

An Inventory of Agricultural Water Technologies and Practices in the SADC, MALAWI

I. Name of technology or practice	Technology 1= VEGETATIVE COVER
1.0 Water technology or practice & detailed description (give technical description, refer to Annexes 1 & 2 ; attach an illustration/picture if technology is not in the lists)	Vetiver grass hedgerows along contours;
1.1 Source of technology (Indigenous or Imported)	Imported;
1.2 If imported, any modifications done (Yes or No)	No
1.3 Provider of technology ^b	Govt. and NGOs;
1.4 Who developed/designed the technology package ^c	John Greenfield and Grmshaw; PROSCARP and MAFE Projects;
1.5 Who installed the technology package ^c	PROSCARP and MAFE; Land Resource Conservation Department;
1.6 Source of water (surface, groundwater, harvested rainwater, wastewater, etc.)	Surface runoff;
1.7 Is the technology used for more than one use (multiple uses)? (Yes/No)	Yes;
1.8 If yes, what are they?	Erosion control and recharging water table; grass for thatching
1.9 If yes, how is the technical design adapted compared to the design for single use?	By planting on contour, hedges form a big barrier to erosion;
1.10 What is seen as advantages of multiple use systems as compared to the design for one single use?	Improved soil conservation and productivity;
1.11 What are the disadvantages of multiple use systems?	None;
2. Specific location/address & distance from main urban center (km)	5km from the trading centre; Kaporo, 25km North, Vinthukutu-70km South;
3. Main source(s) of income in site	Sale of cotton, livestock and green maize; cassava, maize, rice, sweet potatoes;
4. Other source(s) of income in site	Hiring out labour and IGAs; Palm oil production and sale;
5. Type of user (community or individual households)	individual households;
6. No. of benefitted households; average size of households	679, average household size is 5; 650h, 6 people per hh;
7. Total size for all beneficiaries (ha) -note average size per beneficiary	369ha; 1200ha;
8. Profile of beneficiaries (if mostly ultra poor, poor, non-poor or mixed) ^d	Mixed;
8.1 Was project/program area selected based on available data on comparative incidence of poverty? (Yes/No)	No;
8.2 If yes, indicate the poverty status of the project area relative to all other regions of the country	NA
8.3 Were particular populations or groups targeted within the project area (e.g., based on baseline socioeconomic surveys or participatory poverty assessment, etc)? (Yes/No)	No; Yes;
8.4 If yes, indicate the poverty status of the beneficiaries relative to the non-beneficiaries in the project/programme area	NA
8.5 Indicate the proportion of women beneficiaries	Over 40%;
9. Month & year technology was introduced	early 90s to 2002;
10. No. of years of adoption	3-6 years;
11. Is technology still in use (Yes or No)	Yes;
12. If not anymore, why? (STOP here for this technology)	NA

13. Type of technology (water capture such as small dams, rainwater harvesting OR distribution/water use such as treadle pumps, drips, etc.)	soil and water conservation
14. Describe the counterfactual or the old technology (practice) the new water management technology/practice replaces.	Contour napier grass hedge rows; replaces buffer strips
14.1 Is the change partial or complete?	Partial;
14.2 If the change is partial, describe the elements of the old system that were preserved and those that were discarded	Old system confined to ares that are not targeted for field crops;
II. Profitability of the TECHNOLOGY	
a. The new technology or management practice (Note: prepare an enterprise or partial budget)	
15. What is the estimated and actual life of the technology? (in years)	Over 20 years;
16. Was technology given out for free?	Yes but in some sites No;
17. If NOT totally free, what is the capital cost of technology (reference YEAR of cost estimate; separate costs for equipment/tool/parts, pipes for conveyance into farm, installation, water source development)	Main cost in digging and transporting grass;
18. Cost of operation & maintenance per ha (indicate what items are included-- cost of pumping in terms of fuel, energy/electricity, labor costs; maintenance and repair costs, etc.)	Transport K1000, labour K1000 totalling K2000/ha;

18.1 Does the new technology require more or less labour

Not applicable (NA): Not replacing old technology

19. Crops produced (indicate main crops vs. secondary crops)	Maize, cotton, sorghum as main and millet, pigeon peas, cassava, sweet potatoes; beans,
20. Changes in crops grown (into what & when) & reason for new crops or switching	No;
21. Indicate how many croppings per year (1, 2, or 3)	2 in dambos, 1 in upland; 1;
22. Increase in production (in kg/ha) due to technology (including amount used for own consumption & amount sold to market)	Not established;
22. Increase in revenues (in local currency) due to technology (less amount used for own consumption)	Not established;
23. Estimated & actual financial profits (gross revenues-costs of all cash inputs)	Not established;
b. Old water management technology or practice (prepare an enterprise budget)	
24. What is the estimated and actual life of the technology? (in years)	None;
25. What is the capital cost of technology?	NA
26. Cost of operation & maintenance per ha (indicate what items are included-- cost of pumping in terms of fuel, energy/electricity, labor costs; maintenance and repair costs, etc.)	NA;
27. Crops produced (indicate main crops vs. secondary crops)	NA
28. Indicate how many croppings per year (1, 2, or 3)	NA
29. Estimated & actual financial profits (gross revenues-costs of all cash inputs)	NA
III. ROLE OF INSTITUTIONS/ORGANIZATIONS	

30. Support by NGOs (specify the NGO & indicate if international or local)	CADECOM, World Vision International, PROSCARP, MAFE
30.1 Indicate the total value of the support (in Dollars or local currency)	In kind, training and tours;
30.2 Is the support still on-going or withdrawn?	Partly withdrawn;
30.3 If the institutional support is withdrawn, is the system still functioning?	Yes;
30.4 If the system is still functioning, is the pace of technology/practice uptake continuing at the same or better pace than when there was NGO institutional support? (Yes/No)	slow uptake;
30.5 Give reasons for the response to 30.4	Farmers are food insecure, materials are hardly found;
31. Specific support provided ^d	Transport, food, training, labour costs;
32. Support by government extension workers & other government agency (specify which agency & whether local or national government) (yes or no)	Govt. through PROSCARO, MAFE Project;
32.1 Indicate the total value of the support (in Dollars or local currency)	K600 000 - K5 000 000;
32.2 Is the support still on-going or withdrawn?	Yes; in one project site withdrawn;
32.3 If the institutional support is withdrawn, is the system still functioning?	Functional;
32.4 If the system is still functioning, is the pace of technology/practice uptake continuing at the same or better pace than when there was Government institutional support? (Yes/No)	Slow pace;
32.5 Give reasons for the response to 32.4	High cost of transporting grass;
33. Specific support provided ^d	Transport, food, training, labour costs; Transport of vetiver grass;
34. Support by private enterprises (specify enterprise)	Illovo Sugar Ltd.;
35. Specific support provided ^d	Provision of germplasm;
36. Support by other organization (specify organization - e.g. community organization) or private sector service provider (e.g. manufacturers/dealers/retailers)	MASAF
36.1 Indicate the total value of the support (in Dollars or local currency)	Labour by community
36.2 Is the support still on-going or withdrawn?	Yes
36.3 If the institutional support is withdrawn, is the system still functioning?	NA;
36.4 If the system is still functioning, is the pace of technology/practice uptake continuing at the same or better pace than when there was private institutional support? (Yes/No)	Lower pace
36.5 Give reasons for the response to 32.4	NA;
37. Specific support provided ^d	NA;
IV. FACTORS CONTRIBUTING TO PROFITABILITY & SUSTAINABILITY OF TECHNOLOGY (see Annex 3 for sample answers #40-45)	
38. Ease in implementation (Yes & No)	Yes;
39. Ease in O&M (Yes & No)	Yes; Easy;
40. Suitability of technology/ How adapted to local conditions (well, not so well, etc.)	Steep slope; Well;
41. Cultural acceptability	Not accepted; Farmers consider it as misuse of cultivable land;
42. Effectiveness	Effective; High;
42. Environmental impact	Positive impact in that hedge rows trap water, reducing erosion;
43. Other advantages (factors contributing to profitability & Suitability)	Trimmed grass is used for thatching; Increase crop production;

