

Tables

Table 2.4.1 Production, Import and Export of Major Food Crops

(1) Maize

Year	Production	Import		Export	
	(ton)	(ton)	(%)	(ton)	(%)
1992	2,226,000	378,299	17.0	4,982	0.2
1993	2,282,000	147,847	6.5	8,841	0.4
1994	2,159,000	188,149	8.7	1,400	0.1
1995	2,567,000	153,387	6.0	3,858	0.2
1996	2,663,000	55,792	2.1	5,634	0.2
1997	1,831,000	91,396	5.0	1,935	0.1
1998	2,685,000	103,625	3.9	3,216	0.1
1999	2,452,000	259,259	10.6	-	-
2000	2,009,000	48,005	2.4	1,528	0.1
Average	2,319,333	158,418	6.9	3,924	0.2

(2) Wheat

Year	Production	Import		Export	
	(ton)	(ton)	(%)	(ton)	(%)
1992	64,000	49,344	77.1	5,721	8.9
1993	59,000	120,870	204.9	7,280	12.3
1994	59,000	95,377	161.7	5,139	8.7
1995	75,000	118,047	157.4	18,427	24.6
1996	84,000	132,828	158.1	19,931	23.7
1997	78,000	124,786	160.0	21,842	28.0
1998	111,000	102,134	92.0	13,130	11.8
1999	82,000	200,552	244.6	-	-
2000	33,000	237,685	720.3	5,760	17.5
Average	71,667	131,291	219.6	12,154	16.9

(3) Rice

Year	Production	Import		Export	
	(ton)	(ton)	(%)	(ton)	(%)
1992	256,000	31,042	12.1	9,844	3.8
1993	417,000	60,887	14.6	4,050	1.0
1994	399,000	32,865	8.2	4,337	1.1
1995	470,000	38,190	8.1	1,217	0.3
1996	477,000	33,641	7.1	3,337	0.7
1997	357,000	95,058	26.6	3,621	1.0
1998	676,000	42,277	6.3	633	0.1
1999	506,000	115,518	22.8	-	-
2000	508,000	129,394	25.5	1,475	0.3
Average	451,778	64,319	14.6	3,564	1.0

Source: Food Security Department, Ministry of Agriculture and Food Security

Table 2.4.3 Nutrition Status of Children in Tanzania

Region	Moderate Stunting (percent below 2.5 s.d.* median height for age)	Moderate Wasting (percent below 2.5 s.d.* median weight for height)	Moderate Underweight (percent below 2.5 s.d.* median weight for age)
Residence			
Mainland	43.6	7.1	30.5
Total Urban	32.9	7.6	19.5
Total Rural	45.9	7.0	32.9
Zanzibar	37.1	11.0	33.8
Region			
1 Arusha	43.7	7.2	35.1
2 Coast	51.7	11.2	34.3
DSM	30.6	8.1	22.2
3 Dodoma	48.1	8.0	34.2
4 Iringa	70.5	6.2	48.2
5 Kagera	41.6	10.8	36.0
6 Kigoma	52.5	7.6	43.1
7 Kilimanjaro	33.5	5.6	21.0
8 Lindi	58.6	7.0	41.4
9 Mara	32.6	8.4	18.9
10 Mbeya	46.9	6.2	20.8
11 Morogoro	52.7	4.1	25.5
12 Mtwara	58.0	5.9	35.6
13 Mwanza	33.8	7.6	27.0
14 Rukwa	42.0	9.7	30.5
15 Ruvuma	53.5	5.2	29.4
16 Shinyanga	31.3	6.8	27.8
17 Singida	38.6	7.0	28.4
18 Tabora	25.7	4.4	14.2
19 Tanga	55.3	4.9	36.2
Total	43.4	7.2	30.6

Source: Bureau of Statistics (Tanzania) and Macro International Inc (1997a)

*: Standard Deviation

Table 4.2.1 Assessment of Implementation of NIDP

Category	Program Component and Sub-component	Part	Priority	Resources Needed	Comments given when NIDP started	Time schedule						Assessment of the Progress		
						'94	'95	'96	'97	'98	'99		'00	~
Removal of Constraints	1. Policy and Sector													
	- Policy preparation and monitoring	B	1	Funds and TA									The plan marked some of the poor performance attributed to unclear policy requirements and inadequate sectoral coordination.	
	- Sectoral coordination	B,C	1	Funds and TA	Part A Programme components are already coordinated								No activities have been taken yet.	
	2. Institutional Building													
	- Rationalization of Irrigation Department (ID) functions	A	1	TA	Funding covered by the ASMP								The plan was done in ASMP, but not fully performed	
	- Equipment	B	1	Funds									No activities have been taken yet.	
	- On-going training	B	1	Funds and TA									No activities have been taken yet. In relation for this, Human-resource Development Plan in MAFS was formulated in 2000.	
	- Operation and maintenance	B	1	Funds and TA									No activities have been taken yet. Section is not on track in terms of manpower development.	
	3. Information System and Research													
	- Planning and MIS	A,B	1	Funds and TA	Equipment and some software have been installed, a massive data collection, evaluation and analysis exercise is now badly required								ASPS-IC, RBM-SIP	Recently, some technical guidelines and manuals have been prepared in ASPS-IC and RBM-SIC, for the sake of training to LGA's staff.
	- Research	A,B	1	Funds and TA										No activities have been taken yet.
	- National hydromet network	A,B	1	Funds and TA										No substantial activities have been taken yet, besides conducting hydromet measurement under ASPS, RBM-SIP.
	4. End User Involvement													
	- Cost recovery	A	n/a	none	National study executed as part of Madibira project, funded by AIDB									Few contribution was given in the Madibira project.
	- Commercialization	B	2	Funds and TA	Specialist consultancy in association with ID and TA									No activities have been taken yet.
- Contractor based operation	B	1	Funds and TA	Including an evaluation of existing ID construction fleet									Evaluation of equipment operation was done by the COWI consultant.	
- Parastatal reform	B	-	-	Role of ID, if any, unclear at this stage									No activities have been taken yet.	
Infrastructure	1. Planning Studies													
	- Mwanapoli Irrigation Project studies	B	1	Funds and TA	Catchment, dam rehabilitation and schemes expansion studies								The study was completed by financing of AIDB/UNCDF on schedule.	
	- Mgorogola Feasibility Study	B	1	Funds and TA	Preparatory surveys already carried out								It was completed under the F/S on Central Wami River basin Project financed by JICA.	
	- Ruve Basin Master Plan	A	In progress	None	Financed by JICA								It was completed by JICA on schedule.	
	- Irrigation from small dams	B	1	Funds and TA	High priority study because of 1994 food shortages								No activities have been taken yet.	
	- Irrigation from shallow wells	B	1	Funds and TA	High priority study because of 1994 food shortages								No activities have been taken yet.	
	- Ongoing river basin studies	B	1	Funds and TA	River basin water management is pressing issue in basins that have users/are being developed								Some river basin development studies were carried out, such as RBM-SIP, ASPS, projects financed by JICA, and financed by UNDP.	
	2. Implementation													
	1. Rehabilitation/Upgrading Traditional Schemes													
	- Usungu Village Irrigation Project	A,B	In progress	Funds and TA	Present phase due to finish in December 1995									The project was completed by financing of UNDP/FAO.
	- Rehabilitation of traditional irrigation schemes	A,B	1	Funds and TA	Current phase is due to end Nov 1995, but the programme has huge potential for construction									Some schemes have been implemented under the programmes, such as RBM-SIC, ASPS, projects financed by JICA, and financed by UNDP.
	- Pawaga Irrigation Project	B	1	Funds and TA	Rehabilitation of reticulation system and user training, to take advantage of major new offtake									The project was completed by financing of UNDP.
	- SNV TIP	A	In progress	None	SNV is the Dutch Development Organization, funded by the Netherlands									SNV TIP was successfully phased out, then TIPDO has been started.
	- Rehabilitation of schemes in Pangani Basin	A	In progress	None	Programme about to begin									RBM-SIC has been implemented under the financing of World Bank.
	- Ongoing rehabilitation/upgrading of regionally ranked schemes	C	1	Funds and TA	Scheme not covered by current or future phases of UVIP and RTP									No activities have been taken yet.
	- Kinard Irrigation Project	B	2	Funds and TA	Phase I completed in November 1993									The project was completed on schedule by financing of CIDA.
	2. Water Harvesting Schemes													
	- Smallholder Development Project for Marginal Areas	A	In progress	TA	In progress by IFAD, with great potential for replication									SDPMA was successfully phased out, then new project of PDP was started.
	- Ongoing implementation of regionally ranked schemes	C	1	Funds and TA	Schemes not covered by current or future phases of SDPMA									No activities have been taken yet.
	3. New Smallholder Schemes													
	- Mwanapoli Irrigation Project	A	none	None	Due for completion in 1994									The project was completed by financing of AIDB.
	- do-	B	1	Funds and TA	Catchment and spillway rehabilitation and scheme expansion									The scheme was completed simultaneously with the above implementation by financing of AIDB.
	- Madibira Irrigation Project	A	none	None	Due to begin in 1994									The project was completed by financing of AIDB.
- Kitiyo Irrigation Project	A	none	None	Due for completion in 1994									The project was completed in 1994.	
- do-	B	1	Funds and TA	Rehabilitation of damage caused by 1993 floods and Lungusa Extension									The project was affected by floods twice.	
- Schemes in the Ruve Basin	B	2	Funds and TA	Schemes emanating from the recent JICA study, but subject to normal ranking procedures									No activities have been taken yet.	
- Mgorogola Irrigation Scheme	C	2	Funds and TA										Implementation of the project was requested to JICA. However, no activities have been taken yet.	
- Ongoing implementation of regionally ranked schemes	C	1	Funds and TA										No activities have been taken yet.	
- Schemes using small dams	C	1	Funds and TA	Scheme resulting from the above studies, but subject to normal ranking procedures									No activities have been taken yet.	
- Schemes using shallow wells	C	1	Funds and TA	Scheme resulting from the above studies, but subject to normal ranking procedures									No activities have been taken yet.	

□ : originally planned schedule in NIDP ■ : actually implemented schedule

Table 4.7.1 List of Construction and O & M Equipment of MAFS

Equipment	Location																		Total
	MZZHQ	KITIVO	USANGU	CH/NKOLA	MW/PULI	BUTLAMA	NSALALA	KINJARO	BAHI	TZHQ	CHIPANGA	MISUNGWI	KINTINKU	PAWAGA	ITUMBA	MORO Z/HQ	MBV Z/RQ	DODOMA IF	
1 Bulldozer	0	2	4	2	1	1	1	1	2	0	2	0	5	0	0	0	0	0	21
2 Excavator	0	2	2	0	1	1	2	2	0	0	0	0	0	1	0	0	0	0	11
3 Wheel Loader	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3
4 Backhoe	1	1	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	6
5 Scraper	0	2	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	6
6 Motor Grader	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
7 Land Planner	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	3
8 Soil Compactor	0	2	1	0	3	0	0	0	0	0	1	0	0	3	0	0	0	0	10
9 Generator	0	3	3	0	2	0	0	2	2	0	0	0	0	2	0	0	0	0	14
10 Concrete Mixer	0	4	9	1	6	0	0	2	0	0	1	0	1	2	0	0	0	0	26
11 Air Compressor	0	2	1	0	2	0	1	1	0	0	1	0	0	1	0	0	0	0	9
12 Stone Crusher	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	3
13 Welding Machine	0	2	2	0	0	0	1	0	1	0	1	0	0	1	0	0	0	0	8
14 Water Bowser	0	3	3	1	4	0	0	2	0	0	3	0	1	2	0	0	0	0	19
15 Water Pump	0	1	0	0	0	0	0	3	2	1	1	0	0	3	0	0	0	0	11
16 Center Lathe	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
17 Low Loader	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
18 Tipper Truck	0	3	2	0	2	0	1	2	1	1	0	0	1	0	0	1	1	1	16
19 Long Base Truck	1	1	4	0	1	0	0	1	2	1	0	0	0	1	0	1	0	0	13
20 Fuel Tanker/Bowser	0	1	1	0	2	0	1	1	0	0	0	0	1	0	0	0	0	0	7
21 Wood Working Machine	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
22 Agriculture Tractor	0	1	3	1	1	0	0	2	1	2	0	0	1	2	0	1	0	0	15
23 Agriculture Trailer	0	2	3	0	2	0	0	3	0	1	1	0	0	2	0	0	0	0	14
24 Light Truck (Pick-up)	3	0	1	0	2	0	3	2	4	3	0	0	3	2	1	0	1	3	28
25 Light Truck (Hard-top)	1	3	6	2	2	0	0	3	0	2	0	0	0	0	1	0	0	6	26
26 Motor Cycle	5	1	5	2	1	0	3	8	9	2	0	0	3	3	0	0	0	0	42
27 Bar Cutter	0	1	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	4
28 Concrete Vibrator	0	3	1	0	1	0	1	4	0	0	0	0	0	2	0	0	0	0	12
29 Power Hacksaw	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
30 Mini Bus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
31 Workshop Press	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
32 Pillar Drill	0	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	4
Total	11	49	57	9	49	2	14	41	25	13	12	1	17	29	2	3	2	11	347

Remarks:

(1) Abbreviations MZZHQ: Mwanza Zonal Head Quarter

CH/NKOLA: Choma Cha Nkola

MW/PULI: Mwanapuli

KINJARO: Kilimanjaro (Moshi Zonal Head Quarter)

