Republic of Namibia
Ministry of Agriculture, Water and Forestry

THE REPUBLIC OF NAMIBIA

NORTHERN CROP AND LIVESTOCK DEVELOPMENT MASTER PLAN STUDY

FINAL REPORT

VOLUME-III TRAINING MATERIALS

June 2017

JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

NIPPON KOEI CO., LTD.

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Republic of Namibia
Ministry of Agriculture, Water and Forestry

THE REPUBLIC OF NAMIBIA

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IN
THE REPUBLIC OF NAMIBIA

Final Report

Volume-III
Training Materials

PART-1: Training Materials in Phase 2

PART-2: Training Materials in Phase 3

PART-3: Technical Manual

PART-1

Training Materials in Phase 2

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Training Material 1

1st AT Training, November 2015

Phase 2

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Republic of Namibia
Ministry of Agriculture, Water and Forestry

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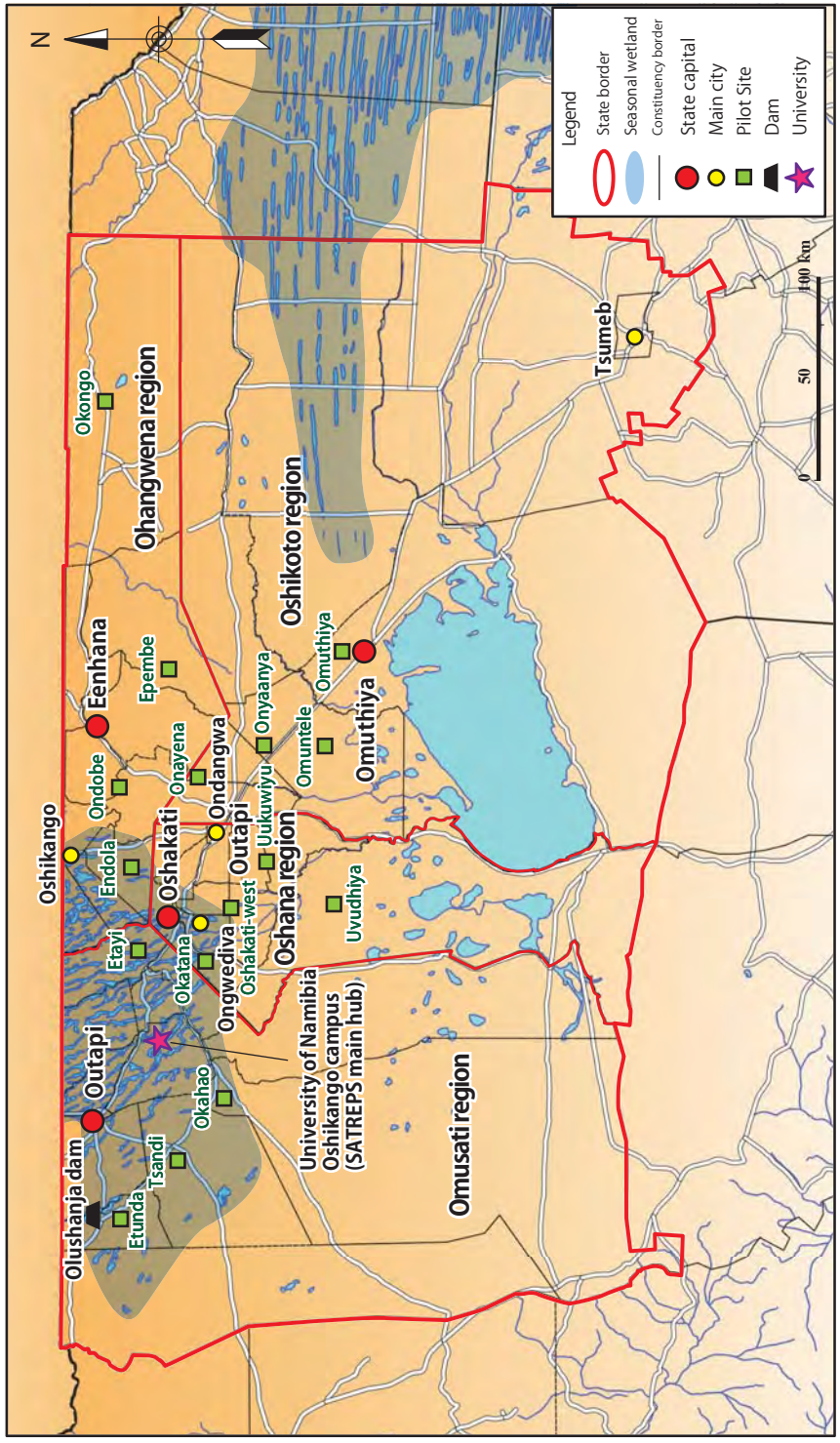
NORTHERN CROP AND LIVESTOCK DEVELOPMENT MASTER PLAN STUDY IN THE REPUBLIC OF NAMIBIA

Pilot Project Activities
Training for Agricultural Technicians

November 2015

JAPAN INTERNANATIONAL COOPERATION AGENCY (JICA)
NIPPON KOEI CO., LTD.



Location Map of Pilot Site Activities

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Northern Crop and Livestock Production Master Plan Study in the Republic of Namibia

Training for Agricultural Technicians
Implementation of Pilot Projects

November 3rd 2014 (Tue), November 4th 2014 (Wed)

at the Meeting Room of AMTA Fresh Produce Business Hubs, Ongwediva

Agenda

Time	Subject	Presenter
08:45-09:00	Registration	-
09:00-09:10	Opening Remarks	◆ Mr. Martin Embundile / Chairperson Acting Deputy Director, NCD
09:10-9:30	Introduction ◆ Schedule, points to be discussed	◆ Mr. Morioka, Deputy Team Leader, JICA Team
9:30-10:10	Crop Sector ◆ Cereal Grains ◆ Horticulture	◆ Mr. Asie Dreyer (Aqualand, SAKATA Seed SA), Resource Person, JICA Team ◆ Mr. Morioka, JICA Team
10:10-10:30	Coffee Breaks	
10:30-11:10	Livestock ◆ Large Stock ◆ Small Stock	◆ Dr. Fonnie Bruwer (AGRA), Resource Person, JICA Team ◆ Dr. Oria, JICA Team
11:10-11:50	Farm Management	◆ Mr. Michael Degé (AGRA), Resource Person, JICA Team ◆ Ms. Bernadette Erago, JiCA Team
11:50-13:00	Training Coaching	◆ Mr. Michael Degé (AGRA), Resource Person, JICA Team ◆ Ms. Bernadette Erago, JiCA Team
13:00-14:00	Lunch	
14:00-15:00	Assessment, Baseline Survey, Scheduling	◆ Mr. Michael Degé (AGRA), Resource Person, JICA Team ◆ Mr. N. Morioka, JICA Team
15:00-15:15	Closing	◆ Mr. Martin Embundile / Chairperson Acting Deputy Director, NCD

Introduction

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Japan International Cooperation Agency (JICA)

Ministry of Agriculture, Water and Forestry (MAWF), Namibia

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Northern Crop and Livestock Development Master Plan Study

Training of Agricultural Technicians

November 2015

Contents

- JICA Team Members
- Outline of the Study (SHEP Approach)
- Technical Measures & Pilot Projects
- Pilot Site Activities & Locations
  (Process taken and to be Taken)
  (Training of ATs)
  (Training of Farmers Group)
  (Baseline Survey)

JICA Team Member (1)

Position / Designation	Name
Experts	
Team Leader / Agri. Develop.	Otsuka Shigeya, Mr.
Deputy TL / Crop Sector	Morioka Naoto, Mr.
Livestock Sector	Orita Iwami, Mr.
Farm Management / Training	Joho Yukiko, Ms, Ph.D
Resource Persons	
Training / Facilitation	Michael Degé, Mr. (AGRA)
Crop (Horticulture)	Asie Dreyer (Aqualand, SAKATA Seed SA)
Livestock	Fonnie Bruwer, Mr. Dr. (AGRA)

JICA Team Member (2)

Position / Designation	Name
Staff	
Farm Management / Training	Bernadette Erago, Ms.
Administrative Officer	Johanna Ekando, Ms.
Field Assistant	Daniel M. Imalwa, Mr.
Field Assistant	Aini AMUKOTO, Ms.

Outline of the Study (1)

- Objective:
  to improve current situation of crop and livestock production of small-scale farmers in northern Namibia
- Scope :
  to identify technical measures to improve farming,
  to examine and verify technical measures, and
  to compile technical measures into the Master Plan
- Target Area:
  4 regions of Oshikoto, Oshana, Ohangwena & Omusati in NCD
- Study Period:
  3 Phases from August 2015 to July 2017
  Phase 1: Aug. 2014 – May 2015, Phase 2: July 2015 – May 2016,
  Phase 3: May 2016 – July 2017

Outline of the Study (2)

Capacity Development by SHEP Approach

- Namibia-type SHEP approach
  Smallholder Horticulture Empowerment and Promotion Approach

Principle: Encourage…

- farmers to have business mind in agriculture,
- farmers to think it possible to increase profit from agriculture,
- farmers to increase their motivation by series of training, and
- ATs to recognize value of duties to enhance their motivation.

Namibia-type SHEP approach

- Application of SHEP approach to overall study activities, and
- Appropriate target for each type of farmers: (i) market promotion for surplus farmers and (ii) home accounts (income and expenditure) improvement for self-consumption farmers

Technical Measures & Pilot Projects

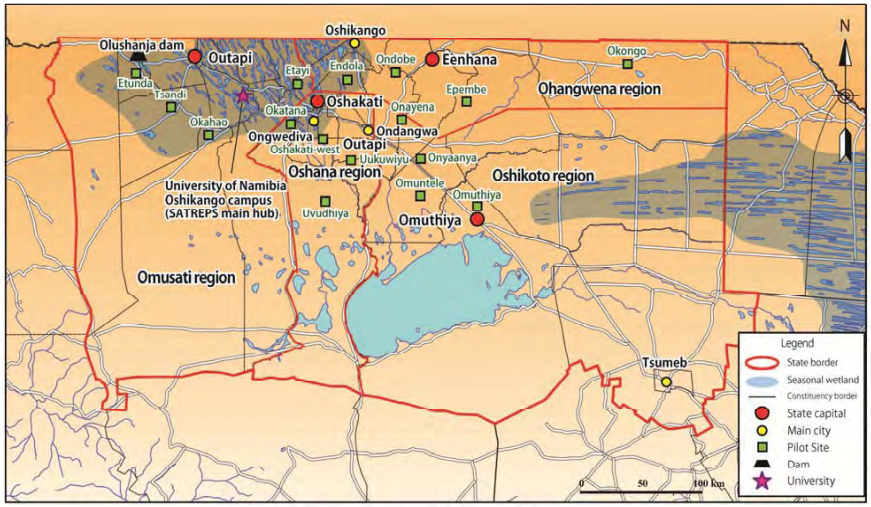
- Phase 1: Sept. 2014 to May 2015
  Total 35 technical measures identified, consists of crop: 9, livestock: 16, farm management: 10
- Phase 2: July 2015 to May 2016
  Examination and verification of technical measures through Pilot Site Activities (Pilot Projects: 16 sites)
- Phase 3: July 2016 to July 2017
  - Expansion of Pilot Site Activities (through MAWF budget)
  - Results and effects to be incorporated in the Master Plan (target year: 2030)

Pilot Site Activities (1)
(Activities by ADC)

Region	Crop Cereal Grains	Horticulture	Cattle	Small Stock
Ohangwena	Ondobe	Epembe	Okongo	Endola
Omusati	Etayi	Etunda	Okahao	Tsandi
Oshana	Oshakati-West	Okatana	Engombe	Uukwiyu-uushana
Oshikoto	Okashana	Onayena	Omuntele	Onyaanya

Pilot Site Activities (2)

Location of Project Sites



Location Map of Pilot Site Activities

Pilot Site Activities (3)

Process taken so far

- Stakeholder Meeting 1:
  Early August 2015, selection of pilot site activities
- Preparatory Training for Farmers' Group:
  Late August to early September 2015, enhancement of farmers motivation
- Stakeholder Meeting 2:
  early September 2015, preparation of action plan by ATs based on the Preparatory Training

Pilot Site Activities (4)

Process to be taken from now

✓ 1st Training of ATs (TOT): 1st week of November 2015
→ 1st Training of Farmers Groups by ATs: 2nd Week of Nov.

✓ 2nd Training of ATs (TOT): 4th week of November 2015
→ 2nd Training for Farmers Groups by ATs: 2nd Week of Dec.

✓ 3rd Training of ATs (TOT): 1st week of February 2016
→ 3rd Training for Farmers Groups by ATs: 2nd Week of Feb.

✓ 4th Training of ATs (TOT): 1st week of April 2016
→ 4th Training for Farmers Groups by ATs: 2nd Week of Apr.

Pilot Site Activities (5)

Trainings of ATs (1st to 4th): Key Points

- One day training at Ongwediva.
- ATs in charge to participate all the sessions of training (regardless of crop & livestock).
- Exercise to train famers included in Training.
- Before training, ATs discuss with farmers to decide the date of farmers training.

Pilot Site Activities (6)
Trainings of Farmers Group (1st to 4th)

- One day trainings to be conducted in demonstration farms by AT with support of JICA Team.
- Other ATs may be requested to participate for training.

	Crop Team	Livestock Team
Member	Morioka, Aini, (Bernadette, Michael)	Orita, Daniel, (Bernadette, Michael)
Morning Session	Cereal Grain	Cattle
Afternoon Session	Horticulture	Small Stock

Refer to Attachment 1 for the 1st Training of Farmers Group for Omusati on Nov. 6.

Pilot Site Activities (7)
1st Trainings of ATs: Key Points

- General Introduction of Training
- Technical Manuals
- Setting-up of Demonstration farm by the 1st Training of Farmers Group (location, area, activities, etc.)
- Estimation of Input Requirement
- Baseline Survey

Pilot Site Activities (8)
Baseline Survey

Baseline Information of Farmers Group Member

- General Information of Farmers
  - Address, family members, land tenancy
- Crop Production (grains, horticulture)
  - Cultivated land, cropped area & production by crop,
- Livestock Production (cattle, small stock, others)
  - Number of livestock, sold animal,.
- Living Condition & Assets
  - Water, sanitation, etc.

Training Schedule (1)

- 1st Training of ATs & Farmers

Region	Training of AT	Training of Farmers
Ohangwena	Nov. 4 (Wed)	Nov. 10 (Tue)
Omusati	Nov. 3 (Tue)	Nov. 6 (Fri)
Oshana	Nov. 17 (Tue)	Nov. 18 (Wed)
Oshikoto	Nov. 4 (Wed)	Nov. 9 (Mon)

Training Schedule (2)

- 2nd Training of ATs & Farmers

Region	Training of AT	Training of Farmers
Ohangwena	Nov. 25 (Wed)	Dec. 10 (Thu)
Omusati	Nov. 24 (Tue)	Nov. 26 (Thu)
Oshana	Nov. 24 (Tue)	Dec. 8 (Tue)
Oshikoto	Nov. 25 (Wed)	Dec. 9 (Wed)

Pilot Site Activities (7)
Baseline Survey

Baseline Information of Farmers Group Member (Attachment 2)

- General Information of Farmers
  - Address, family members, land tenancy
- Crop Production (grains, horticulture)
  - Cultivated land, cropped area & production by crop,
- Livestock Production (cattle, small stock, others)
  - Number of livestock, sold animal,.
- Living Condition & Assets
  - Water, sanitation, etc.

Training Schedule (3)

- 3rd Training of ATs & Farmers

Region	Training of AT	Training of Farmers
Ohangwena	Feb. 3 (Wed)	Feb. 11 (Thu)
Omusati	Feb. 2 (Tue)	Feb. 5 (Fri)
Oshana	Feb. 2 (Tue)	Feb. 9 (Tue)
Oshikoto	Feb. 3 (Wed)	Feb. 10 (Wed)

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Northern **C**rop and **Li**vestock Development **M**aster **P**lan Study

Thank you!