44. Other disadvantages (factors constraining profitability & sustainability-- e.g. lack of specific support services or supplies of specific inputs, etc.-- be very specific)	Scarcity of vetiver grass;
SITE NAME	Various
ADD	All ADDs
EPA	Various
TA	Various
VILLAGE	Various

^a 1: ultra poor - extremely poor or most vulnerable engaged in rainfed cereal production, no potential to diversify because of lack of land, no livestock, limited available labor, labour, no off-farm incomes/ remittances or without access to land or resources at all 2: extension worker 3: private enterprises 4: other (specify)

^b 1: indigenous knowledge; 2: NGO (specify); 3: government agency/extension worker; 4: private enterprises; 5: other (specify)

^c 1: government agency (extension agency/irrigation advisory services/University); 2: representative/authorized dealers of manufacturers; 3: private consultant; 4: farmers the 4: farmers themselves; 5: other (specify)

^d 1: introduction of technology; 2: facilitated access to inputs; 3: facilitated access to output markets; 4: provision of (or facilitated access to) credit; 5: capacity building such as building such as training (specify what); 6: formation of association (specify, water user assoc, producers assoc, etc); 7: other (specify)

Technology 2 =FANYA JUU TERRACES

Technology 3 = STONE LINES

A trench 60cm deep, soil thrown on the upper side to form embankment;

Imported;

No;

Land Resource Department;

Land Resource Department;

Extension workers;

Surface run off;

No;

NA

NA

NA

NA

Near Karonga TTC;

Farming cash crops, casava, maize, bananas;

As a builder;

Individual;

1hh with 6 members;

5ha;

Non poor;

No;

NA

No;

NA

30%;

September 2005;

Less than a year;

Yes;

NA

Stones laid along contours to slow down water flow;

Indigenous;

No

Government agents and locals;

Land Resource department;

Farmers and Extension workers;

Surface run off;

No;

Na

Na

Na

Na

Kaporo near Lupembe school;

Selling cash crops, rice and maize;

Small scale business;

Individual hh;

1 house with 6 members;

1.2ha;

Non poor;

No;

Na

No;

Na

100%;

October 2001;

4;

Yes;

Na

Water capture by channel embankments, slow down run off;

soil and water conservation

None;

Vetiver grass contours;

NA

Partial;

NA

Grass was used instead of stones;

3-7 years;

Not limited;

Free;

Free;

Excavation labour;

Na

Labour cost;

Labour when collecting stones only;

Not applicable (NA): Not replacing old technology

More labour

Main is Maize, secondary is Bananas;

Maize, beans and vegetables;

Beans, pigeon peas, December 2005 as conservation farming;

None;

1;

1;

fff

1000

K24 000;

Na

None;

Na

NA

Not limited;

NA

K4000-K5000/ha;

NA

Labour trimming the grass;

NA

Maize;

NA

1;

NA

Na

None;
NA
NA
NA

NA
NA
NA

Land Resource Department;
Extension support;
On going;
NA

Better adoption;
Water shortage;
Advisory support on design and construction;
NA
NA

NA
NA
B;
NA

NA
NA
NA

Yes;
Yes, low cost;
On over 5% slopes, annual rainfall of 600mm;
Well;
Acceptable;
High;
Reduced erosion;
Increased crop production;

PROSCARP
Over K200 000;
Withdrawn;
Functioning;

Better;
High cost of transport;
Capacity building;

Yes;
Extension support;
On going;
Functioning;

Better;
Farmer want to conserve fields;
Capacity building;
None;
Na

None;
Na
Na
Na

Na
Na
Na

Easy;
Moderate;
Slopes over 10%;
Well;
High;
Very effective;
Slows erosion, increases moisture;
Simple, low technical skills required;

None; Labour intensive in stone collection;

Chidiwo Msiska (Karonga TTC); Lupembe

Karonga; Karonga;

Mpata; Karonga North;

Kyungu; Kaporo North;

Bwiba I section ; Na

no off-farm incomes/remittances, or without access to land and resources at all 2: ; 3: extension worker; 4: private enterprises; 5: other (specify)

oneselves; 5: other (specify)

as training (specify what); 6: formation of association (specify: water user assoc., producers association, etc.) ; 7: other (specify)

Technology 4 = TERRACING

Technology 5 = SMALL EARTH BUNDS/ RAISED FOOTPATHS

Technology 6 = GULLY CONTROL

Soil scooping and refilling to create benches for crops;	Earth bunds/Raised Footpaths containing Irrigation water;	Gully control and utilisation
Imported;	Imported;	Indigenous;
No;	No;	No;
Govt. and farmers association;	Land Resourcs Department;	Ministry of Agriculture, Land Resources Conservation Department;
Land Resource Department;	Land Resourcs Department;	Researchers;
Farmers;	Extension workers;	Extension agents;
Harvested rain water;	River diverted into the field;	Surface;
No;	Yes;	No;
NA	As acces to fields, boundaries and water containers;	NA
NA	Bund is bigger and stone reinforcced;	NA
NA	Fields not damaged by people;	NA
NA	None;	NA
Misuku, 40km North-East Chitipa;	Lufilya and Miyombo in Karonga;	AI over the ADD (Machinga ADD);
Farming beans, coffee, maize, bananas;	Selling rice crop;	NA
Livestock production;	Casual labourers;	NA
Both;	Communal;	Individuals and communities;
500 households;	200 Lufilya, 300 Wovwe, 500 Hara, 100 Miyambo;	6000households;
800ha;	700-800ha;	140;
Mixed;	Mixed;	Mixed;
No, based on topography;	Yes;	No;
NA	Na	NA
Misuku Hills, Chitipa;	No;	No;
Yes;	Na	NA
Over 20%;	20%;	40%;
1970s;	1970-1975;	Long ago;
Over 30 years;	Over 30 years;	Even before independence;
Yes;	Yes;	Yes;
NA	Na	NA