TZ/HQ: Tabora Zonal Head Quarter

MORO Z/HQ: Morogoro Zonal Head Quarter

MBV Z/HQ: Mbeya Zonal Head Quarter

DODOMA IF: Dodoma PAD Head Quarter

(2) As of end of July 2002

Table 4.8.1 List of Past Irrigation Development Project Plans

Project	District	Stage ⁽¹⁾	Year	Required Works	Cost (US\$10 ⁵) ⁽²⁾	Water Resources	Irrigable Area	Irrigation Method	Crops	Remarks
(1) Mkomazi Valley Area Irrigation Development Project										
(a) Kisiwani Scheme	Same	F/S	1984	Rehabilitation/New	2.7	Nakambo river	360 ha	Gravity	Paddy, Maize	Listed in Inventory Survey
(b) Gonja Scheme	Same	F/S	1984	Rehabilitation/New	4.8	Hingilli river	1,040 ha	Gravity	Paddy, Maize	Listed in Inventory Survey
(c) Kihurio Scheme	Same	F/S	1984	Rehabilitation/New	13.3	Saseni/Kambaga rivers	1,670 ha	Gravity	Paddy, Maize	Listed in Inventory Survey
(d) Igoma Scheme	Same	F/S	1984	Rehabilitation/New	12.4	Kambaga river	750 ha	Gravity	Paddy, Maize	Listed in Inventory Survey
(2) Lower Moshi Agricultural Development Project										
(a) Miwareni Pump Lift Scheme	Moshi	F/S	1980	New Development	18.7	Miwareni Spring	2,000 ha	Pump	Paddy, Oil Seeds	Pump station equipped with 4 electrical driven pumps is required.
(b) Makuyuni Scheme	Moshi	F/S	1980	New Development	3.5	Himo river	500 ha	Gravity	Maize, Oil Seeds	Listed in Inventory Survey
(c) Ghona & Kileo Scheme	Mwanga	F/S	1980	New Development	3.5	Himo river	500 ha	Gravity	Paddy, Oil Seeds	Listed in Inventory Survey
(d) North Groundwater Scheme	Moshi	F/S	1980	New Development	9.0	Groundwater	840 ha	Pump	Maize, Oil Seeds	Construction of 14 tubewells equipped with submersible pump is required.
(e) East Ground Water Scheme	Moshi	F/S	1980	New Development	2.0	Groundwater	180 ha	Pump	Maize, Oil Seeds	Construction of 6 tubewells equipped with submersible pump is required.
(3) Smallholder Irrigation Projects in Central Wami River Basin, Morogoro										
(a) Mgeta Scheme	Morogoro	F/S	1997	Rehabilitation	0.3	Mzinga/Mindo river	30 ha	Gravity	Maize, Vegetables	Listed in Inventory Survey
(b) Manyeyere Scheme	Kilosa	M/P	1996	Rehabilitation	9.8	Miyombo river	1,040 ha	Gravity	Paddy	Listed in Inventory Survey
(c) Kilangali Scheme	Morogoro	M/P	1996	Rehabilitation	3.8	Miyombo river	370 ha	Gravity	Paddy	Listed in Inventory Survey
(d) Mgongola Scheme	Morogoro	F/S	1997	Rehabilitation	6.2	Mkindo river	620 ha	Gravity	Paddy, Vegetables	Listed in Inventory Survey
(e) Mdali Scheme	Morogoro	M/P	1996	Rehabilitation	0.4	Mdali river	60 ha	Gravity	Paddy, Tomato	Listed in Inventory Survey
(f) Mvumi Scheme	Kilosa	M/P	1996	Rehabilitation	2.6	Kisangata river	260 ha	Gravity	Paddy, Maize	Listed in Inventory Survey
(g) Msolwa Scheme	Kilombero	M/P	1996	Rehabilitation	1.5	Msolwa river	320 ha	Gravity	Maize, Paddy	Listed in Inventory Survey
(h) Mkula Scheme	Kilombero	F/S	1997	Rehabilitation	1.5	Mkula river	149 ha	Gravity	Paddy, Maize	Listed in Inventory Survey
(i) Sonjo Scheme	Kilombero	M/P	1996	Rehabilitation	2.5	Sonjo river	480 ha	Gravity	Paddy, Maize	Listed in Inventory Survey
(j) Chabima Scheme	Kilosa	M/P	1996	Rehabilitation	0.06	Chabima river	10 ha	Gravity	Maize, Beans	Not recommended by District Office presently (Inventory Survey)
(k) Lumuma Scheme	Morogoro	M/P	1996	Rehabilitation	2.4	Lumuma river	380 ha	Gravity	Maize, Onion	Listed in Inventory Survey
(l) Ndole Scheme	Morogoro	M/P	1996	Rehabilitation	0.4	Ndole river	80 ha	Gravity	Maize, Beans	Listed in Inventory Survey
(m) Mgogozu-Kikalo Scheme	Kilosa	M/P	1996	Rehabilitation	0.5	Kikalo river	100 ha	Gravity	Maize, Onion	Listed in Inventory Survey
(n) Chabi Scheme	Kilosa	M/P	1996	Rehabilitation	1.1	Chabi/Mohazima rivers	270 ha	Gravity	Maize, Onion	Listed in Inventory Survey
(4) Lower Hai and Lower Rombo Agricultural Development Project	Hai	F/S	1990	New Development	15.1	Sanya river/groundwater	1,500 ha	Gravity/pump	Maize, Beans	Listed in Inventory Survey
(5) Study on Water Resources Development in the Ruvu River Basin										
(a) Baganoyo Irrigation Project	Bagamoyo	M/P	1994	Extension	3.5	Ruvu river	1,100 ha	Gravity	Paddy	Listed in Inventory Survey
(b) Low-lift Pump Irrigation Project	Baga./Kibaha	M/P	1994	New Development	0.1	Ruvu river	50 ha	Pump	Paddy	Irrigation is made by small-scale and movable type pumps.
(c) Makurungu Irrigation Project	Bagamoyo	M/P	1994	Rehabilitation	0.5	Ruvu river	150 ha	Pump	Paddy	Listed in Inventory Survey
(d) Ruvu National Youth Irr. Project	Kibaha	M/P	1994	Rehabilitation	1.1	Ruvu river	200 ha	Pump	Paddy	Listed in Inventory Survey
(e) Kidunda Irrigation Project	Morogoro	M/P	1994	New Development	50.1	Ruvu river	15,600 ha	Gravity	Most Crops	No agricultural activities. Construction of Kindunda dam is required.
(f) Ngerengro Irrigation Project	Morogoro	M/P	1994	New Development	7.5	Ruvu river	2,450 ha	Gravity	Most Crops	No agricultural activities. Construction of Ngerengere dam is required.
(g) Mgeta Plain Irrigation Project	Morogoro	M/P	1994	New Development	23.0	Mgeta river	7,000 ha	Gravity	Most Crops	Limited by Selous Game Reserve. Dam construction is required.
(h) Mgeta Plain Mvaha Irr. Project	Morogoro	M/P	1994	New Development	10.9	Mvaha river	5,000 ha	Gravity	Most Crops	Listed in Inventory Survey
(i) Uluguru Mountains West Project	Morogoro	M/P	1994	Rehabilitation	8.1	Mgeta river	2,000 ha	Gravity	Vegetables	Rehabilitation and improvement of traditional irrigation system
(6) Lower Moshi Integrated Agriculture and Rural Development Project	Hai and Moshi	F/S	1998	Extension	53.4	Kikuletwa river	4,700 ha	Gravity	Paddy, Alfalfa	Listed in Inventory Survey
(7) Water Management Improvement Project in Lower Moshi and Upper Areas	Moshi	P/S	2002	Upgrading	1.1	Rau/Njoro rivers	1,560 ha	Gravity	Paddy	Listed in Inventory Survey
(8) Others										
(a) Kyela Plain Irrigation Project	Kyela	P/S	1990	New Development	113.4	Kiwa/Rufiro rivers	12,600 ha	Gravity	Paddy	The Project consists of 4 independent different canal systems.
(b) Kibaha Small Reservoir Irr. Project	Kibaha	P/S	1996	Rehabilitation/New	n.a.	Small streams	n.a.	Gravity	Vegetables	Rehabilitation and New development of many small reservoirs
(c) Pawoga Area Irrigation Project	Iringa	F/S	1989	Rehabilitation	48.0	Little Ruaha river	6,000 ha	Gravity	Paddy	3 to 5 weirs, rehabilitation of existing system, expansion of system
(d) Kitere Small Irrigation Project	Mtwara	F/S	2000	Rehabilitation	4.2	Mpembedi river	2,800 ha	Gravity	Paddy, Beans	Water harvesting technology is proposed.

Note: (1) M/P: Master Plan Study, F/S: Feasibility Study, P/S: Preliminary Study

(2) Current cost of 2002.

Table 5.2.1 Inventorized Irrigation Schemes Conducted by NIMP and RBMSIIP

Region	Traditional Irrigation			Water Harvesting			Modern Irrigation			Improved Traditional Irrigation			Total		
	No. of Schemes	Existing (ha)	Estimated (ha)	No. of Schemes	Existing (ha)	Estimated (ha)	No. of Schemes	Existing (ha)	Estimated (ha)	No. of Schemes	Existing (ha)	Estimated (ha)	No. of Schemes	Existing (ha)	Estimated (ha)
Arusha	192	44,256	89,833	3	740	1,440	15	1,117	3,361	13	3,834	5,373	223	49,947	100,007
Coast	2	300	11,500	2	0	12,870	17	808	33,660	5	25	725	26	1,133	58,755
Dar es Salaam	2	0	142	2	4	190	7	0	5,185	1	0	8	12	4	5,525
Dodoma	12	575	3,150	34	1,596	39,499	1	200	300	4	1,237	740	51	3,608	43,689
Iringa	75	3,392	15,981				3	820	1,534	16	1,327	5,820	94	5,538	23,335
Kagera	18	15	17,166										18	15	17,166
Kigoma	25	3,340	20,930	2	80	1,600							27	3,420	22,530
Kilimanjaro	412	31,099	92,949				9	9,818	16,250	18	4,721	8,734	439	45,638	117,933
Lindi	10	1,231	6,258	2	0	1,200	3	0	1,900				15	1,231	9,358
Mara				14	295	5,511	15	46	11,965				29	341	17,476
Mbeya	71	16,714	51,343				3	7,079	7,094	29	11,446	20,820	103	35,239	79,257
Morogoro	50	9,335	122,684	3	1,680	7,400	31	13,529	43,698	4	600	2,950	88	25,144	176,732
Mtwara	4	630	7,100	5	20	7,275				1	80	946	10	730	15,321
Mwanza	5	224	358	30	573	19,495	18	270	4,975	3	41	58	56	1,108	24,886
Rukwa	16	3,636	43,272	1	400	2,000	1	1,200	2,400				18	5,236	47,672
Ruvuma	11	198	7,850										11	198	7,850
Shinyanga	3	120	700	36	1,270	17,220	1	110	400	3	150	350	43	1,650	18,670
Singida				19	525	11,840							19	525	11,840
Tabora	8	820	9,980	50	751	22,480	1	630	1,500	3	390	920	62	2,591	34,880
Tanga	66	6,746	17,549	2	0	700	3	220	360	13	1,660	2,802	84	8,626	21,411
Total	982	122,631	518,745	205	7,934	150,720	128	35,847	134,582	113	25,511	50,246	1,428	191,922	854,293

Source : Result of Inventory Survey Conducted by NIMP and RBM&SIIP

Rounded (854,300)

Table 5.2.2 Classification of Inventorized Irrigation Schemes

Type 1	Type 2 Water Source		Type 3 (Project scale)			
			1 small	2 Medium	3 Large	Total
1 Rehabilitation	1 Surface	Nos. of schemes	849	163	58	1,070
		Existing Area (ha)	58,238	63,123	62,182	183,543
		Estimated Area (ha)	123,149	162,290	208,693	494,132
	2 G/W	Nos. of schemes	5		1	6
		Existing Area (ha)	86		300	386
		Estimated Area (ha)	443		3,500	3,943
	3 Lake	Nos. of schemes	2			2
		Existing Area (ha)	19			19
		Estimated Area (ha)	70			70
1 Rehabilitation Total / Nos. of schemes			856	163	59	1,078
1 Rehabilitation Total / Existing Area (ha)			58,343	63,123	62,482	183,948
1 Rehabilitation Total / Estimated Area (ha)			123,662	162,290	212,193	498,145
2 New	1 Surface	Nos. of schemes	63	27	15	105
		Existing Area (ha)	40	0	0	40
		Estimated Area (ha)	12,865	32,058	148,850	193,773
	2 G/W	Nos. of schemes	6	1		7
		Existing Area (ha)	0	0		0
		Estimated Area (ha)	795	630		1,425
	3 Lake	Nos. of schemes	30	3	1	34
		Existing Area (ha)	0	0	0	0
		Estimated Area (ha)	3,230	4,600	2,400	10,230
2 New Scheme Total / Nos. of schemes			99	31	16	146
2 New Scheme Total / Existing Area (ha)			40	0	0	40
2 New Scheme Total / Estimated Area (ha)			16,890	37,288	151,250	205,428
3 Water Harvesting	4 Stream Flood	Nos. of schemes	70	47	17	134
		Existing Area (ha)	1,202	2,200	3,480	6,882
		Estimated Area (ha)	16,328	46,926	53,698	116,952
	5 Catchment	Nos. of schemes	16	3		19
		Existing Area (ha)	416	75		491
		Estimated Area (ha)	2,401	3,600		6,001
	6 Rainwater	Nos. of schemes	45	4	2	51
		Existing Area (ha)	561	0	0	561
		Estimated Area (ha)	7,767	4,500	15,500	27,767
3 Water Harvesting Total / Nos. of schemes			131	54	19	204
3 Water Harvesting Total / Existing Area (ha)			2,179	2,275	3,480	7,934
3 Water Harvesting Total / Estimated Area (ha)			26,496	55,026	69,198	150,720
Grand Total / Nos. of schemes			1,086	248	94	1,428
Grand Total / Existing Area			60,562	65,398	65,962	191,922
Grand Total / Estimated Area			167,048	254,604	432,641	854,293

Rounded (854,300)

Table 6.4.1 Population, Road Densities and Cereals Deficits for Respective Districts (1/3)

