	31,632,000	146,491,000
1.5	45.0	30.0	48.6	78.6	105,115,000	24,120,000	34,596,000	163,831,000
1.5	50.0	33.3	54.0	87.3	116,528,000	26,772,000	37,788,000	181,088,000
2.0	5.0	5.3	7.5	12.8	17,226,000	3,936,000	9,716,000	30,878,000
2.0	10.0	10.5	15.1	25.6	33,055,000	7,864,000	14,276,000	55,195,000
2.0	15.0	15.8	22.6	38.4	49,069,000	11,772,000	18,836,000	79,677,000
2.0	20.0	21.0	30.2	51.2	65,324,000	15,700,000	23,624,000	104,648,000
2.0	25.0	27.8	37.7	65.4	84,757,000	20,076,000	29,224,000	134,057,000
2.0	30.0	33.0	45.2	78.2	101,347,000	24,004,000	34,012,000	159,363,000
2.0	35.0	38.3	52.8	91.0	117,905,000	27,932,000	38,572,000	184,409,000
2.0	40.0	43.5	60.3	103.8	135,160,000	31,840,000	43,716,000	210,716,000
2.0	45.0	48.8	67.8	116.6	151,853,000	35,776,000	48,504,000	236,133,000

Dimension		Volume of Concrete m ³			Construction Cost			
Height m	Length m	Wall and Buttress	Foundat'n	Total	Materials MZK	Labor MZK	Engineering Services K	Total MZK
2.0	50.0	54.0	75.4	129.4	169,118,000	39,684,000	53,064,000	261,866,000
2.5	5.0	7.8	10.0	17.8	22,857,000	5,472,000	11,540,000	39,869,000
2.5	10.0	15.6	20.0	35.6	44,568,000	10,944,000	17,924,000	73,436,000
2.5	15.0	23.4	30.0	53.4	66,541,000	16,396,000	24,308,000	107,245,000
2.5	20.0	31.3	40.0	71.3	88,668,000	21,860,000	30,920,000	141,448,000
2.5	25.0	41.7	50.0	91.7	116,180,000	28,128,000	38,800,000	183,108,000
2.5	30.0	49.5	60.0	109.5	139,038,000	33,580,000	45,184,000	217,802,000
2.5	35.0	57.3	70.0	127.3	162,338,000	39,052,000	51,796,000	253,186,000
2.5	40.0	65.1	80.0	145.1	185,542,000	44,516,000	58,764,000	288,822,000
2.5	45.0	72.9	90.0	162.9	209,321,000	49,968,000	65,148,000	324,437,000
2.5	50.0	80.7	100.0	180.7	233,273,000	55,440,000	71,532,000	360,245,000
3.0	5.0	12.0	14.4	26.4	31,466,000	8,100,000	14,504,000	54,070,000
3.0	10.0	24.0	28.8	52.8	61,847,000	16,200,000	24,080,000	102,127,000
3.0	15.0	36.0	43.2	79.2	92,980,000	24,300,000	33,656,000	150,936,000
3.0	20.0	48.0	57.6	105.6	124,657,000	32,400,000	43,232,000	200,289,000
3.0	25.0	64.5	72.0	136.5	164,295,000	41,860,000	54,988,000	261,143,000
3.0	30.0	76.5	86.4	162.9	197,255,000	49,960,000	64,564,000	311,779,000
3.0	35.0	88.5	100.8	189.3	230,675,000	58,060,000	74,140,000	362,875,000
3.0	40.0	100.5	115.2	215.7	264,896,000	66,160,000	84,300,000	415,356,000
3.0	45.0	112.5	129.6	242.1	299,564,000	74,260,000	93,876,000	467,700,000
3.0	50.0	124.5	144.0	268.5	335,125,000	82,340,000	103,452,000	520,917,000

Source: JICA Study Team

Table 3.4.4 Typical BOQ and Construction Cost of Wet Masonry Gravity Type Weir

Dimension		Volume of Masonry			Construction Cost			
Height m	Length m	Masonry m ³	Concrete m ³	Total m ³	Materials MZK	Labor MZK	Engineering Services K	Total MZK
2.0	5.0	11.1	-	11.1	5,660,000	1,128,000	7,664,000	14,452,000
2.0	10.0	22.2	-	22.2	10,098,000	2,236,000	10,172,000	22,506,000
2.0	15.0	33.3	-	33.3	14,554,000	3,344,000	12,680,000	30,578,000
2.0	20.0	44.4	-	44.4	19,029,000	4,452,000	15,188,000	38,669,000
2.0	25.0	55.5	-	55.5	24,145,000	5,560,000	18,280,000	47,985,000
2.0	30.0	66.6	-	66.6	28,657,000	6,668,000	20,788,000	56,113,000
2.0	35.0	77.7	-	77.7	33,188,000	7,776,000	23,296,000	64,260,000
2.0	40.0	88.8	-	88.8	37,938,000	8,884,000	26,388,000	73,210,000
2.0	45.0	99.9	-	99.9	42,855,000	9,992,000	28,896,000	81,743,000
2.0	50.0	111.0	-	111.0	47,441,000	11,100,000	31,404,000	89,945,000
2.5	5.0	17.3	-	17.3	8,182,000	1,752,000	9,032,000	18,966,000
2.5	10.0	34.7	-	34.7	15,092,000	3,476,000	12,908,000	31,476,000
2.5	15.0	52.0	-	52.0	22,535,000	5,228,000	17,012,000	44,775,000
2.5	20.0	69.4	-	69.4	29,536,000	6,952,000	20,888,000	57,376,000
2.5	25.0	86.7	-	86.7	36,855,000	8,684,000	25,348,000	70,887,000
2.5	30.0	104.1	-	104.1	44,426,000	10,428,000	29,452,000	84,306,000
2.5	35.0	121.4	-	121.4	51,561,000	12,160,000	33,328,000	97,049,000
2.5	40.0	138.8	-	138.8	59,371,000	13,884,000	37,788,000	111,043,000
2.5	45.0	156.1	-	156.1	66,821,000	15,628,000	41,892,000	124,341,000
2.5	50.0	173.4	-	173.4	74,092,000	17,360,000	45,768,000	137,220,000
3.0	5.0	25.0	-	25.0	11,095,000	2,500,000	10,628,000	24,223,000
3.0	10.0	50.0	-	50.0	21,516,000	5,000,000	16,328,000	42,844,000
3.0	15.0	74.9	-	74.9	31,694,000	7,500,000	22,028,000	61,222,000
3.0	20.0	99.9	-	99.9	42,301,000	9,992,000	27,728,000	80,021,000
3.0	25.0	124.9	-	124.9	52,944,000	12,492,000	34,012,000	99,448,000
3.0	30.0	149.9	-	149.9	63,742,000	14,992,000	39,712,000	118,446,000
3.0	35.0	174.8	-	174.8	74,282,000	17,492,000	45,412,000	137,186,000
3.0	40.0	199.8	-	199.8	85,565,000	19,984,000	51,696,000	157,245,000
3.0	45.0	224.8	-	224.8	96,296,000	22,484,000	57,396,000	176,176,000
3.0	50.0	249.8	-	249.8	107,482,000	24,984,000	63,096,000	195,562,000

Dimension		Volume of Masonry			Construction Cost			
Height m	Length m	Masonry m3	Concrete m3	Total m3	Materials MZK	Labor MZK	Engineering Services K	Total MZK
3.5	5.0	34.0	-	34.0	14,754,000	3,400,000	12,808,000	30,962,000
3.5	10.0	68.0	-	68.0	28,851,000	6,800,000	20,560,000	56,211,000
3.5	15.0	102.0	-	102.0	43,198,000	10,200,000	28,312,000	81,710,000
3.5	20.0	136.0	-	136.0	57,291,000	13,600,000	36,064,000	106,955,000
3.5	25.0	170.0	-	170.0	72,255,000	17,000,000	44,400,000	133,655,000
3.5	30.0	204.0	-	204.0	87,047,000	20,400,000	52,152,000	159,599,000
3.5	35.0	238.0	-	238.0	102,092,000	23,800,000	59,904,000	185,796,000
3.5	40.0	272.0	-	272.0	117,172,000	27,200,000	68,240,000	212,612,000
3.5	45.0	305.9	-	305.9	132,473,000	30,600,000	75,992,000	239,065,000
3.5	50.0	339.9	-	339.9	148,043,000	34,000,000	83,744,000	265,787,000
4.0	5.0	44.4	-	44.4	19,029,000	4,452,000	15,316,000	38,797,000
4.0	10.0	88.8	-	88.8	37,385,000	8,884,000	25,348,000	71,617,000
4.0	15.0	133.2	-	133.2	56,255,000	13,336,000	35,608,000	105,199,000
4.0	20.0	177.6	-	177.6	75,201,000	17,768,000	45,640,000	138,609,000
4.0	25.0	222.0	-	222.0	94,801,000	22,200,000	56,256,000	173,257,000
4.0	30.0	266.4	-	266.4	114,491,000	26,652,000	66,516,000	207,659,000
4.0	35.0	310.8	-	310.8	134,402,000	31,084,000	76,548,000	242,034,000
4.0	40.0	355.2	-	355.2	154,967,000	35,536,000	87,392,000	277,895,000
4.0	45.0	399.6	-	399.6	175,472,000	39,968,000	97,424,000	312,864,000
4.0	50.0	444.0	-	444.0	196,187,000	44,400,000	107,456,000	348,043,000
4.5	5.0	56.2	-	56.2	24,213,000	5,636,000	18,052,000	47,901,000
4.5	10.0	112.4	-	112.4	47,581,000	11,252,000	30,820,000	89,653,000
4.5	15.0	168.6	-	168.6	71,423,000	16,868,000	43,588,000	131,879,000
4.5	20.0	224.8	-	224.8	95,722,000	22,484,000	56,356,000	174,562,000
4.5	25.0	281.0	-	281.0	121,147,000	28,100,000	69,708,000	218,955,000
4.5	30.0	337.2	-	337.2	146,650,000	33,736,000	82,704,000	263,090,000
4.5	35.0	393.4	-	393.4	172,376,000	39,352,000	95,472,000	307,200,000
4.5	40.0	449.6	-	449.6	198,890,000	44,968,000	108,824,000	352,682,000
4.5	45.0	505.7	-	505.7	225,576,000	50,584,000	121,592,000	397,752,000
4.5	50.0	561.9	-	561.9	253,087,000	56,200,000	134,360,000	443,647,000
5.0	5.0	69.4	-	69.4	29,536,000	6,952,000	21,016,000	57,504,000
5.0	10.0	138.8	-	138.8	58,811,000	13,884,000	36,748,000	109,443,000
5.0	15.0	208.1	-	208.1	88,683,000	20,836,000	52,708,000	162,227,000
5.0	20.0	277.5	-	277.5	119,413,000	27,760,000	68,440,000	215,613,000
5.0	25.0	346.9	-	346.9	150,874,000	34,692,000	84,756,000	270,322,000
5.0	30.0	416.3	-	416.3	183,196,000	41,644,000	100,716,000	325,556,000
5.0	35.0	485.6	-	485.6	215,826,000	48,576,000	116,448,000	380,850,000
5.0	40.0	555.0	-	555.0	249,735,000	55,500,000	132,764,000	437,999,000
5.0	45.0	624.4	-	624.4	283,974,000	62,452,000	148,724,000	495,150,000
5.0	50.0	693.8	-	693.8	319,020,000	69,384,000	164,456,000	552,860,000

Source: JICA Study Team

3.5 Permanent Scheme established in 2010 Dry Season

The pilot project in 2010 undertook the construction of permanent diversion schemes. There are 8 permanent schemes; 5 in Northern province and 3 in Luapula province. The type is either concrete wall type or wet-masonry type, and one earth dam. The site identification was preliminary done during the kick-off training held from May 3 – 7, 2010, and till the beginning of June, all the sites had been confirmed on the ground. Table 3.5.1 summarizes the site profile, e.g. site name, membership with the number of land owners, irrigated area so far, designed irrigable area and the potential irrigable area, design type of the diversion weir, and also the activities undertaken during the 2009 pilot project implementation.

There are 257 members in total, composed of 137 male members and 120 female members. The existing irrigated area in 2010 ranges from as small as 1.25 ha to as large as 7.9 ha with a total of

27.90 ha. As designed irrigable area per site, it is expected to expand the area up to 5 ha in case of minimum and to as far as 10.05 ha, totaling 48.50 ha. Potential irrigable area with the permanent diversion weir was identified from 5 ha to 20 ha with a total of 63.5 ha. Implementation process is briefly presented hereunder:

Table 3.5.1 Profile of the Pilot Project Implementation Sites for Permanent Weir Introduction

- Province - District	- Site Name - Club Name	- Membership: Total, Male, Female, (Land owner) - Village concerned	With Permanent weir: - Irrigated area in 2010 - Designed Irrigated area - Potential area	- Type of permanent structure - Dimension	- Activity in 2009 under COBSI - Area Irrigated with simple weir in 2009
Northern P.					
Luwingu	- Chaiteka site - Milandu Irrigation Group	- 25, 13, 12, (25) - Chaiteka	- 2010: 3.00ha - Designed: 5.00ha - Poten'l: 6.25ha	- Masonry - Height: 2.0 m - Length: 12.0 m	- New site - A simple weir construction - 4 km furrow digging - 2009: 0.25 ha
Mpika	- Malashi site - Ubulini Tabupwa Farming Group	- 53, 27,26, (16) - Chisowa-A: 11, 6, 5 - Chisowa-B:40, 20, 20 - Chiponya:2, 1, 1	- 2010: 7.90ha - Designed: 10.50ha - Poten'i: 20.0ha	- Concrete - Height: 2.3 m - Length: 15.0 m	- Improved site - A simple weir improvement - 2009: 7.90 ha
Mporokoso (1)	- Kasonde site - Right bank: Kayokolo Farmers Group - Left bank: Not been formed yet	- 45, 18, 27, (1) - Land belongs to community - Right bank: Kasonde: 20, 8, 12 - Left bank: Chilangwa: 25, 10, 15	- 2010: 1.25ha - Designed: 5.00ha - Poten'l: 6.00ha	- Masonry - Height: 1.4 m - Length: 8.0 m	- Improved site - A simple weir improvement - 2009: 1.25 ha
Mporokoso (2)	- Chilala site	- 36, 14, 22, (1)	- 2010: 3.30ha - Designed: 5.00ha - Poten'l: 7.00ha	- Masonry - Height: 1.6 m - Length: 13.0 m	- Improved site - A simple weir improvement - 2009: 2.50 ha
Mungwi	- Nseluka site - Kalungu vegetable and saving group	- 33, 20, 13, (1) - Land belongs to community - Kasonde: 2, 2, 0 - Wapata: 1, 0, 1 - Chapewa: 5, 3, 2 - Washanga: 2, 1, 1	- 2010: 6.00ha - Designed: 8.00ha - Poten'l: 8.25ha	- Concrete - Height: 1.8 m - Length: 12.5 m	- New site - A simple weir construction - 4 km furrow digging - 2009: 1.00 ha
Luapula P.					
Kawambwa	- Chibolya site - Luena Irrigation Club	- 20, 15, 5, (1) - Chibolya: 10, 8, 2 - Spinoti: 10, 7, 3	- 2010: 3.20ha - Designed: 5.00ha - Poten'l: 5.00ha	- Masonry - Height: 1.8 m - Length: 24.0 m	- Improved site - A simple weir improvement - 2009: 1.50 ha
Mansa (1)	- Kakose - Tubombele Pano	- 20, 15, 5, (1) - Kakose	- 2010: 2.00ha - Designed: 5.00ha - Poten'l: 5.00ha	- Concrete - Height: 1.8 m - Length: 17.0 m(for the part upgraded in 2010, total length of the weir is 41m)	- Improved site - A simple weir up-grading - 2009: 0.50 ha
Mansa (2)	- Mililwa Lower site - Mililwa Lower Group	- 25, 15, 10, (23) - Timoth: 3, 2, 1 - Chibolya: 3, 2, 1 - Chakulya: 3, 3, 0 - Kashikishi: 4, 2, 2 - Mutiti:12, 6, 6	- 2010: 1.25ha - Designed: 5.00ha - Poten'l: 6.00ha	- Small-scale earth dam - Height: 2.4 m - Length: 32.0 m	- Improved site - A simple weir improvement - 2009: 0.75 ha
Total	- 8 sites	- 257, 137, 120, (69)	- 2010: 27.90 ha - Designed: 48.50ha - Poten'l:63.5ha	- Masonry: 4 - Concrete: 3 - Earth dam: 1	- New site: 2 - Imp't. Site: 6 - 2009: 15.65 ha

Source: JICA Study Team

1) Chaiteka site, Luwingu district, Northern province

Chaiteka is the village name of the project site in Luwingu district. In 1979, the village started its history with 12 households after separating from Sunday village due to lack of farm land for making sure to get staple foods. The number of households of Chaiteka village has been increasing year by year. There are 72 households as of now. The villagers are proud of cooperative-ship of each other, vast farm land available with fertile soil, and so on.



Collecting materials called "Up-front" is in progress at Chaiteka site in Luwingu district (as at mid July in 2010).

Since the village was established, the farmers have been practicing bucket-irrigation farming fetching water from Malandu stream which is the stream they put up a permanent weir under the pilot project in 2010. In 2009, under this Study the farmers introduced a simple diversion structure for withdrawing stream water to the farm lands. This was the first experience for them to practice gravity furrow irrigation.

The membership of Malandu irrigation group formed in 2010 to drive forward the project is 25 in total at present: 13 males, 12 female. In addition to them, the rest of the villagers are expected to join very soon. They gathered to the construction site at least 3 days in a week from 6:00 to 12:00 during the period for "Up-front". The members collected sand, masonry stones as a preparation work for making concrete.

The construction works were supervised by the CEO in charge of the project area and district TSB staff same as the other project sites. They came to the site almost the days when the farmers worked on. Apart from the works like collecting sand and crushing masonry stone assigned to males, female members did clearing works for access road leading to the construction site. A female participant spoke for her colleagues, "although we are very much familiar with this kind of works, they are hard job for us. But we are making efforts and shall get achievement."

The construction works for permanent structure were completed at the middle of September in 2010. It took about 2.5 months to finish the construction work up. During the construction period, 28 members a day on average had participated in the project. After completion of the civil works, the farmers started irrigation farming with 3 hectares of farming land to grow green-maize, tomatoes and some other vegetables by using water diverted by the permanent weir.



The masonry type weir constructed by Chaiteka community people under the supervision of Luwingu TSB staff. The members now enjoy irrigation farming with the water diverted by the new permanent structure. (As of the end of September in 2010).

2) Malashi Site, Mpika District, Northern Province

Malashi project site stretches along the trunk road leading to Nakonde. It is located at 5 km away from

the district center of Mpika. The history of irrigation farming of this area started with furrow construction by 20 farmers participated in 2002. By that time, the farmers relied thoroughly on rain-fed farming. They spent about 190 days in 8 months to complete digging up the furrow, length of which reaches 2.5 km. The furrow was surveyed by some villagers who knew how to align the canal.

The scheme members once constructed a diversion weir to abstract stream water of Malashi, which is a tributary of Chambeshi river, by using sand bags. All the members shared the cost for purchasing 250 empty sand bags when they constructed it. The sand bag weir, however, has been partially worn out and flashed away. Water leakage, therefore, has been created by water pressure beneath of the weir. The sand bags had to be constantly replaced from time to time.



The scheme members are collecting stones for making concrete as preparation work to next stage. (Malashi site, as of the end of June, 2010)

BULIMI TABUPWA – it means “farming never ends” - is the name of the smallholder irrigation scheme in Malashi, which was established with 50 scheme members at the same year when the furrow construction mentioned above was done. Since then, they have been enjoying irrigation farming growing maize and vegetables such as tomatoes, cabbage, onion, and so forth. The membership of the group counts 53 consisting of 27 males and 26 females. They come from 3 villages around the project site; namely, Chisowa-A, Chisowa-B and Chiponya.

In late May 2009, together with a staff of TSB and a CEO covering Mpika Main Camp, the scheme members tried to introduce a simple diversion weir replacing the existing one by using local materials according to the concept of smallholder irrigation development under this Study. The participants of the simple diversion weir construction expressed their impressions, that is, “the works is very easy, no difficult”, “never seen this kind of weir so far”, etc. The scheme members enjoyed 7.7 hectare of irrigation farming with the simple diversion structure constructed in 2009.

The farmers, however, had still problem on the water for irrigation. Since the onset of the scheme, the number of households in 4 villages indicated above had constantly been increasing and as at 2010 there are more than 600 households in total. Furthermore, some outsiders used the water at upstream area of the scheme in order to make bricks. After seeing the effects of simple diversion structure constructed in 2009, the scheme members, therefore, were longing to have more water to make irrigation farming stable throughout a year.

Local markets such as restaurants, guest houses, and open markets buy the farming products of Malashi project site. The site could be placed as a small-sized intensive farming in the suburbs of



The construction reached the final stage to place concrete to last layer. After that, the construction was successfully finished and then the weir has started supplying enough water to irrigated plots being cultivated by 53 farmers.

big town in the district. The farmers usually ferry the products by using bicycle or putting the products on the head. Farmers who can afford to hire a vehicle transport their crops to as far as Mansa district. As for onion, middlemen come to the project site from Lusaka and Kitwe (Copperbelt), and even from DRC as well.

The scheme members together with responsible TSB staff for Mpika district started weir construction works with “*Up-front*” collecting construction materials at the mid June 2010. In order to save the construction cost, they use an ox-cart for transportation of masonry stone instead of hiring tracks from private transporters. The community members achieved their goal by the middle of October in 2010.

The construction processes took them almost 3.5 months. While it was under construction, irrigated farming has been practiced by using water passed through a de-watering canal. The canal had let enough amount of water pass to irrigate the farm land as the farmers always do. By applying an appropriate method, the weir construction doesn’t disturb the farmers to irrigate. The weir newly constructed is able to cover 8 hectares of irrigated land approximately along the furrow extending as far as 5 kilometers.

3) Kasonde Site, Mporokoso District, Northern Province

It takes about an hour to reach Kasonde site from the district center of Mporokoso by vehicle. It is located at a distance of about 40 kilometres away from the center. Farm lands to be benefited by the permanent diversion weir is divided into two areas straddling over Kasakalabwe stream where the project is established. The right bank of the stream covers Kasonde village named as the project site and Chilangwa village is located at the left bank of the stream.

As for Kasonde village, existing simple diversion facility constructed in 2002 as a personal property was improved under the pilot project in 2009 dry season under this Study. The community members participated in the improvement works and then they irrigated vegetable garden of an area of 1 lima. Dominant crops in the area under irrigation are rape, cabbage, tomato, etc. On the other hand, cassava, maize, soya beans, and sweet potatoes are grown under rain-fed farming.

It was in 1942 when the villagers of Chilangwa settled themselves in this place with 65 households. After that, some of the villagers shifted and established another village in 1952, which is the Kasonde. As a result, 45 households live in Chilangwa village at present. Membership for the project from the village is 25 farmers with 10 males and 15 females out of the 45 households.

The farmers of Chilangwa had practiced bucket-irrigation farming fetching water from Kasakalabwe stream and it had covered farm plots of 4 lima (1 ha). Actually, there is a furrow constructed by a Roman Catholic church near the village. However, the villagers hadn’t used it because it belonged to a local school for gardening and fish cultivation. The community people, therefore, had been very much eager to have their own facilities for irrigation farming. Major crops grown by bucket irrigation are onion, tomato, eggplant, etc. in and around the project site.



The masonry type of weir has been almost piled up on the Kasakalabwe stream, Mporokoso district (as of mid July)

The farmers of the project site face marketing difficulties because of the distance to the market place. As mentioned above, the site is far away from the district center where there is the

biggest market for the farmers of the site. It takes nearly 4 hours by riding bicycle. They start off the village at 6:00 and then come back to home at 19:00 to sell their farm products. Also, a refugee camp was established in 1999. It is located at only 2.5 kilometers away from their place, and there are about 8,000 refugees as of 2010. This is another market for the farmers of both Kasonde and Chilangwa villages, though it is not as big as the one in the Mporokoso centre.

As of mid July 2010, the construction work of a new weir progressed satisfactorily. The main body of masonry type weir had come to the designed level by then. The construction was over by the end of September 2010. In response to the completion of weir construction, the farmers started off canal digging work. The length of the furrow is supposed to be about 2.5 kilometers for the right bank and 1.5 kilometers for the left bank respectively for covering more than 6 hectares of farm land in total. As of end of November 2010, the area of 1.25 ha was irrigated by using the water diverted with the new structure. The irrigable land belongs to the communities. According to the participants for the project, the farm plots are to be shared by them.



The permanent weir newly constructed has started delivering the irrigation water to the farm land. (As of the end of September 2010)

4) Chilala Ste, Mporokoso District, Northern Province

Chilala is one of the popular villages in Mporokoso district located 12 km from the district centre. The village was established way back during the pre-independence period, 1960s. At that time, this place was a favourable hiding and sleeping place for lions because of its thick forests, hence the origin of the name Chilala coming from 'Chilala Nkalamo' (where lions used to sleep).

The number of households stands at 35 and the total number of member farmers from this village is 36, 14 males and 22 females. The member farmers were highly interested in putting up a permanent structure there as they kept on mending the temporal diversion point time and again. This site is endowed with abundant water from the Ng'andu stream from where the permanent weir had been constructed. Construction of the 13m long and 1.6m high wet masonry weir was commenced on October 4th and completed on November 12th 2010. This site had been upgraded from temporal weir which was constructed 20m downstream from the permanent one. It was successfully supervised by the TSB staff from Mporokoso district.

The major activities that farmers are engaged in include: fish farming and production of horticultural crops like green maize, tomato, onion and cabbage to mention but a few. Their main outlets for their produce include: Mporokoso, Kawambwa and the Copperbelt. For external market outlets farmers come as group and hire a truck to ferry their produce which fetches more than money when sold. Tomatoes



The permanent weir construction was carried out in collaboration with the community people and some skilled labors (As of the end of October 2010).

and onions are the major crops sold outside the district. The average amount of money realized per farmer per growing period is ZMK 1,200,000 from the production of vegetables and ZMK 800,000 realized from fish sales harvested from the 15 fish ponds.

With completion of weir establishment, the members have started irrigating the farm land of 3.3 ha increasing 0.8 ha as compared to area irrigated in dry season 2009. There is possibility to expand irrigated area and fish ponds as well due to the perennial water of the stream mentioned above which keeps to flow water in plenty even in most dry spell.



A masonry type of weir constructed under 2010 pilot project has started supplying the irrigated land with water (As of mid-November 2010).

5) Nseluka Site, Mungwi district, Northern Province

Nseluka is a smallholder irrigation scheme newly established in 2009 with introduction of a simple diversion weir under this Study. At the end of June 2009, the farmers put the weir along with furrow construction and then some of them started irrigation farming with small areas of farming plots. Since that time, the scheme members had engaged them in the extension work of the furrow. The furrow was extended to as far as 4 km point in May 2010. The lands stretching along the furrow belong to the community, and before the irrigation started they had not used the land for farming. With the completion of the furrow construction, the members demarcated the farm plots by more than 1 lima per head for coming irrigation season in 2010. The land demarcated arrived at a total of about 8 ha altogether.

Kalungu Vegetable and Saving group is the name of the farmers' group aiming mainly at gardening, marketing and saving. In fact, this group was established in 2007 under ASP (Agriculture Support Programme). The group consists of 33 memberships with 20 males as 13 females coming from 4 villages nearby. They have visions to improve the life standard, to send children to school, and so forth through farming activities with the irrigation they are now practicing.

Before the furrow was constructed, the farmers had applied bucket-irrigation farming to grow several vegetables such as winter maize, tomato, and onion. Bucket irrigation used to force the farmers to spend a lot of time and a lot of labours to irrigate all their plots. Farmers who experienced irrigation farming in 2009 feel an effect of the furrow gravity irrigation system because they were able to save the time and labours to take care of their crops through proper water management of irrigation. They actually used saved time to do other things at home and on farms as well.

The scheme members were on the site everyday throughout the week except Sunday during the construction of the permanent structure. The construction work to put a concrete diversion structure progressed smoothly and then it was over at the middle of October 2010 including



The construction stage is to place concrete for foundation of the weir (Nseluka site, as of mid July).

canal lining of 30 meters from the outlet of the weir. In response to equipping with the irrigation facilities, the area to irrigate has been expanded by supervision of the CEO taking care of this site. Through the efforts, the members have started enjoying irrigation agriculture at the field of about 7 ha by using water coming from the newly constructed weir.

6) Chibolya Site, Kawambwa District, Luapula Province

Farmers living in Chibolya village originally came from nearby area of the district center to start rain-fed farming in 1972. The number of households of the village at that time was only 3. The total number of households counts at 35 as of June 2010. In 1992, the farmers commenced furrow irrigation farming through construction of a simple diversion weir made of locally available materials on their own experiences and knowledge. Then, in dry season 2009, farmers introduced a trigonal-type simple diversion structure as one of the sites for the pilot project under this Study. The irrigation scheme irrigated an area of 2.5 ha of farm plots with 15 fishponds.

Dominant crops grown in the project site with irrigation are tomato, cabbage, onion, rape, etc. The farmers, however, were still suffering from shortage of water for the irrigation and also fish cultivation. While the Chibolya farmers are proud of their cooperative-ship of each other, a high sense of solidarity, and very much hard working, they point out some issues and problems; the shortage of water for irrigation and fish cultivation, lack of inputs and equipment for farming, poor clinic facility, and low level of education. To cope with these issues, especially for farming matters, they formed a cooperative named as Kampemba cooperative.

About twenty farmers participated in establishing a masonry-type permanent scheme in 2010 dry season under this Study. The work had been well progressing since the beginning of July 2010. The membership consists of 15 males and 5 females gathering from two villages. During the construction of the permanent weir, they were on the site every day throughout week except Saturday and Sunday. The working hour for them was set from 7:30 up to 15:00. As of 2nd week of July 2010, the project reached a stage at which they were to dig de-watering canal of 100 meter in length to dry the weir construction area up. After completion of the said work, the participants were divided into two groups to share the works for collection of materials such as sand, crushed stones, and masonry stones.

Then, by mid October 201, the weir construction was completed and they started furrow improvement as well. It took the farmers 3.5 months with 18 attendants on average a day. The area that the irrigation water was delivered by the masonry permanent weir is estimated at 3.2 ha



The weir equips a sand sluice gate (Center) from environmental aspect, which is expected to work to flush the sand accumulated in the water pond and to let a small fish go upstream. (As of late in September 2010)



The participants are constructing the de-watering furrow which will be about 100 meter in length. They planned to complete this work within 10 days (Chibolya site, as of beginning of July, 2010).

approximately as of November 2010. In line with the weir construction, the farmers have extended the canal length to 7 km to share the water with Spinoti villagers as they had planned.

7) **Kakose Site, Mansa District, Luapula Province**

The site is in a mountainous area located at 60 km away from Mansa centre. The place was opened by just 5 farmers to cultivate maize, cassava, etc. in 1999 and then a part of existing furrow was dug at that time. After a couple of years, the farmers knew a programme supported by the government through listening to the radio broadcast produced by NAIS, which was "LIMA Programme". The radio told the farmers about effectiveness of diversion weir to utilize river/stream water for irrigation farming.



The masonry main body has completed. The persons concerned such as the community members, TSB staff, and skilled labors are finally checking the details of facility. (As of early in November, 2010)

The farmers learnt how the diversion weir could be helpful for irrigation farming and then they started constructing a temporal weir and a furrow as well. This construction took place in 2001. The length of temporal weir was 46 m at that time, which was made out of locally available materials whatever they could get around the site. Some chassis used for truck vehicle were applied to support the weir body too. Much to the visitor's astonishment, by that time, they managed those activities on their own; they had no external supports from anywhere.

In 2006, the farmers started constructing a permanent diversion weir by themselves while receiving technical supports from TSB Mansa. The officers gave the farmers advices on how to effectively capture the water, align the furrow, construct concrete weir, and so forth. Out of 46 m, 6 m of original temporal part of the weir was replaced to permanent one by spending 50 bags of cement which was contributed by all the 20 committed members.

Since that time, they had been expanding concrete parts of the weir step by step. By July in 2009, the length of permanent portion was extended by 23 m in total. The reinforcement works of the irrigation facility in 2009 took the 20 members about two weeks. All the reinforcing works were done by man-using small tools such as shovel, hummer, trowel, and so on. There was no heavy equipment on the site during whole construction period because of the location of the site. They had no option other



Since 2006, year by year, the farmers of the site have continuously reinforced the temporal weir by using foreign materials like cement and iron bars which have been contributed by members themselves. (As of July 2009).



In year 2010, by improving the remaining temporal parts, all the parts of the weir has at last been graded up from temporal to permanent. (As of late in September, 2010)

than they did it on their own.

The construction works to grade up remaining temporal parts started in the middle of August 2010 after finishing a communal work to put a village road in good condition which took the members about 3 weeks from July to August. By constant participation in the works of about 40 members a day, the weir was completed within 4 weeks. The construction works were over by mid September. With this, all the parts of weir have been upgraded to permanent structure from the previous temporal one. The permanent weir has supplied the water to an area of 2 ha of irrigated plots cultivating banana, tomato, and so forth.

8) Mililwa Lower Site, Mansa District, Luapula Province

Mililwa Lower project site is located at about 10 km away to the east of Mansa town centre. It takes about 20 minutes by vehicle. In the area, Mililwa stream, which is one of the major water sources for irrigation farming and domestic use as well, is gently running through with a certain amount of flow throughout a year. A simple diversion weir was newly constructed under the pilot project implementation in 2009 dry season.

Topographic condition around the weir construction site forms a part of shallow *dambo*, wide-spreading with about 200 m from the right bank to the left one with very gentle slope. The whole surface around there is covered with plenty of grasses. In and around the project site, farmers grow several kinds of vegetable such as cabbage, tomato, onion and winter maize and then those productions are supplied to Mansa center, Samfya market, Mwense Kashikishi town market and as far as to Nchelenge market. The project site can be considered as an area of small-sized intensive farming in the suburbs of townships for the neighbor districts.

“Mililwa Lower Farmers Group” is the name of the participant group for the project. The membership counts at 25 farmers, composed of 13 males and 10 females. They come from 3 villages: Timoth (3 members, 2 males, 1 females), Chibolya (3, 2, 1), Chakulya (3, 0, 3), and Kashikishi (4, 2, 2). They have formed a farming group in 2008 to acquire the certificate of buying subsidized fertilizer, chemical, and to rear livestock such as poultry, goat and cattle.

As mentioned above, the construction site is located in *dambo* area and then the capacity of soil is not suitable to put a heavy weight structure like concrete type and masonry type one as the other sites introduce. Due to the reason, a small-scale earth dam type was selected for this project site. The group members started the construction works with excavation work of core-trench of the small earth dam since the end of May 2010. They worked on the site every 3 days in a week. As of mid July 2010, almost 100m³ of soil were excavated, which was equivalent to 7m³ of



The participants are digging core-trench of the small earth dam. (As of mid-July 2010).



The main body of small-scale earth has been piled up to the level planned. (As of the beginning of November 2010).

excavation per day.

During the course of the dam construction, some sheet piles were also driven into the ground to shut off the water leakage passing through the core trench of the dam. After completion of putting masonry stones to equip a natural-type spillway on its right bank side, the community members completed all the dam construction works by the beginning of November 2010. It took them about 4 months. The dam irrigated 1.25 ha of farm land as of November 2010, and is designed to expand the irrigated area to 5.0 ha with a road crossing on the furrow alignment.

A.1 The Results of Irrigation Scheme Survey in Northern Province

A.1.1 Existing Permanent Irrigation Scheme

Table A.1.1 Existing Permanent Irrigation Scheme, Chinsali District, Northern Province

1. EXISTING PERMANENT IRRIGATION SCHEME								6	
PROVINCE: NORTHERN / DISTRICT: CHINSALI								Total	Average / %
Site No.	1	2	3	4	5	6	7	8	
Name of Scheme/Site:	Vitondo	Mwalala	Lameck	Ilondola	Chipilimba	Milonfi			
Mark on Map:		1031D2	1031D2	1031D4	1031D2	1121 B2			
Name of Camp:	Vitondo	Ilondola	Chinsali Central	Ilondola	Ilondola	Kabangama			
Name of CEO:	Bwalya Lombe	Johns Nyolongo	Francisca Kasonde	Nyirongo	Nyirongo	Mubila Fikice			
Name of River/Stream/Dambo:	Kawama	Milenge	Lubu	Chimpundu	Lumpene	Kabangama			
Name of Village Benefited:	Vitondo	Chama	Lameck	Chakobac Edward	Chipilimba	Kabangama			
Year of Establish/Supported by:	-Year	2001	1985	2001		1989			
	-Government (Specify)	1	1	1	0	0	3	50%	
	-Donor (Specify)	0	0	0	0	0	0	0%	
	-Others (Specify)	0	0	0	Mission	RIF	EE.OA Swedish funded	3	50%
	-Others (Specify)	0	0	0	0	0	0	0	0%
Water Resource:	-Dambo	0	0	0	0	0	1	17%	
	-River/Stream	1	1	1	1	0	1	83%	
	-Bore hole/Shallow well	0	0	0	0	0	0	0%	
	-Springs	0	0	0	0	0	0	0%	
	-Lake	0	0	0	0	0	0	0%	
Intake System:	-River Diversion	0	1	1	0	1	5	83%	
	-Dam/Reservoir	1	0	0	0	0	0	17%	
	-Pump	0	0	0	0	0	0	0%	
	-Others (Specify)	0	0	0	0	0	0	0%	
	-Others (Specify)	0	0	0	0	0	0	0%	
Irrigation System:	-Gravity	1	1	1	1	1	6	100%	
	-Sprinkler	0	0	0	0	0	0	0%	
	-Drip	0	0	0	0	0	0	0%	
	-Others (Specify)	0	0	0	0	0	0	0%	
	-Others (Specify)	0	0	0	0	0	0	0%	
Present Irrigation Area (Ha):	3.7	0.7	0.9	1.5	1.9	11.1	19.84	3.3	
Potential Irrigation Area from Land Availability (Ha):	27.0	47.2	49.3	21.5	49.3	45.1	239.41	39.9	
Dominant Crops in Dry Season with Irrigation:	Tomatoes, Onion, Cabbage		Cabbage, Sugar cane, Rape and Tomatoes	Rape, Cabbage, Tomatoes	Tomatoes, Cabbage, Onion and Rape	Onions, Maize, Tomatoes, Rape, Cabbage			
Dominant Crops in Rainy Season:	Tomatoes, Maize		Maize, Tomatoes	Maize, Cassava, Finger millet	Maize, G/nuts, Sweet potatoes	Maize, Tomatoes and Cassava			
% of river water directing to furrow during peak irrigation period:		20	30	30	25	35	140	23.3	
How long from DACO Office by vehicle (Minutes):	60	60	25	45	60	60	310	51.7	
Distance (Km):							0	0.0	
Is there fish pond in the Scheme:	-Yes	1	1	1	1	1	6	100%	
	-No	0	0	0	0	0	0	0%	
	-if yes, how many	5	11	11	20	25	14	86	14.3
Is there other fish pond in the Village (not including the Scheme):	-Yes	1	1	0	1	1	4	67%	
	-No	1	0	1	0	0	2	33%	
	-if yes, how many						0	0%	
Intake Facility:	-Weir	1	1	1	0	1	4	67%	
	-Masonry Diversion Weir	0	0	0	0	0	1	17%	
	-Dam (Earth)	0	0	0	1	0	1	17%	
	-Dam (Concrete)	0	0	0	0	0	0	0%	
	-Pump (Motor)	0	0	0	0	0	0	0%	
	-Pump (Engine)	0	0	0	0	0	0	0%	
	-Others (Specify)	0	0	0	0	0	0	0%	
Present Condition of Intake Facility:	-Good	0	0	1	0	0	1	17%	
	-Fair	1	1	1	0	1	5	83%	
	-Bad	0	0	0	0	0	0	0%	
Dimension of Intake Facility:	-Length (m)	5.2	50	10	40	25	13	-	
	-Height (m)	3	3	0.7	2.5	1	0.5	-	
	-Width (m)							-	
Dam:	-Length (m)	0	0	0	0	0	0	-	
	-Height (m)	0	0	0	0	0	0	-	
	-capacity(m3)	0	0	0	0	0	0	-	
Pump:	-Capacity (cum./min)	0	0	0	0	0	0	-	
	-Nos. of Pump	0	0	0	0	0	0	-	
	-Head (m)	0	0	0	0	0	0	-	
Length of Furrow (Canal) and Condition:	-Condition	1500	700	1000	4000	3000	2000	12,200	2,033
	-Good	0	0	0	0	0	0	0	0%
	-Fair	1	0	1	1	1	1	5	83%
	-Bad	0	1	0	0	0	0	1	17%
	-Out of the length above, the length of lined main furrow is (m)	610	0	0	0	0	0	610	102
	-Secondary furrow (m)	0	0	0	0	0	0	0	0
	-Good	0	0	0	0	0	0	0	0%
Soil Fertility:	-Fair	0	0	1	0	0	1	17%	
	-Bad	0	0	0	0	0	0	0%	
	-Poor	0	0	0	0	0	0	0%	
Acidity Problem:	-Almost Nil	0	0	1	1	0	2	33%	
	-A Little Appeared	0	0	0	0	1	0	17%	
	-Fairly Appeared	1	1	0	0	1	3	50%	
	-Very much Appeared	0	0	0	0	0	0	0%	
Salinity Problem:	-Almost Nil	1	1	1	1	1	5	83%	
	-A Little Appeared	0	0	0	0	0	1	17%	
	-Fairly Appeared	0	0	0	0	0	0	0%	
	-Very much Appeared	0	0	0	0	0	0	0%	
Irrigation Group:	-Beneficiaries	40	100	20	200	10	25	395	66
	-Nos of Land Owners	7	4	2	5	3	3	24	4
What maintenance works and how often do irrigators carry out:	-What maintenance (1)	Cleaning the furrow	Cleaning the furrow	Cleaning the furrow	Cleaning the waif	Cleaning	Cleaning the furrow	-	-
	-How Often (1)	3times per year	2 in a month	once per month	once	twice per month	twice in a month	-	-
	-What maintenance (2)	Cutting of grass	Slashing grass	Slashing grass				-	-
	-How Often (2)	2times per year	Slashing grass			twice per month		-	-
Issues/problems on operation (water use) and maintenance of irrigation facility:	-Maintenance							-	-
	-Operation							-	-
Apart from Irrigation/maintenance, are there any group (collective) activities by the irrigators:		HIV group	HIV group, Choir group	HIV group, Radio forum group	HIV group, Choir group	HIV group, Church group	HIV group, Jatropha group	-	-
								-	-
Name of the Nearest Major Market and Distance:	-Name	Isaka	Chinsali	Chinsali	Chinsali	Chinsali	Chinsali	-	-
	-Distance (Km)	30	30	10	35	40	67	212	35
Accessibility to the Nearest Market in terms of Road Condition:	-Good	0	0	0	0	0	0	0	0%
	-Fair	1	0	1	1	1	1	5	83%
	-Bad	0	1	0	0	0	0	1	17%
Issues/Problems on Irrigation Facility		The weir is short, we need to increase the current weir span from 5.2m to 12m and line the furrow from the current 610m to 1600m.	The weir is o.k but we need to peg and dig the water furrow to the side where 100 irrigators are.	The facility is too short and too low.	Breaking of the weir by the first farmers. Leaking of water.	Water Leaking	Leaking of water	-	-

Table A.1.2 Existing Permanent Irrigation Scheme, Isoka District, Northern Province (1/2)

1. EXISTING PERMANENT IRRIGATION SCHEME		1	2	3	4	5	6	7	8
PROVINCE: NORTHERN / DISTRICT: ISOKA									
Site No.		1	2	3	4	5	6	7	8
Name of Scheme/Site:		Pwazi	Mwgrya	Katonga	Chapola	Kawandama	Liwelikasya	Nanssala	Malale
Mark on Map:		1	2	3	4	5	6	7	8
Name of Camp:		Mwlekatambo	Isoka Central	Isoka Central	Isoka Central	Isoka Central	Isoka Central	Nanssala	Isoka Central
Name of CEO:		Mwabu Edwaro	Arin old Simukon da Kasama	Arin old Simukonde Katonga	A. Simukonda Chinyansi	A. simukonda Kawandama	A. Simukonde kaumba	P. Mwape Nanssala	A. Simukonde Kavmba
Name of River/Stream/Dambo:		Pwazi							
Name of Village Benefited:		Pwazi		Katonga Lozani	Chinyansi, Chapola	Malale	Kaumba	Nanssala, Mitongo	Malale
Year of Establish/Supported by:	*Year	2007		1960	1999	2001	2001	1999	1998
	*Government	0	1	0	1	1	0	1	1
	(Specify)	0	0	0	0	0	0	0	0
	*Donor	1	0	0	0	0	0	0	0
	(Specify)	JSPRF					JSPRF		
Water Resource:	*Others	0	0	1	0	0	0	0	0
	(Specify)			Community					
	*Dambo	0	0	0	0	0	0	0	0
	*River/Stream	0	1	1	1	1	1	1	1
	*Bore hole/Shallow well	0	0	0	0	0	0	0	0
Intake System:	*Springs	0	0	0	0	0	0	0	0
	*Lake	0	0	0	0	0	0	0	0
	*River Diversion	1	1	1	1	1	1	1	1
	*Dam/Reservoir	0	0	0	0	0	0	0	0
	*Pump	0	0	0	0	0	0	0	0
Irrigation System:	*Others	0	0	0	0	0	0	0	0
	(Specify)								
	*Concrete diversion	1	1	1	1	1	1	1	1
	*Sprinkler	0	0	0	0	0	0	0	0
	*Drip	0	0	0	0	0	0	0	0
Present Irrigation Area (Ha):	*Others	0	0	0	0	0	0	0	0
	(Specify)								
Potential Irrigation Area from Land Availability (Ha):		0.3	0.7	0.4	1.1	7.4	11.1	2.8	0.0
Dominant Crops in Dry Season with Irrigation:		Vegetables	Vegetables	Vegetables	Vegetables	Vegetables, G/nuts, Fruit Trees	Fruits, Vegetables	Vegetables, groundnuts, Bananas	N/a
Dominant Crops in Rainy Season:		Maize	Maize and Vegetables	Maize and Vegetables	Maize, G/Nuts and Vegetables	Fruit Trees, Maize, Potatoes	Maize, G/nuts, Fruits and Coffee	Maize, Bananas, Ground nuts, Vegetables	Maize, Fruits
% of river water directing to furrow during peak irrigation period:		50	10	35	20	25	30	30	0
How long from DACO Office by vehicle (Minutes):		120	10	Na	30	30	30	30	30
Distance (Km):		130	3	Na	3.8	25	20	25	26
Is there fish pond in the Scheme:	*Yes	0	0	1	1	1	1	1	0
	*No	1	1	0	0	0	0	0	1
	*If yes, how many	0	0	10	0	10	0	50	0
Is there other fish pond in the Village (not including the Scheme):	*Yes	0	1	0	1	1	1	1	0
	*No	1	0	1	0	0	0	0	1
	*If yes, how many	0	0						
Intake Facility:	*Concrete diversion	1	1	0	1	1	1	1	1
	*Masonry Diversion Weir	0	0	0	0	1	0	0	0
	*Dam (Earth)	0	0	0	0	0	0	0	0
	*Dam (Concrete)	0	0	0	0	0	0	0	0
	*Pump (Motor)	0	0	0	0	0	0	0	0
	*Pump (Engine)	0	0	0	0	0	0	0	0
	*Others (Specify)	0	0	Direct-No weir	0	0	0	0	0
	Present Condition of Intake Facility:		*Good	1	0	0	1	0	0
		*Fair	0	1	0	1	1	0	1
		*Bad	0	0	1	0	0	0	0
Dimension of Intake Facility:	*Diversion weir:								
	*Length (m)	16	0	N/a	4	21	5	21	15
	*Height (m)	1.2	0	0	1	2.5	0.5	1	2
*Dam:	*Width (m)	0	0	0	0.5	0	0	1	1.5
	*Length (m)	0	0	0	0	0	0	0	0
	*Height (m)	0	0	0	0	0	0	0	0
*Pump:	*Capacity(m3)	0	0	0	0	0	0	0	0
	*Capacity (cum./min)	0	0	0	0	0	0	0	0
	*Nos. of Pump	0	0	0	0	0	0	0	0
	*Head (m)	0	0	0	0	0	0	0	0
Length of Furrow (Canal) and Condition:	*Main Furrow (m) and Condition:	500	2500	3000	3000	2000	3000	9	1000
	*Good	0	0	0	0	0	1	0	0
	*Fair	0	0	1	0	0	0	0	0
	*Bad	1	1	0	1	1	0	1	1
	*Out of the length above, the length of lined main furrow is (m)	20	2500	300	100	100	2000	100	0
	*Secondary furrow (m)	0	0	0	0	0	0	3000	1000
	*Good	0	0	0	0	0	0	0	0
	*Fair	0	0	0	0	0	0	0	0
	*Bad	1	0	1	0	0	0	1	1
	*Good	0	0	0	0	0	0	0	0
Soil Fertility:	*Fair	1	1	0	1	1	1	1	0
	*Poor	0	0	1	0	0	0	0	1
	*Almost Nil	0	0	0	0	0	0	0	0
Acidity Problem:	*A Little Appeared	0	0	0	0	1	0	0	0
	*Fairly Appeared	0	0	0	1	0	1	1	0
	*Very much Appeared	1	1	1	0	0	0	0	1
Salinity Problem:	*Almost Nil	0	0	0	0	1	0	0	0
	*A Little Appeared	0	1	1	1	0	0	0	1
	*Fairly Appeared	0	0	0	0	0	0	0	0
	*Very much Appeared	0	0	0	0	0	0	0	0
Irrigation Group:	*Nos of Irrigators (Beneficiaries)	20	60	50	60	20	20	Over 60	N/a
	*Nos of Land Owners	20	3	50	40	20	20	Over 60	unknown
What maintenance works and how often do Irrigators carry out:	*What maintenance (1)	Cleaning	Cleaning	Cleaning	Cleaning	Cleaning / Slashing	cleaning	N/a	N/a
	*How Often (1)	Irregular	Irregular	Irregular	Irregular	Irregular	Monthly		
	*What maintenance (2)		Repairs			Crack Repair		N/a	N/a
Issues/problems on operation (water use) and maintenance of irrigation facility:	*How Often (2)		Irregular			Irregular			
	*Maintenance	Lack of Tools	Breakages (Vandalism)	Negligence	Burrowing by Moles and mice	Lack of Materials for Repairs		Negligence	Negligence
	*Operation	Seepage due to lack of lining		Domestic activities	N/a	N/a		Conflicts by users	
Apart from Irrigation/maintenance, are there any group (collective) activities by the irrigators:		N/a	N/a	N/a	Womans Club	Co-operative Society		The farmers belong to co-operatives and savings groups	Apparently the farmers are sparsely located, leading to lack of organization.
Name of the Nearest Major Market and Distance:	*Name	Milembo	Isoka Main	Isoka Central	Isoka Town	Isoka Boma		Isoka Boma	Isoka Boma
	*Distance (Km)	3	6	2	4	25			25
Accessibility to the Nearest Market in terms of Road Condition:	*Good	1	1	1	0	0	0	1	0
	*Fair	0	0	0	0	1	0	0	1
	*Bad	0	0	0	0	0	0	0	0
Issues/Problems on Irrigation Facility		See page since most of the furrow is not lined.	Broken lining	Lack of lining and regular cleaning		The weir was not completed when materials ran out.		The old structure is facing excessive and siltation and is being uplifted.	Under passing of water causing uplifting. Cracking and part of the weir is washed away

Table A.1.3 Existing Permanent Irrigation Scheme, Isoka District, Northern Province (2/2)

1. EXISTING PERMANENT IRRIGATION SCHEME		1	1	1	1	4	4
PROVINCE: NORTHERN / DISTRICT: ISOKA						Total	Average / %
Site No.		9	10	11	12	12	-
Name of Scheme/Site:		Mpandao	Kalanga	Nyembe	Kabilya	-	-
Mark on Map:		9	10	11	12	-	-
Name of Camp:		Isoka Central	Muyombe	Isoka Central	Chanama	-	-
Name of CEO:		A. Simukonde	Edwin Kaonga	A. simukonde	K. Sampa	-	-
Name of River/Stream/Dambo:		Kaumba	Kalanga	Chapota	Chanama	-	-
Name of Village Benefited:		Kaumba, Malale	Muyombe	Nyembe	Kabilya	-	-
Year of Establish/Supported by:	-Year	2007	1998	1998	1997	-	-
	-Government	0	1	1	1	8	67%
	(Specify)	0	0	0	0	-	-
	-Donor	1	0	0	0	3	25%
	(Specify)	JSPRF	0	0	0	-	-
Water Resource:	-Others	0	0	0	0	1	8%
	(Specify)						
	-Dambo	0	0	0	0	0	0%
	-River/Stream	1	0	1	1	10	83%
	-Bore hole/Shallow well	1	0	0	0	0	0%
Intake System:	-Springs	0	1	0	0	1	8%
	-Lake	0	0	0	0	0	0%
	-River Diversion	1	0	1	1	11	92%
	-Dam/Reservoir	0	0	0	0	0	0%
	-Pump	0	0	0	0	0	0%
Irrigation System:	-Others	0	1	0	0	1	8%
	(Specify)		Spring harness				
	(=Gravity)	1	0	1	1	11	92%
	-Sprinkler	0	0	0	0	0	0%
	-Drip	0	0	0	0	0	0%
Present Irrigation Area (Ha):		7.4	0.0	N/a	0.4	31.61	2.6
Potential Irrigation Area from Land Availability (Ha):		20	10	5	5	154.00	12.8
Dominant Crops in Dry Season with Irrigation:		Fruits trees, Coffee, Vegetables, G/nuts	N/a	N/a	Vegetables	-	-
Dominant Crops in Rainy Season:		Fruits trees, Coffee, Vegetables, G/nuts, Maize	maize, bananas and G/nuts	Maize, G/nuts, Vegetables	Maize, groundnuts	-	-
% of river water directing to furrow during peak irrigation period:		25	60	100 DTMND	20	305	25.4
How long from DACO Office by vehicle (Minutes)		30	180	25		515	42.9
Distance (Km):		20	190	10		453	37.7
Is there fish pond in the Scheme:	-Yes	1	0	0	1	7	58%
	-No	0	1	1	0	5	42%
	-if yes, how many	20				90	7.5
Is there other fish pond in the Village (not including the Scheme):	-Yes	1	0	0	1	6	50%
	-No	0	1	1	0	6	50%
	-if yes, how many					0	-
Intake Facility:	-Weir	1	1	1	1	11	92%
	-Masonry Diversion Weir	0	0	0	0	1	8%
	-Dam (Earth)	0	0	0	0	0	0%
	-Dam (Concrete)	0	0	0	0	0	0%
	-Pump (Motor)	0	0	0	0	0	0%
	-Pump (Engine)	0	0	0	0	0	0%
	-Others (Specify)	0	0	0	0	0	0%
Present Condition of Intake Facility:	-Good	1	0	0	0	3	25%
	-Fair	0	1	0	0	4	33%
	-Bad	0	0	1	1	5	42%
Length of Furrow (Canal) and Condition:	-Dimension of Intake Facility:						
	*Diversion weir:						
	-Length (m)	10	10	10	15	-	-
	-Height (m)	1	1	1	1	-	-
	-Width (m)	0	0	0	0	-	-
	*Dam:						
	-Length (m)	0	0	0	0	-	-
	-Height (m)	0	0	0	0	-	-
	-Capacity(m3)	0	0	0	0	-	-
	*Pump:						
-Capacity (cum./min)	0	0	0	0	-	-	
-Nos. of Pump	0	0	0	0	-	-	
-Head (m)	0	0	0	0	-	-	
Soil Fertility:	-Condition	2800	5000	unknown	unknown	22,809	1,901
	-Good	1	0	0	0	2	17%
	-Fair	0	0	0	0	1	8%
	-Bad	0	1	1	1	9	75%
	*Out of the length above, the length of lined main furrow is (m)	1800	1000	50	The weir is very difficult to access due to overgrowth	7,970	664
	-Secondary furrow (m)	2000	0	N/a	0	6,000	500
	-Good	0	0	0	0	0	0%
	-Fair	0	0	0	0	0	0%
	-Bad	0	0	0	0	4	33%
	Acidity Problem:	-Good	0	0	0	0	0
-Fair		1	1	1	1	10	83%
-Poor		0	0	0	0	2	17%
-Almost Nil		0	0	0	0	0	0%
-A Little Appeared		0	0	0	0	1	8%
Salinity Problem:	-Fairly Appeared	0	0	0	0	3	25%
	-Very much Appeared	1	1	1	1	8	67%
	-Almost Nil	1	1	1	1	5	42%
	-A Little Appeared	0	0	0	0	4	33%
	-Fairly Appeared	0	0	0	0	0	0%
Irrigation Group:	-Very much Appeared	0	0	0	0	0	0%
	(Beneficiaries)	50	N/a for now	20	undetermined	300	25
	-Nos of Land Owners	20	undetermined	20		193	16
What maintenance works and how often do irrigators carry out:	-What maintenance (1)	Cleaning	Cleaning	N/a	N/a	-	-
	-How Often (1)	twice monthly	Irregular	N/a		-	-
	-What maintenance (2)	De silting				-	-
Issues/problems on operation (water use) and maintenance of irrigation facility:	-How Often (2)	twice monthly				-	-
	-Maintenance	N/a	N/a	N/a		-	-
	-Operation	N/a	N/a	N/a		-	-
Name of the Nearest Major Market and Distance:	-Apart from irrigation maintenance, are there any group (collective) activities by the beneficiaries?	religious activities	N/a	Farmers belong to youth, savings and womans group.	They belong to fish interest group.	-	-
	-Name	Isoka Boma	Muyombe	Isoka Boma	Thendele	-	-
	-Distance (Km)	20	5	10	20	146	12
Accessibility to the Nearest Market in terms of Road Condition:	-Good	0	1	1	1	7	58%
	-Fair	1	0	0	0	5	42%
	-Bad	0	0	0	0	0	0%
Issues/Problems on Irrigation Facility		The canal being at the foot of a hill faces massive siltation due to debris carried by run off.	there are bowling animals along the furrow, leading to the base collapsing in some portions, thus water sinks into the soil and never reaches the beneficiaries	The canal is broken, the upstream of the weir is highly silted and vegetated.	The place is over grown with vegetation making it very difficult to access.	-	-