Water capture;	Water capture;	NA
None;	None;	NA
NA	None;	NA
NA	Na	NA
Over 10 years;	Not limited;	NA
Free;	Free;	NA
Labour costs in construction;	Not costed;	NA
Almost nil;	Na	NA
Not applicable (NA): Not replacing old technology	Not applicable (NA): Not replacing old technology	Not applicable (NA): Not replacing old technology
Main is coffe, secondary is beans;	Rice;	NA
No;	Na	NA
1;	2;	NA
No data;	From 1000 to 1400	NA
No data;	Na	NA
No data;	Na	NA
		NA
NA	Na	NA
NA	Na	NA
NA	Na	NA
NA	Na	NA
NA	Na	NA
NA	Na	NA
NA	Na	NA
		NA
		NA
		NA

Smallholder Coffee Farmers Association;	CONCERN Universal;	NA
Organizational;	Over K1 000 000;	NA
On going;	Withdrawn;	NA
NA	Functioning;	NA
Better;	Same pace;	NA
Farmers own initiative;	Farmers understand need for technology;	NA
Advice on construction procedures;	Capacity building;	NA
Government extension workers;	Smallholder Floodplains Department;	Yes;
Extension advice;	K500 000;	Departments' budget
On going;	Withdrawn;	Yes;
Functioning;	Functioning;	NA
Better;	Same pace;	Yes;
Farmers have no option;	Farmers want to reduce flooding;	Training of farmers and attachment of exercise to input provision in farmer clul
Advise on manuring, mulch, soil and water conservation;	Train farmers on techniques and design;	Training of farmers
None;	Na	None
NA	Na	NA
NA	None;	NA
NA	Na	NA
NA	Na	NA
NA	Na	NA
NA	Na	NA
NA	Na	NA
NA	Na	NA
NA	Na	NA
Yes;	Yes;	Yes
Yes;	Yes;	Yes
Steep terrain and high rainfall;	Flat areas prone to flooding;	Suitable
Well;	Well	Well
Acceptable;	Acceptable;	Acceptable
High;	High;	Very effective
Reduce erosion, conserve moisture;	Reduce flooding and field treading;	Suitable
Increase production of coffee;	Na	NA

Lack of knowledge in farmers is risky;

Water logging if without spillways;

NA

Misuku;

Miyombo, Lufilya, Wovwe and Hara;

Different sites

Karonga; All ADDs

Karonga;

Machinga ADD but also all ADDs

Misuku; various

Kaporo south, Nyungwe, and Vinthukutu;

Different sites

MweneMisuku; various

Many;

Different sites

many;

Many;

Different sites

Technology 7 = CONSERVATION FARMING

Technology 8= CONTOUR CULTIVATION

Conservation farming/ minimum tillage: Minimal soil disturbance with herbicides use

Imported;

No;

Land Resources Department, Sasakawa Global 2000

Land Resources Department, Sasakawa Global 2000

Farmers and extension workers;

Surface run off and harvested rain water in situ

Yes;

Kill weeds, improve soil fertility and structure, conserve moisture

No

NA

NA

All ADDs

Farming and fishing;

Small scale business;

Individual;

300hh, 6 people/hh;

60ha;

Mixed

No

NA

No

NA

30-40%;

April 2004; early 90s

1.5 years; over 10 years in certain locations

Yes;

NA

Contour cultivation and ridging;

Long tradition

No;

Agricultural extension services;

Ministry of Agriculture; Land Resources Conservation; Land Resource Department;

Land resource section of Shire valley ADD; Govt. Extension Agents; Farmers;

Surface run off;

Yes;

Soil erosion control and moisture retention;

Ridges are constructed following the contour;

Reduced erosion boosts fertility, water retention is improved;

None;

All over the ADDs;

Livestock and cotton sales; Farming coffee, rice and bananas;

Casual labour, sale of vegetables, green maize, etc; Fishing for Kaporo north;

Community or Individual;

4237 households, in in each; 20% of households; 1500 households;

1113; 0.2ha; 800 households;

Mixed;

No;

NA;

No

NA;

over 50%;

Before 1964;

More than 40 years; 3 in some areas

Yes;

NA;

water capture in situ

Soil and water conservation

Conventional ridging farming;

Ridging without following contour line;

Partial;

Partial in some areas; complete in most of the country

Ridges, wide spacing, hoe weeding are old;

Ridges still facing the slope;

Budget provided in report

Not limited;

Not limited;

No;

Yes;

K17120

NA;

K17120

K8000/ha for ridging by casual labour; Household labour;

More labour

Not applicable (NA): Not replacing old technology

Maize, beans, pigeon peas;

All suitable crops;

None;

None;

1;

1 for upland

Increased from 2500 to 4000 kg/ha for maize
K6525 (old practice) to K56056 (new practice)

1500kg for maize; It conserves nutrients;

K6525 (old practice) to K56056 (new practice)

K22500/ha; Not assessed in some cases

K19000/ha; Not assessed in some cases

10-15 years;

NA;

K16125/ ha

NA;

K16125/ ha

NA;

Maize;

Maize, sorghum, cotton as main and cassava, sweet potatoes, ground nuts, pulses;

1;

NA;

K6525/ha

K105 000;

Sasakawa Global 2000;

K2 000 000

No

Functioning;

Beter;

Increased unit area production;

Seeds, herbicides, fertilizer as first year start up;

Land Resource Department;

K1 000 000;

On going;

NA

Better adoption;

Increased unit area production;

Seeds, herbicides, fertilizer as first year start up;

NA

NA

NA

NA

NA

NA

NA

NA

NA

Easy;

Yes but low;

Degraded or low fertility area;

Well

Acceptable;

High;

Minimal effect by herbicides;

High production/unit area ;

CADECOM (local), Goal Malawi, and World Vision International; CONCERN UNIVERSAL (International);

In kind; Inputs for work;

Goal Malawi provision withdrawn;

Yes;

No; At low rate;

Food insecurity; Farmers used to handouts;

Capacity building, Food for work;

Govt. Extension Workers, MASAF; PROSCARP with Malawi Govt.;

Variable (not given); Over K10 000 000

Yes; K45/day/person;

On going; Functioning;

Slower pace; Better;

People are used to being paid for work; Farmers are trained;
capacity building, equipment procurement;Line levelling,