No.	Region	District	Land area (km ²)	Population Density			Road Density				Foods Deficit in 2000/01			Overall Evaluation				
				Population (estimated for 2002) ¹	Density (nos/km ²)	Evaluation Score	Judge	(Trunk and Regional Roads) (km)	(District and Other Small Roads) (km)	Total (km)	Density (m/km ²)	Evaluation Score	Judge	Deficit (%)	Evaluation Score	Judge	Score	Judge
1	Arusha	Arumeru	2,979	728,000	244	2	High	388.0	844.0	1,232.0	414	2	High	53	2	High	6	High
2		Arusha		Including Arumeru District				Including Arumeru District									6	High
3		Babati	4,969	332,000	67	2	High	274.0	726.0	1,000.0	201	2	High	n.a	2	High	6	High
4		Hanang	3,436	180,000	52	2	High	140.0	475.0	615.0	179	2	High	44	1	Low	5	Medium
5		Karatu	3,300	153,000	46	2	High	103.0	278.0	381.0	115	2	High	68	2	High	6	High
6		Kiteto	16,305	128,000	8	1	Low	480.0	1,456.0	1,936.0	119	2	High	71	2	High	5	Medium
7		Mbulu	4,352	202,000	46	2	High	150.0	536.0	686.0	158	2	High	68	2	High	6	High
8		Monduli	14,201	174,000	12	1	Low	247.0	913.0	1,160.0	82	1	Low	50	2	High	4	Medium
9		Nrongoro	14,036	110,000	8	1	Low	240.0	275.0	515.0	37	1	Low	inspected ²	2	High	4	Medium
10		Simanjiro	18,851	148,000	8	1	Low	240.0	991.0	1,231.0	65	1	Low	71	2	High	4	Medium
		Sub-total	82,429	2,155,000	26			2,262.0	6,494	8,756.0	106							
11	Coast	Bagamoyo	9,842	240,000	24	1	Low	470.0	433.0	903.0	92	1	Low	26	1	Low	3	Low
12		Kibaha	1,812	115,000	64	2	High	98.0	272.0	370.0	204	2	High	61	2	High	6	High
13		Kisarawe	4,464	175,000	39	2	High	151.0	749.0	900.0	202	2	High	0	1	Low	5	Medium
14		Maña	518	46,000	89	2	High	68.0	141.0	209.0	403	2	High	100	2	High	6	High
15		Mkururanga	2,432	95,000	39	2	High	135.0	317.0	452.0	186	2	High	0	1	Low	5	Medium
16		Rufiji	13,339	210,000	16	1	Low	240.0	639.0	879.0	66	1	Low	26	1	Low	3	Low
		Sub-total	32,407	881,000	27			1,162.0	2,551.0	3,713.0	115							
17	DSM ³	Dar Apex City		Including Kinondoni District				Including Kinondoni District									5	Medium
18		Ilala	210	582,000	2,771	2	High	150.0	42.0	570.0	2,714	2	High	17	1	Low	5	Medium
19		Kinondoni	652	1,084,000	1,663	2	High	248.0	499.0	747.0	1,146	2	High	20	1	Low	5	Medium
20		Temeke	531	708,000	1,333	2	High	232.0	505.0	737.0	1,388	2	High	50	2	High	6	High
		Sub-total	1,393	2,374,000	1,704			630.0	1,046.0	1,676.0	1,203							
21	Dodoma	Dodoma	16,576	789,000	48	2	High	520.0	1,127.0	1,647.0	99	2	High	89	2	High	6	High
22		Kongwa		Including Mpwapwa District				Including Mpwapwa District									5	Medium
23		Kondoa	13,209	482,000	37	2	High	359.0	917.0	1,276.0	97	2	High	76	2	High	6	High
24		Mpwapwa/(Kongwa)	11,526	481,000	42	2	High	356.0	957.0	1,313.0	114	2	High	42	1	Low	5	Medium
		Sub-total	41,311	1,752,000	42			1,235	3,001.0	4,236.0	103							
25	Iringa	Iringa	28,620	653,000	23	1	Low	693.9	1,366.0	2,059.9	72	1	Low	23	1	Low	3	Low
26		Ludewa	8,397	145,000	17	1	Low	259.9	885.0	1,144.9	136	2	High	3	1	Low	4	Medium
27		Makete	4,128	168,000	41	2	High	242.4	502.0	744.4	180	2	High	11	1	Low	5	Medium
28		Mufindi	7,123	334,000	47	2	High	388.5	835.0	1,223.5	172	2	High	18	1	Low	5	Medium
29		Njombe	10,668	460,000	43	2	High	416.2	1,086.0	1,502.2	141	2	High	18	1	Low	5	Medium
		Sub-total	58,936	1,760,000	30			2,000.9	4,674.0	6,674.9	113							
30	Kagera	Bukoba	7,860	585,000	74	2	High	460.5	550.8	1,011.3	129	2	High	3	1	Low	5	Medium
31		Biharamulo	10,095	314,000	31	1	Low	401.0	732.0	1,133.0	112	2	High	14	1	Low	4	Medium
32		Karagwe	7,716	438,000	57	2	High	284.5	434.6	719.1	93	2	High	26	1	Low	5	Medium
33		Muleba	10,739	411,000	38	2	High	245.5	368.6	614.1	57	1	Low	21	1	Low	4	Medium
34		Ngara	4,428	237,000	54	2	High	349.0	424.8	773.8	175	2	High	19	1	Low	5	Medium
		Sub-total	40,838	1,985,000	49			1,740.5	2,510.8	4,251.3	104							

Source: Socio-Economic Profiles. /1: surveyed by Food Security Department, MAFS, /2: inspected by Food Security Department, /3: Das es Salaam Municipality, /4: President's Office (but rounded)

Table 6.4.1 Population, Road Densities and Cereals Deficits for Respective Districts (2/3)

No.	Region	District	Land area (km ²)	Population Density				Road Density						Foods Deficit in 2000/01			Overall Evaluation	
				Population (estimated for 2000) ¹	Density (nos/km ²)	Evaluation		(Trunk and Regional Roads) (km)	(District and Other Small Roads) (km)	Total (km)	Density (m/km ²)	Evaluation		Deficit (%)	Evaluation		Score	Judge
						Score	Judge					Score	Judge		Score	Judge		
35	Kigoma	Kasuu	9,324	470,000	50	2	High	312.0	355.0	667.0	72	1	Low	9	1	Low	4	Medium
36		Kibondo	16,058	258,000	16	1	Low	260.0	164.0	424.0	26	1	Low	43	1	Low	3	Low
37		Kigoma	19,685	525,000	27	1	Low	488.0	202.0	690.0	35	1	Low	15	1	Low	3	Low
		Sub-total	45,067	1,253,000	28			1,060.0	721.0	1,781.0	40							
38	Kilimanjaro	Hai	2,112	416,000	197	2	High	136.0	390.0	526.0	249	2	High	inspected ²	1	Low	5	Medium
39		Moshi	1,771	706,000	399	2	High	562.0	587.0	1,149.0	649	2	High	15	1	Low	5	Medium
40		Mwanga	2,698	204,000	76	2	High	243.0	263.0	506.0	188	2	High	60	2	High	6	High
41		Rombo	1,442	418,000	290	2	High	152.0	618.0	770.0	534	2	High	inspected ²	2	High	6	High
42		Same	5,186	354,000	68	2	High	354.0	414.0	768.0	148	2	High	69	2	High	6	High
		Sub-total	13,209	2,098,000	159			1,447.0	2,272.0	3,719.0	282							
43	Lindi	Kilwa	13,920	206,000	15	1	Low							18	1	Low	4	Medium
44		Lindi Urban	7,846	341,000	44	2	High							33	1	Low	5	High
45		Liwale	36,084	71,000	2	1	Low	957.0	5,729.0	6,686.0	100	2	High	28	1	Low	4	Medium
46		Nachingwea	7,070	161,000	23	1	Low							34	1	Low	4	Medium
47		Ruangwa	2,080	105,000	51	2	High							33	1	Low	5	Medium
		Sub-total	67,000	884,000	13			957.0	5,729.0	6,686.0	100							
48	Mara	Bunda	2,782	298,000	107	2	High	194.0	421.0	615.0	221	2	High	71	2	High	6	High
49		Musoma	4,009	468,000	117	2	High	292.0	547.0	839.0	209	2	High	29	1	Low	5	Medium
50		Tarime	3,885	506,000	130	2	High	348.0	452.0	800.0	206	2	High	14	1	Low	5	Medium
51		Serengeti	10,942	168,000	15	1	Low	300.0	253.0	553.0	51	1	Low	16	1	Low	3	Low
		Sub-total	21,618	1,440,000	67			1,134.0	1,673.0	2,807.0	130							
52	Mbeya	Chunya	29,219	249,000	9	1	Low	315.5	390.4	705.9	24	1	Low	inspected ²	1	Low	3	Low
53		Ileje	1,908	134,000	70	2	High	175.0	408.0	583.0	306	2	High	15	1	Low	5	Medium
54		Kyela	1,322	167,000	126	2	High	149.0	299.0	448.0	339	2	High	38	1	Low	5	Medium
55		Mbarali	16,000	172,000	11	1	Low	263.1	359.7	622.8	39	1	Low	0	1	Low	3	Low
56		Mbeya	19,278	733,000	38	2	High	317.1	433.3	750.4	39	1	Low	0	1	Low	4	Medium
57		Mbozi	9,679	499,000	52	2	High	394.0	377.0	771.0	80	1	Low	6	1	Low	4	Medium
58	Rungwe	2,211	276,000	125	2	High	380.0	616.0	996.0	450	2	High	inspected ²	1	Low	5	Medium	
		Sub-total	79,617	2,230,000	28			1,993.7	2,883.4	4,877.1	61							
59	Morogoro	Kilosa	14,918	515,000	35	2	High	445.0	1,063.0	1,508.0	101	2	High	inspected ²	1	Low	5	Medium
60		Kilombero	14,246	816,000	57	1	Low	345.0	255.0	600.0	42	1	Low	7	1	Low	3	Low
61		Morogoro	19,316	278,000	14	2	High	518.0	645.0	1,163.0	60	1	Low	23	1	Low	4	Medium
62		Ulanga	24,460	206,000	8	1	Low	212.0	259.0	471.0	19	1	Low	69	2	High	4	Medium
		Sub-total	72,940	1,815,000	25			1,520	2,222	3,742.0	51							
63	Mtwara	Masasi	8,940	435,000	49	2	High	746.2	2,813.8	3,560.0	398	2	High	35	1	Low	5	Medium
64		Mtwara	3,760	319,000	85	2	High	199.7	753.3	953.0	253	2	High	28	1	Low	5	Medium
65		Newela	2,126	183,000	86	2	High	120.1	452.7	572.8	269	2	High	21	1	Low	5	Medium
66		Tandahimba	1,894	216,000	114	2	High	106.8	402.9	509.7	269	2	High	21	1	Low	5	Medium
		Sub-total	16,720	1,153,000	69			1,173	4,423	5,595.5	335							

Source: Socio-Economic Profiles. /1: surveyed by Food Security Department, MAFS, /2: inspected by Food Security Department, /3: Das es Salaam Municipality, /4: President's Office (but rounded)

Table 6.4.1 Population, Road Densities and Cereals Deficits for Respective Districts (3/3)

No.	Region	District	Land area (km ²)	Population Density				Road Density						Cereals Deficit in 2000 ¹			Overall Evaluation		
				Population (estimated for 2000) ¹	Density (nos/km ²)	Evaluation		(Trunk and Regional Roads) (km)	(District and Other Small Roads) (km)	Total (km)	Density (m/km ²)	Evaluation		Deficit (%)	Evaluation		Score	Judge	
						Score	Judge					Score	Judge		Score	Judge			
67	Mwanza	Geita	6,775	634,000	94	2	High	444.0	1,073.0	1,517.0	224	2	High	3	1	Low	5	Medium	
68		Kwimba	3,903	340,000	87	2	High	316.2	581.6	897.8	230	2	High	58	2	High	6	High	
69		Magu	3,070	449,000	146	2	High	293.0	943.0	1,236.0	403	2	High	91	2	High	6	High	
70		Misungwi	1,947	279,000	143	2	High	157.8	290.4	448.2	230	2	High	58	2	High	6	High	
71		Mwanza	425	322,000	758	2	High	165.5	695.5	861.0	2,026	2	High	13	1	Low	5	Medium	
72		Sengerema	3,335	439,000	132	2	High	364.0	660.0	1,024.0	307	2	High	6	1	Low	5	Medium	
73		Ukerewe	425	250,000	588	2	High	110.0	255.0	365.0	859	2	High	6	1	Low	5	Medium	
		Sub-total	19,880	2,713,000	137			1,850.5	4,498.5	6,349.0	319								
74	Ruvuma	Mbinga	11,396	418,000	37	2	High	449.2	604.2	1,053.4	92	1	Low	29	1	Low	4	Medium	
75		Songea	34,219	525,000	15	1	Low	799.0	911.0	1,710.0	50	1	Low	13	1	Low	3	Low	
76		Tunduru	18,778	262,000	14	1	Low	350.0	762.0	1,112.0	59	1	Low	inspected ²	2	High	4	Medium	
		Sub-total	64,393	1,205,000	19			1,598.2	2,277.2	3,875.4	60								
77	Rukwa	Mpanda	47,527	394,000	8	1	Low	831.0	977.8	1,808.8	38	1	Low	inspected ²	1	Low	3	Low	
78		Nkasi	13,124	184,000	14	1	Low	451.0	359.0	810.0	62	1	Low	inspected ²	1	Low	3	Low	
79		Sumbawanga	14,587	581,000	40	2	High	1,027.0	808.9	1,835.9	126	2	High	inspected ²	1	Low	5	Medium	
		Sub-total	75,238	1,159,000	15			2,309.0	2,145.7	4,454.7	59								
80	Shinyanga	Bariadi	9,777	567,000	58	2	High	96.8	926.0	1,022.8	105	2	High	20	1	Low	5	Medium	
81		Bukombe	10,482	248,000	24	1	Low		342.8	836.0	1,178.8	112	2	High	39	1	Low	4	Medium
82		Kahama	9,461	747,000	79	2	High							39	1	Low	5	Medium	
83		Meatu	8,871	237,000	27	1	Low	93.4	724.0	817.4	92	2	High	52	2	High	5	Medium	
84		Maswa	2,736	328,000	120	2	High	234.9	383.5	618.4	226	2	High	60	2	High	6	High	
85		Shinyanga	9,454	504,000	53	2	High	549.1	1,483.0	2,032.1	215	2	High	68	2	High	6	High	
		Sub-total	50,781	2,631,000	52			1,317	4,353	5,669.5	112								
86	Singida	Iramba	7,900	415,000	53	2	High	356.0	530.5	886.5	112	2	High	22	1	Low	5	Medium	
87		Manyoni	28,620	194,000	7	1	Low	622.0	227.0	849.0	30	1	Low	24	1	Low	3	Low	
88		Singida	12,821	524,000	41	2	High	477.0	1,025.0	1,502.0	117	2	High	63	2	High	6	High	
		Sub-total	49,341	1,133,000	23			1,455.0	1,782.5	3,237.5	66								
89	Tabora	Igunga	6,788	288,000	42	2	High	379.0	128.0	507.0	75	1	Low	36	1	Low	4	Medium	
90		Nzega	6,961	419,000	60	2	High	401.0	742.0	1,143.0	164	2	High	59	2	High	6	High	
91		Sikonge	45,000	324,000	7	1	Low		996.0	922.0	1,918.0	43	1	Low	44	1	Low	3	Low
92		Tabora	6,104	173,000	28	1	Low							52	2	High	4	Medium	
93		Urambo	21,299	266,000	13	1	Low	140.0	1,132.0	1,272.0	60	1	Low	22	1	Low	3	Low	
		Sub-total	86,152	1,470,000	17			1,916.0	2,924.0	4,840.0	56								
94	Tanga	Handeni	13,209	355,000	27	1	Low	452.5	449.3	901.8	68	1	Low	8	1	Low	3	Low	
95		Korogwe	3,756	307,000	82	2	High	260.4	113.9	374.3	100	2	High	26	1	Low	5	Medium	
96		Lushoto	3,500	503,000	144	2	High	211.6	317.4	529.0	151	2	High	35	1	Low	5	Medium	
97		Muheza/Tanga	5,458	590,000	108	2	High	259.5	441.9	701.4	129	2	High	59	2	High	6	High	
98		Pangani	1,425	53,000	37	2	High	196.8	74.2	271.0	190	2	High	50	2	High	6	High	
99		Tanga		Including Muheza District					Including Muheza District										
		Sub-total	27,348	1,808,000	66			1,380.8	1,396.7	2,777.5	102								

Source: Socio-Economic Profiles. /1: surveyed by Food Security Department, MAFS, /2: inspected by Food Security Department, /3: Das es Salaam Municipality, /4: President's Office (but rounded)

Table 6.5.1 Distribution of Irrigation Development Potential Area in Each Region

(Unit: 1,000ha.)