Table A.1.4 Existing Permanent Irrigation Scheme, Kaputa District, Northern Province

1. EXISTING PERMANENT IRRIGATION SCHEME						1	1
PROVINCE: NORTHERN / DISTRICT: KAPUTA						Total	Average / %
Site No.		1				1	-
Name of Scheme/Site:		Talwaka Lumo co-op				-	-
Mark on Map:						-	-
Name of Camp:		Kaputa Central				-	-
Name of CEO:		A. Liswaniso				-	-
Name of River/Stream/Dambo:		Chichinga				-	-
Name of Villages Benefited:		Kasungwe				-	-
Year of Establish/Supported by:	-Year	1996				-	-
	-Government	0				0	0%
	(Specify)	0				-	-
	-Donor	1				1	100%
	(Specify)	RIF, USAID				-	-
Water Resource:	-Others	0				0	0%
	(Specify)	0				-	-
	-Dambo	1				1	100%
	-River/Stream	0				0	0%
	-Bore hole/Shallow well	0				0	0%
Intake System:	-Springs	0				0	0%
	-Lake	0				0	0%
	-River Diversion	0				0	0%
	-Dam/Reservoir	0				0	0%
	-Pump	1				1	100%
Irrigation System:	-Others	0				0	0%
	(Specify)	0				-	-
	-Subsurface	1				1	100%
	-Sprinkler	1				1	100%
	-Drip	0				0	0%
Present Irrigation Area (Ha):	-Others	0				0	0%
	(Specify)	0				-	-
	-Total	1.0				1.00	1.0
	-Potential Irrigation Area from Land Availability (Ha):	35.0				35.00	35.0
	-Dominant Crops in Dry Season with Irrigation:	Tomatoes, Onion, Chinese cabbage, Rape, Maize, Carrots, Eggplants and Cabbage				-	-
-Dominant Crops in Rainy Season:	Maize, Cassava, Groundnuts, Beans, Sorghum and Cow peas				-	-	
% of river water directing to furrow during peak irrigation period:	Na				0	0.0	
How long from DACO Office by vehicle (Minutes):	35				35	35.0	
Distance (Km):	12.5				13	12.5	
Is there fish pond in the Scheme:	-Yes	1				1	100%
	-No	0				0	0%
	-if yes, how many	2				2	2.0
Is there other fish pond in the Village (not including the Scheme):	-Yes	0				0	0%
	-No	1				1	100%
	-if yes, how many	0				0	-
Intake Facility:	-Gravity Diversion	0				0	0%
	-Masonry Diversion Weir	0				0	0%
	-Dam (Earth)	0				0	0%
	-Dam (Concrete)	0				0	0%
	-Pump (Motor)	0				0	0%
	-Pump (Engine)	1				1	100%
	-Others (Specify)	0				0	0%
Present Condition of Intake Facility:	-Good	0				0	0%
	-Fair	0				0	0%
	-Bad	1				1	100%
Dimension of Intake Facility:	-Length (m)	0				-	-
	-Height (m)	0				-	-
	-Width (m)	2				-	-
Dam:	-Length (m)	2.5				-	-
	-Height (m)	2.5				-	-
	-Capacity(m3)	12.5				-	-
Pump:	-Capacity (cum./min)	658.3				-	-
	-Nos. of Pump	1				-	-
	-Head (m)	66				-	-
Length of Furrow (Canal) and Condition:	-Main Furrow (m) and Condition	600				600	600
	-Good	0				0	0%
	-Fair	1				1	100%
	-Bad	0				0	0%
	-Out of the length above, the length of lined main furrow is (m)	15				15	15
	-Secondary furrow (m)	400				400	400
	-Good	0				0	0%
Soil Fertility:	-Fair	1				1	100%
	-Poor	0				0	0%
	-Almost Nil	1				1	100%
Acidity Problem:	-A Little Appeared	0				0	0%
	-Fairly Appeared	0				0	0%
	-Very much Appeared	0				0	0%
	-Almost Nil	1				1	100%
Salinity Problem:	-A Little Appeared	0				0	0%
	-Fairly Appeared	0				0	0%
	-Very much Appeared	0				0	0%
	-Almost Nil	1				1	100%
Irrigation Group:	-Nos of Irrigators (Beneficiaries)	34				34	34
	-Nos of Land Owners	24				24	24
What maintenance works and how often do Irrigators carry out:	-What maintenance (1)	Cleaning of water sump x canals				-	-
	-How Often (1)	Seasonally				-	-
	-What maintenance (2)	replacement of gaskets				-	-
	-How Often (2)	once/month				-	-
Issues/problems on operation (water use) and maintenance of irrigation facility:	-Maintenance	costs of gaskets and cylinder are very high				-	-
	-Operation	Domestic and irrigation				-	-
Apart from Irrigation/maintenance, are there any group (collective) activities by the irrigators:							
Name of the Nearest Major Market and Distance:	-Name	Kaputa Boma				0	0
	-Distance (Km)	12.5				13	1250%
Accessibility to the Nearest Market in terms of Road Condition:	-Good	0				0	0%
	-Fair	1				1	100%
	-Bad	0				0	0%
Issues/Problems on Irrigation Facility		Fuel x oil expenses are too high due to distance to the nearest fuel station. Poor network. Periodic break downs due to engine capacity.				-	-

Table A.1.5 Existing Permanent Irrigation Scheme, Kasama District, Northern Province

1. EXISTING PERMANENT IRRIGATION SCHEME										9	9	
PROVINCE: NORTHERN / DISTRICT: KASAMA										Total	Average / %	
Site No.	1	1	1	1	1	1	1	1	1	9	9	
Name of Scheme/Site:	Lukulu South	Chilubula	Lukulu North Dryland Zone	Namayakuba	Mwamba	Sani	Milungu	Chisola	Transkei Scheme	-	-	
Mark on Map:	A	B	C	D	E	H	J	K	L	-	-	
Name of Camp:	Lukulu	Lukulu North	Lukulu North	Chiombo	Mwamba	Chilambani	Milungu	Chiombo	Ngoli	-	-	
Name of CEO:	Kunda Stephen	Kunda Stephen	Kunda Stephen	Ntembula Robert	Mwamba	Chilambani	Milungu	Ntembula Robert	Mutondwa S.	-	-	
Name of River/Stream/Dambo:	Luombe	Kamansa Miondo	Luko	Kabundi	Akutukuta	Mullansolo	Milungu	Chisola	Malume	-	-	
Name of Village Benefited:	Lukulu North	Chilubula	Lukulu North	Chiombo	Mwamba	Sani	Milungu	Chisola	Malume	-	-	
Year of Establish/Supported by:	Year	1979	2004	2004	1986	1983	2007	2000	1996	2004	9	
	-Government (Specify)	0	0	1	1	1	1	1	0	1	9	
	-Donor (Specify)	0	0	0	0	0	0	0	0	0	0	
	-Others (Specify)	0	0	0	0	0	0	0	0	0	0	
	-Others (Specify)	0	0	0	0	0	0	0	0	0	0	
Water Resource:	-Dambo	0	0	0	0	0	0	0	0	0	0	
	-River/Stream	1	1	1	1	1	1	1	1	1	9	
	-Bore hole/Shallow well	0	0	0	0	0	0	0	0	0	0	
	-Springs	0	0	0	0	0	0	0	0	0	0	
	-Lake	0	0	0	0	0	0	0	0	0	0	
Intake System:	-River Diversion	1	1	1	1	1	1	1	1	1	9	
	-Dam/Reservoir	0	0	0	0	0	0	0	0	0	0	
	-Pump	0	0	0	0	0	0	0	0	0	0	
	-Others (Specify)	0	0	0	0	0	0	0	0	0	0	
	-Others (Specify)	0	0	0	0	0	0	0	0	0	0	
Irrigation System:	-Surface/furrow	1	1	1	1	1	0	1	1	1	8	
	-Sprinkler	0	0	0	0	0	0	0	0	0	0	
	-Drip	0	0	0	0	0	0	0	0	0	0	
	-Others (Specify)	0	0	0	0	0	1	0	0	1	11%	
	-Others (Specify)	0	0	0	0	0	0	0	0	0	0	
Present Irrigation Area (Ha):	5.0	2.0	Nil	3.0	3.0	Nil	1.5	1.3	2.8	18.55	2.1	
Potential Irrigation Area from Land Availability (Ha):	171.6	4.3	51.5	32.2	23.6	Nil	10.7	64.4	10.7	369.00	41.0	
Dominant Crops in Dry Season with Irrigation:	Tomatoes, Onion, Cabbage, Maize, Rape, Grnuts	Bananas, Vegetables	Nil	Tomatoes, Vegetables, E/plant	Cabbage, Maize, Carrots, E/pants	Nil	Rape, Cabbage, Okra, S/cane, Maize, Tomatoes, Cabbages	Tomatoes, Vegetables	Coffe, Maize, Tomatoes, Onion	-	-	
Dominant Crops in Rainy Season:	S/bans, Ground nuts and Cabbages	Maize	Maize, S/bans, Grnuts, Beans, Cassava	Maize, G/nuts, Beans	Maize, F/millet	Maize, G/nuts, Spotoatoes	Maize, G/nuts, S/bans, Cassava	Maize	Tomatoes, Maize, G/nuts, S/bans	-	-	
% of river water directing to furrow during peak irrigation period:	20	30	0	15	10	0	20	0	40	135	15.0	
How long from DACO Office by vehicle (Minutes):	60	60	60	0	40	30	20	80	60	410	45.6	
Distance (Kmn):	-	-	-	-	-	-	-	-	-	-	-	
Is there fish pond in the Scheme:	-Yes	0	1	0	0	0	0	0	0	1	11%	
	-No	1	0	1	1	1	1	1	1	8	89%	
Is there other fish pond in the Village (not including the Scheme):	-Yes	0	4	0	0	0	0	0	0	4	0.4	
	-No	0	0	0	0	0	0	0	0	0	0%	
Intake Facility:	-Concrete Diversion Weir	1	1	1	1	1	1	1	1	9	100%	
	-Masonry Diversion Weir	0	0	0	0	0	0	0	0	0	0%	
	-Dam (Earth)	0	0	0	0	0	0	0	0	0	0%	
	-Dam (Concrete)	0	0	0	0	0	0	0	0	0	0%	
	-Pump (Motor)	0	0	0	0	0	0	0	0	0	0%	
Present Condition of Intake Facility:	-Pump (Engine)	0	0	0	0	0	0	0	0	0	0%	
	-Others (Specify)	0	0	0	0	0	0	0	0	0	0%	
	-Good	0	1	0	0	0	0	0	0	1	33%	
	-Fair	1	0	0	1	0	0	0	0	0	22%	
	-Bad	0	0	1	0	1	1	0	0	1	44%	
Dimension of Intake Facility:	-Length (m)	15	15	31	56	25	13.7	33.5	16	10	-	
	-Height (m)	0.6	1.5	1.5	2	1.2	1.2	1.8	2	1.1	-	
	-Width (m)	0.5	0	0.4	0	0	0	0.4	0	0	-	
	-Length (m)	0	0	0	0	0	0	0	0	0	-	
	-Height (m)	0	0	0	0	0	0	0	0	0	-	
Length of Furrow (Canal) and Condition:	-Capacity (m ³)	0	0	0	0	0	0	0	0	0	-	
	-Capacity (cum./min)	0	0	0	0	0	0	0	0	0	-	
	-Nos. of Pump	0	0	0	0	0	0	0	0	0	-	
	-Head (m)	0	0	0	0	0	0	0	0	0	-	
	-Main Furrow (m) and Condition	35000	1200	0	5000	1200	Nil	3000	800	2000	48,200	5,356
Soil Fertility:	-Good	0	1	0	0	0	0	0	0	1	11%	
	-Fair	1	0	0	1	0	0	0	1	0	33%	
	-Bad	0	0	0	0	1	0	1	0	1	33%	
	-Out of the length above, the length of lined main furrow is (m)	0	1200	Nil	0	0	Nil	0	Nil	0	1,200	133
	-Secondary furrow (m)	3500	500	Nil	Nil	0	Nil	2000	0	500	6,500	722
Acidity Problem:	-Good	0	0	0	0	0	0	0	0	0	0%	
	-Fair	1	1	0	1	0	0	1	1	1	67%	
	-Bad	0	0	0	0	0	0	0	0	0	0%	
	-Very much Appeared	0	0	0	0	0	0	1	0	1	22%	
	-Almost Nil	1	1	0	1	1	1	1	1	1	89%	
Salinity Problem:	-A Little Appeared	0	0	1	0	0	0	0	0	1	11%	
	-Fairly Appeared	0	0	0	0	0	0	0	0	0	0%	
	-Very much Appeared	0	0	0	0	0	0	0	0	0	0%	
	-Almost Nil	1	1	0	1	1	1	1	1	1	89%	
	-A Little Appeared	0	0	1	0	0	0	0	0	0	0%	
Irrigation Group:	-Nos of Irrigators (Beneficiaries)	30	Nil	Nil	35	15	Nil	35	45	15	175	19
	-Nos of Land Owners	35	1	Nil	20	5	65	35	15	1	177	20
	-What maintenance works and how often do irrigators carry out:	Bush cleaning and desilting	Nil	Nil	Nil	Desilting	Nil	Desilting	Nothing at the moment	Desilting and bush cleaning	-	-
	-How Often (1)	Once per year	Nil	Nil	Nil	Once per year	Nil	Twice per year	Twice per year	Twice per year	-	-
	-How Often (2)	Once per year	Nil	Nil	Nil	Once per year	Nil	Twice per year	Twice per year	Twice per year	-	-
Issues/problems on operation (water use) and maintenance of irrigation facility:	-Maintenance	-	-	-	-	Construct weirs and line 100m	-	-	Nil	-	-	
	-Operation	Water has not reached farmers at the far end.	Water doesn't flow	Does not exist hence need to form one	Not yet operation just reorganizing	Nothing at the moment apart from desilting, furrow has not been operation for over 7 years	Nil	Fail to share water equally due to inadequate water	Nothing at the moment because the weir is not operational as expected.	Nil	-	
Apart from Irrigation/maintenance, are there any group (collective) activities by the irrigators:	-	Nil	Nil	Acquisition of fertilizer	-	-	Nil	Nil	Nil	-	-	
	-	Nil	Nil	Acquisition of fertilizer	-	-	Nil	Nil	Nil	-	-	
Name of the Nearest Major Market and Distance:	-Name	Kasama	Kasama	Kasama	Kasama	Kasama	Kasama	Kasama	Kasama	-	-	
	-Distance (Km)	50	53	75	20	11	6	60	67	342	38	
Accessibility to the Nearest Market in terms of Road Condition:	-Good	1	1	1	0	0	1	1	1	6	67%	
	-Fair	0	0	0	1	1	1	0	0	2	22%	
-Bad	0	0	0	0	0	0	0	0	0	0	0%	
Issues/Problems on Irrigation Facility	High seepage along secondary and a few portions along main canal	Water doesn't reach the farmers at the far end.	Water doesn't flow	Does not exist hence need to form one	Not yet operation just reorganizing	Nothing at the moment apart from desilting, furrow has not been operation for over 7 years	Nil	Fail to share water equally due to inadequate water	Nothing at the moment because the weir is not operational as expected.	Nil	-	

Table A.1.6 Existing Permanent Irrigation Scheme, Luwingu District, Northern Province

1. EXISTING PERMANENT IRRIGATION SCHEME		1	1	1	3		
PROVINCE: NORTHERN / DISTRICT: LUWINGU					Total	Average / %	
Site No.		1	2	3			
Name of Scheme/Site:		Sailli	Michinka Youth Club	Lufubu Resettlement			
Mark on Map:		A1	A3	A2			
Name of Camp:		Luwingu Main	Miuchinka Madulang	Mufili			
Name of CEO:		John Chilundika	Bwembya Chilesae	G.Bwalya			
Name of River/Stream/Dambo:		Muba	Muchinka	Mulalalashi			
Name of Village Benefited:		Sailli	Sumbureni				
Year of Establish/Supported by:	-Year	1964	1994	1996			
	-Government	1	1	1	3	100%	
	(Specify)	0	0	0	-	-	
	-Donor	0	0	0	0	0%	
	(Specify)	0	0	0	-	-	
	-Others	0	0	0	0	0%	
(Specify)	0	0	0	-	-		
Water Resources:	-Dambo	0	0	0	0	0%	
	-River/Stream	1	1	1	3	100%	
	-Bore hole/Shallow well	0	0	0	0	0%	
	-Springs	0	0	0	0	0%	
	-Lake	0	0	0	0	0%	
Intake System:	-River Diversion	1	1	1	3	100%	
	-Dam/Reservoir	0	0	0	0	0%	
	-Pump	0	0	0	0	0%	
	-Others	0	0	0	0	0%	
	(Specify)	0	0	0	-	-	
Irrigation System:	-Surface furrow	1	1	1	3	100%	
	-Sprinkler	0	0	0	0	0%	
	-Drip	0	0	0	0	0%	
	-Others	0	0	0	0	0%	
	(Specify)	0	0	0	-	-	
Present Irrigation Area (Ha):	0.0	2.0	2.0	4.00	1.3		
Potential Irrigation Area from Land Availability (Ha):	0	4.3	51.5	0.00	0.00	130.00	43.3
Dominant Crops in Dry Season with Irrigation:		Cabbage, Rape, Tomatoes, Chinese Cabbage, Maize	Rape, Cabbage, Maize, Tomatoes, Irish potatoes, Onion	Tomatoes, Cabbage, Maize, Rape, Onion			
Dominant Crops in Rainy Season:		Maize, Beans, Sweet potatoes, Groundnuts	Maize, Cassava, Beans, Groundnuts	Maize, Beans, Cabbage, Sweet potatoes			
% of river water directing to furrow during peak irrigation period:		25	NA	25	50	16.7	
How long from DACO Office by vehicle (Minutes):		20	60	30	110	36.7	
Distance (Km):					0	0.0	
Is there fish pond in the Scheme:	-Yes	1	1	1	3	100%	
	-No	0	0	0	0	0%	
Is there other fish pond in the Village (not including the Scheme):	-If yes, how many	5	4	2	11	3.7	
	-Yes	1	1	0	2	67%	
Is there other fish pond in the Village (not including the Scheme):	-No	0	0	1	1	33%	
	-If yes, how many	0	20	0	20	-	
Intake Facility:	-Concrete Diversion Weir	0	1	0	1	33%	
	-Masonry Diversion Weir	1	0	1	2	67%	
	-Dam (Earth)	0	0	0	0	0%	
	-Dam (Concrete)	0	0	0	0	0%	
	-Pump (Motor)	0	0	0	0	0%	
	-Pump (Engine)	0	0	0	0	0%	
	-Others (Specify)	0	0	0	0	0%	
	-Good	0	0	0	0	0%	
Present Condition of Intake Facility:	-Fair	1	1	1	3	100%	
	-Bad	0	0	0	0	0%	
	-Good	0	0	0	0	0%	
Dimension of Intake Facility:	-Length (m)	8	0	8	-	-	
	-Height (m)	2	0	1,200	-	-	
	-Width (m)				-	-	
	-Dam:	-Length (m)	0	0	0	-	-
	-Height (m)	0	0	0	-	-	
	-capacity(m3)	0	0	0	-	-	
*Pump:	Capacity (cum./min)	0	0	0	-	-	
	Nos. of Pump	0	0	0	-	-	
	Head (m)	0	0	0	-	-	
Length of Furrow (Canal) and Condition:	-Main Furrow (m) and Condition	12,000	2,000	2,300	16,300	5,433	
	-Good	0	0	0	0	0%	
	-Fair	1	1	0	2	67%	
	-Bad	0	0	0	0	0%	
	*Out of the length above, the length of lined main furrow is (m)	0	0	Nil	0	0	
	-Secondary furrow (m)	0	0	Nil	0	0	
	-Good	0	0	0	0	0%	
	-Fair	0	0	0	0	0%	
-Bad	0	0	0	0	0%		
Soil Fertility:	-Good	1	1	1	3	100%	
	-Fair	0	0	0	0	0%	
	-Poor	0	0	0	0	0%	
Acidity Problem:	-Almost Nil	1	0	1	2	67%	
	-A Little Appeared	0	0	0	0	0%	
	-Fairly Appeared	0	0	0	0	0%	
	-Very much Appeared	0	0	0	0	0%	
Salinity Problem:	-Almost Nil	1	0	1	2	67%	
	-A Little Appeared	0	0	0	0	0%	
	-Fairly Appeared	0	0	0	0	0%	
	-Very much Appeared	0	0	0	0	0%	
Irrigation Group:	Nos of Irrigators (Beneficiaries)	142	10	80	232	77	
	-Nos of Land Owners	3	1	1	5	2	
What maintenance works and how often do Irrigators carry out:	-What maintenance (1)	Mending Loose Points	Mending of canal	one	-	-	
	-How Often (1)	Once a year	once a year	once per year	-	-	
	-What maintenance (2)	Canal Cleaning	Canal Cleaning	once per year	-	-	
	-How Often (2)	Once a year	once per year	once per year	-	-	
Issues/problems on operation (water use) and maintenance of irrigation facility:	-Maintenance	Lack of Cement to use		Although Mending H2O mines down	-	-	
	-Operation				-	-	
Apart from Irrigation/maintenance, are there any group (collective) activities by the irrigators:		Domestic use, Brick molding	General canal mending	Involved in other community work at school and rural health center	-	-	
Name of the Nearest Major Market and Distance:	-Name	Luwingu	Kasaba	Luwingu	-	-	
	-Distance (Km)	12	40	37	89	30	
Accessibility to the Nearest Market in terms of Road Condition:	-Good	1	0	0	1	33%	
	-Fair	0	0	1	1	33%	
	-Bad	0	1	0	1	33%	
Issues/Problems on Irrigation Facility		A total of 360m long pump breaks during the rain season. From the intake as lining	Weir is undermined	The center part of the permanent kiler	-	-	

Table A.1.7 Existing Permanent Irrigation Scheme, Mbala District, Northern Province

1. EXISTING PERMANENT IRRIGATION SCHEME		1	1	1	3	Average / %
PROVINCE: NORTHERN / DISTRICT: MBALA						
Site No.		1	2	3	Total	Average / %
Name of Scheme/Site:		Chinenke	Mpande	Londe	-	-
Mark on Map:		A	Bwembya Chilesae	C	-	-
Name of Camp:		Luhehe	Mpande	Luhehe	-	-
Name of CEO:		Musaba Eugenia Sikazwe		Uginea	-	-
Name of River/Stream/Dambo:		Mwambezi	Kabisha	Luhehe	-	-
Name of Village Benefited:		Chinenke	Mpande	Londe	-	-
Year of Establish/Supported by:	-Year	1930	2005	2004	-	-
	-Government	1	1	1	3	100%
	(Specify)	0	0	0	-	-
	-Donor	0	0	0	0	0%
	(Specify)	0	0	0	-	-
Water Resource:	-Others	0	0	0	0	0%
	(Specify)	0	0	0	-	-
	-Dambo	0	0	0	0	0%
	-River/Stream	1	1	1	3	100%
	-Bore hole/Shallow well	0	0	0	0	0%
Intake System:	-Springs	0	0	0	0	0%
	-Lake	0	0	0	0	0%
	-River Diversion	1	1	1	3	100%
	-Dam/Reservoir	0	0	0	0	0%
	-Pump	0	0	0	0	0%
Irrigation System:	-Others	0	0	0	0	0%
	(Specify)	0	0	0	-	-
	-Surface furrow	1	1	1	3	100%
	-Sprinkler	0	0	0	0	0%
	-Drip	0	0	0	0	0%
Present Irrigation Area (Ha):		85.0	2.5	37.5	125.0	41.7
	Potential Irrigation Area from Land Availability (Ha):	1300.0	300.0	180.0	1780.0	593.3
Dominant Crops in Dry Season with Irrigation:		Cabbage, Rape, Tomatoes, Green Maize, Onion	Rape, Cabbage, Maize, Tomatoes, Onion, Okra, Sugar cane	Tomatoes, Beans, Maize, Onion	-	-
Dominant Crops in Rainy Season:		Maize, Onion, Tomatoes	Maize, Finger millet	Maize, Beans	-	-
% of river water diverting to furrow during peak irrigation period:		90	50	50	#REF!	#REF!
How long from DACO Office by vehicle (Minutes):		30	270	20	320	106.7
Distance (Km):		14	100	3	#REF!	#REF!
Is there fish pond in the Scheme:	-Yes	1	0	0	1	33%
	-No	0	1	1	2	67%
	-if yes, how many	2	0	0	2	0.7
Is there other fish pond in the Village (not including the Scheme):	-Yes	1	0	0	1	33%
	-No	0	1	1	2	67%
	-if yes, how many	7	0	0	7	-
Intake Facility:	-Concrete Diversion Weir	1	1	0	2	67%
	-Masonry Diversion Weir	0	0	1	1	33%
	-Dam (Earth)	0	0	0	0	0%
	-Dam (Concrete)	0	0	0	0	0%
	-Pump (Motor)	0	0	0	0	0%
	-Pump (Engine)	0	0	0	0	0%
	-Others (Specify)	0	0	0	0	0%
Present Condition of Intake Facility:	-Good	0	0	0	0	0%
	-Fair	0	1	0	1	33%
	-Bad	1	0	1	2	67%
Dimension of Intake Facility:	-Diversion weir:					
	-Length (m)	1	22	8	-	-
	-Height (m)	0.5	0.3	1	-	-
*Dam:	-Width (m)	-	-	-	-	-
	-Length (m)	0	0	0	-	-
	-Height (m)	0	0	0	-	-
*Pump:	-capacity(m3)	0	0	0	-	-
	Capacity (cum./min)	0	0	0	-	-
	Nos. of Pump	0	0	0	-	-
	Head (m)	0	0	0	-	-
Length of Furrow (Canal) and Condition:	-Main Furrow (m) and Condition	4,000	4,000	4,000	12,000	4,000
	-Good	1	0	0	1	33%
	-Fair	0	1	1	2	67%
	-Bad	0	0	0	0	0%
	*Out of the length above, the length of lined main furrow is (m)	3,960	0	2,000	5,960	1,987
	-Secondary furrow (m)	4,000	0	0	4,000	1,333
	-Good	0	0	0	0	0%
Soil Fertility:	-Fair	0	1	1	2	67%
	-Poor	0	0	0	0	0%
	-Almost Nil	0	1	1	2	67%
Acidity Problem:	-A Little Appeared	1	0	0	1	33%
	-Fairly Appeared	0	0	0	0	0%
	-Very much Appeared	0	0	0	0	0%
Salinity Problem:	-Almost Nil	0	1	1	2	67%
	-A Little Appeared	1	0	0	1	33%
	-Fairly Appeared	0	0	0	0	0%
Irrigation Group:	-Very much Appeared	0	0	0	0	0%
	-Nos of Irrigators (Beneficiaries)	350	30	20	400	133
	-Nos of Land Owners	350	3	2	355	118
What maintenance works and how often do Irrigators carry out:	-What maintenance (1)	Seepage mending canal	Cleaning canal	Cleaning canal	-	-
	-How Often (1)	4 times a year	Twice a year	once per year	-	-
	-What maintenance (2)	Slashing the beams	Mending mouse holes	Mending mouse holes	-	-
Issues/problems on operation (water use) and maintenance of irrigation facility:	-How Often (2)	3 times a year	Whenever it occurs	Whenever it occurs	-	-
	-Maintenance	Sickness, death and other commitments	Lack of maintenance funds	Although Mending H2O mines down	-	-
	-Operation	Water users at the tail end not getting enough water			-	-
Apart from irrigation maintenance, are there any group (collective) activities by the irrigators?		Maintenance of road network and shelter at road side.	The works in schools	They maintain the road.	-	-
Name of the Nearest Major Market and Distance:	-Name	Mbala	Mbala	Mbala	-	-
	-Distance (Km)	14	100	3	117	39
Accessibility to the Nearest Market in terms of Road Condition:	-Good	1	0	1	2	67%
	-Fair	0	1	0	1	33%
	-Bad	0	0	0	0	0%
Issues/Problems on Irrigation Facility			Seepage at the intake and along the canal	Seepage at the intake and along the canal length	-	-

Table A.1.8 Existing Permanent Irrigation Scheme, Mpika District, Northern Province

1. EXISTING PERMANENT IRRIGATION SCHEME						4	
PROVINCE: NORTHERN / DISTRICT: MPIKA						Total	Average / %
Site No.	1	1	1	1	4		
Name of Scheme/Site:	Lusu Mwaiseni	Kabundi Irrigation	Mumbulu	Chipushi	4	-	-
Mark on Map:	A	B	C	D	-	-	-
Name of Camp:	Mufubushi	Mufubushi	Mufubushi	Chlonga	-	-	-
Name of CEO:	Mrs.Mwami	Mrs.Mwanu	Mrs.Mwami	Francis Mulenga	-	-	-
Name of River/Stream/Dambo:	Lusu		Spring water (mumbulu)		-	-	-
Name of Village Benefited:	Lusu and Mwaiseni	Kabundi	Mumbulu		-	-	-
Year of Establish/Supported by:				2005			
-Government	0	0	0	1	1	25%	
(Specify)	0	0	0	0	0	-	-
-Donor	1	0	1	0	3	75%	
(Specify)	Economic Expansion	North lungwa	North lungwa	0	-	-	-
-Others	0	0	0	0	0	0%	
(Specify)	0	0	0	0	-	-	-
Water Resource:							
-Dambo	0	0	0	0	0	0%	
-River/Stream	1	0	0	1	2	50%	
-Bore hole/Shallow well	0	0	0	0	0	0%	
-Springs	0	0	1	0	1	25%	
-Lakes	0	0	0	0	0	0%	
-River Diversion	1	1	1	1	4	100%	
-Dam/Reservoir	0	0	0	0	0	0%	
-Pump	0	0	0	0	0	0%	
-Others	0	0	0	0	0	0%	
(Specify)	0	0	0	0	-	-	-
Irrigation System:							
-Surface furrow	1	1	1	1	4	100%	
-Sprinkler	0	0	0	0	0	0%	
-Drip	0	0	0	0	0	0%	
-Others	0	0	0	0	0	0%	
(Specify)	0	0	0	0	-	-	-
Present Irrigation Area (Ha):	5.0	1.0	2.0	0.3	8.25	2.1	
Potential Irrigation Area from Land Availability (Ha):	6.0	5.0	6.0	20.0	37.00	9.3	
Dominant Crops in Rainy Season:	Maize, Beans and onion	Tomatoes, Maize	Maize and Vegetables	Vegetables	-	-	
Present Irrigation Type:	Maize Beans and Groundnut	Maize	Maize, Beans, and Groundnuts	Maize and Beans	-	-	
Distance (Km):	20	30	90	10	150	37.5	
-Yes	60	60	60	30	210	52.5	
-No	0	1	0	1	2	0.5	
Is there fish pond in the Scheme:	1	0	1	1	3	75%	
-if yes, how many	0	2	0	0	2	0.5	
-Yes	0	0	0	0	0	0%	
-No	1	1	0	1	3	75%	
Is there other fish pond in the Village (not including the Scheme):	0	0	0	0	0	-	
-if yes, how many	0	1	1	1	3	75%	
-Yes	1	0	0	0	1	25%	
-Masonry Diversion Weir	0	0	0	0	0	0%	
-Dam (Earth)	0	0	0	0	0	0%	
-Dam (Concrete)	0	0	0	0	0	0%	
-Pump (Motor)	0	0	0	0	0	0%	
-Pump (Engine)	0	0	0	0	0	0%	
-Others (Specify)	0	0	0	0	0	0%	
Present Condition of Intake Facility:	1	1	1	0	3	75%	
-Fair	0	0	0	0	0	0%	
-Bad	0	0	0	1	1	25%	
Dimension of Intake Facility:							
*Diversion weir:							
-Length (m)	5	6	6	11.5	-	-	
-Height (m)	4	4	3	1.5	-	-	
*Dam:							
-Length (m)	0	0	0	0	-	-	
-Height (m)	0	0	0	0	-	-	
-Capacity(m3)	0	0	0	0	-	-	
*Pump:							
-Capacity (cum./min)	0	0	0	0	-	-	
-Nos. of Pump	0	0	0	0	-	-	
-Head (m)	0	0	0	0	-	-	
Length of Furrow (Canal) and Condition:							
-Main Furrow (m) and Condition:	3,000	3,000	3,000	3,000	12,000	3,000	
-Good	0	0	0	0	0	0%	
-Fair	1	1	1	1	4	100%	
-Bad	0	0	0	0	0	0%	
*Out of the length above, the length of lined main furrow is (m)	1,500	0	0	10	1,510	378	
-Secondary furrow (m)	0	0	0	0	0	0	
-Good	0	0	0	0	0	0%	
-Fair	0	0	0	0	0	0%	
-Bad	0	0	0	0	0	0%	
Soil Fertility:							
-Good	1	0	0	0	1	25%	
-Fair	0	1	1	1	3	75%	
-Poor	0	0	0	0	0	0%	
Acidity Problem:							
-Almost Nil	0	0	0	0	0	0%	
-A Little Appeared	1	1	0	1	3	75%	
-Fairly Appeared	0	0	1	0	1	25%	
-Very much Appeared	0	0	0	0	0	0%	
Salinity Problem:							
-Almost Nil	1	0	0	1	2	50%	
-A Little Appeared	0	1	1	0	2	50%	
-Fairly Appeared	0	0	0	0	0	0%	
-Very much Appeared	0	0	0	0	0	0%	
Irrigation Group:	79		20	40	139	35	
-Nos of Land Owners	79		20	2	101	25	
What maintenance works and how often do Irrigators carry out:							
-How Often (1)	Cleaning of furrow	Cleaning of Furrow	Cleaning Furrow	Cleaning furrow	-	-	
-How Often (2)	3times a year	once a year	once a year	once a year	-	-	
Issues/problems on operation (water use) and maintenance of irrigation facility:							
-Maintenance		The furrow is not lined so there is a lot of seepage.		They have aimed to rehabilitate the weir part which is broken.	-	-	
-Operation				Most of it is going back to stream though broken space.	-	-	
Are there any group (collective) activities by the Irrigators?	Nil	They have growned half a Lima of tomatoes for the group.		Nil	-	-	
Name of the Nearest Major Market and Distance:	Mpika Boma	Mpika Boma	Mpika	Mpika	-	-	
-Distance (Km)	60	40	50	30	180	45	
Accessibility to the Nearest Market in terms of Road Condition:							
-Good	0	0	0	1	1	25%	
-Fair	1	1	1	0	3	75%	
-Bad	0	0	0	0	0	0%	
Issues/Problems on Irrigation Facility	It needs lining the remaining stretch to reduce on seepage.	The main furrow needs lining to reduce on seepage.	People in the village are related so when they see that their relative is producing, in the night they flood their field.	The weir needs rehabilitation and lining of the furrow.	-	-	

Table A.1.9 Existing Permanent Irrigation Scheme, Mporokoso District, Northern Province

1. EXISTING PERMANENT IRRIGATION SCHEME		1	1	1	1	1	1	6	
PROVINCE: NORTHERN / DISTRICT: MPOROKOSO									Total
Site No.		1	2	3	4	5	6		Average / %
Name of Scheme/Site:		Kawiksha Farmers Group	Chipoma woman club	Kalabwe	Kapumo Farmers Group	Bwaland Womens Club	GRZ School Vincent		
Mark on Map:		(A)	(B)	(C)	(D)	(E)	(F)		
Name of Camp:		Mporokoso Central	Mporokoso Central	Kalabwe	Kapumo	Luangwa	Luangwa		
Name of CEO:		A.B Ng'oma	A.B Ng'oma	Michelo Mwemba	B. Mayenda	UN Maned	UN maned		
Name of River/Stream/Dambo:		Kawiksha	Shili Stream	Kasakalabwe	Mipa	Mituma stream	Fikambo		
Name of Village Benefited:		Kawiksha	Mumba Kapambe	Chilangwa	Kapumo	Vincent Bulaya	Vincent Bulaya		
Year of Establish/Supported by:	-Year	1966	2001	2004	1997	1986	0		
	-Government	1	0	0	0	0	0	1	17%
	(Specify)	0	0	0	0	0	0		
	-Donor	0	1	1	1	1	1	5	83%
Water Resource:	(Specify)	0	RIF	World Vision	RIF	RIF	RIF		
	-Others	0	0	0	0	0	0	0	0%
	(Specify)	0	0	0	0	0	0		
	-Dambo	0	0	0	0	0	0	0	0%
Intake System:	-River/Stream	1	1	1	1	1	1	6	100%
	-Bore hole/Shallow well	0	0	0	0	0	0	0	0%
	-Springs	0	0	0	0	0	0	0	0%
	-Lake	0	0	0	0	0	0	0	0%
Irrigation System:	-River Diversion	0	1	1	1	1	1	5	83%
	-Dam/Reservoir	1	0	0	0	0	0	1	17%
	-Pump	0	0	0	0	0	0	0	0%
	-Others	0	0	0	0	0	0	0	0%
Present Irrigation Area (Ha):	(Specify)	0	0	0	0	0	0		
	-Surface/furrow	1	1	1	1	1	1	6	100%
	(-Gravely)	0	0	0	0	0	0	0	0%
	-Sprinkler	0	0	0	0	0	0	0	0%
Potential Irrigation Area from Land Availability (Ha):	-Drip	0	0	0	0	0	0	0	0%
	-Others	0	0	0	0	0	0	0	0%
	(Specify)	0	0	0	0	0	0		
	-Others	0	0	0	0	0	0	0	0%
Dominant Crops in Dry Season with Irrigation:		Winter maize, Tomatoes, Vegetable	Tomato,Rape, Cabbage Winter maize	Rape,Chines Cabbage, Tomato,Onion	Cabbage, Tomato, Eggplant	Veg, Tomato, Oranges, winter Maize	Vegetables, Winter maize		
Dominant Crops in Rainy Season:		Maize, Cassava, Beans	Maize,Cassava,Beans	Maize, Cassava,Bean, Finger Millet	Maize, Cassava, Beans, Groundnuts	Maize, Beans, Groundnuts, Sweet potato's	Maize, Cassava, Groundnuts		
% of river water directing to furrow during peak irrigation period:		30	25	16	30	25	20	146	24.3
How long from DACO Office by vehicle (Minutes):		15	5	60	20	120	105	325	54.2
Distance (Km):		10	3	38	12	77	63	203	33.8
Is there fish pond in the Scheme:	-Yes	1	0	1	0	1	1	3	50%
	-No	0	1	0	1	0	0	3	50%
	-if yes, how many	3	0	4	0	0	3	10	1.7
Is there other fish pond in the Village (not including the Scheme):	-Yes	1	0	1	0	0	0	2	33%
	-No	0	1	0	1	1	1	4	67%
	-if yes, how many	2	0	0	0	0	0	2	-
Intake Facility:	-Concrete Diversion Weir	0	1	1	1	1	1	5	83%
	-Masonry Diversion Weir	0	0	0	0	0	0	0	0%
	-Dam (Earth)	0	0	0	0	0	0	0	0%
	-Dam (Concrete)	1	0	0	0	0	0	1	17%
	-Pump (Motor)	0	0	0	0	0	0	0	0%
	-Pump (Engine)	0	0	0	0	0	0	0	0%
	-Others (Specify)	0	0	0	0	0	0	0	0%
	-Good	0	0	0	0	0	0	0	0%
Present Condition of Intake Facility:	-Fair	1	1	1	0	1	1	5	83%
	-Bad	0	0	0	1	0	0	1	17%
	-Bad	0	0	0	0	0	0	0	0%
Dimension of Intake Facility:	-Length (m)								
	-Height (m)	0.0	3.0	17.7	4.0	3.0	2.0		
	-Width (m)	0.0	2.5	4.5	2.0	1.5	2.0		
	-Dam:								
*Pump:	-Length (m)	0.0	0.5	0.5	0.5	0.5	0.5		
	-Height (m)	120	0	0	0	0	0		
	-capacity(m3)	3	0	0	0	0	0		
	Capacity (cum./min)	0	0	0	0	0	0		
Length of Furrow (Canal) and Condition:	Nos. of Pump	0	0	0	0	0	0		
	Head (m)	0	0	0	0	0	0		
	-Main Furrow (m) and Condition	0	0	0	0	0	0		
	-Good	0	0	0	0	0	1	1	17%
	-Fair	1	1	0	1	1	0	4	67%
	-Bad	0	0	1	0	0	0	1	17%
	-Out of the length above the length of lined main furrow is (m)	0	0	1	0	0	0	1	17%
	-Secondary furrow (m)	2	3	100	300	4	200	609	102
Soil Fertility:	-Good	0	1	0	1	0	0	3	50%
	-Fair	0	0	1	0	0	1	3	50%
	-Poor	0	0	0	0	0	0	0	0%
	-Almost Nil	1	0	0	1	1	1	3	50%
Acidity Problem:	-A Little Appeared	0	0	1	0	0	1	2	33%
	-Fairly Appeared	0	1	0	0	0	0	1	17%
	-Very much Appeared	0	0	0	0	0	0	0	0%
	-Almost Nil	1	1	1	1	1	1	6	100%
Salinity Problem:	-A Little Appeared	0	0	0	0	0	0	0	0%
	-Fairly Appeared	0	0	0	0	0	0	0	0%
	-Very much Appeared	0	0	0	0	0	0	0	0%
	-Almost Nil	1	1	1	1	1	1	6	100%
Irrigation Group:	-Nos of Irrigators (Beneficiaries)	10	30	20	15	12	200	287	48
	-Nos of Land Owners	1	Community	Community	15	1	community	17	3
	-What maintenance (1)	cleaning the dam/furrow every year	Cleaning the furrow	Furrow Cleaning	Cleaning the furrow	Cleaning the furrow	cleaning the furrow		
What maintenance works and how often do Irrigators carry out:	-How Often (1)	Every 4 mouths	After one year	Twice per year	Twice per year	Twice per year	every year		
	-What maintenance (2)	Maintaining the weir	0	0	0	0	Removing Mady		
	-How Often (2)	Every 2 years	0	0	0	0	low water leaves every year		
Issues/problems on operation (water use) and maintenance of irrigation facility:	-Maintenance	People work together (No problems)	Nil	Nil	People work together	Some members were not attending	Nil		
	-Operation	Nil	Nil	Nil	Nil	Some members are lazy	Nil		
Apart from Irrigation/maintenance, are there any group (collective) activities by the irrigators:		Growing fish in the dam		There is co-operative among the members.	Keeping Pigs	Cookery and Tailoring	Nil		
Name of the Nearest Major Market and Distance:	-Name	Mporokoso	District Market	Mwange	Mporokoso	Vincent	Vincent		
	-Distance (Km)	6	2	4	7	6	5	30	5
	-Good	1	1	1	1	0	0	3	50%
Accessibility to the Nearest Market in terms of Road Condition:	-Fair	0	0	1	0	0	1	2	33%
	-Bad	0	0	0	0	1	0	1	17%
	-Bad	0	0	0	0	0	0	0	0%
Issues/Problems on Irrigation Facility		The concern is not strong (old one).	Gully	Gully in the furrow	The weir is not working apart from direct diversion	Gully, Seepage			

Table A.1.10 Existing Permanent Irrigation Scheme, Mungwi District, Northern Province (1/2)

1. EXISTING PERMANENT IRRIGATION SCHEME		1	1	1	1	1	1	1	1
PROVINCE: NORTHERN / DISTRICT: Mungwi									
Site No:		1	2	3	4	5	6	7	8
Name of Scheme/Site:		Shangula	Tubalange	Numa	Chipokoso	Mutankula	Chikondi	Minshe	Mwashe
Mark on Map:		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Name of Camp:		Chonya	Chonya	Chonya	Nseluka	Nseluks	Ngulula	Malole	Msamfu
Name of CEO:		Robert Chanda	Robert Chanda	Robert Chanda	Beauty Chisanga		Josephine Mulenga	Reuben Mwenya	Carol Mukonko
Name of River/Stream/Dambo:		Mifuti	Mifuti	Numa	Chipokoso	Miscue kamena	Chiba	Minshe	Mwahe
Name of Village Benefited:		Chonya	Stephen Kasongo-Nsako	Daudi Mulusa	Ngoli		Leo Mukosa		Mwashe
Year of Establish/Supported by:	-Year	2001	1999	2000	2004	2001	2002	1970	2008
	-Government	1	1	1	1	1	1	1	1
	(Specify)	0	0	0	0	0	0	0	0
	-Donor	0	0	0	0	0	0	0	0
Water Resource:	(Specify)	0	0	0	0	0	0	0	0
	-Others	0	0	0	0	0	0	0	0
	(Specify)	0	0	0	0	0	0	0	0
	-Dambo	0	0	0	0	0	1	0	0
Intake System:	-River/Stream	1	1	1	1	1	0	1	1
	-Bore hole/Shallow well	0	0	0	0	0	0	0	0
	-Springs	0	0	0	0	0	0	0	0
	-Lake	0	0	0	0	0	0	0	0
Irrigation System:	-River Diversion	0	0	1	1	1	1	1	1
	-Dam/Reservoir	1	1	0	0	0	0	0	0
	-Pump	0	0	0	0	0	0	0	0
	(Specify)	0	0	0	0	0	0	0	0
Present Irrigation Area (Ha):	-Surface/furrow (=Gravity)	1	1	1	1	1	1	1	1
	-Sprinkler	0	0	0	0	0	0	0	0
	-Drip	0	0	0	0	0	0	0	0
	(Specify)	0	0	0	0	0	0	0	0
Potential Irrigation Area from Land Availability (Ha):		7.4	3.7	7.4	0.0	0.0	6.2	11.1	4.4
Dominant Crops in Dry Season with Irrigation:		Tomatoes,Cabbage,Rape,Green Maize	Rape,Okra,Green maize,tomatoes,Cabbage	Rape,Okra,Cabbage,Green maize	Rape,Cabbage, Onion	Nil	Onion, Rape,cabbage,Green maize	Green maize,Vegetables and sugar Cane	Rape,Cabbage, Onion
Dominant Crops in Rainy Season:		Maize,Cassava,G/nuts,Cabbage	Tomato,G/nuts,Maize	0	Maize, G/nuts,Cassava	Maize,cassava,Millet,G/nuts	Cassava,maize,millet,Beans	Cassava, Maize,soya,Beans,G/nuts,Banana	Maize,G/nuts,Cassava
% of river water directing to furrow during peak irrigation period:		50	80	32	80	0	60	50	80
How long from DACO Office by vehicle (Minutes):		35	30	30	30	90	40	50	30
Distance (Km):		25	22	22	45	80	10	35	35
Is there fish pond in the Scheme:	-Yes	1	0	1	0	0	0	1	1
	-No	0	1	0	1	1	1	0	0
Is there other fish pond in the Village (not including the Scheme):	-If yes, how many	4	0	5	0	0	0	6	NA
	-No	0	1	0	0	0	0	1	0
Intake Facility:	-Concrete Diversion Weir	0	1	1	1	1	1	0	1
	-Masonry Diversion Weir	0	0	0	0	0	0	0	0
	-Dam (Earth)	1	0	0	0	0	0	1	0
	-Dam (Concrete)	0	0	0	0	0	0	0	0
	-Pump (Motor)	0	0	0	0	0	0	0	0
	-Pump (Engine)	0	0	0	0	0	0	0	0
	-Others (Specify)	0	0	0	0	0	0	0	0
Present Condition of Intake Facility:	-Good	0	0	1	1	1	1	1	1
	-Fair	1	0	0	0	0	0	0	0
Dimension of Intake Facility:	-Bad	0	1	0	0	0	0	0	0
	-Diversion weir:								
*Dam:	-Length (m)	0	5	2	32	13	20	0	26
	-Height (m)	0	0.7	1.5	2	1.5	1	0	1.2
	-Width (m)	0	0.5	0.5	0.5	0.5	0.4	0	0.5
*Pump:	-Length (m)	200	0	0	0	0	0	40	0
	-Height (m)	2	0	0	0	0	0	8	0
	-capacity(m3)	0	0	0	0	0	0	0	0
Length of Furrow (Canal) and Condition:	Capacity (cum./min)	0	0	0	0	0	0	0	0
	Nos. of Pump	0	0	0	0	0	0	0	0
	Head (m)	0	0	0	0	0	0	0	0
	-Main Furrow (m) and Condition	0	3,000	2,000	0	0	1,000	5,000	1,500
Soil Fertility:	-Good	0	1	0	0	0	0	1	1
	-Fair	0	0	1	1	1	1	0	0
	-Poor	0	0	0	0	0	0	0	0
	-Almost Nil	1	1	1	1	1	1	0	0
Acidity Problem:	-A Little Appeared	0	0	0	0	0	0	0	0
	-Fairly Appeared	0	0	0	0	0	0	1	1
	-Very much Appeared	0	0	0	0	0	0	0	0
Salinity Problem:	-Almost Nil	1	1	1	1	1	1	0	0
	-A Little Appeared	0	0	0	0	0	0	0	0
	-Fairly Appeared	0	0	0	0	0	0	1	1
Irrigation Group:	-Very much Appeared	0	0	0	0	0	0	0	0
	-Nos of Irrigators (Beneficiaries)	52	25	10	120	0	28	60	40
What maintenance works and how often do Irrigators carry out:	-Nos of Land Owners	52	25	0	0	0	3	0	0
	-What maintenance (1)	Cleaning Debris	Furrow cleaning	Furrow cleaning	N/A	N/A	Furrow cleaning	Furrow Cleaning	Furrow cleaning
	-How Often (1)	Twice per year	Twice per year	Every time	Nil	Nil	Once/season	Twice/year	Once per year
	-What maintenance (2)	Nil	Slashing	Slashing	N/A	N/A	0	0	0
Issues/problems on operation (water use) and maintenance of irrigation facility:	-How Often (2)	Once per year	Once per year	Twice per year	Nil	Nil	0	0	0
	-Maintenance	Nil	Nil	Low attendance when cleaning and slashing	Nil	Furrow non functional	No maintenance committee established	No major Problems	0
Apart from Irrigation/maintenance, are there any group (collective) activities by the irrigators:	-Operation	Nil	Nil	Water lost due to the see page	Nil	Furrow non functional	0	0	0
	Farm vegetables interest group, Road maintenance	Road maintenance	Community work such as road cleaning ,maintenance	endured on their small businesses, community work, contribution of pegging are possibly lining at 2,000m	They grow crops during rain season, road maintenance and construction	Involved on small businesses, Greeneries		Involved on small businesses	
Name of the Nearest Major Market and Distance:	-Name	Mungwi	Kasama	Mungwi	Muani	Kosoma	Mungwi	Mungwi	Kasama
	-Distance (Km)	18	34	22	40	40	10	80	35
Accessibility to the Nearest Market in terms of Road Condition:	-Good	0	0	0	1	1	0	0	1
	-Fair	1	0	1	0	0	1	1	0
Issues/Problems on Irrigation Facility	-Bad	0	1	0	0	0	0	0	0
	Water loss to see page along canal requires lining at 2,000m	Canal not wired a lot of see page requires 2500m lining	see page along the main canal, requires lining at least 2,500m	The intake facility has been completed, remaining water are excretion continuation of pegging as possibly lining og furrow at least 2,000m.	Furrow non functional requires survey and lining	Intake facility or need inring at least 2,500m	See page along canal requires lining at least 2,000m under irrigation furrow		

Table A.1.11 Existing Permanent Irrigation Scheme, Munqwi District, Northern Province (2/2)

1. EXISTING PERMANENT IRRIGATION SCHEME									
PROVINCE: NORTHERN / DISTRICT: Munqwi									
Site No.	9	10	11	12	13	14	6		
Name of Scheme/Site:	Mpasuka	Ngulula Weire	Musambo Uhwale	Namukonda	Tikondane	Rosa	-	Average / %	
Mark on Map:	(9)	(10)	(11)	(12)	(13)	(14)	-	-	
Name of Camp:	Chanaaweyaya	Ngulula	Mungwi East	Ngulula	Ngulula	Rosa	-	-	
Name of CEO:	Sichima Alex	Josephine Mulenga	Watson Banda	Josephine Mulenga	Josephine Mulenga	Suzyo Nguni	-	-	
Name of River/Stream/Dambo:	Liyaya Stream	Chibille	Mungwi	Seya	Chiba	Rosa	-	-	
Name of Village Benefited:	Chikombwe	Chabalale	-	Leo Mukosa	Leo Mukosa	-	-	-	
Year of Establish/Supported by:	1999	1948	1999	2005	2001	1925	-	-	
-Government	1	0	1	0	1	0	11	79%	
-(Specify)	0	0	0	0	0	0	-	-	
-Donor	0	0	0	0	0	0	0	0%	
-(Specify)	0	0	0	0	0	0	-	-	
-Others	0	1	0	1	0	1	3	21%	
-(Specify)	0	Community	0	Catholic	0	Catholic	-	-	
Water Resource:	-Dambo	1	0	0	0	0	2	14%	
-River/Stream	0	1	1	1	1	1	12	86%	
-Bore hole/Shallow well	0	0	0	0	0	0	0	0%	
-Springs	0	0	0	0	0	0	0	0%	
-Lake	0	0	0	0	0	0	0	0%	
Intake System:	-River Diversion	0	1	1	1	1	11	79%	
-Dam/Reservoir	1	0	0	0	0	0	3	21%	
-Pump	0	0	0	0	0	0	0	0%	
-Others	0	0	0	0	0	0	0	0%	
-(Specify)	0	0	0	0	0	0	-	-	
Irrigation System:	-Surface/furrow (±Gravty)	1	1	1	1	1	14	100%	
-Sprinkler	0	0	0	0	0	0	0	0%	
-Drip	0	0	0	0	0	0	0	0%	
-Others	0	0	0	0	0	0	0	0%	
-(Specify)	0	0	0	0	0	0	-	-	
Present Irrigation Area (Ha):	0.0	66.7	2.2	2.2	7.4	5.9	123.85	8.8	
Potential Irrigation Area from Land Availability (Ha):	4.3	NA	17.2	15.0	15.0	19.3	280.90	20.1	
Dominant Crops in Dry Season with Irrigation:	Vegetables	Onion,Rape,Cabbage,T omatoes	Vegetables,Green Maize	Rape, Cabbage, Tomatoes	Onion,Rape,Tomatoes, Green maize ,Cassava	Vegetables, Sugar Cana	-	-	
Dominant Crops in Rainy Season:	Maize	Maize, G/nuts,Cassava	Maize, G/Nuts	Maize, Cassava, G,nuts	Maize, G/nuts,Beans	Maize, Cassava	-	-	
% of river water directing to furrow during peak irrigation period:	NA	40	40	20	90	60	650	46.4	
How long from DACO Office by vehicle (Minutes):	240	20	20	30	25	60	732	52.3	
Distance (Km):	-	16	18	10	8	95	421	30.1	
Is there fish pond in the Scheme:	-Yes	0	1	1	0	1	7	50%	
-No	1	0	0	1	0	1	7	50%	
-If yes, how many	0	7	12	0	0	0	34	2.4	
Is there other fish pond in the Village (not including the Scheme):	-Yes	1	1	1	1	0	6	43%	
-No	0	0	0	0	1	1	8	57%	
-If yes, how many	-	-	-	-	-	-	0	-	
Intake Facility:	-Concrete Diversion Weir	1	0	1	1	1	10	71%	
-Masonry Diversion Weir	0	1	0	0	0	1	2	14%	
-Dam (Earth)	0	0	0	0	0	0	2	14%	
-Dam (Concrete)	0	0	0	0	0	0	0	0%	
-Pump (Motor)	0	0	0	0	0	0	0	0%	
-Pump (Engine)	0	0	0	0	0	0	0	0%	
-Others (Specify)	0	0	0	0	0	0	0	0%	
Present Condition of Intake Facility:	-Good	0	1	0	1	0	8	57%	
-Fair	1	1	0	1	0	1	5	36%	
-Bad	0	0	0	0	0	0	1	7%	
Dimension of Intake Facility:	-Diversion weir:	-Length (m)	9	15	NA	10	15	8	-
-Height (m)	1.5	0.5	NA	1.5	1	2	-	-	
-Width (m)	0.5	NA	0.3	0.6	0.4	0.9	-	-	
-Dam:	-Length (m)	0	0	0	0	0	-	-	
-Height (m)	0	0	0	0	0	0	-	-	
-capacity(m3)	0	0	0	0	0	0	-	-	
-Pump:	Capacity (cum/min)	0	0	0	0	0	-	-	
Nos. of Pump	0	0	0	0	0	0	-	-	
Head (m)	0	0	0	0	0	0	-	-	
Length of Furrow (Canal) and Condition:	-Main Furrow (m) and Condition	0	7,000	0	1,500	1,500	1,500	24,000	1,714
-Good	0	1	0	0	0	0	2	14%	
-Fair	0	0	0	0	1	1	7	50%	
-Bad	0	0	0	1	0	0	2	14%	
-Out of the length above, the length of lined main furrow is (m)	0	3,500	0	0	0	0	3,529	252	
-Secondary furrow (m)	0	0	0	0	0	0	0	0	
-Good	0	0	0	0	0	0	0	0%	
-Fair	0	0	0	0	0	0	0	0%	
-Bad	0	0	0	0	0	0	1	7%	
Soil Fertility:	-Good	1	0	0	1	0	1	7	50%
-Fair	0	1	1	0	1	0	7	50%	
-Poor	0	0	0	0	0	0	0	0%	
-Almost Nil	0	1	1	0	1	1	10	71%	
Acidity Problem:	-A Little Appeared	0	0	0	1	0	1	7%	
-Fairly Appeared	1	0	0	0	0	0	3	21%	
-Very much Appeared	0	0	0	0	0	0	0	0%	
Salinity Problem:	-Almost Nil	0	1	1	1	1	11	79%	
-A Little Appeared	1	0	0	0	0	0	1	7%	
-Fairly Appeared	0	0	0	0	0	0	2	14%	
-Very much Appeared	0	0	0	0	0	0	0	0%	
Irrigation Group:	-Nos of Irrigators (Beneficiaries)	0	180	30	15	25	15	600	43
-Nos of Land Owners	0	0	3	0	3	0	86	6	
What maintenance works and how often do irrigators carry out:	-What maintenance (1)	N/A	Furrow Cleaning Every season	Furrow Cleaning Once per year	NA	Furrow Cleaning Once a year	Furrow Cleaning Once per year	-	-
-How Often (1)	Nil	NA	NA	NA	NA	NA	NA	-	
-What maintenance (2)	N/A	NA	NA	NA	NA	NA	NA	-	
-How Often (2)	Nil	Nil	Nil	NA	NA	NA	NA	-	
Issues/problems on operation (water use) and maintenance of irrigation facility:	-Maintenance	Does not hold water	0	NA	Maintenance not done furrow non	postpositions from users is very little	NA	-	-
Operation	NA	0	NA	functional	facility is under utilised	NA	-	-	
Apart from Irrigation/maintenance, are there any group (collective) activities by the irrigators:	No	members of cooperatives,sarhing Groups	NA	NA	involved in operatives and small business	Involved in small business	-	-	
Name of the Nearest Major Market and Distance:	-Name	Nseluka	NA	Mungwi	Mungwi	Mungwi	Kasama	-	-
-Distance (Km)	55	NA	15	12	8	65	434	31	
Accessibility to the Nearest Market in terms of Road Condition:	-Good	0	0	1	0	0	1	5	36%
-Fair	0	1	0	0	1	0	7	50%	
-Bad	1	0	0	0	0	0	2	14%	
Issues/Problems on Irrigation Facility	There is a sea page/leakages and dries up during dry season.	Needs distribution gates to control water going to the secondary furrow	the furrow is under utilized working at	Furrow non functional due to discontinued funding donor	Intake facility is in good condition but furrow requires lining to reduce seepage	-	-	-	