Attachment 1

Itinerary of Training of Farmers Group

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Nov. 6 (Fri) at Omusati

	Crop Team	Livestock Team
	N. Morioka, Aini, Assie Dreyer, (Bernadette, Michael Dege)	I. Orita, Daniel, (Bernadette, Michael Dege)
(transport)	08:00 start from Ongwediva 09:00 arrival at Etayi ADC 09:30 arrival at Demo-farm	07:30 start from Ongwediva 08:30 arrival at Okahao ADC 09:50 arrival at Demo-farm
Morning	Etayi (cereal grain) AT: Ms. Miriyam Fikunawa 09:30 - 11:30 Training of Farmers	Okahao (cattle) AT: Ms. Rachel Anghuwa 09:50 - 11:50 Training of Farmers
(transport)	11:30 start from Etayi (lunch) 13:30 arrival at Etunda	11:50 start from Demo-farm 12:10 Okahao ADC (lunch) 13:20 arrival at Tsandi ADC 13:30 arrival at Demo-farm
Afternoon	Etunda (horticulture) AT: Ms. Lucia Naunyango 13:30 - 15:30 Training of Farmers	Tsandi (small stock) AT: Ms. Monika Moses 14:00 - 16:00 Training of Farmers
(transport)	15:30 start from Etunda 17:30 arrival at Ongwediva	16:00 start from Tsandi 17:30 arrival at Ongwediva

Nov. 9 (Mon) at Oshikoto

	Crop Team	Livestock Team
	N. Morioka, Aini, (Bernadette, Michael Dege)	I. Orita, Daniel, (Bernadette, Michael Dege)
(transport)	07:30 start from Ongwediva 09:30 arrival at Okashana ADC 10:00 arrival at Demo farm	08:00 start from Ongwediva 09:30 arrival at Omuntele ADC 10:00 arrival at Demo farm
Morning	Okashana (cereal grain) AT: Mr. Wilhelm Kashimba 10:00 – 12:00 Training of Farmers	Omuntele (cattle) AT: Mr. George Haufiku 10:00 – 12:00 Training of Farmers
(transport)	12:00 Start from Demo Farm (lunch) 14:00 Arrival at Onayena ADC 14:30 Arrival of Demo farm	12:00 Start from Demo farm (lunch) 14:00 Arrival at Onyaanya ADC 14:15 Arrival at Demo farm
Afternoon	Onayena (horticulture) AT: Ms. Ester Namhinga At: Mr. Hosea Salmon 14:30 – 16:30 Farmers Trainng	Onyaanya (small stock) AT: Ms. Hambeleni Shileka 14:15 – 16:15 Farmers Training
	16:30 start from Demo farm at Onayena 17:30 arrival at Ongwediva	16:15 start from Tsandi 17:30 arrival at Ongwediva

Nov. 10 (Tue) at Ohangwena

	Crop Team	Livestock Team
	N. Morioka, Aini, (Bernadette, Michael Dege)	I. Orita, Daniel, (Bernadette, Michael Dege)
(transport)	07:30 Start from Ongwediva 09:00 Arrival at Ondobe ADC 09:20 Arrival at Demo Farm	07:30 Start from Ongwediva 09:45 Arrival at Okongo ADC 09:55 Arrival at Demo Farm
Morning	Ondobe (cereal grain) AT: Mr. Henrry Shilumba 09:30 – 11:30 Training of Farmers	Okongo (cattle) AT: Mr. Paulus Mbaile 10:00 – 12:00 Training of Farmers
(transport)	11:30 Start from Demo Farm at Ondobe (lunch) 14:00 Arrival at Enhaana / Epembe ADC 14:30 Arrival of Demo Farm	12:00 Start from Demo Farm at Okongo (lunch) 14:15 Arrival at Endora ADC 14:30 Arrival at Demo Farm
Afternoon	Epembe (horticulture) AT: Mr. Bruce Kasaonda 14:30 – 16:30 Farmers Trainng	Endola (small stock) AT: Ms. Nicklaus Enjala 14:30 – 16:30 Farmers Training
	16:30 Start from Demo Farm at Epembe 18:00 Arrival at Ongwediva	16:30 Start from Demo Farm at Enfdola 17:30 Arrival at Ongwediva

Nov. 18 (Wed) at Oshana

	Crop Team	Livestock Team
	N. Morioka, Aini, (Bernadette, Michael Dege)	I. Orita, Daniel, (Bernadette, Michael Dege)
(transport)	08:00 Start from Ongwediva 09:00 Arrival at Oshakati-west ADC 09:15 Arrival at Demo Farm at Okau-Kamashese	08:00 Start from Ongwediva 09:30 Arrival at Engombe ADC 10:00 Arrival at Demo Farm at Uuvudhiya
Morning	Okau-Kanasheshe (cereal grain) AT: Mr. Amon Agasty 09:30 – 11:30 Training of Farmers	Uuvdhiya (cattle) AT: Mr. Taimi Nambabi 10:00 – 12:00 Training of Farmers
(transport)	11:15 Start from Demo Farm at Okau-Kamasheshe (lunch) 13:30 Arrival at Okatana ADC 13:45 Arrival of Demo Farm at Uukwangula	12:00 Start from Demo Farm at Uuvudhiya (lunch) 14:30 Arrival at Uukwiyu-Uushana ADC 14:40 Arrival at Demo Farm at Uukwiyu-Uushana
Afternoon	Okatana (horticulture) AT: Mr. Ndilimeke Tuyeni Hango 14:00 – 16:00 Farmers Training	Endola (small stock) AT: Ms. Kaarina Nghili 14:40 – 16:40 Farmers Training
	16:30 Start from Demo Farm at Okatana 17:30 Arrival at Ongwediva	16:40 Start from Demo Farm at Uukwiyu-Uushana 17:30 Arrival at Ongwediva

Japan International Cooperation Agency (JICA)

Ministry of Agriculture, Water and Forestry (MAWF), Namibia

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Northern Crop and Livestock Development Master Plan Study

1st Training of Agricultural Technicians Crop Sector

November 2015

Distributed Materials

- List of Technical Measures for each Pilot Site
- Work Plan for
  1 Crop Production Training
  2 Livestock Production Training
  3 Farm Management Training
- Training Details

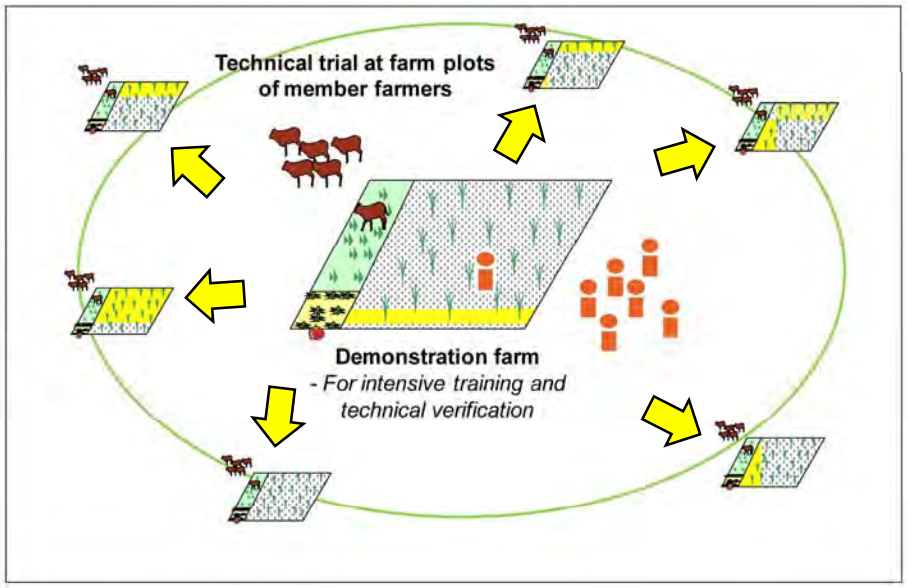
"for each region"

- List of Farmers / Demonstration Farm
- Action Plan for Pilot Site Activities
- AT's Action Plan for Pilot Site Activities

Technical Measures

- Okau-Kamasheshe ADC (Oshakati-West):Creal Grains
  - CR-2: Cropping patter and crop management
  - CR-3: Conservation agriculture
  - FM-2 (book keeping), FM-3 (post harvest), FM-6 (group a/c),
- Uukwangula ADC (Okatana Constituency): Horticulture
  - CR-5: Water source / water harvesting
  - CR-6: Water saving cultivation
  - CR-7: Water saving cultivation
  - CR-8: Cropping plan and horticulture crop management
  - FM-2 (book keeping), FM-3 (post harvest), FM-8 (collective selling / purchasing), FM-9 (rural finance accessibility)

Image of Demonstration Farm

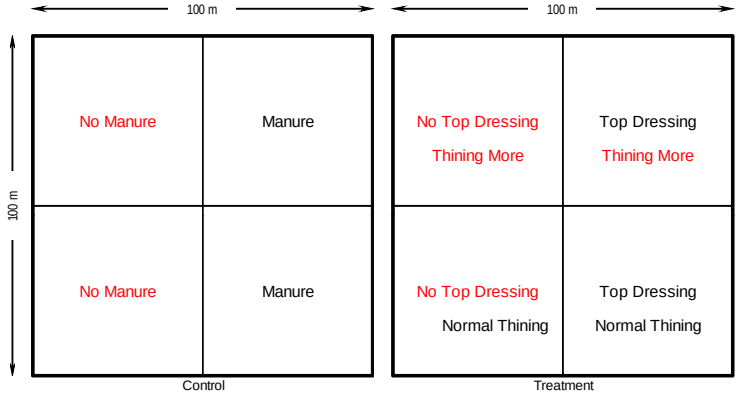


Setup of Demonstration Farm
Okau-Kamasheshe ADC: Cereal Grains

- Demo Plots
  - Treatment Plot (1 ha) under improved practice
  - Control Plot (1 ha) under usual practice
- Necessary Input
  - Land preparation (ripper furrowing / normal land preparation)
  - Mahang seeds, fertilizer, agro-chemicals
  - Markers, poles, rope, ….., (rain gauge), record notes
  - Fencing, …

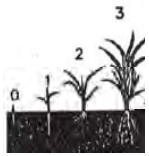
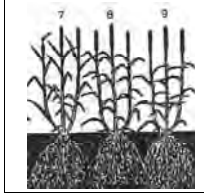
Setup of Demonstration Farm
Okau-Kamasheshe ADC: Cereal Grains

Plot Layout for Cereal Grains

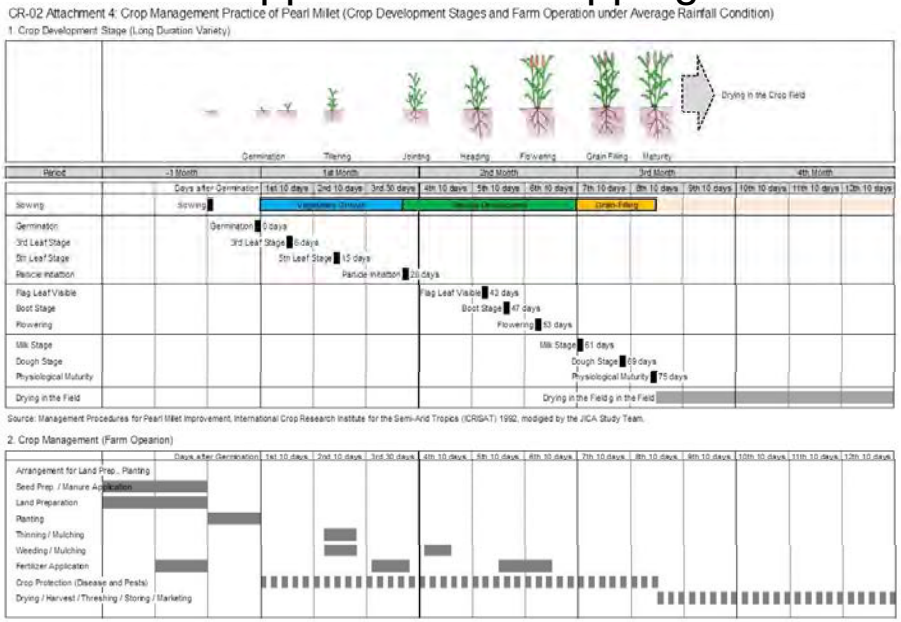


Basal Fertilizer	"by Farmers method" Manure: _____ kg	Manure: _____ kg
Land Prepartion	"by Farmers method"	Ripper Furrowing
Seed	No treatment	Seed Selection, Pre-Germination
Seeding / Planting	"by Farmers method": _____ kg	Less Seeding
Weeding	"by Farmers method"	"by Farmers method"
Thining	"by Farmers method" Plant Density: _____ plants / sq. m	Low Density Plant Density: _____ plants / sq. m

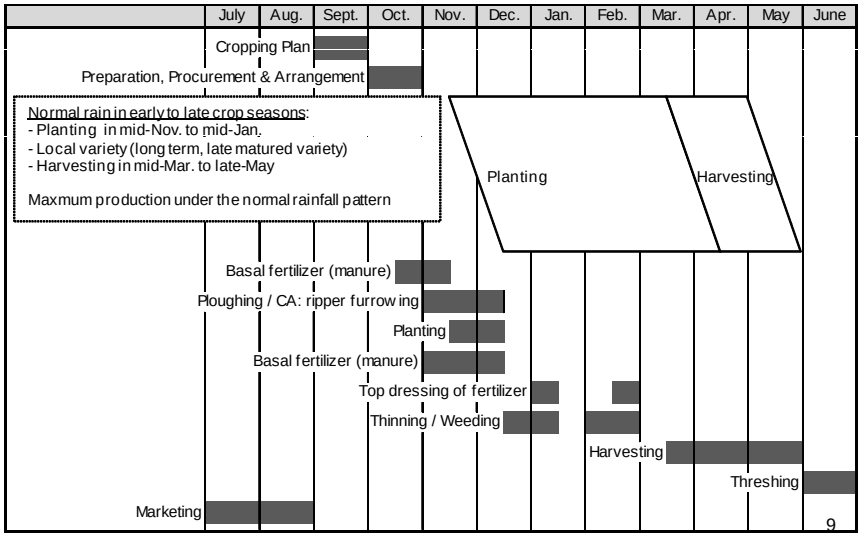
Crop Development Stage

	Growth Phase 1: Vegetative Growth Stage Seedling establishment with root, leaf, and tiller development takes place during this phase. Panicle initiation also begins. Dry-matter accumulation is primarily in the roots and leaves. Inter-node elongation is limited. In late varieties, the floral initiation is considerably delayed. Size of the apex may range from 0.5 mm in early varieties to 1.0 mm in late varieties.
	Growth Phase 2: Panicle Development Stage Expansion of all the leaves, emergence of all the tillers, floral initiation in the tillers, and stem elongation through elongation of inter-nodes takes place during this phase. Dry-matter accumulation is in roots, leaves, stem, and panicle. Elongation of panicle and formation of floral parts are found. This stage comes to an end with the emergence of stigmas on the panicle (flowering).
	Growth Phase 3: Grain Filling Stage This phase begins with fertilization of florets and continues up to maturity of the plant. Dry-matter accumulation is mainly in the grain formation and partly in the enlargement of stem and leaves of the tillers. Tillers arising from upper nodes (nodal tillers) are late and produce small panicles which usually sterile. End of this phase, physiological maturity, is indicated by development of a small dark layer at the bottom of grain.