Region	High Potential area (H1-H3)		Medium Potential Area (M1-M3)		Low Potential Area (L1-L6)		Forest and Marginal Land		Water Body		Protected Area		Total Area	
	(1,000 ha.)	(%)	(1,000 ha.)	(%)	(1,000 ha.)	(%)	(1,000 ha.)	(%)	(1,000 ha.)	(%)	(1,000 ha.)	(%)	(1,000 ha.)	(%)
Arusha	455.3	5.4	758.3	9.0	2,626.4	31.2	2,939.9	34.9	315.1	3.7	1,322.0	15.7	8,417.0	100.0
Coast	83.0	2.6	171.8	5.4	961.7	30.1	1,417.6	44.4	49.9	1.6	511.0	16.0	3,195.0	100.0
DSM	-	-	-	-	68.9	39.6	83.3	47.9	20.8	12.0	1.0	0.6	174.0	100.0
Dodoma	1.2	0.0	68.9	1.6	2,015.4	47.8	1,736.4	41.2	41.1	1.0	350.0	8.3	4,213.0	100.0
Iringa	163.6	2.8	1,091.5	18.4	1,125.0	19.0	2,630.1	44.4	268.8	4.5	646.0	10.9	5,925.0	100.0
Kagera	96.3	2.4	59.0	1.5	1,053.2	27.0	669.2	17.0	1,158.3	29.5	887.0	22.6	3,933.0	100.0
Kigoma	0.7	0.0	107.4	2.3	271.1	5.9	1,389.3	30.1	944.4	20.5	1,899.0	41.2	4,612.0	100.0
Kilimanjaro	238.5	17.9	109.6	8.2	231.6	17.4	332.9	25.0	31.4	2.4	390.0	29.2	1,334.0	100.0
Lindi	-	-	19.6	0.3	1,704.9	25.3	2,433.6	36.1	22.9	0.3	2,552.0	37.9	6,733.0	100.0
Mara	210.1	6.9	576.5	18.9	123.4	4.0	435.4	14.3	899.5	29.5	809.0	26.5	3,054.0	100.0
Mbeya	285.1	4.5	499.7	7.9	884.8	14.0	3,329.6	52.6	309.8	4.9	1,016.0	16.1	6,325.0	100.0
Morogoro	376.8	5.4	602.4	8.7	574.3	8.3	2,299.1	33.2	30.4	0.4	3,045.0	44.0	6,928.0	100.0
Mtwara	-	-	-	-	1,332.7	60.7	768.6	35.0	20.7	0.9	72.0	3.3	2,194.0	100.0
Mwanza	98.5	2.8	165.0	4.7	1,013.0	28.6	479.7	13.6	1,577.7	44.6	204.0	5.8	3,538.0	100.0
Rukwa	11.0	0.1	79.8	1.1	888.9	12.0	1,808.2	24.5	974.1	13.2	3,622.0	49.1	7,384.0	100.0
Ruvuma	23.2	0.4	283.7	4.3	1,617.8	24.6	3,283.9	49.9	336.3	5.1	1,042.0	15.8	6,587.0	100.0
Shinyanga	80.4	1.6	215.5	4.3	1,821.2	36.3	811.0	16.2	61.9	1.2	2,023.0	40.4	5,013.0	100.0
Singida	-	-	-	-	1,348.9	27.6	931.1	19.1	112.0	2.3	2,494.0	51.0	4,886.0	100.0
Tabora	-	-	-	-	1,517.0	20.0	1,888.9	24.9	170.1	2.2	4,025.0	53.0	7,601.0	100.0
Tanga	-	-	-	-	1,151.3	41.1	1,428.2	51.0	1.5	0.1	219.0	7.8	2,800.0	100.0
Total	2,123.7	2.2	4,808.9	5.1	22,341.7	23.6	31,096.1	32.8	7,346.7	7.7	27,129.0	28.6	94,846.0	100.0

Remarks: Based on the results of GIS analysis

Table 7.3.1 Future Demand of Staple Food Products (1/2)

(1) Food Crop Proportions Used to Estimate Requirements

Mainland									
Commodity	Consumption*1 (kg/person)	Seeds*2	Feed*2	Losses*2	Trade*2	Keals/ 100g edible stuff *10	Extraction rate (%) *10	Keals 100g unprocessed *10	
1 Maize*3	74.5	1.3	2.0	8.7	4.4	335	90	302	
2 Rice*4	14.1	2.5		2.5	1.8	335	65	218	
3 Wheat	4.3	2.5		2.5		340	75	255	
4 Sorghm	15.5	1.5	0.6	8.5		345	82	283	
5 Millets*5	15.5	2.3	0.6	7.7		340	100	340	
6 Pulses*6	11.4	5.0		2.5		320	100	320	
7 Cassaba*7	38.2					320 (Dry)			
8 Bananas*7, 8	15.3					106 (Raw)			
9 Potatoes*7, 9	16.3					93 (Raw)			

*1: Per capita annual consumption

*2 Percent used of total consumption

*3 Whole grain

*4 Paddy converts to rice at 65% conversion ratio

*5 Includes bulrush and finger millets

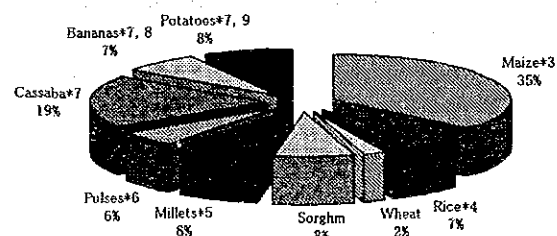
*6 Mainly beans, but other pulses included

*7 Based on dry weight, from which waste is already subtracted

*8 Includes sweet and cooking bananas

*9 Includes sweet potatoes, irish and round potatoes

*10 Source: Study on Food Consumption Patterns and Nutritional Economic Values of Common Foods in Dar es Salaam, Tanzania, 2000, TFNC supported by JICA



Commodity	Yield (Raw) (ton/ha)	Waste (%)	Moisture Content (ton/ha)	Moisture Content (%)	Waste and Moist (ton/ha)	Yield (Dry wt) (ton/ha)
Banana	15.0	33	4.95	70	7.035	3.0
Cassaba	7.5	15	1.125	60	3.825	2.6
Potato	5.0	15	0.75	70	2.975	1.3

Source: Tanzania Food Security Bulletin, June/July 1997, Dar es Salaam, 15 August 1997

Energy Content of Common Commodities

Table 7.3.1 Future Demand of Staple Food Products (2/2)

(2) Staple Foods Demand Forecast

	Per capita consumption		Kcal /100g	Dry	Total Kcal	Ratio	Unmilled kg	2002	2007	2012	2017
	(Dry) kg	(Raw) kg						Required Production (1,000ton)			
								33,897,966	39,458,095	45,930,230	53,463,961
Maize	74.5		335	Dry	249,575	36.7%	96.4	3,266	3,802	4,426	5,151
Rice	14.1		335	Dry	47,235	6.9%	23.2	785	914	1,064	1,239
Wheat	4.3		340	Dry	14,620	2.1%	6.0	204	238	275	322
Sorghum	15.5		345	Dry	53,475	7.9%	20.9	709	825	960	1,118
Millet	15.5		340	Dry	52,700	7.7%	17.1	581	676	787	917
Pulses	11.4		320	Dry	36,480	5.4%	12.3	415	484	563	655
Cassava	38.2	95.5	320	Dry	122,240	18.0%	112.4	3,809	4,433	5,160	6,007
Bananas	15.3	51.0	106	Raw	54,060	7.9%	76.1	2,580	3,004	3,496	4,070
Potatoes*1	16.3	54.3	93	Raw	50,258	7.4%	63.9	2,167	2,522	2,935	3,418
Total	205 kg/person/year		680,643 Kcal/person/year								
	562 g/person/day		1,865 Kcal/person/day								

*1 Consist of Potato and Sweet Potato

Intake Calorie

(Unit: Kcal/person/day)

Items	Staple food	Other food	Total
Present Condition	1,865	367	2,232

Demand Projection

(Unit: 1,000 ton)

Crops	year 2017
Maize	5,151
Rice	1,239
Wheat	322
Sorghum	1,118
Millet	917
Pulses	655
Cassava	6,007
Bananas	4,070
Potatoes	3,418

Table 7.4.1 Indicators on Irrigation Development Level

Scheme Type			Rehabilitation of Existing Scheme			New Irrigation Scheme			Water Harvesting Scheme		
Water Resources			Surface Water	Groundwater	Others (lake etc.)	Surface Water	Groundwater	Others (lake etc.)	Stream Flood	Catchment Water	Rainwater
1	Position of a Balance in Hardware and Software*	Village scheme	level E	level C	level D	level D	level C	level C	not applicable	level E	level E
		Small-scale	level C~level E	level B~level D	level B~level D	level A~level C	level B~level C	level A~level C	level D~level E	level E	not applicable
		Medium-scale	level C~level D	level B~level D	level B~level D	level A~level C	level B~level C	level A~level C	level D~level E	not applicable	not applicable
2	Project Scale (ha.)	Large-scale	level C~level D	not applicable	not applicable	level A~level C	not applicable	not applicable	not applicable	not applicable	not applicable
		Village scheme	up to 10~20 ha	up to 10~20ha	up to 10~20ha	up to 10~20 ha	up to 10~20ha	up to 10~20ha	not applicable	up to 10~20ha	up to 10~20ha
		Small-scale	Area ≤ 500 ha	Area ≤ 500 ha	Area ≤ 500 ha	Area ≤ 500 ha	Area ≤ 500 ha	Area ≤ 500 ha	Area ≤ 500 ha	Area ≤ 500 ha	Area ≤ 500 ha
3	Applicable Crop for Irrigation	Medium-scale	500ha < Area ≤ 2,000ha	500ha < Area ≤ 2,000ha	500ha < Area ≤ 2,000ha	500ha < Area ≤ 2,000ha	500ha < Area ≤ 2,000ha	500ha < Area ≤ 2,000ha	500ha < Area ≤ 2,000ha	not applicable	not applicable
		Large-scale	2,000ha < Area	not applicable	not applicable	2,000ha < Area	not applicable	not applicable	not applicable	not applicable	not applicable
		Village scheme	Rice, Maize, Vegetable, others	Rice, Vegetable, others	Rice, Maize, Vegetable, others	Rice, Maize, Vegetable, others	Rice, Vegetable, others	Rice, Maize, Vegetable, others	not applicable	Rice, Maize, Tree crops, others	Rice, Maize, Tree crops, others
4	Target Yield of Irrigated Crop	Small-scale	Rice, Maize, Vegetable, others	Rice, Vegetable, others	Rice, Maize, Vegetable, others	Rice, Maize, Vegetable, others	Rice, Vegetable, others	Rice, Maize, Vegetable, others	Rice, Maize, Tree crops, others	Rice, Maize, Tree crops, others	not applicable
		Medium-scale	Rice, Maize, Vegetable, others	Rice, Vegetable, others	Rice, Maize, Vegetable, others	Rice, Maize, Vegetable, others	Rice, Vegetable, others	Rice, Maize, Vegetable, others	Rice, Maize, Tree crops, others	not applicable	not applicable
		Large-scale	Rice, Maize, Vegetable, others	not applicable	not applicable	Rice, Maize, Vegetable, others	not applicable	not applicable	not applicable	not applicable	not applicable
5	Irrigation Method, and Modality of Irrigation System	Village scheme	3.0t<Paddy<5.0t	3.0t<Paddy<5.0t	3.0t<Paddy<5.0t	3.0t<Paddy<6.0t	3.0t<Paddy<6.0t	3.0t<Paddy<6.0t	not applicable	1.0t<Paddy<1.5t	1.0t<Paddy<1.5t
		Small-scale	3.0t<Paddy<5.0t	3.0t<Paddy<5.0t	3.0t<Paddy<5.0t	3.0t<Paddy<6.0t	3.0t<Paddy<6.0t	3.0t<Paddy<6.0t	1.0t<Paddy<2.0t	1.0t<Paddy<1.5t	not applicable
		Medium-scale	3.0t<Paddy<5.0t	3.0t<Paddy<5.0t	3.0t<Paddy<5.0t	3.0t<Paddy<6.0t	3.0t<Paddy<6.0t	3.0t<Paddy<6.0t	1.0t<Paddy<2.0t	not applicable	not applicable
6	Expectable Project Life (years)	Large-scale	3.0t<Paddy<5.0t	not applicable	not applicable	3.0t<Paddy<6.0t	not applicable	not applicable	not applicable	not applicable	not applicable
		Village scheme	Gravity surface	Gravity surface, pressured water	Gravity surface, pressured water	Gravity surface	Gravity surface, pressured water	Gravity surface, pressured water	not applicable	Submerged water	Submerged water
		Small-scale	Gravity surface	Gravity surface, pressured water	Gravity surface, pressured water	Gravity surface	Gravity surface, pressured water	Gravity surface, pressured water	Gravity surface	Submerged water	not applicable
7	Reliability of Project (drought occurrences; %)	Medium-scale	Gravity surface	Gravity surface, pressured water	Gravity surface, pressured water	Gravity surface	Gravity surface, pressured water	Gravity surface, pressured water	Gravity surface	not applicable	not applicable
		Large-scale	Gravity surface	not applicable	not applicable	Gravity surface	not applicable	not applicable	not applicable	not applicable	not applicable
		Village scheme	~20	~20	~20	~20	~20	~20	not applicable	~10	~10
8	Affordable Range of Project Cost (per ha.)	Small-scale	20~50	20~50	20~50	20~50	20~50	20~50	~20	~10	not applicable
		Medium-scale	25~50	25~50	25~50	25~50	25~50	25~50	~20	not applicable	not applicable
		Large-scale	50	not applicable	not applicable	50	not applicable	not applicable	not applicable	not applicable	not applicable
9	Allowable Limit in Economic Indicator (EIRR; %)	Village scheme	~50	~50	~50	~50	~50	~50	not applicable	depending on the rain occurrence	depending on the rain occurrence
		Small-scale	50~20	50~20	50~20	50~20	50~20	50~20	depending on the rain occurrence	depending on the rain occurrence	not applicable
		Medium-scale	25~20	25~20	25~20	25~20	25~20	25~20	depending on the rain occurrence	not applicable	not applicable
8	Affordable Range of Project Cost (per ha.)	Large-scale	20~10	not applicable	not applicable	20~10	not applicable	not applicable	not applicable	not applicable	not applicable
		Village scheme	~1,500US\$/ha	~2,000US\$/ha	~1,500US\$/ha	~2,000US\$/ha	~2,500US\$/ha	~2,000US\$/ha	not applicable	~500US\$/ha	~500US\$/ha
		Small-scale	1,000~5,000US\$/ha	1,000~5,000US\$/ha	1,000~5,000US\$/ha	1,250~10,000US\$/ha	1,250~10,000US\$/ha	1,250~10,000US\$/ha	400~1,600US\$/ha	300~1,200US\$/ha	not applicable
9	Allowable Limit in Economic Indicator (EIRR; %)	Medium-scale	1,200~5,000US\$/ha	1,200~5,000US\$/ha	1,200~5,000US\$/ha	1,500~10,000US\$/ha	1,500~10,000US\$/ha	1,500~10,000US\$/ha	400~1,600US\$/ha	not applicable	not applicable
		Large-scale	1,300~5,000US\$/ha	not applicable	not applicable	1,650~10,000US\$/ha	not applicable	not applicable	not applicable	not applicable	not applicable
		Village scheme	more than 8%	more than 8%	more than 8%	more than 8%	more than 8%	more than 8%	not applicable	more than 8%	more than 8%
9	Allowable Limit in Economic Indicator (EIRR; %)	Small-scale	more than 10~12%	more than 10~12%	more than 10~12%	more than 10~12%	more than 10~12%	more than 10~12%	more than 8%	more than 8%	not applicable
		Medium-scale	more than 10~12%	more than 10~12%	more than 10~12%	more than 10~12%	more than 10~12%	more than 10~12%	more than 8%	not applicable	not applicable
		Large-scale	more than 10~12%	not applicable	not applicable	more than 10~12%	not applicable	not applicable	not applicable	not applicable	not applicable