A.1.2 Existing Temporary Irrigation Scheme

Table A.1.13 Existing Temporary Irrigation Scheme, Chilubi District, Northern Province

3. EXISTING TEMPORARY IRRIGATION SCHEME PROVINCE: NORTHERN / DISTRICT: CHILUBI		1	Total	Average / %
Camp No.		1		-
Name of Camp:	Mubili			
Number of Temporary Schemes/Sites:	15		15	-
Number of Schemes having Temporary Diversion Weir:	0		0	0%
Number of Schemes having Furrow (canal) only:	0		0	0%
Others	15	0	15	100%
Total	0	0	0	0%
Range and Average of Present Irrigated Area:				
-From (Ha)	0.3		0.3	0.02
-To (Ha)	3.8		3.8	0.25
-Average (Ha)	0.5		0.5	0.03
Total	0.0	0.0	0.0	0.00
Range and Average of Potential Irrigable Area:				
-From (Ha)	10.0		10.0	0.67
-To (Ha)	30.0		30.0	2.00
-Average (Ha)	15.0		15.0	1.00
Total	0.0	0.0	0.0	0.00
Range and Average Length of Main Furrow:				
-From (m)	75		75.00	75.00
-To (m)	200		200.00	200.00
-Average (m)	150		150.00	150.00
Range and Average of the Number of Irrigators:				
-From (members)	15		15.0	1.00
-To (members)	30		30.0	2.00
-Average (members)	8		8.0	0.53
Dominant Crops in Dry Season:				
Dominant Crops in Rainy Season:	Maize, Cabbage, Rape, Tomatoes, C/cabbage Cassava, Maize, S/flower, S/potatoes, Grnuts			
Water Resource				
-Dambo	15		15	100%
-River/Stream	0		0	0%
-Borehole/Shallow Well	0		0	0%
-Springs	0		0	0%
-Lake	0		0	0%
-Others	0		0	0%
(Specify)	0		0	-
Type of Irrigation System				
-Surface/Furrow (=Gravity)	0	0	0	0%
-Pump/Sprinkler	0		0	0%
-Drip	0		0	0%
-Others	15	0	15	100%
(Specify)	0		0	-
Number of Scheme having Fish Pond	6		6	-
Major Material used for Making Temporary Diversion Weir	Nil			-

Table A.1.14 Existing Temporary Irrigation Scheme_Chinsali District, Northern Province

3. EXISTING TEMPORARY IRRIGATION SCHEME		PROVINCE: NORTHERN / DISTRICT: CHINSALI					Total	Average / %
1	2	3	4	5	6	7	8	
1	Mwenge	Konja	Kabangama	Charles	ILONDOLA	5	-	
2	4	5	20	7	15	51	-	
3	2	2	2	1	4	11	22%	
4	2	3	8	4	7	24	47%	
5	0	0	10	2	4	16	31%	
6	4	5	10	5	11	35	69%	
7	0.3	0.3	0.3	0.3	0.3	1.3	0.02	
8	1.0	0.8	1.3	0.8	0.5	4.3	0.08	
9	0.6	0.5	5.0	0.4	0.4	6.9	0.14	
10	2.2	2.2	44.5	1.8	3.9	54.6	1.07	
11	1.0	1.0	0.5	1.0	10.0	13.5	0.26	
12	50.0	100.0	1.8	3.0	150.0	304.8	5.98	
13	50.0	30.0	17.5	2.0	20.0	119.5	2.34	
14	82.9	62.2	72.5	4.1	91.2	313.0	6.14	
15	1,000	1,000	500	9,000	500	12,000.0	342.86	
16	1,000	1,500	2,000	9,000	2,000	15,500.0	442.86	
17	1,000	700	1,000	9,000	1,000	12,700.0	362.86	
18	1	10	10	1	10	32.0	0.63	
19	20	20	25	70	25	160.0	3.14	
20	20	12	10	20	12	74.0	1.45	
21	80	60	100	100	132	472.0	9.25	
22	Rape, Cabbage, Tomatoes, Onion	Cabbage, Tomatoes, Rape, Onion	Leaf vegetables, Maize, Tomatoes, Onion, Beans	Rape, C/cabbage, Tomatoes, Cabbage	Maize, Tomatoes, Beans, Leaf vegetables	-	-	
23	Maize, Sp/otatoes, Cassava	Maize, Cassava	Maize, Tomatoes, Beans, G/nuts, S/beans	Maize	G/nuts, Millet, Maize, Beans	-	-	
24	1	2	4	2	3	12	24%	
25	3	3	16	5	12	39	76%	
26	0	0	0	0	0	0	0%	
27	0	0	0	0	0	0	0%	
28	0	0	0	0	0	0	0%	
29	0	0	0	0	0	0	0%	
30	4	5	10	5	11	35	69%	
31	0	0	0	0	0	0	0%	
32	0	0	0	0	0	0	0%	
33	0	0	10	2	4	16	31%	
34	4	5	13	3	15	40	-	
35	Sand bags, stones and soil	Poles, grass and soil	Poles, grasssand sand	Sticks, Soil and Sand Bags	Poles, Grass and Soil	-	-	

Table A.1.15 Existing Temporary Irrigation Scheme, Isoka District, Northern Province

Camp No.	3. EXISTING TEMPORARY IRRIGATION SCHEME										Total	Average / %
	PROVINCE: NORTHERN / DISTRICT: ISOKA											
Name of Camp:	1	2	3	4	5	6	7	8	9	Total	Average / %	
Number of Schemes/Sites:	1	4	1	2	4	6	3	2	2	25	-	
Number of Temporary Schemes/Sites:	1	0	1	0	0	0	3	2	2	9	36%	
Number of Schemes having Temporary Division Weir:	0	4	0	2	3	3	0	0	0	12	48%	
Number of Schemes having Furrow (canal) only:	0	0	0	0	1	3	0	0	0	4	16%	
Others:	1	4	1	2	3	3	3	2	2	21	84%	
Total	0.3	6.0	0.5	0.1	0.1	0.1	0.5	1.0	0.3	8.7	0.35	
Range and Average of Present Irrigated Area:	-From (Ha)	15.0	1.3	1.3	0.8	1.3	1.3	4.0	1.0	34.3	1.37	
	-To (Ha)	8.0	0.8	0.7	0.3	0.3	0.3	2.0	0.5	18.5	0.74	
	-Average (Ha)	28.5	0.7	0.4	0.4	10.7	5.3	2.7	0.9	52.2	2.09	
Range and Average of Potential Irrigable Area:	-From (Ha)	10.0	1.0	1.0	0.3	2.0	1.0	1.0	1.0	19.3	0.77	
	-To (Ha)	20.0	5.0	5.0	5.0	10.0	5.0	5.0	2.0	60.0	2.40	
	-Average (Ha)	12.0	2.0	2.0	0.5	5.0	3.0	3.0	2.0	31.0	1.24	
Total	1.5	48.0	2.0	1.0	1.0	6.0	4.0	6.0	2.0	92.5	3.70	
Range and Average Length of Main Furrow:	-From (m)	200	2,000	2,000	1,000	1,000	100	1,000	50	4,650.0	221.43	
	-To (m)	900	2,000	2,000	1,000	1,000	2,000	2,000	150	12,050.0	573.81	
	-Average (m)	800	800	2,000	500	400	1,500	1,500	100	8,100.0	385.71	
Range and Average of the Number of Irrigators:	-From (members)	20	60	10	10	15	5	25	5	155.0	6.20	
	-To (members)	150	70	25	20	20	15	25	10	303.0	12.12	
	-Average (members)	20	280	25	12	15	8	23	8	197.0	7.88	
Dominant Crops in Dry Season with Irrigation:	Vegetables, Fish	Vegetables, Fish, Grnuts	S/cane, Vegetables, Maize	Vegetables, Tomatoes, Bananas	Vegetables, S/cane, Maize	Vegetables, S/cane	Fruits trees, Vegetables	Tomatoes, Vegetables, Fish, Bananas, Maize	Vegetables, Fish	-	-	
Dominant Crops in Rainy Season:	Vegetables, Fish	Maize, Vegetables, Fish	Maize, S/flower, Vegetables	Maize, Bananas	Bananas, Maize, S/cane	Maize, Vegetables, Bananas, S/cane	Maize, G/nuts, Vegetables, Fish	Maize, Bananas, Vegetables	Maize, Beans, Vegetables	-	-	
Water Resource	-Dambo	1	3	1	2	4	3	2	1	5	20%	
	-River/Stream	0	0	0	0	0	0	0	0	0	0%	
	-Borehole/Shallow Well	0	0	0	0	0	0	0	0	0	0%	
	-Springs	0	0	0	0	0	0	0	0	0	0%	
	-Lake	0	0	0	0	0	0	0	0	0	0%	
	-Others	0	0	0	0	0	0	0	0	0	0%	
	(Specify)	0	0	0	0	0	0	0	0	0	-	
	-Surface/Furrow (=Gravity)	1	4	1	2	3	3	2	2	21	84%	
	-Pump/Sprinkler	0	0	0	0	0	0	0	0	0	0%	
	-Drip	0	0	0	0	0	0	0	0	0	0%	
	-Others	0	0	0	0	1	3	0	0	4	16%	
	(Specify)	0	0	0	0	0	0	0	0	0	-	
Number of Scheme having Fish Pond	0	2	0	2	2	3	3	2	2	16	-	
Major Material used for Making Temporary Division Weir	Logs, sand bags, vertical grass	Nil	Nil	Nil	Nil	Nil	Sand bags	Traditional (poles;bamboos;t wigs)	Sand bags	-	-	

Table A.1.16 Existing Temporary Irrigation Scheme, Kaputa District, Northern Province

3. EXISTING TEMPORARY IRRIGATION SCHEME		PROVINCE: NORTHERN / DISTRICT: KAPUTA		PROVINCE: NORTHERN / DISTRICT: KAPUTA		PROVINCE: NORTHERN / DISTRICT: KAPUTA		PROVINCE: NORTHERN / DISTRICT: KAPUTA		PROVINCE: NORTHERN / DISTRICT: KAPUTA		PROVINCE: NORTHERN / DISTRICT: KAPUTA	
Camp No.	Name of Camp:	1	2									Total	Average / %
Number of Temporary Schemes/Sites:		Kasepa 2	Chisela 3									5	-
Number of Schemes having Temporary Diversion Weir:		1	2									3	60%
Number of Schemes having Furrow (canal) only:		1	1									2	40%
Others		0	0									0	0%
Total		2	3									5	100%
Range and Average of Present Irrigated Area:		0.5	0.3									0.8	0.15
-From (Ha)		1.0	0.5									1.5	0.30
-To (Ha)		1.5	0.3									1.8	0.35
-Average (Ha)		2.6	0.6									3.2	0.65
Total		3.0	0.5									3.5	0.70
Range and Average of Potential Irrigable Area:		6.0	2.5									8.5	1.70
-From (Ha)		3.0	1.0									4.0	0.80
-To (Ha)		2.5	1.2									3.7	0.75
-Average (Ha)		250	10									260.0	52.00
Total		250	50									300.0	60.00
Range and Average Length of Main Furrow:		250	30									280.0	56.00
-From (m)		10	10									20.0	4.00
-To (m)		30	30									60.0	12.00
-Average (m)		20	20									40.0	8.00
Total		40	60									100.0	20.00
Dominant Crops in Dry Season with Irrigation:		Tomatoes, Onion, Rape, Cabbage, Carrots, Mize	Bananas, S/cane, Maize, Cabbage, Rape, Onion									-	-
Dominant Crops in Rainy Season:		Maize, Beans, G/nuts, S/beans, Cassava, Milite	Cassava, Maize, Spotaatoes, Bananas, S/cane, Cow peas									-	-
Water Resource		-Dambo -River/Stream -Borehole/Shallow Well -Springs -Lake -Others (Specify)	1 1 0 1 0 0 0									1	20%
Type of Irrigation System		-Surface/Furrow (=Gravity) -Pump/Sprinkler -Drip -Others (Specify)	3 0 0 0 0									5	100%
Number of Scheme having Fish Pond		0	0									0	0%
Major Material used for Making Temporary Diversion Weir		Grass and Mud	Mud, Grass, Hard soil and Rocks									1	-

Table A.1.17 Existing Temporary Irrigation Scheme, Kasama District, Northern Province

Camp No.	3. EXISTING TEMPORARY IRRIGATION SCHEME										Total	Average / %
	PROVINCE: NORTHERN / DISTRICT: KASAMA											
Name of Camp:	1	2	3	4	5	6	7	8	9	10	Total	Average / %
Number of Temporary Schemes/Sites:	CHITAMBI	LUKULU - NORTH	MUSA	MULOBOLA	CHIOMBO	MWNILONGE	MULANSHI	MWAMBA	CHILONGOSHI			
Number of Schemes having Temporary Diversion Weir:	3	1	7	9	12	8	2	5	10		57	-
Number of Schemes having Furrow (canal) only:	3	1	6	2	4	2	1	2	10		31	54%
Others	0	0	1	7	8	6	1	3	0		26	46%
Total	3	1	7	9	12	8	2	5	10		57	100%
Range and Average of Present Irrigated Area:	-From (Ha)	1.0	0.1	0.1	0.1	6.0	0.5	0.3	0.1		8.3	0.15
	-To (Ha)	14.0	0.5	8.0	10.0	7.0	1.0	2.0	0.4		45.9	0.80
	-Average (Ha)	7.5	0.0	4.0	5.0	3.0	0.8	1.0	0.3		21.7	0.38
	Total	6.7	0.0	32.0	53.4	21.3	1.3	4.4	2.3		122.0	2.14
Range and Average of Potential Irrigable Area:	-From (Ha)	1.0	1.0	1.0	0.3	10.0	1.0	1.0	2.3		21.6	0.38
	-To (Ha)	400.0	5.0	10.0	10.0	12.0	0.0	5.0	20.0		492.0	8.63
	-Average (Ha)	200.0	0.0	5.0	5.0	6.0	1.0	3.0	7.0		232.0	4.07
	Total	15.0	200.0	45.0	60.0	48.0	2.0	15.0	70.0		455.0	7.98
Range and Average Length of Main Furrow:	-From (m)	1,500	4	800	2,000	1,000	7,000	1,000	1,500		16,803.5	294.80
	-To (m)	3,645	0	3,200	5,000	500	2,000	4,000	4,000		29,345.0	514.82
	-Average (m)	0	4	0	1,000	800	4,500	1,500	2		9,305.5	163.25
	-From (members)	10	1	6	3	4	4	5	2		40.0	0.70
	-To (members)	50	50	24	14	10	10	30	9		217.0	3.81
	-Average (members)	30	25	0	5	6	7	17	4		103.4	1.81
	Total	90	25	0	45	48	14	85	44		459.0	8.05
Dominant Crops in Dry Season with Irrigation:		Rape, Cabbage, Onion, Maize, C/cabbage	Cabbage, Tomatoes, Onion, Rape, C/cabbage, E/plant, Carrots	Vegetables, W/maize		W/maize, Vegetables	Rape, Tomatoes, Cabbage	Eggplants, Amaranth, Carrots, Cabbage, Rape	Rape, C/cabbage, Maize, E/plant		-	-
Dominant Crops in Rainy Season:		Maize, G/nuts, Cassava, S/beans, Beans	Tomatoes, Maize, Sbeans, G/nuts, Cabbage, E/plant	Maize, Vegetables		Vegetables, Maize	Maize, G/nuts, Cassava, Sbeans	Maize, Rape, Cabbage, C/cabbage	Maize, Beans, G/nuts		-	-
Water Resource	-Dambo	1	0	0	2	2	0	0	2		11	19%
	-River/Stream	2	1	7	7	6	2	5	8		46	81%
	-Borehole/Shallow Well	0	0	0	0	0	0	0	0		0	0%
	-Springs	0	0	0	0	0	0	0	0		0	0%
	-Lake	0	0	0	0	0	0	0	0		0	0%
	-Others	0	0	0	0	0	0	0	0		0	0%
	(Specify)	0	0	0	0	0	0	0	0		0	-
	-Surface/Furrow (=Gravity)	3	1	7	9	8	2	5	10		57	100%
	-Pump/Sprinkler	0	0	1	0	0	0	0	0		1	2%
	-Drip	0	0	1	0	0	0	0	0		1	2%
	-Others	0	0	0	0	0	0	0	0		0	0%
	(Specify)	Dambo	0	0	0	0	0	0	0		0	-
Number of Scheme having Fish Pond	1	1	0	4	9	5	2	1	8		31	-
Major Material used for Making Temporary Diversion Weir		E/Grass, C/soil, C/soil, Fber, Logs	S/bags, W/poles, Grass, Earth	S/bags, Sticks, Mud	S/bags, Tree barks, Poles, Mud	Gags of sand, Poles, Sticks, Mud		Wooden sticks, Soil	Mud, Pegs, Poles, Breaches		-	-

Table A.1.18 Existing Temporary Irrigation Scheme, Luwingu District, Northern Province

3. EXISTING TEMPORARY IRRIGATION SCHEME										Total	Average / %
PROVINCE: NORTHERN / DISTRICT: LUWINGU										8	-
Camp No.	1	2	3	4	5	6	7	8			
Name of Camp:	TUNGATI	SHIMUMBI	MUFILILI	CHUNGU	KAPISHA	MFUNGWE	MAPOLANGA	NODE			
Number of Temporary Schemes/Sites:	12	4	25	3	52	2	4	1		103	
Number of Schemes having Temporary Diversion Weir:	12	1	0	1	3	1	3	1		22	21%
Number of Schemes having Furrow (canal) only:	0	1	25	0	49	0	0	0		75	73%
Others:	0	2	0	2	0	1	1	0		6	6%
Total:	12	2	25	1	52	1	3	1		97	94%
Range and Average of Present Irrigated Area:	0.4	0.3	0.3	0.5	1.3	0.3	3.0	0.1		6.0	0.06
-From (Ha)	3.0	0.5	5.0	1.0	5.0	0.8	9.0	0.3		24.5	0.24
-To (Ha)	1.0	0.5	5.0	0.5	3.8	0.5	6.0	0.3		17.5	0.17
-Average (Ha)	10.7	0.9	111.2	0.4	173.4	0.4	16.0	0.2		313.3	3.04
Total:	12.0	2.0	1.3	1.0	2.5	5.0	3.0	0.3		27.0	0.26
-From (Ha)	60.0	4.0	12.5	5.0	10.0	10.0	9.0	0.5		111.0	1.08
-To (Ha)	36.0	2.5	25.0	5.0	6.3	10.0	6.0	0.5		91.3	0.89
-Average (Ha)	179.1	2.1	259.1	2.1	134.7	4.1	7.5	0.2		588.8	5.72
Total:	300	Nil	500	50	300	100	7,000	30		8,280.0	80.39
-From (m)	1,600	Nil	12,000	500	12,000	300	15,000	50		41,450.0	402.43
-To (m)	600	Nil	7,000	350	6,000	200	7,300	40		21,490.0	208.64
-Average (m)	2	23	10	2	60	18	10	5		130.0	1.26
-To (members)	8	35	90	5	160	30	250	7		585.0	5.68
-Average (members)	4	20	40	3	110	20	120	5		322.0	3.13
Total:	48	40	1,000	3	5,720	20	360	5		7,196.0	69.86
Dominant Crops in Dry Season with Irrigation:	Cabbage, Rape, Tomatoes, C/cabbage	Rape, C/cabbage, Tomatoes, Onion	Tomatoes, Cabbage, Rape, C/cabbage, Maize	Rape, Cabbage, Tomatoes	Cabbage, Rape, Tomatoes, Maize	Tomatoes, Cabbage, C/cabbage, Maize	Rape, Onions, Tomatoes, Maize, I/potatoes	Tomatoes, Cabbage, E/plant, Maize, C/cabbage		-	-
Dominant Crops in Rainy Season:	Maize, G/nuts, Beans, Cassava, Sp/atoes	G/nuts, Beans, Cassava, Maize, Sp/atoes	Maize, Cassava, Sp/atoes	Maize, Cassava, Beans, Sp/atoes	Cabbage, Rape, Tomatoes, Maize	Maize, Beans, G/nuts, Cassava, Sp/atoes	Maize, Cassava	Maize, Cassava, G/nuts, Sp/atoes		-	-
Water Resource	-Dambo -River/Stream -Borehole/Shallow Well -Springs -Lake -Others (Specify)	3 1 0 0 0 0 0	1 24 0 0 0 0 0	2 1 0 0 0 0 0	0 52 0 0 0 0 0	1 1 0 0 0 0 0	0 4 0 0 0 0 0	1 0 0 0 0 0 0		8 95 0 0 0 0 0	8% 92% 0% 0% 0% 0% 0%
Type of Irrigation System	-Surface/Furrow (=Gravity) -Pump/Sprinkler -Drip -Others (Specify)	2 0 0 0 0	25 0 0 0 0	1 0 0 2 0	52 0 0 0 0	1 0 0 1 0	3 0 0 1 0	1 0 0 0 0		97 0 0 6 -	94% 0% 0% 6% -
Number of Scheme having Fish Pond		4	11	2	11	2	1	1		39	-
Major Material used for Making Temporary Diversion Weir	C/soil, E/grass, Poles, Fiber	Earth, E/Grass, Poles, Fiber	Earth, Grass, Poles, Fiber	Clay soil	Earth (clay soil), E/grass	Earth Material	Earth, Grass, Poles, Fiber	Earth material		-	-

Table A.1.19 Existing Temporary Irrigation Scheme, Mbala District, Northern Province

Camp No.	3. EXISTING TEMPORARY IRRIGATION SCHEME										Total	Average %
	PROVINCE: NORTHERN / DISTRICT: MBALA											
Name of Camp:	1	2	3	4	5	6	7	8	9	10		
Number of Temporary Schemes/Sites:	Sikalembe 2	Kawimbe 20	Masamba 35	Mwanba 25	Kaka 7	Mambwe Mission 9	Luchheche 43	Tanzuka 5	Nondo 45	Kasetha 10		
Number of Schemes having Temporary Division Weir:	2	19	35	7	2	0	43	5	45	2	201	-
Number of Schemes having Furrow (canal) only:	0	1	0	18	5	2	0	0	0	0	26	80%
Others:	0	0	0	0	0	7	0	0	0	8	15	13%
Total	2	20	35	25	7	2	43	5	45	2	186	7%
Range and Average of Present Irrigated Area:	-From (Ha) 0.1	0.2	0.3	0.1	0.1	0.3	0.2	0.1	0.1	1.3	2.5	0.01
	-To (Ha) 3.0	1.0	0.8	1.0	0.8	1.0	4.0	0.3	0.5	10.0	22.3	0.11
	-Average (Ha) 1.5	0.5	0.5	0.4	0.4	0.8	1.2	0.7	0.3	7.5	13.2	0.07
Total	3.0	10.0	17.5	10.0	2.8	1.5	52.9	0.7	11.3	15.0	124.6	0.62
Range and Average of Potential Irrigable Area:	-From (Ha) 5.0	1.0	1.0	0.5	3.5	5.0	4.0	0.3	0.1	10.0	30.3	0.15
	-To (Ha) 10.0	5.0	5.0	4.0	5.0	10.0	37.5	4.0	0.8	15.0	96.3	0.48
	-Average (Ha) 7.5	2.0	3.0	1.5	3.8	7.5	11.5	1.5	0.5	12.5	51.3	0.26
Total	15.0	40.0	105.0	37.5	26.6	15.0	494.5	7.5	22.5	25.0	788.6	3.92
Range and Average Length of Main Furrow:	-From (m) 20	250	500	100	250	400	2,000	50	500	300	4,370.0	23.49
	-To (m) 50	1,000	4,000	3,000	800	700	4,500	500	3,000	1,600	19,150.0	102.96
	-Average (m) 35	570	1,500	1,400	437	450	3,600	220	1,200	850	10,202.0	54.85
Range and Average of the Number of Irrigators:	-From (members) 10	2	5	5	4	20	15	2	5	10	78.0	0.39
	-To (members) 20	100	30	150	12	25	40	10	40	30	457.0	2.27
	-Average (members) 15	43	15	76	7	20	26	6	8	20	236.0	1.17
Total	30	860	525	1,900	49	40	1,118	30	360	40	4,952.0	24.64
Dominant Crops in Dry Season with Irrigation:	Rape, Cabbage, Tomatoes	Rape, Cabbage, Sugar, I/potatoes	Tomatoes, Cabbage, Onion, G/maize	Maize, Rape, Cabbage, E/plant	Beans, Maize, I/potatoes, Tomatoes, Rape, Cabbage, Onion	Vegetables, Tomatoes	Tomatoes, Onion, Okra, G/maize, Cabbage	Tomatoes, Cabbage	Maize, Beans, I/potatoes, Vegetables	Tomatoes, Cabbage, Rape, G/maize	-	-
Dominant Crops in Rainy Season:	Maize, Beans	Maize, Beans, G/Nuts, Cassava	Maize, Beans	Maize, Rape, Cabbage, E/plant	Maize, Beans, S/flower, G/Nuts, G/Nuts, Cassava	Maize, Beans	Maize, Beans, G/Nuts, Cassava	Maize, Cassava, Beans	Maize, Beans	Maize, Beans, S/flower, G/nuts	-	-
Water Resource	-Dambo 0	0	0	0	0	0	0	0	0	0	0	0%
	-River/Stream 1	19	35	25	7	9	43	5	45	10	199	99%
	-Borehole/Shallow Well 0	0	0	0	0	0	0	0	0	0	0	0%
	-Springs 0	1	0	0	0	0	0	0	0	0	1	0%
	-Lake 0	0	0	0	0	0	0	0	0	0	0	0%
	-Others 0	0	0	0	0	0	0	0	0	0	0	0%
(Specify)	0	0	0	0	0	0	0	0	0	0	0	-
-Surface/Furrow (=Gravity) 2	20	20	35	25	7	2	43	5	45	2	186	93%
-Pump/Sprinkler 0	0	0	0	0	0	0	0	0	0	0	0	0%
-Drip 0	0	0	0	0	0	0	0	0	0	0	0	0%
-Others 0	0	0	0	0	0	7	0	0	0	8	15	7%
(Specify)	0	0	0	0	0	0	0	0	0	0	0	-
Number of Scheme having Fish Pond	1	3	5	15	4	3	6	0	30	0	67	-
Major Material used for Making Temporary Division Weir	Steels, Stones, Sand and soil	Nil	Nil	Soil, Masonry stones, Gard bags	Masonry Stones logs	Some farmers use sand bags	Sand Bags, Logs	Sand bags, Logs, Stones	Poles, grass and soil	Nil	-	-

Table A.1.20 Existing Temporary Irrigation Scheme, Mbika District, Northern Province

3. EXISTING TEMPORARY IRRIGATION SCHEME PROVINCE: NORTHERN / DISTRICT: MBIKA		1	2	3	4	Total	Average / %
Camp No.		CHINTU	MPIKA MAIN	CHILONGA	MUTAMBA	4	-
Name of Camp:		6	6	3	5	20	-
Number of Temporary Schemes/Sites:		2	3	2	0	7	35%
Number of Schemes having Temporary Diversion Weir:		4	1	1	5	11	55%
Number of Schemes having Furrow (canal) only:		0	2	0	0	2	10%
Others:		6	4	3	5	18	90%
Total		0.3	3.0	0.8	1.0	5.0	0.25
Range and Average of Present Irrigated Area:		-To (Ha)	6.8	5.6	2.0	16.4	0.82
		-Average (Ha)	4.9	2.8	1.5	10.2	0.51
		Total	5.3	17.4	7.5	36.8	1.84
Range and Average of Potential Irrigable Area:		-From (Ha)	7.5	10.0	5.0	27.0	1.35
		-To (Ha)	10.0	30.0	10.0	60.5	3.03
		-Average (Ha)	9.0	15.0	8.0	37.0	1.85
		Total	12.4	14.9	18.7	62.6	3.13
Range and Average Length of Main Furrow:		-From (m)	500	300	1,000	4,800.0	240.00
		-To (m)	3,500	1,500	7,000	17,000.0	850.00
		-Average (m)	2,000	750	4,600	11,350.0	567.50
Range and Average of the Number of Irrigators:		-From (members)	15	24	10	79.0	3.95
		-To (members)	50	45	10	155.0	7.75
		-Average (members)	33	10	36	114.0	5.70
		Total	210	30	180	552.0	27.60
Dominant Crops in Dry Season with Irrigator:		Tomatoes, Onion, Rape, Cabbage, W/maize	Rape, Cassava, Tomatoes, Onion, C/cabbage	NA	Tomatoes, Rape, Onion, Cabbage	-	-
Dominant Crops in Rainy Season:		Maize, F/millet, G/nuts, S/beans, S/flower, Sorghum	Maize, Beans, F/millet, Cassava, G/nuts	NA	Maize, G/nuts, Beans, Cassava, F/millet, S/potatoes	-	-
		-Dambo	0	0	0	0	0%
		-River/Stream	5	6	5	19	95%
		-Borehole/Shallow Well	0	0	0	0	0%
		-Springs	1	0	0	1	5%
		-Lake	0	0	0	0	0%
		-Others	0	0	0	0	0%
		(Specify)	0	0	0	0	-
		-Surface/Furrow (=Gravity)	6	4	3	18	90%
		-Pump/Sprinkler	0	0	0	0	0%
		-Drip	0	0	0	0	0%
		-Others	0	2	0	2	10%
		(Specify)	0	Bucket	0	0	-
Number of Scheme having Fish Pond		5	2	0	2	9	-
Major Material used for Making Temporary Diversion Weir		Trees, E/grass, Fibber, Soil and Sacks	Logs, E/grass, Clay soil and ordinary soil, Grass	Trees, E/grass, Fiber and soil	Wooden poles, Grass, Clay soil	-	-

Table A.1.21 Existing Temporary Irrigation Scheme, Mporokoso District, Northern Province (1/2)

3. EXISTING TEMPORARY IRRIGATION SCHEME
PROVINCE: NORTHERN / DISTRICT: MPOROKOSO

Camp No.	1	2	3	4	5	6	7	8	
Name of Camp:	Kalabwe	Chitoshi	Chishamwamba	Mukupa Kaoma	Chiwala	Mutotshi	Shibwala Kapila	Kamboobe	
Number of Temporary Schemes/Sites:	12	14	7	33	13	14	24	15	
Number of Schemes having Temporary Diversion Weir:	1	5	4	23	7	0	0	0	
Number of Schemes having Furrow (canal) only:	11	9	3	10	6	9	14	15	
Others:	0	0	0	0	0	5	10	0	
Total	12	14	7	33	13	9	14	15	
Range and Average of Present Irrigated Area:	-From (Ha) -To (Ha) -Average (Ha) Total	2.0 4.0 3.0 32.0	2.0 3.0 1.5 18.7	1.0 3.0 2.0 58.7	1.0 3.0 2.5 28.9	2.0 3.0 0.6 5.0	0.5 0.8 1.5 5.0	1.0 2.0 1.5 18.7	5.0 10.0 7.5 100.1
Range and Average of Potential Irrigable Area:	-From (Ha) -To (Ha) -Average (Ha) Total	10.0 30.0 20.0 99.5	5.0 15.0 10.0 58.0	10.0 15.0 12.5 36.3	5.0 10.0 7.1 97.1	3.0 4.0 3.1 11.6	5.0 10.0 7.5 43.5	10.0 20.0 15.0 93.3	
Range and Average Length of Main Furrow:	-From (m) -To (m) -Average (m)	3,000 3,500 3,250	1,000 5,000 3,000	2,000 3,000 2,500	500 1,000 5,500	500 800 650	500 8,000 4,000	2,000 7,000 4,500	
Range and Average of the Number of Irrigators:	-From (members) -To (members) -Average (members)	10 15 12	20 50 25	50 200 70	50 200 70	20 40 30	10 15 7	15 25 20	
Dominant Crops in Dry Season with Irrigation:	Veg, Winter Maize, Eggplant, Sugar Cane	Winter Maize, Vegetables	Veg, Winter Maize, Sugar Cane	veg, winter maize	veg, winter maize, fruits	Tomato, Rape, Cabbage, C/cabbage	G/vegetable, Maize, Fruits	Tomatoes, Rape, E/plant, W/maize	
Dominant Crops in Rainy Season:	Maize, Cassava, Finger Millet, Beans, G/Nuts	Maize, Cassava, Beans, Finger Millet, G/Nuts	Maize, Cassava, Beans, G/Nuts	maize, cassava, millet, Beans, G/nuts	Beans, maize, cassava millet	Cassava, Maize, G/nuts, Beans	Maize, Cassava	Maize, Cassava, G/nuts, Beans, F/millet	
Water Resource	-Dambo -River/Stream -Borehole/Shallow Well -Springs -Lake -Others (Specify)	0 12 0 0 0 0 0	0 14 0 0 0 0 0	0 7 0 0 0 0 0	0 33 0 0 0 0 0	0 13 0 0 0 0 0	0 14 0 0 0 0 0	0 14 1 0 0 0 0	
Type of Irrigation System	-Surface/Furrow (=Gravity) -Pump/Sprinkler -Drip -Others (Specify)	12 0 0 0 0	14 0 0 0 0	7 0 0 0 0	33 0 0 0 0	9 0 0 5 0	13 0 0 0 0	13 0 0 10 0	
Number of Scheme having Fish Pond	4	10	7	0	13	6	8	0	
Major Material used for Making Temporary Diversion Weir	Sand bags, Clay soil	Direct Diversion from the stream, logs, poles, clay soil	Direct Diversion, poles, clay soil	logs, poles, clay soil, direct diversion and sand bagging	Direct Division, poles, logs and clay soils	Direct division form the stream, poles, clay soils	poles, clay soil, direct division	poles, logs, clay soil, Direct Division from the stream	

Table A.1.22 Existing Temporary Irrigation Scheme, Mporokoso District, Northern Province (2/2)

Camp No.	9	10	11	12	Total	Average / %
Name of Camp:	Kapagu	Moseni	Muyembe	Chalabesa	12	-
Number of Temporary Schemes/Sites:	15	10	7	13	177	-
Number of Schemes having Temporary Diversion Weir:	5	0	4	6	55	31%
Number of Schemes having Furrow (canal) only:	10	10	3	7	107	60%
Others:	0	0	0	0	15	8%
Total	15	10	7	13	162	92%
Range and Average of Present Irrigated Area:						
-From (Ha)	1.0	4.0	2.0	3.0	24.5	0.14
-To (Ha)	5.0	10.0	3.5	5.0	51.3	0.29
-Average (Ha)	3.0	7.0	2.0	4.0	36.6	0.21
Total	40.0	62.3	12.5	46.2	435.4	2.46
Range and Average of Potential Irrigable Area:						
-From (Ha)	5.0	20.0	10.0	5.0	93.0	0.53
-To (Ha)	10.0	25.0	15.0	15.0	179.0	1.01
-Average (Ha)	7.0	10.0	12.5	10.0	119.7	0.68
Total	43.5	41.5	36.3	53.9	641.3	3.62
Range and Average Length of Main Furrow:						
-From (m)	1,000	500	3,000	1,000	15,100.0	85.31
-To (m)	3,500	2,000	4,000	3,000	44,800.0	253.11
-Average (m)	2,500	1,000	3,500	2,000	34,900.0	197.18
Range and Average of the Number of Irrigators:						
-From (members)	15	15	15	20	290.0	1.64
-To (members)	20	20	20	30	735.0	4.15
-Average (members)	15	10	15	25	374.0	2.11
Dominant Crops in Dry Season:	225	100	105	325	5,692.0	32.16
Dominant Crops in Rainy Season:						
-Dambo	0	0	0	0	0	0%
-River/Stream	15	10	7	13	176	99%
-Borehole/Shallow Well	0	0	0	0	1	1%
-Springs	0	0	0	0	0	0%
-Lake	0	0	0	0	0	0%
-Others	0	0	0	0	0	0%
(Specify)	0	0	0	0	0	0%
-Surface/Furrow (=Gravity)	15	10	7	13	162	92%
-Pump/Sprinkler	0	0	0	0	0	0%
-Drip	0	0	0	0	0	0%
-Others	0	0	0	0	15	8%
(Specify)	0	0	0	0	-	-
Number of Scheme having Fish Pond	8	6	7	0	69	-
Major Material used for Making Temporary Diversion Weir	Clay soil, Direct Diversion Stones,	Direct Diversion	poles, Clay soil, Direct Diversion	Direct Division, Clay soil, poles	-	-

Table A.1.23 Existing Temporary Irrigation Scheme, Mpulungu District, Northern Province

3. EXISTING TEMPORARY IRRIGATION SCHEME						Total	Average / %
PROVINCE: NORTHERN / DISTRICT: MPULUNGU						4	-
Camp No.	1	2	3	4			
Name of Camp:	Isoko	Vyamba	Chinaklia	Chitimowa			
Number of Temporary Schemes/Sites:	4	4	3	5		16	-
Number of Schemes having Temporary Diversion Weir:	3	4	2	5		14	88%
Number of Schemes having Furrow (canal) only:	1	0	1	0		2	13%
Others:	0	0	0	0		0	0%
Total:	4	4	3	5		16	100%
Range and Average of Present Irrigated Area:							
-From (Ha)	0.2	0.0	0.0	0.1		0.3	0.02
-To (Ha)	1.0	1.0	0.5	0.2		2.7	0.17
-Average (Ha)	0.9	0.3	0.3	0.1		1.6	0.10
Total	3.6	1.2	0.8	0.7		6.2	0.39
Range and Average of Potential Irrigable Area:							
-From (Ha)	7.5	4.0	2.0	3.0		16.5	1.03
-To (Ha)	10.0	15.0	5.0	8.0		38.0	2.38
-Average (Ha)	8.0	8.0	3.5	5.0		24.5	1.53
Total	32.0	32.0	10.5	25.0		99.5	6.22
Range and Average Length of Main Furrow:							
-From (m)	1,500	500	200	900		3,100.0	193.75
-To (m)	3,000	2,500	10,000	7,000		22,500.0	1406.25
-Average (m)	2,000	1,000	5,100	3,950		12,050.0	753.13
Range and Average of the Number of Irrigators:							
-From (members)	15	6	21	5		47.0	2.94
-To (members)	45	18	60	18		141.0	8.81
-Average (members)	27	12	25	10		74.0	4.63
Dominant crops in dry season with Irrigation:							
Dominant Crops in Rainy Season:							
-Dambo	0	0	0	0		0	0%
-River/Stream	4	4	3	5		16	100%
-Borehole/Shallow Well	0	0	0	0		0	0%
-Springs	0	0	0	0		0	0%
-Lake	0	0	0	0		0	0%
-Others	0	0	0	0		0	0%
(Specify)	0	0	0	0		0	-
-Surface/Furrow (=Gravity)	4	4	3	5		16	100%
-Pump/Sprinkler	0	0	0	0		0	0%
-Drip	0	0	0	0		0	0%
-Others	0	0	0	0		0	0%
(Specify)	0	0	0	0		0	-
Number of Scheme having Fish Pond	0	2	2	3		7	-
Major Material used for Making Temporary Diversion Weir	Sandbag, logs, Masonry	Sand bags, Masonry stones, Logs	Sand bags, Masonry stone, Logs	Sand bags, Logs, Masonry stones		-	-

Table A.1.24 Existing Temporary Irrigation Scheme, Mungwi District, Northern Province (1/2)

Camp No.	3. EXISTING TEMPORARY IRRIGATION SCHEME							
	PROVINCE: NORTHERN / DISTRICT: MUNGWI							
Name of Camp:	1	2	3	4	5	6	7	8
Number of Temporary Schemes/Sites:	MAWLE	ROSA	NGULULA	MUNGWI WEST	MISAMFU	NSELUKA	CHIMBA	CHAMFUBU
Number of Schemes having Temporary Diversion Weir:	62	2	25	4	53	35	6	10
Number of Schemes having Furrow (canal) only:	54	2	25	4	34	28	5	0
Others:	8	0	0	0	19	7	1	10
Total:	0	0	0	0	0	0	0	0
	62	2	25	4	53	35	6	10
	0.6	0.1	0.3	0.1	0.1	0.1	0.8	0.1
Range and Average of Present Irrigated Area:	0.5	0.5	3.0	0.3	0.1	0.3	3.0	4.0
	0.3	0.3	0.5	0.1	0.2	1.0	1.0	2.0
Total	15.5	0.5	12.5	0.5	10.1	35.0	6.0	20.0
Range and Average of Potential Irrigable Area:	2.0	0.1	0.3	0.1	0.2	2.0	1.0	0.1
	70.0	0.5	3.0	0.8	0.8	2.0	5.0	28.0
	35.0	0.3	0.5	0.5	0.4	2.0	2.0	12.0
Total	2170.0	0.5	12.5	2.0	9.7	29.0	5.0	49.7
Range and Average Length of Main Furrow:	500	500	1,000	1,500	700	200	1,000	100
	5,000	1,000	7,000	4,500	4,000	4,000	3,500	1,500
	2,750	750	3,000	2,500	2,350	2,500	1,000	750
Range and Average of the Number of Irrigators:	3	5	1	10	50	1	5	1
	60	15	180	30	350	17	25	12
	32	10	45	20	106	10	15	8
	1,984	20	1,125	80	5,618	350	90	80
Dominant Crops in Dry Season with Irrigation:	G/maize, S/cane, Vegetables		Onion, Rape, Cabbage, Maize	Vegetables, G/maize		Vegetables		Tomatoes, Vegetables
	Maize, G/nuts, Beans, Cassava, Bananas		Maize, G/nuts	Maize, G/nuts		Maize, G/nuts		Maize, G/nut, Cassava, Millet
Dominant Crops in Rainy Season:								
	-Dambo	0	0	0	4	0	1	0
	-River/Stream	2	25	4	19	35	5	10
	-Borehole/Shallow Well	0	0	0	27	0	0	0
	-Springs	0	0	0	3	0	0	0
	-Lake	0	0	0	0	0	0	0
	-Others	0	0	0	0	0	0	0
	(Specify)	0	0	0	0	0	0	0
	-Surface/Furrow (=Gravity)	2	25	4	53	35	6	10
	-Pump/Sprinkler	0	0	0	1	0	0	0
	-Drip	0	0	0	0	0	0	0
	-Others	0	0	0	0	0	0	0
	(Specify)	0	0	0	0	0	0	0
Number of Scheme having Fish Pond	30	0	0	0	7	0	0	6
Major Material used for Making Temporary Diversion Weir	Poles, Stamps, Grass, Earth	Poles, Stones, Mud	Stones, Logs, Mud, Fiber	Rocks, Logs, Mud	C/soil, Grass, Bamboo, Poles	Rocks, Poles, Mud	Logs, Grass, Sticks	0

Table A.1.25 Existing Temporary Irrigation Scheme, Mungwi District, Northern Province (2/2)

3. EXISTING TEMPORARY IRRIGATION SCHEME		PROVINCE: NORTHERN / DISTRICT: MUNGWI		Camp No.		Name of Camp:		CHONYA		MUNGWI EAST		CHANDAWEYAYA		Total		Average / %	
Number of Temporary Schemes/Sites:		10		13		9		11		10		11		11		-	
Number of Schemes having Temporary Diversion Weir:		6		13		6		4		13		4		175		76%	
Number of Schemes having Furrow (canal) only:		4		0		4		5		0		5		54		24%	
Others		0		0		0		0		0		0		0		0%	
Total		10		13		10		9		13		9		229		100%	
Range and Average of Present Irrigated Area:		-From (Ha)		0.1		0.1		0.1		0.5		0.1		2.9		0.01	
		-To (Ha)		8.0		8.0		8.0		0.8		0.3		20.6		0.09	
		-Average (Ha)		3.5		12.0		3.5		12.0		0.3		21.1		0.09	
Total		35.0		156.0		35.0		2.3		156.0		0.0		293.3		1.28	
Range and Average of Potential Irrigable Area:		-From (Ha)		1.0		1.0		1.0		0.5		0.5		7.4		0.03	
		-To (Ha)		23.0		15.0		3.0		1.5		3.0		137.5		0.60	
		-Average (Ha)		10.0		15.0		3.0		15.0		3.0		80.7		0.35	
Total		41.5		80.8		11.2		75		80.8		0.0		2411.9		10.53	
Range and Average Length of Main Furrow:		-From (m)		600		1,000		400		1,000		75		7,175.0		31.33	
		-To (m)		3,000		4,000		250		4,000		400		37,900.0		165.50	
		-Average (m)		2,500		2,000		250		2,500		400		20,350.0		88.86	
Range and Average of the Number of Irrigators:		-From (members)		1		5		1		1		1		83.0		0.36	
		-To (members)		25		15		15		15		15		744.0		3.25	
		-Average (members)		13		10		8		10		8		277.0		1.21	
Dominant Crops in Dry Season with Irrigation:		130		130		Potatoes, Rape, Onion, Cabbage, G/maize		72		130		0		9,679.0		42.27	
Dominant Crops in Rainy Season:		Maize, G/nuts, Beans		Maize, G/nuts, Beans		Rape, Tomatoes, Cabbage		Maize, G/nuts, Cassava		Maize, G/nuts, Beans		Rape, Tomatoes, Cabbage		-		-	
Water Resource		-Dambo		0		0		1		0		1		14		6%	
		-River/Stream		10		13		3		13		3		179		78%	
		-Borehole/Shallow Well		0		0		2		0		2		30		13%	
		-Springs		0		0		3		0		3		6		3%	
		-Lake		0		0		0		0		0		0		0%	
		-Others		0		0		0		0		0		0		0%	
(Specify)		0		0		0		0		0		0		-		-	
Type of Irrigation System		-Surface/Furrow		10		13		9		13		0		229		100%	
		(-Gravity)		0		0		0		0		0		1		0%	
		-Pump/Sprinkler		0		0		0		0		0		0		0%	
		-Drip		0		0		0		0		0		0		0%	
		-Others		0		0		0		0		0		0		0%	
(Specify)		0		0		0		0		0		0		-		-	
Number of Scheme having Fish Pond		3		0		3		6		0		6		52		-	
Major Material used for Making Temporary Diversion Weir		Poles, Stones, Clay, Dambo soil		Rocks, Sand bags, Earth, Logs		Earth, Poles, Sticks		-		-		-		-		-	

Table A.1.26 Existing Temporary Irrigation Scheme, Nakonde District, Northern Province

Camp No.	3. EXISTING TEMPORARY IRRIGATION SCHEME PROVINCE: NORTHERN / DISTRICT: NAKONDE										Total	Average / %	
	1	2	3	4	5	6	7	8	9	10			
Name of Camp:	ILOLA	KATONGO	KALUNGU	NAITWIKA	SHEMU	OLD FIFE	MWENZO	NDINGINDI	NTATUMBILA	CHANKA	10	-	
Number of Temporary Schemes/Sites:	4	9	4	1	4	9	10	3	9	4	57	-	
Number of Schemes having Temporary Diversion Weir:	0	4	0	0	0	8	10	0	0	1	23	40%	
Number of Schemes having Furrow (canal) only:	0	0	0	0	0	0	0	0	0	1	1	2%	
Others:	4	5	4	1	4	1	0	3	9	2	33	58%	
Total	0	4	0	0	4	8	10	0	0	2	24	42%	
Range and Average of Present Irrigated Area:	-From (Ha) -To (Ha) -Average (Ha) Total	0.3 2.0 1.1 4.0	0.3 3.0 1.6 0.0	0.3 1.0 0.6 0.0	0.3 2.0 1.1 0.0	0.3 30.0 15.0 106.7	0.3 2.0 1.3 11.1	0.3 2.0 1.3 11.1	0.1 0.4 0.3 0.0	0.5 5.0 2.8 0.0	0.3 1.0 0.6 1.1	2.6 47.4 25.0 123.0	0.05 0.83 0.44 2.16
Range and Average of Potential Irrigable Area:	-From (Ha) -To (Ha) -Average (Ha) Total	0.3 10.0 10.2 0.0	0.3 20.0 10.2 25.0	0.3 50.0 25.0 0.0	0.3 20.0 10.1 10.0	0.3 50.0 25.0 82.9	0.3 20.0 10.1 41.9	0.3 20.0 10.1 41.9	0.3 1.0 0.6 0.0	0.3 40.0 20.1 0.0	0.3 5.0 2.6 2.2	2.5 236.0 118.9 143.9	0.04 4.14 2.09 2.52
Range and Average Length of Main Furrow:	-From (m) -To (m) -Average (m) -From (members) -To (members) -Average (members)	0 0 600 5 25 15	200 1,000 600 2 30 16	0 0 0 6 20 13	0 0 0 1 20 10	100 2,000 900 6 36 21	300 3,000 1,000 6 20 13	300 3,000 1,000 6 20 13	0 0 0 1 7 4	0 0 0 2 20 11	0 0 0 4 7 0	700.0 6,200.0 2,650.0 39.0 204.0 121.0	29.17 258.33 110.42 0.68 3.58 2.12
Dominant Crops in Dry Season with Irrigation:	Cabbage, Rape, Tomatoes	G/beans, Tomatoes, Cabbage	Tomatoes, Rape, C/cabbage	Tomatoes, Cabbage, Rape	C/Cabbage, Cabbage, Tomatoes and Onion	Rape, G/maize, Tomatoes, Okra, Cabbage	Tomatoes, Onion, Rape, Cabbage, Okra	Rape, Cabbage, Tomatoes	Tomatoes, C/Cabbage, Rape	Cabbage, Rape, Tomatoes	-	-	
Dominant Crops in Rainy Season:	F/millet, Maize, G/nuts, Beans	Maize, S/beans, F/millet, Cassava, Beans, G/nuts	F/millet, Rice, Maize, G/nuts	Maize, S/flower, F/millet, Cassava, Rice, Beans	Maize, Beans, Rice, G/nuts, S/beans, Rice and F/millet	Maize, F/millet, S/beans	Maize, Beans, S/beans, F/millet	Rice, G/nuts, Maize, Cassava, F/millet and Beans	Rice, Maize, Scane, G/nuts, S/beans, Beans	Rice, Maize, Cassava, Beans, G/nuts, F/millet	-	-	
Water Resource	-Dambo -River/Stream -Borehole/Shallow Well -Springs -Lake -Others (Specify)	0 2 5 0 0 0 0	0 4 0 0 0 0 0	0 4 0 0 0 0 0	0 1 0 0 0 0 0	0 8 1 0 0 0 0	0 10 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 2 1 0 0 0 0	12 35 9 1 0 0 0	21% 61% 16% 2% 0% 0% 0%	
Type of Irrigation System	-Surface/Furrow (=Gravity) -Pump/Sprinkler -Drip -Others (Specify)	0 0 0 4 0	4 0 0 5 0	0 3 0 4 0	0 0 0 1 0	8 0 0 1 0	10 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	2 6 0 2 0	42% 11% 0% 58% -	
Number of Scheme having Fish Pond Major Material used for Making Temporary Diversion Weir		2 Nil	0 Nil	1 Nil	0 Nil	0 Sand bags	9 Sand bags	0 Buckets	2 Buckets	0 Buckets	15 Nil	- -	

A.1.3 Proposed/Identified Potential Irrigation Scheme

Table A.1.27 Proposed/Identified Potential Irrigation Scheme, Chinsali District, Northern Province

Site No.	PROVINCE: NORTHERN / DISTRICT: CHINSALI								Total	Average / %								
	1	2	3	4	5	6	7	8										
Name of scheme:	Chabala	Nkula	Kulasha	Charifas	Seed farm	Kamanangombe	Kasenga	Chandaula	8	-								
Mark on Map:	1131B4	1031D2	1032C1	1034A2	1032C1	1032C1	1131A1	1131A1	8	-								
Name of Camp:	Museniko	Nkula	Mulalipalika	Charifas	Chinsali Central	Museniko	Matumbo	Matumbo	8	-								
Name of CEO:	Alick Chanda	Chiluya	Kabwe Vincent	Chandula Bernard	Annie Mukidwe	Eric Charida	Ernest Chise	Ernest Chise	8	-								
Name of River/Stream/Dambo:	Chibangwa	Lubwa	Kulasha	Kambiyoshi	Mishishi	Kamanangombe	Kasenga	Chandaula	8	-								
Name of Block:	Chiwengatu Block 4	Central Block 2	Chinsali Block 1	One	Block 2	Matumbo-Block 4	Block 4	Block 4	8	-								
Present Situation of the Scheme:	*Completely new scheme? -Farmers are already practicing irrigation farming with temporary irrigation facilities? If so,																	
Time taken to scheme from DACO offices (min.):	120	30	60	90	15	180	60	60	615	76.9								
Expected fund source:	-Government	-Donor	-Others	-Dambo	-River/Stream	-Bore hole/Shallow well	-Spring	-Lake	-Others	-River/Stream	-Dam/Reservoir	-Pump	-Others	-Surface/Furrow (=Gravity)	-Sprinkler	-Drip	-Others	
Water Resources:	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Intake System Planned:	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Irrigation System Planned:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Irrigation Area Planned (Ha):	52.7	26.3	8.8	8.8	1.8	1.1	4.4	2.6	106.4	13.3								
Planned Crops in Dry Season with Irrigation:	Tomatoes, Onions, Cabbage	Tomatoes, Rape, Cabbage, Onion, Beans	Maize, Cabbage, Tomatoes, Rape, Onion	Onion, Cabbage, Tomatoes, Rape	Maize, Tomatoes, Rape, Cabbage	Maize, Tomatoes, Rape, Cabbage	Maize, Rape, Cabbage, Onion	Rape, Cabbage, Tomato, Onion	Rape, Cabbage, Tomato, Onion	100%								
Intake Facility Planned:	-Concrete Diversion Weir	-Masonry Diversion Weir	-Dam (Earth)	-Dam (Concrete)	-Pump (Motor)	-Others	-Length (m)	-Height (m)	-Width (m)	-Length (m)	-Height (m)	-Capacity (m ³)	-Nos of pump	-Head (m)	-Main Furrow (m)	-Out of the length mentioned left, the length to be lined (m)	-Nos of Irrigators (Beneficiaries) expected	-Nos of Land Owners expected
Dimension of Intake Facility Planned:	0	0	0	0	0	0	20.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	5,000	0	8	1
*Diversion Weir:	0	0	0	0	0	0	20.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	4,000	0	30	7
*Dam:	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0
*Pump:	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0
Length of Furrow Planned:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Irrigation Group:	Mpika	Chinsali Boma	Chinsali Boma	Chinsali	Chinsali	Chinsali	Matumbo	Matumbo	Matumbo	125.3								
Name of the Nearest Major Market and Distance:	1	1	1	1	1	1	1	1	1	13%								

Table A.1.28 Proposed/Identified Potential Irrigation Scheme, Isoka District, Northern Province