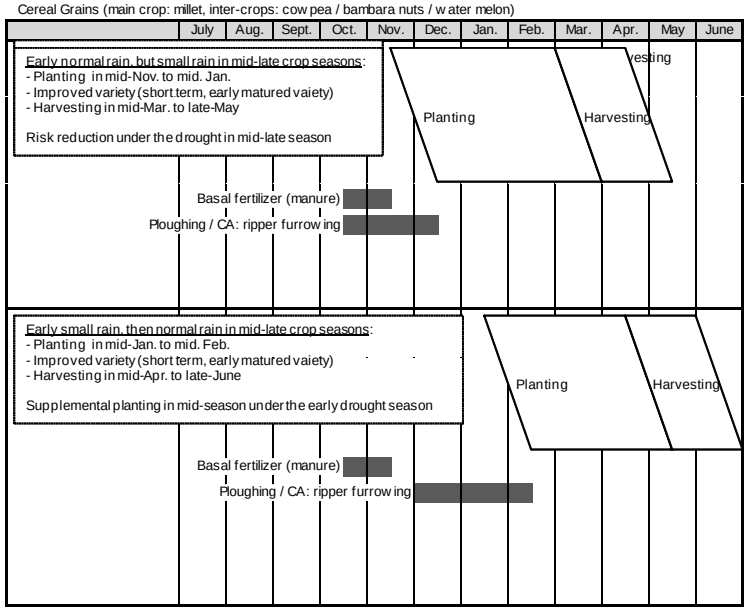
Fertilizer Application & Cropping Pattern



Typical Cropping Pattern



Modification of Cropping Patter



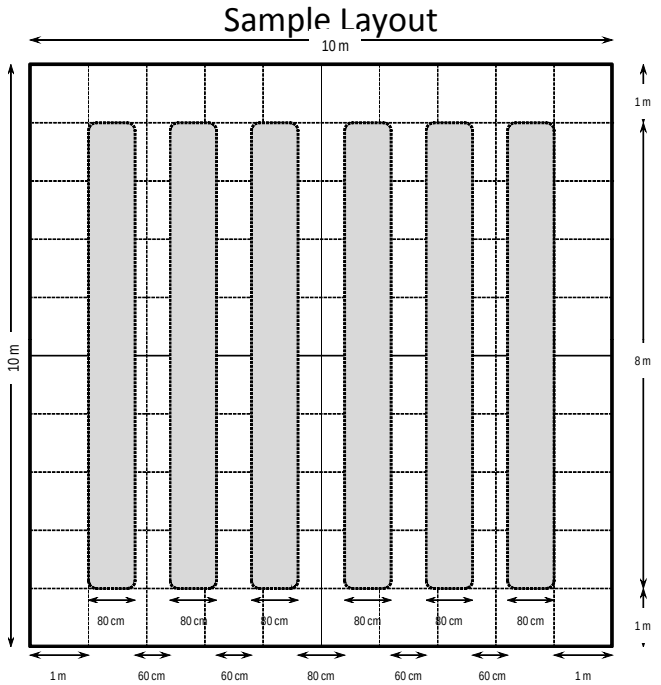
Cereal / Grains: Rainfall per Plant

- Plant density: 100,000 plants / ha (row: 75 cm, 7.5 plants per m)
  = <u>100 plants / m^2</u>
- Rainfall: about 400 mm from Dec. to Mar.
  = <u>400 lit. / m^2 for 4 months</u>
- 400 lit. per 100 plants for 4 months
  = <u>4 lit. per plants for 4 months</u>
- ⇒ 10 plants / m2 ⇒ 40 lit. per plants
  ⇒ 5 plants / m2 ⇒ 80 lit. per plants
- Thinning to reduce plant density according to the rainfall situation

Setup of Demonstration Farm

Okatana: Horticulture

- Irrigation Equipments
  Low pressure drip irrigation system
  - Demo Plots: 150 m^2
  - Key Farmers: 30 m^2
- Necessary Inputs
  - Seed, fertilizer, agro-chemical, mulching materials, Shade
  - Markers, pole, rope, fencing, lifting etc., …..



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Northern **C**rop and **Li**vestock Development **M**aster **P**lan Study

Thank you!

Training Material 2

2nd AT Training, November 2015

Phase 2

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Republic of Namibia
Ministry of Agriculture, Water and Forestry

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NORTHERN CROP AND LIVESTOCK DEVELOPMENT MASTER PLAN STUDY IN THE REPUBLIC OF NAMIBIA

Pilot Project Activities

2nd Training for Agricultural Technicians

November-December 2015

JAPAN INTERNANATIONAL COOPERATION AGENCY (JICA)

NIPPON KOEI CO., LTD.

N-CLIMP

Northern Crop and Livestock Production Master Plan Study in the Republic of Namibia

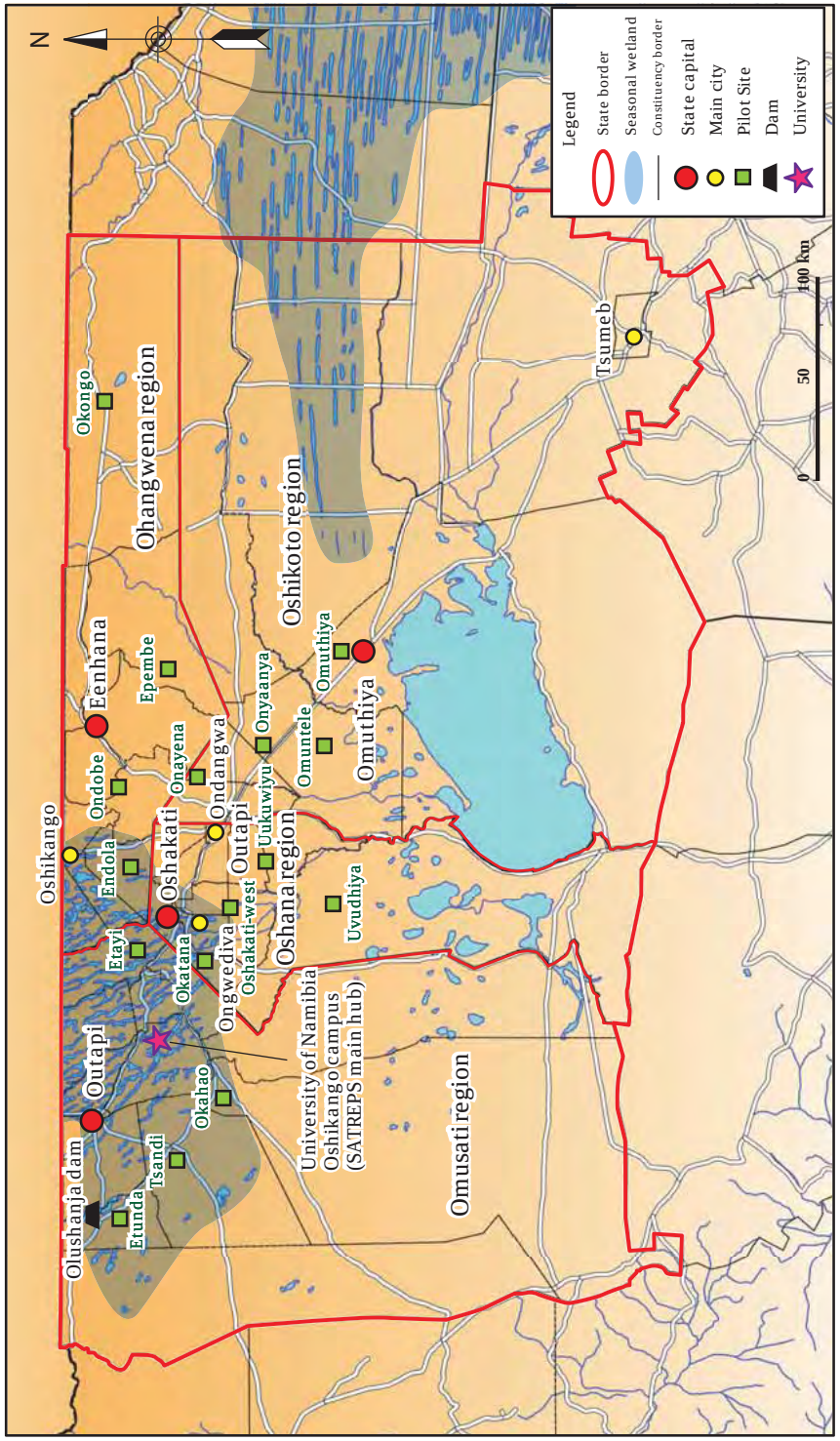
The 2nd Training for Agricultural Technicians
Implementation of Pilot Projects

November 23rd, 24th and December 8th 2015

at the Meeting Room of AMTA Fresh Produce Business Hubs, Ongwediva

Draft Agenda

Time	Subject	Presenter
08:45-09:00	Registration	-
09:00-09:10	Opening Remarks	◆ Chairperson
09:10-9:50	Review and Lesson Learnt in the 1st Training ◆ Schedule, points to be discussed	◆ Mr. Morioka, Deputy Team Leader, JICA Team
9:50-10:30	Crop ◆ Cereal Grains ◆ Horticulture	◆ Mr. Morioka, JICA Team ◆ Mr. Asie Dreyer (Aqualand, SAKATA Seed SA), Resource Person, JICA Team
10:30-10:40	Coffee Breaks	
10:40-11:20 11:20-12:00	Livestock ◆ Large Stock ◆ Small Stock (Chicken & Goat)	◆ Mr. Michael Degé (AGRA), Resource Person, JICA Team ◆ Dr. Fonnie Bruwer (AGRA), Resource Person, JICA Team ◆ Dr. Oria, JICA Team
12:00-12:40	Farm Management	◆ Mr. Michael Degé (AGRA) ◆ Ms. Bernadette Erago, JICA Team
12:40-13:00	Training Coaching	◆ Mr. Michael Degé (AGRA), Resource Person, JICA Team ◆ Ms. Bernadette Erago, JiCA Team
13:00-14:00	Lunch	
14:00-15:00	Assessment, Baseline Survey, Scheduling	◆ Mr. Michael Degé (AGRA), Resource Person, JICA Team ◆ JICA Team Members & Resource Persons
15:00-15:15	Closing	◆ Chairperson



Location Map of Pilot Site Activities

Japan International Cooperation Agency (JICA)

Ministry of Agriculture, Water and Forestry (MAWF), Namibia

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Northern Crop and Livestock Development Master Plan Study

2nd Training of Agricultural Technicians

November-December 2015

Agenda of the 2nd Training for ATs

Time	Subject	Presenter
08:45 – 09:00	Registration	
09:90 – 09:10	Opening Remarks	Chairperson
09:10 – 09:50	Review of the 1st Training, Lesson Learnt and Schedule	Mr. N. Morioka, JICA Team Mr. Michael Dege, AGRA
09:50 – 10:30	Crop (Cereal Grains, Horticulture)	Mr. Morioka, JICA Team
10:30 – 10:50	Coffee Breaks	
10:50 – 12:00	Livestock (Large & Small Stock)	Mr. Mickael Duge, AGRA Dr. Fonnie Bruwer, AGRA Dr. Orita, JICA Team
12:00 – 12:30	Farm Management	Mr. Michael Duge, AGRA Ms. Bernadette E., JICA Team
12:30 – 12:30	Training Coaching	Mr. Michael Duge, AGRA
13:00 – 14:00	Lunch	
14:00 – 15:00	Baseline Survey, Assessment, Scheduling of 2nd Training of Farmers	Mr. N. Morioka, JICA Team Mr. Michael Dege, AGRA
15:00 – 15:15	Closing	Chairperson

Contents of Introduction

- JICA Team Members, Resource Persons and Staff
- 1st Training for ATs and Farmers Group in each Region ⇒ scheduling for further trainings
- Review of the 1st Training

JICA Team Member

Position / Designation	Name
Experts	
Team Leader	Otsuka Shigeya, Mr.
Deputy Team Leader / Crop	Morioka Naoto, Mr.
Livestock	Orita Iwami, Mr. Dr.
Farm Management / Training	Joho Yukiko, Ms. Dr.
Resource Persons	
Training / Facilitation	Michael Dege, Mr.
Livestock	Finnie Bruwer Mr. Dr.
Staff	
Farm Management / Training	Bernadette Erago, Ms.
Administrative Officer	Johanna Ekandjo Ms.
Field Assistant (Livestock)	Daniel M. Imalwa Mr.
Field Assistant (Crop)	Aini Amukoto, Ms.

1st Training for ATs & Farmers Group

Region (AT Training)	Crop Cereal Grains (Farmers Training)	Horticulture (Farmers Training)	Cattle (Farmers Training)	Small Stock (Farmers Training)
Ohangwena Nov. 4 (Wed)	Ondobe Nov. 10 (Tue)	Epembe Nov. 10 (Tue)	Okongo Nov. 10 (Tue)	Endola Nov. 16 (Mon)
Omusati Nov. 3 (Tue)	Etayi (rice-mahangu) Nov. 19 (Thu)	Etunda Nov. 6 (Fri)	Okahao Nov. 6 (Fri)	Tsandi Nov. 19 (Thu)
Oshana Nov. 4 (Wed)	Oshakati-West Nov. 18 (Wed)	Okatana Nov. 18 (Wed)	Engombe (Uuvidiya) Nov. 18 (Wed)	Uukwiyu-uushana Nov. 19 (Fri)
Oshikoto Nov. 17 (Tue)	Okashana (Omuthiya) Nov. 12 (Thu)	Onayena Nov. 12 (Thu)	Omuntele Nov. 12 (Thu)	Onyaanya Nov. 12 (Thu)

1st Training for ATs & Farmers Group

Sun	Mon	Tue	Wed	Thu	Fri	Sat
Nov. 01	Nov. 02	Nov. 03 ATs 1st Training Omusati	Nov. 04 ATs 1st Training Ohangwena Oshikoto	Nov. 05 Presentation. N-CLIMP in Oshana DAPEES	Nov. 6 Farmers 1st Training Omusati: 3. Okahao, 2. Etunda (rain in early morning & rain in late evening)	Nov. 07
	Oshana: Planning Workshop					
Nov. 08	Nov. 09	Nov. 10 Farmers 1st Training Ohangwena 1. Ondobe, 2. Epembe. 3. Okongo	Nov. 11 Etunda Scheme	Nov. 12 Farmers 1st Training Oshikoto (4 sites) 1. Okashana, 2. Onayena, 3. Omuntele, 4. Onyaanya	Nov. 13	Nov. 14
	Omusati: Planning Workshop, Oshana: Manure Training at Okashana					
Nov. 15	Nov. 16 Farmers 1st Training Ohangwena 4. Endola OROI: Chicken Site	Nov. 17 ATs 1st Training Oshana	Nov. 18 Farmers 1st Training 1. Oshakati West, 2. Okatana, 3. Uuvudiya,	Nov. 19 Farmers 1st Training Omusati 1. Etayi, 4. Tsandi Oshana 4. Uukwiyu-UUshona	Nov. 20 Etunda Scheme	Nov. 21
	Johanna: leave					
Nov. 22 Meeting SATREPS at Ogongo	Nov. 23 ATs 2nd Training Omusati + Okongo SATREPS Workshop at Onamundindi	Nov. 24 ATs 2nd Training Ohangwena Oshikoto NCA LMC Meeting (AMTA Boarding Room)	Nov. 25 Farmers 2nd Training Oshikoto 1. Okashana, 2. Onayena, 3. Omuntele 4. Onayaanya	Nov. 26 Farmers 2nd Training Omusati 2. Etunda (Morning), 3 Okahao, 4. Tsandi	Nov. 27 (Election Day)	Nov. 28