*: balance of hardware(HW) and software(SW).

A :HW remarkably surpasses SW in project investment, B :HW rather surpasses SW, C :HW is almost balanced with SW, D :SW rather surpasses HW, E :SW remarkably surpasses HW, X: Balance of the both highly depends on the characteristics in physical and social conditions of the project area.

Table 7.6.1 Present Cropping Pattern for Paddy and Maize

PADDY	Total			Rainfed			Irrigated		
	Yield (ton/ha)	Area (ha)	Production (ton)	Yield (ton/ha)	Area (ha)	Production (ton)	Yield (ton/ha)	Area (ha)	Production (ton)
Arusha	1.2	9,800	12,200	0.9	6,420	5,778	1.9	3,380	6,422
Coast	1.5	39,100	60,200	1.5	38,214	57,321	3.3	886	2,879
Dar-es-salaam	0.3	1,500	500	0.2	1,100	220	0.7	400	280
Dodoma	1.5	8,200	12,600	1.2	6,475	7,770	2.8	1,725	4,830
Iringa	1.5	1,700	2,600	1.5	1,692	2,572	3.5	8	28
Kagera	1.9	4,400	8,200	1.5	2,857	4,343	2.5	1,543	3,857
Kigoma	2.3	9,200	21,400	1.3	2,457	3,194	2.7	6,743	18,206
Kilimanjaro	1.5	9,900	15,200	1.4	9,047	12,213	3.5	853	2,987
Lindi	1.9	900	1,700	1.5	732	1,113	3.5	168	587
Mara	3.0	61,700	189,800	1.8	22,330	40,194	3.8	39,370	149,606
Mbeya	1.5	67,100	103,200	1.2	54,500	65,400	3.0	12,600	37,800
Morogoro	1.0	24,200	26,000	1.1	23,897	25,092	3.0	303	908
Mtwara	1.5	71,000	109,200	1.5	70,190	106,689	3.1	810	2,511
Mwanza	2.3	29,100	67,200	2.1	25,518	53,587	3.8	3,582	13,613
Rukwa	2.1	13,900	29,800	2.1	13,837	29,612	3.0	63	188
Ruvuma	0.5	96,600	44,600	0.5	95,731	43,079	1.8	869	1,521
Shinyanga	0.5	6,400	2,900	0.4	5,988	2,096	2.0	413	804
Singida	0.9	48,200	44,500	0.9	46,707	42,036	1.7	1,493	2,464
Tabora	2.2	14,100	30,500	1.5	7,867	11,800	3.0	6,233	18,700
Total	1.5	517,000	782,300	1.2	435,558	514,108	3.3	81,442	268,192

MAIZE	Total			Rainfed			Irrigated		
	Yield (ton/ha)	Area (ha)	Production (ton)	Yield (ton/ha)	Area (ha)	Production (ton)	Yield (ton/ha)	Area (ha)	Production (ton)
Arusha	1.7	129,500	213,800	1.6	100,444	155,689	2.0	29,056	58,111
Coast	0.9	34,500	30,800	0.9	34,450	30,661	2.8	50	139
Dar-es-salaam	0.5	61,700	28,900	0.4	59,320	25,329	1.5	2,380	3,571
Dodoma	2.0	187,200	373,700	2.0	186,594	371,882	3.0	606	1,818
Iringa	1.1	58,800	65,300	1.1	58,799	65,296	3.8	1	4
Kagera	1.7	69,800	119,900	1.7	67,320	114,444	2.2	2,480	5,456
Kigoma	2.0	90,000	181,300	1.9	67,632	129,853	2.3	22,368	51,447
Kilimanjaro	1.0	69,200	66,200	1.0	69,115	66,005	2.3	85	195
Lindi	1.4	49,000	68,100	1.4	48,949	67,941	3.1	51	159
Mara	1.9	124,200	235,000	1.9	123,630	233,289	3.0	570	1,711
Mbeya	1.3	76,000	96,600	1.2	70,600	84,720	2.2	5,400	11,880
Morogoro	0.9	42,200	39,800	0.9	41,903	38,760	3.5	297	1,040
Mtwara	1.2	109,100	129,400	1.2	109,050	129,224	3.5	50	176
Mwanza	1.7	118,500	203,700	1.7	118,235	202,774	3.5	265	926
Rukwa	1.8	110,700	199,800	1.8	110,619	199,556	3.0	81	244
Ruvuma	0.5	211,700	103,800	0.5	211,634	103,700	1.5	66	100
Shinyanga	0.6	57,300	32,900	0.6	57,289	32,884	1.5	11	16
Singida	1.3	78,300	103,800	1.3	78,262	103,697	2.7	38	103
Tabora	1.8	86,600	158,900	1.8	86,347	158,016	3.5	253	884
Total	1.4	1,764,300	2,451,700	1.4	1,700,191	2,313,720	2.2	64,109	137,980

IRRIGATED AREA	ventorized Existing Irrigated Ar		Paddy		Maize		Others	
	Area (ha)	(%)	Area (ha)	(%)	Area (ha)	(%)	Area (ha)	(%)
Arusha	49,797	100.0	3,380	6.8	29,056	58.3	17,361	34.9
Coast	1,134	100.0	886	78.1	50	4.4	199	17.5
Dar-es-salaam	3,557	100.0	400	11.2	2,380	66.9	777	21.8
Dodoma	3,535	100.0	1,725	48.8	606	17.1	1,204	34.1
Iringa	15	100.0	8	53.9	1	6.4	6	39.7
Kagera	6,769	100.0	1,543	22.8	2,480	36.6	2,746	40.6
Kigoma	45,678	100.0	6,743	14.8	22,368	49.0	16,567	36.3
Kilimanjaro	1,231	100.0	853	69.3	85	6.9	293	23.8
Lindi	341	100.0	168	49.2	51	15.1	122	35.8
Mara	49,112	100.0	39,370	80.2	570	1.2	9,172	18.7
Mbeya	25,144	100.0	12,600	50.1	5,400	21.5	7,144	28.4
Morogoro	730	100.0	303	41.4	297	40.7	130	17.9
Mtwara	1,008	100.0	810	80.4	50	5.0	148	14.6
Mwanza	4,736	100.0	3,582	75.6	265	5.6	889	18.8
Rukwa	198	100.0	63	31.7	81	41.0	54	27.2
Ruvuma	1,210	100.0	869	71.8	66	5.5	274	22.7
Shinyanga	525	100.0	413	78.6	11	2.0	102	19.4
Singida	1,923	100.0	1,493	77.7	38	2.0	391	20.4
Tabora	8,626	100.0	6,233	72.3	253	2.9	2,140	24.8
Total	205,269	100.0	81,442	39.7	64,109	31.2	59,718	29.1

Source: Estimation based on Basic data Agricultural Sector and Inventory Survey

Table 7.6.2 Present Cropping Pattern

Unit : %

Region	Rainfed				Irrigation Rainy Season				Irrigation Dry Season				Irrigation Total			
	Paddy	Maize	Others	Total	Paddy	Maize	Others	Total	Paddy	Maize	Others	Total	Paddy	Maize	Others	Total
Arusha	2.9	41.6	55.5	100.0	6.8	58.3	34.9	100.0	2.7	0	19.7	22.4	9.5	58.3	54.6	122.4
Coast	12.7	17.9	69.4	100.0	78.1	4.4	17.5	100.0	39.1	0	20.0	59.1	117.2	4.4	37.5	159.1
Dar-es-salaam	12.7	17.9	69.4	100.0	78.1	4.4	17.5	100.0	39.1	0	20.0	59.1	117.2	4.4	37.5	159.1
Dodoma	0.5	24.7	74.8	100.0	0.0	66.9	33.1	100.0	0.0	0	8.1	8.1	0.0	66.9	41.2	108.1
Iringa	2.1	53.4	44.5	100.0	48.8	17.1	34.1	100.0	9.8	0	12.1	21.8	58.6	17.1	46.1	121.8
Kagera	0.5	17.6	81.9	100.0	53.9	6.4	39.7	100.0	0.0	0	0.0	0.0	53.9	6.4	39.7	100.0
Kigoma	2.2	38.0	59.8	100.0	22.8	36.6	40.6	100.0	0.0	0	9.5	9.5	22.8	36.6	50.0	109.5
Kilimanjaro	3.7	35.5	60.8	100.0	14.8	49.0	36.3	100.0	2.0	0	13.2	15.2	16.8	49.0	49.5	115.2
Lindi	5.4	38.0	56.6	100.0	69.3	6.9	23.8	100.0	0.0	0	0.0	0.0	69.3	6.9	23.8	100.0
Mara	0.4	19.4	80.2	100.0	49.2	15.1	35.8	100.0	0.0	0	2.7	2.7	49.2	15.1	38.5	102.7
Mbeva	17.4	38.1	44.5	100.0	80.2	1.2	18.7	100.0	17.6	0	12.8	30.4	97.8	1.2	31.4	130.4
Morogoro	25.0	27.7	47.3	100.0	50.1	21.5	28.4	100.0	12.5	0	18.7	31.2	62.6	21.5	47.1	131.2
Mtwara	7.9	13.8	78.3	100.0	41.4	40.7	17.9	100.0	8.3	0	2.2	10.5	49.7	40.7	20.0	110.5
Mwanza	18.0	27.8	54.2	100.0	80.4	5.0	14.6	100.0	24.1	0	6.2	30.3	104.5	5.0	20.8	130.3
Rukwa	10.3	42.7	47	100.0	75.6	5.6	18.8	100.0	26.5	0	12.6	39.1	102.1	5.6	31.4	139.1
Ruvuma	6.1	48.5	45.4	100.0	31.7	41.0	27.2	100.0	9.5	0	10.0	19.5	41.2	41.0	37.2	119.5
Shinyanga	15.0	32.8	52.2	100.0	71.8	5.5	22.7	100.0	7.2	0	2.5	9.7	79.0	5.5	25.2	109.7
Singida	2.9	26.8	70.3	100.0	78.6	2.0	19.4	100.0	0.0	0	0.0	0.0	78.6	2.0	19.4	100.0
Tabora	19.9	32.3	47.8	100.0	77.7	2.0	20.4	100.0	7.8	0	3.7	11.4	85.4	2.0	24.0	111.4
Tanga	5.1	39.2	55.7	100.0	72.3	2.9	24.8	100.0	21.7	0	12.2	33.9	93.9	2.9	37.0	133.9
Average	8.9	32.3	58.8	100.0	39.5	31.2	29.3	100.0	9.0	0	14.7	23.3	48.5	31.2	44.0	123.3

Note: Estimation based on Basic Data Agricultural Sector 1993/94-1999/2000 and the Inventory survey