2. PROPOSED/IDENTIFIED POTENTIAL IRRIGATION SCHEME PROVINCE: NORTHERN / DISTRICT: ISOKA	1 1 1 1 1 1 1 1 1									Total	Average / %
	1	2	3	4	5	6	7	8	9		
Site No.	Mulingo	Isoka prisons	Choma	Chimanda	Kaumba Middle	Lupula	Chimilia	Lualaba	Nlonga	9	-
Mark on Map:	1	2	3	4	5	6	7	8	9		
Name of Camp:	Nansala	Isoka central	Kalvmani	Isoka central	Isoka Central	Chanama	Muyombe	Lualaba	Mwenisi		
Name of CEO:	P. Mwahe	A. Simukonde	Sakela	A. Simukonde	A. Simukonde	K. Sampa	Edwin Kaonga	B. Kashiwa	B. Kashiwa		
Name of River/Stream/Dambo:	Nansala	Kasoka	Choma	Kasoka	Kaumba	Chanama	Chimilia	Lualaba	Nlonga		
Name of Block:	Isoka Central	Central	Thendele	Central	Isoka Central	Thendele	Thendele	Isoka Central	Nzobae	2	22%
Present Situation of the Scheme:	1	1	1	1	1	1	1	1	1	7	78%
Time taken to scheme from DACO offices (min.):	2.0	3.0	0.8	2.0	3.0	1.0	0.0	3.0	0.0	14.8	1.6
Expected fund source:	Government	Donor	Others	Government	Donor	Others	Government	Donor	Others	6	67%
Water Resources:	River/Stream	Bore hole/Shallow well	Spring	Lake	Others	River/Stream	Bore hole/Shallow well	Spring	Lake	9	100%
Intake System Planned:	Pump	Others	Others	Others	Others	Pump	Others	Others	Others	6	67%
Irrigation System Planned:	Surface/Furrow (Gravity)	Drip	Others	Others	Others	Surface/Furrow (Gravity)	Drip	Others	Others	9	100%
Irrigation Area Planned (Ha):	5.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	10.0	75.0	8.3
Planned Crops in Dry Season with Irrigation:	Vegetables, Grains, Bananas, Fish	Vegetables, Grains, Fruit, Bananas	Vegetables, Maize, Fish	Vegetables, Maize	Vegetables, Grains, Maize, Onions	Vegetables, Fish, Vegetable	Maize, Grains, Vegetable	Tomatoes, Potatoes, Maize	Tomatoes, Potatoes, Onion, Maize, Vegetable	-	-
Inake Facility Planned:	Concrete Diversion Weir	Masonry Diversion Weir	Dam (Earth)	Dam (Concrete)	Pump (Motor)	Others	Others	Others	Others	5	56%
Dimension of Intake Facility Planned:	Length (m)	Height (m)	Width (m)	Height (m)	Capacity (m ³)	Capacity (cm/min)	Nos of pump	Head (m)	Main Furrow (m)	1,855.6	733.3
Length of Furrow Planned:	30	30	20	20	20	20	20	20	20	265	29
Irrigation Group:	Isoka Town	FTC/Isoka Town	Muyombe Center	Isoka Boma	Isoka Boma	Thendele	Muyombe	Isoka Boma	Kampumbu Central	137	15
Name of the Nearest Major Market and Distance:	Good	Fair	Bad	Good	Fair	Bad	Good	Fair	Bad	147.0	16.3
	1	1	1	1	1	1	1	1	1	8	89%
	0	0	0	0	0	0	0	0	0	1	11%
	0	0	0	0	0	0	0	0	0	0	0%

Table A.1.29 Proposed/Identified Potential Irrigation Scheme, Kaputa District, Northern Province

2. PROPOSED/IDENTIFIED POTENTIAL IRRIGATION SCHEME		1		1		2		2		Average / %	
PROVINCE: NORTHERN / DISTRICT: KAPUTA		1		1		2		2		Total	
Site No.	Name of scheme: (Mark on Map)	Kananda	Mukonwe Farmer group								
Name of C.E.O:	Name of River/Stream/Dam/bo:	Munyale	Munyale								
Name of Block:	Present Situation of the Scheme:	James Sirwiringa Chubo	James Sirwiringa Mukonwe Nsama								
	Completely new scheme?	1	1							2	100%
	Farmers are already practicing irrigation farming with temporary irrigation facilities? if so:									0	0%
	Irrigation area at present (Ha) <small>Specify Irrigation in Dry Season/Summer Irrigation.</small>	0.0	0.0							0.0	0.0
	Time taken to scheme from DACO offices (min.):	150	150							300	150.0
	Expected fund source:	Government	Government							0	0%
		Donor (Specify)	Donor (Specify)							2	100%
		Others (Specify)	Others (Specify)							-	-
	Water Resources:	Dam/bo	Dam/bo							0	0%
		River/Stream	River/Stream							2	100%
		Bore hole/Shallow well	Bore hole/Shallow well							0	0%
		Spring	Spring							0	0%
		Lake	Lake							0	0%
		Others (Specify)	Others (Specify)							0	0%
	Intake System Planned:	River Diversion	River Diversion							2	100%
		Dam/Reservoir	Dam/Reservoir							0	0%
		Pump	Pump							0	0%
		Others (Specify)	Others (Specify)							0	0%
	Irrigation System Planned:	Surface/Furrow (±Gravity)	Surface/Furrow (±Gravity)							2	100%
		Sprinkler	Sprinkler							0	0%
		Drip	Drip							0	0%
		Others (Specify)	Others (Specify)							0	0%
	Irrigation Area Planned (Ha):	Planned Crops in Dry Season with Irrigation:	Planned Crops in Dry Season with Irrigation:							2.6	1.3
		Concrete Diversion Weir	Concrete Diversion Weir							-	-
		Masonry Diversion Weir	Masonry Diversion Weir							2	100%
		Dam (Earth)	Dam (Earth)							0	0%
		Dam (Concrete)	Dam (Concrete)							0	0%
		Pump (Motor)	Pump (Motor)							0	0%
		Others (Specify)	Others (Specify)							0	0%
	Dimension of Inlet Facility Planned:	Length (m)	Length (m)							-	-
		Height (m)	Height (m)							-	-
		Width (m)	Width (m)							-	-
		Length (m)	Length (m)							-	-
		Height (m)	Height (m)							-	-
		Capacity (m ³)	Capacity (m ³)							-	-
		Capacity (cm/min)	Capacity (cm/min)							-	-
		Nos of pump	Nos of pump							-	-
		Main Furrow (m)	Main Furrow (m)							1,350.0	675.0
		Out of the length mentioned left, the length to be lined (m)	Out of the length mentioned left, the length to be lined (m)							900.0	450.0
	Irrigation Group:	Nos of Irrigators (Beneficiaries) expected	Nos of Irrigators (Beneficiaries) expected							40	20
		Nos of Land Owners expected	Nos of Land Owners expected							250	125
	Name of the Nearest Major Market and Distance:	Mporokoso Boma	Mporokoso Boma							-	-
		Distance (km)	Distance (km)							55.0	27.5
		Good	Good							0	0%
		Fair	Fair							2	100%
		Bad	Bad							0	0%

Table A.1.30 Proposed/Identified Potential Irrigation Scheme, Kasama District, Northern Province

2. PROPOSED/IDENTIFIED POTENTIAL IRRIGATION SCHEME													10
PROVINCE: NORTHERN / DISTRICT: KASAMA													Total
Site No.	1	2	3	4	5	6	7	8	9	10	11	12	Average /%
Name of scheme:	Chilieshe Mwamba	Lukulu south	Kasonde Chisuma	D	Chitombo	Musa	Kasani		Chimpiti	Nsansa			
Mark on Map:	A	B	C		E	F	G	H	I	J			
Name of Camp:	Lwabwe	Lukulu south	kasonde Chisuma	Kasonde Wulokwa	Lukulu south	Musa	mulanshi	Chibote	Chibote	Chibote			
Name of CEO:	Main I. C.	Kunda Stephen	Ngosa	Suse	Kunda Steven	Chisanga C.	Mulenga Emmanuel	Mrs. Kapuka	Njemba Robert	Njemba Robert			
Name of River/Stream/Dambo:					Lukupa	kupumaula	Lukasya	milima	Kabundi	Mwelo			
Name of Block:	Nkidelimfumu	Mwamba	Kasama central		Mwamba	Nkole Mfumu	Nkidelimfumu	Kasama Central	Mulimbonge	Mulimbonge			
Present Situation of the Scheme:	-Completely new scheme? -Farmers are already practicing irrigation farming with temporary irrigation facilities? if so. Irrigation area at present (Ha) -Crops cultivated in dry season under irrigation												
Time taken to scheme from DACO offices (min.):	50	30	60	60	30	40	80	35	60	80	525		
Expected fund source:	Government	Donor	Any	Any	Any	Any	Any	Any	Any	JICA			
Water Resources:	-River/Stream	-Bore hole/Shallow well	-Lake	-Others	-River/Stream	-Bore hole/Shallow well	-Lake	-Others	-River/Stream	-Bore hole/Shallow well	-Lake	-Others	
Inake System Planned:	-River/Reservoir	-Dam/Reservoir	-Pump	-Others	-Surface/Furrow (Gravity)	-Sprinkler	-Drip	-Others	-Surface/Furrow (Gravity)	-Sprinkler	-Drip	-Others	
Irrigation Area Planned (Ha):	4.4	13.2	6.6	7.0	17.6	7.9	8.8	7.0	4.4	1.8	78.5		
Planned Crops in Dry Season with Irrigation:	Planned Crops in Dry Season with Irrigation: Onion, Cabbage, Bananas, Maize												
Inake Facility Planned:	-Concrete Diversion Weir	-Masonry Diversion Weir	-Dam (Earth)	-Dam (Concrete)	-Pump (Motor)	-Others	-Concrete Diversion Weir	-Masonry Diversion Weir	-Dam (Earth)	-Dam (Concrete)	-Pump (Motor)	-Others	
Dimension of Intake Facility Planned:	-Length (m)	25.0	19.0	23.0	18.0	20.0	16.0	22.0	40.0	22.0			
-Width (m)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5			
-Height (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4			
-Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
-Height (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
-Capacity (m ³)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
-Capacity (m ³ /min)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
-Nos of pump	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
-Head (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Length of Furrow Planned:	-Plan Furrow (m)	200	3,000	2,500	1,200	5,000	7,000	3,500	2,900	2,000	32,200.0		
-Out of the length mentioned left, the length to be lined (m)	0	100	200	100	200	200	200	200	200	200	1,700.0		
Irrigation Group:	-Nos of Irrigators (Beneficiaries) expected	40	80	45	45	75	150	300	21	30	856		
-Nos of Land Owners expected	20	30	20	20	30	5	70	150	21	30	406		
Name	Kasama	Kasama south	Kasama	Kasama	Kasama	Kasama	Kasama	Kasama	Kasama	Kasama	Kasama		
Distance (km)	25	25	25	55	26	20	30	16	65	70	359.0		
-Good	1	1	1	1	1	1	1	1	1	1	9		
-Fair	0	0	0	0	0	0	0	0	0	0	1		
-Bad	0	0	0	0	0	0	0	0	0	0	0		
													10%
													0%

Table A.1.31 Proposed/Identified Potential Irrigation Scheme, Luwingu District, Northern Province

2. PROPOSED/IDENTIFIED POTENTIAL IRRIGATION SCHEME												
PROVINCE: NORTHERN / DISTRICT: LUWINGU												
Site No.	1	2	3	4	5	6	7	8	9	10	Total	Average / %
Name of scheme:	Chibishi B2	Kapisha B1	Kapisha	Kambulu Club B7	Mapulanga B6	Tungati B3	Maiwi B5	Chimbini Irrigation B4	Mufili chibwalle B3	Makumba	10	-
Name of Camp:	Kapisha	Kapisha	John Chilundika	Mapulanga	Mapulanga	Tungati	Mufili	Mawansa	Mufili	Shimumbi		
Name of CEO:	John Chilundika	John Chilundika	John Chilundika	John Chilundika	Mark Kombe	Mark Kombe	G.Bwalya	Mlungwe	G. Bwalya	Nyerenda		
Name of Block:	Chibishi	Chibishi	Katopola	Kambulu	Kambulu	Mufili	Mufili	Mufili	Mufili	Makumba		
	Chullungoma	Chullungoma	Chullungoma	Chungu	Chungu	Tungati	Chungu	Tungati	Chungu	Chifwile	3	30%
Present Situation of the Scheme:											7	70%
Time taken to scheme (from DACO offices (min.):											24.0	2.4
Expected fund source:												
Water Resources:												
Intake System Planned:												
Irrigation System Planned:												
Irrigation Area Planned (Ha):												
Planned Crops in Dry Season with Irrigation:												
Intake Facility Planned:												
Dimension of Intake Facility Planned:												
Dam:												
Pump:												
Length of Furrow Planned:												
Irrigation Group:												
Name of the Nearest Major Market and Distance:												

Table A.1.32 Proposed/Identified Potential Irrigation Scheme, Mbala District, Northern Province (1/2)

2. PROPOSED/IDENTIFIED POTENTIAL IRRIGATION SCHEME									
PROVINCE: NORTHERN / DISTRICT: MBALA									
Site No.	1	2	3	4	5	6	7	8	
Name of scheme:	Munzimbe A	Chingombe B	Kallo C	Muzuma CI	Saase D	Chisinga D	Mwuluzi E	Nondo F	
Mark on Map:									
Name of Camp:	Mambwa Mission	Mambwa Mission	Lunzuwa	Mambwa Mission	Lunzu	Mambwa mission	Nondo	Nondo	
Name of CEO:	Nicholas Kapaya	Nicholas Kapaya	Chansa Grace	Nicholas Kapaya	Grace	Nicholas Kapaya	Kasasa	Kasasa	
Name of River/Stream/Dam/Dam/Dam:	Chizembe Mission	Chilima Stream	Lungu	Muzuma Stream	Saie	Chisinga	Mpamfu	Nangina	
Name of Block:	Nsololo	Nsololo	Central Block	Mesokolo	Central	Nsololo	Sengga	Sengga	
Present Situation of the Scheme:	1	1	1	1	1	1	1	1	
Time taken to scheme from DACO offices (min.):									
Expected fund source:	Government	Donor	JICA	JICA	JICA	JICA	JICA	JICA	
Water Resources:	Vegetables	Vegetables	Coffee, Tomato, Maize	Vegetables	Vegetables	Okra, Maize, Vegetables	Vegetables, Maize, Beans	Vegetables, Maize, Beans	
Intake System Planned:	1	1	1	1	1	1	1	1	
Irrigation System Planned:	0	0	0	0	0	0	0	0	
Irrigation Area Planned (Ha):	4.0	8.0	10.0	19.0	10.0	10.0	10.0	15.0	
Planned Crops in Dry Season with Irrigation:	Vegetables, Maize	Vegetables, Maize	Coffee, Tomato, Maize, Ipotaatoes	Citrus, Vegetable, Maize	Maize, Tomato, Rape, Cabbage, Ipotaatoes	Maize, Vegetables, Okra	G/maize, Beans, Okra, Vegetables	Vegetables, G/maize, Beans, Ipotaatoes	
Intake Facility Planned:	Concrete Diversion Weir	Masonry Diversion Weir	Dam (Earth)	Dam (Concrete)	Pump (Motor)	Others	Others	Others	
Dimension of Intake Facility Planned:	Length (m)	7.0	5.0	4.0	10.0	7.0	5.0	3.0	
*Diversion Weir:	Height (m)	1.0	1.5	1.3	1.0	1.5	2.5	1.5	
*Dam:	Width (m)	0.0	0.0	50.0	0.0	30.0	0.0	50.0	
*Pump:	Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Height (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Capacity (m3)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Capacity (cm/min)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Nos of pump	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Head (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Length of Furrow Planned:	Main Furrow (m)	5,000	5,000	7,500	4,000	4,500	3,000	4,000	
	Out of the length mentioned left, the length to be lined (m)	2,000	1,000	1,000	1,500	2,000	500	3,000	
Irrigation Group:	Nos of Irrigators (Beneficiaries) expected	25	20	35	25	31	30	40	
	Nos of Land Owners expected	15	18	3	10	25	5	6	
Name of the Nearest Major Market and Distance:	Name	Mbala	Mbala	Mbala	Mbala	Mbala	Sengga	Nondo	
	Distance (km)	70	70	35	70	65	15	4	
	Good	1	1	1	1	1	1	1	
	Fair	0	0	0	0	0	0	0	
	Bad	0	0	0	0	0	0	0	

Table A.1.33 Proposed/Identified Potential Irrigation Scheme, Samfya District, Luapula Province (2/2)

Site No.	9	10	11	12	13	14	15	7	Average / %	
Name of scheme:	Mwanda G	Teya H	Kapoli I	Mukatula J	Twime N	Kapatu S	Ngambwe P	15	-	
Mark on Map:	Lunzuwa Kaka	Saidi Hussein	M Namabela	Senga M.Nambela	Masamba F.K. Kasonde	Masamba F.K. Kasonde	Masamba F.K. Kasonde	15	-	
Name of CEO:	Munyazi Chiplia	Mwamba Central	Chambeshi Senga	Musada Senga	Sambwe Mbiaia Central	Sambwe Mbiaia Central	Mpando Mbiaia Central	15	-	
Name of Block:	Central	Mwamba Central	Senga	Senga	Mbiaia Central	Mbiaia Central	Mbiaia Central	15	-	
Present Situation of the Scheme:	1	1	1	1	1	1	1	4	27%	
Time taken to scheme from DACO offices (min):	2.0	1.0	2.0	13.0	0.0	0.0	0.0	30.5	2.0	
Expected fund source:	Government	Donor	Others	Others	Others	Others	Others	Others	Others	
Water Resources:	River/Stream	Bore hole/Shallow well	Lake	Others	Others	Others	Others	Others	Others	
Intake System Planned:	River/Reservoir	Pump	Others	Others	Others	Others	Others	Others	Others	
Irrigation System Planned:	Surface/Furrow (=Gravity)	Sprinkler	Drip	Others	Others	Others	Others	Others	Others	
Irrigation Area Planned (Ha):	15.0	3.5	0.0	28.0	20.0	15.0	10.0	177.5	11.8	
Planned Crops in Dry Season with Irrigation:	Tomatoes, Cabbage, Rape, Maize	Maize, Beans, Onion, Tomatoes, Rape, Potatoes	Cabbage, Tomato, G/maize	G/maize, Beans, Tomatoes, Cabbage	Tomatoes, Onion, Cabbage, Rape, G/maize	Rape, Onion, Potatoes, Maize, Tomatoes, Cabbage	Tomatoes, Onion, Cabbage, Rape	Tomatoes, Onion, Cabbage, Rape	-	
Intake Facility Planned:	Concrete Diversion Weir	Masonry Diversion Weir	Dam (Earth)	Dam (Concrete)	Pump (Motor)	Others	Others	Others	Others	
Dimension of Intake Facility Planned:	*Diversion Weir: -Length (m) -Height (m) -Width (m) -Length (m) -Height (m) -Capacity (m ³) -Capacity (cm/min) -Nos of pump -Head (m)	15.0 1.5 1.0 0.0 0.0 0.0 0.0 0.0 0.0	4.0 1.5 3.0 0.0 0.0 0.0 0.0 0.0 0.0	1.6 1.6 1.5 0.0 0.0 0.0 0.0 0.0 0.0	2.0 1.5 3.0 0.0 0.0 0.0 0.0 0.0 0.0	6.0 3.0 2.0 0.0 0.0 0.0 0.0 0.0 0.0	10.0 2.0 2.0 0.0 0.0 0.0 0.0 0.0 0.0	10.0 2.0 2.0 0.0 0.0 0.0 0.0 0.0 0.0	-	-
Length of Furrow Planned:	1,500	250	5,000	3,000	1,500	3,000	2,000	52,250.0	3,483.3	
Irrigation Group:	1,000	250	5,000	3,000	1,000	1,500	2,000	26,250.0	1,750.0	
Name of the Nearest Major Market and Distance:	Mpulumung	Kaka	Senga Kasama	Kasama	Mbiaia	Mbiaia	Mbiaia	813.0	54.2	
	12	3	100	100	68	83	83	12	80%	
	1	1	1	1	1	1	1	3	20%	
	0	0	0	0	0	0	0	0	0%	

Table A.1.34 Proposed/Identified Potential Irrigation Scheme, Mpika District, Northern Province (2/2)

2. PROPOSED/IDENTIFIED POTENTIAL IRRIGATION SCHEME											
PROVINCE: NORTHERN / DISTRICT: MPIKA											
Site No.	1	2	3	4	5	6	7	Total	Average / %		
Name of scheme:	Kabene Irrigation	Chintu	Bullini Tabupwa	Minamba	Kashala	Mudamba	Chishibesonde				
Mark on Map:	A	B	C	D	E	F	G				
Name of Camp:	Chintu	Chintu	Mpika main	Childga	Katbunga	Francis Banda	Shill a Mwmba				
Name of CEO:	Mercy Banda	Mercy Banda	Fidewe Bwaliva	Francis mulenga	Geoffrey N'gandu	Kabale Stream	Lubambala Stream				
Name of River/Stream/Dambo:	Kabene stream	Mukungwa River	Majashi Stream	Minamba stream	Kashala Stream	Mpika Central	Mpika Central				
Name of Block:	Mpika Central	Mpika Central	Mpika Central	Mpika Central	Makungule Block	Mpika Central	Mpika Central				
Present Situation of the Scheme:	Completely new scheme? -Farmers are already practicing irrigation farming with temporary irrigation facilities? if so, Irrigation area at present (Ha) -Crops cultivated in dry season under irrigation										
Time taken to scheme from DACO offices (min.):	60	30	15	40	30	60	30	265	37.9		
Expected fund source:	Government	Donor	JICA	JICA	JICA	JICA	JICA	0	0%		
Water Resources:	River/Stream	Bore hole/Shallow well	Spring	Lake	Others	Others	Others	Others	0%		
Intake System Planned:	Dam/Reservoir	Pump	Others	Others	Others	Others	Others	Others	0%		
Irrigation System Planned:	Surface/Furrow (e-Gravity)	Sprinkler	Drip	Others	Others	Others	Others	Others	0%		
Irrigation Area Planned (Ha):	15.0	30.0	3.5	5.0	10.0	5.0	5.0	73.5	10.5		
Planned Crops in Dry Season with Irrigation:	Maize, Tomatoes, Onion	Tomatoes, Onion, Vegetables	Onion, Tomatoes, Vegetables	Vegetables, Maize	Bananas	Maize, Vegetables	Onion, Vegetables				
Intake Facility Planned:	Concrete Diversion Weir	Masonry Diversion Weir	Dam (Earth)	Dam (Concrete)	Pump (Motor)	Others	Others	Others	86%		
Dimension of Intake Facility Planned:	Length (m)	11.0	20.0	15.0	15.0	15.0	10.0	10.0			
Height (m)	4.0	4.0	4.0	4.0	2.0	4.0	4.0	4.0			
Width (m)											
Length (m)		0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Height (m)		0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Capacity (m3)		0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Capacity (cm/min)		0.0	0.0	0.0	0.0	0.0	0.0	0.0			
No. of pump		0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Head (m)		0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Length of Furrow Planned:	Out of the length mentioned left, the length to be lined (m)	10,000	15,000	4,000	5,000	5,000	3,000	50,800.0	7,257.1		
No. of Irrigators (Beneficiaries) expected		5,000	10,000	4,000	3,000	3,000	3,000	35,000.0	5,000.0		
No. of Land Owners expected		200	200	60	100	150	100	910	130		
Irrigation Group:		Mpika Boma	Mpika Boma	Mpika Boma	Mpika Boma	Mpika Boma and Tazara Market	Mpika Boma and Tazara				
Name of the Nearest Major Market and Distance:		Mpika Boma	Mpika Boma	Mpika Boma	Mpika Boma	Mpika Boma and Tazara Market	Mpika Boma and Tazara				
Distance (km)		40	30	10	25	45	15	185.0	26.4		
-Good		1	1	1	1	1	1	6	86%		
-Fair		0	0	0	0	0	0	1	14%		
-Bad		0	0	0	0	0	0	0	0%		

Table A.1.35 Proposed/Identified Potential Irrigation Scheme, Mporokoso District, Northern Province (2/2)

	PROVINCE: NORTHERN / DISTRICT: MPOROKOSO							Total	Average / %
	1	2	3	4	5	6	7		
Site No:	1	2	3	4	5	6	7		
Name of scheme:	Mukulu Farmers Group	Makungu Farmers Group	Kusopole Farmer G.	Koananda Farmers Group	Chibanzwamba Farmers	Kamaku Farmers G.	Kapatu Farmers		
Mark on Map:	(D)	(C)	(B)	(A)	(E)	(F)	(G)		
Name of Camp:	Kalabwe	Kalabwe	Kalabwe	Chalabesa	Chishamwamba	Kalabwe	Kapatu		
Name of CEO:	Michelo Mwemba	Michelo Mwemba	Michelo Mwemba	A. Chikumata	Chehine Mwemba	Michelo Mwemba	S. Halwino		
Name of River/Stream/Dambo:	Itubu	Mwange	Kasakalabwe	chimpololongo	Kanyimbo				
Name of Block:	mwange	Mwange	Mwange	mwange	Mporokoso	Mwemba	Kapatu		
Completely new scheme?	1	1	1	1	0	1	1	6	86%
-Farmers are already practicing irrigation farming with temporary irrigation facilities? if so:	0	0	0	0	1	0	0	1	14%
Present Situation of the Scheme:									
-Irrigation area at present (Ha)	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.1
-Crops cultivated in dry season under irrigation	0	0	0	0	Vegetables, Grmatize, Scrane	0	0	0	-
Time taken to scheme from DACO offices (min):	60	50	60	20	5	80	120	395	56.4
-Government	0	0	0	0	0	0	0	0	0%
-Donor	1	1	1	1	1	1	1	7	100%
-Others (Specify)	0	0	0	0	0	0	0	0	0%
-Others (Specify)	0	0	0	0	0	0	0	0	0%
-Dambo	0	0	0	0	0	0	0	0	0%
-River/Stream	1	1	1	1	0	1	1	6	86%
-Bore hole/Shallow well	0	0	0	0	0	0	0	0	0%
-Spring	0	0	0	0	0	0	0	0	0%
-Lake	0	0	0	0	0	0	0	0	0%
-Others (Specify)	0	0	0	0	0	0	0	0	0%
-Others (Specify)	0	0	0	0	0	0	0	0	0%
-River Diversion	1	1	1	1	1	1	0	6	86%
-Dam/Reservoir	0	0	0	0	0	0	1	1	14%
-Pump	0	0	0	0	0	0	0	0	0%
-Others (Specify)	0	0	0	0	0	0	0	0	0%
-Others (Specify)	0	0	0	0	0	0	0	0	0%
-Surface/Furrow (-Gravity)	1	1	1	1	1	1	1	7	100%
-Sprinkler	0	0	0	0	0	0	0	0	0%
-Drip	0	0	0	0	0	0	0	0	0%
-Others (Specify)	0	0	0	0	0	0	0	0	0%
-Others (Specify)	0	0	0	0	0	0	0	0	0%
Irrigation Area Planned (Ha): -Farmers Crops in dry season with Irrigation:	10.0	6.0	4.0	4.0	5.0	15.0	5.0	48.0	7.0
-Concrete Diversion Weir	5	3	2	2	3	5	5	5	-
-Masonry Diversion Weir	1	1	1	1	1	1	1	6	86%
-Dam (Earth)	0	0	0	0	0	0	0	0	0%
-Dam (Concrete)	0	0	0	0	0	0	0	0	0%
- Pump (Motor)	0	0	0	0	0	0	0	0	0%
-Others (Specify)	0	0	0	0	0	0	0	0	0%
-Others (Specify)	0	0	0	0	0	0	0	0	0%
Dimension of Intake Facility Planned:									
-Length (m)	30.0	15.0	15.0	5.0	20.0	15.0	0.0	-	-
-Height (m)	2.0	1.5	2.0	2.0	2.0	2.0	0.0	-	-
-Width (m)	0.0	0.0	0.0	0.0	0.5	0.5	-	-	-
-Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	100.0	-	-
-Height (m)	0.0	0.0	0.0	0.0	0.0	0.0	5.0	-	-
-Capacity (m3)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
-Capacity (cmm/m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
-Nos of pump	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
-Head (m)	8.000	0.0	2.000	2.000	1.500	4.000	800	19,800.0	2,828.6
-Main Furrow (m)	20	20	20	50	30	20	20	180.0	25.7
-Out of the length mentioned left, the length to be lined (m)	30	25	20	15	20	20	50	180	26
-Nos of Irrigators (Beneficiaries) expected	Communal	Communal	Communal	Communal	communal	Communal	communal	0	0
-Nos of Land Owners expected	Mporokoso	Mporokoso	Mporokoso	Mporokoso	Mporokoso	Mporokoso	Kapatu	-	-
Name	43	30	40	18	5	5	5	141.0	20.1
Distance (km)	-Good	-Good	-Good	-Good	-Good	-Good	-Good	1	14%
-Fair	1	1	1	1	1	1	1	6	86%
-Bad	0	0	0	0	0	0	0	0	0%
Name of the Nearest Major Market and Distance:									

Table A.1.36 Proposed/Identified Potential Irrigation Scheme, Mungwi District, Northern Province (2/2)

2. PROPOSED/IDENTIFIED POTENTIAL IRRIGATION SCHEME											
PROVINCE: NORTHERN / DISTRICT: MUNGWU											
Site No.	1	1	1	1	1	1	1	1	1	1	6
Name of scheme:	Panjala (2)	Nunia	Chonya Dam (2)	Minshe (2)	Itule/Kasopola (2)	Chabukila (2)					
Mark on Map:	Chonya	Chonya	Chonya	Maloie	Mungwi East	Ngulula					
Name of Camp:	Robert Chanda	Robert Chanda	Robert Chanda	Reuben Mwenya	Watson Banda	Josephine Mulenga					
Name of CEO:	mitulu	Nunia	Chonya	Minshe							
Name of Block:	Mungwi Central	Mungwi Central	Mungwi	Mungwi Central	mungwi Central	mungwi Central					
Present Situation of the Scheme:	1	1	1	1	1	1					
Time taken to scheme from DKCO offices (min.):	10.0	35.0	1.0	15.0	0.0	12.5					
Expected fund source:	Government	Donor	Others	Others	Others	Others					
Water Resources:	River/Stream	Bore hole/Shallow well	Lake	Others	Others	Others					
Intake System Planned:	Dam/Reservoir	Pump	Others	Others	Others	Others					
Irrigation System Planned:	Sprinkler	Drip	Others	Others	Others	Others					
Irrigation Area Planned (Ha):	17.6	6.6	2.6	6.1	10.5	4.4					
Planned Crops in Dry Season with Irrigation:	Vegetables, G/maize	Vegetables, G/maize	Vegetables	Vegetables	Rape, Onion, Tomatoes, G/maize	Rape, Tomatoes, Onion					
Intake Facility Planned:	Concrete Diversion Weir	Masonry Diversion Weir	Dam (Earth)	Dam (Concrete)	Pump (Motor)	Others					
Dimension of Intake Facility Planned:	Length (m)	Height (m)	Width (m)	Length (m)	Height (m)	Capacity (cum/m)					
Length of Furrow Planned:	Head (m)	Flow (m)	Flow (m)	Flow (m)	Flow (m)	Flow (m)					
Irrigation Group:	Nos of Irrigators (Beneficiaries) expected	Nos of Land Owners expected	Name	Distance (km)	Fair	Bad					
Name of the Nearest Major Market and Distance:											
Average / %											

Table A.1.37 Proposed/Identified Potential Irrigation Scheme, Nakonde District, Northern Province (1/2)

2. PROPOSED/IDENTIFIED POTENTIAL IRRIGATION SCHEME											
PROVINCE: NORTHERN / DISTRICT: NAKONDE											
Site No.	1	2	3	4	5	6	7	8			
Name of scheme:	Matipa	Ndiridi	Inusukilo Small Holder	Musamvu	Bulajimu	Nega	Mwanga	Mwaji			
Mark on Map:	L1 M1	K1 M1	J1 M2	G1 M2	H1 M2	H1 M2	C1 M2	D1 M2			
Name of Camp:	Mwanzo	Old File	Old File	Shemu	Old File	Mwanzo	Shemu	Old File			
Name of CEO:	James Simbeye	Thaddeus Mwamba	Thaddeus Mwamba	N. Mutuna	Thaddeus Mwamba	James Simbeye	Thaddeus Mwamba	Thaddeus Mwamba			
Name of River/Stream/Damboo:	Matipa	Muswato Stream	Mukwela	M. banga	Old File	Nkonde	Mwanga	Wulongo			
Name of Block:	Old File	Old File	Old File	Shemu	Old File	Old File	Shemu	Old File			
Present Situation of the Scheme:	1	1	1	1	1	1	1	1			
Time taken to scheme from DACO offices (min.):	1.0	4.5	1.0	11/2 hour	30 minutes	8.0	1 hour	15 minutes and 7			
Expected fund source:	-Government	-Donor	-Others	-Damboo	-River/Stream	-Bore hole/Shallow well	-Spring	-Lake			
Water Resources:	-Others	-Others	-Others	-Others	-Others	-Others	-Others	-Others			
Intake System Planned:	-River/Diversion	-Dam/Reservoir	-Pump	-Others	-Others	-Others	-Others	-Others			
Irrigation System Planned:	-Surface/Furrow (=Gravity)	-Sprinkler	-Drip	-Others	-Others	-Others	-Others	-Others			
Irrigation Area Planned (Ha):	20.0	10.0	10.0	5.0	15.0	10.0	5.0	15.0			
Planned Crops in Dry Season with Irrigation:	Tomatoes, Rape, Onion	G/beans, Peas, Tomatoes	Tomatoes, Cabbage, Rape	Tomatoes, Cabbage, Rape	Cabbage, Onion, Okra	Tomatoes, Cabbages	Vegetables	Okra, Carrots, Eplants			
Intake Facility Planned:	-Concrete Diversion Weir	-Masonry Diversion Weir	-Dam (Earth)	-Dam (Concrete)	-Pump (Motor)	-Others	-Others	-Others			
Dimension of Intake Facility Planned:	-Length (m)	-Height (m)	-Width (m)	-Height (m)	-Capacity (cm/min)	-Head (m)	-Main Furrow (m)	-Out of the length mentioned left, the length to be lined (m)			
Length of Furrow Planned:	15	20	15	1,700	300	1,700	1,000	2,000			
Irrigation Group:	3,000	6	12	48	7/8	21	15	33			
Name of the Nearest Major Market and Distance:	15	5	5	1	1	1	1	1			
	-Good	-Fair	-Fair	-Bad	-Bad	-Bad	-Bad	-Bad			

Table A.1.38 Proposed/Identified Potential Irrigation Scheme, Nakonde District, Northern Province (2/2)

2. PROPOSED/IDENTIFIED POTENTIAL IRRIGATION SCHEME		1	1	1	1	1	1	1	4	Average / %
PROVINCE: NORTHERN / DISTRICT: NAKONDE		9	10	11	12	Total				
Name of scheme:		Tukundane	Chisioka A	Chisilala	Katzi					
Mark on Map:		E1 M2	B1 M2	A1 M1	B1 M2					
Name of Camp:		Kalungu	Kalungu	wagwika						
Name of CEO:		Ethel Chanda	Ethel Chanda	Dan Lee Mwaba	Thaddeus Mwamba					
Name of River/Stream/Dam/Dambo:		Nakonde Stream	Kalungu	Ngombwa	Ikawa					
Name of Block:		Old Fife	Old	Ilola	Old Fife					
Present Situation of the Scheme:		1	1	1	1					
Time taken to scheme from DACO offices (min.):						10 minutes				
Expected fund source:		-Government					9	75%		
		-Donor					0	0%		
		(Specify)					0	0%		
		-Others					0	0%		
		(Specify)					0	0%		
Water Resources:		-Dambo					0	0%		
		-River/Stream					12	100%		
		-Bore hole/Shallow well					0	0%		
		-Spring					0	0%		
		-Lake					0	0%		
		-Others					0	0%		
		(Specify)					0	0%		
Intake System Planned:		-River Diversion					7	58%		
		-Dam/Reservoir					1	8%		
		-Pump					4	33%		
		-Others					0	0%		
		(Specify)					0	0%		
Irrigation System Planned:		-Surface/Furrow (-Gravity)					12	100%		
		-Sprinkler					0	0%		
		-Drip					0	0%		
		-Others					0	0%		
		(Specify)					0	0%		
Irrigation Area Planned (Ha):		10.0	15.0	15.0	3.0	126.0				
Planned Crops in Dry Season with Irrigation:		Tomatoes, Cabbage, Onion, Rape	Tomatoes, Cabbage, Rape	Tomatoes, Cabbage, Rape	Rape, Okra, Tomatoes					
Intake Facility Planned:		-Concrete Diversion Weir					2	17%		
		-Masonry Diversion Weir					6	50%		
		-Dam (Earth)					0	0%		
		-Dam (Concrete)					0	0%		
		-Pump (Motor)					4	33%		
		-Others					0	0%		
		(Specify)					0	0%		
Dimension of Intake Facility Planned:		-Length (m)					12			
*Diversion Weir:		-Height (m)					2			
		-Width (m)					0			
		-Length (m)					0			
		-Height (m)					225			
		-Capacity (m ³)					0			
		-Capacity (cm/min)					3			
		-Nos of pump					30			
		-Head (m)					1,000			
		-Main Furrow (m)					12,500.0			
		-Out of the length mentioned left, the length to be lined (m)					8,700.0			
Irrigation Group:		-Nos of Irrigators (Beneficiaries) expected					121			
		-Nos of Land Owners expected					37			
Name of the Nearest Major Market and Distance:		Name	Nakonde	Nakonde	Tunduma/Nakonde					
		-Distance (km)	76	85	40					
		-Good	1	0	1					
		-Fair	1	1	1					
		-Bad	0	0	0					

A.2 The Results of Irrigation Scheme Survey in Luapula Province

A.2.1 Existing Permanent Irrigation Scheme

Table A.2.1 Existing Permanent Irrigation Scheme, Chieng District, Luapula Province

1. EXISTING PERMANENT IRRIGATION SCHEME			1	
PROVINCE: LUAPULA / DISTRICT: CHIENGE			Total	Average / %
Site No:	1		1	
Name of Scheme/Site:	Kaseke		1	
Mark on Map:	F		-	-
Name of Camp:	Kaseke		-	-
Name of CEO:	Mwambi		-	-
Name of River/Stream/Dambo:	kaseke		-	-
Name of Village Benefited:			-	-
Year of Establish/Supported by:	-Year	1998	-	-
	-Government	0	0	0%
	(Specify)	0	-	-
	-Donor	0	0	0%
	(Specify)	0	Mason 1, RF-1, EE, GA 1	-
Water Resource:	-Others	1	1	100%
	(Specify)	Owners	-	-
	-Dambo	0	0	0%
	-River/Stream	1	1	100%
	-Bore hole/Shallow well	0	0	0%
Intake System:	-Springs	0	0	0%
	-Lake	0	0	0%
	-River Diversion	1	1	100%
	-Dam/Reservoir	0	0	0%
	-Pump	0	0	0%
Irrigation System:	-Others	0	0	0%
	(Specify)	0	-	-
	-Surface/furrow (=Gravity)	1	1	100%
	-Sprinkler	0	0	0%
	-Drip	0	0	0%
Present Irrigation Area (Ha):		1.30	1.30	1.3
	Potential Irrigation Area from Land Availability (Ha):	5.00	5.00	5.0
Dominant Crops in Dry Season with Irrigation:	Tomatoes, Rape, Onion, Cabbage, C/cabbage, E/plant		-	-
Dominant Crops in Rainy Season:	Tomatoes, E/plant, Rape, C/cabbage, Maize, Cassava, G/nuts		-	-
% of river water directing to furrow during peak irrigation period:	5		5.00	5.0
How long from DACO Office by vehicle (Minutes):	30		30.00	30.0
Distance (Km):	50		50.00	50.0
Is there fish pond in the Scheme:	-Yes	0	0.00	0%
	-No	1	1	100%
	-if yes, how many	0	0	0.0
Is there other fish pond in the Village (not including the Scheme):	-Yes	0	0	0%
	-No	1	1	100%
	-if yes, how many	0	0	-
Intake Facility:	-Concrete Diversion Weir	0	0	0%
	-Masonry Diversion Weir	0	0	0%
	-Dam (Earth)	0	0	0%
	-Dam (Concrete)	0	0	0%
	-Pump (Motor)	0	0	0%
	-Pump (Engine)	0	0	0%
	-Others (Specify)	1	1	100%
Present Condition of Intake Facility:	-Good	0	0	0%
	-Fair	1	1	100%
	-Bad	0	0	0%
Dimension of Intake Facility:	-Diversion weir:			
	-Length (m)	0.0	-	-
	-Height (m)	0.0	-	-
Dam:	-Width (m)	0.0	-	-
	-Length (m)	0	-	-
	-Height (m)	0	-	-
Pump:	-Capacity (m ³)	0	-	-
	-Capacity (cum./min)	0	-	-
	-Nos. of Pump	0	-	-
Length of Furrow (Canal) and Condition:	-Head (m)	0	-	-
	-Main Furrow (m) and Condition		0	0
	-Good		0	0%
	-Fair		0	0%
	-Bad		0	0%
	-Out of the length above, the length of lined main furrow is (m)		0	0
	-Secondary furrow (m)		0	0
Soil Fertility:	-Good	1	1	100%
	-Fair	0	0	0%
	-Poor	0	0	0%
Acidity Problem:	-Almost Nil	1	1	100%
	-A Little Appeared	0	0	0%
	-Fairly Appeared	0	0	0%
	-Very much Appeared	0	0	0%
Salinity Problem:	-Almost Nil	1	1	100%
	-A Little Appeared	0	0	0%
	-Fairly Appeared	0	0	0%
	-Very much Appeared	0	0	0%
Irrigation Group:	-Nos of irrigators	14	14	14
	-Nos of Land Owners	200	200	200
What maintenance works and how often do Irrigators carry out:	-What maintenance (1)	Cleaning of wells	-	-
	-How Often (1)	Twice per year	-	-
	-What maintenance (2)		-	-
	-How Often (2)		-	-
Issues/problems on operation (water use) and maintenance of irrigation facility:	-Maintenance		-	-
	-Operation		-	-
Apart from Irrigation/maintenance, are there any group (collective) activities by the irrigators:	Fish farming		-	-
Name of the Nearest Major Market and Distance:	-Name	Samiya	-	-
	-Distance (Km)	65	65	65
Accessibility to the Nearest Market in terms of Road Condition:	-Good	1	1	100%
	-Fair	0	0	0%
	-Bad	0	0	0%
Issues/Problems on Irrigation Facility:	Bucket irrigation is quite labourous			

Table A.2.2 Existing Permanent Irrigation Scheme, Kawambwa District, Luapula Province(1/2)

1. EXISTING PERMANENT IRRIGATION SCHEME		1	1	1	1	1	1	1	1	1	
PROVINCE: LUAPULA / DISTRICT: KAWAMBWA											
Site No.		1	2	3	4	5	6	7	8	9	10
Name of Scheme/Site:		Koni/Lendengoma	Kupweshi	Kafwanka	Chibote Mission	Chimpili	Miswau	Kabalenge	Tsimora mixed farming	Kala	Ntenke / Shinonde
Mark on Map:											
Name of Camp:		Mbereshi	Lufubu	Musungu	Chibote	Chimpili	Musungu	kabalenge	Chishela	Shinonde	Shinonde
Name of CEO:		Cry ton Simbaya	John Mwenda	Paul Lombe	Julius Kazembe		Paul Lombe	Cry ton Simbaya	Michael Chilambwe		
Name of River/Stream/Dambo:		Ngona	Kapweshi	Chifwinka	mpuposhi	Mpanshi	Miswau	Mbetreshi	Ngona	Kala	Senga
Name of Village Benefited:		Koniandlengoma	Kapweshi	Kafwanka	Chibote Mission	Musundu	miswau	Kabalenge	Dairy area	Jelasi	Ntenke / Shinonde
Year of Establish/Supported by:	-Year	1996	2005	2008	1960	2008	2007	1996	2005	1999	2007
	-Government (Specify)	0	0	0	0	0	0	0	0	0	0
	-Donor (Specify)	1	1	0	1	0	0	0	British Grant	1	0
	-Others (Specify)	FAC	FAO	0	Mission	0	0	0	0	FINNIDA	0
Water Resource:	-Dambo	0	0	0	0	0	0	0	0	0	0
	-River/Stream	1	1	1	1	1	1	1	1	1	1
	-Bore hole/Shallow well	0	0	0	0	0	0	0	0	0	0
	-Springs	0	0	0	0	0	0	0	0	0	0
	-Lake	0	0	0	0	0	0	0	0	0	0
Intake System:	-River Diversion	1	1	1	1	1	1	1	1	1	1
	-Dam/Reservoir	0	0	0	0	0	0	0	0	0	0
	-Pump	0	0	0	0	0	0	0	0	0	0
	-Others (Specify)	0	0	0	0	0	0	0	0	0	0
Irrigation System:	-Surface/furrow (=Gravity)	1	1	1	1	1	1	1	1	1	1
	-Sprinkler	0	0	0	0	0	0	0	0	0	0
	-Drip	0	0	0	0	0	0	0	0	0	0
	-Others (Specify)	0	0	0	0	0	0	0	0	0	0
Present Irrigation Area (Ha):		0.00	4.00	2.00	2.00	2.00	3.75	5.00	3.00	1.00	5.00
Potential Irrigation Area from Land Availability (Ha):		10.00	15.00	10.00	5.00	10.00	15.00	20.00	12.50	5.00	20.00
Dominant Crops in Dry Season with Irrigation:		N/a	Vegetables	Vegetables	Vegetables	Vegetables	Vegetables	Vegetables	Vegetables, E/plant	Aquaculture	Vegetables
Dominant Crops in Rainy Season:		Cassava, Maize	Cassava, Maize	Maize, Cassava	Maize, Cassava	Beans, Maize	Beans, Maize	Cassava, Maize	Maize, Cassava	Maize	Maize, Cassava
% of river water directing to furrow during peak irrigation period:		30	40	30	20	Nil	30	15	50	30	40
How long from DACD Office by vehicle (Minutes):		60	120	360	300	Nil	420	30	15	40	15
Distance (Km):		50	60	130	90	Nil	140	45	5	24	12
Is there fish pond in the Scheme:	-Yes	0	1	1	1	0	1	1	1	1	1
	-No	1	0	0	0	1	0	0	0	0	0
Is there other fish pond in the Village (not including the Scheme):	-Yes, how many	0	5	10	10	0	15	15	18	58	45
	-No	0	0	0	1	0	0	1	0	1	1
Intake Facility:	-Concrete Diversion Weir	1	0	0	0	0	0	0	1	0	0
	-Masonry Diversion Weir	0	0	0	0	0	0	0	0	0	0
	-Dam (Earth)	0	0	0	0	0	0	0	0	0	0
	-Dam (Concrete)	0	0	0	0	0	0	0	0	0	0
	-Pump (Motor)	0	0	0	0	0	0	0	0	0	0
	-Pump (Engine)	0	0	0	0	0	0	0	0	0	0
	-Others (Specify)	0	1	1	1	1	1	1	1	1	1
Present Condition of Intake Facility:	-Good	1	0	0	0	0	0	0	1	0	1
	-Fair	0	1	1	0	1	1	1	0	1	1
Dimension of Intake Facility:	-Bad	0	0	0	1	0	0	0	0	0	0
	-Length (m)	28.0	N/a	N/a	20.0	0.0	0.0	0.0	16.0	5.0	0.0
*Diversion weir:	-Height (m)	2.8	N/a	N/a	3.0	0.0	0.0	0.0	0.5	0.5	0.0
	-Width (m)	0.5	N/a	N/a	0.5	0.0	0.0	0.0	0.9	0.4	0.0
	-Length (m)	0	0	0	0	0	0	0	0	0	0
*Dam:	-Height (m)	0	0	0	0	0	2	0	0	0	0
	-Capacity (m ³)	0	0	0	0	0	7,000	0	0	0	0
	-Capacity (cum./min)	0	0	0	0	0	0	0	0	0	0
	-Nos. of Pump	0	0	0	0	0	0	0	0	0	0
Length of Furrow (Canal) and Condition:	-Head (m)	0	0	0	0	0	0	0	0	0	0
	-Main Furrow (m) and Condition	5,000	4,000	3,000	4,000	1,000	2,500	2,500	3,500	1,500	3,000
	-Good	0	0	0	0	0	0	0	0	0	1
	-Fair	0	1	1	1	0	0	1	1	1	0
	-Bad	1	0	0	0	0	0	0	0	0	0
	-Out of the length above, the length of lined main furrow is (m)	0	200	0	500	0	0	0	1,000	300	0
	-Secondary furrow (m)	0	0	0	0	0	0	0	800	0	0
Soil Fertility:	-Good	0	0	0	0	0	0	0	0	0	0
	-Fair	1	0	0	1	1	0	1	1	1	1
	-Poor	0	0	0	0	0	0	0	0	0	0
	-Almost Nil	0	0	0	0	0	0	0	0	0	0
Acidity Problem:	-A Little Appeared	1	1	1	1	1	1	1	1	1	1
	-Fairly Appeared	0	0	0	0	0	0	0	0	0	0
	-Very much Appeared	0	0	0	0	0	0	0	0	0	0
	-Almost Nil	1	1	1	1	1	1	1	1	1	1
Salinity Problem:	-A Little Appeared	0	0	0	0	0	0	0	0	0	0
	-Fairly Appeared	0	0	0	0	0	0	0	0	0	0
	-Very much Appeared	0	0	0	0	0	0	0	0	0	0
	-Almost Nil	0	0	0	0	0	0	0	0	0	0
Irrigation Group:	-Nos of irrigators (beneficiaries)	60	10	15	Mainly mission	15	10	30	6	20	40
	-Nos of Land Owners	40	2	5	(1) mission	2	4	1	4	1	5
What maintenance works and how often do irrigators carry out:	-What maintenance (1)	Cleaning Canal	Canal Cleaning	Canal Cleaning	Cleaning Canal	Canal Cleaning	Canal Cleaning	Canal Cleaning	Canal Cleaning	Canal Cleaning	Canal Cleaning
	-How Often (1)	Regularly	Annually	Twice per year	Annually	Once per year	Annually	Annually	Annually	Annually	Annually
	-What maintenance (2)								Mending Canal		
Issues/problems on operation (water use) and maintenance of irrigation facility:	-How Often (2)										
	-Maintenance	The Division canal convey all river water			The canal through used by community supplies water to the mission.				The group is well organized. Most of the water is not utilized.		The intake is not diverting outflow water.
Apart from Irrigation/maintenance, are there any group (collective) activities by the irrigators:	-Operation	The group is ready to start work on canal			Farmers want to maintain the weir and canal so that they can use it for irrigation.						
			They have a co-operative	Nil			Not Significant		The group regularly meets	Nil	They have a Livestock group
Name of the Nearest Major Market and Distance:	-Name	Kawambwa	Kawambwa	Luwingu	Kawambwa	Luwingu	Luwingu	Kawambwa	Kawambwa	Kawambwa	Kawambwa
	-Distance (Km)	50	50	54	90	40	12	38	5	24	12
Accessibility to the Nearest Market in terms of Road Condition:	-Good	0	0	0	0	0	0	1	0	0	0
	-Fair	1	1	1	0	1	1	0	1	1	1
	-Bad	0	0	0	1	0	0	0	0	0	0
Issues/Problems on Irrigation Facility		The division canal is eroded and water passes through it instead of weir.	Seepage losses due to sandy soils	Sea page Losses	Currently the canal belong to the Catholic		To line canal	To Line canal and thick vegetables growth in the canal route and seepage at one point	Need to construct intake structure sufficient for fish pond		The community despite water being converted, they want a dam to improve water and be breeding area for fish.