2nd Training for ATs & Farmers Group

Sun	Mon	Tue	Wed	Thu	Fri	Sat
Nov. 22 Meeting SATREPS at Ogongo	Nov. 23 ATs 2nd Training Omusati + Okongo SATREPS Workshop at Onamundindi	Nov. 24 ATs 2nd Training Ohangwena Oshikoto NCA LMC Meeting (AMTA Boarding Room)	Nov. 25 Farmers 2nd Training Oshikoto 1. Okashana, 2. Onayena, 3. Omuntele 4. Onayaanya	Nov. 26 Farmers 2nd Training Omusati 2. Etunda (Morning), 3 Okahao, 4. Tsandi	Nov. 27 (Election Day	Nov. 28
Nov. 29	Nov. 30 Farmers 2nd Training Omusati 1. Etayi (Morning)	Dec. 01	Dec. 02	Dec. 03	Dec. 04 JICA Mr. KATO Site Visits	Dec. 05
	Installation of AGRA Drip Irrigation Kit at Okatana, Onayena, Epembe					
		Monitoring		Monitorings		
Dec. 6	Dec. 07 Farmers 2nd Training Ohangwena 1. Ondobe, 2. Epembe, 3. Okongo, 4. Endola IO: – HKG – NRT	Dec. 08 ATs 2nd Training Oshana	Dec. 09 Farmers 2nd Training Oshana 1. Oshakati-West, 2. Okatana, 3. Uuvudiya, 4. Uukwiyu Uushona	Dec. 10 National Holiday (Human Rights Day)	Dec. 11 Monitoring	Dec. 12
Dec. 13	Dec. 14	Dec. 15 Monitoring	Dec. 16	Dec. 17 Monitoring	Dec. 18	Dec. 19
Dec. 20	Dec. 21	Dec, 22 (Monitoring)	Dec. 23	Dec. 24 (Monitoring)	Dec. 25 National Holiday (Christmass Day)	Dec. 26 National Holiday (Family Day)

3rd Training of ATs & Farmers

Sun	Mon	Tue	Wed	Thu	Fri	Sat
Jan. 31	Feb. 01	Feb. 02 ATs 2nd Training Omusati, Oshana	Feb. 03 ATs 2nd Training Ohangewna, Oshikoto	Feb. 04	Feb. 05 Farmers 2nd Training Omusati 1. Etayi, 2. Etunda, 3. Okahao, 4. Tsandi	Feb. 06
Feb. 07	Feb. 08	Feb. 09 Farmers 2nd Training Oshana 1. Oku-kamasheshe, 2. Okatana, 3. Uuvidiya, 4. Uukwiyu-Uushona	Feb. 10 Farmers 2nd Training Oshikoto 1. Okashana, 2. Onayena, 3. Omuntele, 4. Onayaanya	Feb. 11 Farmers 2nd Training Ohangwena 1. Ondobe, 2. Epembe, 3. Okongo, 4. Endola	Feb. 12	Feb. 13
Feb. 14	Feb. 15	Feb. 16 Monitoring	Feb. 17	Feb. 18 Monitoring	Feb. 19	Feb. 20
Feb. 21	Feb. 22	Feb. 23 (Monitoring)	Feb. 24	Feb. 25 (Monitoring)	Feb. 26	Feb. 27
Feb. 28	Feb. 29	Mar. 01 (Monitoring)	Mar. 02	Mar. 03 (Monitoring)	Mar. 04	Mar. 05

2nd Training of ATs & Farmers

Region	Training of AT	Training of Farmers
Ohangwena	Nov. 24 (Tue)	Dec. 07 (Mon): Ondobe, Epembe, Okongo, Endola:
Omusati	Nov. 23 (Mon)	Nov. 26 (Fri): Okahao, Etunda, Tsandi Dec. 30 (Mon): Etayi
Oshana	Dec. 08 (Tue)	Nov. 09 (Wed): Oshakati-west, Okatana, Uuvudiya, Uukwiyu-Uushona
Oshikoto	Nov. 4 (Wed)	Nov. 25 (Wed): Okashana, Onayena, Omuntele, Onyaanya

3rd Training of ATs & Farmers

Region	Training of AT	Training of Farmers
Ohangwena	Feb. 3 (Wed)	Feb. 11 (Thu)
Omusati	Feb. 2 (Tue)	Feb. 5 (Fri)
Oshana	Feb. 2 (Tue)	Feb. 9 (Tue)
Oshikoto	Feb. 3 (Wed)	Feb. 10 (Wed)

4th Training of ATs & Farmers

Sun	Mon	Tue	Wed	Thu	Fri	Sat
Mar. 20	Mar. 21 National Holiday (Independence Day)	Mar. 22 Monitoring	Mar. 23	Mar. 24 Monitoring	Mar. 25 National Holiday (Christmass Day)	Mar. 26
Mar. 27	Mar. 28 National Holiday (Christmass Day)	Mar. 29 Monitoring	Mar. 30 Apr. 06 ATs 2nd Training Omusati, Oshana	Mar. 31 ATs 2nd Training Ohangewna, Oshikoto	Apr. 01 Monitoring	Apr. 02
Apr. 03	Apr. 04 Farmers 2nd Training Omusati 1. Etayi, 2. Etunda, 3. Okahao, 4. Tsandi	Apr. 05	Apr. 06 Farmers 2nd Training Oshana 1. Oku-kamasheshe, 2. Okatana, 3. Uuvidiya, 4. Uukwiyu-Uushona	Apr. 07 Farmers 2nd Training Oshikoto 1. Okashana, 2. Onayena, 3. Omuntele, 4. Onayaanya	Apr. 08 Farmers 2nd Training Ohangwena 1. Ondobe, 2. Epembe, 3. Okongo, 4. Endola	Apr. 09
Apr. 10	Apr. 11	Apr. 12 Monitoring	Apr. 13	Apr. 14 Monitoring	Apr. 15	Apr. 16
Apr. 17	Apr. 18	Apr. 19	Apr. 20	Apr. 21	Apr. 22	Apr. 23

4th Training of ATs & Farmers

Region	Training of AT	Training of Farmers
Ohangwena	Mar. 31 (Thu)	Apr. 08 (Fri)
Omusati	Mar. 30 (Wed)	Apr. 04 (Mon)
Oshana	Mar. 30 (Wed)	Apr. 06 (Wed)
Oshikoto	Mar. 31 (Thu)	Apr. 07 (Thu)

Observations in Training for Farmers Group

- **General:** ATs well done explanation and interaction with farmers.
- **Farmers Group:** Mostly female members are dominant more than males. Some farmers groups have members more than 15 farmers.
- **Expectations from Farmers:**
- **Farm Management like Book Keeping / Record Keeping:** to be put more emphasis
- **Baseline Survey:** Not covered in the 1st training, and to be included in the 2nd training.

Baseline Survey

Baseline Information of Farmers Group Member

- General Information of Farmers
  - Address, family members, land tenancy
- Crop Production (grains, horticulture)
  - Cultivated land, cropped area & production by crop,
- Livestock Production (cattle, small stock, others)
  - Number of livestock, sold animal,.
- Living Condition & Assets
  - Water, sanitation, etc.

Monitoring, Field Days

- Monitoring
  - Mr. Daniel (livestock) & Ms Aini (crop) visit the Demo Farms with AT to observe the plots and to interview farmers.
  - 4 sites (1 region) in 1 day, 2 days in 1 week, 2 times a month in each site.

- Field Days
  - 1st Field Days in December / January
  - 2nd Field Days in January / February
  - 3rd Field Days in February / March
  - 4th Field Days in March / April

Monitoring Schedule

Sun	Mon	Tue	Wed	Thu	Fri	Sat
Nov. 22 Meeting SATREPS at Ogongo	Nov. 23 ATs 2nd Training Omusati + Okongo SATREPS Workshop at Onamundindi	Nov. 24 ATs 2nd Training Ohangwena Oshikoto NCA LMC Meeting (AMTA Boarding Room)	Nov. 25 Farmers 2nd Training Oshikoto 1. Okashana, 2. Onayena, 3. Omuntele 4. Onayaanya	Nov. 26 Farmers 2nd Training Omusati 2. Etunda (Morning), 3 Okahao, 4. Tsandi	Nov. 27 (Election Day)	Nov. 28
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	Installation of AGRA Drip Irrigation Kit at Okatana, Onayena, Epembe					
		Monitoring		Monitorings		
Dec. 6	Dec. 07 Farmers 2nd Training Ohangwena 1. Ondobe, 2. Epembe, 3. Okongo, 4. Endola IO: – HKG – NRT	Dec. 08 ATs 2nd Training Oshana	Dec. 09 Farmers 2nd Training Oshana 1. Oshakati-West, 2. Okatana, 3. Uuvudiya, 4. Uukwiyu Uushona	Dec. 10 National Holiday (Human Rights Day)	Dec. 11 Monitoring	Dec. 12
Dec. 13	Dec. 14	Dec. 15 Monitoring	Dec. 16	Dec. 17 Monitoring	Dec. 18	Dec. 19
Dec. 20	Dec. 21	Dec, 22 (Monitoring)	Dec. 23	Dec. 24 (Monitoring)	Dec. 25 National Holiday (Christmass Day)	Dec. 26 National Holiday (Family Day)

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Thank you!

Japan International Cooperation Agency (JICA)

Ministry of Agriculture, Water and Forestry (MAWF), Namibia

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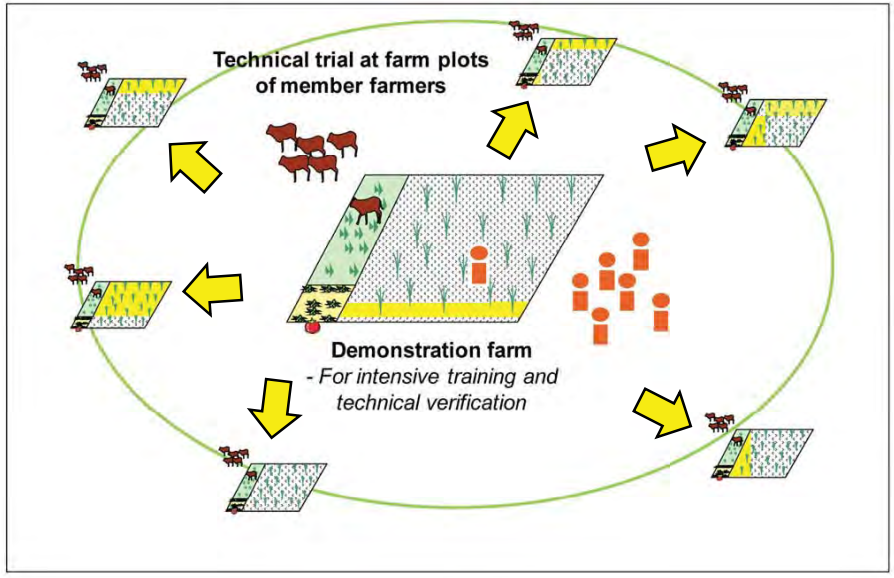
Northern Crop and Livestock Development Master Plan Study

2nd Training of Agricultural Technicians
Crop Sector: Oshana Region

November 2015



Image of Demonstration Farm



Technical Measures: Cereal Grains

Technical Measures	Etayi	Okau-Kamashe she	Okahsha na	Ondobe
CR-1 Fertilizer Application	○			○
CR-2 Cropping Pattern and Crop Management	○	○	○	○
CR-3 Conservation Agriculture		○	○	○
CR-4 Rice-mahangu mixed cropping	○			

Technical Measures: Horticulture

Technical Measures	Etunda	Okatana	Onayena	Epembe
CR-5 Water Source / Water Harvesting	○	○	○	
CR-6 Water Saving Cultivation	○	○	○	○
CR-7 Crop Selection & Marketing	○	○		
CR-8 Cropping Plan and Horiticulture Crop Management	○	○	○	○

Setup of Demonstration Farm
Cereal Grains (1)

Etaye: Rice – Mahangu Mixed Cropping System

- Demo Plots
  - Ondonbe
- Necessary Input
  - Land preparation (ripper furrowing)
  - Rice seedlings, mahangu seeds, fertilizer, agro-chemicals
  - Markers, poles, rope, ….., (rain gauge), record notes
  - Fencing, …

Setup of Demonstration Farm
Cereal Grains (2)

Okau-kamasheshe, Okashna, Ondobe

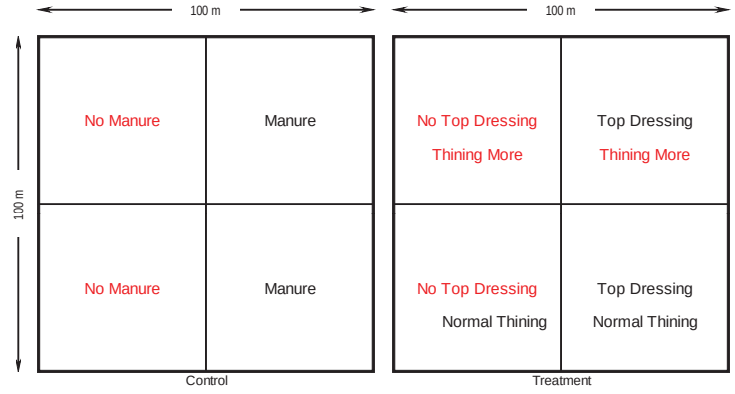
- Demo Plots
  - Treatment Plot (1 ha) under improved practice
  - Control Plot (1 ha) under usual practice
- Necessary Input
  - Land preparation (ripper furrowing / normal land preparation)
  - Mahang seeds, fertilizer, agro-chemicals
  - Markers, poles, rope, ….., (rain gauge), record notes
  - Fencing, …

Cereal / Grains: Rainfall per Plant

- Plant density: 100,000 plants / ha (row: 75 cm, 7.5 plants per m)
  = 100 plants / m^2
- Rainfall: about 400 mm from Dec. to Mar. = 400 lit. / m^2 for 4 months
- 400 lit. per 100 plants for 4 months
  = 4 lit. per plants for 4 months
- ⇒ 10 plants / m2 ⇒ 40 lit. per plants
  ⇒ 5 plants / m2 ⇒ 80 lit. per plants
- Thinning to reduce plant density according to the rainfall situation

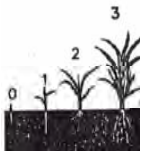
Setup of Demonstration Farm
Okau-Kamasheshe ADC: Cereal Grains

Plot Layout for Cereal Grains



Basal Fertilizer	"by Farmers method" Manure: _____ kg	Manure: _____ kg
Land Prepartion	"by Farmers method"	Ripper Furrowing
Seed	No treatment	Seed Selection, Pre-Germination
Seeding / Planting	"by Farmers method": _____ kg	Less Seeding
Weeding	"by Farmers method"	"by Farmers method"
Thining	"by Farmers method" Plant Density: _____ plants / sq. m	Low Density Plant Density: _____ plants / sq. m

Crop Development Stage



Growth Phase 1: Vegetative Growth Stage

Seedling establishment with root, leaf, and tiller development takes place during this phase. Panicle initiation also begins.

Dry-matter accumulation is primarily in the roots and leaves. Inter-node elongation is limited.

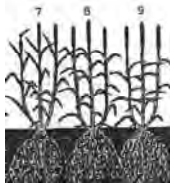
In late varieties, the floral initiation is considerably delayed. Size of the apex may range from 0.5 mm in early varieties to 1.0 mm in late varieties.

Growth Phase 2: Panicle Development Stage

Expansion of all the leaves, emergence of all the tillers, floral initiation in the tillers, and stem elongation through elongation of inter-nodes takes place during this phase.

Dry-matter accumulation is in roots, leaves, stem, and panicle. Elongation of panicle and formation of floral parts are found.

This stage comes to an end with the emergence of stigmas on the panicle (flowering).