None;

NA;

Rural income enhancemnt project by ADB; Sef Help International, World Vision;

Not easily calculable;

Yes;

Yes;

Slight drop in pace;

Limited resources;

Staff and farmer capacity building, procurement of equipment;

Yes;

Yes; but low;

Suitable; but not in steep terrain;

Well;

Acceptable;

Very effective; High;

Conserves moisture, nutrients, reduces soil erosion;

Increased production;

Inputs cost is limiting;

Labour intensive;

All EPAs;

Various

All ADDs

All ADDs

All EPAs;

All EPAs;

Various;

Various

Various;

Various;

Technology 9 = TIED RIDGING

Technology 10 = RETENTION DITCHES/INFILTRATION PITS

Tied ridges or box ridges;

Indigenous;

No;

Rural Income Enhancement Project; Ministry of Agriculture; Land Resource Department;

Researchers (MOA); Land Resource Department;

Ministry of Agriculture; Govt., NGOs; Farmers;

Surface runoff

Yes;

Ties strengthen the ridges in addition to its role in soil and water conservation;

No adaptation

Moisture retention, reduced erosion and increased production;

none;

Shire valley ADD; All over the ADDs; Kaporo North and Chingale EPAs;

Cotton and livestock sales; Farming; Farming rice and groundnuts;

Ganyu, IGAs Small business; Fishing;

Individual households;

2938 households, 5 is average household size; 60%; 450hh;

Over 5,000ha/year;

Mixed; Poor;

No;

NA;

No;

NA;

20% - Over 50%;

Has been there for a long time; 1970s; 1990s in some locations;

Has been there for a long time; Over 30 years;

Yes;

NA;

Swalles/retention ditches/infiltration pits/ contour furrows: Run off trapped and collected into pits, trenches

Imported;

Yes;

Land Resource Department;

Land Resource Department;

Farmers;

Hill side run off; harvested rainwater

Yes;

Reduce flooding, soil erosion and increase moisture;

Pits are deeper for flood control;

Increase crop production, Protect the environment;

labour intensive;

Mlare, 30km karonga south; Balaka, Chikwawa & Nsanje Districts

Farming Maize, beans; cotton, livestock sales, etc;

Hired labour, selling livestock;

Community;

15hh, 5/hh; 214 households in Chikwawa

20-36ha;

Poor;

No;

NA

No;

NA

20%;

March 2004; July 2005

1.5 years;

Yes;

NA

Rain water harvesting; Water capture within field;	Rain water harvesting;
None;	None;
Partial;	NA
No tied ridges	NA
None, it is part of standrad field practice recommended for dry areas	Not determined, new technology
2-3 season;	2;
Yes;	Free; in some cases no
NA;	K200/day/head for digging
K700-K1000/ha;	10-15 people/day/ha
Less labour	Not applicable (NA): Not replacing old technology
Mainly cotton, maize, then sorghum, millet and sweet potatoes; beans, and cassava;	Maize, pigeon peas, beans, sweet potatoes; sorghum, cotton, cassava, millet
None;	NA
1 crop;	1;
Not established; from 1000 to 1300 kg/ha increase in poor seasons;	up to 1,400 kg/ha
Not evaluated but would be 20-30% increase as in Q29 below	NA
Not established but would be 20-30% increase as in Q29 below	NA
Ridges	
Ridges remade every year	Na
K23,562/ha	Na
K34,650/ha	NA
Mainly cotton, maize, then sorghum, millet, cassava and sweet potatoes; Especially maize;	NA
1 crop;	Na
K6,525/ha	Na

CADECOM(local), GOAL-Malawi(international), World Vision International; World Vision Malawi;

Providd in kind (food); K25000;

GOAL-Malawi withdrawn; Others on going;

Yes;

Better;

Farmers enthusiastic;

Farmer capacity building (ridge realignment on contour) and food support;

Yes, extension services; Land Resource Department;

Not calculated; Extension support;

On going

Not withdrawn;

Better;

Farmers well trained;

Advisory support;

None;

NA;

None;

None;

None;

None;

None;

None;

None;

Yes;

Yes; High; Low;

High because suitable where rain is erratic; Slopy areas, 600-800mm rainfall;

Well;

Acceptable;

Very efective; High; High;

Positive impact e.g. on micro climate; Conserves water; Reduce soil erosion;

None

Red Cross International;

K480 000;

Withdrawn;

Yes;

Slow pace;

It ie labour intensive;

Food for work;

Extension support;

NA

On going;

Na

Slow uptake;

Labour intensive;

Technical support;

None;

NA

NA

NA

NA

Na

Na

Na

Na

na

Yes;

Low;

Hill sides with a lot of run off;

Well;

Low acceptance;

High;

Controls erosion and flooding;

Increase soil moisture;

Labour intensive; Lack of knowledge;

Labour cost high during construction;

Nsanje, Chikwawa; Karonga, Machinga Mangochi Districts

Mlare;

Shire valley ADD; Mangochi; Karonga and Machinga ADDs;

Karonga; Shire Valley ADD, Machinga ADD

All Nsanje Chikwawa EPAs; Blank; Kaporo North and ChingaleEPAs;

Lupembe in Karonga ADD; Different EPAs in Shire Valley, Machinga

All TAs in locations mentioned

Kyungu; All TAs in Shire Valley, Machinga

Numerous;

Welusi; various in Shire Valley

Technology 11 = PLANTING PITS

60cm deep hole, subsoil used to make bund, top soil mixed with manure and put back; Planting holes(cholo pits);

Indigenous;

No;

Extension workers; Farmers knowledge;

Min. of Agriculture; Farmers;

Min. of Agriculture; Farmers;

Surface runoff; Streams, shallow wells;

Yes;

Erosion control

None;

Reduces erosion;

Needs more land;

Near Karonga TTC; Chingale EPA, 20km Zomba West;

Selling maize, bananas, beans, etc;

Small business;

Individual;

1 household of 6 people; Over 1500

4ha; Over 800;

Non poor; Mixed;

No;

NA

No;

Not determined

30-50%;

Feb. 2003; Old tradition;

2.5 years;

Yes;

NA

Technology 12= ROAD/FOOTPATH RUNOFF HARVESTING

Roads or footpath run off is diverted into crop land or infiltration pits;

Both;

Yes;

Land Resource Department;

Land Resource Department;

Land Resource Department;

Roads or footpath run off harvested;

Yes;

Crop and livestock production;

For livestock, water is diverted into storage structures;

Maximize use, reduce wastage;

Storage structures not well designed;

Lupembe, 15km from Karonga;

Cotton production;

Hired labour, fishing;

Community;

200-300hh;

450ha;

Poor;

Yes;

Lupembe;

Na

Lupembe;

30%;

March 2004;