Table 7.6.3 Development Direction and Crop Intensity Potential for Each Region

Region	Present Condition	Suitability for Paddy	Suitability for Maize	Development Direction	Present Crop Intensity	Temperature Regime	Moisture Zones	Crop Intensity
Arusha	Maize	-	-	Others	Low	T2	SU	Low
Coast	Paddy	+	+	Paddy	High	T1	DM/SM	High
Dar-es-salaam	Paddy	+	+	Paddy	High	T1	SM	High
Dodoma	Maize	-	-	Others	Low	T2	SU	Low
Iringa	Paddy	+-	+-	Paddy/Maize	Medium	T3	SH/SM	Medium
Kagera	Paddy	+-	+-	Paddy	Low	T2/T3	SC/SM	Low
Kigoma	Others	+-	+	Paddy	Low	T2/T3	SM/SU	Medium
Kilimanjaro	Maize	+-	+-	Others	Low	T2/T4	SH/SU	Medium
Lindi	Paddy	+-	+-	Paddy	Low	T1/T2	DM/SM	High
Mara	Paddy	-	+-	Paddy/Maize	Low	T2/T3	SU	Low
Mbeva	Paddy	+	+-	Paddy	Medium	T2/T3	SH/SU	High
Morogoro	Paddy	+	+	Paddy	Medium	T3	SH/SM	High
Mtwara	Paddy/Maize	+-	+-	Paddy/Maize	Medium	T1	SM	Medium
Mwanza	Paddy	+	+	Paddy	High	T2	SU	High
Rukwa	Paddy	+-	+	Paddy	High	T2/T3	SH/SM	High
Ruvuma	Maize	+	+	Paddy/Maize	Medium	T2	SH/SM	Medium
Shinyanga	Paddy	+-	+	Paddy	Medium	T2	SU	Medium
Singida	Paddy	-	+	Paddy	Low	T2	SU	Low
Tabora	Paddy	+	+	Paddy	Medium	T2	SU	Medium
Tanga	Paddy	-	+-	Paddy	High	T1	DM/SU	High

Note: + = Suitable area is widely distributed, +- = Suitable area is limited, - = Suitable area is not distributed

Note: T1(Max/Min)=29-31/19-23, T2(Max/Min)=27-30/15-18, T3(Max/Min)=22-25/10-15, T4(Max/Min)=16-19/5-10

Note: DM=double cropping, SC=single (often continuous), SH=single (highly responsive to moisture storage capacity)

SM=single (moderately responsive to moisture storage capacity), SU=single (unresponsive to moisture storage capacity)

Note: Estimation based on Agro-ecological Zone map

Table 7.6.4 Future Cropping Pattern

Unit : %

Region	Rainfed				Irrigation Rainy Season				Irrigation Dry Season				Irrigation Total			
	Paddy	Maize	Others	Total	Paddy	Maize	Others	Total	Paddy	Maize	Others	Total	Paddy	Maize	Others	Total
Arusha	2.9	41.6	55.5	100.0	20.0	50.0	30.0	100.0	5.0	0	19.7	24.7	25.0	50.0	49.7	124.7
Coast	12.7	17.9	69.4	100.0	80.0	5.0	15.0	100.0	50.0	0	20.0	70.0	130.0	5.0	35.0	170.0
Dar-es-salaam	12.7	17.9	69.4	100.0	80.0	5.0	15.0	100.0	50.0	0	20.0	70.0	130.0	5.0	35.0	170.0
Dodoma	0.5	24.7	74.8	100.0	20.0	50.0	30.0	100.0	0.0	0	8.1	8.1	20.0	50.0	38.1	108.1
Iringa	2.1	53.4	44.5	100.0	50.0	30.0	20.0	100.0	10.0	0	12.1	22.1	60.0	30.0	32.1	122.1
Kagera	0.5	17.6	81.9	100.0	80.0	5.0	15.0	100.0	0.0	0	0.0	0.0	80.0	5.0	15.0	100.0
Kigoma	2.2	38.0	59.8	100.0	50.0	30.0	20.0	100.0	5.0	0	9.5	14.5	55.0	30.0	29.5	114.5
Kilimanjaro	3.7	35.5	60.8	100.0	20.0	50.0	30.0	100.0	5.0	0	13.2	18.2	25.0	50.0	43.2	118.2
Lindi	5.4	38.0	56.6	100.0	80.0	5.0	15.0	100.0	10.0	0	0.0	10.0	90.0	5.0	15.0	110.0
Mara	0.4	19.4	80.2	100.0	50.0	30.0	20.0	100.0	0.0	0	2.7	2.7	50.0	30.0	22.7	102.7
Mbeva	17.4	38.1	44.5	100.0	80.0	5.0	15.0	100.0	25.0	0	12.8	37.8	105.0	5.0	27.8	137.8
Morogoro	25.0	27.7	47.3	100.0	80.0	5.0	15.0	100.0	25.0	0	18.7	43.7	105.0	5.0	33.7	143.7
Mtwara	7.9	13.8	78.3	100.0	50.0	30.0	20.0	100.0	10.0	0	2.2	12.2	60.0	30.0	22.2	112.2
Mwanza	18.0	27.8	54.2	100.0	80.0	5.0	15.0	100.0	50.0	0	6.2	56.2	130.0	5.0	21.2	156.2
Rukwa	10.3	42.7	47	100.0	80.0	5.0	15.0	100.0	50.0	0	12.6	62.6	130.0	5.0	27.6	162.6
Ruvuma	6.1	48.5	45.4	100.0	50.0	30.0	20.0	100.0	10.0	0	10.0	20.0	60.0	30.0	30.0	120.0
Shinyanga	15.0	32.8	52.2	100.0	80.0	5.0	15.0	100.0	10.0	0	2.5	12.5	90.0	5.0	17.5	112.5
Singida	2.9	26.8	70.3	100.0	80.0	5.0	15.0	100.0	0.0	0	0.0	0.0	80.0	5.0	15.0	100.0
Tabora	19.9	32.3	47.8	100.0	80.0	5.0	15.0	100.0	10.0	0	3.7	13.7	90.0	5.0	18.7	113.7
Tanga	5.1	39.2	55.7	100.0	80.0	5.0	15.0	100.0	50.0	0	12.2	62.2	130.0	5.0	27.2	162.2
Average	8.9	32.3	58.8	100.0	63.5	18.0	18.5	100.0	18.8	0	14.7	33.5	82.3	18.0	33.2	133.5

Note: Estimation by JICA Study Team

Table 8.3.1 Relation between Identified Constraints in PCM Workshops and Themes on Subject-wise Programme

Constraints identified by PCM		Theme 1					Theme 2			Theme 3					Theme 4					Theme 5						Theme 6						Theme 7		Theme 8		Theme 9		Important Assumption			
		1.1	1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3	3.1	3.2	3.3	3.4	3.5	4.1	4.2	4.3	4.4	4.5	5.1	5.2	5.3	5.4	5.5	5.6	6.1	6.2	6.3	6.4	6.5	6.6	6.7	7.1	7.2	8.1	8.2	9.1	9.2		
PCM Session I	I-1 Inlets constructions not durable	○	○	○	○	○	○									○	○	○	○	○																					
	I-2 Poor irrigation infrastructure	○	○	○	○	○	○																																		
	I-3 Inadequate water utilization on farm																																					○			
	I-4 Low participation of farmers in self-help activities																									○	○	○	○	○	○	○	○								
	I-5 Intakes are dissipated																																							○	
	I-6 Unreliable availability of water at source	○																																							
PCM Session II	II-1 Recognition of present condition	○	○							○						○						○	○					○	○												
	II-2 Planning			○				○			○											○									○										
	II-3 Designing			○				○			○													○								○									
	II-4 Construction				○				○			○								○				○																	
	II-5 Monitoring and evaluation adjustment						○			○					○										○						○	○							○		
PCM Session III	III-1 Reliability of database secured									○	○	○	○	○																											
	III-2 Coordination amongst programmes/projects within IS								○	○	○																														
	III-3 Appropriate institutional set-up for irrigation development put in place	○	○	○	○	○	○		○	○	○	○	○	○	○																										
	III-4 Adequate policy guidelines in irrigation development provided																																								
	III-5 Adequate irrigation development capacity	○	○	○	○	○	○				○	○	○	○	○																										
	III-6 Staff morale improvement																																								
PCM Session IV	IV-1 Adequate maintenance of irrigation infrastructure					○											○							○															○		
	IV-2 Improved water utilization																																						○	○	
	IV-3 Irrigation infrastructure adequately protected																																						○	○	
	IV-4 Irrigation infrastructure adequately developed																						○	○	○	○	○	○													
	IV-5 Water adequately distributed																											○	○	○	○	○	○	○	○	○	○	○	○	○	
	IV-6 Environmental protection at water sources						○	○			○					○	○								○	○			○	○	○	○	○	○	○	○	○	○	○		
PCM Session V	V-1 Inadequate adoption of irrigation development policies by the districts																									○	○	○	○	○	○										
	V-2 Mismanagement of extension staff																											○	○	○	○	○	○								
	V-3 Lack of knowledge on the importance of irrigation to LGA's leaders																												○	○	○	○	○	○							
	V-4 Inadequate resources and capacity in the districts																												○	○	○	○	○	○							

Note: Above mentioned constraints are the identified route causes by the PCM sessions.

Constraints identified by "Problem Analysis for Selected Schemes"		Theme 1					Theme 2			Theme 3					Theme 4					Theme 5						Theme 6						Theme 7		Theme 8		Theme 9		Important Assumption		
		1.1	1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3	3.1	3.2	3.3	3.4	3.5	4.1	4.2	4.3	4.4	4.5	5.1	5.2	5.3	5.4	5.5	5.6	6.1	6.2	6.3	6.4	6.5	6.6	6.7	7.1	7.2	8.1	8.2	9.1	9.2	
P1	Misleading of farmers' participation					●																																		●
P2	Unsound logical structure of irrigation scheme			●																																				●
P3	Misunderstanding for "Simple and low-cost technology"		●							●	●	●																												
P4	Looking down of basic technology	●	●	●	●							●																												●
P5	No accumulation of instructive experiences					●									●																								●	
P6	Not effective use of technical manuals	●	●	●	●							●																												●
P7	Needs for contractors' training															●	●	●	●	●	●																			
P8	Needs of strengthening supporting system to WUAs						●			●				●	●												●	●									●	●	●	●
P9	Strengthening LGAs in irrigation development																																							●

Note: For the serial number such as "P-", refer Clause 4.4 in the Main Report.

Table 8.3.3 Outline of Proposed Development Programme in NIMP

Reference No	Programme Title	Target Organization or	Outlines of Programme
A1	IS Institutional Improvement Programme	Irrigation Section	Institutional improvement plan of the IS's organization is authorized. And the institutional improvement plan of the IS is carried out.
A2	LGA Institutional Strengthening Programme for Irrigation Development	LGAs	Institutional improvement plan of the irrigation sector's organization in the district office is authorized. And the institutional improvement plan of the irrigation sector of the district office (IS district) is carried out.
B1	IS Working Mandate Formulation Programme	Irrigation Section	Proper working mandate of IS is regulated and started to be applied.
B2	Contract Management System Improvement programme	Any	Contract management system for the works on irrigation development is improved. New contract management system is started to be applied.
B3	Regulatory Networking System Establishment between LGAs and IS	Irrigation Section and LGAs	Regulatory Networking System between LGAs (districts) and IS is established, and the system starts to work.
B4	NGOs' Intervention in Irrigation Development Encourage Programme	Any	Encouragement plan for NGOs' intervention in irrigation development is established. The encouragement plan for NGOs' intervention in irrigation development is started.
B5	Cooperation Channeling within Irrigation-Sector Establishment Programme	Irrigation Section and LOAs	Properly linked mandate and duties of each agency in irrigation sector are established.
B6	Sub-sectors Coordination System Establishment	Any agencies related	Proper coordination directive among every sub-sectors related to irrigated agriculture are established.
C1	Survey and Investigation Guideline Establishment Programme	Any	Survey and Investigation(S&I) Guideline which is convenient for survey and investigation of new irrigation planning is completed. A copy of the S&I Guideline is placed in each district and section related irrigation development.
C2	C2.1 Planning Guideline Establishment Programme	Any	Planning Guideline which is convenient for planning of new irrigation scheme is completed. A copy of the Planning Guideline is placed in each district and section related irrigation development.
	C2.2 Designing Guideline Establishment Programme	Any	Designing Guideline which is convenient for designing of new irrigation scheme is completed. A copy of the Designing Guideline is placed in each district and section related irrigation development.
C3	C3.1 O&M Guideline Establishment Programme	Any	O&M Guideline which is convenient for the works of operation and maintenance of any irrigation schemes is completed. A copy of the O&M Guideline is placed in each district and section related irrigation development.
	C3.2 Monitoring & Evaluation Guideline Establishment Programme	Any	M&E Guideline which is convenient for monitoring and evaluation of any irrigation schemes is completed. A copy of the M&E Guideline is placed in each district and section related irrigation development.
C4	Farmers' Participation in Irrigation Development Programme	Farmers and Farmers' Group	A Guideline for farmers participation is prepared. Some numbers of pilot model irrigation schemes for farmers participation are established, and replicable effects of the pilot models for farmers participation are expanded to other areas.
C5	Village Irrigation Development Guideline Establishment Programme	L Gas and Farmers	Village Irrigation Development (VID) Guideline which is convenient for planning, designing, construction and O&M of new village irrigation scheme is completed. A copy of the VID Guideline is placed in each district and organization related irrigation dev
C6	Farmers' O&M Manual Establishment Programme	Farmers and Farmers' Group	Farmers' O&M Manual which is convenient for the farmers' works and activities to be taken during operation and maintenance of any irrigation schemes is completed. A copy of the F&O&M Manual is placed in each district, section related irrigation developme
C7	Establishment of DADP Formulation Guideline for Irrigated Agriculture Development (DADP-IA)	LGAs	DADP-IA Guideline which is convenient for planning of new irrigation scheme dealt with Districts is completed. A copy of the DADP-IA Guideline is placed in each district and organization related irrigation development (including NGOs).
D1	Web-site and Networking Establishment Programme	Irrigation Section	Web-site for IS is established. And, intra-network system is extended within IS and in between ZIOs.
D2	Technical Manuals Handling Guideline Establishment Programme	Any	Technical Manuals Handling TMH Guideline which is convenient for handling and managing all technical references is completed. A copy of the TMH Guideline is placed in each section related irrigation development in central government and districts.
D3	Information and Database Improvement Programme	Irrigation Section	Databases related to irrigation development and management are completed and started for its services.
D4	Irrigation Development Contractors and Consultants' Listing Programme	Any	Contractors and consultants' inventory for the contract works of irrigation development is completed. Up-dating system for the contractors and consultants' inventory is established.
D5	LGAs' Data Organization Programme	LGAs	LGAs' data (related to irrigation development) organization system are established or improved. LGAs are enabled to organize necessary information and data related to irrigation development using the system.
D6	LGA Networking System Establishment Programme	LGAs	Irrigation offices of districts are enabled to access intra-network of IS and ZIOs individually and at any time, so as to communicate any matters of irrigation development.
D7	Existing-scheme Monitoring System Establishment Programme	Irrigation Section and LGAs	An existing irrigation monitoring system is established. The monitoring system starts its operation as required.
E1	E1.1 Irrigation Technology Research Center Establishment Programme	Irrigation Section	An Irrigation Technology Research Center is established in suitable manners. The Irrigation Technology Research Center starts its operation as required.
	E1.2 Perennial Irrigation Method Improvement Programme	Irrigation Section	Improving measures for perennial irrigation practice in Tanzania are established on the basis of real hindrances and inconveniences.
	E1.3 Flood Irrigation Development Programme	Irrigation Section	Sustainable flood irrigation (water harvesting) know-how for marginal areas in Tanzania is established on the bases of the previous failures. And proper methods of flood irrigation (water harvesting) take the place of improper ones which were practiced.
	E1.4 Small Dam Technology for Irrigation Development Establishment Programme	Irrigation Section	Adequate small dam technology for irrigation development to meet circumstances in Tanzania is established on the bases of the previous lessons. Proper method of water utilization by small dam is introduced to engineers in irrigation.
	E1.5 Environmental Assessment Study for Irrigation Practice in Tanzania	Irrigation Section	Environmental issues affected presently in and by irrigation practice in Tanzania are elucidated. Measures of avoiding environmental deterioration by irrigation practice are worked out.
	E1.6 Study of River-Basin Approach in Irrigation Development	Irrigation Section	Proper river-basin approach for irrigation sector is established as a form of guideline. And the proper river-basin approach for irrigation sector is expanded for irrigators.
E2	Hydraulic Experimental Center Establishment Programme	Irrigation Section	A Hydraulic Experimental Center is established in suitable manners. The Hydraulic Experimental Center starts its operation as required.
E3	IS's Equipment Management Programme	Irrigation Section	An equipment management system in IS is established in suitable manners. The equipment management system starts its operation as prescribed.
E4	Irrigation Development Contractors and Contractors' Training Programme	Contractors	Irrigation development contractors and consultants' training system raising their skill for the works in irrigation development is created. Motivated contractors and consultants are trained on the works in irrigation development.
E5	Farmers' Participation Training Programme	Farmers and Farmers' Group	Farmers' participation training programme for irrigated agriculture is established. The farmers' participation training programme is executed.
E6	E6.1 Irrigated Agriculture Training Programme for Rice Production Increase	Farmers and Farmers' Group	Productivities of rice increases in the model sites through the KATC's training.
	E6.2 Irrigated Agriculture Training Programme for Cash Crops Production Increase	Farmers and Farmers' Group	Productivities of irrigated cash crop increase in the model sites through training of the programme.
E7	Integrated Irrigation Development Model establishment Programme	Any	Pilot models of integrated irrigation development which is irrigated agricultural development with fulfilling rural development comprehensively, are implemented. The pilot models sustain outcomes of the development.