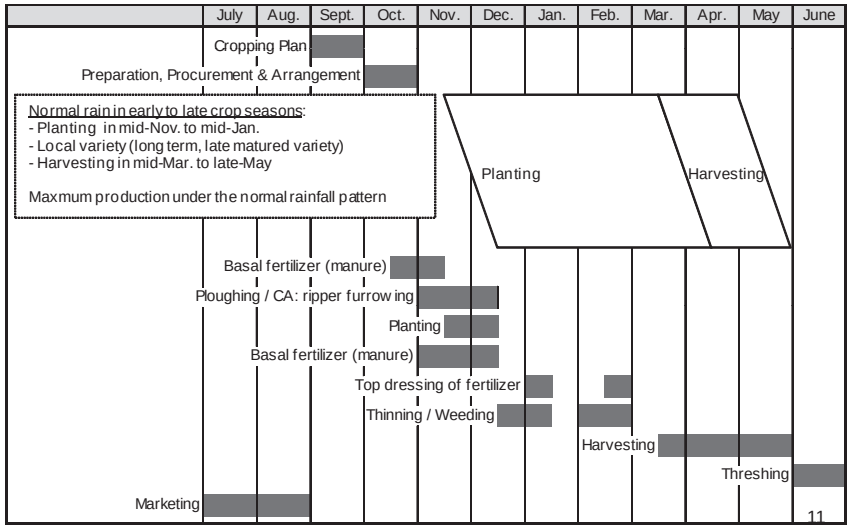
Growth Phase 3: Grain Filling Stage

This phase begins with fertilization of florets and continues up to maturity of the plant.

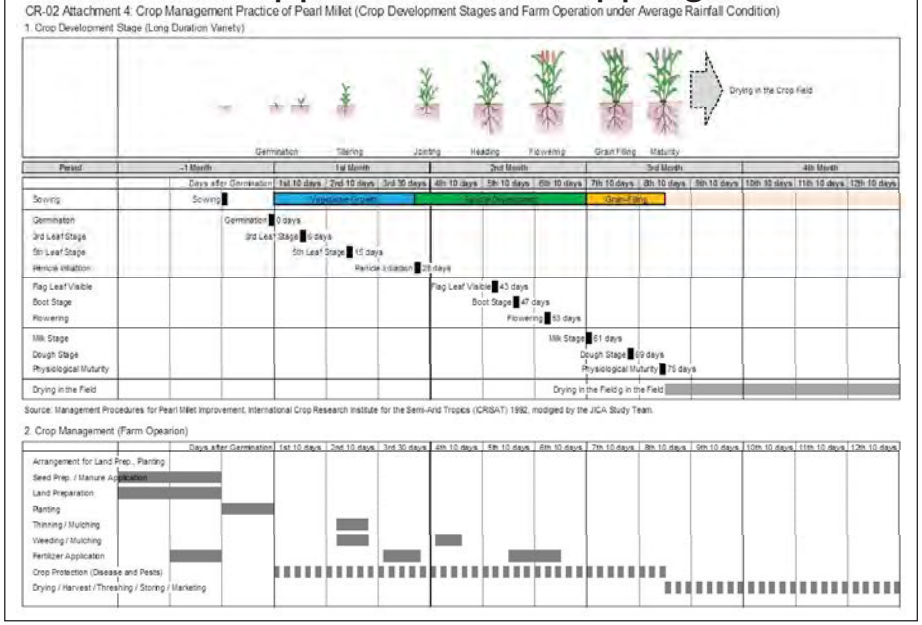
Dry-matter accumulation is mainly in the grain formation and partly in the enlargement of stem and leaves of the tillers. Tillers arising from upper nodes (nodal tillers) are late and produce small panicles which usually sterile.

End of this phase, physiological maturity, is indicated by development of a small dark layer at the bottom of grain.

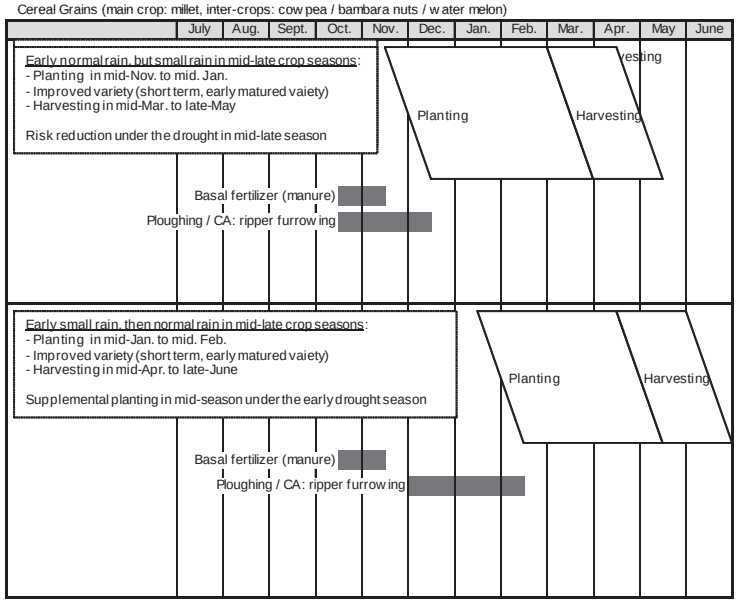
Typical Cropping Pattern

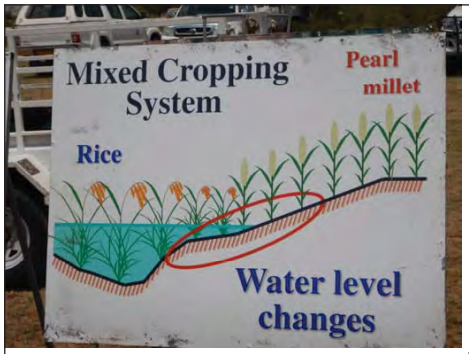


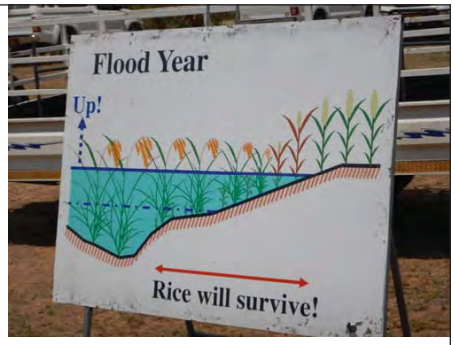
Fertilizer Application & Cropping Pattern



Modification of Cropping Patter





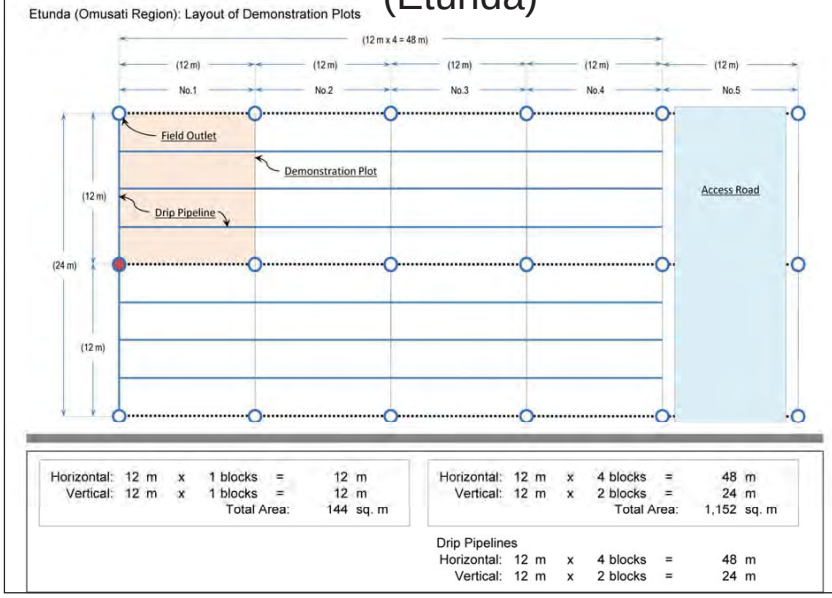


Setup of Demonstration Farm Horticulture (1)

Etunda Irrigation Scheme

- Irrigation Equipments
  24 m x 48 m drip irrigation system
  - Demo Plots: 12 m x 12 m = 144 m^2
- Necessary Inputs
  - Seeds, fertilizer, agro-chemical, mulching materials, Shade, etc.
  - Markers, pole, rope, lifting etc., …..

Typical Layout of Drip Irrigation System (Etunda)

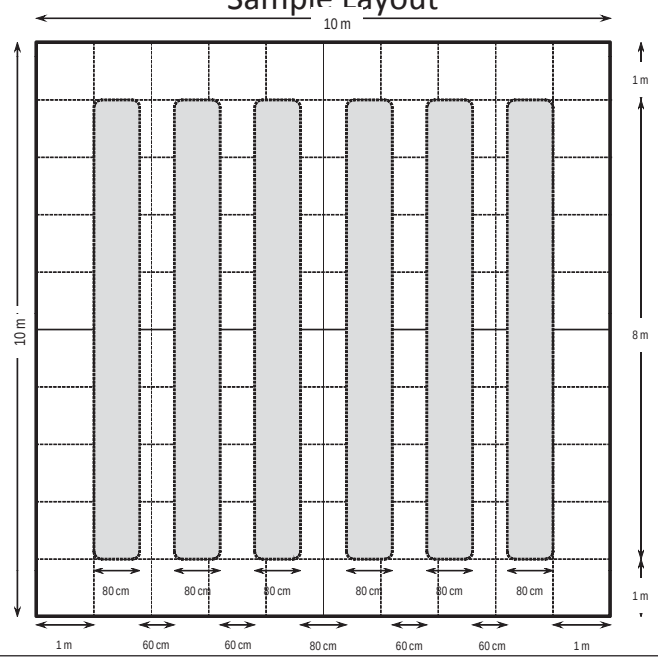


Setup of Demonstration Farm
Horticulture (2)

Okatana, Epembe, Onayena

- Irrigation Equipments
  Low pressure drip irrigation kit
  - Demo Plots: 150 m^2
  - Key Farmers: 30 m^2
- Necessary Inputs
  - Seed, fertilizer, agro-chemical, mulching materials, Shade
  - Markers, pole, rope, fencing, lifting etc., …..

Sample Layout



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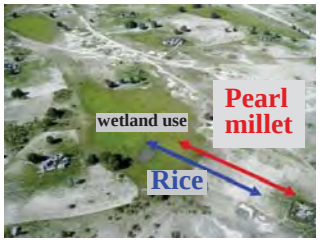
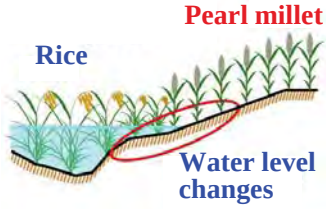
Thank you!

Mixed cropping in wetlands



Use of field wetlands

– Rice may be grown in the lowland towards upland
– Pearl millet or Sorghum may be cultivated on upland towards lowland



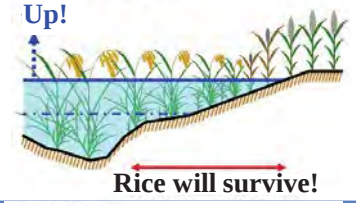
Mixed cropping system

Normal year:

– Rice will grow well in lowland
– Pearl millet will grow well on upland
– Both crops will perform better on the transition region

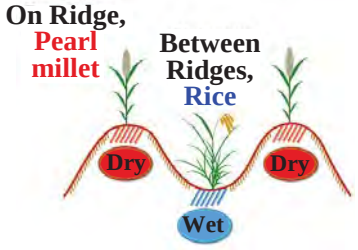
Dry year:

– Wetland water level will be low
– Rice will grow well with little water in lowland
– Pearl millet will be killed by drought on upland
– However, pearl millet may grow well on the transition



Flood year:

– Wetland water level will be high
– Rice will still grow well in lowland
– Pearl millet will also grow well on upland
– However, only rice may grow well on transition, pearl millet will be killed by flood



Tillage system and planting pattern in wetlands

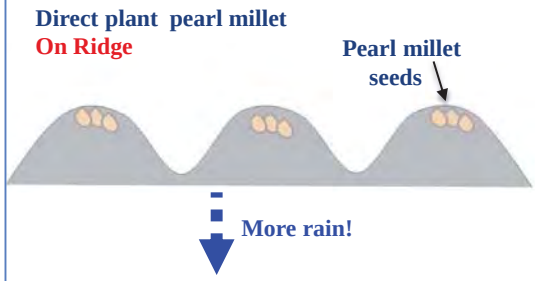
– Two tillage systems: ridge and furrow
– Ridges are normally drier, while furrows are wetter
– Plant pearl millet/sorghum on rides
– Transplant or plant rice in furrows

Please replant if the first or second planting fails.

Mixed cropping in wetlands

A. Ondombe unflooded

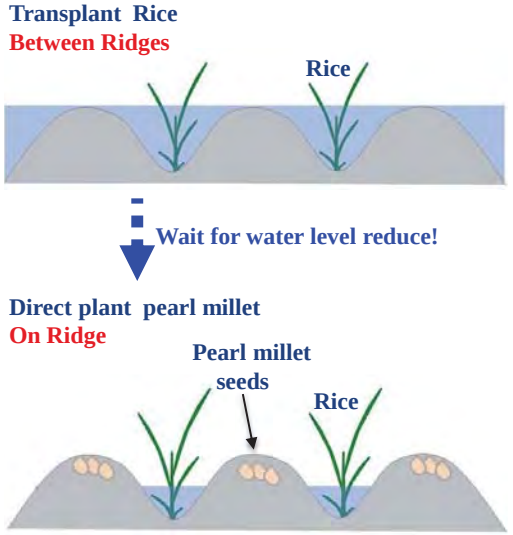
Ploughing and planting after good rainfall



– Make ridges after rain
– Direct plant pearl millet on ridges
– Pearl millet will germinate and grow
– Wait for more rain to transplant rice
– Transplant rice in furrows after receiving more rainfall
– Take care of the crops

B. Ondombe flooded

Ploughing and planting after heavy rainfall



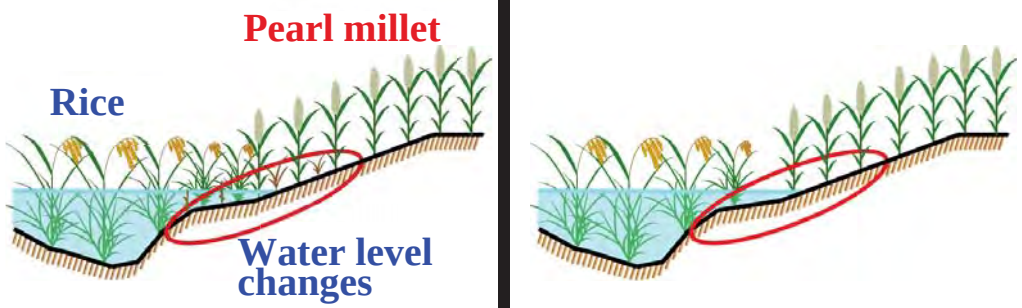
– Make ridges after heavy rain
Transplant rice between ridges
– Direct plant pearl millet on ridges after water level reduces
– Take care of the crops

Please replant if the first or second planting fails.