2;

Yes;

Na

Water capture into crop area; Water utilization efficiency;

Planting on flat land;

Complete;

NA

4-5 years; 1-2 years;

Free;

NA

NA

Not applicable (NA): Not replacing old technology

Bananas, fruit trees; maize, beans during winter;

None;

1;

No data;

No data;

No data;

NA

NA

NA

NA

NA

NA

Water capture in pits and fields;

None;

Na

Na

No limit;

Free;

Na

Na

Not applicable (NA): Not replacing old technology

Cotton, Rice, Maize;

Na

1 crop;

1250-1400

K3000-K4000 depending on crop;

Na

None;

Na

Na

Na

Na

Na

Na

None;	Red Cross International;
None;	K1 000 000;
NA	Withdrawn;
NA	Yes;
NA	No;
NA	No motivation;
NA	Food for work;
Yes; Land Resource Department;	Advisory support;
Extension support; Advice;	Na
Yes; On going;	On going;
Yes; Functioning;	Functioning;
Yes; Better;	Slow pace in Lupembe, good in Kapani;
Farmers initiative;	Lack of incentives;
Technology introduction and capacity building; Extension advice;	Na
None;	None;
NA	Na
NA	Na
NA	Na
NA	Na
NA	Na
NA	Na
NA	Na
NA	Na
NA	Na
Yes; Yes;	Yes;
Yes; Low;	Yes;
In very dry areas; Dambos;	Na
Well; Well;	Well adapted;
Well accepted; Acceptable;	Accepted;
Very effectivel; High;	Very;
Reduce erosion, increase soil moisture; Minimal;	Reduce flooding;
Increase in yield; Better water efficiency;	Livestock watering;

Lack of capacity, low adoption of he technology;

Poor situation of field structures;

Chidiwa Msiska, Karonga TTC; Chingale;

Lupembe;

Karonga; Machinga;

Karonga;

Bwiba; Chingale;

Lupembe;

Karonga; Mulumbe;

Kyungu;

Teaka, Chisamge, Mdeka;

Kayuni 1 and2

Technology 13 = STREAM/ FLOOD DIVERSION**Technology 14 = DRIP IRRIGATION SYSTEM**

Stream diversion; River flood plain irrigation in fields with bunds; Flood water diverted into bunds to irrigate crops;

Drip irrigation

Indigenous; Imported;

Imported

No;

No

Irrigation Department

NGOs (Total Land Care; Action Aid, IDE)

malawi Govt Public Works Program; Irrigation Department; Farmers;

NGOs (Total Land Care; Action Aid, IDE)

malawi Govt Public Works Program; Irrigation Department; Farmers;

NGOs (Total Land Care; Action Aid, IDE)

Surface; Diverted seasonal river; Gullies an ephemeral stream run off;

Surface

Yes;

No

Fish ponds;

NA

No significant difference;

NA

Maximise water and land use;

NA

With scarce water, high losses;

NA

Chipuka irrigation scheme, Ntchisi; Lufilya, Miyombo, Wovwe, Chonanga and Hara; 15km Karonga North;

Chatata urban development initiative (Lilongwe);

Irrigated crop sales, Farming and fishing;

Farming and small business;

upland rainfed, mushroom; Small business like livestock;

Piece work;

Community; Individual;

Individual household;

400-1500 hh in Karonga and Kasungu ADDs

19, 5 members per household;

8 - 400ha;

0.094ha

mixed;

Ultra poor;

No;

Yes;

Na

low productivity in the year but with available water;

No;

Yes;

Na

Poorest households;

Over 40-56%;

10%;

June 2004; 1970s; Traditional knowledge;

May 2005;

Over 30 years; some recent

less than a year;

Yes;

Yes;

Na

NA

distribution/ water use

Bucket, treadle pump then stream diversion;
complete;

Na

Not limited;

Yes; No;

K60 000 000 Flood Plain Project; Maintenance of bunds;

Canals maintenance labour; Over K2 000 000; Labour costs;

Less labour

Maize and vegetables; Rice is the main crop and Maize is secondary;

No change of crops;

2 crops per year; 1;

7ton/ha maize; 1100 to 1400kg/ha increase;

10-20% increase;

K15 000-K20 000;

5 years;

K14000;

Mainly own labour;

Maize and vegetables;

3 crops;

Na

water use

Watering cans;

Partial;

NA

Data not yet available for determination of enterprise budget.

2-3 years;

No;

Nutrition kit-K732, Bucket kit-K732, actual bucket-K250, drum kit-K2440, drum-K3000;

Not determined

Not applicable (NA): Not replacing old technology

Beans;

No change of crops;

1 so far;

Crop still in the field;

as above;

Not determined

NA

NA

NA

NA

NA

NA

Govt. project; Concern Univeral; NASFAM;

Flood Plain Project Info; Not given;

Ongoing; On going; On going;

Functioning;

Still supported; Better; Better;

Farmers well trained; Good prices;

Training, supervision, start up inputs; Capacity building; Market;

Yes; Irrigation, Land Resouces and Research Departments; Extension workers;

NA

Yes, on going;

NA;

NA;

Farmers organised; Better usage of water;

Research, Canal design and construction; Bunds design and construction capacity building;

None

Na

Na

Na

Na

Na

Na

Na

Na

Yes;

Yes;

Yes; Flood plain with seasonal river; 500-600mm rainfall, clay soils;

So well;

Acceptable;

High;

Good water resource management; Increased erosion and siltation; Poor water management;

Provision of start up inputs; Improved food security; Improved food security, minimal skills required;

Total Land Care, Action Aid and IDE(both international);

Not determined

Ongoing;

NA

No experience yet as it is new;

No experience yet as it is new;

Orientation, supply of kits;

Yes, Agicultural Extension workers(Government);

K53 760 for 6 months;

Ongoing;

NA

NA

NA

Financial;

NA

NA

NA

NA

NA

NA

NA

NA

NA

Yes;

NA

NA

Well

Well

Well

NA

Water efficiency, portability;

Limited land area; High cost of maintenance; Bund breaking, water logging;

Dependency for supply of equipment, small irrigated areas;

Chipuka irrigation scheme; Lufiya, Miyombo, Wovwe, Hara, Chonanga; Miyombo, Posi, Lupembe;

Chatata urban development initiative (Lilongwe);

Kasungu; Karonga; All ADDs

Lilongwe ADD

Various

Lilongwe West

Various

Malili

Various

Chatata

Technology 15 = SPRINKLER IRRIGATION SYSTEM

Sprinkler irrigation system

Imported

No

Agricultural extension services

Department of irrigation

Shire valley ADD

surface

No

NA

NA

None

NA

15km from urban centre

Sales of livestock

Canal labour, sales of vegetables, sweet potatoes

Community

192 beneficiaries

0.125ha

Mixed

No

NA

No

NA

40.8%;