Table A.2.3 Existing Permanent Irrigation Scheme, Kawambwa District, Luapula Province(2/2)

1. EXISTING PERMANENT IRRIGATION SCHEME										18	
PROVINCE: LUAPULA / DISTRICT: KAWAMBWA										Total	Average / %
Site No:	1	1	1	1	1	1	1	1	1		
Name of Scheme/Site:	Chisheta / Lumpa	Kabale Fish Farmer	Kapako	Chibende	Kampemba	Mbereshi Mission	Chikoya - Kampemba	Folotyia			
Mark on Map:											
Name of Camp:	Chisheta	Chibote	Luenia	Musungu	Musungu	Mbereshi	Lusambo	Folotyia			
Name of CEO:	Michael Chilambwe	Julius Kozembe	Duncan Mulenga	Paul Lombe	Paul C. Lombe	Cryton Simbaya	Mrs Mundando	UN Marked			
Name of River/Stream/Dambo:	Ngonia	Kabale	Kapako	Ludngo	Kampemba	Mbereshi	Luenia	Tunduma			
Name of Village Benefited:	Chisheta and Lumpa	Chibote		Chibende	Mulilo and Musungu	Kabalenge, Mulala miand Mbosshi	Kampemba / Chiboya	Chibwechama / Tunduma farm			
Year of Establish/Supported by:	-Year	1960	2007	2007	2005	2008	1940	2006	1999	-	-
	-Government (Specify)	1	0	1	0	0	1	0	0	3	17%
	-Donor (Specify)	0	0	0	0	0	0	0	0	0	0%
	-Others (Specify)	0	0	0	0	0	Mission	0	0	5	28%
	-Others (Specify)	0	1	0	1	1	0	1	1	10	56%
Water Resource:	-Dambo	0	Community (wcz)	0	Community	Community	0	Community	Community	-	-
	-River/Stream	1	1	1	1	1	1	1	1	18	100%
	-Bore hole/Shallow well	0	0	0	0	0	0	0	0	0	0%
	-Springs	0	0	0	0	0	0	0	0	0	0%
	-Lake	0	0	0	0	0	0	0	0	0	0%
Intake System:	-River Diversion	1	1	1	1	1	1	1	1	18	100%
	-Dam/Reservoir	0	0	0	0	0	0	0	0	0	0%
	-Pump	0	0	0	0	0	0	0	0	0	0%
	-Others (Specify)	0	0	0	0	0	0	0	0	0	0%
	-Others (Specify)	0	0	0	0	0	0	0	0	-	-
Irrigation System:	-Surface/furrow (=Gravity)	1	1	1	1	1	1	1	1	18	100%
	-Sprinkler	0	0	0	0	0	0	0	0	0	0%
	-Drip	0	0	0	0	0	0	0	0	0	0%
	-Others (Specify)	0	0	0	0	0	0	0	0	0	0%
	-Others (Specify)	0	0	0	0	0	0	0	0	-	-
Present Irrigation Area (Ha):	2.00	1.25	0.00	2.50	2.50	5.00	2.00	2.50	46	2.5	
Potential Irrigation Area from Land Availability (Ha):	20.00	12.50	40.00	12.50	25.00	20.00	10.00	12.50	275	15.3	
Dominant Crops in Dry Season with Irrigation:	vegetables	Vegetables, Fish Farming		Vegetables	Vegetables	Vegetables, Oil palm, Aquaculture	Vegetables	Vegetables, Fish Farming	-	-	
Dominant Crops in Rainy Season:	Maize, Cassava	Maize, Cassava, Beans	Cassava, Fmillet, Maize	Beans, Cassava	Beans, Cassava	Maize, Cassava	Cassava, Maize	Beans, Maize, Cassava	-	-	
% of river water directing to furrow during peak irrigation period:	10	30		25	40	25	30	20	465	25.8	
How long from DACO Office by vehicle (Minutes):	10	300	20	360	360	30	25	360	2825	156.9	
Distance (Km):	6	90		133	135	38	15	1120	2093	116.3	
Is there fish pond in the Scheme:	-Yes	0	1	0	1	1	1	1	14	78%	
	-No	1	0	1	0	0	0	0	4	22%	
	-if yes, how many	0	150	0	8	20	40	5	15	414	23.0
Is there other fish pond in the Village (not including the Scheme):	-Yes	1	1	1	0	0	0	0	7	39%	
	-No	0	0	0	1	1	1	1	11	61%	
	-if yes, how many								0	-	
Intake Facility:	-Concrete Diversion Weir	0	0	1	0	0	0	0	3	17%	
	-Masonry Diversion Weir	0	0	0	0	0	1	0	1	6%	
	-Dam (Earth)	0	0	0	0	0	0	0	0	0%	
	-Dam (Concrete)	0	0	0	0	0	0	0	0	0%	
	-Pump (Motor)	0	0	0	0	0	0	0	0	0%	
	-Pump (Engine)	0	0	0	0	0	0	0	0	0%	
	-Others (Specify)	1	0	0	1	1	0	1	1	14	78%
Present Condition of Intake Facility:	-Good	0	0	0	0	0	0	0	2	11%	
	-Fair	0	1	0	1	1	1	0	1	12	67%
-Bad	1	0	0	0	0	0	1	0	3	17%	
Dimension of Intake Facility:	-Diversion weir:										
	-Length (m)	5.0	0.0	56.0	0.0	0.0	30.0	0.0	0.0	-	-
	-Height (m)	0.5	0.0	2.5	0.0	0.0	1.5	0.0	0.0	-	-
	-Width (m)	0.5	0.0	0.5	0.0	0.0	0.4	0.0	0.0	-	-
Dam:	-Length (m)	0	0	0	25	0	0	30	20	-	-
	-Height (m)	0	0	0	1	0	0	1	2	-	-
	-Capacity(m3)	0	0	0	10,000	0	0	10,000	0	-	-
	-Capacity (cum./min)	0	0	0	0	0	0	0	0	-	-
Pump:	-Nos. of Pump	0	0	0	0	0	0	0	0	-	-
	-Head (m)	0	0	0	0	0	0	0	0	-	-
	-Main Furrow (m) and Condition	2,000	1,000	N/a	2,000	2,000	15,000	1,500	2,000	55,500	3,083
	-Good	0	0	0	0	0	0	0	0	1	6%
-Fair	0	1	0	1	1	1	1	1	13	72%	
-Bad	1	0	0	0	0	0	0	0	2	11%	
Length of Furrow (Canal) and Condition:	-Out of the length above, the length of lined main furrow is (m)	500	0	0	0	0	2,000	0	0	4,500	250
	-Secondary furrow (m)	0	0	0	0	0	0	0	0	800	44
	-Good	0	0	0	0	0	0	0	0	1	6%
	-Fair	0	1	1	1	1	1	1	1	16	89%
	-Bad	0	0	0	0	0	0	0	0	0	0%
Soil Fertility:	-Good	0	1	0	0	0	0	0	1	5	28%
	-Fair	1	0	1	1	1	1	1	0	13	72%
	-Poor	0	0	0	0	0	0	0	0	0	0%
Acidity Problem:	-Almost Nil	0	0	0	0	0	0	0	0	1	6%
	-A Little Appeared	1	1	1	1	1	1	1	1	15	83%
	-Fairly Appeared	1	0	0	0	0	0	0	0	2	11%
	-Very much Appeared	0	0	0	0	0	0	0	0	0	0%
Salinity Problem:	-Almost Nil	1	1	1	1	1	1	1	1	18	100%
	-A Little Appeared	0	0	0	0	0	0	0	0	0	0%
	-Fairly Appeared	0	0	0	0	0	0	0	0	0	0%
	-Very much Appeared	0	0	0	0	0	0	0	0	0	0%
Irrigation Group:	-Nos of irrigators	100	50	100	10	30	100	10	30	636	35
	-Nos of Land Owners	200	4	20	2	10	20	5	10	335	19
	-What maintenance (1)	Cleaning canal	Canal Cleaning	Not yet in place	Intake maintenance	Cleaning the Canal	Canal Cleaning	Canal cleaning	Canal Cleaning	-	-
What maintenance works and how often do irrigators carry out:	-How Often (1)	Annually	Annually		Annually	Annually	Twice	Annually	-	-	
	-What maintenance (2)	Blocking intake			Canal Cleaning			Intake Maintenance	-	-	
	-How Often (2)				Annually				-	-	
Issues/problems on operation (water use) and maintenance of irrigation facility:	-Maintenance	Maintenance tasks are appropriate. Others are not appropriate. Only 1000m has water flowing.	Sea page losses			No regulated water usage	Sea page losses	No material for lining	-	-	
	-Operation								-	-	
Apart from Irrigation/maintenance, are there any group (collective) activities by the irrigators:		None		Not Significant	Not many				-	-	
Name of the Nearest Major Market and Distance:	-Name	Kawambwa	Kawambwa	Kawambwa	Luwingu	Luwingu	Kawambwa	Kawambwa	Luwingu	-	-
	-Distance (Km)	4	90	17	28	27	38	15	50	644	36
Accessibility to the Nearest Market in terms of Road Condition:	-Good	1	0	0	0	0	1	0	0	3	17%
	-Fair	0	0	1	1	1	0	1	1	13	72%
	-Bad	0	1	0	0	0	0	0	0	2	11%
Issues/Problems on Irrigation Facility		The irrigation facility originally used to be the water. Supply system for Kawambwa town in colonial time, but after the villagers do not have a maintenance plan.	Sea page need lining	The lining of the weir was broken but the river bed is intact.		Need to cross main road to extend canal	No water users association in place	Seepage losses	Needs to line canal to avoid conveyance losses	-	-

Table A.2.4 Existing Permanent Irrigation Scheme, Mansa District, Luapula Province

1. EXISTING PERMANENT IRRIGATION SCHEME		1	1	1	1	1	1	7	Total	Average / %
PROVINCE: LUAPULA / DISTRICT: MANSA										
Site No.		Mansa	Bright Chanda	Bahat seminary	Mutanga Akose	Farm Institute	Fiyongoli	Kabuta Irrigation		
Name of Scheme/Site:		Mansa	Bright Chanda	Bahat seminary	Mutanga Akose	Farm Institute	Fiyongoli	Kabuta Irrigation		
Mark on Map:										
Name of Camp:		Kansenga	Bahati	Bahat	Chisunka	Chibalashi	Chibalashi	Chimfula		
Name of CEO:		Marvin Musonda	Golden Mwaba	Mwaba Golden	Musonda Kawmbu	Nil	Nil	Mr Nondo Michael		
Name of River/Stream/Dambo:		Mopofye	Lubakila Stream	Lukwinu		Kanyabatemi	Fiyongoli	Lokangata		
Name of Village Benefited:		Mansa	Katakwe			Farm Institute	Motoka	Lubeleto		
Year of Establish/Supported by:	-Year	2005	0	0	1988	1972	1952	2004		
	-Government	1	0	0	0	1	1	0	3	43%
	(Specify)	0	0	0	0	0	0	0		
	-Donor	0	0	1	0	0	0	1	2	29%
	(Specify)	0	0	Missionary	0	0	0	0		
	-Others	0	1	0	1	0	0	0	2	29%
	(Specify)	0	0	0	Owner	0	0	0		
Water Resource:	-Dambo	0	0	0	0	0	0	0	0	0%
	-River/Stream	1	1	1	0	1	1	1	6	86%
	-Bore hole/Shallow well	0	0	0	1	1	0	0	2	29%
	-Springs	0	0	0	0	0	0	0	0	0%
	-Lake	0	0	0	0	0	0	0	0	0%
Intake System:	-River Diversion	0	0	0	0	0	0	0	0	0%
	-Dam/Reservoir	1	1	1	0	1	1	0	5	71%
	-Pump	0	0	0	1	1	0	1	3	43%
	-Others	0	0	0	0	0	0	0	0	0%
	(Specify)	0	0	0	0	0	0	0		
Irrigation System:	-Surface/furrow (=Gravity)	1	1	0	0	1	1	1	5	71%
	-Sprinkler	0	0	1	1	0	0	0	2	29%
	-Drip	0	0	0	0	0	0	0	0	0%
	-Others	0	0	0	0	0	0	0	0	0%
	(Specify)	0	0	0	0	0	0	0		
Present Irrigation Area (Ha):		2.00	0.00	0.50	2.00	1.00	1.00	1.00	7.50	1.1
Potential Irrigation Area from Land Availability (Ha):		15.00	2.00	1.00	6.00	3.00	1.00	4.00	32.00	4.6
Dominant Crops in Dry Season with Irrigation:		Onion, Cabbage, Ipotoatoes, C/cabbage	Rape, Tomatoes, cabbage and Carrots	Tomatoes, Onions, Cabbage, Rape	Tomatoes, Cabbage	Cabbage, Rape, Tomatoes	Cabbage, Rape, Tomatoes	Rape, Cabbage, Onion		
Dominant Crops in Rainy Season:		Maize, Cabbage	Maize, Tomatoes and Cabbage	Maize, Beans	Maize, Cassava, Beans	Tomatoes, Maize	Maize, S/potatoes, G/nuts	Maize, E/plant, Cabbage		
% of river water directing to furrow during peak irrigation period:		0	0	0	0	0	0	0	0.00	0.0
How long from DACO Office by vehicle (Minutes):		0	30	25	300	5	10	20	390.00	55.7
Distance (Km):		0	23	25	42	2	4	25	120.50	17.2
Is there fish pond in the Scheme:	-Yes	0	1	0	0	1	1	0	3.00	43%
	-No	1	0	1	1	0	0	1	4.00	57%
	-if yes, how many	0	0	0	0	8	19	0	27.00	3.9
Is there other fish pond in the Village (not including the Scheme):	-Yes	0	0	0	0	0	0	0	0	0%
	-No	1	0	1	1	1	1	1	6	86%
	-if yes, how many									
Intake Facility:	-Concrete Diversion Weir	0	0	0	0	0	0	0	0	0%
	-Masonry Diversion Weir	0	0	0	0	0	0	0	0	0%
	-Dam (Earth)	1	1	1	0	1	1	0	5	71%
	-Dam (Concrete)	0	0	0	0	0	0	0	0	0%
	-Pump (Motor)	0	0	0	0	0	0	0	0	0%
	-Pump (Engine)	0	0	0	1	1	0	1	3	43%
	-Others (Specify)	0	0	0	0	0	0	0	0	0%
Present Condition of Intake Facility:	-Good	1	0	0	1	0	1	0	3	43%
	-Fair	0	1	1	0	1	0	0	3	43%
	-Bad	0	0	0	0	0	0	1	1	14%
Dimension of Intake Facility:	-Diversion weir:									
	-Length (m)	0.0	0.0	6.0	0.0	0.0	0.0	0.0	-	-
	-Height (m)	0.0	0.0	2.0	0.0	0.0	0.0	0.0	-	-
	-Width (m)	0.0	0.0	4.0	0.0	0.0	0.0	0.0	-	-
-Dam:	-Length (m)	0.0	100.0	100.0	0	56.0	300.0	0	-	-
	-Height (m)	5.3	8.0	6.0	0	3.0	6.0	0	-	-
	-Capacity(m3)	0.0	0.0	0.0	0	0.0	0.0	0	-	-
-Pump:	-Capacity (cum./min)	0	0	210.0	0.2/5	0	0	2.3/5	-	-
	-Nos. of Pump	0	0	1.0	2	0	0	1	-	-
	-Head (m)	0	0	600.0	145	0	0	0	-	-
Length of Furrow (Canal) and Condition:	-Main Furrow (m) and Condition	0	50	0	0	1,000	3,000	100	4,150	593
	-Good	0	0	0	0	0	0	0	0	0%
	-Fair	1	1	0	0	1	0	1	4	57%
	-Bad	0	0	0	0	0	1	0	1	14%
	-*Out of the length above, the length of lined main furrow is (m)	100	0	0	0	0	0	0	100	14
	-Secondary furrow (m)	0	0	0	0	0	0	75	75	11
	-Good	0	0	0	0	0	0	0	0	0%
	-Fair	1	1	1	1	1	1	1	7	100%
	-Bad	0	0	0	0	0	0	0	0	0%
Soil Fertility:	-Good	0	1	1	0	0	1	1	4	57%
	-Fair	1	0	0	1	1	0	0	3	43%
	-Poor	0	0	0	0	0	0	0	0	0%
Acidity Problem:	-Almost Nil	1	1	0	0	0	1	0	3	43%
	-A Little Appeared	0	0	0	0	0	0	0	0	0%
	-Fairly Appeared	0	0	1	1	1	0	1	4	57%
	-Very much Appeared	0	0	0	0	0	0	0	0	0%
Salinity Problem:	-Almost Nil	1	1	1	0	0	0	1	4	57%
	-A Little Appeared	0	0	0	0	0	0	0	0	0%
	-Fairly Appeared	0	0	0	0	0	1	0	1	14%
	-Very much Appeared	0	0	0	0	0	0	0	0	0%
Irrigation Group:	-Nos of Irrigators (Beneficiaries)	0	1	Students and Teachers		Peck FTI	35	10	46	7
	-Nos of Land Owners	0	1	Missionary (Catholic)	1	Government	Government and Traditional	1	3	0
What maintenance works and how often do Irrigators carry out:	-What maintenance (1)	Cleaning	Slashing and Reopening	Slashing and use of sand bag	Draining of main lines	Cleaning	Slashing along the furrow every two weeks in rain seasons	Twice per year	-	-
	-How Often (1)	quarterly	once per year	once per year	once per year	Every month	Slashing along the furrow	-	-	-
	-What maintenance (2)						Slashing along the furrow	-	-	-
	-How Often (2)						Every week in dry season	-	-	-
Issues/problems on operation (water use) and maintenance of irrigation facility:	-Maintenance			Irrigation pipes as major problems			Luck of tools and Labour	Engine, Cylinder, burial and injector	-	-
	-Operation								-	-
Apart from Irrigation/maintenance, are there any group (collective) activities by the irrigators:		Fish farming, Vegetable production	Animal and irrigation	Animal domestic and supply to seminary	Domestic, Livestock, Vegetables		Irrigation of crops	Cassava production	-	-
Name of the Nearest Major Market and Distance:	-Name	Mabumba	Senama	Senama	Senama	UB2 market	Senama	U.B market	-	-
	-Distance (Km)	20	23	25	40	3	2	26	139	20
Accessibility to the Nearest Market in terms of Road Condition:	-Good	1	0	1	0	1	1	1	5	71%
	-Fair	0	1	0	1	0	0	0	2	29%
	-Bad	0	0	0	0	0	0	0	0	0%
Issues/Problems on Irrigation Facility		Sea page	Collapsing of the weir	Irrigation pipes	Low water level in June-Sep, Quality of water is salinity, Need of a deep borehole	Seepage	Seepage along the furrow about 1.5 km and lining		-	-

Table A.2.5 Existing Permanent Irrigation Scheme, Milenge District, Luapula Province

1. EXISTING PERMANENT IRRIGATION SCHEME		1					1	1
PROVINCE: LUAPULA / DISTRICT: MILENGE							Total	Average / %
Site No.		1					1	-
Name of Scheme/Site:		Mulumbi					-	-
Mark on Map:	(Specify)	Chiswishi Stream					-	-
Name of Camp:		Mulumbi					-	-
Name of CEO:		Bernard Mukuma					-	-
Name of River/Stream/Dambo:							-	-
Name of Village Benefited:							-	-
Year of Establish/Supported by:	-Year						-	-
	-Government	1					1	100%
	(Specify)	0					-	-
	-Donor	0					0	0%
	(Specify)	0					-	-
Water Resource:	-Others	0					0	0%
	(Specify)	0					-	-
	-Dambo	0					0	0%
	-River/Stream	1					1	100%
	-Bore hole/Shallow well	0					0	0%
Intake System:	-Springs	0					0	0%
	-Lake	0					0	0%
	-River Diversion	1					1	100%
	-Dam/Reservoir	0					0	0%
	-Pump	0					0	0%
Irrigation System:	-Others	0					0	0%
	(Specify)	0					-	-
	-Surface/furrow (=Gravity)	1					1	100%
	-Sprinkler	0					0	0%
	-Drip	0					0	0%
Present Irrigation Area (Ha):	-Others	0					0	0%
	(Specify)	0					-	-
		2.00					2.00	2.0
Potential Irrigation Area from Land Availability (Ha):		10.00				10.00	10.0	
Dominant Crops in Dry Season with Irrigation:		Vegetables, G/Maize				-	-	
Dominant Crops in Rainy Season:		Maize, Cassava				-	-	
% of river water directing to furrow during peak irrigation period:		0				0	0.0	
How long from DACO Office by vehicle (Minutes):		180				180	180.0	
Distance (Km):		170				170	170.0	
Is there fish pond in the Scheme:	-Yes	1				1	100%	
	-No	0				0	0%	
	-if yes, how many	2				2	2.0	
Is there other fish pond in the Village (not including the Scheme):	-Yes	1				1	100%	
	-No	0				0	0%	
	-if yes, how many	0				0	-	
Intake Facility:	-Concrete Diversion Weir	1				1	100%	
	-Masonry Diversion Weir	0				0	0%	
	-Dam (Earth)	0				0	0%	
	-Dam (Concrete)	0				0	0%	
	-Pump (Motor)	0				0	0%	
Present Condition of Intake Facility:	-Pump (Engine)	0				0	0%	
	-Others (Specify)	0				0	0%	
	-Good	1				1	100%	
	-Fair	0				0	0%	
	-Bad	0				0	0%	
Dimension of Intake Facility:	-Diversion weir:							
	-Length (m)	6.0				-	-	
	-Height (m)	2.5				-	-	
	-Width (m)	1.0				-	-	
	-Dam:							
Length of Furrow (Canal) and Condition:	-Length (m)	0				-	-	
	-Height (m)	0				-	-	
	-Capacity (m ³)	0				-	-	
	-Capacity (cum./min)	0				-	-	
	-Nos. of Pump	0				-	-	
Soil Fertility:	-Head (m)	0				-	-	
	-Main Furrow (m) and Condition	12,000				12,000	12,000	
	-Good	1				1	100%	
	-Fair	0				0	0%	
	-Bad	0				0	0%	
Acidity Problem:	-Out of the length above, the length of lined main furrow is (m)	8,000				8,000	8,000	
	-Secondary furrow (m)	0				0	0	
	-Good	0				0	0%	
	-Fair	1				1	100%	
	-Bad	0				0	0%	
Salinity Problem:	-Good	1				1	100%	
	-Fair	0				0	0%	
	-Poor	0				0	0%	
	-Almost Nil	0				0	0%	
	-A Little Appeared	1				1	100%	
Irrigation Group:	-Fairly Appeared	0				0	0%	
	-Very much Appeared	0				0	0%	
	-Almost Nil	0				0	0%	
	-A Little Appeared	1				1	100%	
	-Fairly Appeared	0				0	0%	
What maintenance works and how often do irrigators carry out:	-Very much Appeared	0				0	0%	
	-Maintenance	They don't meet all the costs				-	-	
	-Operation					-	-	
	-What maintenance (1)	Slashing along canal				60	60	
	-How Often (1)	Seasonal				-	-	
Issues/problems on operation (water use) and maintenance of irrigation facility:	-What maintenance (2)	Mending the Lining				-	-	
	-How Often (2)	Seasonal				-	-	
	-Apart from Irrigation/maintenance, are there any group (collective) activities by the irrigators:	They have started digging fish ponds				-	-	
	-Name of the Nearest Major Market and Distance:	Manisa				55	55	
	-Distance (Km)	55				-	-	
Accessibility to the Nearest Market in terms of Road Condition:	-Good	0				0	0%	
	-Fair	0				0	0%	
	-Bad	1				1	100%	
Issues/Problems on Irrigation Facility		The canal is not completed to the intended target due to material shortage and lack of funds.				-	-	

Table A.2.6 Existing Permanent Irrigation Scheme, Mwense District, Luapula Province

1. EXISTING PERMANENT IRRIGATION SCHEME		1	1	
PROVINCE: LUAPULA / DISTRICT: MWENSE			Total	Average / %
Site No.		1	1	-
Name of Scheme/Site:		Mwense East	-	-
Mark on Map:			-	-
Name of Camp:		Kashiba	-	-
Name of CEO:		Waika Kunda	-	-
Name of River/Stream/Dambo:		Mwense	-	-
Name of Village Benefited:		Gesham	-	-
Year of Establish/Supported by:	-Year	2002-2008	-	-
	-Government	0	0	0%
	(Specify)	0	-	-
	-Donor	1	1	100%
	(Specify)	FAO and PRP	-	-
Water Resource:	-Others	0	0	0%
	(Specify)	0	-	-
	-Dambo	0	0	0%
	-River/Stream	1	1	100%
	-Bore hole/Shallow well	0	0	0%
Intake System:	-Springs	0	0	0%
	-Lake	0	0	0%
	-River Diversion	1	1	100%
	-Dam/Reservoir	0	0	0%
	-Pump	0	0	0%
Irrigation System:	-Others	0	0	0%
	(Specify)	0	-	-
	(=Gravity)	1	1	100%
	-Sprinkler	0	0	0%
	-Drip	0	0	0%
Present Irrigation Area (Ha):	-Others	0	0	0%
	(Specify)	0	-	-
Potential Irrigation Area from Land Availability (Ha):		1.50	1.50	1.5
		5.00	5.00	5.0
Dominant Crops in Dry Season with Irrigation:		Vegetables, Citrus, Fish	-	-
Dominant Crops in Rainy Season:		Bananas, Maize, Cassava, Grnuts	-	-
% of river water directing to furrow during peak irrigation period:		35	35	35.0
How long from DACO Office by vehicle (Minutes):		30	30	30.0
Distance (Km):		20	20	20.0
Is there fish pond in the Scheme:	-Yes	1	1	100%
	-No	0	0	0%
	-if yes, how many	8	8	8.0
Is there other fish pond in the Village (not including the Scheme):	-Yes	1	1	100%
	-No	0	0	0%
	-if yes, how many	12	12	-
Intake Facility:	-Concrete Diversion Weir	1	1	100%
	-Masonry Diversion Weir	0	0	0%
	-Dam (Earth)	0	0	0%
	-Dam (Concrete)	0	0	0%
	-Pump (Motor)	0	0	0%
	-Pump (Engine)	0	0	0%
	-Others (Specify)	0	0	0%
Present Condition of Intake Facility:	-Good	0	0	0%
	-Fair	0	0	0%
	-Bad	1	1	100%
Dimension of Intake Facility:	-Length (m)	14.0	-	-
	-Height (m)	1.0	-	-
	-Width (m)	40.0	-	-
*Dam:	-Length (m)	0	-	-
	-Height (m)	0	-	-
	-capacity(m3)	0	-	-
*Pump:	Capacity (cum./min)	0	-	-
	Nos. of Pump	0	-	-
	Head (m)	0	-	-
Length of Furrow (Canal) and Condition:	-Main Furrow (m) and Condition	1,500	1,500	1,500
	-Good	0	0	0%
	-Fair	1	1	100%
	-Bad	0	0	0%
	*Out of the length above, the length of lined main furrow is (m)	0	0	0
	-Secondary furrow (m)	0	0	0
	-Good	0	0	0%
Soil Fertility:	-Fair	1	1	100%
	-Poor	0	0	0%
	-Fairly Appeared	0	0	0%
Acidity Problem:	-Almost Nil	0	0	0%
	-Fairly Appeared	1	1	100%
	-Very much Appeared	0	0	0%
Salinity Problem:	-Almost Nil	0	0	0%
	-A Little Appeared	0	0	0%
	-Fairly Appeared	1	1	100%
Irrigation Group:	-Very much Appeared	0	0	0%
	(Beneficiaries)	25	25	25
	-Nos of Land Owners	8	8	8
What maintenance works and how often do Irrigators carry out:	-What maintenance (1)	Slashing	-	-
	-How Often (1)	Twice per year	-	-
	-What maintenance (2)	Silt remover	-	-
	-How Often (2)	once per year	-	-
Issues/problems on operation (water use) and maintenance of irrigation facility:	-Maintenance	Equipment	-	-
	-Operation		-	-
Apart from Irrigation/maintenance, are there any group (collective) activities by the irrigators:		Woman in irrigation and nutrition	-	-
Name of the Nearest Major Market and Distance:	-Name	Mwense	-	-
	-Distance (Km)	20	20	20
Accessibility to the Nearest Market in terms of Road Condition:	-Good	0	0	0%
	-Fair	1	1	100%
	-Bad	0	0	0%
Issues/Problems on Irrigation Facility		See page and siltation, inadequate water due to increased Ha	-	-

Table A.2.7 Existing Permanent Irrigation Scheme, Nchelenge District, Luapula Province

1. EXISTING PERMANENT IRRIGATION SCHEME		1					1	Total	Average / %
PROVINCE: LUAPULA / DISTRICT: NCHELANGE									
Site No.		1					1	-	
Name of Scheme/Site:		Munsa					-	-	
Mark on Map:		D					-	-	
Name of Camp:		Munsa					-	-	
Name of CEO:		Damiano Chishala					-	-	
Name of River/Stream/Dambo:		Munsa					-	-	
Name of Village Benefited:							-	-	
Year of Establish/Supported by:	-Year	1984					-	-	
	-Government	1					1	100%	
	(Specify)	0					-	-	
	-Donor	0					0	0%	
	(Specify)	0					-	-	
Water Resource:	-Others	0					0	0%	
	(Specify)	0					-	-	
	-Dambo	0					0	0%	
	-River/Stream	1					1	100%	
	-Bore hole/Shallow well	0					0	0%	
Intake System:	-Springs	0					0	0%	
	-Lake	0					0	0%	
	-River Diversion	1					1	100%	
	-Dam/Reservoir	0					0	0%	
	-Pump	0					0	0%	
Irrigation System:	-Others	0					0	0%	
	(Specify)	0					-	-	
	-Surface/furrow (=Gravity)	1					1	100%	
	-Sprinkler	0					0	0%	
	-Drip	0					0	0%	
Present Irrigation Area (Ha):	-Others	0					0	0%	
	(Specify)	0					-	-	
		5.00					5.00	5.0	
Potential Irrigation Area from Land Availability (Ha):		5.00				5.00	5.0		
Dominant Crops in Dry Season with Irrigation:		Vegetables, Cabbage, Rape, Onion, Tomatoes, C/cabbage				-	-		
Dominant Crops in Rainy Season:		Maize, Tomatoes				-	-		
% of river water directing to furrow during peak irrigation period:		40				40	40.0		
How long from DACO Office by vehicle (Minutes):		30				30	30.0		
Distance (Km):		26				26	26.0		
Is there fish pond in the Scheme:	-Yes	0				0	0%		
	-No	1				1	100%		
	-if yes, how many	0				0	0.0		
Is there other fish pond in the Village (not including the Scheme):	-Yes	1				1	100%		
	-No	0				0	0%		
	-if yes, how many					0	-		
Intake Facility:	-Concrete Diversion Weir	1				1	100%		
	-Masonry Diversion Weir	0				0	0%		
	-Dam (Earth)	0				0	0%		
	-Dam (Concrete)	0				0	0%		
	-Pump (Motor)	0				0	0%		
	-Pump (Engine)	0				0	0%		
	-Others (Specify)	0				0	0%		
Present Condition of Intake Facility:	-Good	1				1	100%		
	-Fair	0				0	0%		
	-Bad	0				0	0%		
Dimension of Intake Facility:	-Diversion weir:								
	-Length (m)	3.0				-	-		
	-Height (m)	1.0				-	-		
	-Width (m)	0.5				-	-		
	-Dam:								
Pump:	-Length (m)	0				-	-		
	-Height (m)	0				-	-		
	-Capacity(m3)	0				-	-		
	-Capacity (cum./min)	0				-	-		
	-Nos. of Pump	0				-	-		
Length of Furrow (Canal) and Condition:	-Head (m)	0				-	-		
	-Main Furrow (m) and Condition	1,000				1,000	1,000		
	-Good	0				0	0%		
	-Fair	1				1	100%		
	-Bad	0				0	0%		
	-Out of the length above, the length of lined main furrow is (m)	600				600	600		
	-Secondary furrow (m)	0				0	0		
Soil Fertility:	-Good	0				0	0%		
	-Fair	0				0	0%		
	-Poor	1				1	100%		
	-Almost Nil	0				0	0%		
Acidity Problem:	-A Little Appeared	0				0	0%		
	-Fairly Appeared	1				1	100%		
	-Very much Appeared	0				0	0%		
	-Almost Nil	1				1	100%		
Salinity Problem:	-A Little Appeared	0				0	0%		
	-Fairly Appeared	0				0	0%		
	-Very much Appeared	0				0	0%		
	-Almost Nil	1				1	100%		
Irrigation Group:	(Beneficiaries)	12				12	12		
	-Nos of Land Owners	6				6	6		
	-What maintenance (1)	Cleaning to avoid Siltation				-	-		
What maintenance works and how often do Irrigators carry out:	-How Often (1)	Twice per year				-	-		
	-What maintenance (2)					-	-		
	-How Often (2)					-	-		
Issues/problems on operation (water use) and maintenance of irrigation facility:	-Maintenance	No Problem				-	-		
	-Operation					-	-		
Apart from Irrigation/maintenance, are there any group (collective) activities by the irrigators:		All are members of kabuta munsa dambo vegetable farmers.				-	-		
Name of the Nearest Major Market and Distance:	-Name	Kashikishi				-	-		
	-Distance (Km)	26				26	26		
Accessibility to the Nearest Market in terms of Road Condition:	-Good	0				0	0%		
	-Fair	1				1	100%		
	-Bad	0				0	0%		
Issues/Problems on Irrigation Facility		The 400m needs lining and rehabilitation of 600m lined.				-	-		

Table A.2.8 Existing Permanent Irrigation Scheme, Samfya District, Luapula Province

1. EXISTING PERMANENT IRRIGATION SCHEME											
PROVINCE: LUAPULA / DISTRICT: SAMFYA											
Site No.	1	1	1	1	1	1	1	1	1	8	
Name of Scheme/Site:	Musaba		Maximo		4		Makasa		7	8	
Mark on Map:	A	B	E				P		C		
Name of Camp:	libalala	Mano mwinga	Central 2	Lubwe 1		Murimbwe	Lubwe 1	Lubwe 2	Kasaba		
Name of CEO:	Levy R. Chusi		Maggie Myanda	Mubita Elvis		Claudia Mulele	Mubita Elvis	Kilembe Davies	Francis M. Banji		
Name of River/Stream/Dambo:	Musaba	Mano	Chimana			Murimbwe stream	1	Chunga	Kasaba Lagoon		
Name of Village Benefited:		Mano resettlement	Maximo		Kasamba	Chisalo		Katola			
Year of Establish/Supported by:	-Year	1980	0	0	0	1992	2000	2009	2009	-	
-Government	0	0	0	0	0	0	0	0	0	0%	
(Specify)	0	0	0	0	0	0	0	0	0	-	
-Donor	0	0	1	0	0	0	0	1	3	38%	
(Specify)	0	0	PAM	0	0	0	PAM	PAVIDIA (JICA)	0	-	
-Others	1	1	0	1	1	1	1	0	5	63%	
Water Resource:	-Dambo	1	0	0	1	0	1	1	0	4	
-River/Stream	1	0	0	0	1	0	0	0	0	2	
-Bore hole/Shallow well	0	0	1	0	0	0	0	0	1	2	
-Springs	0	0	0	0	0	0	0	0	0	0	
-Lake	0	0	0	0	0	0	0	0	0	0	
Intake System:	-River Diversion	0	0	0	0	0	0	0	0	0	
-Dam/Reservoir	0	0	0	0	1	0	0	0	0	1	
-Pump	0	0	0	0	0	0	0	0	1	1	
-Others	1	1	1	1	1	1	1	1	1	6	
(Specify)	Dambo/Stream	Buckets	Shallow well	Shallow well	0	0	Shallow wells	Shallow wells	Shallow well	0	
Irrigation System:	-Surface/furrow (-Gravity)	0	0	0	0	0	0	0	0	0	
-Sprinkler	0	0	0	0	0	0	0	0	0	0	
-Drip	0	0	0	0	0	0	0	0	0	0	
-Others	1	1	1	1	1	1	1	1	1	8	
(Specify)	Buckets	Buckets	Treadle pump	Bucket Irrigation	Buckets	Bucket irrigation	Buckets irrigation	Bucket	1	100%	
Present Irrigation Area (Ha):	4.00	0.75	2.25	1.50	2.00	2.00	2.50	2.00	17.00	2.1	
Potential Irrigation Area from Land Availability (Ha):	4.00	2.50	9.00	5.00	5.00	5.00	2.60	2.00	35.10	4.4	
Dominant Crops in Dry Season with Irrigation:	Vegetables, Maize	Vegetables	Vegetables	W/maize, Vegetables	Vegetables	Winter Maize, Vegetables	Vegetables	Vegetables	-	-	
Dominant Crops in Rainy Season:	Maize, Cassava, Ground Beans	Vegetables, Field Beans	Cassava, Sweetpotatoes, Maize	Maize, Vegetables	Maize, Beans, Sweetpotatoes	Maize, Rice	Rice, Vegetables, Maize, Cassava	Field Crops	-	-	
% of river water directing to furrow during peak irrigation period:	0	0	0	0	20	0	0	0	20	2.5	
How long from DACO Office by vehicle (Minutes):	0	15	3	60	5	0	45	60	188	23.5	
Distance (Km):	15	3	62	5	0	50	92	227	28.4	13%	
Is there fish pond in the Scheme:	-Yes	0	0	0	0	0	0	0	1	13%	
-No	1	1	1	0	1	1	1	1	6	75%	
-if yes, how many	0	0	0	6	0	0	0	0	6	0.8	
Is there other fish pond in the Village (not including the Scheme):	-Yes	0	0	0	1	0	0	1	0	2	25%
-No	1	1	1	0	0	0	0	0	3	38%	
-if yes, how many									0	-	
Intake Facility:	-Concrete Diversion Weir	0	0	0	0	0	0	0	0	0	
-Masonry Diversion Weir	0	0	0	0	0	0	0	0	0	0	
-Dam (Earth)	0	0	0	0	1	0	0	0	1	13%	
-Dam (Concrete)	0	0	0	0	0	0	0	0	0	0	
-Pump (Motor)	0	0	0	0	0	0	0	0	0	0	
-Pump (Engine)	0	0	0	0	0	0	0	0	0	0	
-Others (Specify)	1	1	1	1	1	1	1	1	1	7	
-Good	0	0	0	1	1	0	0	0	2	25%	
Present Condition of Intake Facility:	-Fair	0	1	1	0	1	1	1	1	5	63%
-Bad	1	0	0	0	0	0	0	0	1	13%	
Dimension of Intake Facility:	-Diversion weir:	-Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	
-Height (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	
-Width (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	
-Dam:	-Length (m)	0	0	0	0	0	0	0	0	-	
-Height (m)	0	0	0	0	0	0	0	0	0	-	
-Capacity (m3)	0	0	0	0	0	0	0	0	0	-	
-Pump:	-Capacity (cum./min)	0	0	0	0	0	0	0	0	-	
-Nos. of Pump	0	0	0	0	0	0	0	0	0	-	
-Head (m)	0	0	0	0	0	0	0	0	0	-	
Length of Furrow (Canal) and Condition:	-Main Furrow (m) and Condition	0	0	0	0	100	0	0	0	100	13
-Good	0	0	0	0	0	0	0	0	0	0%	
-Fair	1	1	1	1	1	1	1	1	1	8	100%
-Bad	0	0	0	0	0	0	0	0	0	0	
-Length of lined main furrow is (m)	0	0	0	0	0	0	0	0	0	0	
-Secondary furrow (m)	0	0	0	0	50	0	0	0	50	6	
-Good	0	0	0	0	0	0	0	0	0	0%	
-Fair	1	1	1	1	1	1	1	1	1	8	100%
-Bad	0	0	0	0	0	0	0	0	0	0	
Soil Fertility:	-Good	1	1	0	1	0	1	1	0	5	63%
-Fair	0	0	1	0	1	0	0	0	1	3	38%
-Poor	0	0	0	0	0	0	0	0	0	0	
Acidity Problem:	-Almost Nil	1	0	0	0	0	0	0	0	1	13%
-A Little Appeared	0	1	0	0	0	1	1	0	3	38%	
-Fairly Appeared	0	0	1	1	1	0	0	1	4	50%	
-Very much Appeared	0	0	0	0	0	0	0	0	0	0%	
Salinity Problem:	-Almost Nil	1	1	1	1	1	1	1	0	7	88%
-A Little Appeared	0	0	0	0	0	0	0	1	1	13%	
-Fairly Appeared	0	0	0	0	0	0	0	0	0	0%	
-Very much Appeared	0	0	0	0	0	0	0	0	0	0%	
Irrigation Group:	-Beneficiaries	14	12	36	15	32	15	20	50	194	24
-Nos of Land Owners	200	12	36	15	32	15	20	50	380	48	
What maintenance works and how often do irrigators carry out:	-What maintenance (1)	Cleaning of wells		N/a	Cleaning of wells		Cleaning of wells	Cleaning of wells	Cleaning of wells	-	-
-How Often (1)	Twice per year			once per year	twice per year	twice per year	twice per year	twice per year	-	-	
-What maintenance (2)			N/a						-	-	
-How Often (2)									-	-	
Issues/problems on operation (water use) and maintenance of irrigation facility:	-Maintenance				Bucket Irrigation is tiresome		Buckets irrigation is tiresome	Buckets irrigation is tiresome	Lack of equipment like shovels. It is labour demanding to use a bucket.	-	-
-Operation										-	-
Apart from Irrigation/maintenance, are there any group (collective) activities by the irrigators:	Fish farming	No				Vegetable and grain marketing			They have improved goat structures and they are only waiting for the animals to be bought.	-	-
Name of the Nearest Major Market and Distance:	-Name	Samfya	Mwamfuli	Mwamfuli	Lubwe	Mwamfuli market	Lubwe	ILubwe	Kasaba	-	-
-Distance (Km)	65	18	2	17	10	51	5	2	170	21	
Accessibility to the Nearest Market in terms of Road Condition:	-Good	1	0	1	0	1	1	0	0	4	50%
-Fair	0	0	0	0	0	0	0	0	1	13%	
-Bad	0	1	0	1	0	0	1	0	3	38%	
Issues/Problems on Irrigation Facility	Bucket irrigation is quite laborious	Work is difficult when using buckets				Lower water level during the dry season		The group would like to be assisted with four treadle pumps and irrigation pipes.		-	-

A.2.2 Existing Temporary Irrigation Scheme

Table A.2.9 Existing Temporary Irrigation Scheme, Chiengwe District, Luapula Province

3. EXISTING TEMPORARY IRRIGATION SCHEME										Total	Average / %	
PROVINCE: LUAPULA / DISTRICT: CHIENGWE										5	-	
Camp No.	1	2	3	4	5							
Name of Camp:	MVABU	KALEMBWE	KASEKE	CHIPUNGU	CHIENGWE							
Number of Temporary Schemes/Sites:	7	3	9	6	13						38	
Number of Schemes having Temporary Division Weir:	1	0	0	1	0						2	
Number of Schemes having Furrow (canal) only:	1	0	0	0	6						7	
Others	5	3	9	5	7						29	
Total	2	0	0	1	6						9	
Range and Average of Present Irrigated Area:	-From (Ha) 5.5 -To (Ha) 6.3 -Average (Ha) 5.9 Total 11.8	1.0 2.0 1.5 0.0 1.0	0.3 2.5 0.3 0.0 1.3	4.5 6.3 5.4 5.4 6.3	3.0 4.0 3.0 0.0 12.5	0.38 0.55 0.42 0.92 0.78						14.3
Range and Average of Potential Irrigable Area:	10.0 9.4 18.8 NA NA NA 30 35 32 64	3.0 2.0 0.0 50 100 75 50 85 67 0	5.0 1.4 0.0 120 150 125 13 17 15 0	8.8 7.5 7.5 NA NA NA 37 45 41 41	15.0 12.5 75.0 NA NA 5,000 45 60 45 270	1.10 0.86 2.66 18.89 27.78 577.78 4.61 6.37 5.26 9.87					29.8	
Range and Average Length of Main Furrow:	-From (m) NA -To (m) NA -Average (m) NA -From (members) 30 -To (members) 35 -Average (members) 32	0.0 50 100 75 50	0.0 120 150 125 13	7.5 NA NA 37 45 41	0.0 NA NA 0 0 0	2.66 18.89 27.78 577.78 4.61					170.0	
Dominant Crops in Dry Season with Irrigation:	Maize, C/cabbage, Amaranths, Cabbage, Tomatoes, Onions, Rape	Cabbages, Tomatoes, Onions, Maize, Carrots, C/cabbage, Rape	Vegetables, Cabbage, Rape, Onion, Tomatoes, C/cabbage	Cabbage, Tomatoes, Maize, C/cabbage, Onion	Rape, Onion, Cabbage, C/cabbage, Tomatoes						5,200.0	
Dominant Crops in Rainy Season:	Rice, Tomatoes, C/cabbage	Maize, Tomatoes, Grnuts, Cassava, Sp potatoes	Maize, Grnuts, Rice, Cassava, Beans, Sp potatoes	Maize, Tomatoes, Cabbage	Maize						175.0	
Water Resource	-Dambo -River/Stream -Borehole/Shallow Well -Springs -Lake -Others (Specify)	0 3 0 0 0 0	1 8 0 0 0 0	0 1 5 0 0 0	5 4 4 0 0 0	29%	47%	24%	0%	0%	11	
Type of Irrigation System	-Surface/Furrow (=Gravity) -Pump/Sprinkler -Drip -Others (Specify)	0 0 0 3	0 0 0 9	1 0 0 5	4 6 0 3	16%	18%	0%	66%		6	
Number of Scheme having Fish Pond	0	0	0	0	0						0	
Major Material used for Making Temporary Division Weir	Grass, Trees and soil	Grass, Poles, Mud and Hoe	Building and river sand, empty grain bags	Trees, Grass, Soil							0	

Table A.2.10 Existing Temporary Irrigation Scheme, Kawambwa District, Luapula Province

Camp No.	3. EXISTING TEMPORARY IRRIGATION SCHEME											Total	Average / %	
	PROVINCE: LUAPULA / DISTRICT: KAWAMBWA													
Name of Camp:	1	2	3	4	5	6	7	8	9	10	11	CHISHETA		
Number of Schemes/Sites:	NTENKE	LUENA	CHIBOTE	MBEESHU	MUSUNGU	LENGWESHAKALABA	LUFUBU	SHINONDE	MUYEMBE	MUNKANTA	CHISHETA			
Number of Schemes having Temporary Diversion Weir:	2	1	4	4	6	2	2	4	3	2	2	32		
Number of Schemes having Furrow (canal) only:	0	0	0	0	0	0	1	1	2	0	0	21		
Others:	0	0	0	0	0	0	0	0	0	0	0	0		
Total	2	1	4	4	6	2	2	4	3	2	2	32		
Range and Average of Present Irrigated Area:	-From (Ha) -To (Ha) -Average (Ha) Total	0.3 1.0 0.5 1.0	0.3 1.0 0.5 1.0	0.3 1.0 0.5 2.0	0.3 1.0 0.5 2.0	0.3 1.3 0.5 1.5	0.3 1.3 0.5 2.0	0.3 2.5 0.5 3.0	0.3 0.5 0.3 1.0	0.3 2.0 0.8 5.0	0.5 1.0 0.8 2.0	0.5 2.0 1.0 2.0	3.3 13.3 5.3 14.0	0.10 0.41 0.16 0.44
Range and Average of Potential Irrigable Area:	-From (Ha) -To (Ha) -Average (Ha) Total	2.0 5.0 1.0 10.0	2.0 5.0 1.0 10.0	4.0 10.0 3.0 15.0	4.0 15.0 7.0 28.0	10.0 30.0 10.0 40.0	10.0 30.0 10.0 40.0	10.0 30.0 2.0 12.0	10.0 30.0 2.0 12.0	10.0 30.0 2.0 12.0	5.0 15.0 2.0 12.0	5.0 15.0 2.0 12.0	91.0 284.0 111.0 486.0	2.84 1.06 3.47 13.34
Range and Average Length of Main Furrow:	-From (m) -To (m) -Average (m)	150 1,000 500	5 100 50	100 400 200	1,500 1,500 1,500	1,500 1,500 1,500	4,000 2,000 2,000	5,000 2,000 2,000	500 250 250	300 200 200	500 500 500	18,600.0 8,600.0 275.00	581.25 1.94 8.75	
Range and Average of the Number of Irrigators:	-From (members) -To (members) -Average (members)	10 20 40	5 15 7	5 20 10	NA NA 10	10 40 20	5 20 10	5 15 10	10 60 20	5 20 15	5 5 5	62.0 280.0 137.0	1.94 8.75 4.28	
Dominant Crops in Dry Season with Irrigation:	Rape, Tomatoes, Cabbage	Rape, Cabbage, Tomatoes, Onion	Rape, Cabbage, Tomatoes, Onion	Rape, Cabbage, Tomatoes, Onion	Rape, Cabbage, Tomatoes, Onion	Rape, Cabbage, Tomatoes, Onion	Oil palm, Rape, Cabbage, Tomatoes, Onion	Rape, Cabbage, Tomatoes, Onion	Rape, Cabbage, Tomatoes, Cabbage	Rape, Cabbage, Tomatoes, Onion	Rape, Cabbage, Tomatoes, Onion	-		
Dominant Crops in Rainy Season:	Maize, Cassava	Cabbage, Maize, Finger millet	Cabbage, Maize, Grnuts	Cabbage, Maize	Cabbage, Maize, Beans	Cabbage, Maize	Cabbage, Maize	Cabbage, Maize	Cabbage, Maize, Finger millet	Cabbage, Maize	Cabbage, Maize	-		
Water Resource	-Dambo -River/Stream -Borehole/Shallow Well -Springs -Lake -Others (Specify)	0 1 0 0 0 0	0 4 0 0 0 0	0 4 0 0 0 0	0 4 0 10 0 0	0 1 1 0 0 0	0 1 1 0 0 0	0 2 0 0 0 0	0 1 0 0 0 0	0 2 0 0 0 0	0 2 0 0 0 0	1 28 0 1 0 0	3% 88% 0% 3% 0% 0%	
Type of Irrigation System	-Surface/Furrow (=Gravity) -Pump/Sprinkler -Drip -Others (Specify)	2 0 0 0 0	4 0 0 0 0	4 0 0 10 0	4 0 0 10 0	2 0 0 0 0	2 0 0 0 0	4 0 0 0 0	3 0 0 0 0	3 0 0 0 0	2 0 0 0 0	32 0 0 0 0	100% 0% 0% 31% -	
Number of Scheme having Fish Pond	1	0	0	0	0	0	0	0	0	0	0	17		
Major Material used for Making Temporary Diversion Weir	Earth	NA	Wood	Stones	Wood	Wood, Soil	Masonry stones	Wood	Wood, Grass, Soil	Poles, Mud	Wood, Grass	-		

Table A.2.11 Existing Temporary Irrigation Scheme, Mansa District, Luapula Province

3. EXISTING TEMPORARY IRRIGATION SCHEME
PROVINCE: LUAPULA / DISTRICT: MANSa

Camp No.	1	2	3	4	5	6	7	8	9	10
Name of Camp:	FIMPULU	CHIKONSHI	MATANDA	KABENDE	CHIMFULA	KASOMALWELA	LUKOLA	LUWO	MBASO	NTOPOSHI
Number of Temporary Schemes/Sites:	18	4	11	23	3	14	4	7	11	11
Number of Schemes having Temporary Diversion Weir:	3	1	1	12	2	2	4	7	8	9
Number of Schemes having Furrow (canal) only:	15	1	2	11	0	0	0	0	3	2
Others	0	2	8	0	1	12	0	0	0	0
Total	18	2	3	23	2	2	4	7	11	11
-From (Ha)	0.1	0.8	0.8	1.3	0.3	1.0	0.1	0.1	0.3	1.0
-To (Ha)	0.3	3.0	0.9	4.2	1.0	5.0	0.5	0.5	1.7	4.9
-Average (Ha)	0.1	0.8	0.9	2.0	0.8	1.0	0.3	0.3	1.0	2.8
Total	2.3	1.6	2.6	46.0	1.5	2.0	1.0	2.0	10.5	30.8
-From (Ha)	0.3	NA	1.0	5.8	1.0	1.0	0.1	0.1	0.9	1.6
-To (Ha)	0.5	36.0	8.0	18.5	5.0	15.0	0.4	0.8	3.5	10.8
-Average (Ha)	0.3	36.0	5.0	2.3	2.5	5.0	0.3	0.4	2.2	2.0
Total	4.5	72.0	15.0	52.9	5.0	10.0	1.0	2.8	24.2	22.0
Range and Average Length of Main Furrow:										
-From (m)	500	20	100	100	1,500	1,000	25	25	100	100
-To (m)	NA	30	500	600	0	1,500	300	300	5	1,500
-Average (m)	200	25	300	225	1,500	700	163	163	500	650
-From (members)	40	8	3	10	3	1	5	4	10	10
-To (members)	100	15	15	70	10	3	10	15	130	132
-Average (members)	7	12	15	9	7	1	7	9	18	14
Total	126	24	45	207	14	2	28	63	198	154
Dominant Crops in Dry Season with Irrigation:	NA	Vegetables	Vegetables and Maize	Vegetables, Maize, Banana	Cabbage, Tomatoes, Onion, W/maize	Rape, Bananas, Pineapples, S/cane	NA	Rape, Tomatoes, Cabbage, Onions	Vegetables, Maize, Beans, Bananas, S/cane	Vegetables, Beans, Bananas, Maize
Dominant Crops in Rainy Season:	NA	NA	NA	Vegetables, Maize, Banana	Maize, Spotato, Potatoes, Beans, Cassava	NA	NA	Eggplant, Cabbage and Rape	Vegetables, Maize, G/nuts, Beans, S/cane, Bananas	Vegetables, Maize, Bananas
Water Resource										
-Dambo	14	0	3	0	1	0	0	0	0	0
-River/Stream	4	4	5	21	0	14	4	7	7	5
-Borehole/Shallow Well	1	0	3	0	1	0	0	0	0	0
-Springs	0	0	0	2	1	0	0	0	2	6
-Lake	0	0	0	0	0	0	0	0	0	0
-Others	0	0	0	0	0	0	0	0	0	0
(Specify)	0	0	0	0	0	0	0	0	0	0
-Surface/Furrow (=Gravity)	14	1	2	23	2	2	4	7	11	11
-Pump/Sprinkler	0	1	1	0	0	0	0	0	0	0
-Drip	0	0	0	0	0	0	0	0	0	0
-Others	4	2	8	0	1	12	0	0	0	0
(Specify)	0	Bucket	Bucket	0	0	Buckets	0	0	0	0
Number of Scheme having Fish Pond	8	2	3	13	1	1	1	2	21	22
Major Material used for Making Temporary Diversion Weir	Hoes, Axes and Shovels	Nil	Nil	Poles, Hard soil, Clay soil and grass	Muddy only	Stones, Logs, Sand in bags	Sand in Bags and Logs	Sand in grain bags and logs	Poles, Hard soil, Mound of clay, Grass	Poles, Hard soil, Clay and grass

Table A.2.12 Existing Temporary Irrigation Scheme, Mansa District, Luapula Province

3. EXISTING TEMPORARY IRRIGATION SCHEME
PROVINCE: LUAPULA / DISTRICT: MANSA

Camp No.	11	12	13	14	15	16	17	Total	Average / %
Name of Camp:	KABUNDA	BAHATI	MALAMBA	MANTUMBUBA	MUTITI	MUCHINKA	CHIBALASHI	17	-
Number of Temporary Schemes/Sites:	4	4	7	3	7	1	1	133	-
Number of Schemes having Temporary Division Weir:	1	1	0	1	6	1	1	60	45%
Number of Schemes having Furrow (canal) only:	3	1	3	2	0	0	0	43	32%
Others:	0	2	4	0	1	0	0	30	23%
Total:	4	2	3	3	6	1	1	103	77%
Range and Average of Present Irrigated Area:	-From (Ha) -To (Ha) -Average (Ha)	1.0 4.0 1.0	0.1 0.8 0.1	0.1 0.4 0.3	0.1 1.5 1.5	2.0 2.0 2.0	1.0 1.0 1.0	9.8 31.5 17.3	0.07 0.24 0.13
Range and Average of Potential Irrigable Area:	-From (Ha) -To (Ha) -Average (Ha)	1.0 20.0 5.0	2.0 5.0 2.5	0.4 5.0 0.5	0.5 15.0 5.0	5.0 5.0 5.0	2.5 2.5 2.5	121.5 146.5 78.4	0.91 1.10 0.59
Range and Average Length of Main Furrow:	-From (m) -To (m) -Average (m)	1,200 0 600	NA NA 300	NA NA 50	150 200 1,040	2,000 2,000 2,000	500 500 500	273.9 8,570.0 9,435.0	2.06 83.20 101.12
Range and Average of the Number of Irrigators:	-From (members) -To (members) -Average (members)	5 10 9	2 15 15	2 2 15	10 35 14	15 15 15	25 25 25	158.0 615.0 205.8	1.19 4.62 1.55
Dominant Crops in Dry Season with Irrigation:	Rape, C/Cabbage, Pumpkin	G/maize, Tomatoes, Rape, Cabbage	Rape, C/cabbage, Cabbage, Tomatoes, Onion, E/plant	Cabbage, Tomatoes, Onion, Maize	Cabbage, Tomatoes, Amaranths, Onion, Rape, Okra, Carrots, E/plant	Tomatoes, Cabbage, Onion, E/plant	Cabbage, Tomatoes, Carrots	-	-
Dominant Crops in Rainy Season:	Maize, groundnuts and Cassava	Maize and Cabbage	Tomatoes, Cabbage, E/plant	Maize, Groundnuts, Beans, Cassava	Maize, Cabbage, Rape, Tomatoes, Beans, G/nuts	Maize, Fish farming	Maize, Cassava, G/nuts, Beans, E/plants, Cabbage	-	-
Water Resource	-Dambo -River/Stream -Borehole/Shallow Well -Springs -Lake -Others (Specify)	1 0 0 1 0 1	3 2 0 2 0 0	2 1 0 0 0 0	1 6 0 0 0 0	0 1 0 0 0 0	0 1 0 0 0 0	28 82 5 15 1 1	21% 62% 4% 11% 1% 1%
Type of Irrigation System	-Surface/Furrow (=Gravity) -Pump/Sprinkler -Drip -Others (Specify)	2 0 0 2 0	3 0 0 4 3	1 1 0 1 1	6 0 0 1 0	1 0 0 0 0	1 0 0 0 0	95 3 0 35 -	71% 2% 0% 26% -
Number of Scheme having Fish Pond	1	3	3	1	3	1	0	86	-
Major Material used for Making Temporary Division Weir	Mad. Stones, Earth	Only muddy	Buckets	Soil	Sand bags and Soil only	Soil	Soil	-	-

Table A.2.13 Existing Temporary Irrigation Scheme, Milenge District, Luapula Province

3. EXISTING TEMPORARY IRRIGATION SCHEME										Total	Average / %
PROVINCE: LUAPULA / DISTRICT: MILENGE											
Camp No.	1	2	3	4	5	6					
Name of Camp:	MUPITA	MUMANSE	SHITAMBULI	KAPALALA	FIBALALA	MULUMBI				6	
Number of Temporary Schemes/Sites:	4	6	12	10	6	1				39	
Number of Schemes having Temporary Diversion Weir:	4	0	0	0	0	1				5	13%
Number of Schemes having Furrow (canal) only:	0	0	0	0	0	0				0	0%
Others	0	6	12	10	6	0				34	87%
Total	4	0	0	0	0	1				5	13%
Range and Average of Present Irrigated Area:											
-From (Ha)	0.3	0.1	0.3	0.3	1.0	0.5				2.3	0.06
-To (Ha)	1.5	0.3	0.5	0.5	3.0	0.8				6.5	0.17
-Average (Ha)	1.0	0.1	0.4	0.4	1.0	0.5				3.4	0.09
Total	4.0	0.0	0.0	0.0	0.0	0.0				4.5	0.12
Range and Average of Potential Irrigable Area:											
-From (Ha)	1.0	0.8	3.8	5.0	3.0	5.0				18.5	0.47
-To (Ha)	4.0	3.0	6.3	7.5	4.0	15.0				39.8	1.02
-Average (Ha)	4.0	1.0	5.0	5.0	3.0	10.0				28.0	0.72
Total	16.0	0.0	0.0	0.0	0.0	0.0				26.0	0.67
Range and Average Length of Main Furrow:											
-From (m)	NA	50	NA	NA	NA	10,000				10,050.0	2010.00
-To (m)	NA	100	NA	NA	NA	12,000				12,100.0	2420.00
-Average (m)	NA	50	NA	NA	NA	12,000				12,050.0	2410.00
Range and Average of the Number of Irrigators:											
-From (members)	15	10	NA	NA	NA	10				35.0	0.90
-To (members)	30	15	NA	NA	NA	15				60.0	1.54
-Average (members)	20	8	NA	NA	NA	12				40.0	1.03
Total	80	0	NA	NA	NA	12				92.0	2.36
Dominant Crops in Dry Season with Irrigation:	Maize, Rape, Tomatoes, Onion, S/cane, Garlic, Cabbage	Rape, C/cabbage, Tomatoes, Cabbage, Onion	NA	NA	Vegetables, Maize	Vegetables, G/maize				-	-
Dominant Crops in Rainy Season:	Maize, G/nuts, Beans, S/potatoes, Cassava	Tomatoes, Onions, Rape, Cabbage, E/plant	NA	NA	Rice	Maize, Cassava				-	-
-Dambo	4	0	6	6	3	0				19	49%
-River/Stream	0	6	4	3	3	1				17	44%
-Borehole/Shallow Well	0	0	2	1	0	0				3	8%
-Springs	0	0	0	0	0	0				0	0%
-Lake	0	0	0	0	0	0				0	0%
-Others	0	0	0	0	0	0				0	0%
(Specify)	0	0	0	0	0	0				0	0%
-Surface/Furrow (=Gravity)	4	0	0	0	0	1				5	13%
-Pump/Sprinkler	0	0	0	0	0	0				0	0%
-Drip	0	0	0	0	0	0				0	0%
-Others	0	6	12	10	6	0				34	87%
(Specify)	0	0	Bucket	Bucket	shallow well (buckets)	0				-	-
Number of Scheme having Fish Pond	0	4	0	0	1	1				6	-
Major Material used for Making Temporary Diversion Weir	NA	Muddy and Hard stone	NA	NA	In the camp people block the water by using mud and some logs and grass not on weir	Cement, Stone, Sand, Bricks				-	-

Table A.2.14 Existing Temporary Irrigation Scheme, Mwense District, Luapula Province