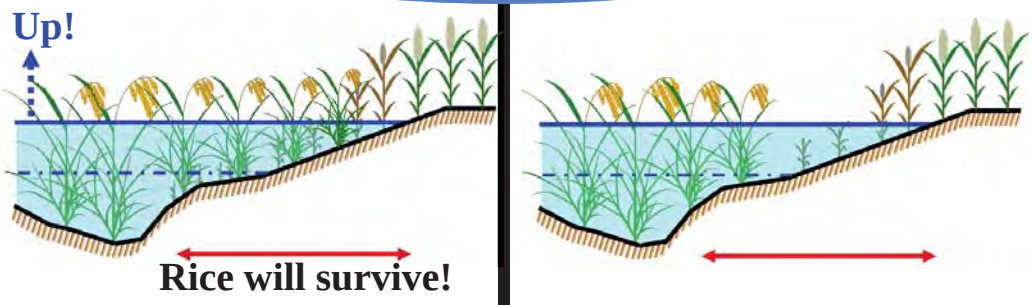
Mixed Cropping

Zone Cropping (Present System)

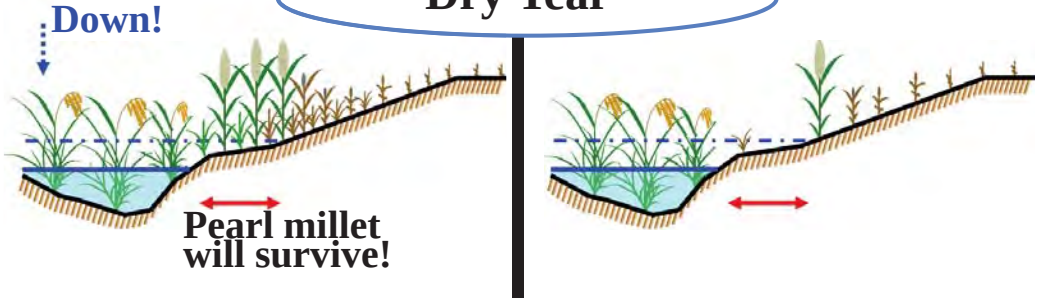
Normal Year



Flood Year



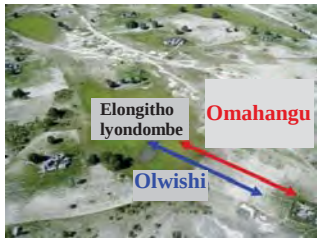
Dry Year



RICE MAHANGU PROJECT

Ekuno lyOhwangalahwahwa mOondombe

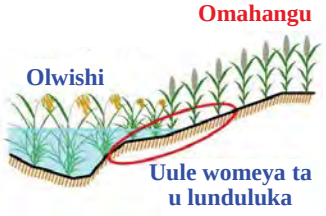
UNAM



Elongitho lyoondombe momapya

– Oto vulu okukuna olwishi mondombe wu uka lwokomutunda

– Oto vulu okukuna omahangu nenge omushokolo komutunda wu uka lwomondombe



Omulandu gwekuno lyohwangalahwahwa

Momuvo gwomuloka omwaanawa:

– Olwishi ota lu ka koka nawa mondombe

– Omahangu ota ga ka koka nawa komutunda

– Iimeno mbino ayihe otayi ka koka hwepo moshitopolwa shoka shi li pokati kondombe nomutunda

Momuvo gwoshikukuta

– Omeya mondombe otaga ka kala omashona

– Nolwishi mondombo otalu ka koka nawa kuumeya mbuka

– Omahangu komutunda otaga kasa koshikukuta

– Nonando ongawo, otashi vulika omahangu ga ka koke nawa pokati kondombe nomutunda

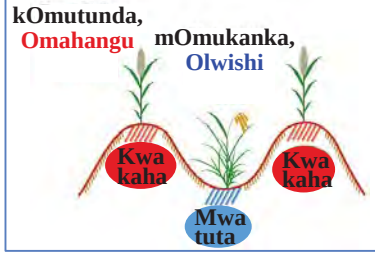
Omuvo gwefundja:

– Omeya mondombe otaga ka kala ogendji

– Nolwishi otalu ka koka nawa mondombo

– Omahangu otaga ka koka wo nawa komutunda

– Ashike, olwishi aluke talu ka koka nawa pokati kondombe nomutunda; omahangu otaga ka sa omeya



Omulandu gwokupulula nokukuna mondombe

– Opu na omilandu 2 dhokupulula: Omitunda, nOmikanka

– Omitunda ohadhi kala dha kaha, omanga omikanka hadhi kala dha tuta

– Kuna omahangu nenge omushokolo komitunda

– Tsika nenge kuna olwishi momikanka

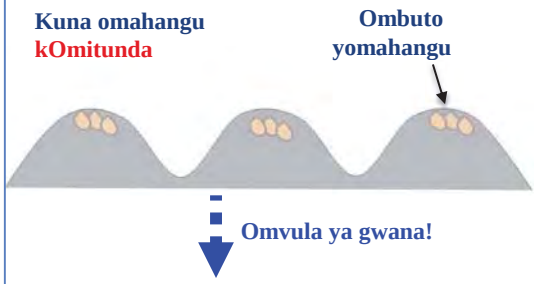
Kununa uuna ekuno lyotango nenge etiyali lya ndopa.

JICA JST

Ekuno lyOhwangalahwahwa mOondombe

A. Ondombe kaayi na omeya

Nkene to pulula nokukuna konima yomvula ondjeleke

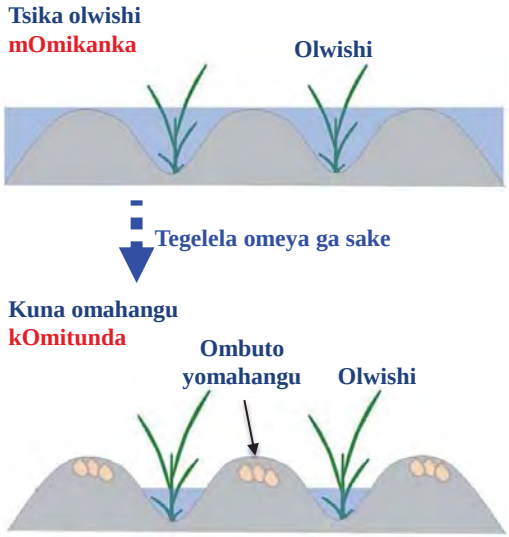


– Ninga omitunda mondombe yoye
– Kuna omahangu komitunda
– Omahangu otaga ka mena nokukoka nawa
– Tegelela u mone omvula ya gwana opo u tsike olwishi

– Tsika olwishi momikanka konima wa mona omvula ya gwana
– Tonatela iimeno yoye

B. Ondombe yu udha omeya

Nkene to pulula nokukuna konima yomvula oyindji



– Ninga omitunda mondombe
– Tsika olwishi momikanka

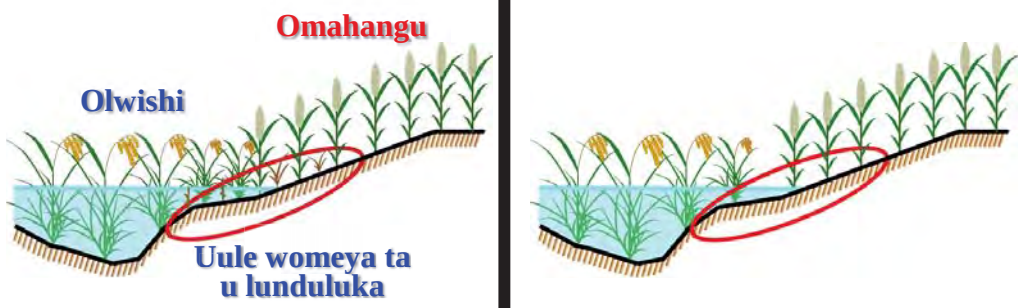
– Kuna omahangu komitunda uuna omeya ga saka
– Tonatela iimeno yoye

Kununa uuna ekuno lyotango nenge etiyali lya ndopa.

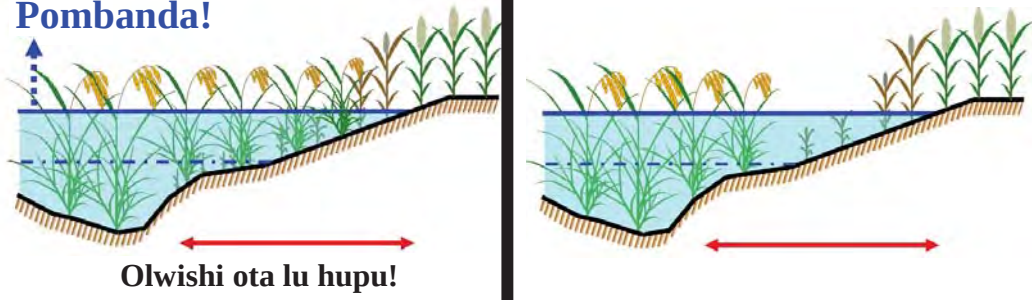
Ekuno lyohwangalahwahwa

Elongo lyiimpungu ya topoka (Omulandu gwongashingeyi)

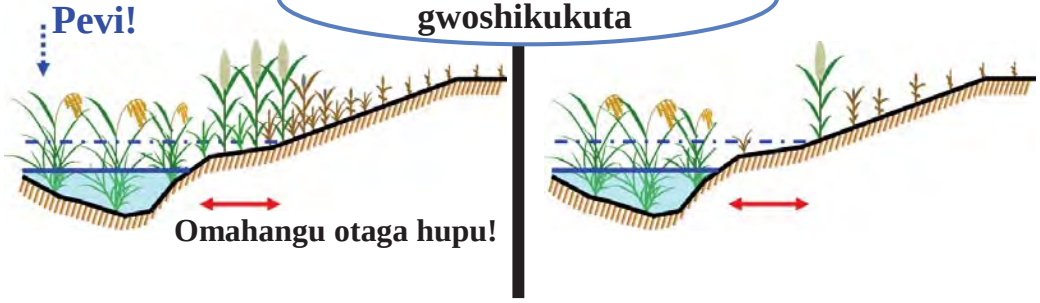
Omuvo gwomuloka omwaanawa



Omuvo gwefundja



Omuvo gwoshikukuta



Training Material 3

3rd AT Training, February 2016

Phase 2

N-CLIMP

Japan International Cooperation Agency (JICA)

Ministry of Agriculture, Water and Forestry (MAWF), Namibia

N-CLIMP

Northern Crop and Livestock Development Master Plan Study

3rd Training for Agricultural Technicians

February 2016

JICA Team Member

Position / Designation	Name
Experts	
Team Leader	Otsuka Shigeya, Mr.
Deputy Team Leader / Crop	Morioka Naoto, Mr.
Livestock	Orita Iwami, Mr. Dr.
Farm Management / Training	Joho Yukiko, Ms. Dr.
Resource Persons	
Training / Facilitation	Michael Dege, Mr.
Livestock	Fonnie Bruwer Mr. Dr.
Staff	
Farm Management / Training	Bernadette Erago, Ms.
Administrative Officer	Johanna Ekandjo Ms.
Field Assistant (Livestock)	Daniel M. Imalwa Mr.
Field Assistant (Crop)	Aini Amukoto, Ms.

Agenda of the 3rd Training for ATs

Time	Subject	Presenter
08:45 – 09:00	Registration	
09:00 – 09:10	Opening Remarks	Chairperson
09:10 – 10:40	Introduction	Mr. N. Morioka, Dr. Joho, Mr. Michael Dege
10:40 – 11:00	Coffee Breaks	
11:00 – 14:00	Training by Sector - Crop: grains, horticulture - Livestock: cattle, goat, chiken	Mr. Morioka, Dr. Orita Dr. Fonnie Bruwer, Dr. Joho, Mr. Michael Dege
13:00 – 14:00	Lunch	
14:00 – 15:00	Farm Management - Book keeping - Group formation	Dr. Joho, Mr. Michael Dege, Mr. Morioka, Dr. Orita, Dr. Fonnie Bruwer
15:00 – 15:30	Training Coaching - Rehearsal & role play	
15:30 – 16:00	Assessment & Schedule	
16:00 – 16:15	Closing	Chairperson

Introduction

1. Outline of the Study and Pilot Site Activities
2. Confirmation of the date of trainings for farmers groups by ATS
3. Review of the 1st & 2nd Trainings
4. Revision of technical measures applied to each pilot sites

1. Outline of the Study

Outline of the Study (1)

- Objective:
  to improve current situation of crop and livestock production of small-scale farmers in northern Namibia
- Scope :
  to identify technical measures to improve farming,
  to examine and verify technical measures, and
  to compile technical measures into the Master Plan
- Target Area:
  4 regions of Oshikoto, Oshana, Ohangwena & Omusati in NCD
- Study Period:
  3 Phases from August 2015 to July 2017
  Phase 1: Aug. 2014 – May 2015
  Phase 2: July 2015 – May 2016
  Phase 3: May 2016 – July 2017

Outline of the Study (2)

Capacity Development by SHEP Approach

Principle: Encourage…

- farmers to have business mind in agriculture,
- farmers to think it possible to increase profit from agriculture,
- farmers to increase their motivation by series of training, and
- ATs to recognize value of duties to enhance their motivation.

Namibia-type SHEP approach

- Application of SHEP approach to overall study activities, and
- Appropriate target for each type of farmers: (i) market promotion for surplus farmers and (ii) home accounts (income and expenditure) improvement for self-consumption farmers

- Namibia-type SHEP approach
  SHEP: *Smallholder Horticulture Empowerment and Promotion Approach*

Outline of the Study (3)

Technical Measures & Pilot Site Activities

- Phase 1: Sept. 2014 to May 2015
  - Total 35 technical measures identified, consists of crop: 9, livestock: 16, farm management: 10
  - Framework of Master Plan to apply technical measures
- Phase 2: July 2015 to May 2016
  - Examination and verification of 27 technical measures through Pilot Site Activities (Pilot Projects: 16 sites)
  - Results to be incorporated into Draft Master Plan
- Phase 3: July 2016 to July 2017
  - Expansion of Pilot Site Activities (through MAWF budget)
  - Results and effects to be incorporated in the Master Plan (target year: 2030)

Outline of the Study (4)

Technical Measures (27 measurs)

CR: Crop (8)	LS-6: Large & Small Stock Fattening
CR-1: Fertilizer Application	LS-7: Periodical Production
CR-2: Cropping Pattern & Crop Management	LS-11: Goat Production
CR-3: Conservation Agriculture	LS-12: Pig Production
CR-4: Rice-Mahangu Mixed Cropping System	LS-13: Chicken Production
CR-5: Water Source / Water Harvesting (horticul.)	LS-16: Strengthening of Livestock Cooperative (8)
CR-6: Water Saving Cultivation (horticulture)	FM-2: Record Keepig
CR-7: Crop Selection (horticulture)	FM-3: Post Harvest
CR-8: Cropping Plan & Crop Management (hort.)	FM-5: Group formation & Strengthening
LS: Livestock (11)	FM-6: Group Accounting Management
LS-1: Fodder Production	FM-7: Formation of Water Users Association
LS-2: Range Management	FM-8: Collective Selling & Purchasing
LS-3: Water Harvesting / Water Source Facilities	FM-9: Rural Finance Accessibility Improvement
LS-4: Feed Supply for Small Stocks	FM-10: Market Information Access Improvement
LS-5: Disease Control	

Outline of the Study (5)

Process for Preparation of Pilot Site Activities

- Stakeholder Meeting 1: early Aug. 2015
  Selection of pilot sites
- Preparatory Training for Farmers' Group: Aug. to Sept. 2015
  Preparation of the action plan by farmers to enhance farmers motivation
- Stakeholder Meeting 2: early Sept. 2015
  Preparation of action plan by ATs based on the action plan by farmers group in the Preparatory Training and the list of key farmers

Outline of the Study (6)

Process for Preparation of Pilot Site Activities

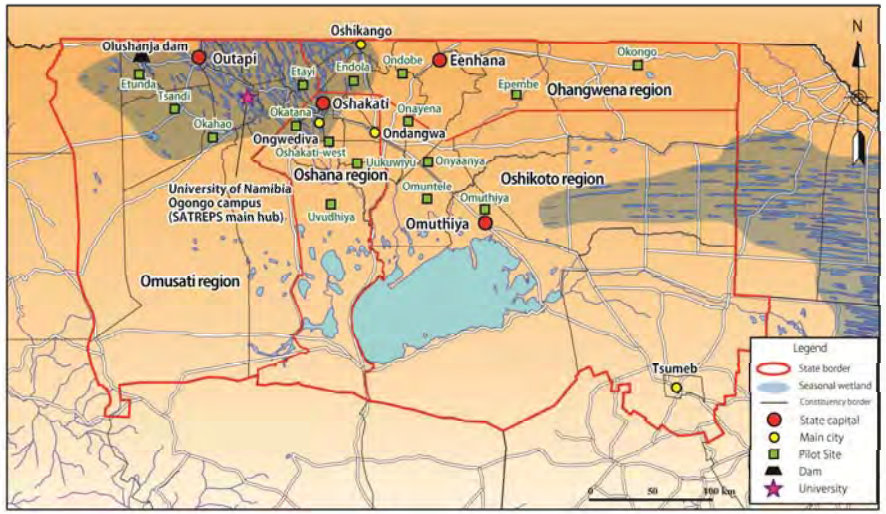
Region	Stakeholder Meeting (1)	Preparatory Training for Farmers Group	Stakeholder Meeting (2)
Ohangwena	Aug. 04 (Tue)	Aug. 20 (Thu)	Sept. 02 (Wed)
Omusati	Aug. 05 (Wed)	Aug. 24 (Mon)	Sept. 03 (Thu)
Oshana	Aug. 17 (Mon)	Aug. 27 (Thu)	Sept. 08 (Tue)
Oshikoto	Aug. 25 (Tue)	Sept. 09 (Wed)	Sept. 09 (Wed)

Outline of the Study (7)

Pilot Site Activities by ADC (Constituency)

Region	Crop Cereal Grains	Horticulture	Cattle	Small Stock
Ohangwena	Ondobe (Ondone)	Epembe (Epembe)	Okongo (Okongo)	Endola (Endola)
Omusati	Etayi (Etayi)	Etunda (Ruacana)	Okahao (Okahao)	Tsandi (Tsandi)
Oshana	Okau-Kamasheshe (Oshakati-West)	Uukwangula (Okatana)	Engombe (Uuvdiya)	Uukwiyu-uushona (Uukwiyu)
Oshikoto	Okashana (Omuthiya)	Onayena (Onayena)	Omuntele (Omuntele)	Onankali (Onyaanya)

Outline of the Study (8)
Location of Pilot Project Sites

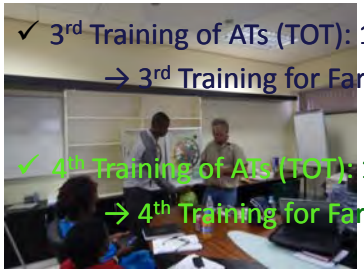


Location Map of Pilot Site Activities

Outline of the Study (9)
Training Process for ATs & Farmers Groups

✓ 1st Training of ATs (TOT): 1st week of November 2015
→ 1st Training of Farmers Groups by ATs: 2nd–3rd Weeks of Nov.