Feb-95

10 years

Yes

NA

Sprinkler irrigation system, water use

traditional dig works alongside banks

partial

Some still dependent on rainfed agriculture, traditional dig works alongside banks;

15

Yes

NA

K301200 for fuel for 12ha

Less labour

Maize is main crop, Okra and leaf vegetables are scondary crops

NA

3

600kg/ha

k1224000 for 12ha

K72000 for 12ha

1 season of rainfed agriculture

Not established

K8000/ha land preparation cost

Maize, sorghum, millet are main crops, sweet potatoes, pulses are secondary

1 crop for upland, 2 crops for wetlands

K34000

GOAL Malawi(international), MASAF(local)

In kind

On going

NA

Better pace

cash is the incentive for work by farmers

Farm inputs and fuel

Crop husbandry advise by extension workers

Variable

On going

NA

NA

NA

Capacity building

None

NA

None

NA

NA

NA

NA

NA

NA

Blank

Yes

Highly suitable

Blank

Accepted

Very efficient

No adverse effects

Reduces workload and time

Fuel prices and scarcity

Sapatongwe in Nsanje

Shire valley ADD

Mpatsa

Tengani

Sapatongwe in Nsanje

Technology 16 = TREADLE PUMP IRRIGATION SYSTEM

Treadle pump irrigation

imported

Yes(modification not specified); others no modification

Malawi Govt; NASFAM; Agricultural Extension Services; Irrigation Department

Govt; Department of Irrigation;

NASFAM; Shire valley ADD; Irrigation Department; Extension workers;

Harvested rain water; Surface(river, canal, wells); Ground water,

Yes;

Irrigation, moulding bricks;

No modification for alternative use.

Not applicable

Not applicable

Chatata urban development initiative(Lilongwe); Shire valley ADD; the whole ADD;

Casual labour, sales of livestock, firewood, vegetables, green maize; sell of maize;

Piece work; Casual labour; Public works programme;

Community; Individual household;

100 - 25000 households;

average of 0.1 - 0.3ha

Ultra poor; Mixed

Yes; No

Data not available

Yes; No;

Poorest households;

25 - 30%

1997 - 2003

2-9 years

Yes;

Not applicable

Distribution/ water use

Watering cane or pail;

Partial;

Some still use watering cans;

Budget provided in report.

10 years;

Free; Credit

K2500 in 1997 and K9000 in 2003; K9000 on loan;

Not established [see submission from Total Land Care]

Less labour

Maize and vegetables; tomatoes, strawberries, onions, etc;

Because of new markets;

2 winter crops are possible

5000kg/ha of maize with technology and 2000kg/ha without;

K80 000/0.3ha;

K71 300/ 0.3ha;

Watering cane or pail;

2-5 years;

K450 - K500

Not established;

Maize and vegetables;

1-2;

K6,000; Not calculated;

Action Aid; NASFAM; CADECOM, GOAL Malawi, EAGES, ELDP; Save the Children

K90,000.00 (Action Aid); Within Irrigation Department's budget;

Ongoing;

Yes; Not applicable;

No; Not applicable;

The organization (Action Aid) no longer giving treadle pumps, communities are still using same old pumps;

Technical advice on use of pumps, farmer capacity building (crops to be grown and cultural practices);

Yes, Agricultural Extension workers(Government); Rual Income Enhancement Project by ADB/GoM

Not indicated;

Ongoing;

Yes;

No change;

Extension technical advice and support; free technologies provided;

Treadle pumps and capacity building;

None;

NA;

NA;

NA;

NA;

NA;

NA;

NA;

NA;

Yes; Low

Yes; Low

Yes(not specified); Suitable; Good where water is abundant;

Not so well as it requires a lot of energy to pump water;

Acceptable;

Not very efective where access to water problem; Effective to very effective;

Not noted;

Big hectarage covered compared to drip lots; Less expensive; Water flow is controlled;

Heavy energy requirements, inavailability of spare parts at times, requires a lot of water; Small irigated area compared to gravity irrigation; It is costly to buy and maintain;

All Extension Planning Areas (EPAs)

All Agricultural Development Divisions

All EPAs;

Most TAs covered

Most villages

Technology 17 = RIVER DIVERSION IRRIGATION SYSTEM

Technology 18 = RESIDUAL MOISTURE

Stream diversion; river diversion;

Indigenous;

No;

Ministry of Agriculture;

Malawi Government Public Works Program; Department of Irrigation;

Malawi Government Public Works Program; Department of Irrigation; Shire valley ADD;

Surface; stream river, water;

Yes;

Fish farming;

No significant difference;

Maximise water and land use;

With scarce water, high losses;

Chipuka irrigation scheme, Ntchisi; Livuzu EPA, 40km from Thabwa Chikwawa;

Irrigated crop sales; Livestock sales;

upland rrainfed mushroom; Canal labour, sales of green maize;

community; Community;

48 houses, 6 members each; 27;

8ha; 7.ha;

Mixed;

No;

NA;

No

NA;

30-42%;

7/1/2004; 2004;

1 year;

Yes;

NA;

Using dambos, river bank residual moisture for crops cultivation,

Indigenous

Na

Na

Local farmers

Communities

No

Na

Na

Na

Na

Na

Different locations

Farming maize and rice

As hired labour

Community

20-30hh, 5people/hh

60ha

Poor

No

Na

Na

Na

Over 50%

No records

No records

Yes

Na

Water capture and distribution	Using residual moisture
Bucket, treadle pump; rainfed agriculture; complete; Partial;	None
Rainfed agriculture	None
	Na
over 2 years;	Not limited
Yes;	Free
NA;	Na
Not established;	Almost nill
Less labour	Not applicable (NA): Not replacing old technology
Maize and vegetables;	Maize, sweet potatoes, cassava, sugarcane and beans
No change of crops;	Na
	03-Feb 2;
3000 7000kg /ha maize;	up to 1600kg/ha increase
K80 000 when sold green;	Na
K71 300	Na
Treadle pump	
5 - 6 years	Na
K14000;	Na
Mainly own labour; K12 150;	Na
Maize as main crop, and vegetables;	Na
1-3 crops	Na
K25 000;	Na

None;	Evangelical Rutheran Church
NA;	Over K10 000
NA;	Withdrawn
NA;	Functional
NA;	Better pace
NA;	Drought and food shortage
NA;	Provide improved seed
Yes,	Ministry of Agriculture
Not evaluated;	Over K50 000
On going;	On going
NA;	Na
Same;	Better
Farmes want to avert hunger; Sasakawa methods, weirs made of local materials;	Drought and food shortage Provide improved seed
None;	Na
NA;	Na
Japanese International Cooperation Agency:	Na
Not established;	Na
Withdrawn	Na
Yes,	Na
Yes,	Na
Training provided to farmers and their governance structures Capacity building for staff;	Na Na
Yes;	Yes
Yes;	Low
Yes; Very suitable;	Along flood prone rivers
So well;	Well
Good; Well accepted;	Acceptable
Good; Very efective;	High
Good water resource management; Nothing has been noted;	Rehabilitation effect on river
Provision of start up inputs;	Better water mangement