Camp No.	3. EXISTING TEMPORARY IRRIGATION SCHEME										Total	Average / %
	PROVINCE: LUAPULA / DISTRICT: MWENSE											
Name of Camp:	1	2	3	4	5	6	7	8	Total			
Number of Temporary Schemes/Sites:	4	4	6	3	3	2	2	2	2	26	-	
Number of Schemes having Temporary Diversion Weir:	2	2	1	2	2	2	2	2	2	15	58%	
Number of Schemes having Furrow (canal) only:	0	1	2	1	1	0	0	0	0	5	19%	
Others:	2	1	3	0	0	0	0	0	0	6	23%	
Total:	2	3	3	3	3	2	2	2	2	20	77%	
Range and Average of Present Irrigated Area:	1.0	1.0	1.5	0.3	0.1	0.5	0.3	0.3	0.3	4.9	0.19	
-From (Ha)	2.0	2.5	3.0	0.5	0.5	1.0	0.5	0.5	0.5	15.0	0.58	
-To (Ha)	1.5	1.5	2.0	0.3	0.4	0.8	0.5	0.5	0.5	9.4	0.36	
Average (Ha)	3.0	4.5	6.0	0.8	1.1	1.5	1.0	1.0	1.0	22.9	0.88	
Total	3.0	1.0	NA	0.3	0.3	2.0	2.0	4.0	4.0	12.5	0.48	
Range and Average of Potential Irrigable Area:	8.0	7.5	NA	1.0	1.0	4.0	4.0	10.0	10.0	35.5	1.37	
-From (Ha)	5.5	5.0	2.5	0.5	0.5	3.0	4.0	6.0	6.0	27.0	1.04	
-Average (Ha)	11.0	15.0	7.5	1.5	1.5	6.0	8.0	12.0	12.0	62.5	2.40	
Total	4,000	2,000	3,600	500	2,000	1,500	1,000	1,000	1,000	14,601.0	730.05	
Range and Average Length of Main Furrow:	4,500	2,000	3,600	2,000	2,500	2,000	2,000	2,000	2,000	18,620.0	931.00	
-To (m)	4,250	400	3,600	500	2,500	2,000	1,500	1,500	1,500	14,750.0	737.50	
Average (m)	80	10	15	10	20	10	8	1	1	154.0	5.92	
Range and Average of the Number of Irrigators:	100	50	60	15	40	15	10	20	10	310.0	11.92	
-To (members)	90	15	20	10	30	12	10	8	8	195.0	7.50	
-Average (members)	180	45	60	30	90	24	20	16	16	465.0	17.88	
Dominant Crops in Dry Season with Irrigation:	Vegetables, Sp/otatoes, Banana	Bananas, Vegetables, Oil palm, S/cane	Maize, Vegetables, Oil palm, Bananas	Groundnuts, Cabbage, Tomatoes	Na	Vegetables, Fruits	Vegetables	Cabbage, Bananas, Tomatoes, S/cane				
Dominant Crops in Rainy Season:	Cassava, Maize, G/nuts, B/nuts	NA	NA	Maize, Sp/otatoes, E/plant, Vegetable	Na	Vegetables, Fruits	Vegetables	NA				
-Dambo	2	2	2	0	1	1	2	0	0	10	38%	
-River/Stream	1	2	4	3	2	0	0	2	2	14	54%	
-Borehole/Shallow Well	1	0	0	0	0	0	0	0	0	1	4%	
-Springs	0	0	0	0	0	1	0	0	0	1	4%	
-Lake	0	0	0	0	0	0	0	0	0	0	0%	
-Others	0	0	0	0	0	0	0	0	0	0	0%	
(Specify)	0	0	0	0	0	0	0	0	0	0	-	
Surface/Furrow (=Gravity)	2	3	3	3	2	2	2	2	2	19	73%	
-Pump/Sprinkler	0	0	0	0	1	0	0	0	0	1	4%	
Drip	0	0	0	0	0	0	0	0	0	0	0%	
-Others	2	1	3	0	0	0	0	0	0	6	23%	
(Specify)	0	0	0	0	0	0	0	0	0	0	-	
Number of Scheme having Fish Pond	0	1	45	0	2	2	2	1	1	53	-	
Major Material used for Making Temporary Diversion Weir	Mud	Poles, Grass, Mud	Stones, Sand, Cement, I/bars, Conforce wire	Sacks sand and stones	Sacks, Sand, Polythene Sheets	Hard soil	Hard soil	Sand Stones				

Table A.2.15 Existing Temporary Irrigation Scheme, Nchelenge District, Luapula Province

3. EXISTING TEMPORARY IRRIGATION SCHEME											Total	Average / %	
PROVINCE: LUAPULA / DISTRICT: NCHELENGE											1	-	
Camp No.													
Name of Camp:													
Number of Temporary Schemes/Sites:													
Number of Schemes having Temporary Diversion Weir:													
Number of Schemes having Furrow (canal) only:													
Others													
Total													
Range and Average of Present Irrigated Area:													
-From (Ha)													
-To (Ha)													
-Average (Ha)													
Total													
Range and Average of Potential Irrigable Area:													
-From (Ha)													
-To (Ha)													
-Average (Ha)													
Total													
Range and Average Length of Main Furrow:													
-From (m)													
-To (m)													
-Average (m)													
Range and Average of the Number of Irrigators:													
-From (members)													
-To (members)													
-Average (members)													
Dominant Crops in Dry Season with Irrigation:													
Dominant Crops in Rainy Season:													
Water Resource													
-Dambo													
-River/Stream													
-Borehole/Shallow Well													
-Springs													
-Lake													
-Others													
(Specify)													
-Surface/Furrow (=Gravity)													
-Pump/Sprinkler													
-Drip													
-Others													
(Specify)													
Number of Scheme having Fish Pond													
Major Material used for Making Temporary Diversion Weir													

Table A.2.16 Existing Temporary Irrigation Scheme, Samfya District, Luapula Province

Camp No.	3. EXISTING TEMPORARY IRRIGATION SCHEME						Total	Average / %
	PROVINCE: LUAPULA / DISTRICT: SAMFYA							
Name of Camp:	1 FIBALALA	2 MANO	3 SAMFYA CENTRAL	4 LUBWE 1	5 MUNIMBWE	6 LUBWE 2		
Number of Temporary Schemes/Sites:	1	1	6	5	2	6	21	-
Number of Schemes having Temporary Diversion Weir:	0	0	0	0	0	1	1	5%
Number of Schemes having Furrow (canal) only:	0	0	0	0	0	3	3	14%
Others:	1	1	6	5	2	2	17	81%
Total:	0	0	0	0	0	4	4	19%
-From (Ha)	2.5	0.5	9.0	2.0	2.0	1.5	17.5	0.83
-To (Ha)	5.0	0.8	10.0	4.0	3.0	2.5	25.3	1.20
-Average (Ha)	3.0	0.8	9.0	3.0	3.0	2.0	20.8	0.99
Total	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.38
-From (Ha)	NIL	3.0	9.0	4.0	3.0	5.0	24.0	1.14
-To (Ha)	NIL	5.0	10.0	20.0	5.0	10.0	50.0	2.38
-Average (Ha)	NIL	4.0	9.0	12.0	5.0	5.0	35.0	1.67
Total	NIL	0.0	0.0	0.0	0.0	20.0	20.0	0.95
-From (m)	NIL	N/a	N/a	N/a	100	N/a	100.0	25.00
-To (m)	NIL	N/a	N/a	N/a	100	N/a	100.0	25.00
-Average (m)	NIL	N/a	N/a	N/a	100	N/a	100.0	25.00
-From (members)	20	12	6	10	32	10	90.0	4.29
-To (members)	80	15	10	15	46	20	186.0	8.86
-Average (members)	40	12	6	12	39	15	124.0	5.90
Total	0	0	0	0	0	60	60.0	2.86
Dominant Crops in Dry Season with Irrigation:	NIL	Vegetables Maize, G/nuts, Cassava, Sp/otatoes	Vegetables Cassava, Maize, Sp/otatoes, B/nuts	Vegetables, W/maize	Vegetables	Vegetables	Vegetables	-
Dominant Crops in Rainy Season:	NIL	Maize, G/nuts, Cassava, Sp/otatoes	Cassava, Maize, Sp/otatoes, B/nuts	Cassava, Maize, G/nuts, B/nuts	G/nuts, Rice, S/beans, Cassava, Beans, Maize	Cassava, Rice, Maize	-	-
Water Resource	-Dambo -River/Stream -Borehole/Shallow Well -Springs -Lake -Others (Specify)	0 1 0 0 0 0	0 1 0 0 0 5	0 0 5 0 0 0	0 0 2 0 0 0	0 1 5 0 0 0	0 3 13 0 0 5	0% 14% 62% 0% 0% 24%
Types of Irrigation System	-Surface/Furrow (=Gravity) -Pump/Sprinkler -Drip -Others (Specify)	0 0 0 1 0	0 0 0 6 0	0 0 0 5 0	0 0 0 2 0	0 0 0 2 0	4 0 0 2 0	19% 0% 0% 81% -
Number of Scheme having Fish Pond Major Material used for Making Temporary Diversion Weir	2 NIL	0 NIL	0 N/a	4 Earth	1 N/a	2 Earthen Weir	9 -	- -

A.2.3 Proposed/Identified Potential Irrigation Scheme

Table A.2.17 Proposed/Identified Potential Irrigation Scheme, Chiengwe District, Luapula Province

2. PROPOSED/IDENTIFIED POTENTIAL IRRIGATION SCHEME									
PROVINCE: LUAPULA / DISTRICT: CHIENGWE									
Site No.	1	1	1	1	1	1	1	1	4
Name of scheme:									Total
Mark on Map:									Average / %
Name of Camp:									
Name of CEO:									
Name of River/Stream/Damboo:									
Name of Block:									
Present Situation of the Scheme:	0	1	1	1	1	1	1	1	3
Time taken to scheme from DACO offices (min):	0	5.5	25	15	5.0	30	0.8	11.3	2.8
Expected fund source:	1	1	1	1	1	1	1	4	100%
Water Resources:	0	0	0	0	0	0	0	0	0%
Intake System Planned:	0	0	0	0	0	0	0	0	0%
Irrigation System Planned:	1	1	1	1	1	1	1	4	100%
Irrigation Area Planned (Ha):	0	10	10	11	5	5	5	26.0	6.5
Planned Crops in Dry Season with Irrigation:	0	Cabbage, Tomatoes, Onion	Cabbage, Tomatoes, Onion	Cabbage, Tomatoes, Onion	Cabbage, Rape, Cabbage, Onion	Cabbage, Rape, Cabbage, Onion	Cabbage, Onion	4	100%
Intake Facility Planned:	0	0	0	0	0	0	0	0	0%
Dimension of Intake Facility Planned:	0	0	0	0	0	0	0	0	0%
*Diversion Weir:	3.0	3.0	4.0	4.0	8.0	8.0	8.0	100.0	25.0
*Dam:	0.6	0.6	1.0	1.0	1.0	1.0	1.0	0.0	0.0
*Pump:	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.0	0.0
Length of Furrow Planned:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Irrigation Group:	33	41	50	50	50	50	50	124	31
Name of the Nearest Major Market and Distance:	15	5	5	5	1	1	1	26.0	6.5
	1	1	1	1	1	1	1	4	100%
	0	0	0	0	0	0	0	0	0%
	0	0	0	0	0	0	0	0	0%

Table A.2.18 Proposed/Identified Potential Irrigation Scheme, Kawambwa District, Luapula Province

Scheme Name	2. PROPOSED/IDENTIFIED POTENTIAL IRRIGATION SCHEME													Total	Average %
	1	2	3	4	5	6	7	8	9	10	11	12	13		
Province: LUAPULA / DISTRICT: KAWAMBWA	1	2	3	4	5	6	7	8	9	10	11	12	13	13	-
Source of scheme:	Change Community	Chibabashi	Munguashi	Nika	Mindu	Chhessa	Lulubu / De Bacco	Bubashi	Chianda / Kola	Muchulla	Shtima	Chifisa	Kansombo	13	-
Name of CEO:	Lulubu	Muyemba	Shirode	Chibote	Muyemba	Muyemba	Lulubu	Joe Kasonge	Fobhya	Shirode	Chimpuka	Shikaba	Muyemba	0	0%
Name of River/Stream/Dam:	Lulubu	Eliza Lishimba	Mabumba	Julius Kazembe	Eliza Lishimba	Elizabeth Lishimba	John mwenda	Joe Kasonge	Chianda	Not named	Chimpuka	Albert Kasonga	Not named	0	0%
Name of Block:	Salanga	Chibabashi	Kawambwa Cent.	Chibote	Kawambwa Cent.	Kawambwa Cent.	Salanga	Kawambwa Cent.	Chianda	Kawambwa Central	Munash	Chifisa	Chibote	13	100%
Present Situation of the Scheme:	Completely new scheme?													13	100%
Time taken to scheme from DACO offices (mths.):	180	180	60	240	150	120	150	90	360	15	180	30	360	2115	162.7
Expected fund source:	Government													0	0%
Water Resources:	Government													0	0%
Intake System Planned:	Dam/Reservoir													0	0%
Irrigation System Planned:	Drip													0	0%
Irrigation Area Planned (Ha):	5	2	10	NA	10	3	5	5	5	3	5	10	5	68.0	5.2
Planned Crops in Dry Season with Irrigation:	Planned Crops in Dry Season with Irrigation:													4	31%
Intake Facility Planned:	Concrete Diversion Weir													9	66%
Dimension of Intake Facility Planned:	Concrete Diversion Weir													0	0%
Diversion Weir:	Concrete Diversion Weir													0	0%
Dam:	Dam (Concrete)													0	0%
Pump:	Pump (Motor)													0	0%
Length of Furrow Planned:	Out of the length mentioned left, the length to be fixed (m)	5,000	3,000	5,000	2,000	2,000	7,000	4,000	4,000	4,000	7,000	5,000	5,000	45,000.0	4,230.8
Irrigation Group:	Out of the length mentioned left, the length to be fixed (m)	2,000	1,000	1,000	1,000	500	3,000	1,000	2,000	1,500	2,500	3,500	2,000	21,500.0	1,653.8
Name of the Nearest Major Market and Distance:	Name	Kawambwa	Kawambwa	Kawambwa	Kawambwa	Kawambwa	Kawambwa	Kawambwa	Kawambwa	Kawambwa	Kawambwa	Kawambwa	Chibote	11	9
	Distance (km)	74	37	28	72	28	66	8	110	20	111	16	120	716.0	56.1
	Far	0	0	0	0	0	0	0	0	0	0	0	0	8	6%
	Closest	0	0	0	0	0	0	0	0	0	0	0	0	4	31%

Table A.2.19 Proposed/Identified Potential Irrigation Scheme, Mansa District, Luapula Province

2. PROPOSED/IDENTIFIED/POTENTIAL IRRIGATION SCHEME		1	1	2	1	1	2	1	2	Total	Average / %
PROVINCE: LUAPULA / DISTRICT: MANSA											
Site No.	Name of scheme:	Name of scheme:	1	2	1	2	1	2	1	Total	Average / %
	Mark on Map:	Chobani								2	-
	Name of Camp:	Bahati									
	Name of CEO:	Mwaba Golden									
	Name of River/Stream/Dambo:	Mwengele Stream									
	Name of Block:	Mansa North									
			1							1	50%
	Present Situation of the Scheme:	Completely new scheme? Farmers are already practicing irrigation farming with temporary irrigation facilities, if so.			1					1	50%
		Irrigation area at present (Ha)	0.0	0.1						0.1	-
		Crops cultivated in dry season under irrigation		Tomatoes, Cabbage, Onion							-
	Time taken to scheme from DACO offices (min):		20	22						42	21.0
	Expected fund source:	-Government -Donor (Specify) -Others (Specify)	0 1 0 0	0 1 0 0						2	100%
		-Dambo -River/Stream -Bore hole/Shallow well -Spring -Lake -Others (Specify)	0 0 0 1 0 0	0 1 0 0 0 0						1	50%
	Water Resources:	-River/Reservoir -Dam -Others (Specify)	1 0 0 0	1 0 0 0						2	100%
	Intake System Planned:	-Surface Furrow (=Gravity) -Sprinkler -Drip -Others (Specify)	1 0 0 0	1 0 0 0						2	100%
	Irrigation System Planned:										
	Irrigation Area Planned (Ha):		7	2						9.0	4.5
	Planned Crops in Dry Season with Irrigation:			Maize, Vegetables, Tomatoes, Cabbage, Onion							-
	Intake Facility Planned:	-Concrete Diversion Weir -Dam (Earth) -Dam (Concrete) -Pump (Motor) -Others (Specify)	1 0 0 0 0	1 0 0 0 0						2	100%
	Dimension of Intake Facility Planned:										
		-Length (m) -Height (m) -Width (m) -Length (m) -Height (m) -Capacity (m3) -Capacity (cm/min) -Head (m) -Nos of pump -Main Furrow (m) -Out of the length mentioned left, the length to be lined (m)	30.0 1.2 2.0 0.5 0.0 0.0 0.0 1.000 100	20.0 2.0 0.5 0.0 0.0 0.0 0.0 1.000 100						2,000.0 200.0	1,000.0 100.0
	Irrigation Group:	-Nos of Land Owners expected	3	2						5	15
	Name of the Nearest Major Market and Distance:										
		-Good -Fair -Bad	29 0 1	22 0 1						51.0 0 2	25.5 0% 100%
			0	0						0	0%

Table A.2.20 Proposed/Identified Potential Irrigation Scheme, Milenge District, Luapula Province

2. PROPOSED/IDENTIFIED POTENTIAL IRRIGATION SCHEME										3		
PROVINCE: LUAPULA / DISTRICT: MILENGE										Total	Average / %	
Site No.	Name of scheme:	1	2	3	1	2	3	1	2	3	Total	Average / %
	Name of scheme:											
	Mark on Map:	Mupila	Mumansa	Fibalala								
	Name of Camp:	Brian Mwenda	Hopkins Shipopa	Yoze Zulu								
	Name of CEO:	Mupila	Milungusili	Mwansa Bantu								
	Name of River/Stream/Dam/bo:	Milenge East	Milenge	Milenge East								
	Present Situation of the Scheme:	1	1	1							0	0%
	(mth.):	1.0	0.3	3.0							3	100%
	Expected fund source:	Government	Vegetables	Vegetables, Maize							360	120.0
	Water Resources:	Donor	Any	Any							3	100%
	Intake System Planned:	River/Stream	Bore hole/Shallow well	Spring							0	0%
	Irrigation System Planned:	Sprinkler	Drip	Others							0	0%
	Irrigation Area Planned (Ha):	0	0	0							0	0%
	Planned Crops in Dry Season with Irrigation:	0	0	0							0	0%
	Intake Facility Planned:	0	0	0							0	0%
	Dimension of Intake Facility Planned:	0	0	0							0	0%
	*Diversion Weir:	0	0	0							0	0%
	*Dam:	0	0	0							0	0%
	*Pump:	1	0	0							1	33%
	Length of Furrow Planned:	0	100	Nil							100.0	33.3
	Irrigation Group:	30	20	20							70	23
	Name of the Nearest Major Market and Distance:	188	170	170							528.0	176.0
		1	1	1							3	100%
		0	0	0							0	0%

Table A.2.21 Proposed/Identified Potential Irrigation Scheme, Mwense District, Luapula Province

2. PROPOSED/IDENTIFIED POTENTIAL IRRIGATION SCHEME												
PROVINCE: LUAPULA / DISTRICT: MWENSE												
Site No.	1	1	1	1	1	1	1	1	1	1	1	9
Name of scheme:	Kalunda	Chibwe Mumpulu	Lupososhi	Isuubilo	Loto	Luminu	Mwense South	Lumanda	Mubende	Mubende	Mubende	Total
Mark on Map:												Average / %
Name of Camp:	Kalunda	Mubende	Lupososhi	Mwense Central	Mubende	Luminu	Kashiba	Mubende	Mubende	Mubende		
Name of CEO:	Ngombeva Juvenal	Ngani Dickson	Numbwa	Christine Kanambal	Nguni Dickson	Fest us Phiri	Wilika Kundu	Nguni Dickson	Nguni Dickson	Nguni Dickson		
Name of River/Stream/Dam/bo:												
Name of Block:	Lupososhi	Lukwesa	Kalundji	Kashiba	Mubende	Mwense	Kashiba	Lukwesa	Lukwesa	Lukwesa		
Present Situation of the Scheme:	-Completely new scheme? -Farmers are already practicing irrigation farming with temporary irrigation facilities? if so, Irrigation area at present (Ha) -crops cultivated in dry season under irrigation (min.): -Government -Donor (Specify) -Others (Specify) -Dambo -River/Stream -Bore hole/Shallow well -Spring -Lake -Others (Specify) -River Diversion -Dam/Reservoir -Pump -Others (Specify) -Surface/Furrow (=Gravity) -Sprinkler -Drip -Others (Specify)											
Expected fund source:	-Government -Donor (Specify) -Others (Specify)											
Water Resources:	-Dambo -River/Stream -Bore hole/Shallow well -Spring -Lake -Others (Specify)											
Intake System Planned:	-River Diversion -Dam/Reservoir -Pump -Others (Specify)											
Irrigation System Planned:	-Surface/Furrow (=Gravity) -Sprinkler -Drip -Others (Specify)											
Irrigation Area Planned (Ha):	10	10	6	46	10	8	30	12	5	137.0	152	
Planned Crops in Dry Season with Irrigation:	Vegetables, Maize											
Intake Facility Planned:	-Concrete Diversion Weir -Masonry Diversion Weir -Dam (Earth) -Dam (Concrete) -Pump (Motor) -Others (Specify)											
Dimension of Intake Facility Planned:												
Diversion Weir:	Length (m)	20.0	10.0	14.0	10.0	15.0	15.0	10.0	20.0			
	Height (m)	60.0	1.0	1.0	60.0	1.0	1.0	1.0	1.0			
	Width (m)	0.7	0.6	0.4	0.4	0.6	0.5	0.5	0.5			
*Dam:	Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
	Height (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
	Capacity (m3)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
*Pump:	Capacity (m3/min)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
	Nos of pump	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
	Head (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Length of Furrow Planned:	Main Furrow (m)	1,500	1,500	1,500	1,500	300	5	200	1,000	8,505.0	945.0	
	-Out of the length mentioned left, the length to be lined (m)											
Irrigation Group:	Nos of Irrigators (Beneficiaries) expected	60	25	20	23	40	40	25	30	283	31	
	Nos of Land Owners expected	60	25	20	11	6	4	50	30	207	23	
Name of the Nearest Major Market and Distance:	Name	Luwingu	Mulonga	Luwingu	Mwense	Mwense	Mwense	Mulonga	Mulonga	Mulonga		
	Distance (km)	75	20	60	3	15	25	15	20	243.0	27.0	
	-Good	0	0	0	0	0	0	0	0	0	0	
	-Fair	1	1	1	1	1	1	1	1	9	100%	
	-Bad	0	0	0	0	0	0	0	0	0	0%	

Table A.2.22 Proposed/Identified Potential Irrigation Scheme, Nchelenge District, Luapula Province

2. PROPOSED/IDENTIFIED POTENTIAL IRRIGATION SCHEME												
PROVINCE: LUAPULA / DISTRICT: NCHELANGE												
Site No.	1	2	3	4	5	5		5		5		
Name of scheme:												
Mark on Map:												
Name of Camp:	Kanani	Munkombwe	Nchelenge Central	Nchelenge Central	Mulenga							
Name of CEO:	Bandu Busuman	Mr Albert Mumbi	Victor Mwanza	Victor Mwanza	Simpanda Donald							
Name of River/Stream/Dambo:		Kapak	Lushiba Lagoon	Lushiba Lagoon	Kasamba							
Name of Block:		Nchelenge North	Nchelenge Central	Nchelenge Central	Nchelenge North							
Completely new scheme?												
Present Situation of the Scheme:	Farmers are already practicing irrigation farming with temporary irrigation facilities? If so:											
Time taken to scheme from DACO offices (min.):	25	0.3	6.0	10.0	18.8							
Expected fund source:	Government	Donor	Others	Others	Others							
Water Resources:	River/Stream	Bore hole/Shallow well	Spring	Lake	Others							
Intake System Planned:	Dam/Reservoir	Pump	Others	Others	Others							
Irrigation System Planned:	Surface Furrow (Gravity)	Sprinkler	Drip	Others	Others							
Irrigation Area Planned (Ha):	30	1	6	10	47.5							
Planned Crops in Dry Season with Irrigation:	All Vegetables											
Intake Facility Planned:	Concrete Diversion Weir	Masonry Diversion Weir	Dam (Earth)	Dam (Concrete)	Pump (Motor)	Others						
Dimension of Intake Facility Planned:	Length (m)	6.0	5.0	0.0	0.0	6.0						
Height (m)	2.0	0.4	0.0	0.0	2.0							
Width (m)	0.5	0.3	0.0	0.0	0.5							
Dam:	Length (m)	0.0	0.0	0.0	0.0							
Height (m)	0.0	0.0	0.0	0.0	0.0							
Capacity (m ³)	0.0	0.0	0.0	0.0	0.0							
*Pump:	Capacity (cm ³ /min)	0.0	0.0	0.0	35.0							
Nos of pump	0.0	0.0	0.0	1.0	0.0							
Head (m)	0.0	0.0	0.0	10.0	0.0							
Length of Furrow Planned:	Main Furrow (m)	10,000	400	1,000	1,000	200						
-Out of the length mentioned left, the length to be lined (m)	0	0	0	0	0							
Irrigation Group:	Nos of Irrigators (Beneficiaries) expected	50	12	60	40	10						
Nos of Land Owners expected	15	8	47	40	1	22						
Name	Kashikishi	Mununga	Kashikishi	Kashikishi	Kashikishi	muwakwa						
Distance (km)	13	13	2	1	7	36.0						
Name of the Nearest Major Market and Distance:	Good	0	0	1	1	0						
Fair	1	1	0	0	1	1						
Bad	0	0	0	0	0	0						
Total	5	5	5	5	5	5						
Average / %	-	-	-	-	-	-						
	20%	80%	-	-	-	-						
	18.8	3.8	-	-	-	-						
	180	36.0	5	100%	4	80%						
	5	100%	4	80%	1	20%						
	0	0%	0	0%	0	0%						
	1	20%	4	80%	0	0%						
	0	0%	0	0%	0	0%						
	0	0%	0	0%	0	0%						
	2	40%	1	20%	1	20%						
	0	0%	0	0%	0	0%						
	4	80%	1	20%	0	0%						
	0	0%	1	20%	1	20%						
	47.5	9.5	1	10	1	10						
	3	60%	0	0	0	0						
	0	0%	0	0	0	0						
	1	20%	1	20%	1	20%						
	0	0%	0	0%	0	0%						
	12,800.0	2,520.0	0.0	0.0	0.0	0.0						
	172	34	111	22	36.0	7.2						
	2	40%	3	60%	0	0%						

Table A.2.23 Proposed/Identified Potential Irrigation Scheme, Samfya District, Luapula Province

2. PROPOSED/IDENTIFIED POTENTIAL IRRIGATION SCHEME		PROVINCE: LUAPULA / DISTRICT: SAMFYA							7	
Site No.	1	2	3	4	5	6	7	Total	Average / %	
Name of scheme:	Kalandya				Makasa			Z	-	
Mark on Map:				Lubwe 1						
Name of Camp:	Fibabela	Mako	Samfya Central		Lubwe					
Name of CEO:	Livy R. Chushi	Mwanga	Meggie Mvanda	Mubita Elvis	Claude Mubita	Mubita				
Name of River/Stream/Dambo:	Kalandya	Pabwaca			Makasa/Stream					
Name of Block:	Musaba		Bangweulu	Mweshilungu	Bangweulu	Mweshilungu				
Present Situation of the Scheme:	1	1	1	1	1	1	1	7	0%	
Time taken to scheme from DICO offices (min):	1.0	0.8	9.0	2.0	2.0	2.0	2.5	19.3	2.8	
Expected fund source:	NI	Vegetables	Vegetables	Vegetables, Rice	Vegetables	Vegetables	Vegetables	380	54.3	
Water Resources:	60	15	180	60	10	10	45	6	86%	
Intake System Planned:	1	1	1	1	0	1	1	0	0%	
Irrigation System Planned:	1	0	0	0	0	0	0	0	0%	
Irrigation Area Planned (Ha):	10	5	10	5	5	3	4	41.5	5.9	
Planned Crops in Dry Season with Irrigation:	0	Vegetables, Wheat	Vegetables	Vegetables	Vegetables	0	0	0	0%	
Intake Facility Planned:	0	0	0	0	0	0	0	0	0%	
Dimension of Intake Facility Planned:	30.0	30.0	0.0	20.0	25.0	0.0	0.0	0	0%	
*Diversion Weir:	1.5	15.0	0.0	1.5	1.5	0.0	0.0	0	0%	
Dam:	0.6	0.6	0.0	0.6	0.6	0.0	0.0	0	0%	
*Pump:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%	
Length of Furrow Planned:	300	300	0	300	100	0	100	1,100.0	157.1	
Irrigation Group:	200	200	0	200	80	0	80	760.0	108.6	
Name of the Nearest Major Market and Distance:	120	30	36	30	32	60	40	428	61	
	65	15	36	15	32	0	40	273	39	
	1	0	0	0	1	1	0	3	43%	
	0	0	0	0	0	0	0	1	14%	
	0	1	0	1	0	0	1	3	43%	
	0	1	0	1	0	0	1	3	43%	

A.3 Breakdown of Typical BOQ and Construction Cost of Weir
A.3.1 Wet-masonry Wall Type Weir

Table A.3.1 Breakdown of Typical BOQ and Construction Cost of Wet-masonry Wall Type Weir

Dimension of Weir	Volume of structure		Construction cost										Casual labour	Engineering services (GRZ)			Total Amount
	Height	Masonry part	Base Concre'te	Materials and Tools			Transport'n of materials and tools		Skilled labour	Fuel	Depreciation	Total		Salary	MA and DSA	Transportati on	
m	m	m ³	m ³	R-bar (Y16)	Others	Sub total (Materials and tools)	Amount (K)	Amount (K)	Amount (K)	Amount (K)	Amount (K)	Amount (K)	Amount (K)	Amount (K)	Amount (K)	Amount (K)	Amount (K)
1.0	5.0	2.5	6.3	450,000	4,810,000	5,260,000	700,000	180,000	685,000	949,000	7,774,000	704,000	2,048,000	4,620,000	312,000	6,980,000	15,458,000
1.0	10.0	5.0	12.5	750,000	9,431,000	10,181,000	700,000	360,000	1,199,000	1,690,000	14,130,000	1,400,000	3,200,000	5,520,000	312,000	9,032,000	24,562,000
1.0	15.0	7.5	18.8	1,200,000	14,128,000	15,328,000	700,000	540,000	1,712,000	2,458,000	20,738,000	2,104,000	4,352,000	6,420,000	312,000	11,084,000	33,926,000
1.0	20.0	10.0	25.0	1,500,000	18,748,000	20,248,000	1,050,000	700,000	2,168,000	3,167,000	27,333,000	2,800,000	5,376,000	7,220,000	312,000	12,908,000	43,041,000
1.0	25.0	12.9	31.3	1,950,000	23,603,000	25,553,000	1,050,000	900,000	2,855,000	4,234,000	34,590,000	3,536,000	7,040,000	8,420,000	312,000	15,772,000	53,898,000
1.0	30.0	15.4	37.5	2,250,000	28,213,000	30,463,000	1,050,000	1,060,000	3,310,000	4,993,000	40,876,000	4,240,000	8,064,000	9,220,000	312,000	17,596,000	62,712,000
1.0	35.0	17.9	43.8	2,550,000	32,912,000	35,462,000	1,400,000	1,240,000	3,823,000	5,863,000	47,788,000	4,936,000	9,216,000	10,120,000	312,000	19,648,000	72,372,000
1.0	40.0	20.4	50.0	3,000,000	37,528,000	40,528,000	1,400,000	1,420,000	4,451,000	6,927,000	54,726,000	5,640,000	10,752,000	11,220,000	312,000	22,284,000	82,650,000
1.0	45.0	22.9	56.3	3,300,000	42,230,000	45,530,000	1,400,000	1,600,000	4,964,000	7,850,000	61,344,000	6,336,000	11,904,000	12,120,000	312,000	24,336,000	92,016,000
1.0	50.0	25.4	62.5	3,600,000	46,862,000	50,462,000	1,750,000	1,760,000	5,420,000	8,705,000	68,097,000	7,040,000	12,928,000	12,920,000	312,000	26,160,000	101,297,000
1.5	5.0	4.1	7.5	600,000	6,071,000	6,671,000	700,000	240,000	856,000	1,192,000	9,659,000	928,000	2,432,000	4,920,000	312,000	7,664,000	18,251,000
1.5	10.0	8.1	15.0	1,050,000	12,027,000	13,077,000	700,000	480,000	1,541,000	2,195,000	17,993,000	1,856,000	3,968,000	6,120,000	312,000	10,400,000	30,249,000
1.5	15.0	12.2	22.5	1,500,000	17,970,000	19,470,000	1,050,000	700,000	2,168,000	3,158,000	26,546,000	2,776,000	5,376,000	7,220,000	312,000	12,908,000	42,230,000
1.5	20.0	16.3	30.0	1,950,000	23,841,000	25,791,000	1,050,000	940,000	2,853,000	4,245,000	34,879,000	3,704,000	6,912,000	8,420,000	312,000	15,644,000	54,227,000
1.5	25.0	21.3	37.5	2,400,000	30,161,000	32,561,000	1,400,000	1,180,000	3,652,000	5,548,000	44,341,000	4,704,000	8,832,000	9,820,000	312,000	18,964,000	68,009,000
1.5	30.0	25.3	45.0	2,850,000	36,031,000	38,881,000	1,400,000	1,420,000	4,336,000	7,347,000	53,384,000	5,632,000	10,368,000	11,020,000	312,000	21,700,000	80,716,000
1.5	35.0	29.4	52.5	3,300,000	41,987,000	45,287,000	1,400,000	1,640,000	4,964,000	7,857,000	61,148,000	6,552,000	11,776,000	12,120,000	312,000	24,208,000	91,908,000
1.5	40.0	33.4	60.0	3,750,000	47,919,000	51,669,000	1,750,000	1,880,000	5,763,000	9,291,000	70,353,000	7,480,000	13,696,000	13,520,000	312,000	27,528,000	105,361,000
1.5	45.0	37.5	67.5	4,200,000	53,875,000	58,075,000	1,750,000	2,100,000	6,390,000	10,507,000	78,822,000	8,400,000	15,104,000	14,620,000	312,000	30,036,000	117,258,000
1.5	50.0	41.6	75.0	4,650,000	59,744,000	64,394,000	1,750,000	2,340,000	7,075,000	11,857,000	87,416,000	9,328,000	16,640,000	15,820,000	312,000	32,772,000	129,516,000
2.0	5.0	5.8	8.8	600,000	7,445,000	8,045,000	700,000	300,000	1,027,000	1,438,000	11,510,000	1,168,000	2,816,000	5,220,000	312,000	8,348,000	21,026,000
2.0	10.0	11.7	17.5	1,200,000	14,751,000	15,951,000	700,000	600,000	1,883,000	2,709,000	21,843,000	2,336,000	4,736,000	6,720,000	312,000	11,768,000	35,947,000
2.0	15.0	17.5	26.3	1,800,000	21,984,000	23,784,000	1,050,000	880,000	2,682,000	3,964,000	32,360,000	3,504,000	6,528,000	8,120,000	312,000	14,960,000	50,824,000
2.0	20.0	23.3	35.0	2,250,000	29,283,000	31,533,000	1,050,000	1,180,000	3,538,000	5,365,000	42,666,000	4,672,000	8,448,000	9,620,000	312,000	18,380,000	65,718,000
2.0	25.0	30.8	43.8	2,850,000	37,062,000	39,912,000	1,400,000	1,500,000	4,565,000	7,103,000	54,480,000	5,968,000	10,880,000	11,420,000	312,000	22,612,000	83,060,000
2.0	30.0	36.7	52.5	3,450,000	44,369,000	47,819,000	1,400,000	1,800,000	5,420,000	8,649,000	65,088,000	7,136,000	12,800,000	12,920,000	312,000	26,032,000	98,256,000
2.0	35.0	42.5	61.3	4,050,000	51,676,000	55,726,000	1,750,000	2,080,000	6,219,000	10,169,000	75,944,000	8,304,000	14,592,000	14,320,000	312,000	29,224,000	113,472,000
2.0	40.0	48.3	70.0	4,500,000	58,890,000	63,390,000	1,750,000	2,380,000	7,189,000	12,014,000	86,723,000	9,472,000	16,896,000	16,020,000	312,000	33,228,000	129,423,000
2.0	45.0	54.2	78.8	5,100,000	66,209,000	71,309,000	2,100,000	2,660,000	7,988,000	13,665,000	97,722,000	10,640,000	18,688,000	17,420,000	312,000	36,420,000	144,782,000
2.0	50.0	60.0	87.5	5,700,000	73,436,000	79,136,000	2,100,000	2,960,000	8,844,000	15,476,000	108,516,000	11,800,000	20,608,000	18,920,000	312,000	39,840,000	160,156,000

A.3.2 Concrete Wall Type Weir

Table A.3.2 Break down of Typical BOQ and Construction Cost of Concrete Wall Type Weir

Dimension of Weir	Volume of structure		Materials and Tools				Construction cost				Casual labour				Engineering services (GRZ)				Total Amount
	Height	Length	M/body + Buttress	Base Concre	R-bar (Y16)	Others	Sub total (Materials and tools)	Transport of materials and tools	Skilled labour	Fuel	Depreciation	Total	Salary	MA and DSA	Transportation	Sub total (Engineering services)	Amount (K)	Amount (K)	
1.5	5.0	3.3	3,450,000	5,948,000	700,000	9,398,000	360,000	970,000	1,364,000	12,792,000	2,312,000	2,688,000	5,120,000	312,000	8,120,000	23,224,000			
1.5	8.5	5.8	5,850,000	10,208,000	700,000	16,058,000	600,000	1,541,000	2,217,000	35,737,000	3,984,000	3,968,000	6,120,000	312,000	10,400,000	35,500,000			
1.5	15.0	9.8	9,600,000	17,641,000	1,050,000	27,241,000	1,040,000	2,568,000	3,338,000	67,272,000	4,317,000	6,272,000	7,920,000	312,000	14,504,000	57,161,000			
1.5	18.0	12.0	11,850,000	21,382,000	1,050,000	33,232,000	1,260,000	3,024,000	4,610,000	83,176,000	5,384,000	7,296,000	8,720,000	312,000	16,328,000	67,888,000			
1.5	25.0	17.0	16,650,000	29,949,000	1,050,000	46,599,000	1,760,000	4,279,000	6,797,000	108,275,000	6,419,000	10,240,000	10,920,000	312,000	21,472,000	93,693,000			
1.5	26.0	18.3	18,000,000	31,553,000	1,050,000	49,553,000	1,860,000	4,508,000	7,227,000	113,284,000	6,498,000	10,752,000	11,320,000	312,000	22,384,000	98,942,000			
1.5	35.0	23.5	22,950,000	41,577,000	1,400,000	64,527,000	2,460,000	5,877,000	9,862,000	128,400,000	8,412,000	13,824,000	13,720,000	312,000	27,856,000	128,334,000			
1.5	40.0	26.8	26,100,000	47,433,000	1,400,000	73,533,000	2,800,000	6,790,000	11,680,000	146,213,000	9,620,000	16,000,000	15,320,000	312,000	31,632,000	146,491,000			
1.5	45.0	30.0	29,250,000	53,289,000	1,750,000	82,539,000	3,160,000	7,531,000	13,295,000	168,275,000	10,275,000	17,664,000	16,620,000	312,000	34,596,000	163,831,000			
1.5	50.0	33.3	32,250,000	59,125,000	1,750,000	91,375,000	3,500,000	8,330,000	15,073,000	190,028,000	12,028,000	19,456,000	18,020,000	312,000	37,788,000	181,088,000			
2.0	5.0	5.3	4,500,000	8,705,000	700,000	13,205,000	520,000	1,370,000	1,951,000	17,746,000	3,416,000	3,584,000	5,820,000	312,000	9,716,000	30,878,000			
2.0	10.0	10.5	8,550,000	17,209,000	1,050,000	25,759,000	1,040,000	2,511,000	3,735,000	34,095,000	6,824,000	7,820,000	7,820,000	312,000	14,276,000	55,195,000			
2.0	15.0	15.8	12,900,000	25,799,000	1,050,000	38,699,000	1,540,000	3,652,000	5,668,000	50,609,000	10,232,000	8,704,000	9,820,000	312,000	18,836,000	79,677,000			
2.0	18.5	19.9	16,200,000	32,060,000	1,050,000	48,260,000	1,920,000	4,508,000	7,212,000	62,950,000	12,744,000	14,592,000	14,320,000	312,000	22,256,000	97,950,000			
2.0	25.0	27.8	22,650,000	43,985,000	1,400,000	66,635,000	2,620,000	6,219,000	10,503,000	87,377,000	17,456,000	14,592,000	16,020,000	312,000	29,224,000	134,057,000			
2.0	29.0	32.3	26,250,000	51,029,000	1,750,000	77,279,000	3,040,000	7,189,000	12,524,000	101,782,000	20,264,000	16,768,000	16,020,000	312,000	33,100,000	155,146,000			
2.0	35.0	38.3	31,050,000	61,005,000	1,750,000	92,055,000	3,660,000	8,558,000	15,542,000	121,565,000	24,272,000	19,840,000	18,420,000	312,000	38,572,000	184,409,000			
2.0	40.0	43.5	35,250,000	69,877,000	2,100,000	104,827,000	4,160,000	9,813,000	18,420,000	139,320,000	27,680,000	22,784,000	20,620,000	312,000	43,716,000	210,716,000			
2.0	45.0	48.8	39,300,000	78,079,000	2,100,000	117,379,000	4,680,000	11,012,000	21,362,000	156,533,000	31,096,000	25,472,000	22,720,000	312,000	48,504,000	236,133,000			
2.0	50.0	54.0	43,500,000	86,663,000	2,450,000	130,163,000	5,180,000	12,153,000	24,352,000	174,298,000	34,504,000	28,032,000	24,720,000	312,000	53,064,000	261,866,000			
2.5	5.0	7.8	5,700,000	11,988,000	700,000	17,688,000	720,000	1,826,000	2,643,000	23,577,000	4,752,000	4,608,000	6,620,000	312,000	11,540,000	39,869,000			
2.5	10.0	15.6	11,100,000	23,746,000	1,050,000	34,846,000	1,440,000	3,424,000	5,248,000	46,008,000	9,504,000	8,192,000	9,420,000	312,000	17,924,000	73,436,000			
2.5	15.0	23.4	16,500,000	35,492,000	1,400,000	51,992,000	2,140,000	5,021,000	8,128,000	68,681,000	14,256,000	11,776,000	12,220,000	312,000	24,308,000	107,245,000			
2.5	20.0	31.3	21,900,000	47,310,000	1,400,000	69,210,000	2,860,000	6,676,000	11,382,000	91,528,000	19,000,000	15,488,000	15,120,000	312,000	30,920,000	141,448,000			
2.5	28.0	44.8	31,200,000	66,868,000	2,100,000	98,068,000	4,040,000	9,414,000	17,382,000	131,004,000	26,880,000	21,760,000	19,920,000	312,000	41,992,000	199,876,000			
2.5	30.0	49.5	34,650,000	72,741,000	2,100,000	107,391,000	4,380,000	10,213,000	19,334,000	143,418,000	29,200,000	23,552,000	21,320,000	312,000	45,184,000	217,802,000			
2.5	35.0	57.3	40,050,000	84,487,000	2,450,000	124,537,000	5,100,000	11,867,000	23,484,000	167,438,000	33,952,000	27,264,000	24,220,000	312,000	51,796,000	253,186,000			
2.5	40.0	65.1	45,300,000	96,226,000	2,450,000	141,526,000	5,820,000	13,579,000	27,987,000	191,362,000	38,696,000	31,232,000	27,220,000	312,000	58,764,000	288,822,000			
2.5	45.0	72.9	50,700,000	108,057,000	2,800,000	158,757,000	6,520,000	15,176,000	32,588,000	215,841,000	43,448,000	34,816,000	30,020,000	312,000	65,148,000	324,437,000			
2.5	50.0	80.7	56,100,000	119,791,000	3,150,000	175,891,000	7,240,000	16,774,000	37,458,000	240,513,000	48,200,000	38,400,000	32,820,000	312,000	71,532,000	360,245,000			
3.0	5.0	12.0	6,750,000	17,300,000	1,050,000	24,050,000	1,060,000	2,568,000	3,798,000	32,526,000	7,040,000	6,272,000	7,920,000	312,000	14,504,000	54,070,000			
3.0	10.0	24.0	13,200,000	34,357,000	1,400,000	47,557,000	1,400,000	4,964,000	7,926,000	63,967,000	14,080,000	11,648,000	12,120,000	312,000	24,080,000	102,127,000			
3.0	15.0	36.0	19,800,000	51,445,000	1,750,000	71,245,000	3,180,000	7,360,000	12,625,000	96,116,000	21,200,000	17,024,000	16,320,000	312,000	33,656,000	150,936,000			
3.0	20.0	48.0	26,400,000	68,510,000	2,100,000	94,910,000	4,240,000	9,756,000	17,891,000	128,897,000	28,160,000	22,400,000	20,520,000	312,000	43,232,000	200,289,000			
3.0	25.0	64.5	35,400,000	88,735,000	2,450,000	124,135,000	5,460,000	12,666,000	25,044,000	169,755,000	36,400,000	29,056,000	25,620,000	312,000	54,985,000	261,143,000			
3.0	27.0	72.0	39,750,000	97,511,000	2,800,000	137,261,000	6,000,000	13,864,000	28,324,000	188,249,000	39,936,000	31,744,000	27,720,000	312,000	59,776,000	287,961,000			
3.0	35.0	88.5	48,600,000	122,814,000	3,150,000	171,414,000	7,580,000	17,458,000	38,653,000	238,255,000	50,480,000	39,808,000	34,020,000	312,000	74,140,000	362,875,000			
3.0	40.0	100.5	55,050,000	139,870,000	3,500,000	194,920,000	8,640,000	19,969,000	46,507,000	273,536,000	57,520,000	45,568,000	38,420,000	312,000	84,300,000	415,356,000			
3.0	45.0	112.5	61,650,000	156,959,000	3,850,000	218,609,000	9,700,000	22,365,000	54,740,000	309,264,000	64,560,000	50,944,000	42,620,000	312,000	93,876,000	467,700,000			
3.0	50.0	124.5	68,250,000	174,024,000	4,550,000	242,274,000	10,740,000	24,761,000	63,540,000	345,865,000	71,600,000	56,320,000	46,820,000	312,000	103,452,000	520,917,000			

A.3.3 Wet-masonry Gravity Type Weir

Table A.3.3 Typical I of BOQ and Construction Cost of Wet-masonry Gravity Type Weir

Dimension of Weir	Volume of structure				Construction cost										Casual labour	Engineering services (GRZ)				Total Amount
	Height	Length	Masonry part	Base Conc'te	Materials and Tools			Transport'n of materials and tools	Skilled labour	Fuel	Depreciation	Total	Salary	MA and DSA		Transportation	Sub total			
m	m	m ²	m ²	R-bar (Y16)	Others	Sub total (Materials)	Amount (K)	Amount (K)	Amount (K)	Amount (K)	Amount (K)	Amount (K)	Amount (K)	Amount (K)	Amount (K)	Amount (K)	Amount (K)	Amount (K)		
2.0	5.0	11.1	0.0	0	2,927,000	2,927,000	700,000	240,000	856,000	1,177,000	5,900,000	888,000	2,432,000	4,920,000	312,000	7,664,000	14,452,000			
2.0	10.0	22.2	0.0	0	5,852,000	5,852,000	700,000	460,000	1,484,000	2,062,000	10,558,000	1,776,000	3,840,000	6,020,000	312,000	10,172,000	22,506,000			
2.0	15.0	33.3	0.0	0	8,778,000	8,778,000	700,000	680,000	2,211,000	2,965,000	15,234,000	2,664,000	5,248,000	7,120,000	312,000	12,680,000	30,578,000			
2.0	20.0	44.4	0.0	0	11,704,000	11,704,000	700,000	900,000	2,739,000	3,886,000	19,929,000	3,552,000	6,656,000	8,220,000	312,000	15,188,000	38,669,000			
2.0	25.0	55.5	0.0	0	14,629,000	14,629,000	1,050,000	1,120,000	3,481,000	4,985,000	25,265,000	4,440,000	8,448,000	9,520,000	312,000	18,280,000	47,985,000			
2.0	30.0	66.6	0.0	0	17,555,000	17,555,000	1,050,000	1,340,000	4,108,000	5,944,000	29,997,000	5,328,000	9,856,000	10,620,000	312,000	20,788,000	56,113,000			
2.0	35.0	77.7	0.0	0	20,481,000	20,481,000	1,050,000	1,560,000	4,736,000	6,921,000	34,748,000	6,216,000	11,264,000	11,720,000	312,000	23,296,000	64,260,000			
2.0	40.0	88.8	0.0	0	23,334,000	23,334,000	1,050,000	1,780,000	5,477,000	8,077,000	39,718,000	7,104,000	13,056,000	13,020,000	312,000	26,388,000	73,210,000			
2.0	45.0	99.9	0.0	0	26,259,000	26,259,000	1,400,000	2,000,000	6,105,000	9,091,000	44,855,000	7,992,000	14,464,000	14,120,000	312,000	28,896,000	81,743,000			
2.0	50.0	111.0	0.0	0	29,184,000	29,184,000	1,400,000	2,220,000	6,733,000	10,124,000	49,661,000	8,880,000	15,872,000	15,220,000	312,000	31,404,000	89,945,000			
2.5	5.0	17.3	0.0	0	4,625,000	4,625,000	700,000	360,000	1,199,000	1,658,000	8,542,000	1,392,000	3,200,000	5,520,000	312,000	9,032,000	18,966,000			
2.5	10.0	34.7	0.0	0	9,174,000	9,174,000	700,000	700,000	2,168,000	3,050,000	15,792,000	2,776,000	5,376,000	7,220,000	312,000	12,908,000	31,476,000			
2.5	15.0	52.0	0.0	0	13,725,000	13,725,000	1,050,000	1,060,000	3,195,000	4,565,000	23,595,000	4,168,000	7,680,000	9,020,000	312,000	17,012,000	44,775,000			
2.5	20.0	69.4	0.0	0	18,275,000	18,275,000	1,050,000	1,400,000	4,165,000	6,046,000	30,936,000	5,552,000	9,856,000	10,720,000	312,000	20,888,000	57,376,000			
2.5	25.0	86.7	0.0	0	22,824,000	22,824,000	1,050,000	1,740,000	5,249,000	7,732,000	38,595,000	6,944,000	12,416,000	12,620,000	312,000	25,348,000	70,887,000			
2.5	30.0	104.1	0.0	0	27,362,000	27,362,000	1,400,000	2,100,000	6,276,000	9,388,000	46,526,000	8,328,000	14,720,000	14,420,000	312,000	29,452,000	84,306,000			
2.5	35.0	121.4	0.0	0	31,912,000	31,912,000	1,400,000	2,440,000	7,246,000	11,003,000	54,001,000	9,720,000	16,896,000	16,120,000	312,000	33,328,000	97,049,000			
2.5	40.0	138.8	0.0	0	36,462,000	36,462,000	1,750,000	2,780,000	8,330,000	12,829,000	62,151,000	11,104,000	19,456,000	18,020,000	312,000	37,788,000	111,043,000			
2.5	45.0	156.1	0.0	0	41,086,000	41,086,000	1,750,000	3,140,000	9,357,000	14,628,000	69,961,000	12,488,000	21,760,000	19,820,000	312,000	41,892,000	124,341,000			
2.5	50.0	173.4	0.0	0	45,636,000	45,636,000	1,750,000	3,480,000	10,327,000	16,379,000	77,572,000	13,880,000	23,936,000	21,520,000	312,000	45,768,000	137,220,000			
3.0	5.0	25.0	0.0	0	6,571,000	6,571,000	700,000	500,000	1,598,000	2,226,000	11,595,000	2,000,000	4,096,000	6,220,000	312,000	10,628,000	24,223,000			
3.0	10.0	50.0	0.0	0	13,130,000	13,130,000	1,050,000	1,000,000	3,024,000	4,312,000	22,516,000	4,000,000	7,296,000	8,720,000	312,000	16,328,000	42,844,000			
3.0	15.0	74.9	0.0	0	19,701,000	19,701,000	1,050,000	1,500,000	4,451,000	6,492,000	33,194,000	6,000,000	10,496,000	11,220,000	312,000	22,028,000	61,222,000			
3.0	20.0	99.9	0.0	0	26,259,000	26,259,000	1,400,000	2,000,000	5,877,000	8,765,000	44,301,000	7,992,000	13,696,000	13,720,000	312,000	27,728,000	80,021,000			
3.0	25.0	124.9	0.0	0	32,830,000	32,830,000	1,400,000	2,500,000	7,417,000	11,297,000	55,444,000	9,992,000	17,280,000	16,420,000	312,000	34,012,000	99,448,000			
3.0	30.0	149.9	0.0	0	39,388,000	39,388,000	1,750,000	3,000,000	8,844,000	13,760,000	66,742,000	11,992,000	20,480,000	18,920,000	312,000	39,712,000	118,446,000			
3.0	35.0	174.8	0.0	0	45,946,000	45,946,000	1,750,000	3,500,000	10,270,000	16,316,000	77,782,000	13,992,000	23,680,000	21,420,000	312,000	45,412,000	137,186,000			
3.0	40.0	199.8	0.0	0	52,517,000	52,517,000	2,100,000	4,000,000	11,810,000	19,138,000	89,565,000	15,984,000	27,264,000	24,120,000	312,000	51,696,000	157,245,000			
3.0	45.0	224.8	0.0	0	59,075,000	59,075,000	2,100,000	4,500,000	13,237,000	21,884,000	100,796,000	17,984,000	30,464,000	26,620,000	312,000	57,396,000	176,176,000			
3.0	50.0	249.8	0.0	0	65,645,000	65,645,000	2,450,000	5,000,000	14,663,000	24,724,000	112,482,000	19,984,000	33,664,000	29,120,000	312,000	63,096,000	195,562,000			
3.5	5.0	34.0	0.0	0	8,976,000	8,976,000	700,000	680,000	2,111,000	2,967,000	15,434,000	2,720,000	5,376,000	7,120,000	312,000	12,808,000	30,962,000			
3.5	10.0	68.0	0.0	0	17,878,000	17,878,000	1,050,000	1,360,000	4,051,000	5,872,000	30,211,000	5,440,000	9,728,000	10,520,000	312,000	20,560,000	56,211,000			
3.5	15.0	102.0	0.0	0	26,853,000	26,853,000	1,400,000	2,040,000	5,991,000	8,954,000	45,238,000	8,160,000	14,080,000	13,920,000	312,000	28,312,000	81,710,000			
3.5	20.0	136.0	0.0	0	35,755,000	35,755,000	1,400,000	2,720,000	7,931,000	12,205,000	60,011,000	10,880,000	18,432,000	17,320,000	312,000	36,064,000	106,955,000			
3.5	25.0	170.0	0.0	0	44,718,000	44,718,000	1,750,000	3,400,000	9,985,000	15,802,000	75,655,000	13,600,000	23,168,000	20,920,000	312,000	44,400,000	133,655,000			
3.5	30.0	204.0	0.0	0	53,620,000	53,620,000	2,100,000	4,080,000	11,924,000	19,403,000	91,127,000	16,320,000	27,520,000	24,320,000	312,000	52,152,000	159,599,000			
3.5	35.0	238.0	0.0	0	62,595,000	62,595,000	2,450,000	4,760,000	13,864,000	23,183,000	106,852,000	19,040,000	31,872,000	27,720,000	312,000	59,904,000	185,796,000			
3.5	40.0	272.0	0.0	0	71,497,000	71,497,000	2,450,000	5,440,000	15,918,000	27,307,000	122,612,000	21,760,000	36,608,000	31,320,000	312,000	68,240,000	212,612,000			
3.5	45.0	305.9	0.0	0	80,386,000	80,386,000	2,800,000	6,120,000	17,858,000	31,429,000	138,593,000	24,480,000	40,960,000	34,720,000	312,000	75,992,000	239,065,000			
3.5	50.0	339.9	0.0	0	89,362,000	89,362,000	3,150,000	6,800,000	19,798,000	35,733,000	154,843,000	27,200,000	45,312,000	38,120,000	312,000	83,744,000	265,787,000			
4.0	5.0	44.4	0.0	0	11,704,000	11,704,000	700,000	900,000	2,739,000	3,886,000	19,929,000	3,552,000	6,784,000	8,220,000	312,000	15,316,000	38,797,000			
4.0	10.0	88.8	0.0	0	23,334,000	23,334,000	1,050,000	1,780,000	5,249,000	7,752,000	39,165,000	7,104,000	12,416,000	12,620,000	312,000	25,348,000	71,617,000			
4.0	15.0	133.2	0.0	0	35,036,000	35,036,000	1,400,000	2,680,000	7,817,000	12,002,000	58,935,000	10,656,000	18,176,000	17,120,000	312,000	35,608,000	105,199,000			
4.0	20.0	177.6	0.0	0	46,666,000	46,666,000	1,750,000	3,560,000	10,327,000	16,458,000	78,761,000	14,208,000	23,808,000	21,520,000	312,000	45,640,000	138,609,000			
4.0	25.0	222.0	0.0	0	58,368,000	58,368,000	2,100,000	4,440,000	12,951,000	21,382,000	99,241,000	17,760,000	29,824,000	26,120,000	312,000	56,256,000	173,257,000			
4.0	30.0	266.4	0.0	0	69,998,000	69,998,000	2,450,000	5,340,000	15,519,000	26,524,000	119,831,000	21,312,000	35,584,000	30,620,000	312,000	66,516,000	207,659,000			
4.0	35.0	310.8	0.0	0	81,701,000	81,701,000	2,800,000	6,220,000	18,029,000	31,872,000	140,622,0									

A.4 Detail of Pilot Project

A.4.1 Detail of 2009 Pilot Project (Temporary Scheme)

Table A.4.1 Summary of Improvement for Existing Sites in 2009 Dry Season(1/3)