✓ 2nd Training of ATs (TOT): 4th week of November 2015
→ 2nd Training for Farmers Groups by ATs: 2nd–3rd Weeks of Dec.



✓ 3rd Training of ATs (TOT): 1st week of February 2016
→ 3rd Training for Farmers Groups by ATs: 2nd–3rd Weeks of Feb.

✓ 4th Training of ATs (TOT): 1st week of April 2016
→ 4th Training for Farmers Groups by ATs: 2nd–3rd Weeks of Apr.

Outline of the (10)
Trainings of ATs (TOT)

- One day training at Ongwediva:
  - Inviting the CASOs, SASOs, ASOs, CATs, SATs and ATs, in addition to ATs in charge.
  - Invite the officers from relevant agencies, like DVS, DARD, Meat Board, AMTA, Etunda Green Scheme, etc.
- ATs in charge to participate all the sessions of training (regardless of crop & livestock).
- Exercise through role play by rehearsal for training for famers.
- Before training, ATs discuss with farmers to decide the date of farmers training.

Outline of the Study (11)
Trainings of Farmers Groups

- One day trainings to be conducted in demonstration farms by AT with support of JICA Team.
- Other ATs may participate for training.

	Crop Team	Livestock Team
Morning Session	Cereal Grain	Cattle
Afternoon Session	Horticulture	Small Stock

2. Confirmation of Date
Training for Farmers Groups by ATs

2. Confirmation of Date (1)
3rd Training for ATs & Farmers Group by ATs

Region (AT Training)	Cereal Grains (Farmers Training)	Horticulture (Farmers Training)	Cattle (Farmers Training)	Small Stock (Farmers Training)
Omusati Feb. 2 (Tue)	13:00 Etayi Feb. 4 (Thu)	Etunda -	08:00 Okahao Feb. 4 (Thu)	09:00 Tsandi Feb. 8 (Mon)
Oshana Feb. 2 (Tue)	11:00 Okaukamasheshe (Oshakati-West) Feb. 9 (Tue)	09:00 Uukwangula (Okatana) Feb. 10 (Wed)	10:00 Engombe (Uuvudhiya) Feb. 9 (Tue)	(to be informed) Uukwiyu-uushona Feb. 10 (Wed)
Oshikoto Feb. 3 (Wed)	10:00 Okashana (Omuthiya) Feb. 11 (Thu)	09:00 Onayena Feb. 12 (Fri)	09:00 Omuntele Feb. 11 (Thu)	09:00 Onankali (Onyaanya) Feb. 12 (Fri)
Ohangwena Feb. 3 (Tue)	10:00 Ondobe Feb. 18 (Thu)	10:00 Epembe Feb. 17 (Wed)	10:00 Okongo Feb. 16 (Tue)	10:00 Endola Feb. 17 (Wed)

2. Confirmation of Date (2)
3rd Trainings of Farmers Group

- One day trainings to be conducted in demonstration farms by AT with support of JICA Team.
- If AT in charge cannot attend, need to arrange the support from ATs nearby, through arrangement by CASOs/ASOs/CATs (regional office).
- Other ATs can participate for training.

	Crop Team	Livestock Team
Member	Morioka, Joho, Mickael, Bernadette, Aini	Orita, Joho, Fonnie, Michael, Bernadette, Daniel
Pilot Project Site	1 site for crop (grains or horticulture)	1 site for livestock (cattle or small stock)

2. Confirmation of Date (3)
4th Training for ATs & Farmers Group by ATs

Region	Tentative Date for Training of AT	Tentative Date of Training of Farmers Group	
Omusati	Mar. 30 (Wed)	Apr. 01 (Fri)	Etayi (grains), Etunda (hort.), Okahao (cattle), Tsandi (chicken)
Oshana	Mar. 31 (Thu)	Apr. 04 (Mon)	Okau-Ka. (grains), Okatana (hort.), Uuvudiya (cattle), Uukwiyu (chicken)
Oshikoto	Mar. 31 (Thu)	Apr. 05 (Tue)	Okashana (grains), Onayena (hort.), Omuntele (cattle), Onankali (chicken
Ohangwena	Mar. 30 (Wed)	Apr. 12 (Tue)	Okashan (grains), Epembe (hort.), Omuntele (cattle), Endola (goat)

3. Review of Trainings

1st Training & 2nd Training

Review of 1st & 2nd Trainings (1)

1st Training for ATs & Farmers Groups

Region	Training of AT	ADC in charge of Training of Farmers Groups	
Omusati	Nov. 03 (Tue)	Nov. 06 (Fri): Nov. 19 (Thu):	Okahao (cattle), Etunda (hort.) Etayi (grain), Tsandi (chicken)
Oshana	Nov. 17 (Tue)	Nov. 18 (Wed): Nov. 19 (Thu):	Okau-Kamasheshe (grain), Uukwangla (hort.), Uuvudiya (cattle) Uukwiyu-Uushona (chicken)
Oshikoto	Nov. 04 (Wed)	Nov. 12 (Thu):	Okashana (grain), Onayena (hort.), Omuntele (cattle), Onankali (chicken)
Ohangwena	Nov. 04 (Wed)	Nov. 10 (Mon): Nov. 16 (Mon):	Ondobe (grain), Epembe (hort.), Okongo (cattle) Endola (goat)

Review of 1st & 2nd Trainings (2)

2nd Training for ATs & Farmers

Region	Training of AT	ADC in charge of Training of Farmers Groups	
Omusati	Nov. 23 (Mon)	Nov. 26 (Thu): Dec. 01 (Tue):	Etunda (hort.), Okahao (cattle), Tsandi 'chicken) Etayi(grain)
Oshana	Dec. 08 (Tue)	Dec. 09 (Wed):	Oshakati-west (grain), Ungwangula (hort.), Uuvudiya (cattle), Uukwiyu-Uushona (chicken)
Oshikoto	Nov. 24 (Tue)	Nov. 25 (Wed): Nov. 26 (Thu):	Onayena (hort.), Omuntele (cattle), Onankali (chicken) Okashana (grain)
Ohangwena	Nov. 24 (Tue)	Dec. 07 (Mon):	Ondobe (grains), Epembe (hort.), Okongo (cattle), Endola (goat)

Review of 1st & 2nd Trainings (3)

Issues & Lesson Learnt

- Crop Sector in General
  - Rainfall situation
  - Grains
    - Plot layout (1 ha for control, 1 ha for treatment)
    - Supply of materials & services
    - Basal fertilizer, land prep., planting, weeding, thinning
  - Horticulture
    - Pilot sites and groups
    - Plot layout and installation of drip irrigation
    - Supply of materials and services
- Livestock
  - Cattle
  - Small Stock
- Baseline Survey, Monitoring, Field Day, etc.
- Sign Board at Pilot Project Sites

4. Revision of Technical Measures applied to each Pilot Sites

Modification of Technical Measures (1)

- Preparatory Training for Farmers Groups
  - Technical measures were selected for each pilot site by the representatives from selected farmers groups.
- 1st and 2nd Trainings for Farmers Groups
  - Technical measures to be applied were explained and discussed among key farmers, ATs and JICA Team at the demonstration farm.
  - Based on the discussion at the site, technical measures at each site were modified.
  - For example, CR-7: “Crop Selection and Marketing” is essential for horticulture under the SHEP Approach, and additionally included in list of technical measures at each site of horticulture.

Modification of Technical Measures (1)
Omusati and Oshana

List of Techniques and Technical Measures for each pilot site

		Region	Omusati								Oshana							
		ADC	Etayi		Etunda		Okahao		Tsandi		Oshakati West		Okatana		Uuvudhiya		Uukwiyu	
		Activity	Cereal		Horticulture		Cattle		Small Stocks		Cereal		Horticulture		Cattle		Small Stocks	
		No.	1-1		1-2		1-3		1-4		2-1		2-2		2-3		2-4	
			Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual
Crop Production																		
	Cereal																	
	CR-1	Fertilizer Application	○									○						
	CR-2	Cropping Pattern	○	○							○	○						
	CR-3	Conservation Agriculture									○	○						
	CR-4	Flood- and drought- adaptive cropping system (rice-mahangu mixed	○	○														
	Horticulture																	
	CR-5	Water source / Water harvesting			○								○	○				
	CR-6	Water saving cultivation			○	○							○	○				
	CR-7	Crop selection and Marketing			○	○							○	○				
	CR-8	Cropping plan and horticulture crop management			○	○							○	○				
Livestock Production																		
	Cattle																	
	LS-1	Fodder production					○	○							○	○		
	LS-2	Range management					○	○							○	○		
	LS-3	Water harvesting and/or construction of water resource facilities for					○								○			
	LS-5	Disease control					○	○							○	○		
	LS-6	Large and small stock fattening					○	○										
	LS-7	Periodical production																
	LS-16	Establishment and strengthening livestock cooperatives													○			
	Small Stocks																	
	LS-1	Fodder production																
	LS-2	Range management																
	LS-3	Water harvesting and/or construction of water resource facilities for							○								○	
	LS-4	Nutritiuos food supply for pig and chicken							○	○							○	○
	LS-5	Disease control							○	○							○	○
	LS-6	Large and small stock fattening							○									
	LS-7	Periodical production																
	LS-11	Goat production																
	LS-12	Pig production																
	LS-13	Chicken production (indigenous)							○	○							○	○
	LS-16	Establishment and strengthening livestock cooperatives																
Farm Management																		
	FM-2	Book keeping (Farm Record)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	FM-3	Post harvest									○		○					
	FM-5	Group formation/ Group strengthening			○	○	○		○	○				○	○		○	○
	FM-6	Group account management	○		○	△	○		○		○			○	○		○	
	FM-7	Formulation of WUA															○	
	FM-8	Collective selling/ Purchasing							○				○				○	
	FM-9	Rural finance accessibility improvement							○				○					
	FM-10	Market information access improvement	○		○	○	○		○	○				○	○		○	○
Total number of techniques			6	3	8	7	9	5	11	6	5	4	8	8	9	4	10	6

P: Plan, A:Actual

Modification of Technical Measures (3)
Oshikoto and Ohangwena

List of Techniques and Technical Measures for each pilot site

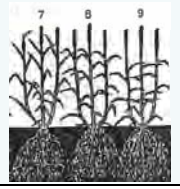
		Region	Oshikoto								Ohangwena							
		ADC	Omuthiya		Onayena		Omuntele		Onyaanya		Ondobe		Epembe		Okongo		Endola	
		Activity	Cereal		Horticulture		Cattle		Small Stocks		Cereal		Horticulture		Cattle		Small Stocks	
		No.	3-1		3-2		3-3		3-4		4-1		4-2		4-3		4-4	
			Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual
Crop Production																		
	Cereal																	
	CR-1	Fertilizer Application		○							○	○						
	CR-2	Cropping Pattern	○	○							○	○						
	CR-3	Conservation Agriculture	○	○							○	○						
	CR-4	Flood- and drought- adaptive cropping system (rice-mahangu mixed																
	Horticulture																	
	CR-5	Water source / Water harvesting			○													
	CR-6	Water saving cultivation			○	○							○	○				
	CR-7	Crop selection and Marketing				○								○				
	CR-8	Cropping plan and horticulture crop management			○	○							○	○				
Livestock Production																		
	Cattle																	
	LS-1	Fodder production					○	○							○	○		
	LS-2	Range management					○	○							○	○		
	LS-3	Water harvesting and/or construction of water resource facilities for					○								○			
	LS-5	Disease control					○	○							○	○		
	LS-6	Large and small stock fattening					○											
	LS-7	Periodical production													○	○		
	LS-16	Establishment and strengthening livestock cooperatives					○											
	Small Stocks																	
	LS-1	Fodder production															○	○
	LS-2	Range management															○	
	LS-3	Water harvesting and/or construction of water resource facilities for															○	
	LS-4	Nutritiuos food supply for pig and chicken							○	○								
	LS-5	Disease control							○	○							○	○
	LS-6	Large and small stock fattening																
	LS-7	Periodical production																
	LS-11	Goat production															○	○
	LS-12	Pig production																
	LS-13	Chicken production (indigenous)							○	○								
	LS-16	Establishment and strengthening livestock cooperatives																
Farm Management																		
	FM-2	Book keeping (Farm Record)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	FM-3	Post harvest	○										○					
	FM-5	Group formation/ Group strengthening			○	△	○			○	○	○	○	○	○		○	
	FM-6	Group account management	○		○						○		○		○			
	FM-7	Formulation of WUA					○						○		○			
	FM-8	Collective selling/ Purchasing			○		○		○									
	FM-9	Rural finance accessibility improvement	○						○									
	FM-10	Market information access improvement	○			○	○		○	○	○			○	○			
Total number of techniques			7	4	7	6	11	4	7	6	7	5	7	6	10	5	8	4

N-CLIMP

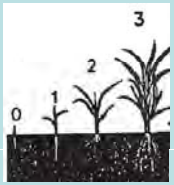
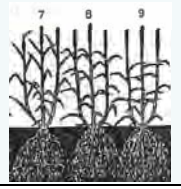
Northern **C**rop and **Li**vestock Development **M**aster **P**lan Study

Thank you!