Limited land area;

Lack of such inputs as seed and fertilizer

Chipuka irrigation scheme; Mkuzi in Livuzu

Miyombo and Ipyana; variuos locations throughout country

Kasungu; Shire valley ADD and all ADDs

Karonga; variuos locations

Chipuka; Makhuwila;

Kaporo North and Sounth; variuos locations

Numerous

Kyungu and Kilipula; variuos locations

Numerous

Miyombo and Ipyana; variuos locations

Technology 19 = BAG GARDENING

Technology 20 = ROOF HARVESTING WITH ABOVE GROUND TANK

Old sand filled gunny bags with holes on sides for planting crops;

Imported

No;

Japanese Volunteers;

No information;

Extension workers;

Harvested rain water;

No;

NA

NA

NA

NA

Kaporo North EPA, 30km Karonga North;

Farming rice;

Farming cassava, palm oil production, soap making;

Individual;

2hh on trial basis;

3ha;

Poor;

No;

NA

No;

NA

None;

July 2003;

1;

No;

NA

Roof catchment with above ground tank;

Imported;

No;

Land resources conservation Department

Land Resource Department;

Shire valley ADD; Land Resource Department;

Harvested rain water;

Yes;

For irrigation and domestic use; Water for drinking, washing and irrigation; Domestic use, crop and animal waterig;

Wel adapted; the same design; Non painted roofs used, big tanks sieved and water guard chemical added;

Ease of water access; Multiple use of the same water; Farmers water ned met;

Water depletes fast;

Nthumba model school, Chikwawa; Balaka 30km, Chingale 25km; Lupembe 15km from Karonga, Sokola in Chitipa;

Livestock and cotton sales;;

Casual labour; World Vision International; Small business;

Community; Individual;

500 students, 10 teachers; 80 hoseholds; 15hh, 6 people/hh;

540; Not yet; 50ha;

Poor; Mixed;

Based on aridity; Yes;

There is poverty; Miuku, Lupembe area;

Yes, not just poverty;

Based on water problems;

20%; 40%; 20%;

5/1/2005; 2004; June 2004;

Less than a year; 1; 1.5 years;

Yes;

Na

Water capture;

Rain water harvesting

NA

using buckets for water storage; Using roof catchment without gutters replaced;

NA

Partial; Complete;

NA

Roof top is still the catchment area, the gutters are still there;

2 years;

20 years;

Free;

Yes; No;

None;

K60 000-K70 000

None;

Maintanance and repair costs are variable; Gutters K2000-K3000, Filling cracks KK500-K6000

Not applicable (NA): Not replacing old technology

Less labour

Vegetables;

Vegetables, tree seedlings;

No changes;

Na

1;

2-3;

No data;

Not yet evaluated;

NA

Not yet evaluated;

NA

Not yet evaluated;

NA

10 years; As long as the roof is there;

NA

Not determined

NA

Zero;

NA

Vegetables, tree sedlings;

NA

Na

NA

Not yet evaluated;

None;	World Vision in Chingale EPA
NA	K3 900 000
NA	On going
NA	Na
NA	Better
NA	Financial support; Farmer still receiving support
NA	Financial support; Construction materials
Japanese volunteers with Malawi Govt.;	Land Resource Department;
Advisory support;	K89 000 each system; K300 000 for 3 tanks;
On going;	Withdrawn
NA	Functioning
Slow;	Slow pace
High labour requirement;	Too costly for farmers; High inputs cost
Design and construction design;	Financial and expertise; Construction materials
None;	None
NA	Na
NA	Na
NA	Na
NA	Na
NA	Na
NA	Na
NA	Na
NA	Na
NA	Na
Yes;	Yes
Low;	Yes
Land shortage;	Suitable for iron roofed houses;
Not so well;	No well; Not so well; cost
Acceptable;	Very efective; Well accepted
High;	Positive, reduces runoff;
None;	Conserves water; High
Increase vegetable production;	Conserves water; Reduced burden of fetching water

Low production;

; High inputs cost

Kaporo North;

Mthumba model school; Lupembe; but also various locations in the country

Karonga;

Shire valley ADD; Karonga ADD and Machinga ADD; Lilongwe ADD

Kaporo North;

various locations

Kilipula;

various locations

Various

various locations

Technology 21= SHALLOW WELLS

Technology 22 = UNDER GROUND TANKS

Shallow wells

Underground hemispherical tanks;

Indigenous;

Imported;

None

No;

Govt. and Japanese volunteers;

Land Resource Department

Ministry of Irrigation;

Land Resource Department

Ministry of Irrigation and Water Development;

Land Resource Department

Ground water;

Running water from roads and other sources; Surface run off

Yes;

Yes

Drinking, domestic use and construction;

They will be used to irrigate crops in dry spells; Crop and livestock

Lining with bricks and cover provided;

Silt traps for crop production, water troughs provided for animals

Farmers needs are met;

Designed to meet farmers needs

Costly construction, labour and extension;

High costs

Lupembe, 15km Karonga South;

Lupembe 20 km South of Karonga, Chingale EPA, Zomba West

Farming cotton;

Farming cotton, maize, beans and sugarcane

Fishing;

Small bussinesses;

Both;

Community and individuals;

200hh;

Averaga sizes; 250hh, 6 people per hh

400ha;

600ha

Poor;

Mixed;

Yes;

No

NA

Na

No

Yes

NA

As above

60%;

50%;

July 2005;

May / June 2005

Less than 1 year;

Less than 1 year

Yes;

Yes

NA

Na

water capture	Capture running water; Rain water harvesting
Unprotected water holes;	; Water ponds for fish farming
Complete;	; Partial
None	; Silt traps fitted, cement lining, shape and purpose are new
Over 10 years;	Not known; 15-20 years
No;	Yes; Communities contributed
K4000 cement, K2000 reinforcement, labour K3000 and cover K1000;	K40 000-K50 000
K2000/year;	K2000-K3000 for desilting and filling cracks
Less labour	Less labour
Vegetable crop;	Vegetable crops, onions, Tomato
No;	None
1;	; 2
No data;	Na
No data;	Na
No data;	Na
Less than a year;	2-3 years
Nil;	; K5000-K10 000
Nil;	K1000-K1200 for ponds drilling
Not clear;	Vegetables
NA	Na
NA	No data

Tokuyama Rotary Club from Japan;

\$800;