Table 8.3.4 Profiles of Proposed Components (1/5)

Reference No	Programme Title	Target Organization (Groups)	Location	Objectives	Major Outputs
A1	IS Institutional Improvement Programme	Irrigation Section	Dar es Salaam	Institutional improvement plan of the IS's organization is authorized. And the institutional improvement plan of the IS is carried out.	1 Institutional improvement plan of the IS's organization is finalized. 2 Organizational structure of IS is legitimately changed. 3 Personnel changes and if necessary recruitment of staff are done in the IS in line with the institutional improvement plan. 4 New organization of IS is enabled to work.
A2	LGA Institutional Strengthening Programme for Irrigation Development	LGAs	Nationwide	Institutional improvement plan of the irrigation sector's organization in the district office is authorized. And the institutional improvement plan of the irrigation sector of the district office (IS district) is carried out.	1 General institutional improvement plan of the IS district's organization is finalized. 2 Organizational structure of IS district is legally changed by district. 3 Personnel changes and if necessary recruitment of staff are done in the IS district in line with the institutional improvement plan by district. 4 New organization of IS district is enabled to work by district.
B1	IS Working Mandate Formulation Programme	Irrigation Section	Dar es Salaam	Proper working mandate of IS is regulated and started to be applied.	1 Mission statement of IS is established. 2 Task duties of IS is established in line with the Mission statement of IS.
B2	Contract Management System Improvement programme	Any	Dar es Salaam	Contract management system for the works on irrigation development is improved. New contract management system is started to be applied.	1 Guidelines of contract procedures are prepared. 2 The new guideline is expanded to every concerned governmental staff. 3 The new guideline is expanded to contractors and organization concerned.
B3	Regulatory Networking System Establishment between LGAs and IS	Irrigation Section and LGAs	Nationwide	Regulatory Networking System between LGAs (districts) and IS is established, and the system starts to work.	1 Communication channel for transferring information between districts and IS (sometimes by way of ZICOs) is set up. 2 Necessary equipment to make communicate between both parties possible is installed. 3 Arrangement for open utilization of useful tools and information in IS to districts is made.
B4	NGOs' Intervention in Irrigation Development Encourage Programme	Any	Nationwide	Encouragement plan for NGOs' intervention in irrigation development is established. The encouragement plan for NGOs' intervention in irrigation development is started.	1 NGOs' cooperation in irrigation sector in Tanzania is unveiled 2 Strategy for encouragement of NGOs' cooperation in irrigation sector is established. 3 A encouragement plan for NGOs' intervention in irrigation development is made. 4 Necessary arrangement for implementation of the encouragement plan for NGOs' intervention in irrigation development is settled.
B5	Cooperation Channeling within Irrigation-Sector Establishment Programme	Irrigation Section and LGAs	Nationwide	Properly linked mandate and duties of each agency in irrigation sector are established.	1 Cooperative mission statement of every parties in irrigation sector is established in consideration with linkage each other. 2 Cooperative Duties and Mandate of irrigation sector is established in line with the Mission Statements.
B6	Sub-sectors Coordination System Establishment	Any agencies related	Nationwide	Proper coordination directive among every sub-sectors related to irrigated agriculture are established.	1 Coordination system (or directive and rules system) among sub-sectors related to irrigated agriculture development are established. 2 The coordination system among sub-sectors works on retaining of good progress of irrigated agriculture.
C1	Survey and Investigation Guideline Establishment Programme	Any	Nationwide	Survey and Investigation(S&I) Guideline which is convenient for survey and investigation of new irrigation planning is completed. A copy of the S&I Guideline is placed in each district and section related irrigation development.	1 Fields and its level of survey and investigation to meet requirement for the S&I Guidelines are decided. 2 A S&I Guideline is prepared. 3 Handling manual for the S&I Guideline is prepared. 4 Copy of the S&I Guideline is delivered to each district and section related irrigation development.
C2	C2.1 Planning Guideline Establishment Programme	Any	Nationwide	Planning Guideline which is convenient for planning of new irrigation scheme is completed. A copy of the Planning Guideline is placed in each district and section related irrigation development.	1 Fields and its level of planning and decision making to meet requirement for the Planning Guideline are decided. 2 A Planning Guideline is prepared. 3 Handling manual for the Planning Guideline is prepared. 4 Copy of the Planning Guideline is delivered to each district and section related irrigation development.

Table 8.3.4 Profiles of Proposed Components (2/5)

Reference No	Programme Title	Target Organization (Groups)	Location	Objectives	Major Outputs
C2	C2.1 Designing Guideline Establishment Programme	Any	Nationwide	Designing Guideline which is convenient for designing of new irrigation scheme is completed. A copy of the Designing Guideline is placed in each district and section related irrigation development.	1 Fields and its level of designing of irrigation system to meet requirement for the Designing Guideline are decided. 2 A Designing Guideline is prepared. 3 Handling manual for the Designing Guideline is prepared. 4 Copy of the Designing Guideline is delivered to each district and section related irrigation development.
C3	C3.1 O&M Guideline Establishment Programme	Any	Nationwide	O&M Guideline which is convenient for the works of operation and maintenance of any irrigation schemes is completed. A copy of the O&M Guideline is placed in each district and section related irrigation development.	1 Fields and its level of works in O&M of irrigation system to meet requirement for the O&M Guideline are decided. 2 A O&M Guideline is prepared. 3 Handling manual for the O&M Guideline is prepared. 4 Copy of the O&M Guideline is delivered to each district and section related irrigation development.
	C3.2 Monitoring & Evaluation Guideline Establishment Programme	Any	Nationwide	M&E Guideline which is convenient for monitoring and evaluation of any irrigation schemes is completed. A copy of the M&E Guideline is placed in each district and section related irrigation development.	1 Fields and its level of works in M&E of irrigation system to meet requirement for the M&E Guideline are decided. 2 A M&E Guideline is prepared. 3 Handling manual for the M&E Guideline is prepared. 4 Copy of the M&E Guideline is delivered to each district and section related irrigation development.
C4	Farmers' Participation in Irrigation Development Programme	Farmers and Farmers' Group	Nationwide	A Guideline for farmers' participation is prepared. Some numbers of pilot model irrigation schemes for farmers participation are established, and redictable effects of the pilot models for farmers participation are	1 Contents for the Farmers' Participation Guideline are decided. 2 The Farmers' Participation Guideline is prepared. 3 Typical irrigation schemes for good farmers' participation are selected as the pilot models. 4 Strengthening Plan for farmers' participation to the selected pilot schemes are made. 5 The Strengthening Plan for farmers' participation is executed in the pilot schemes. 6 Good farmers' participation is maintained in the pilot schemes. 7 Tours of other villagers to the pilot schemes are prepared and executed often. 8 Leaflet propagating pilot model effects for strengthening farmers' participation is prepared as being effective.
C5	Village Irrigation Development Guideline Establishment Programme	L Gas and Farmers	Nationwide	Village Irrigation Development (VID) Guideline which is convenient for planning, designing, construction and O&M of new village irrigation scheme is completed. A copy of the VID Guideline is placed in each district and organization related irrigation dev	1 Fields and its level of contents for the VID Guideline are decided. 2 A VID Guideline is prepared. 3 Handling manual for the VID Guideline is prepared. 4 Copy of the VID Guideline is delivered to each district and organization related irrigation development including NGOs.
C6	Farmers' O&M Manual Establishment Programme	Farmers and Farmers' Group	Nationwide	Farmers' O&M Manual which is convenient for the farmers' works and activities to be taken during operation and maintenance of any irrigation schemes is completed. A copy of the F'O&M Manual is placed in each district, section related irrigation development	1 Fields and its level of works in O&M of irrigation system to meet requirement for the F'O&M Manual are decided. 2 A O&M Guideline is prepared. 3 Handling manual for the F'O&M Manual is prepared. 4 Copy of the F'O&M Manual is delivered to each district and section related irrigation development.
C7	Establishment of DADP Formulation Guideline for Irrigated Agriculture Development (DADP-IA)	LGAs	Nationwide	DADP-IA Guideline which is convenient for planning of new irrigation scheme dealt with Districts is completed. A copy of the DADP-IA Guideline is placed in each district and organization related irrigation development (including NGOs).	1 Fields and its level of contents for the DADP-IA Guideline are decided. 2 A DADP-IA Guideline is prepared. 3 Handling manual for the DADP-IA Guideline is prepared. 4 Copy of the DADP-IA Guideline is delivered to each district and organization related irrigation development (including NGOs).

Table 8.3.4 Profiles of Proposed Components (3/5)

Reference No	Programme Title	Target Organization (Groups)	Location	Objectives	Major Outputs
D1	Web-site and Networking Establishment Programme	Irrigation Section	Dar es Salaam	Web-site for IS is established. And, intra-network system is extended within IS and in between ZICs.	1 Web-site for IS is opened. 2 Up-dating routine for the web-site is established. 3 Extending plan of the MAFS intra-network to the IS is made. 4 The extending plan of the intra-network is executed.
D2	Technical Manuals Handling Guideline Establishment Programme	Any	Nationwide	Technical Manuals Handling TMH Guideline which is convenient for handling and manage all technical references is completed. A copy of the TMH Guideline is placed in each section related irrigation development in central government and districts.	1 Realistic utilization system for technical references is drawn up. 2 A TMH Guideline is prepared. 3 Copy of the TMH Guideline is delivered to each section related irrigation development in central government and districts.
D3	Information and Database Improvement Programme	Irrigation Section	Dar es Salaam	Databases related to irrigation development and management are completed and started for its services.	1 Databases related to irrigation development and management are constructed. 2 Operation manual for the databases are prepared. 3 Up-dating system for the databases is structured.
D4	Irrigation Development Contractors and Consultants' Listing Programme	Any	Dar es Salaam	Contractors and consultants' inventory for the contract works of irrigation development is completed. Up-dating system for the contractors and consultants' inventory is established.	1 Outlines of contractors having proper capability above required level are collected. 2 Collected data for the contractors are arranged in specified format of inventory. 3 Up-dating plan for the contractors' inventory is made. 4 The up-dating plan for the contractors' inventory is systematized.
D5	LGAs' Data Organization Programme	LGAs	Nationwide	LGAs' data (related to irrigation development) organization system are established or improved. LGAs are enabled to organize necessary information and data related to irrigation development using the system.	1 Method and modality of data organization for LGAs offices are framed. 2 Preparation and Establishment manual for the LGAs' data organization system are prepared. 3 The data organization system is set up in the districts office in line with the manual. 4 Established data organizational system in the districts start its operation.
D6	LGA Networking System Establishment Programme	LGAs	Nationwide	Irrigation offices of districts are enabled to access intra-view of IS and ZICs individually and at any time, so as to communicate any matters of irrigation	1 Information facilities so as to access to internet is installed in the irrigation offices of districts. 2 Staff of the irrigation offices of districts can operate the installed system to access to internet. 3 The network system linked to internet installed in the irrigation offices of districts utilize effectively for the purpose of irrigation development.
D7	Existing-scheme Monitoring System Establishment Programme	Irrigation Section and LGAs	Nationwide	An existing irrigation monitoring system is established. The monitoring system starts its operation as required.	1 Hardware of the monitoring system is stationed. 2 Software of the monitoring system (database of schemes, and necessary information etc.) is prepared. 3 Operation and utilized arrangement is systemized. 4 Up-dating system for the monitoring system is systemized. (linked with the programme D5)
E1	E1.1 Irrigation Technology Research Center Establishment Programme	Irrigation Section	Dar es Salaam	An Irrigation Technology Research Center is established in suitable manners. The Irrigation Technology Research Center starts its operation as required.	1 Failures and problems in the subject in irrigation technology are identified in the previous irrigation schemes, and technical themes to be strengthened are clarified. 2 Objectives and outlines of establishment of Irrigation Technology Research Center is set up. 3 Feasibility Study for the establishment of Irrigation Technology Research Center is carried out, and a feasible plan is prepared so as to be manageable and sustainable. 4 The Irrigation Technology Research is constructed as planned, and staff and equipment required in the plan is stationed.
	E1.2 Perennial Irrigation Method Improvement Programme	Irrigation Section	Nationwide	Improving measures for perennial irrigation practice in Tanzania are established on the basis of real hindrances and inconveniences.	1 Points to be improved in perennial irrigation practice in Tanzania are clarified. 2 Improving measures in hardware of irrigation system are prepared. 3 Improving measures in software of irrigation practice are prepared.