Nr.	Site Name	Nr. of member farmers		Nr. of Land Owners	Wair Type	Original C. Length, km	Original Area originally irrigated, ha	Additional with Improvement		Original + Newly Irrigated, ha	Original + Opened, ha	Command Area, ha	Nr. of Fish Pond
		Total	Male					Female	Canal Length newly dug, km				
Kasama													
1		0	0	0		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Total		0	0	0		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Mbala													
1	Chintombe	30	15	15	2	2.50	0.00	0.25	0.25	0.25	0.25		
2	Chisinga	10	5	5	3	1.50	0.75	1.50	1.25	2.25	2.25		
3	Songolo	14	7	7	4	1.50	6.00	3.00	2.00	8.00	9.00		
4	Mukufula	15	14	1	7	2	5.00	0.20	0.50	4.00	5.00		
5	Kawezwe	12	8	4	12	3.00	3.00	3.25	3.00	6.00	6.25		
6	Nakatali	26	3	23	2	3.00	1.00	0.75	0.50	1.50	1.75		
7	Mukaserika	15	10	5	3	2	3.00	0.50	3.50	3.00	6.00		
8	Kasago	40	30	10	31	2	2.50	0.50	0.50	3.00	3.00		
9	Twikalane	40	30	10	2	4	4.50	0.00	1.00	2.50	3.00		
10	Twikalane	40	25	15	7	3	3.50	0.00	0.75	4.25	4.50		
11	Fikachilika	34	20	14	7	4.00	2.50	1.00	0.50	3.00	3.50		
12	Takulika	28	18	9	7	3.50	2.50	1.25	0.50	3.00	3.75		
13	Sandulula	35	25	10	10	3.00	2.50	0.50	0.25	2.75	3.00		
14	Buyantashi	30	25	5	8	3.00	2.50	0.75	0.50	3.00	3.25		
15	Township	15	9	6	2	2.00	0.75	0.00	1.50	2.25	2.50		
16	Mushisa	12	7	5	3	1.50	0.50	1.50	1.00	1.50	2.00		
17	Nyambwe	25	15	10	6	4	2.00	0.00	0.50	1.50	2.00		
18	Chipuncu	14	10	4	3	2	2.00	1.00	0.75	1.50	1.75		
19	Saise B	25	17	8	1	5	1.20	0.75	1.50	1.25	2.25		
20	Twazwane	15	9	6	1	2	1.80	1.50	3.00	2.00	4.50		
21	Saise	45	35	10	4	2	0.10	1.00	1.25	1.00	1.75		
22	Katibo	35	25	10	1	2	3.50	1.50	3.50	1.50	5.00		
Total	22	555	362	196	123	56.60	42.75	33.50	18.50	61.25	76.25	91.14	NA
Average		25	16	9	6	2.57	1.94	1.52	0.84	2.78	3.47	4.14	NA
Mpikwa													
1	Ubulimi Tabuwa	54	45	9	4	3.50	1.25	8.20	7.70	8.95	9.45	10.50	
2	Natubalanga	20	12	8	2	3	1.50	1.50	1.50	2.00	2.00	3.50	
3	Kabale Inji Scheme	31	17	14	1	4	5.00	3.00	3.00	4.50	4.50	7.50	
4	Katongo Kapala	50	37	13	50	4	3.50	3.00	3.50	6.50	6.50	7.00	
5	Minaamba Inji Scheme	24	17	7	1	1	1.00	0.50	0.83	2.20	2.33	9.00	
6	Nkupisha	23	15	8	5	3	4.00	5.00	5.00	7.00	7.00	12.00	
7	Challo Inji Scheme	15	9	6	15	3	4.00	1.50	1.00	6.00	6.50	16.00	
Total	7	217	152	62	78	22.50	14.75	23.53	22.40	37.15	38.28	65.50	NA
Average		31	22	9	11	3.21	2.11	3.36	3.20	5.31	5.47	9.36	NA
Mporokoso													
1	Katwamba	977	655	422	0	3	2.00	10.00	0.00	12.00	22.00	20.00	4
2	Pilibuani FG	15	9	6	1	1	0.50	2.50	1.00	1.50	3.00	5.00	1
3	Kayokolo	20	8	12	1	2	1.50	0.50	0.00	1.50	1.50	5.00	1
4	Kampemba	15	10	5	0	2	0.30	0.75	0.00	1.00	1.75	5.00	3
5	Msumbi	35	15	20	20	2	3.00	1.00	0.00	1.00	2.00	4.00	2
6	Cheli	30	18	12	20	2	1.25	0.50	0.00	0.50	1.00	0.50	0
7	Chiala	50	20	30	41	2	2.00	3.00	1.00	2.00	4.00	5.00	6
8	Kalbe	21	16	5	1	1	1.60	0.30	0.00	2.00	2.30	1.20	0
9	Mukenga Malupanga	6	6	0	1	1	1.00	0.50	0.00	2.00	2.50	1.50	2
10	Milupanga	15	11	4	3	1	2.00	0.25	0.00	1.80	2.05	2.00	0
11	Kawikisha G. 1	40	29	11	0	2	1.50	1.50	0.00	0.50	2.00	2.00	0
12	Kawikisha G. 2	10	8	2	1	2	0.80	1.25	0.00	1.25	2.50	3.00	3

Table A.4.2 Summary of Improvement for Existing Sites in 2009 Dry Season(2/3)

Nr.	Site Name	Nr. of member farmers			Nr. of Land Owners	Weir Type	Original C. Length, km	Original Area originally irrigated, ha	Additional with Improvement		Original + Newly Irrigated, ha	Original + Opened, ha	Command Area, ha	Nr. of Fish Pond
		Total	Male	Female					Canal Length newly dug, km	Opened Area in 2009, ha				
13	Mulenga	8	6	2	4	1.60	5.00	0.00	5.00	0.00	5.00	10.00	0	
14	Sokoni FG	35	30	5	0	1.50	0.25	0.00	0.25	0.00	0.25	0.50	3	
15	Chongo Chinondo	50	30	20	0	2.00	1.00	0.00	0.25	0.00	1.00	1.25	0	
16	Sokoni Men's Club	20	15	5	0	0.40	0.25	0.00	1.00	0.00	0.25	1.25	0	
Total	16	1,347	786	561	93	22.95	31.05	0.50	28.55	2.00	33.05	59.60	25	
Average	Mungwi	84	49	35	6	1.43	1.94	0.03	1.78	0.13	2.07	3.73	1.56	
1	Kalupa Wamiimo	53	28	25	0	0.80	0.00	1.00	4.00	2.00	2.00	4.00	8	
2	Twikalane	50	35	15	0	2.00	0.00	0.00	4.50	4.50	4.50	4.50	0	
3	Chipamano	20	13	7	0	3.50	0.00	0.05	3.00	0.50	3.00	5.00	0	
4	Buyantanshi	15	5	10	0	7.00	0.00	3.00	3.00	1.00	3.00	10.00	0	
5	Twikalane Kabulyeni	44	39	5	0	2.00	0.00	3.00	3.00	0.00	3.00	5.00	0	
Total	5	182	120	62	0	15.30	0.00	1.05	17.50	8.00	8.00	27.50	8	
Average	Luwingu	36	24	12	0	3.06	0.00	0.21	3.50	1.60	1.60	5.50	1.60	
1	Chambata	60	52	8	1	0.20	0.00	0.00	0.25	0.25	0.25	0.25	0	
2	Chishishi	63	48	15	1	0.30	0.50	1.50	2.00	1.50	2.00	15.00	0	
3	Lima	75	68	7	12	0.40	0.00	0.25	0.25	0.25	0.25	12.00	4	
4	Twallileni	45	25	20	1	0.70	0.00	0.00	0.00	0.00	0.00	10.00	0	
5	Milandu	53	30	23	2	0.70	0.00	0.00	7.00	3.00	3.00	8.00	0	
6	Ipandula	68	50	18	1	0.30	0.00	0.00	0.00	0.00	0.00	12.00	0	
7	Katwesteko	35	20	15	3	0.10	0.00	0.20	0.00	0.00	0.00	8.00	0	
8	Natumane Akapi	40	22	18	1	0.20	0.00	0.00	0.00	0.00	0.00	6.00	0	
9	Muchishe	23	20	3	2	0.40	0.00	0.00	0.00	0.00	0.00	5.00	0	
10	Lunika	20	12	8	4	0.35	0.00	0.00	0.00	0.00	0.00	7.00	0	
11	Bwatwanc	63	33	30	3	1.50	1.00	0.06	0.50	0.00	1.00	12.00	0	
12	Chinyanta	40	15	25	1	8.00	0.00	0.00	0.00	0.00	0.00	10.00	0	
13	Mapulanga	98	50	48	3	12.00	0.75	0.00	1.00	0.00	0.75	18.00	0	
14	Kapisha	150	105	45	3	3.00	2.00	0.00	2.00	0.00	2.00	10.00	4	
15	Chisosa Sali	150	90	60	6	12.00	4.00	0.50	5.00	1.00	5.00	8.00	0	
16	Mufili/Chibwate	120	73	47	2	4.20	3.00	0.00	4.00	0.00	3.00	18.00	3	
17	Makumba	35	32	3	1	1.30	0.25	0.00	0.25	0.00	0.25	4.00	2	
Total	17	1,138	745	393	47	45.65	11.50	2.26	22.25	6.00	17.50	33.75	13	
Average	Kawambwa	67	44	23	3	2.69	0.68	0.13	1.31	0.35	1.03	9.88	0.76	
1	Kabalenge 1	30	18	12	6	0.10	0.25	0.05	0.75	0.75	1.00	1.00	18	
2	Kapweshi	12	8	4	2	3.00	0.75	0.10	0.25	0.25	1.00	1.00	6	
3	Kabalenge 2	40	28	12	4	3.00	1.00	0.06	0.50	0.50	1.50	1.50	0	
4	Lende Ngoma	50	29	21	5	1.50	0.75	0.75	0.25	0.25	1.00	1.00	0	
5	Katulwende	4	3	1	4	0.71	2.00	0.01	0.25	0.25	2.25	2.25	7	
6	Mipanga	10	4	6	10	1.50	0.50	0.00	0.00	0.00	0.50	0.50	0	
7	Milundu	47	30	17	1	0.50	2.00	0.00	0.00	0.00	2.00	2.00	0	
8	Senga	57	37	20	25	1.50	1.20	0.30	0.50	0.50	1.70	1.70	38	
9	Chansamaimba	7	4	3	1	0.50	0.50	0.00	0.00	0.00	0.50	0.50	2	
10	Kapama	25	7	18	3	0.34	0.20	0.30	0.40	0.40	0.60	0.60	0	
11	Kamungu	13	9	4	5	0.45	0.50	0.05	0.10	0.10	0.60	0.60	4	
12	Luena	22	17	5	14	1.30	2.80	0.32	0.20	0.20	3.00	3.00	3	
13	Chibolva	7	5	2	1	0.30	0.75	0.00	0.00	0.00	0.75	0.75	0	
14	Kamtukeshi 1	35	20	15	3	0.15	0.18	0.03	0.07	0.07	0.25	0.25	2	
Total	14	359	219	140	84	14.85	13.38	1.97	7.60	3.27	16.65	20.98	80	
Average		26	16	10	6	1.06	0.96	0.14	0.54	0.23	1.19	1.50	5.71	

Table A.4.3 Summary of Improvement for Existing Sites in 2009 Dry Season(3/3)

Nr.	Site Name	Nr. of member farmers		Nr. of Land Owners	Weir Type	Original C. Length, km	Original Area originally irrigated, ha	Additional with Improvement		Original + Newly Irrigated, ha	Original + Opened, ha	Command Area, ha	Nr. of Fish Pond
		Total	Male					Female	Canal Length newly digg. km				
Mansa													
1	Makondo	10	5	5	2	0.10	3.00	0.10	4.00	4.00	7.00	8.00	
2	Akasakalabwé	10	5	5	2	0.50	0.50	0.10	1.00	1.50	1.50	3.50	
3	Mwiniwa	25	14	11	3	1.50	3.00	0.10	0.75	3.75	3.75	16.00	
4	Kapundu	30	18	12	3	0.30	2.00	0.30	3.00	3.00	5.00	7.00	
5	Mulima	15	10	5	3	0.50	3.00	0.10	2.00	2.00	5.00	11.00	
6	Chimbwi	11	7	4	3	0.40	0.75	0.10	1.00	1.75	1.75	4.75	
7	Lwimfumu	20	15	5	3	1.50	3.00	0.10	2.25	4.25	5.25	24.00	
8	Makanga	10	5	5	2	0.20	1.00	1.50	2.00	3.00	3.00	10.00	
9	Kanisa	10	8	2	2	0.20	1.00	1.50	3.00	4.00	4.00	4.00	
10	Mwengele 1	8	5	3	2	1.50	2.00	1.50	2.00	2.00	4.00	7.00	
11	Mwengele 2	8	5	3	2	2.00	2.00	2.00	5.00	7.00	7.00	7.00	
12	Bumpoketa	12	8	4	2	1.00	2.00	0.20	2.00	3.00	4.00	12.00	
13	Chimula	10	7	3	4	1.50	1.00	0.50	1.00	1.00	2.00	6.00	
14	Bungia	15	11	4	3	0.10	1.00	0.50	3.00	2.00	4.00	8.00	
15	Lupuma 1	12	8	4	2	0.40	0.10	1.00	6.00	5.00	6.10	5.00	
16	Likumfushi	10	7	3	3	2.00	2.00	2.00	1.00	3.00	3.00	5.00	
17	Lupuma 2	12	8	4	2	0.20	2.00	0.10	1.00	3.00	3.00	5.00	
18	Tinda Ujukasu	19	12	7	2	2.00	5.00	1.00	1.00	6.00	6.00	17.00	
19	Chesemba	15	11	4	3	0.10	1.00	1.00	1.00	2.00	2.00	2.00	
Total	19	252	169	83	40	16.00	35.35	13.70	44.00	38.00	73.35	164.25	NA
Average		14	9	5	2	0.84	1.86	0.72	2.32	2.00	3.86	8.64	NA
Grand Total	100	4,060	2,553	1,507	465	103.85	148.78	26.68	176.92	98.17	246.95	639.59	126
Average Per Member		41	26	15	5	1.94	1.49	0.27	1.77	0.98	2.47	6.40	2.42
						0.05	0.0368	0.01	0.04	0.0242	0.0603	0.1575	0.06

Weir Type: 0. Natural Diversion, 1. Inclined, 2. Single-Line, 3. Double-Line, 4. Triagonal, 5. Masonry

A.4.2 Detail of 2009 Pilot Project (Newly Constructed Scheme)

Table A.4.4 Summary of New Development in 2009 Dry Season (1/3)

Nr.	Site Name	Nr. of member farmers			Nr. of Land Owners	Weir Type	Done in This 2009 Dry Season		Plan for Next 2010 Dry Season		Command Area, ha	Nr. of Fish Ponds
		Total	Male	Female			Canal Length (dig in 2009, km)	Opened Area in 2009, ha	Canal Length to be dug, km	Area to be irrigated, ha		
Kasama												
1	Mowani	54	54	0	9	3	1.70	0.13	0.00	2.00	2.50	2.50
2	Sani	6	5	1	6	0	0.00	0.00	0.00	1.00	0.75	0.75
3	Chipompo	90	54	36	6	5	0.30	0.00	0.00	7.70	2.00	2.00
4	Lunda	53	32	21	7	3	0.60	0.25	0.25	1.00	2.00	2.25
5	Kaunguluka	17	14	3	0	2	0.30	0.26	0.13	1.60	1.00	1.13
Total	5	220	159	61	28	2	2.90	0.63	0.38	13.30	8.25	8.63
Average		44	32	12	6	2	0.58	0.13	0.08	2.66	1.65	1.73
Members Irrigated												
Mbala												
1	Muzuma	30	19	11	1	2	0.50	0.00	0.00	1.00	0.50	0.50
2	Kwala	40	20	20	2	3	0.20	0.50	0.25	2.00	0.50	0.75
3	Kaele	20	10	10	2	2	0.30	0.55	0.30	1.00	1.50	1.80
4	Munsimbe	30	20	10	1	2	0.30	0.25	0.25	0.50	0.50	0.75
5	Twikalane	24	23	1	2	4	0.10	0.25	0.00	0.50	0.50	0.50
6	Mukani	38	30	8	17	2	0.50	0.75	0.25	1.50	0.50	0.75
7	Kalwya	34	34	0	17	2	1.00	0.25	0.00	1.00	1.00	1.00
8	Chishela	55	55	0	60	2	0.10	0.25	0.00	0.50	0.25	0.25
9	Twakizya	25	16	9	1	2	0.20	1.25	0.25	1.00	1.00	1.25
10	Mulunda	10	8	2	10	4	0.20	0.25	0.00	1.00	0.25	0.25
11	Mwenje	100	78	22	85	3	1.50	4.00	1.00	1.50	3.00	4.00
12	Nachasiwa	100	47	53	22	3	0.80	0.75	0.50	0.50	0.25	0.75
13	Twikalane	35	23	12	4	4	1.00	1.00	0.50	2.50	2.00	2.50
14	Michelo	20	13	7	7	2	0.50	0.75	0.25	2.00	0.75	1.00
15	Mpanankulu	39	30	9	10	2	1.00	0.75	0.25	1.00	0.50	0.75
16	Bomba Ngoye	70	64	6	7	3	0.50	0.00	0.00	3.00	1.00	1.00
17	Narwabe	50	40	10	8	2	0.30	0.75	0.00	2.00	0.75	0.75
18	Chishavasha	20	15	5	2	2	0.10	0.25	0.00	0.50	0.25	0.25
19	Samuel	15	15	0	2	4	0.20	0.25	0.25	2.00	0.50	0.75
20	Tulimane	15	10	5	11	4	0.50	1.00	0.50	1.00	0.50	1.00
21	Kaputu	15	11	4	6	4	1.00	0.75	0.25	1.00	0.75	1.00
22	Chione	12	10	2	5	2	0.10	0.00	0.00	0.50	0.50	0.50
23	Manyika	11	8	3	11	2	0.10	0.00	0.00	0.10	1.00	1.00
24	Twikalane	70	40	30	20	5	3.00	0.50	0.50	0.00	2.00	2.50
25	Tulimane	25	15	10	10	4	0.20	0.50	0.50	1.50	1.50	2.00
Total	25	903	654	249	323		13.30	14.30	5.80	29.10	21.75	27.55
Average		36	26	10	13		0.53	0.57	0.23	1.16	0.87	1.10
Members Irrigated												
Mpika												
1	Yende Irig. Scheme	40	21	19	1	3	1.50	1.00	0.25	1.00	2.25	2.50
2	Lubuto Irig. Scheme	34	22	12	1	4	2.75	1.60	1.10	0.00	2.38	3.48
3	Kuluba Irig. Scheme	15	7	8	1	3	2.50	0.75	0.75	0.00	2.50	3.25
4	Mis-sawa Irig. Scheme	32	19	13	1	4	1.50	2.50	2.50	2.00	1.50	4.00
5	Kampemba Irig. Sch.	21	16	5	1	1	0.53	0.50	0.50	0.50	2.50	3.00
6	Itongo Irig. Scheme	20	14	6	3	3	0.50	1.00	0.75	0.00	3.00	3.75
7	Kakabika Irig. Sch.	15	10	5	1	4	0.20	0.30	0.30	1.50	2.00	2.30
8	Kamanjipandu I. S	20	13	7	2	1	0.15	0.05	0.05	1.80	3.00	3.05
9	Chibanga Twikalane	16	12	4	2	3	0.08	0.20	0.20	1.50	2.00	2.20
10	Mufamba Irig. Sch.	54	40	14	0	3	4.00	0.00	0.00	1.50	5.00	5.00
11	Makaliki Irig. Sch.	28	20	8	1	3	6.00	0.00	0.00	0.50	2.00	30.00
12	Chikwanda Irig. Sch.	50	40	10	2	3	0.10	0.25	0.25	5.00	5.00	5.25
Total	12	365	234	121	16	3	19.81	8.15	6.65	15.30	33.13	39.78
Average		30	20	10	1	1	1.65	0.68	0.56	1.28	2.76	3.31
											17.06	NA
											0.68	NA
											3.00	0
											3.50	0
											3.25	0
											3.00	0
											2.63	0
											1.25	0
											0.40	0
											0.45	0
											0.28	0
											12.00	0
											30.00	12
											0.10	0
											59.86	12
											4.99	1

Table A.4.5 Summary of New Development in 2009 Dry Season (2/3)

Nr.	Site Name	Nr. of member farmers			Nr. of Land Owners	Weir Type	Done in This 2009 Dry Season		Plan for Next 2010 Dry Season		Command Area, ha	Nr. of Fish Pond
		Total	Male	Female			Canal Length dug in 2009, km	Deposed Area in 2009, ha	Irrigated Area in 2009, ha	Canal Length to be dug, km		
Mporokoso												
1	Mwlabia	30	20	10	0	1	0.20	1.50	0.00	1.80	2.00	2.00
2	Mwange Wampandwe	15	9	6	1	1	0.50	1.00	0.00	0.50	1.00	1.50
3	Kabusha	148	72	76	11	2	0.30	5.00	0.00	2.70	6.00	6.00
4	Mulima	10	10	0	2	2	0.30	3.25	0.75	2.20	2.50	2.50
5	Malandira	25	15	10	0	2	0.20	2.40	0.00	1.00	2.40	2.40
Total	5	228	126	102	14	2	1.60	14.15	1.25	8.20	13.90	15.15
Average		46	25	20	3	3	0.32	2.83	0.25	1.64	2.78	3.03
Mungwi												
1	Nalubombeshe	25	17	8	0	2	1.80	1.75	0.25	0.50	1.50	1.75
2	Twatwane	35	20	15	0	1,2,4	0.50	0.00	0.00	0.00	0.75	0.75
3	Kalemba	60	35	45	0	3	0.92	0.00	0.00	4.00	4.00	4.00
4	Kalungu	30	20	10	0	2	2.80	5.30	0.80	4.50	5.30	7.00
5	Chikwama	70	35	35	0	1	2.40	2.25	0.25	2.00	4.00	4.25
6	Mungwi Bridge	25	15	10	0	5	1.50	2.00	0.00	0.50	2.00	2.50
Total	6	265	142	123	0	13	9.12	11.30	1.30	7.50	16.75	18.05
Average		44	24	21	0	2	1.52	1.89	0.22	1.25	2.79	3.01
Luwingu												
1	Chambets	60	52	6	1	1	0.20	0.00	0.00	4.00	4.00	4.00
2	Chishishi	63	48	15	1	1	0.30	1.00	0.50	3.50	14.00	15.00
3	Lima	75	68	7	12	1	0.40	0.00	0.00	6.00	10.00	12.00
4	Twalitani	45	25	20	1	3	0.70	0.00	0.00	15.00	8.00	10.00
5	Milandu	53	30	23	2	1	0.70	4.00	0.00	2.70	7.00	8.00
6	Ipandua	68	50	18	1	3	0.30	0.00	0.00	5.30	10.00	12.00
7	Nalumbwe AMapi	40	22	18	1	4	0.20	0.00	0.00	14.80	4.00	6.00
8	Much-sha	23	20	3	2	1	0.40	0.00	0.00	3.60	3.00	5.00
9	Lumka	20	12	8	4	1	0.35	0.00	0.00	8.65	5.00	7.00
Total	9	447	327	120	25	3	3.55	5.00	0.50	63.65	65.00	80.00
Average		50	36	13	3	2	0.39	0.65	0.06	7.06	7.22	8.89
Kawambwa												
1	Chifusa 1	15	9	6	4	1	0.50	0.50	0.50	0.80	1.50	2.10
2	Chifusa 2	12	10	2	7	2	0.04	0.05	0.05	0.78	3.00	3.05
3	Kalwa	78	51	27	35	5	1.30	1.10	1.10	0.20	0.50	1.60
4	Tumhane	25	16	9	1	2	0.20	0.50	0.50	0.00	0.25	0.75
5	Kansombo	12	7	5	2	4	0.32	0.75	0.75	0.50	0.25	1.00
6	Kabalenje	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
7	Chipapa	25	17	8	4	2	0.30	0.50	0.50	0.41	0.25	0.75
8	Kasanda	15	11	4	4	5	0.12	1.00	1.00	0.15	0.50	1.50
9	Nalwange	8	5	3	2	5	0.13	0.30	0.30	0.07	0.10	0.40
10	Kapulo	35	29	6	2	2	0.00	0.00	0.00	0.00	0.00	0.00
Total	10	225	155	70	61	2	3.01	8.71	4.71	2.91	6.45	11.16
Average		23	16	7	6	2	0.30	0.87	0.47	0.29	0.65	1.12
Mansa												
1	Mushashi	12	8	4	12	3	0.20	2.00	2.00	0.10	1.00	3.00
2	Lwamfumu	45	30	15	2	2	3.00	3.00	3.00	0.50	1.00	4.00
3	Chilia	15	9	6	3	3	0.20	0.75	0.75	0.50	2.00	2.75
4	Scope	10	8	2	4	3	1.00	1.00	1.00	0.10	0.50	1.50
5	Mabondo-ntopashi	25	18	6	1	2	2.50	4.75	4.50	0.50	0.50	5.00

Table A.4.6 Summary of New Development in 2009 Dry Season (3/3)

Nr.	Site Name	Nr. of member farmers			Nr. of Land Owners	Weir Type	Done in This 2009 Dry Season		Irrigated Area in 2009, ha		Plan for Next 2010 Dry Season		Commanded Area, ha	Nr. of Fish Pond
		Total	Male	Female			Canal Length dug in 2009, km	Spurred Area in 2009, ha	Canal Length to be dug, km	Area to be irrigated, ha	Area to be irrigated, ha			
6	Kamabala	32	16	16	2	3	1.00	3.50	1.90	1.00	2.00	3.50	6.50	
7	Kapayata	10	7	3	2	2	0.50	1.00	1.00	0.50	1.00	2.00	2.00	
8	Frangwa	30	18	12	4	2	0.20	0.25	0.25	1.00	2.00	2.25	2.25	
9	Kipundu	36	20	16	5	3	0.30	2.00	2.00	1.00	0.75	2.75	2.25	
10	Mwilibwa Upper	20	12	8	1	3	0.30	3.00	1.00	0.50	4.00	5.00	8.00	
11	Mwilibwa	20	10	10	7	2	0.03	2.25	2.25	0.50	2.00	2.25	5.25	
12	Chilwe	18	10	8	5	3	0.40	2.75	0.75	1.00	3.00	3.75	6.75	
13	Mabondor/Chimfula	10	7	3	2	2	1.00	0.25	0.25	0.50	2.00	2.25	6.00	
14	Mapaso	10	6	4	2	3	0.30	1.00	1.00	0.80	5.00	6.00	5.00	
15	Mwilibwa Lower	25	15	10	2	2	3.50	5.00	5.00	1.00	0.50	5.50	9.00	
16	Sweulu	30	23	7	1	3	0.40	2.00	2.00	1.00	7.00	9.00	10.25	
17	Marchangela	16	9	7	5	2	0.10	0.25	0.25	0.10	0.50	0.75	10.25	
18	Mwambi	12	9	3	1	2	0.10	1.00	1.00	0.50	2.00	3.00	3.00	
19	Talwaka	48	30	18	2	3	0.40	2.00	1.00	1.00	2.00	3.00	3.00	
20	Tweshoko	15	9	6	3	2	0.20	0.75	0.75	0.25	0.50	1.25	5.00	
21	Kabula	19	12	7	2	3	2.00	2.00	1.00	1.00	1.00	2.00	3.00	
22	Chimfula	16	10	6	1	3	0.03	1.00	1.00	1.00	2.00	3.00	106.50	NA
Total	22	476	298	177	69	69	17.66	41.50	31.25	14.35	42.25	73.50	106.50	NA
Average	Members irrigated	22	14	8	3	3	0.80	1.89	1.42	0.65	1.92	3.34	4.80	NA
Grand	94	3,118	2,095	1,023	536	536	70.84	193.74	51.84	154.21	207.475	259.32	398.665	20
Average	Per Member	33	22	11	6	6	0.76	1.10	0.56	1.64	2.21	2.76	4.13	0.43
Per Member	31	not irrigated yet at all in 2009 dry season out of the total 94 sites												
63	Members irrigated	1,680	1,061	599	332	332	0.02	0.0333	0.0166	0.0495	0.0565	0.0832	0.1247	0.0128

Weir Type: 0: Natural; Diversion, 1: Inclined, 2: Single-Line, 3: Double-Line, 4: Trilateral, 5: Masonry

A.4.3 Detail of 2010 Pilot Project (Temporary Scheme)

Table A.4.7 Detail of 2010 Pilot Project (Temporary Scheme) [Kasama]

FORM 2: IMPROVEMENT (TEMPORARY)
SUBMIT to the Follow up Training in November. District: Kasama Province: Northern

: SITE PROFILE for SMALLHOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)

No.	Camp Name	Name of the CEO	Site Name: if this was constructed in 2009 under JICA, tick or indicate the year originally constructed.	No. of member farmers		No. of farmers who irrigated	No. of Land Owners	Weir Type	Original		Additional by Improvement in 2010		Original + Newly Irrigated Area, ha (a+b)	Compost Making		No. of Fish Pond			
				Male	Female				Original Canal Length, km	Area originally irrigated, ha (a)	Canal Length newly dug, km	Opened Area in 2010, ha		Area newly irrigated in 2010, ha (b)	No. of farmers	No. of heaps	Original	Newly Constructed	
1	Chitambi	K. Sanama	Molwani	10	13	23	6	2	1.50	1.50	0.50	2.20	0.30	1.80	18	4			
2	Mulibola	J. Banda	Mulibola	8	3	11	5	1	1.00	0.20	0.20	0.40	0.30	0.50					
3	Kasakula	M. Kalumbi	Kasakula	16	2	18	10	1	2.00	1.00	0.50	1.50	1.20	2.20					
4	Chionbo	R. Ntembula	NA	13	5	18	6	3	1.20	0.80	0.50	2.00	1.20	2.00	14	2			
5	Mwamba	S. Chishimba	Jeremani	20	5	25	14	1	0.90	0.20	0.10	0.50	0.20	0.40					
6	Munkonge	R. Bbella	kalulu	14	4	18	10	1	0.80	0.10	0.20	0.50	0.30	0.40			1	1	
7	Nkole Mfumu	L. Kauvo	Nkole Mfumu	18	5	23	8	1	1.10	0.20	0.80	0.00	0.00	0.20					
8	Chanda Mukulu	N. Mudela	Chanda mukulu	21	7	28	9	1	1.30	1.00	0.60	2.00	0.50	1.50					
9	Mulianshi	E. Mulenga	Chingimbwa	8	3	11	6	1	2.10	0.50	0.20	0.80	0.20	0.70			4		
10	Ngoli	S. Mutondo	Kasonde mutokwa	7	1	8	5	1	0.70	0.60	0.30	1.00	0.50	1.10					
11	Misengo	R. Chikumbi	Misengo	11	3	14	5	1	0.80	0.50	0.00	0.80	0.50	1.00			6	2	
12	Chilufya	L. Muchindu	Chilufya	6	2	8	5	1	1.50	0.20	0.20	0.50	0.20	0.40					
13	Lukulu north	S. Kunda	Lukulu North	15	5	20	10	1	1.20	1.50	2.00	8.00	0.50	2.00	18	6			
14	Mlungu	P. Kanda	Mwika	60	24	84	35	3	4.00	2.20	1.00	1.00	0.30	2.50					
15	K. Chisuna	W. Ngosa	kanchule	15	6	21	8	1	0.80	0.20	0.30	0.50	0.25	0.45	10	2			
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40																			
Total				15	242	88	330	142	20	20.90	10.70	7.40	21.70	6.45	17.15	60.00	14.00	11.00	3.00
Last Year Started					17	14	31	11	3	2.20	2.10	0.80	3.20	0.80	2.90	18.00	4.00	0.00	0.00

Weir Type: 0: Natural Diversion, 1: inclined, 2: Single-Line, 3: Double-Line, 4: Trigonai, 5: Masonry, 6: Sandwich line
Camp Name: yellow CEO

Table A.4.8 Detail of 2010 Pilot Project (Temporary Scheme) [Mbala]

FORM 2: IMPROVEMENT (TEMPORARY)
SUBMIT to the Follow up Training in November, District: Mbala, Province: Northern

: SITE PROFILE for SMALLHOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)

No.	Camp Name	Name of the CEO	Site Name: if this was constructed in 2009 under JICA, tick or indicate the year originally constructed.	No. of member farmers		No. of Land Owners	Weir Type	Original		Additional by Improvement in 2010		Original + Newly Irrigated Area, ha (a+b)	Compost Making		No. of Fish Pond		
				Male	Female			Original Canal Length, km	Area originally irrigated, ha (a)	Canal Length newly dug, km	Opened Area in 2010, ha		Area newly irrigated in 2010, ha (b)	No. of farmers	No. of heaps	Original	Newly Constructed
1	Tanzuka	Julius Mulienga	Kampopo	5	2	7	4	0.30	0.25	0.20	0.75	0.50	0.75				
2	Tanzuka	Julius Mulienga	Kaeszuma	12	3	15	6	0.20	0.70	0.05	0.90	0.75	1.45				
3	Nsokolo	Clement Mumbi	Kanyai	7	5	12	4	0.30	1.00	0.20	0.79	0.50	1.50				
4	Mpande	Sichimata	Muyaya	20	5	25	4	1.00	0.30	0.20	1.00	0.50	0.80				
5	Mpande	Sichimata	Lupashi	10	5	15	4	0.80	0.60	0.40	1.00	0.75	1.35				
6	Kasasha	Cliff Katula	Nawelwa	6	4	10	6	0.60	1.50	0.40	1.50	1.50	3.00			2	0
7	Kasasha	Cliff Katula	Masyayi	6	2	8	4	0.40	1.00	0.10	1.00	0.75	1.75				
8	Kasasha	Cliff Katula	Kaluluzi	8	2	10	1	0.60	0.60	0.40	0.75	0.50	1.10				
9	Maule	S. Simposo	Kamyanga	7	5	12	12	1.00	0.50	0.50	1.50	1.00	1.50			1	0
10	Maule	S. Simposo	Kasupa	6	3	9	1	1.50	0.75	1.00	1.00	0.75	1.50			2	0
11	Maule	S. Simposo	Chinyika	7	8	15	7	0.50	1.00	0.40	1.20	1.00	2.00				
12	Maule	S. Simposo	Chundu	5	3	8	3	0.30	1.00	0.20	0.50	0.50	1.50				
13	Mpulumungu	TSB	Kapata	10	5	15	15	2.00	2.00	0.50	1.00	1.00	3.00				1
14	Nondo	C. Kaonga	Kambatwile	6	2	8	2	1.00	2.00	0.50	1.50	1.00	3.00				
15	Nondo	C. Kaonga	Malipenga	5	2	7	7	0.75	0.25	0.25	0.75	0.50	0.75			2	
16	Nondo	C. Kaonga	Mpangakulu	20	5	25	5	1.00	1.00	0.50	1.50	1.00	2.00				
17	Masamba	Francis kasonde	Kapatu	8	4	12	2	1.50	1.00	0.20	0.25	0.25	1.25				
18	Masamba	Francis kasonde	Kapatu	10	5	15	15	2.50	0.50	1.00	2.00	2.00	2.50				
19	Masamba	Francis kasonde	Pampa	7	5	12	2	1.00	1.00	0.25	1.00	0.75	1.75				
20	Ludheche	Eugenia Musaba	Mwengo	8	4	12	12	1.00	1.00	0.60	0.50	0.50	1.50			4	
21	Mambwe	Nicholus Kapaya	Chishinga	2	3	5	5	1.00	1.00	0.75	0.50	0.25	1.25				
22	Mambwe	Nicholus Kapaya	Ching'ombe	8	2	10	1	1.00	0.50	0.50	1.50	0.75	1.25				
23	Kasasha	Cliff Katula	Nshizye	9	4	13	13	0.40	0.25	1.00	0.75	0.50	0.75				2
24	Kasasha	Cliff Katula	Ngelesani	22	8	30	30	1.00	0.25	0.50	0.75	0.75	1.00				
25	Maule	S. Simposo	Mulisha	4	6	10	1	0.20	0.25	0.40	0.25	0.25	0.50				
26	Ludheche	Eugenia Musaba	Nakatali	0	10	10	1	0.10	0.25	1.50	0.50	0.50	0.75				
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	Total		26	0	218	112	330	21.75	20.45	12.50	24.64	19.00	39.45	12.00	4.00	7.00	3.00

Weir Type: 0: Natural Diversion, 1: Inclined, 2: Single-Line, 3: Double-Line, 4: Trigonial, 5: Masonry, 6: Sandwicheh line
Camp Name: fellow CEO

Table A.4.9 Detail of 2010 Pilot Project (Temporary Scheme) [Mpika]

FORM 2: IMPROVEMENT (TEMPORARY)

SUBMIT to the Follow up Training in November, District: Mpika

: SITE PROFILE for SMALLHOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)

No.	Camp Name	Name of the CEO	Site Name: if this was constructed in 2009 under JICA, tick or indicate the year originally constructed.	No. of member farmers		No. of farmers who irrigated	No. of Land Owners	Weir Type	Original Canal Length, km	Area originally irrigated, ha (a)	Additional Length newly dug, km	Opened Area in 2010, ha	Area newly irrigated in 2010, ha (b)	Original + Newly Irrigated Area, ha (a+b)	Compost Making		No. of Fish Pond	
				Male	Female										No. of farmers	No. of heaps	Original	Newly Constructed
1	Chintu	Deodatus Mwewa	Chabuluma	1	13	7	20	10	4	1.00	3.00	5.00	2.00	5.00				
2	Chintu	Deodatus Mwewa	Chintu		7	8	15	10	5	1.00	0.25	2.00	1.00	1.25				
3	Chintu	Deodatus Mwewa	Chintu		15	10	25	15	2	1.50	4.00	6.00	5.00	9.00				
4	Mutamba	Patista Malama	Lubashe		8	7	15	10	4	1.10	1.00	4.00	2.00	3.00				
5	Chaiwe	Josephene Ngulube	Chintu		1	20	30	25	3	3.00	10.00	13.00		10.00				
6	Chaiwe	Josephene Ngulube	Chaiwe A		1	30	45	20	3	3.50	12.00	0.00		12.00				6
7	Chaiwe	Josephene Ngulube	Chaiwe B		1	15	20	15	2	2.00	8.00	0.00		8.00				5
8	Chaiwe	Josephene Ngulube	Kalenga		5	2	7	7	3	2.50	6.00	1.00	1.75	7.75				
9	Chaiwe	Josephene Ngulube	Mwalala		1	10	15	10	2	4.00	11.00	0.00		11.00				
10	Mpika miah	Shila Mumba	Matete		1	12	9	21	2	1.50	2.00	0.00		2.00				
11	Chishibesonde	Kalolo Simbeya	Chailo		1	35	45	20	3	3.50	5.00	0.00		5.00				
12	Chishibesonde	Kalolo Simbeya	Makalliki		1	12	22	18	3	4.00	4.00	0.00		4.00				
13																		
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Total				12	8	182	280	190	146	28.60	66.25	6.90	31.75	78.00	18.00	0.00	11.00	0.00
Last Year Started					147	71	218	148	120	22.50	55.00	1.50	2.00	57.00	14.00	0.00	11.00	0.00

Weir Type: 0: Natural Diversion, 1: Inclined, 2: Single-Line, 3: Double-Line, 4: Trigonal, 5: Masonry, 6: Sandwich line
Camp Name: fellow CEO

Table A.4.10 Detail of 2010 Pilot Project (Temporary Scheme) [Mprokoso]

FORM 2: IMPROVEMENT (TEMPORARY)
SUBMIT to the Follow up Training in November, District: Mprokoso, Province Northern

No.	Camp Name	Name of the CEO	No. of member farmers		No. of farmers who irrigated	No. of Land Owners	Weir Type	Original		Additional by Improvement in 2010		Original + Newly Irrigated Area, ha (a+b)	Compost Making		No. of Fish Pond Newly Constructed		
			Male	Female				Original Canal Length, km	Area originally irrigated, ha (a)	Canal Length newly dug, km	Opened Area in 2010, ha		Area newly irrigated in 2010, ha (b)	No. of farmers		No. of heaps	
1	Kapila	C. Chikasa	15	12	27	1	0	0.75	0.25	1.00	2.50	1.75	2.00		6		
2	Kapila	C. Chikasa	16	14	30	25	1	2	1.00	2.50	4.50	2.25	4.25		2		
3	Kapila	C. Chikasa	27	22	49	28	1	2	7.00	0.50	7.50	1.75	2.50				
4	Kapila	C. Chikasa	15	8	23	15	1	2	0.50	1.00	2.25	2.00	3.00		3		
5	Kapila	C. Chikasa	18	13	31	18	1	2	0.50	2.00	0.50	2.00	3.75		2		
6	Kapila	C. Chikasa	12	4	16	10	1	1	1.00	1.00	3.75	1.00	1.00				
7	Kapila	C. Chikasa	17	22	39	39	1	2	1.00	1.50	3.00	2.50	4.00				
8	Kapila	C. Chikasa	15	3	18	10	1	0	2.00	0.50	2.25	0.50	0.50				
9	Kapila	C. Chikasa	23	18	41	26	1	2	3.00	0.25	3.00	3.50	0.25				
10	Kapila	C. Chikasa	12	5	17	12	1	2	1.50	2.00	1.50	2.00	3.75				
11	Mukolve	L. Mutale	17	6	23	17	1	2	3.00	0.50	3.00	4.75	0.50		1		
12	M/ mapesa	B.Mweemba	12	8	20	6	1	2	1.50	0.50	0.00	2.75	2.00				
13	M/ mapesa	B.Mweemba	5	2	7	4	1	2	0.25	0.25	0.00	1.25	2.00				
14	M/ mapesa	B.Mweemba	5	3	8	7	1	2	1.00	0.75	0.00	2.50	3.25				
15	M/ kaoma	O. Musowa	7	4	11	8	1	0	0.25	0.25	0.00	3.75	2.25				
16	M/ kaoma	O. Musowa	12	5	17	7	1	2	1.50	0.25	0.00	2.00	1.75		2		
17	M/ kaoma	O. Musowa	7	4	11	11	1	2	2.00	2.00	1.25	1.70	3.70		2		
18	Mpalapata	K. Nyirenda	6	1	7	4	1	2	0.25	0.25	0.00	1.00	1.75				
19	Mpalapata	K. Nyirenda	5	0	5	3	1	2	0.25	0.25	0.00	1.25	2.00				
20	Chitoshi	A. Silupumbwe	8	2	10	8	1	2	0.25	0.25	0.00	2.75	2.00				
21	Chitoshi	A. Silupumbwe	20	4	24	19	1	2	0.50	0.75	0.00	2.00	2.75				
22	Chiwala	Gift Malumo	15	12	27	27	1	2	3.00	2.00	0.50	1.25	4.50		7		
23	Chiwala	Gift Malumo	7	11	18	9	1	1	2.00	1.00	0.25	1.75	3.00		3		
24	Chiwala	Gift Malumo	10	4	14	7	1	2	3.50	1.50	0.50	2.00	3.50				
25	Chiwala	Gift Malumo	11	8	19	12	1	2	1.50	2.00	0.50	1.25	2.50				
26	Chalabesa	B. Mooba	10	5	15	15	1	6	0.50	3.75	0.25	2.75	6.25		4		
27	Chalabesa	B. Mooba	5	4	9	9	1	2	1.20	1.00	0.00	1.00	2.75		9		
28	Munyela	J. Simwinda	5	5	10	4	1	2	3.00	0.50	0.50	2.25	2.25				
29	District	T S B	9	6	15	15	1	2	7.00	2.00	1.75	2.50	4.50		4		
30	District	T S B	6	3	9	9	1	2	1.50	1.00	0.50	2.00	2.75				
31	Chalabesa	B. Mooba	10	4	14	10	1	2	1.00	0.50	1.25	0.50	0.50				
32																	
33																	
34																	
35																	
36																	
37																	
38																	
39																	
40																	
Total			31	0	362	222	584	421	31	59.20	26.50	70.75	84.45	3.00	1.00	46.00	7.00

IMPROVED SITE (TEMPORARY)

Weir Type: 0: Natural Diversion, 1: inclined, 2: Single-Line, 3: Double-Line, 4: Trigon, 5: Masonry, 6: Sandwiche line
Camp Name: fellow CEO

Table A.4.11 Detail of 2010 Pilot Project (Temporary Scheme) [Mungwi]

: SITE PROFILE for SMALLHOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)

No.	Camp Name	Name of the CEO	Site Name: if this was constructed in 2009 under JICA, tick or indicate the year originally constructed.	No. of member farmers		No. of farmers who irrigated	No. of Land Owners	Weir Type	Original		Additional by Improvement in 2010		Original + Newly Irrigated Area, ha (a+b)	Compost Making		No. of Fish Pond			
				Male	Female				Total	Original Canal Length, km	Area originally irrigated, ha (a)	Canal Length newly dug, km		Opened Area in 2010, ha	Area newly irrigated in 2010, ha (b)	No. of farmers	No. of heaps	Original	Newly Constructed
1	Nseluka	Beauty	Chipemano	13	12	25	12	5	2	2.00	0.12	0.50	2.75	2.00	2.12				
2	Nseluka	Beauty	Chalolwa	3	0	3	3	3	0	3.00	0.13	0.00	0.25	1.00	1.13				
3	Nseluka	Beauty	Katumba	8	6	14	8	1	0	0.30	0.13	0.00	3.00	2.25	2.38				
4	Nseluka	Beauty	Kanundwe	4	2	6	6	1	0	0.30	0.75	0.10	1.00	1.00	1.75			2	
5	Mungwi	E.w Banda	Kanyanta	12	4	16	7	3	2	2.50	1.00	1.00	0.50	0.50	1.50				
6	Mungwi	E.w Banda	Kabula	8	14	22	6	4	2	1.50	0.25	0.00	0.13	0.13	0.38			10	
7	Majole. S.	R. Mwenya	Mfinsh	16	5	21	0	7	2	1.50	0.00				0.00				
8	Majole. S.	R. Mwenya	Kabamba	8	0	8	2	10	2	1.00	0.02	0.00	0.75	0.75	0.77				
9	Majole. S.	R. Mwenya	Nkanda	21	1	22	11	9	2	2.50	0.50	0.00	0.87	0.87	1.37				
10	Majole. S.	R. Mwenya	Mukosa	8	2	10	10	6	2	0.80	0.75	0.00	0.50	0.50	1.25				
11	Majole. N.	A. Katulwende	Mulewa	14	5	19	0	11	2	3.00	0.00				0.00				
12	Chisali	A. Tembo	Mumena	20	5	25									0.00				
13	Chonya	R. Chanda	Mabula	15	8	23	18	7	2	2.50	0.50	1.00	1.00	0.50	1.00				
14	Chonya	R. Chanda	Luchindashi	10	7	17	15	6	2	1.30	0.50	0.30	0.50	0.50	1.00				
15	Chonya	R. Chanda	Chonya	18	10	28	25	10	2	3.00	4.00	1.00	1.50	0.50	4.50				
16	Rosa	Nguni Suzyo	Rosa	15	10	25	16	6	2	3.00	1.00	0.50	2.50	2.00	3.00			1	
17	Rosa	Nguni Suzyo	Shimpa	20	10	30	28	10	2	5.00	5.00	1.00	2.00	2.00	7.00			2	
18	Rosa	Nguni Suzyo	Luombe	10	5	15	14	5	2	1.00	0.75	0.50	0.50	0.50	1.25				
19	Chanda weyaya	Elvis Nsunge	Kayaya	6	7	13	8	2	2	1.50	1.00	0.50	0.50	0.50	1.50				
20	Katusha	Chiza Museeteka	Katusha	10	8	18	15	4	2	1.00	1.00	0.50	0.50	0.50	1.50				
21	Katusha	Chiza Museeteka	Lunyungo	7	3	10	10	3	2	1.00	0.75	0.30	0.20	0.20	0.95				
22	Katusha	Chiza Museeteka	Kabisha	5	2	7	7	2	2	0.80	0.80	0.20	0.50	0.50	1.30				
23	Makasa	Conrius Chibale	Makasa	16	4	20	15	5	2	1.00	0.50	0.40	0.20	0.20	0.70				
24	Makasa	Conrius Chibale	Kalumu	9	5	14	12	6	2	1.00	0.75	0.30	0.30	0.30	1.05				
25	Kayambi	Conrius Chibale	Chibote	8	3	11	10	4	2	1.00	0.75	0.30	0.20	0.20	0.95				
26	Kayambi	Conrius Chibale	Lumdeshi	22	10	32	10	6	2	2.50	1.00	0.50	0.50	0.50	1.50				
27																			
28																			
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40																			
	Total		26	0	306	148	454	268	136	44.00	21.94	8.90	20.65	17.90	39.84	0.00	0.00	12.00	3.00

Weir Type: 0: Natural Diversion, 1: Inclined, 2: Single-Line, 3: Double-Line, 4: Trigonal, 5: Masonry, 6: Sandwich line
Camp Name: fellow CEO

Table A.4.12 Detail of 2010 Pilot Project (Temporary Scheme) [Luwingu]

FORM 2: IMPROVEMENT (TEMPORARY)

No.	Camp Name	Name of the CEO	Site Name: if this was constructed in 2009 under JICA, tick or indicate the year originally constructed.	No. of member farmers		Province Northern		Weir Type	Original Canal Length, km	Original Area originally irrigated, ha (a)	Additional by Improvement in 2010, ha	Area newly irrigated in 2010, ha (b)	Original + Newly Irrigated Area, ha (a+b)	Compost Making		No. of Fish Pond		
				Male	Female	Total	No. of farmers irrigated							No. of Land Owners	No. of farmers	No. of heaps	Original	Newly Constructed
1	Mufili	Bwalya Giles	Milandu	1	20	15	35	25	1	7	3.00	4.00	2.50	2.50				
2	Mufili	Bwalya Giles	Iparidula	1	11	8	19	6	1	3	0.30	1.00	1.50	1.75				
3	Mufili	Bwalya Giles	Winsenga	1	17	9	26	1	3	0.20			0.00					
4	Mufili	Bwalya Giles	Chilima	1	13	4	17	10	1	2	0.20		0.50	0.50				
5	Mufili	Bwalya Giles	Kafinsa	1	14	5	19	1	4	0.20			0.00					
6	Shimumbi	Nyirenda A.	Makumba	1	13	5	18	5	1	0	0.80	1.25	0.50	0.75				
7	Mapulanga	Chileshe B	Kambula	1	18	8	26	26	1	2	4.00	5.00	5.00	5.25				
8	Mapulanga	Chileshe B	Chinyanta	1	20	6	26	26	1	2	0.30	2.00	5.00	5.00				
9	Mfungwe	Kaumba Bertha	Muchishe	1	17	3	20		1	2	0.35		0.00	0.00				
10	Tungati	Kombe Mark	Chibolwe	1	17	12	29	11	1	0	0.90	0.50	0.75	1.75				
11	Tungati	Kombe Mark	Kansasa	1	17	8	25		1	2	0.25	0.70	0.00	0.00				
12	Kapisha	TSB	Chishishi	1	25	23	48	22	1	2	0.90	1.10	1.00	1.25	25	2		
13	Luwingu Main	TSB	Salli	1	18	12	30	4	1	3	0.48	0.00	1.50	1.75				
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Total				13	220	118	338	135	13	11.88	2.25	9.30	23.75	18.25	20.50	25.00	2.00	0.00
Last Year Started					220	118	338	135	13						21	25	2	0

Weir Type: 0: Natural Diversion, 1:Inclined, 2:Single-Line, 3:Double-Line, 4:Trigonal, 5:Masomy, 6:Sandwich line
Camp Name: fellow CEO

Table A.4.13 Detail of 2010 Pilot Project (Temporary Scheme) [Nakonde]

FORM 2: IMPROVEMENT (TEMPORARY)
SUBMIT to the Follow up Training in November, District: Nakonde, Province: Northern

: SITE PROFILE for SMALLHOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)

No.	Camp Name	Name of the CEO	Site Name: if this was constructed in 2009 under JICA, tick or indicate the year originally constructed.	No. of member farmers		No. of farmers who irrigated	No. of Land Owners	Weir Type	Original		Additional by Improvement in 2010		Original + Newly Irrigated Area, ha (a+b)	Compost Making		No. of Fish Pond		
				Male	Female				Total	Original Canal Length, km	Area originally irrigated, ha (a)	Canal Length newly dug, km		Opened Area in 2010, ha	Area newly irrigated in 2010, ha (b)	No. of farmers	No. of heaps	Original
1	Old iffe	Thadlus Mwaniba	Ibrahim A	7	2	9	1	2	0.30	1.00	0.00	2.50	1.50	2.50	17	1		
2	Old iffe	Thadlus Mwaniba	Ibrahim B	5	5	5	1	5	0.15	3.00	0.00	1.75	1.60	4.60				
3	Old iffe	Thadlus Mwaniba	Katzi	3	2	5	1	5	0.09	0.30	0.05	1.75	1.60	1.90				
4	Mwenzo	James Simbeye	Musesengoma	5	5	10	2	2	0.80	0.13	0.50	0.88	0.75	0.88				
5	Mwenzo	James Simbeye	Matipa	10	4	14	2	0	0.10	0.25	0.10	0.63	0.63	0.88				
6	Mwenzo	James Simbeye	Kalulu	11	4	15	3	0	1.00	0.75	0.05	0.63	0.50	1.25	15	1	2	1
7	Mwenzo	James Simbeye	Kasichila	3	3	6	1	0	0.10	0.50	0.03	0.73	0.63	1.13				
8	Mwenzo	James Simbeye	Wulungo	5	2	7	5	2	0.20	0.25	0.10	0.75	0.65	0.90				
9	Waiwika	Dan-Lee Mwaba	Chilonga	7	0	7	3	2	0.20	0.25	0.07	0.74	0.64	0.89				
10	Shem	Choolwe Hambwaza	Nangungulu	5	4	9	5	1	0.20	0.13	0.20	0.88	0.63	0.75				
11	Ilica	Grace Mvape	Muziwa A	5	0	5	1	2	0.30	0.25	0.05	0.75	0.75	1.00				
12	Kantongo	M. Mukelabai	Ilendela A	8	2	10	8	3	0.20	0.25	0.10	0.75	0.63	0.88			3	1
13	Kantongo	M. Mukelabai	Ilendela B	5	0	5	5	1	0.10	0.25	0.05	0.63	0.63	0.88				
14	TSB	K. Sakajilla	Musesengoma	7	2	9	7	3	0.05	0.13	0.02	0.88	0.63	0.75				
15	TSB	K. Sakajilla	Matipa	2	1	3	3	1	0.10	0.13	0.03	0.75	0.63	0.75			1	1
16	TSB	K. Sakajilla	Mosu A	5	0	5	3	1	0.04	0.13	0.10	1.00	0.75	0.88				
17	TSB	K. Sakajilla	Wulungo Forest	2	1	3	3	1	0.05	0.13	0.30	0.75	0.63	0.75			2	
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19																		
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	Total		17	0	95	32	127	94	27	3.98	7.80	1.75	16.72	13.74	21.54	32.00	8.00	3.00

IMPROVED SITE (TEMPORARY)

Weir Type: 0: Natural Diversion, 1: inclined, 2: Single-Line, 3: Double-Line, 4: Trigonai, 5: Masonry, 6: Sandwrich line
Camp Name: fellow CEO

Table A.4.14 Detail of 2010 Pilot Project (Temporary Scheme) [Isoka]

FORM 2: IMPROVEMENT (TEMPORARY)
 SUBMIT to the Follow up Training in November, District: Isoka, Province Northern

: SITE PROFILE for SMALLHOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)

No.	Camp Name	Name of the CEO	Site Name: if this was constructed in 2009 under JICA, tick or indicate the year originally constructed.	No. of member farmers		No. of farmers who irrigated	No. of Land Owners	Weir Type	Original			Additional by Improvement in 2010			Original + Newly Irrigated Area, ha (a+b)	Compost Making		No. of Fish Pond	
				Male	Female				Total	Original Canal Length, km	Area originally irrigated, ha (a)	Canal Length newly dug, km	Opened Area in 2010, ha	Area newly irrigated in 2010, ha (b)		No. of farmers	No. of heaps	Original	Newly Constructed
1	Lualizi	Kaluma Collins	Ndeke	17	19	36	25	6	4	2.50	1.00	0.00	2.00	1.80	2.80	40	39	1	0
2	Lualizi	Kaluma Collins	Sizala A	5	22	27	17	2	2	1.04	0.50	0.00	1.75	1.50	2.00	27	15	0	0
3	Nansala	P. Mwape	Chizako	11	15	26	26	2	2	2.00	1.00	0.20	0.00	0.00	1.00	14	1	2	0
4	Nansala	P. Mwape	Nansala Upper	10	10	20	16	16	2	1.50	1.50	0.20	2.00	1.75	3.25	29	2	2	0
5	Katwimbi	B. Chishimba	Masenje	20	8	28	15	10	2	3.00	2.00	0.00	3.00	2.00	4.00				
6	Longwe	R. Mpenbamoto	Longwe	11	7	18	10	11	0	0.90	0.75	0.00	2.00	1.50	2.25				
7	Nacisitu	TSB	Nacisitu A	11	10	21	8	4	0	1.50	0.80	0.20	2.00	1.50	2.30				
8	Chanama	Sampa B	Lupita	8	8	16	16	1	2	0.90	0.25	0.10	2.00	1.20	1.45			12	
9	Lualizi	C. Kaluma	Simukoko	1	2	3	3	1	2	0.50	1.00	0.00	1.00	0.50	1.50	3	3		1
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Total				94	101	195	136	77		13.84	8.80	0.70	15.75	11.75	20.55	113.00	60.00	17.00	1.00

Weir Type: 0: Natural Diversion, 1: inclined, 2: Single-Line, 3: Double-Line, 4: Trigonai, 5: Masonry, 6: Sandwich line
 Camp Name: fellow CEO

Table A.4.15 Detail of 2010 Pilot Project (Temporary Scheme) [Mansa]