Withdrawn;

Functional;

Better;

Farmers have acquired skill;

Cement, reinforcement and builders;

Land Resource and Irrigation and Water departments;

Advisory support;

On going;

NA

Better adoption;

Farmers trained in construction;

Construction advice and maintenance;

None;

NA

NA

NA

NA

NA

NA

NA

NA

Yes;

Yes;

Dry areas, 300-500mm rainfall;

Well;

Not against norms;

High;

Minimal;

Farmers have water nearby;

World Vision International; World Vision Malawi

Not assessed; K3 900 000

On going; On going

NA;

Better

Farmers receiving support

Supply of non locally available materials

Govt., World Vision; Land Resource Department MoA

K62 000

Withdrawn

Functional

Slow pace

Cost of inputs prohibitive

Industrial construction material

None

Na

Na

Na

Na

Na

Na

Na

Na

Yes; Yes

Low; Moderate

Anywhere; Stable, average soils than sandy or heavy clay

Well; Well

Acceptable; Accepted

High; High

Conserve water; Reduce erosion

Enhancing horticultural production

Lack of suppliers for specifics like cement, bars;

Lack of financial support to buy materials; High costs of inputs

Lupembe;

Chingale; Lupembe, Chingale EPAs

Karonga; all ADDs

MADD; Karonga, Machinga ADDs

Lupembe; various

Chingale; Lupembe, Chingale EPAs

Kyungu; various

Kyungu and Mulumbe

Kayni 1 and 2, Mwenelupembe; various

GVH Mwakabanga and Many

Technology 23 = SMALL EARTH DAMS

Technology 24 = RIVER IMPOUNDING

Water harvesting Dam; Water impounding for irrigation;

indigenous; Imported;

No;

Ministry of Agriculture; Land Resource Department;

Department of Irrigation;

Farmers;

Rain water and surface water;

Yes;

water storage, irrigation, fish ponds; soil and water conservation;

Vetiver planted on the other side;

It assists more people in the community; Used to rehabilitate degraded land;

Some people are irresponsible in its care; Labour requirements high;

GVH Nyambo, TA Malili, Lilongwe; Livungu, Mitole, 40km and 15km from Chikwawa; Chiwondo, 20km Karonga south;

Selling agri produce; Sell of livestock and cotton; Farming;

brewing beer, selling firewood; Casual labour, public works, sale of vegetables; Fishing;

Community;

100 households, 1hh(8people);

2ha;

Mixed;

Yes; No;

Food shortage from drought and poor harvest;

Yes; No

We targeted the willing through leaders;

20-40%;

2001-2004;

Less than 1 year - 4;

Yes;

Na

River impounding

Indigenous

NA

Irrigatiopn Department;

Irrigatiopn Department;

Extension agents with Irrigation Department

Surface;

Yes;

Irrigation and domestic use;

The same design;

Maximize use of water

NA

No specific location;

Farming;

NA

Community and individuals;

Not assessed;

0.1/ha;

Mixed;

No;

NA

No;

NA

80%;

Not known;

Many;

Yes;

NA

Water capture;

shallow wells; Planting was only on residual moisture;

Complete change; Partial;

Na

Not known

Yes; Free;

Maize and beans as secondary crop;

Not established;

Not applicable (NA): Not replacing old technology

2; Maize as main and vegetables as secondary; sweet potatoes and beans;

Cassava and sweet potatoes because of hunger;

1-2;

slight increase, 3000kg/ha for maize;

K80 000 when green;

K71 300;

Not established;

Not established;

K12 150;

Maize as main and vegetables as second;

one;

K10 500;

Capture running water;

Not replacing then old;

Complete;

NA

Depends on availability of water in streams;

Bags were for free;

NA

Farmers provide labour;

Not applicable (NA): Not replacing old technology

Maize;

NA

2;

Regular increase;

K350,000/ha

K190,000/ha

NA

NA

NA

NA

NA

NA

CPAR(international);

NA;

Withdrawn;

Yes

No

Na

Na

Land Resouce Department;

Variable; Advise and Extension Support;

On going;

Na

Same; Better;

Farmers are averting hunger; Gullies are common;
Sasakawa planting, channels, beds; Design and construction advice;

None;

Na

Japanese International coporation Agency;

Not establishd;

It was tie specific; withdrawn

Yes

Na

Na

Capacity building;

Yes;

Yes;

Community capaity to manage it; Very suitable; Where gullies develop;

Well;

High; Well accepted;

High; Very effective;

Positive effect;

crop production and fish sales increse; Cheap technology; Increased production;

World Vision International;

Not known;

Still going on;

NA

Slow;

Requires buying sacks;

Sacks;

Irrigation Department

Not known;

On going;

NA;

Slow pace;

Depends on availability of water;
Sacks;

NA;

NA;

NA;

NA;

NA;

NA;

NA;

NA;

NA;

Easy;

Low;

Seasonal where streams dry faster;

Well;

Acceptable;

High;

Reduced erosion, water availability;

Raises water level, making treadle pump use easier;

Lack of finance an community maintanance capacity; Initial labout intensive;

NA;

Various

Various

Lilongwe; Shire valley ADD; Kasungu;

All ADDs

Various

Various

Various

Various

Various

Various

Technology 25 = UNDER GROUND WATER SPRINGS

Captured spring water stored in reservoir before irrigation;

Imported;

No;

Irrigation department;

Irrigation department;

Irrigation Department with community contributing;

Ground water;

Yes;

Drinking, domestic use and construction; irrigation

Lining with bricks and cover provided;

Farmers needs are met;

Costly construction, labour and extension;

Lupembe, 15km Karonga South; Mkungwi site, Mpata EPA 10km Karonga West;

Farming: cotton, cassava, and sweet potatoes;

Fishing; Livestock production;

Both;

40hh, 6 people/hh;

25ha;

Poor;

No;

NA

No;

NA

20%;

October 1991;

14 years;

Yes;

NA

Water capture

None;

Complete;

NA

10-20 years;

Communities contributed;

K1 500 000;

K2000- K3000 for canals and reservoir maintainance;

Not applicable (NA): Not replacing old technology

Maize, beans and sweet potatoes;

None;

2;

No data;

No data;

No data;

NA

NA

NA

NA

NA

NA

None;

None;

None

None

None

NA

NA

Irrigation Department;

K700 000;

On going;

Yes;

No

Available springs harnessed

Design, materials, procedure and payments;

None

None

None

None

None

None

None

None

None

No;

Not easy, High cost;

At specific locations endowed with spring water

Well;

High;

High;

not determined, but considered minimal

Increased crop production, 2 per year;

High cost;

Lupembe; Mkungwi Smallholder Irrigation Scheme;

Karonga; all ADDs

Mpata; various

STA Lungu; various

Mkungwi; various