Table 8.3.4 Profiles of Proposed Components (4/5)

Reference No	Programme Title	Target Organization (Groups)	Location	Objectives	Major Outputs
E1	E1.3 Flood Irrigation Development Programme	Irrigation Section	Marginal Areas	Sustainable flood irrigation (water harvesting) know-how for marginal areas in Tanzania is established on the bases of the previous failures. And proper methods of flood irrigation (water harvesting) take the place of improper ones which were practiced	<ol style="list-style-type: none"> 1 Failures and troubles are identified in the previous water harvesting practices, and inadequacy and indiscretion for the practices are generalized. 2 Adequate approach of water harvesting is found out by type of situation in the marginal areas. 3 Realistic and sustainable method of water harvesting are developed by type of situation in the marginal areas. 4 Guideline for the new method of water harvesting is completed. 5 The guideline is provided widely and quickly for open use to every person related to water harvesting practice.
	E1.4 Small Dam Technology for Irrigation Development Establishment Programme	Irrigation Section	Nationwide	Adequate small dam technology for irrigation development to meet circumstances in Tanzania is established on the bases of the previous lessons. Proper method of water utilization by small dam is introduced to engineers in irrigation.	<ol style="list-style-type: none"> 1 Failures and troubles are identified in the previous small dam schemes, and inadequacy and indiscretion for the previous techniques are generalized. 2 Adequate small dam technology is developed by type of scheme site. 3 Guideline for the new technology of small dam is completed. 4 The guideline is provided widely and quickly for open use to every person related to small dam development.
	E1.5 Environmental Assessment Study for Irrigation Practice in Tanzania	Irrigation Section	Nationwide	Environmental issues affected presently in and by irrigation practice in Tanzania are elucidated. Measures of avoiding environmental deterioration by irrigation practice are worked out.	<ol style="list-style-type: none"> 1 Environmental issues presented are scientifically analyzed, and causes and mechanism of the issues are found out. 2 Alternatives of improvement measures to the environmental deterioration for which irrigators can deal with, are proposed. 3 The alternatives of improvement measures are finalized so as to be manageable.
	E1.6 Study of River-Basin Approach in Irrigation Development	Irrigation Section	Nationwide	Proper river-basin approach for irrigation sector is established as a form of guideline. And the proper river-basin approach for irrigation sector is expanded for irrigators.	<ol style="list-style-type: none"> 1 Procedures of obtaining and/or renewing water right for irrigation water use are routinized within irrigation sector. 2 Technical skills to make allowable water for irrigation increase are developed. 3 Technical skills to make demanding water for irrigation reduce are developed. 4 Organizational arrangement towards negotiation between water users is proposed. 5 A guideline of river-basin approach for irrigation sector is prepared.
E2	Hydraulic Experimental Center Establishment Programme	Irrigation Section	Dar es Salaam	<p>A Hydraulic Experimental Center is established in suitable manners.</p> <p>The Hydraulic Experimental Center starts its operation as required.</p>	<ol style="list-style-type: none"> 1 Failures and problems in the subject in hydraulics are identified in the previous irrigation schemes, and hydraulic themes to be strengthened are clarified. 2 Objectives and outlines of establishment of Hydraulic Experimental Center is set up. 3 Feasibility Study for the establishment of Hydraulic Experimental Center is carried out, and a feasible plan is prepared so as to be manageable and sustainable. 4 The Hydraulic Experimental Center is constructed as planned, and staff and equipment required in the plan is stationed.
E3	IS's Equipment Management Programme	Irrigation Section	Nationwide	<p>An equipment management system in IS is established in suitable manners.</p> <p>The equipment management system starts its operation as prescribed.</p>	<ol style="list-style-type: none"> 1 Actual situation of existing equipment for irrigation development works belonging to MAFS is unveiled. 2 Realistic and permissible institutional framework for handling management of the equipment is studied taking possibility of private sector's intervention into consideration. 3 Feasibility Study for the establishment of equipment management system is carried out, and a feasible plan is prepared so as to be manageable and sustainable. 4 The equipment management system is organized as planned, and staff and equipment required in the plan is stationed.
E4	Irrigation Development Contractors and Contractors' Training Programme	Contractors	Nationwide	<p>Irrigation development contractors and consultants' training system raising their skill for the works in irrigation development is created.</p> <p>Motivated contractors and consultants are trained on the works in irrigation development.</p>	<ol style="list-style-type: none"> 1 Needs of contractors training is confirmed, and required fields on its training is clarified. 2 Style of organization which is capable for handling the contractors training is hunted out, and operation system of the training is outlined. 3 Plan of contractors training system is formulated. 4 The contractors training system is established. 5 The contractors training system starts its operation.

Table 8.3.4 Profiles of Proposed Components (5/5)

Reference No	Programme Title	Target Organization (Groups)	Location	Objectives	Major Outputs
E5	Farmers' Participation Training Programme	Farmers and Farmers' Group	Nationwide	Farmers' participation training programme for irrigated agriculture is established. The farmers' participation training programme is executed.	<ol style="list-style-type: none"> 1 Curriculum of farmers' participation training in irrigation development is completed. 2 Areas and schedule to be executed the training are decided. 3 Plan of farmers' participation training programme is formulated. 4 Preparation for the implementation of farmers' participation training programme is prepared
E6	E6.1 Irrigated Agriculture Training Programme for Rice Production Increase	Farmers and Farmers' Group	Nationwide	Productivities of rice increases in the model sites through the KATC's training.	<ol style="list-style-type: none"> 1 The concept of and approach to the model sites are established. 2 The capacity of the KATC in identifying training needs is improved. 3 Technical training programmes on irrigated rice production are strengthened to meet local needs. 4 Training programmes for improving institutional framework of irrigation scheme are strengthened. 5 The capacity of the KATC in collecting and providing useful irrigated rice cultivation information is improved. 6 The concept and approach to mainstream gender into planning, implementing and monitoring technical training on irrigated rice production are established.
	E6.2 Irrigated Agriculture Training Programme for Cash Crops Production Increase	Farmers and Farmers' Group	Nationwide	Productivities of irrigated cash crop increase in the model sites through training of the programme.	<ol style="list-style-type: none"> 1 Training system is set up in organizationally. 2 Trainers are trained as above required level. 3 Technical training programme on irrigated cash crop production increase are prepared so as to meet local needs too. 4 Programmed trainings are given to the farmers of the selected model sites and extension staff concerned district. 5 Irrigated cash crop production at the model sites is maintained at succeeded level.
E7	Integrated Irrigation Development Model establishment Programme	Any	Nationwide	Pilot models of integrated irrigation development which is irrigated agricultural development with fulfilling rural development comprehensively, are implemented. The pilot models sustain outcomes of the development.	<ol style="list-style-type: none"> 1 Development concept of integrated irrigation development is clarified. 2 Method and modality for integrated irrigation development are established. 3 Works for pilot model development are implemented at selected sites (villages). 4 A monitoring routine is established, and starts operation.

Table 8.6.1 Estimated Cost of Proposed Development Programmes in NIMP

Reference No.	Programme Title	Implementation Period (Year)	Required M/M	Personnel Expenses	Procurement/Construction	Programme Cost (thousand US\$)
A1	IS Institutional Improvement Programme	2.0	22	440	-	440
A2	LGA Institutional Strengthening Programme for Irrigation Development	2.0	18	360	-	360
B1	IS Working Mandate Formulation Programme	1.0	18	270	-	270
B2	Contract Management System Improvement programme	1.0	28	420	-	420
B3	Regulatory Networking System Establishment between LGAs and IS	1.0	24	360	-	360
B4	NGOs' Intervention in Irrigation Development Encourage Programme	1.0	27	405	-	405
B5	Cooperation Channeling within Irrigation-Sector Establishment Programme	1.0	21	310	-	310
B6	Sub-sectors Coordination System Establishment	1.0	21	320	-	320
C1	Survey and Investigation Guideline Establishment Programme	1.0	30	360	90	450
C2	C2.1 Planning Guideline Establishment Programme	1.0	57	680	-	680
	C2.2 Designing Guideline Establishment Programme	1.0	52	620	-	620
C3	C3.1 O&M Guideline Establishment Programme	1.0	55	820	-	820
	C3.2 Monitoring & Evaluation Guideline Establishment Programme	1.0	49	590	-	590
C4	Farmers' Participation in Irrigation Development Programme	1.0	60	720	-	720
C5	Village Irrigation Development Guideline Establishment Programme	1.0	63	760	-	760
C6	Farmers' O&M Manual Establishment Programme	1.0	49	590	-	590
C7	Establishment of DADP Formulation Guideline for Irrigated Agriculture Development (DADP-LA)	1.0	69	830	-	830
D1	Web-site and Networking Establishment Programme	1.0	9	108	27	135
D2	Technical Manuals Handling Guideline Establishment Programme	0.5	12	180	-	180
D3	Information and Database Improvement Programme	1.5	24	360	360	720
D4	Irrigation Development Contactors and Consultants' Listing Programme	1.0	15	225	-	225
D5	LGAs' Data Organization Programme	1.5	21	252	63	315
D6	LGA Networking System Establishment Programme	1.0	5	50	25	75
D7	Existing-scheme Monitoring System Establishment Programme	3.0	48	720	300	1,020
E1	E1.1 Irrigation Technology Research Center Establishment Programme	2.0	51	765	2,000	2,765
	E1.2 Perennial Irrigation Method Improvement Programme	1.5	48	720	-	720
	E1.3 Flood Irrigation Development Programme	2.0	48	720	-	720
	E1.4 Small Dam Technology for Irrigation Development Establishment Programme	2.0	64	960	-	960
	E1.5 Environmental Assessment Study for Irrigation Practice in Tanzania	2.0	60	900	-	900
	E1.6 Study of River-Basin Approach in Irrigation Development	1.0	24	360	-	360
E2	Hydraulic Experimental Center Establishment Programme	2.5	33	495	1,000	1,495
E3	IS's Equipment Management Programme	1.5	16	240	500	740
E4	Irrigation Development Contractors and Contractors' Training	1.5	13	195	-	195
E5	Farmers' Participation Training Programme	1.0	48	720	-	720
E6	E6.1 Irrigated Agriculture Training Programme for Rice Production Increase	5.0	on-going	-	-	-
	E6.2 Irrigated Agriculture Training Programme for Cash Crops Production Increase	3.0	54	810	-	810
E7	Integrated Irrigation Development Model establishment Programme	3.0	52	780	-	780
Total						22,780

Table 8.9.1 Tentative PDM for Implementation of NIMP

Name of Project : National Irrigation Master Plan
 Project Area : Mainland in Tanzania
 Executing Agency : Ministry of Agriculture and Food Security (MAFS)
 Duration : 15 years
 Target Group : Government and Private Sector
 Date : August 15, 2002

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal 1.1 Improving productivity and profitability	1.1 Food production progressively increases by 2017.	1.1 Monitoring reports of MAFS	<ul style="list-style-type: none"> ● The Government does not change the agricultural policy.
Project Purpose 2.1 Execution of sustainable irrigation development through effective use of national resources	2.1 Total irrigable area progressively increases by 2017, and stable food production is realized.	2.1 Monitoring reports of IS, MAFS	<ul style="list-style-type: none"> ● The Government does not hinder the implementation of irrigation development ● Adequate resources are allocated.
Outputs 3.1 Irrigation facilities are rehabilitated/improved/newly constructed. 3.2 Subject-wise improvement programme for sustainable irrigation development is completed.	3.1.1 Irrigation facilities are rehabilitated/improved/newly constructed with participatory approach by 2007. - Total irrigable areas developed 266,000 ha 3.1.2 Irrigation facilities are rehabilitated/improved/newly constructed with farmers-oriented approach by 2012. - Total irrigable areas developed 325,000 ha 3.1.3 Irrigation facilities are rehabilitated/improved/newly constructed with self-reliant philosophy by 2017. - Total irrigable areas developed 405,000 ha 3.2.1 27 components of Subject-wise Improvement Programme are completed by 2007. 3.2.2 37 components of Subject-wise Improvement Programme are completed by 2010.	3.1.1 Monitoring reports of IS, MAFS and Local Governments 3.1.2 Monitoring reports of IS, MAFS and Local Governments 3.1.3 Monitoring reports of IS, MAFS and Local Governments 3.2.1 Monitoring reports of IS, MAFS and Local Governments 3.2.2 Monitoring reports of IS, MAFS and Local Governments	<ul style="list-style-type: none"> ● Implementation of other sub-sectors (marketing of farm inputs and outputs, credit services, rural infrastructure) are executed concurrently. ● Required fund is available on time. ● IS has enough capacity to make coordination for implementation of irrigation schemes. ● Local government has enough capacity to make implementation of irrigation schemes.
Activities 4.1 Implementing irrigation schemes 4.1.1 Rehabilitating existing small-scale irrigation schemes. 4.1.2 Improving existing small-scale irrigation schemes. 4.1.3 Constructing water harvesting schemes. 4.1.4 Constructing smallholder irrigation schemes. 4.2 Implementing supporting programme 4.2.1 Implementing institutional and organizational development programme 4.2.2 Implementing research and technology programme. 4.2.3 Implementing capacity building programme 4.2.4 Implementing legal framework development programme.	Inputs Foreign Donor <ul style="list-style-type: none"> ● Adequate financial assistance Tanzania Side (1) Central Government/MAFS <ul style="list-style-type: none"> ● Arrangement of 80 % of total construction cost ● Arrangement of adequate recurrent cost ● Execution of inter-sectoral coordination ● Strengthening of irrigation section ● Legal framework strengthening for irrigation development ● Monitoring and evaluation of schemes (2) Local Government <ul style="list-style-type: none"> ● Preparation and implementation of DADP ● Execution of project implementation ● Smallholder supporting ● Monitoring and evaluation of schemes (3) Farmers <ul style="list-style-type: none"> ● 20% of total construction cost ● 100% of operation and maintenance cost 		Pre-conditions <ul style="list-style-type: none"> ● Tanzania Government arrange all project costs through contact with donors ● Decentralization for all districts is finished by 2011.