FORM 2: IMPROVEMENT (TEMPORARY)
 SUBMIT to the Follow up Training in November, District: Mansa, Province Luapula, : SITE PROFILE for SMALLHOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)

No.	Camp Name	Name of the CEO	Site Name: if this was constructed in 2009 under JICA, tick or indicate the year originally constructed.	No. of member farmers		No. of farmers irrigated	No. of Land Owners	Weir Type	Original Canal Length, km	Original Area irrigated, ha (a)	Additional by Improvement in 2010		Original + Newly Irrigated Area, ha (a+b)	Compost Making		No. of Fish Pond				
				Male	Female						Canal Length newly dug, km	Opened Area in 2010, ha		Area newly irrigated in 2010, ha (b)	No. of farmers	No. of heaps	Original	Newly Constructed		
1	Kapyata	Melody S.	Kapyata	1	6	4	10	5	1	2	0.90	0.75	0.40	0.63	1.38	2	1			
2	Mhaso	Changwa K.	Talweka	1	20	10	30	10	1	3	0.08	0.50	0.00	0.00	0.50					
3	Chimfola	Michael Nondo	Chalwe	1	10	7	17	8	1	3	0.20	1.00	0.50	0.68	1.68				1	
4	Mutiti	Michael Nondo	Kapondo west		8	6	14	14	14	2	0.50	0.50	0.50	0.88	1.38	1	2		1	
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Total				4	36	21	57	23	3	1.68	2.75	1.40	2.19	4.93	3.00	3.00	1.00	1.00	0.00	
Last Year Started					44	27	71	37	17											

Weir Types: 0: Natural Diversion, 1: inclined, 2: Single-Line, 3: Double-Line, 4: Trigon, 5: Masonry, 6: Sandwich line
 Camp Name: yellow CEO

Table A.4.16 Detail of 2010 Pilot Project (Temporary Scheme) [Kawambwa]

FORM 2: IMPROVEMENT (TEMPORARY)
SUBMIT to the Follow up Training in November, District: KAWAMBWA Province LUAPULA : SITE PROFILE for SMALLHOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)

No.	Camp Name	Name of the CEO	Site Name, if this was constructed in 2009 under JICA, tick or indicate the year originally constructed.	No. of member farmers		No. of farmers who irrigated	No. of Land Owners	Weir Type	Original		Additional by Improvement in 2010		Original + Newly Irrigated Area, ha (a+b)	Compost Making		No. of Fish Pond Original	Newly Constructed			
				Male	Female				Original Canal Length, km	Area originally irrigated, ha (a)	Canal Length newly dug, km	Opened Area in 2010, ha		Area newly irrigated in 2010, ha (b)	No. of farmers			No. of heaps		
1	Nlenke	P. Mpongwe	Senga	12	10	22	14	2	1.00	1.50	0.60	2.00	1.50	3.00		2	1			
2	Nlenke	P. Mpongwe	Chipwalele	20	13	33	20	2	2.00	2.00	0.30	1.00	1.00	3.00		1	1			
3	Lusambo	P. Mpongwe	M. Makombola	8	2	10	10	8	1.00	2.00	0.10	0.50	0.50	2.50		2				
4	Lusambo	M. Chilandwe	Kampemba	13	6	19	11	4	1.00	3.00	0.10	0.50	0.50	3.50						
5	Muyemba	TSB	Milindu	10	5	15	4	1	0.50	0.50	0.20	1.00	1.00	1.50		2				
6	Luenta	TSB	Kapama	12	8	20	8	2	0.08	0.25	0.04	0.25	0.25	0.50						
7	Luenta	TSB	Kampemba	8	5	13	4	3	0.60	1.00	0.40	4.00	2.00	3.00						
8	Chibote	J. Kazembe	Mukaka	17	13	30	6	1	0.70	0.50	0.10	0.25	0.25	0.75	10	4	2			
9	Chibote	J. Kazembe	Misanfwa	16	8	24	2	2	0.20	0.25	0.05	1.25	1.00	1.25						
10	Chibote	J. Kazembe	Alex Chipasha	10	6	16	7	2	0.20	0.50	0.05	0.50	0.50	1.00						
11	Chibote	J. Kazembe	Kamanampango	7	6	13	5	2	0.40	0.25	0.15	0.25	0.25	0.50		4	2			
12	Folotiya	W. Sikaonga	Kanshamba	7	4	11	8	2	0.30	0.25	0.20	0.25	0.25	0.50	1	2				
13	Folotiya	W. Sikaonga	Chimbwi	5	3	8	5	2	1.20	0.60	1.00	1.00	1.00	1.60						
14	Folotiya	W. Sikaonga	Kapemba	6	4	10	2	2	1.00	0.25	0.50	0.50	0.50	0.75						
15	Folotiya	W. Sikaonga	Makanga	5	2	7	3	2	0.60	0.20	0.20	0.50	0.50	0.70						
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40																				
Total				15	0	15	95	251	109	64	10.78	13.05	3.99	13.75	11.00	24.05	11.00	6.00	13.00	8.00

IMPROVED SITE (TEMPORARY)

Weir Type: 0: Natural Diversion, 1: Inlined, 2: Single-Line, 3: Double-Line, 4: T: Trigonal, 5: Masonry, 6: Sandwich line
Camp Name: fellow CEO

Table A.4.17 Detail of 2010 Pilot Project (Temporary Scheme) [Mileenge]

FORM 2: IMPROVEMENT (TEMPORARY)
 SUBMIT to the Follow up Training in November, District: Mileenge, Province: Luapula, : SITE PROFILE for SMALLHOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)

No.	Camp Name	Name of the CEO	Site Name: if this was constructed in 2009 under JICA, tick or indicate the year originally constructed.	No. of member farmers			No. of Land Owners	Weir Type	Original		Additional by Improvement in 2010		Original + Newly Irrigated Area, ha (a+b)	Compost Making		No. of Fish Pond		
				Male	Female	Total			Original Canal Length, km	Area originally irrigated, ha (a)	Canal Length newly dug, km	Opened Area in 2010, ha		Area newly irrigated in 2010, ha (b)	No. of farmers	No. of heaps	Original	Newly Constructed
1	Mulumbi	Mukuna Bernard	Mulumbi	10	3	13	4	1	0	0.50	0.50	0.10	2.50	1.50	2.00			
2	Milambo	Matza hanganda	Milambo	4	2	6	2	2	3	0.70	0.10	0.20	1.50	1.00	1.10		1	
3	Kaberige	Mazunda Chimuka	Chiswishi	6	2	8	2	2	2	0.40	0.30	0.25	1.50	1.20	1.50			
4																		
5																		
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Total				3	0	20	7	27	8	5	1.60	0.90	0.55	5.50	3.70	4.60	0	0

IMPROVED SITE (TEMPORARY)

Weir Type: 0: Natural Diversion, 1:Inclined, 2:Single-Line, 3:Double-Line, 4:Trigonal, 5:Masonry, 6:Sandwich line
 Camp Name: fellow CEO

Table A.4.18 Detail of 2010 Pilot Project (Temporary Scheme) [Nchelenge]

IMPROVED SITE (TEMPORARY)

No.	Camp Name	Name of the CEO	Site Name; if this was constructed in 2009 under JICA, tick or indicate the year originally constructed.	No. of member farmers			No. of farmers who irrigated	No. of Land Owners	Weir Type	Original		Additional by Improvement in 2010		Original + Newly Irrigated Area, ha (a+b)	Compost Making		No. of Fish Pond	
				Male	Female	Total				Original Canal Length, km	Area originally irrigated, ha (a)	Canal Length newly dug, km	Opened Area in 2010, ha		Area newly irrigated in 2010, ha (b)	No. of farmers	No. of heaps	Original
1	Tusha	Kaunda L	Kabalenge	12	3	15	8	8	5	4.50	1.00	0.00	0.50	1.50	0	0	0	0
2																		
3																		
4																		
5																		
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38																		
39																		
40																		
Total				1	0	12	3	15	8	8	4.50	1.00	0.00	0.50	1.50	0	0	0

Weir Type: 0: Natural Diversion, 1: Inclined, 2: Single-Line, 3: Double-Line, 4: Trigonial, 5: Masonry, 6: Sandwich line
Camp Name: fellow CEO

Table A.4.19 Detail of 2010 Pilot Project (Temporary Scheme) [Mwense]

FORM 2: IMPROVEMENT (TEMPORARY)
 SUBMIT to the Follow up Training in November, District: Mwense Province Luapula

: SITE PROFILE for SMALLHOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)

No.	Camp Name	Name of the CEO	Site Name: if this was constructed in 2009 under JICA, tick or indicate the year originally constructed.	No. of member farmers		No. of Land Owners	Weir Type	Original		Additional by Improvement in 2010		Original + Newly Irrigated Area, ha (a+b)	Compost Making		No. of Fish Pond Newly Constructed					
				Male	Female			Total	No. of farmers irrigated	Original Canal Length, km	Area originally irrigated, ha (a)		Canal Length newly dug, km	Opened Area in 2010, ha		Area newly irrigated in 2010, ha (b)	No. of farmers	No. of heaps		
1	Mwense	C. Kananda	Chebele	11	7	18	12	8	1	1.0	2.0	0.00	2.00	4.00	18	1	7	2		
2	Mwense	C. Kananda	Kambo	20	25	45	0							0.00	45	1				
3	Mwense	C. Kananda	Chimbala	22	18	40	0							0.00	40	1				
4	Mubende	D. Nguni	Lumande	21	17	38	8	2	5	1.0	0.5	0.50	0.50	1.00	38	1	6	2		
5	Mubende	D. Nguni	Chibwemumpulu	6	5	11	8	2	1	1.5	0.8	0.50	2.50	1.00						
6	Mubende	D. Nguni	mubende	12	8	20	4	2	2	2.0	0.5	0.00	0.03	0.53						
7	Kalundu	B. Mulamba	Tambalala	18	12	30	16	1	4	1.0	0.5	0.50	2.50	3.00	30		10			
8	kashiba	L. Witika	Namukoselo	23	8	31	41	5	1	0.3	1.0	2.20	0.50	1.50	60	2				
9	kashiba	L. Witika	Mwense south	15	7	22	11	4	1	9.0	0.5	0.00	0.50	1.00	22		12			
10	kashiba	L. Witika	Mwense East	7	4	11	3	2	2	1.0	0.5	0.00	0.50	0.75						
11	kashiba	L. Witika	Machiluka	6	5	11	4	1	2	0.5	0.3	0.00	0.50	0.50						
12	Kamami	J. Mukuya	Kamami	30	40	70	15	40	2	15.0	1.0	0.00	6.00	2.00			17			
13	Musalango	B. Mukupa	Fisaka	13	7	20	7	1	3	2.0	6.0	0.00	12.00	12.00			1			
14	Musalango	B. Mukupa	Chone Bamba	12	8	20	3	1	1	0.5	0.0	0.50	1.25	1.00			2			
15	Musalango	B. Mukupa	Kafolya	10	5	15	4	1	1	1.5	0.8	0.00	1.00	1.75						
16	Lupososhi	J. Numbwa	Kafita	9	4	13	3	5	2	0.5	0.3	0.00	2.00	1.25						
17	Lubunda	S. Chungu	Muyabi	7	5	12	3	1	2	1.0	0.3	0.00	5.50	2.50						
18	Lubunda	S. Chungu	Mulonga	10	6	16	7	2	2	0.1	1.0	0.00	6.50	4.25						
19	Musonda	Chikonde R	Fimampelo	10	8	18	5	4	2	1.0	0.5	0.00	0.50	0.53			1			
20	Musonda	Chikonde R	Musafya	13	2	15	4	2	4	1.5	0.8	0.50	1.00	1.00						
21	Kalundu	B. Mulamba	Kapesa	10	2	12	2	1	2	0.5	0.3	0.50	1.00	0.50						
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34																				
35																				
36																				
37																				
38																				
39																				
40																				
Total				21	0	285	203	488	160	85	40.85	17.28	5.20	46.28	23.55	40.83	253	6	53	7

Weir Type: 0:Natural Diversion, 1:inclined, 2:Single-Line, 3:Double-Line, 4:Trigonal, 5:Masonry, 6:Sandwich line
 Camp Name: yellow CEO

A.4.4 Detail of 2010 Pilot Project (Newly Constructed Scheme)

Table A.4.20 Detail of 2010 Pilot Project (Newly Constructed Scheme) [Kasama]

SUBMIT to the Follow up Training in November, District: Kasama										Province Northern										SITE PROFILE for SMALLHOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)									
No.	Camp Name	Name of the CEO	Site Name: If this was firstly started by farmer themselves by seeing another site, tick.	No. of member farmers		No. of farmers who irrigated	No. of Land Owners	Weir Type	Done in This 2010 Dry Season		Plan for Next 2011 Dry Season		No. of Fish Pond Constructed																
				Male	Female				Canal Length to be dug, km	Irrigated Area in 2010, ha (a)	Additional Area to be irrigated, ha (b)	Total Area to be irrigated, ha (a+b)		No. of farmers	No. of heaps														
1	Chibote	E. Nakamanga	Molwani	1	10	6	16	10	2	2	2.20	0.80	0.40	1.20	18	6	2												
2	Chibote	E. Nakamanga	Lupungu		8	3	11	6	1	3	1.80	1.00	0.70	2.70															
3	Kasakula	M. Kalumbi	Pontini		17	5	22	16	2	2	3.00	1.20	1.00	0.50	1.50														
4	K Chisuma	W. Ngosa	Nsesamina	1	14	6	20	15	1	2	0.80	0.50	0.20	0.40	36	3													
5	Chibote	P. Kanda	Chikompe		10	6	16	11	4	3	2.00	1.20	0.80	0.30	28	5	1												
6	Munkonge	R. Bbela	Kabulubulu		6	3	9	6	3	3	1.60	0.40	0.20	0.30															
7	Mlungu	P. Kanda	Mwika	1	20	16	36	31	20	1	5.00	0.20	0.10	0.80															
8	K/ Central	E. Nakamanga	Misolo		8	7	15	0	1	2	3.00	4.00	1.00	1.50															
9	Mulobola	S. Musonda	Mulobola		5	3	8	0	2	2	0.80	0.90		0.80															
10	Misengo	S. Musonda	Salala		3	3	6	0	1	3	0.40	2.00		1.00															
11	Mlungu	S. Musonda	Chilyaeka		18	11	29	7	2	1	1.20	2.00	1.80	1.00															
12																													
13																													
14																													
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38																													
39																													
40																													
Total					3	119	69	188	102	39	21.80	14.20	6.20	8.00	14.20	82	14	3											

Weir Type: 0: Natural Diversion, 1:Inclined, 2:Single-Line, 3:Double-Line, 4:Trigonal, 5:Masomy, 6:Sandwich line
Camp Name: yellow CEO

Table A.4.21 Detail of 2010 Pilot Project (Newly Constructed Scheme) [Mbala]

No.	Camp Name	Name of the CEO	Site Name: If this was firstly started by farmer themselves by seeing another site, tick.	No. of member farmers		Province		Northern		Weir Type	Done in This 2010 Dry Season		Plan for Next 2011 Dry Season		No. of Fish Pond Constructed					
				Male	Female	Total	No. of farmers who irrigated	No. of Land Owners	Canal Length dug in 2010, km		Opened Area in 2010, ha	Irrigated Area in 2010, ha (a)	Canal Length to be dug, km	Additional Area to be irrigated, ha (b)		Total Area to be irrigated, ha (a+b)	No. of farmers	No. of heaps		
1	Tanzuka	Julius Mulenga	Isanzi	8	4	12	12	8	2	0.60	1.00	0.75	0.60	0.25	1.00					
2	Tanzuka	Julius Mulenga	Ntumba	7	3	10	10	6	4	0.40	1.00	1.00	0.50	0.50	1.50					
3	Kapesha	Cliff Kafula	Chipoko	7	5	12	12	2	2	1.50	1.20	1.00	0.75	0.50	1.50					
4	Maula	S. Simpso	Luomba	4	3	7	7	1	4	2.50	1.50	1.20	1.00	0.25	1.45	2				
5	Chindo	Farai Chigoye	Chikwanda	30	5	35	35	5	2	0.50	1.00	0.75	0.50	0.25	1.00					
6	Mpulumu	TSB	Kapanda	20	10	30	5	10	2	0.50	1.00	0.90	2.00	0.50	1.40					
7	Mpulumu	TSB	Iyendwe	30	10	40	40	10	4	2.00	1.50	0.50	0.50	0.25	0.75	4				
8	Mpulumu	TSB	Kapoko	40	10	50	5	5	5	2.00	1.00	0.50	2.00	1.00	1.50					
9	Nondo	C. Kaonga	Isusa	8	2	10	10	2	2	2.00	1.50	1.50	1.00	1.00	2.50					
10	Nondo	C. Kaonga	Muluzi	7	1	8	8	4	2	1.00	0.50	0.50	1.00	0.50	1.00					
11	Masamba	Francis Kasonde	Musisha	4	2	6	6	6	2	1.00	1.00	0.25	1.00	0.25	0.50					
12	Mambwe	Nicholus Kapaya	Kawala	10	9	19	19	19	2	4.50	30.00	1.00	0.00	1.00	2.00					
13	Kashesha	Cliff Kafula	Chilwa	7	3	10	10	3	2	0.60	1.00	0.50	0.50	0.20	0.70					
14	Tanzuka	Julius Mulenga	Chipando	10	6	16	16	3	3	1.50	1.50	1.00	0.60	0.50	1.50					
15																				
16																				
17																				
18																				
19																				
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31																				
32																				
33																				
34																				
35																				
36																				
37																				
38																				
39																				
40			Not irrigated sites	0																
Total				14		14	0	192	73	265	195	84	20.60	44.70	11.35	6.95	18.30	0	0	6

NEWLY CONSTRUCTED SITE (TEMPORARY)
 Weir Type: 0: Natural Diversion, 1:Inclined, 2:Single-Line, 3:Double-Line, 4:Trigonal, 5:Masomy, 6:Sandwich line
 Camp Name: yellow CEO

Table A.4.22 Detail of 2010 Pilot Project (Newly Constructed Scheme) [Mpika]

No.	Camp Name	Name of the CEO	Site Name: If this was firstly started by farmer themselves by seeing another site, tick.	No. of member farmers		No. of farmers who irrigated	No. of Land Owners	Weir Type	Canal Length dug in 2010, km	Done in This 2010 Dry Season		Plan for Next 2011 Dry Season		Compost Making		No. of Fish Pond Constructed	
				Male	Female					Opened Area in 2010, ha	Irrigated Area in 2010, ha	Canal Length in 2010, km	Additional Area to be irrigated, ha (b)	Total Area to be irrigated, ha (a+b)	No. of farmers		No. of heaps
1	Chintu	Deodatus Mwewa	Danger hill	20	10	30	6	2	2.00	1.00	1.00	4.00	4.00	5.00		1	
2	Chintu	Deodatus Mwewa	Mulenga kasomo	8	5	13	2	4	2.00	1.00	1.00	5.00	6.00	7.00	1	4	
3	Chintu	Deodatus Mwewa	Sunnise	20	10	30	20	2	2.00	1.00	1.00	2.60	3.00	4.00			
4	Mutamba	Patrista Malama	Kondo	10	4	14	4	4	3.00	2.00	0.75	5.00	2.00	2.75			
5	Chalwe	Josephine Ngulube	Nkupisha	7	5	12	0	2	2.00			2.50	2.00	2.00			
6	Chalwe	Josephine Ngulube	Chitindi	9	4	13	0	2	1.50			2.00	2.00	2.00			
7	Mpika main	Shila Mumba	Mirsoshi	21	9	30	9	4	1.00			2.00	3.00	3.00			
8	Mufubushi	Estella Nalupya	Mirsoshi	18	10	28	20	15	5.00	8.00	5.00	7.00	7.00	12.00			
9	Mufubushi	Estella Nalupya	Mufubushi	10	8	18	0	3	1.00			2.00	1.00	1.00			
10	Chishebesinde	Kalolo Simbeya	Lubangala	35	10	45	15	10	2.50	15.00	7.50	4.00	1.50	9.00			
11	Chishebesinde	Kalolo Simbeya	Chitope	15	12	27	10	4	1.50	15.00	0.75		1.00	1.75			
12	Chishebesinde	Kalolo Simbeya	Mulla	6	7	13	4	4	1.00	0.50	1.00	2.00	0.50	1.50		2	
13	Lulimala	Margin Phiri	Lulimala	21	9	30	0	2	1.00			1.50	0.50	0.50			
14	Lulimala	Margin Phiri	Luboshi	15	10	25	0	2	1.50			2.00	1.00	1.00			
15	Chundaponde	Jeff Mutiale	Lukulu														
16																	
17																	
18																	
19																	
20																	
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37																	
38																	
39																	
40																	
			6						27.00	43.50	18.00	41.60	34.50	52.50	6	1	7
			15	2	215	113	328	89	124								
			Not irrigated sites														
			Total														

Weir Type: 0: Natural Diversion, 1:Inclined, 2:Single-Line, 3:Double-Line, 4:Triangular, 5:Masonry, 6:Sandwich line
Camp Name: fellow CEO

Table A.4.23 Detail of 2010 Pilot Project (Newly Constructed Scheme) [Mporokoso]

SUBMIT to the Follow up Training in November, District: Mporokoso, Province: Northern										: SITE PROFILE for SMALLHOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)									
No.	Camp Name	Name of the CEO	Site Name: If this was firstly started by farmer themselves by seeing another site, tick.	No. of member farmers		No. of farmers who irrigated	No. of Land Owners	Weir Type	Done in This 2010 Dry Season	Plan for Next 2011 Dry Season	Compost Making		No. of Fish Pond Constructed						
				Male	Female						No. of farmers	No. of heaps							
1	S/Kapila	C. Chikasa	Kapiya	61	26	87	4	1	4	1.50	2.50	1.75	0.00	0.50	2.25				
2	S/Kapila	C. Chikasa	Potokoshi	18	11	29	6	1	4	0.50	1.50	0.75	1.50	2.75	3.50				
3	S/Kapila	C. Chikasa	Mpela	21	26	47	15	1	1	1.50	3.50	2.25	0.50	1.00	3.25		2		
4	S/Kapila	C. Chikasa	Mukolwe	45	25	70	2	1	3	0.50	1.13	0.63	10.00	15.00	15.63				
5	M/Mapesa	C. Chikasa	Kalanda	15	10	25	2	1	2	0.50	2.50		3.00	3.00					
6	M/Mapesa	B. Mweemba	Mullia	10	6	16	8	1	2	0.50	1.50	1.00	0.50	0.50	1.50				
7	M/Mapesa	B. Mweemba	Mullia	8	2	10	4	1	4	0.50	2.50	1.00	0.50	0.50	1.50				
8	M/Kaoma	O. Musowa	M/Kaoma	19	7	26	11	1	2	5.50	3.50	1.50	0.50	0.50	2.00		4		
9	Chiwala	Gift Malumo	Fisaka	8	4	12	1	1	1	0.80	2.50	0.75	0.50	1.00	1.75		6		
10	Chiwala	Gift Malumo	Kanjale	11	5	16	3	1	2	1.20	3.50		1.00	0.50	0.50				
11	Chiwala	Gift Malumo	Minkomaule	4	9	13	2	1	3	2.00	4.50	0.75	1.50	2.00	2.75				
12	Mutitima	N. Phiri	Kantanga	7	4	11	3	1	2	1.50	3.50	0.75	0.50	0.50	1.25				
13	Munyele	J. Simwiringa	Kananda	7	3	10	10	1	1	0.05	2.50	1.00	1.00	3.00	4.00		2		
14	Munyele	J. Simwiringa	Matete	6		6	6	1	2	0.30	1.25	0.75	0.50	0.75	1.50				
15	Munyele	J. Simwiringa	Kananda	5	5	10	3	1	1	0.05	5.50	0.75	2.00	2.00	2.75				
16	District	TSB	Kasanda	1	5	20	11	1	3	1.06	2.00	1.50	1.00	1.50	3.00		5		
17	M/Kaoma	O. Musowa	Kalimanshila	10	8	18	15	1	2	4.00	2.00	1.25	1.00	1.00	2.25		3		
18																			
19																			
20																			
21																			
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38																			
39																			
40																			
Total				2	270	421	106	17		21.96	45.88	16.38	25.50	36.00	52.38	0	0	22	

Weir Type: 0: Natural Diversion, 1:Inclined, 2:Single-Line, 3:Double-Line, 4:Trigonal, 5:Masonry, 6:Sandwich line
Camp Name: yellow CEO

Table A.4.24 Detail of 2010 Pilot Project (Newly Constructed Scheme) [Mungwi]

SUBMIT to the Follow up Training in November, District: Mungwi, Province: Northern

: SITE PROFILE FOR SMALLHOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)

No.	Camp Name	Name of the CEO	Site Name: If this was firstly started by farmer themselves by seeing another site, tick.	No. of member farmers			No. of farmers who irrigated	No. of Land Owners	Weir Type	Done in This 2010 Dry Season			Plan for Next 2011 Dry Season			No. of Fish Pond Constructed	
				Male	Female	Total				Canal Length dug in 2010, km	Opened Area in 2010, ha	Irrigated Area in 2010, ha (a)	Canal Length to be dug, km	Additional Area to be irrigated, ha (b)	Total Area to be irrigated, ha (a+b)		No. of farmers
1	Nseluka	Beauty C.	Chatolwa2	5	0	5	5	2	2	0.40	1.00	0.75	2.00	1.00	1.75	5	
2	Nseluka	Beauty C.	Chambashi 1	7	5	12	2	1	2	0.30	0.25	0.25	1.00	1.00	1.25	3	
3	Nseluka	Beauty C.	Chambashi 2	20	0	20	0	10	2	0.20	0.00		5.00	0.00	0.00	6	
4	Nseluka	Beauty C.	Kapata	29	10	39	0	5	2	0.00	0.00		3.00	0.00	0.00	9	
5	Mungwi	W. Banda	Chale 1	10	5	15	10	5	2	0.50	0.30	0.30	1.00	1.60	1.90		
6	Mungwi	W. Banda	Chale 2	8	4	12	12	4	2	0.30	0.60	0.60	1.20	1.00	1.60		
7	Maiolo S.	R. Mwenya	Tompwe	30	20	50	6	17	1	0.90	0.25	0.25	1.00	1.00	1.25		
8	Maiolo S.	R. Mwenya	Munyema	13	4	17	1	8	2	1.50	0.13	0.13	0.50	0.50	0.63		
9	Maiolo S.	R. Mwenya	Bwambi	8	0	8	4	3	1	0.05	0.12	0.12	0.80	0.50	0.82		
10	Chonya	R. Chanda	Perjala	20	4	24	19	10	2	1.50	0.50	0.50	1.00	1.00	1.50		
11	Rosa	Suzyo Nguni	Shimpa B	6	0	6	6	2	2	1.00	1.00	1.00	1.00	1.00	2.00		
12	Chandaweyaya	Elvis Nsunge	Sampa	20		20	0	10	2	6.00	0.00		6.00		0.00		
13	Kafusha	Chiza Museteka	Changala	10	5	15	14	4	2	1.00	0.40	0.40	0.30	0.40	0.80		
14	Kafusha	Chiza Museteka	Tukuta	15	7	22	18	6	2	2.00	0.70	0.70	0.60	1.00	1.70		
15	Makasa	Cornrius Chibale	Makasa hills	30	5	35	28	15	2	3.00	0.30	0.30	0.50	0.20	0.50		
16	Kayambi	Cornrius Chibale	Lundesha	15	10	25	20	8	2	1.00	0.75	0.75	1.00	0.50	1.25		
17	Kayambi	Cornrius Chibale	Mpande	18	9	27	25	10	2	1.50	1.00	1.00	0.50	1.00	2.00		
18	Mungwi	J. Mulienga	Ngulula	30	15	45	40	15	2	2.00	3.00	3.00	0.50	0.50	3.50		
19																	
20																	
21																	
22																	
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34																	
35																	
36																	
37																	
38																	
39																	
40																	
				3													
Total				294	103	397	210	135		23.15	10.30	10.05	26.90	12.20	22.25	23	0

Weir Type: 0: Natural Diversion, 1: Inclined, 2: Single-Line, 3: Double-Line, 4: Trigonal, 5: Masonry, 6: Sandwich line
Camp Name: fellow CEO

Table A.4.25 Detail of 2010 Pilot Project (Newly Constructed Scheme) [Luwingu]

SUBMIT to the Follow up Training in November, District: Luwingu, Province Northern

: SITE PROFILE for SMALLHOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)

No.	Camp Name	Name of the CEO	Site Name: If this was firstly started by farmer themselves by seeing another site, tick.	No. of member farmers			No. of farmers who irrigated	No. of Land Owners	Weir Type	Done in This 2010 Dry Season			Plan for Next 2011 Dry Season			No. of Fish Pond Constructed	
				Male	Female	Total				Canal Length dug in 2010, km	Opened Area in 2010, ha	Irrigated Area in 2010, ha (a)	Canal Length to be dug, km	Additional Area to be irrigated, ha (b)	Total Area to be irrigated, ha (a+b)		No. of farmers
1	Mufili	Bwalya Giles	mabula	26	8	34	16	1	0	0.30	4.25	3.50	1.00	2.00	5.50		
2	Mufili	Bwalya Giles	Lwenge	12	6	18	7	1	2	0.40	1.00	0.25	2.50	1.50	1.75		
3	Mufili	Bwalya Giles	Chebela	11	7	18	0	1	0	0.40	0.50		1.00	1.50	1.50		
4	Mufili	Bwalya Giles	Matwi	8	5	13	9	1	0	0.45	1.00	0.50	0.30	1.00	1.00		
5	Shimumbi	Nyirenda A	kandata	6	6	12	0	1	0	0.30	0.00		1.00	3.00	3.00		
6	Mapulanga	Chieshe B	Amalamba	20	12	32	0	1	2	0.50	0.00		0.50	3.00	3.00		
7	Mapulanga	Chieshe B	Kampashi	23	6	29	8	1	0	1.00	1.50	1.50	1.00	1.00	2.50		
8	Mapulanga	Chieshe B	Mulabalala	22	9	31	0	1	2	0.60			0.60	4.00	4.00		
9	Mutoro	Mumbal Kelvin	Mulilashi	30	23	53	0	1	2	0.27	0.25		2.75	2.00	2.00		
10	Tungati	Kombe Mark	Nsenga	9	8	17	8	1	0	0.60	0.75	0.25	1.00	1.50	1.75		
11	Luwingu Main	TSB	Lina	22	9	31	3	3	2	4.00	0.25	0.25	2.00	5.00	5.25		
12	Luwingu Main	TSB	Musonda Mboo	31	11	42	28	1	0	1.70	1.20	0.90	3.00	6.00	6.90		
13	Mucheleka	TSB	Mwine musunga	8	4	12	4	1	0	0.35	0.13	0.13	1.00	1.00	1.13		
14	Mucheleka	TSB	Chansaula	7	5	12	0	2	0	0.40	0.25		1.00	2.00	2.00		
15																	
16																	
17																	
18																	
19																	
20																	
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31																	
32																	
33																	
34																	
35																	
36																	
37																	
38																	
39																	
40																	
				Not irrigated sites	6												
Total				14	0	235	119	354	83	17	11.27	11.08	7.28	18.65	32.50	39.78	0

NEWLY CONSTRUCTED SITE (TEMPORARY)

Weir Type: 0: Natural Diversion, 1: inclined, 2: Single-Line, 3: Double-Line, 4: Trigonal, 5: Masonry, 6: Sandwich line
Camp Name: fellow CEO

Table A.4.26 Detail of 2010 Pilot Project (Newly Constructed Scheme) [Nakonde]

SUBMIT to the Follow up Training in November, District: Nakonde, Province Northern

No.	Camp Name	Name of the CEO	Site Name: If this was firstly started by farmer themselves by seeing another site, tick.	No. of member farmers		No. of Land Owners	Weir Type	Done in This 2010 Dry Season		Plan for Next 2011 Dry Season		Compost Making		No. of Fish Pond Constructed			
				Male	Female			Canal Length dug in 2010, km	Opened Area in 2010, ha	Irrigated Area in 2010, ha (e)	Canal Length to be dug, km	Additional Area to be irrigated, ha (b)	Total Area to be irrigated, ha (a+b)		No. of farmers	No. of heaps	
1	Old fife	Thadius Mwamba	Koiazi	8	0	8	1	5	0.80	1.00	1.00	0.50	1.50	15	1		
2	Old fife	Thadius Mwamba	Vyonga	14	4	18	3	1	0.25	1.00	1.00	0.50	1.50	24	1		
3	Old fife	Thadius Mwamba	Muji	17	0	17	3	1	0.25	0.50	0.50	1.00	1.00	12	1		
4	Old fife	Thadius Mwamba	Izongolo	8	0	8	1	2	0.04	0.50	0.75	0.50	0.50	18	1		
5	Mwanzo	James Simbeye	Nega	13	2	15	3	1	1.00	1.00	0.75	0.10	1.25	25	3		
6	Mwanzo	James Simbeye	Mikuwa A.	13	0	13	1	3	0.80	0.65	0.63	1.00	0.50	20	1		
7	Mwanzo	James Simbeye	Mikuwa C1 A	5	4	9	3	1	0.10	0.65	0.63	1.00	0.05	15	2		
8	Shern	C. Haribwaza	Shern	2	8	10	8	1	0.25	1.00	0.63	2.00	1.00	15	1		
9	Ilola	Grace Mwape	Namalungu	6	2	8	6	3	0.30	0.75	0.75	1.00	1.75	15	2	1	
10	Ilola	Grace Mwape	Muziva B	8	3	11	8	2	0.10	0.70	0.63	0.50	0.75	10	1		
11	Ilola	Grace Mwape	Kaku	9	2	11	4	1	0.50	0.70	0.63	0.50	0.25	9	1		
12	Ilola	Salius Mwansa	yalamanga	7	6	13	10	3	0.20	0.25	0.13	0.50	0.50	15	3		
13	TSB	K. Sakajila	Musanza	17	3	20	7	5	1.20	1.75	1.25	1.00	1.00	20	1	3	
14	TSB	K. Sakajila	Sakatila	5	2	7	5	2	0.20	1.00	0.63	1.00	1.00	10	1		
15	TSB	K. Sakajila	Mikuwa C1 B	5	2	7	0	1	0.50	1.25		0.25	0.25	10	1		
16	TSB	K. Sakajila	Movu iyoto B	6	3	9	3	1	0.50	0.50	0.50	0.50	0.25	15	1		
17				10	2	12	4	2	0.70	0.63	0.63	0.50	1.13	12	1		
18																	
19																	
20																	
21																	
22																	
23																	
24																	
25																	
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34																	
35																	
36																	
37																	
38																	
39																	
40																	
				1													
Total				16	43	196	84	30	7.69	13.83	10.50	12.35	9.30	19.30	260	23	4

NEWLY CONSTRUCTED SITE (TEMPORARY)

Weir Type: 0: Natural Diversion, 1: Inclined, 2: Single-Line, 3: Double-Line, 4: Trigon, 5: Masonry, 6: Sandwitch line
Camp Name: fellow CEO

Table A.4.27 Detail of 2010 Pilot Project (Newly Constructed Scheme) [Isoka]

SUBMIT to the Follow up Training in November, District: Isoka, Province Northern, : SITE PROFILE for SMALLHOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)

No.	Camp Name	Name of the CEO	Site Name: If this was firstly started by farmer themselves by seeing another site, tick.	No. of member farmers		No. of farmers who irrigated	No. of Land Owners	Weir Type	Done in This 2010 Dry Season		Plan for Next 2011 Dry Season		Compost Making		No. of Fish Pond Constructed		
				Male	Female				Canal Length dug in 2010, km	Opened Area in 2010, ha	Irrigated Area in 2010, ha (a)	Canal Length to be dug, km	Additional Area to be irrigated, ha (b)	Total Area to be irrigated, ha (a+b)		No. of farmers	No. of heaps
1	Lualizi	Collins Kaluma	Sizala B	13	14	27	6	3	0.21	6.00	2.00	0.79	1.00	3.00	77	54	1
2	Lualizi	Collins Kaluma	Mugata	3	0	3	3	4	0.20	3.00	2.00	0.25	2.00	4.00	3	3	
3	Mpandwa	Peter Zimba	Mulamba	18	13	31	10	4	0.02	0.00	0.00	1.00	2.00	2.00	31	31	
4	Statambule	Kunda Elijah	Statambule	31	5	36	0	4	0.00	0.00	0.40	1.00	3.00	3.00	36	9	
5	Lungwe	R. Mpembamoto	Chawa	7	8	15	5	1	0.40	0.40	0.40	0.50	5.00	5.40	15	5	
6	Nzoche	G. Tembo	Boundary	12	7	19	11	2	0.10	4.00	1.25	1.50	3.00	4.25	19	6	1
7	Ntipp	G. Chilisheshe	Chiwanda	5	4	9	9	5	0.20	4.30	2.00	1.50	0.75	2.75	9	9	2
8																	
9																	
10																	
11																	
12																	
13																	
14																	
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16																	
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32																	
33																	
34																	
35																	
36																	
37																	
38																	
39																	
40																	
Total				89	51	140	58	21	1.13	17.70	7.65	6.54	16.75	24.40	190	117	4

NEWLY CONSTRUCTED SITE (TEMPORARY)

Weir Type: 0: Natural Diversion, 1:Inclined, 2:Single-Line, 3:Double-Line, 4:Trigonal, 5:Masonry, 6:Sandwich line
Camp Name: fellow CEO

Table A.4.28 Detail of 2010 Pilot Project (Newly Constructed Scheme) [Mansa]

SUBMIT to the Follow up Training in November, District: Mansa											: SITE PROFILE for SMALLHOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)										
No.	Camp Name	Name of the CEO	Site Name: If this was firstly started by farmer themselves by seeing another site, tick.	No. of member farmers			No. of farmers who irrigated	No. of Land Owners	Weir Type	Done in This 2010 Dry Season		Irrigated Area in 2010, ha	Canal Length dug in 2010, km	Additional Area to be irrigated, ha (a)	Total Area to be irrigated, ha (a+b)	Compost Making		No. of Fish Pond Constructed			
				Male	Female	Total				No. of farmers	No. of heaps										
1	Chimfula	Nondo Michael	Mukuku	1	7	18	1	3	0.10	1.13	1.13	0.50	1.63	1	1	4					
2	Chimfula	Nondo Michael	Nachabala	7	3	10	2	2	0.50	0.63	0.63	0.50	1.13	3	1						
3	Chimfula	Nondo Michael	Fitwingili	8	7	15	1	0	0.20	0.94	0.94	0.50	1.44			2					
4	Mbaso	Changwa K.	Nchichi waba billi	7	3	10	0	2	0.00	0.00	0.00	0.50	0.50			1					
5	Mbaso	Changwa K.	Umunwe umo	10	5	15	0	2	0.00	0.00	0.00	10.00	10.00								
6	Kapayata	Melody S.	Kallia	7	6	13	0	2	0.00	0.00	0.00	7.00	7.00								
7	Kale	Helwiti L.	Nkanga	3	2	5	2	2	0.03	1.50	0.50	2.50	3.00								
8	R. Scheme	Helwiti L.	Mantapala	18	11	29	0	1	0.80	0.00	0.00	4.00	4.00								
9	R. Scheme	Helwiti L.	Bomba Iya	5	0	5	0	3	0.60	0.00	0.00	4.00	4.00								
10	R. Scheme	Helwiti L.	Twafwane	5	5	10	0	2	0.45	0.00	0.00	2.00	2.00								
11	Musalla	Wamara M.	Luapula	7	3	10	0	1	0.00	0.00	0.00	5.00	5.00			7					
12																					
13																					
14																					
15																					
16																					
17																					
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32																					
33																					
34																					
35																					
36																					
37																					
38																					
39																					
40		Not irrigated sites	7																		
Total				11	3	88	52	140	45	17	2.68	4.38	3.19	9.15	36.50	39.69	2.00	4.00	14		

Weir Type: 0:Natural Diversion, 1:Inclined, 2:Single-Line, 3:Double-Line, 4:Trigonal, 5:Masonry, 6:Sandwich line
Camp Name: fellow CEO

Table A.4.29 Detail of 2010 Pilot Project (Newly Constructed Scheme) [Kawambwa]

SUBMIT to the Follow up Training in November, District: Kawambwa, Province Luapula														: SITE PROFILE for SMALLHOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)									
No.	Camp Name	Name of the CEO	Site Name: If this was firstly started by farmer themselves by seeing another site, tick	No. of member farmers		No. of farmers who irrigated	No. of Land Owners	Weir Type	Done in This 2010 Dry Season		Plan for Next 2011 Dry Season		Additional Area to be irrigated, ha (a-b)	Total Area to be irrigated, ha (a+b)	No. of farmers	No. of heaps	No. of Fish Pond Constructed						
				Male	Female				Canal Length dug in 2010, km	Opened Area in 2010, ha	Canal Length to be dug, km	Total Area to be irrigated, ha (a)											
1	Nieke	P. Pongwe	Kolwe	8	6	14	3	10	3	1.00	2.50	2.00	5.00	7									
2	Lwambo	P. Pongwe	Kampemba	11	9	20	12	12	3	0.30	1.00	1.00	2.00	3									
3	Lwambo	P. Pongwe	Chiboya	22	14	36	10	20	4	0.30	1.00	1.00	2.00	3									
4	Lwambo	P. Pongwe	Katwala	14	8	22	0	10	4	0.00	0.00	1.50	4.00	4									
5	Nienie	P. Pongwe	Mukanushi	10	9	19	0	11	4	0.00	0.00	2.00	3.00	3									
6	Munkanta	P. Pongwe	Kasanda	12	10	22	14	16	3	0.80	1.50	1.50	2.00	3.5									
7	Nienie	P. Pongwe	Senga	10	6	16	5	12	4	0.20	1.00	1.00	2.00	3									
8	Lusambo	P. Pongwe	Mipanga	17	10	27	0	15	4	0.00	0.00	1.00	3.00	3									
9	Lusambo	P. Pongwe	Chaba	13	11	24	0	16	3	0.00	0.00	1.50	3.00	3									
10	Miyembe	TSB	Svalimalanda	15	8	23	4	2	2	0.70	1.00	1.00	4.00	5.00									
11	Shinonde	TSB	Mabumba	10	8	18	6	4	2	0.80	1.50	1.50	2.00	3.50									
12	Nienie	TSB	Malombola	8	6	14	4	3	4	0.05	0.25	0.25	4.00	4.25									
13	Nienie	TSB	Chansa Manewe	12	10	22	3	4	1	0.10	0.25	0.25	2.00	2.25									
14	Chibote	T. Kazembe	Fikatwe	1	8	2	10	4	1	2	0.14	0.25	0.40	2.00	2.25	3							
15	Chibote	T. Kazembe	Mupoposhi	1	7	5	12	6	1	2	0.10	0.25	0.50	2.00	2.25	1							
16	Chibote	T. Kazembe	Miyafi	1	11	4	15	2	1	2	0.60	0.25	2.00	3.25	2.25								
17	Chibote	T. Kazembe	Busuku	1	7	5	12	4	1	2	0.40	0.25	2.00	2.25	2.25								
18	Fotiya	W. Sikaonga	Kampemba	6	2	8	2	2	2	0.12	0.50	0.50	0.00	0.50									
19	Fotiya	W. Sikaonga	Chapakasa	5	3	8	2	1	2	0.20	0.10	0.10	0.50	0.60									
20	Fotiya	W. Sikaonga	Balondo	9	6	15	6	8	2	0.20	0.25	0.25	2.00	2.25									
21	Fotiya	W. Sikaonga	Chifinsa	13	4	17	8	5	2	0.15	0.50	1.50	1.50	1.75									
22	Fotiya	W. Sikaonga	Mpashi	9	7	16	7	4	2	0.30	0.50	1.70	1.50	2.00									
23	Fotiya	W. Sikaonga	Ndulwe	10	4	14	7	2	2	0.15	0.25	1.20	2.00	2.25									
24	Fotiya	W. Sikaonga	Nkulu	8	5	13	9	2	2	0.10	0.25	2.00	2.50	2.75									
25																							
26																							
27																							
28																							
29																							
30																							
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32																							
33																							
34																							
35																							
36																							
37																							
38																							
39																							
40		Not irrigated sites	4																				
		Total	24	4	255	162	417	118	163	6.71	13.35	12.60	57.00	69.60	6	1	3						

Weir Type: 0: Natural Diversion, 1:Inclined, 2:Single-Line, 3:Double-Line, 4:Trigonal, 5:Masomy, 6:Sandwich line
Camp Name: fellow CEO

Table A.4.30 Detail of 2010 Pilot Project (Newly Constructed Scheme) [Milenge]

SUBMIT to the Follow up Training in November, District: Milenge, Province: Luapula, : SITE PROFILE for SMALL-HOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)

No.	Camp Name	Name of the GEO	Site Name: If this was firstly started by farmer themselves by seeing another site, tick.	No. of member farmers		No. of farmers who irrigated	No. of Land Owners	Weir Type	Done in This 2010 Dry Season			Plan for Next 2011 Dry Season			Compost Making		No. of Fish Pond Constructed
				Male	Female				Total	Canal Length dug in 2010, km	Opened Area in 2010, ha	Irrigated Area in 2010, ha (a)	Canal Length to be dug, km	Additional Area to be irrigated, ha (b)	Total Area to be irrigated, ha (a+b)	No. of farmers	
1	Mupita	Mwanda Brian	Kansanda	9	7	16	16	2	0.20	1.50	1.00	2.00	1.00	2.00	16		
2	Mupita	Mwanda Brian	Kalali	7	3	10	0	4	0.00	0.00		3.00	0.50	0.50			
3	Kapalala	Ponde Jstone	Kantupu	16	10	26	5	0	0.25	1.75	1.25	1.50	1.50	2.75	26		5
4	Sokontwe	Besa Philip	Ngubwe	8	4	12	8	0	0.30	0.70	0.50	1.00	0.20	0.70	26		
5	Kasangwe	Mazunda C.	Butute	5	4	9	6	1	0.20	0.80	0.60	1.00	0.50	1.10	10		6
6	Milambo	Maiza H	Itemba	6	4	10	7	1	0.20	0.50	0.20	2.00	1.00	1.20	3		3
7	Milumbi	Mukuma B.	NGO	5	1	6	2	3	0.30	1.00	0.80	3.00	1.50	2.30			2
8	Milumbi	Mukuma B.	Chiswishi	23	3	26	5	26	0.30	2.00	1.00	3.00	1.50	2.50			
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
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32																	
33																	
34																	
35																	
36																	
37																	
38																	
39																	
40																	
			Not Irrigated sites	1					1.75	8.25	5.35	16.50	7.70	13.05	78	0	16
			Total	0	79	36	115	49	70								

NEWLY CONSTRUCTED SITE (TEMPORARY)

Weir Type: 0: Natural Diversion, 1: inclined, 2: Single-Line, 3: Double-Line, 4: Trigonal, 5: Masonry, 6: Sandwich line
Camp Name: fellow CEO

Table A.4.31 Detail of 2010 Pilot Project (Newly Constructed Scheme) [Nchelenge]

SUBMIT to the Follow up Training in November, District: Nchelenge, Province: Luapula, : SITE PROFILE for SMALLHOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)

No.	Camp Name	Name of the CEO	Site Name: If this was firstly started by farmer themselves by seeing another site, tick.	No. of member farmers		No. of farmers who irrigated	No. of Land Owners	Weir Type	Done in This 2010 Dry Season		Plan for Next 2011 Dry Season		Compost Making		No. of Fish Pond Constructed		
				Male	Female				Canal Length dug in 2010, km	Opened Area in 2010, ha	Irrigated Area in 2010, ha (a)	Canal Length to be dug, km	Additional Area to be irrigated, ha (b)	Total Area to be irrigated, ha (a+b)		No. of farmers	No. of heaps
1	Mwatishi	L. Mukwanje	Mwatishi	8	7	15	4	2	1	0.50	0.50	7.00	4.00	4.50			
2	Mulanga	L. Mukwanje	Katuiwa	7	2	9	6	7	4	0.40	0.75	4.00	3.00	3.75			
3	Kanyembo	Mpumpo W.	Katele	11	5	16	4	3	4	0.40	1.00	2.10	3.75	4.75			
4	Tusha	Kaunda L F	Tusha	7	3	10	5	2	0	1.50	2.00	1.50	3.00	3.75		8	
5	Kenani	Mupeteka B	Kasensele	4	3	7	3	1	2	0.50	0.75	0.50	1.00	1.75			
6	Central	Mupeteka B	Kambili	3	1	4	2	1	2	0.30	0.50	0.80	1.50	2.00			
7	Tusha	Kaunda L F	Mbereshi	7	6	13	3	7	1	0.35	3.00	3.00	4.00	4.75			
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
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31																	
32																	
33																	
34																	
35																	
36																	
37																	
38																	
39																	
40																	
Total				0													
Total				7	0	47	27	74	27	23	3.95	8.50	18.90	20.25	25.25	0	8

NEWLY CONSTRUCTED SITE (TEMPORARY)

Weir Type: 0: Natural Diversion, 1: Inclined, 2: Single-Line, 3: Double-Line, 4: Trigonial, 5: Masonry, 6: Sandwich line
Camp Name: fellow CEO

Table A.4.32 Detail of 2010 Pilot Project (Newly Constructed Scheme) [Mwense]

: SITE PROFILE for SMALLHOLDER IRRIGATION DEVELOPMENT (Temporary Scheme)

No.	Camp Name	Name of the CEO	Site Name: If this was firstly stated by farmer themselves by seeing another site, tick.	No. of member farmers		No. of farmers who irrigated	No. of Land Owners	Weir Type	Done in This 2010 Dry Season		Plan for Next 2011 Dry Season		Compost Making		No. of Fish Pond Constructed			
				Male	Female				Canal Length dug in 2010, km	Opened Area in 2010, ha	Irrigated Area in 2010, ha	Additional Area to be irrigated, ha (b)	Total Area to be irrigated, ha (a+b)	No. of farmers		No. of heaps		
1	Mwense	C. Kananda	Roads camp	6	11	17	1	4	1.00	3.00	2.00	1.00	0.50	2.50	16	2	6	
2	Mwense	C. Kananda	Chonge	8	4	12	8	1	1.00	3.50	2.00	1.00	0.50	2.50	12	1		
3	Musangu	F. Bweliya	Tente	8	6	14	14	1	2.00	0.75	0.50	1.00	1.00	1.50	14	1	1	
4	Musalango	B. Mukupa	Mukabi	12	9	21	4	4	1.00	3.00	1.25	8.00	0.50	1.75				
5	Musalango	B. Mukupa	Mullia	10	6	16	3	6	1.00	1.00	1.00	2.00	1.00	2.00			1	
6	Mubende	D. Nguni	Kasengu	13	6	19	6	5	0.50	1.50	1.00	1.00	1.00	2.00				
7	Mubende	D. Nguni	Chiposa	25	8	33	16	4	0.50	0.50	0.50	0.50	0.50	1.00				
8	Kalundu	B. Muliamba	Nlika	9	6	15	3	2	0	0.50	2.25	1.30	0.50	2.00	1	1		
9	Kalundu	B. Muliamba	Kapasa	15	10	25	0	3	0	0.00	0.00	0.00	0.00	0.00	4	3	3	
10	Kalundu	B. Muliamba	Milayi	20	15	35	15	5	4	0.40	2.50	1.50	1.00	0.25	1.75		18	
11	Lupososhi	Numbwa. J	Kalita	20	15	35	10	2	2	2.00	3.00	2.00	0.00	2.25	10	1		
12	Lupososhi	Numbwa. J	Abraham	5	3	8	2	1	3	0.50	1.00	0.50	0.00	0.75	8	1		
13	Lupososhi	Numbwa. J	Fitululu	18	4	22	4	2	3	0.50	2.00	1.00	0.00	1.50	20	1		
14	Lupososhi	Numbwa. J	Shamamba(School)			0	2	3	1	0.25	0.25	1.00	0.25	1.25	School	1		
15	Numbwa	J. Kawama	Nonga	15	6	21	4	25	2	0.50	0.50	1.00	1.25	1.75		8		
16	Numbwa	J. Kawama	Numbwa upper	8	4	12	4	6	4	0.60	0.50	1.20	1.50	2.00				
17	Numbwa	J. Kawama	Numbwa lower	4	2	6	4	2	1	0.10	0.50	1.00	1.00	1.50				
18	Kamami	J. Mukuya	mawonde	8	10	18	8	2	2	0.50	0.25	0.40	0.50	0.75			2	
19	Kamami	J. Mukuya	Kapemba	7	10	17	12	2	2	0.40	0.25	0.40	0.25	0.50			1	
20																		
21																		
22																		
23																		
24																		
25																		
26																		
27																		
28																		
29																		
30																		
31																		
32																		
33																		
34																		
35																		
36																		
37																		
38																		
39																		
40			1															
Total				19	0	211	135	346	130	101	13.25	26.25	17.75	11.50	29.25	85	12	40

NEWLY CONSTRUCTED SITE (TEMPORARY)

Weir Type: 0: Natural Diversion, 1: Inclined, 2: Single-Line, 3: Double-Line, 4: Trigon, 5: Masonry, 6: Sandwich line
Camp Name: yellow CEO

A.4.5 Detail of 2010 Pilot Project (Permanent Scheme)

Table A.4.33 Profile of the Permanent Diversion Schemes for the 2010 Pilot Project Implementation

Province District	Site Name Club Name	Membership: Total, Male, Female, (L. owner) Village concerned	With Permanent weir: Irrigated area in 2010 Designed Irrigated area Potential area	Type of structure Dimension	Construction Cost, Materials, ZMK Tools, ZMK Transportation, ZMK Skilled Labor, ZMK Total, ZMK	Activity in 2009 under COBSI Area Irrigated with simple
Northern Luwingu	Chaiteka site Milandu Irrigation Group	25, 13, 12, (25) Chaiteka	2010: 3.00 ha Designed: 5.00 ha Potential: 6.25ha	Masonry Height: 2.0 m Length: 12.0 m	16,160,000 5,450,000 7,100,000 3,700,000 32,410,000	New site A simple weir construction 4 km furrow digging 2009: 0.25 ha
Mpika	Malashi site Ubulini Tabupwa Farming Group	53, 27, 26, (16) Chisowa-A: 11, 6, 5 Chisowa-B: 40, 20, 20 Chiponva: 2, 1, 1	2010: 7.90 ha Designed: 10.50ha Potential: 20.0ha	Concrete Height: 2.3 m Length: 15.0 m	20,320,000 1,630,000 1,750,000 15,400,000 39,100,000	Improved site A simple weir improvement 2009: 7.90 ha
Mporokoso (1)	Kasonde site Kayokolo Farmers Group Left bank: Not been formed yet	45, 18, 27, (1) Land belongs to community Right bank: Kasonde: 20, 8, 12 Left bank: Chilandwa: 25, 10, 15	2010: 1.25 ha Designed: 5.00 ha Potential: 6.00ha	Masonry Height: 1.4 m Length: 8.0 m	25,720,000 2,580,000 550,000 6,100,000 34,950,000	Improved site A simple weir improvement 2009: 1.25 ha
Mporokoso (2)	Chilala site	36, 14, 22, (1)	2010: 3.30 ha Designed: 5.00 ha Potential: 7.00ha	Masonry Height: 1.6 m Length: 13.0 m	31,211,000 0 2,714,000 6,500,000 40,425,000	Improved site A simple weir improvement 2009: 2.50 ha
Mlungwi	Nseluka site Kailungu vegetable and saving group	33, 20, 13, (1) Land belongs to community Kasonde: 2, 2, 0 Wapata: 1, 0, 1 Chapewa: 5, 3, 2 Washanga: 2, 1, 1	2010: 6.00 ha Designed: 8.00 ha Potential: 8.25ha	Concrete Height: 1.8 m Length: 12.5 m	36,135,000 5,830,000 1,570,000 9,800,000 53,335,000	New site A simple weir construction 4 km furrow digging 2009: 1.00 ha
Luabula Kawambwa	Chibolya site Luena Irrigation Club	20, 15, 5, (1) Chibolya: 10, 8, 2 Spinoti: 10, 7, 3	2010: 3.20 ha Designed: 5.00 ha Potential: 5.00ha	Masonry Height: 1.8 m Length: 24.0 m	36,671,000 3,090,000 5,440,000 12,540,000 57,741,000	Improved site A simple weir improvement 2009: 1.50 ha
Mansa (1)	Kakose Tubombele Pano	20, 15, 5, (1) Kakose	2010: 2.00 ha Designed: 5.00 ha Potential: 5.00ha	Concrete Height: 1.8 m Length: 17.0 m(for the	30,705,000 4,320,000 1,600,000 1,680,000 38,305,000	Improved site A simple weir up-grading 2009: 0.50 ha
Mansa (2)	Mililwa Lower site Mililwa Lower Group	25, 15, 10, (23) Timoth: 3, 2, 1 Chibolya: 3, 2, 1 Chakulya: 3, 3, 0 Kashikishi: 4, 2, 2 Mutiti: 12, 6, 6	2010: 1.25 ha Designed: 5.00 ha Potential: 6.00ha	Small-scale earth dam Height: 2.4 m Length: 32.0 m	12,505,000 2,700,000 455,000 15,000,000 30,660,000	Improved site A simple weir improvement 2009: 0.75 ha
Total	8 sites	257, 137, 120, (69)	2010: 27.90 ha Designed: 48.50 ha Potential: 63.5ha	Masonry: 4 Concrete: 3 Earth dam: 1	209,427,000 25,600,000 21,179,000 70,720,000 326,926,000	New Site: 2 Improved Site: 6 2009: 15.65 ha

Source: JICA Study Team, based on the pilot project implementation 2010 for permanent scheme.