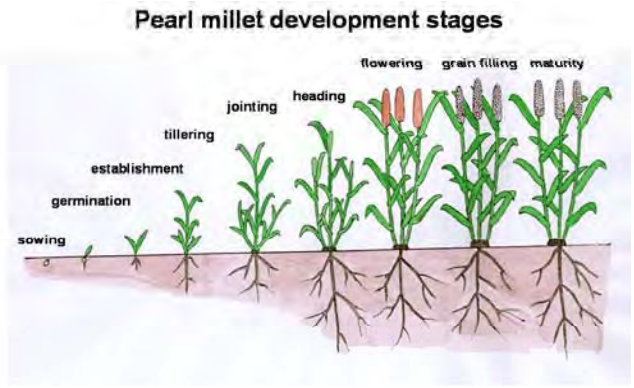
Growth Stage of Mahangu

	Growth Phase 1: Vegetative Growth Stage (After germination to 4 weeks) • Major symptom: • Dry-matter accumulation:. • In late varieties:.
	Growth Phase 2: Panicle Development Stage (4 to 8 weeks after germination) • Major symptom: • Dry-matter accumulation: • This stage comes to: .
	Growth Phase 3: Grain Filling Stage (8 weeks to 11 weeks) • Major symptom • Dry-matter accumulation: • End of this phase, physiological maturity, is indicated by development of a small dark layer at the bottom of grain.

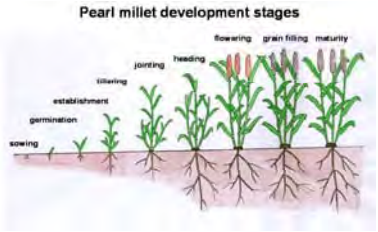
Growth Stage of Mahangu

	Growth Phase 1: Vegetative Growth Stage (After germination to 4 weeks) • Major symptom: Seedling establishment with root, leaf, and tiller development. Panicle initiation. Inter-node elongation. • Dry-matter accumulation: in the roots and leaves. • In late varieties: the floral initiation is considerably delayed.
	Growth Phase 2: Panicle Development Stage (4 to 8 weeks after germination) • Major symptom: Expansion of all the leaves, emergence of all the tillers, floral initiation in the tillers, and stem elongation through elongation of inter-nodes • Dry-matter accumulation: in roots, leaves, stem, and panicle. Elongation of panicle and formation of floral parts are found. • This stage comes to: an end with the flowering.
	Growth Phase 3: Grain Filling Stage (8 weeks to 11 weeks) • Major symptom Starting with fertilization of florets and continues up to maturity of the plant. • Dry-matter accumulation: mainly in the grain formation and partly in the enlargement of stem and leaves of the tillers. Tillers arising from upper nodes (nodal tillers) are late and produce small panicles which usually sterile. • End of this phase: physiological maturity, is indicated by development of a small dark layer at the bottom of grain.

Crop Management of Mahangu



- Basal Application: early – mid November
- Land Preparation: mid – late November
- Planting / Sowing: after 2-3 consecutive rainy days with 20 mm
- Weeding / Thinning: 1st at 2-3 weeks, 2nd at 6-7 weeks from germination
- Top Dressing: 1st after 1st weeding, 2nd after 2nd weeding



Crop Management of Mahangu

- Basal Application: early – mid November, before land preparation manure to be recommended.
- Land Preparation: mid – late November, hopefully before starting rain in order to catch rain into soil deeper.
- Planting / Sowing: after 2-3 consecutive rainy days with 20 mm, to keep enough moisture for germination.
- Weeding / Thinning: 1st at 2-3 weeks, 2nd at 6-7 weeks from germination, depending on rainfall, to avoid nutrient confliction with weeds.
  Thinning is important to adjust plant density to effective utilization of nutrient and water content.
- Top Dressing: 1st after 1st weeding, 2nd after 2nd weeding, for healthy seedling development, better panicle initiation and grain filling.

Basal Fertilizer

- Effect for _____
- Manure if readily and easily available, not inorganic (commercial) fertilizer.
- Application _____ _____
- Effect to be appeared _____
- Heavy dosage to be avoided _____ _____
-

Basal Fertilizer

- Effect for healthy initial growth after germination
- Manure if readily and easily available, not inorganic (commercial) fertilizer.
- Application before land preparation, well mixed with soil to prevent fertilizer burning
- Effect to be appeared under the good rainfall
- Heavy dosage to be avoided under unstable rainfall condition
- If farmers wants apply inorganic fertilizer, let him know that cost may not be recovered due to unstable rain

Top Dressing (Fertilizer)

- Effect:
  1st top dressing for _____.
  2nd top dressing for _____.
- Timing after germination:
  1st top dressing at _____.
  2nd top dressing at _____.
- Dosage: _____.
- Heavy dosage to be avoided _____ _____.

Top Dressing (Fertilizer)

- Effect:
  1st top dressing for better tillering and panicle initiation,
  2nd top dressing for more grains and better filling.
- Timing after germination:
  1st top dressing at 2-3 weeks (3th to 4th leaf stage)
  2nd top dressing at 5-6 weeks (before flag leaf appear)
- Dosage: 0.5 - 1 bag for 1 ha, composite fertilizer
- Heavy dosage to be avoided under unstable rainfall condition and poor growth

Conservation Agriculture

- Principles of Conservation Agriculture
  particularly cultivation of crop under rainfed condition
  - Minimum disturbance of soil surface
    - to reduce _____,
    - to increase _____.
  - Soil Surface Cover: Mulching
    - to avoid _____,
    - to avoid _____,
    - to reduce _____.
  - Crop Rotation
    - to maintain _____, to avoid _____ culture

Conservation Agriculture

- Principles of Conservation Agriculture
  particularly cultivation of crop under rainfed condition
  - Minimum disturbance of soil surface
    - to reduce decomposing soil organic matter
    - to increase organic matter contents
  - Soil Surface Cover: Mulching
    - to avoid wind erosion of surface soil,
    - to avoid high temperature,
    - to reduce evaporation
  - Crop Rotation
    - to maintain soil fertility, to avoid mono culture

Tillage

Tillage

- Conventional tillage (disc harrow):
  increases decomposition of plant residue.
- Zero tillage:
  retains plant residue, increase organic matter contents,
  improving soil structure.

Ripper Furrowing (1)

1. _____

2. _____

3. _____

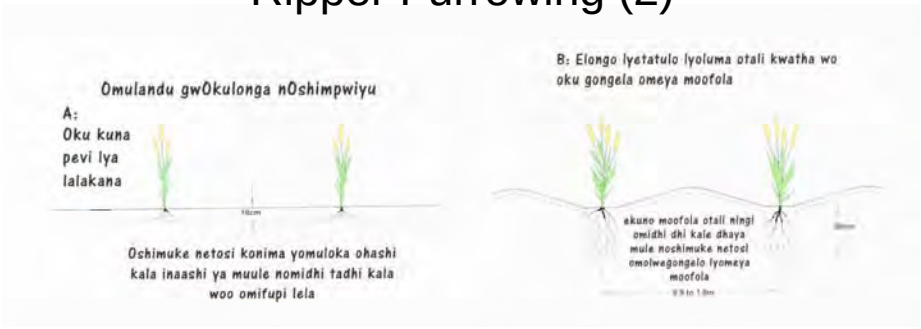
Ripper Furrowing (1)

1. Ridges & Furrows by Ripper Furrowing

2. Ridges & Furrows after Rainfall

2. Progress of Plant Growth

Ripper Furrowing (2)

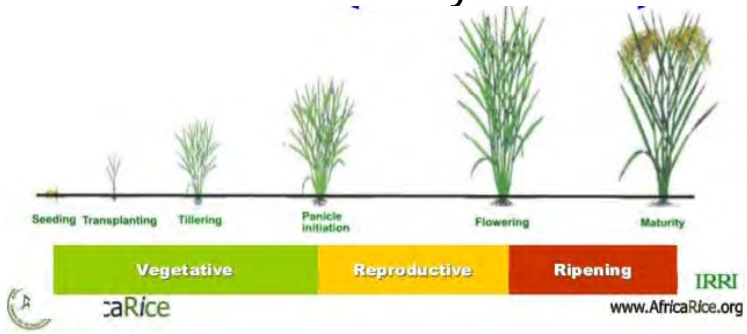


- Breaking the hard surface pan
- Creating furrows for in-field water harvesting
- Demerit:

Ripper Furrowing (2)

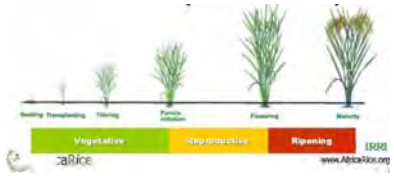
- Breaking the hard surface pan
  - To allow plant root penetration of 30 cm
- Creating furrows for in-field water harvesting
  - To increase soil moisture for crop growth
- Some farmers already have experience showing much better growth than the usual land preparation
- Demerit: cost for ripper furrowing is higher than the usual land preparation

Rice Life Cycle



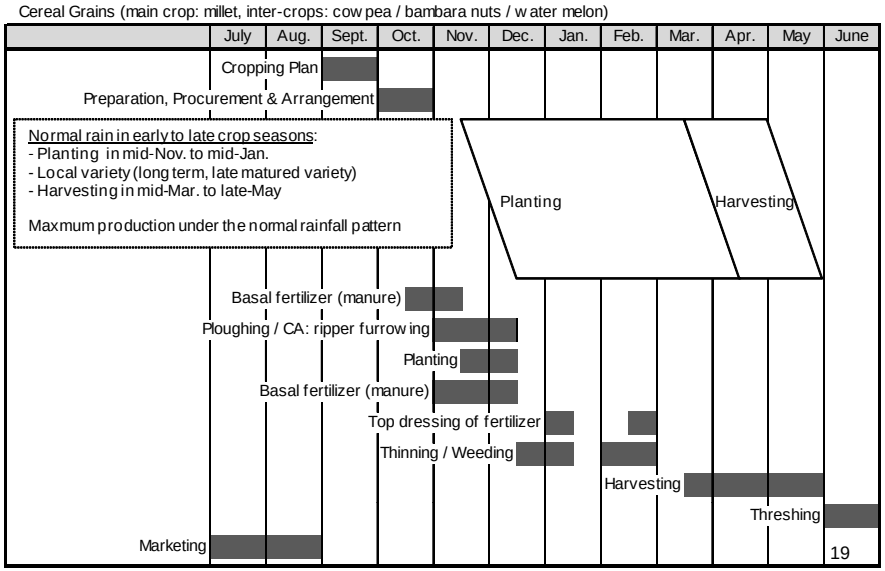
- Whole Life: about 120 - 150 days
- Transplanting at 3-5 leaves stage
- Tolerant to water depth: 10 to 15 cm
- Vegetative stage: growth for healthy plant body
- Reproductive stage: need to avoid heat
- Ripening stage: need to avoid bird attack

Rice Life Cycle

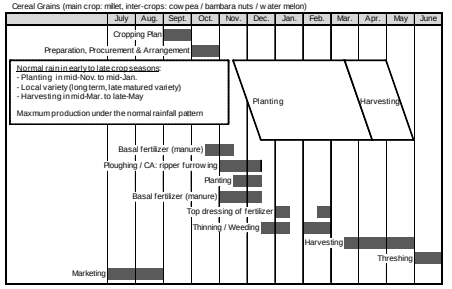


- Whole Life: about 120 - 150 days (from germination to ripening, depending on variety and growth condition)
- Transplanting at 3-5 leaves stage (3 - 4 weeks after germination, 3 to 4 seedling per hill, line planting recommended for easy weeding)
- Tolerant to water depth: 10 to 15 cm (better to avoid dry-up of ground surface by making ridges surrounding the plot)
- Vegetative stage: growth for healthy plant body (to increase number of tillers and proper formation of panicles)
- Reproductive stage: need to avoid heat (to accelerate proper pollination fertilization to increase filled grains)
- Ripening stage: need to avoid bird attack (better)
- Yield component =
  (number of panicles) x (grains per panicles) x (weight of 1,000 grains

Cropping Pattern



Cropping Pattern



- Standard cropping schedule and area under normal rainfall (average ranfall)
- Based on the above schedule, farming practices will tentatively set (basal fertilizer, land preparation, planting, weeding, thinning, top dressing,).
- Based on the actual rainfall, planting will be carried out. Then, other farming practices will be adjusted according to the actual rainfall and plant growth.

Water harvesting – Calculation of roof catchment

- Estimation of potential volume:

Roof catchment:

- Formula:
  Area in square metre x annual rainfall x 50%
- Example: Roof is 8 m x 5 m = 40 m^2
- Annual Rainfall = 400 mm
- Calculation:
  40 m^2 x 400 mm x 50%
  = _____ litre of water

Water harvesting – Calculation of roof catchment

- Estimation of potential volume:

Roof catchment:

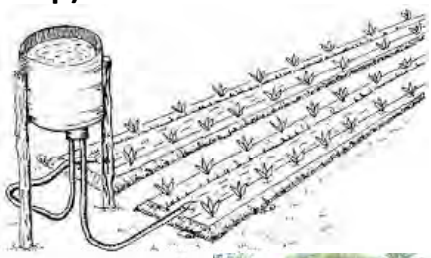
- Formula:
  Area in square metre x annual rainfall x 50%
- Example: Roof is 8 m x 5 m = 40 m^2
- Annual Rainfall = 400 mm
- Calculation:
  40 x 400 x 50%
  = 8,000 litre of water

Low pressure drip irrigation using a tank

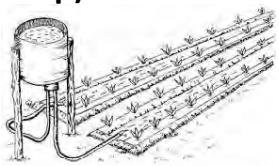
Low pressure drip irrigation using a tank

- Larger tank (more than 200 lit.) is to be installed for larger area, at 1.5 m to 1.8 m high.

Low pressure drip irrigation using a bucket (no tank or tap)



Low pressure drip irrigation using a bucket (no tank or tap)



- Bucket (20 lit. to 50 lit.) is to be installed for smaller area, at 1.5 m to 1.8 m high.

Low pressure drip irrigation using a tap (no tank)

Low pressure drip irrigation using a tap (no tank)

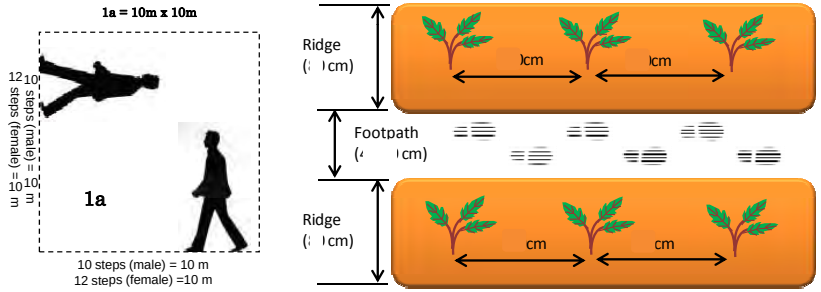
- Low pressure drip irrigation kit can be connected directly to water tap. This is not recommendable because water will be wasted (not saving water).

Drip irrigation maintenance

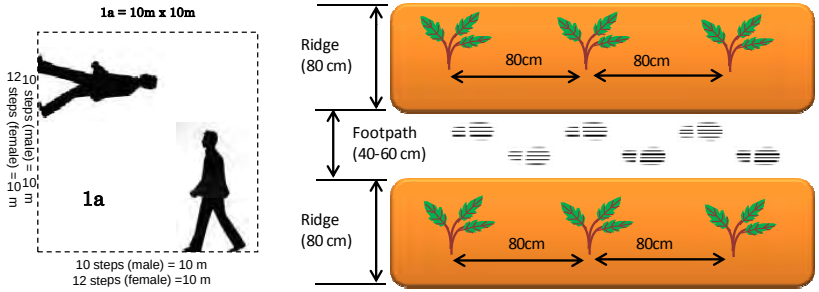
- Clear _____ weekly
- Check daily for pipe _____
- Check daily for nozzle _____

Drip irrigation maintenance

- Clear filter weekly
- Check daily for pipe leakages
- Check daily for nozzle blockages



CR 8: Cropping plan and horticulture crop management Field Preparation (1)



Interval of ridge: about 1.0 -1.2 m, in order to maintain the space for smooth work and ventilation among plants.

CR 8: Cropping plan and horticulture crop management Field preparation (1)

CR 8: Cropping plan and horticulture crop management Field preparation (2)

Planting and transplanting on the ridge of 15 to 20 cm high, well mixed soils with manure.

CR 8: Cropping plan and horticulture crop management Field preparation (3)

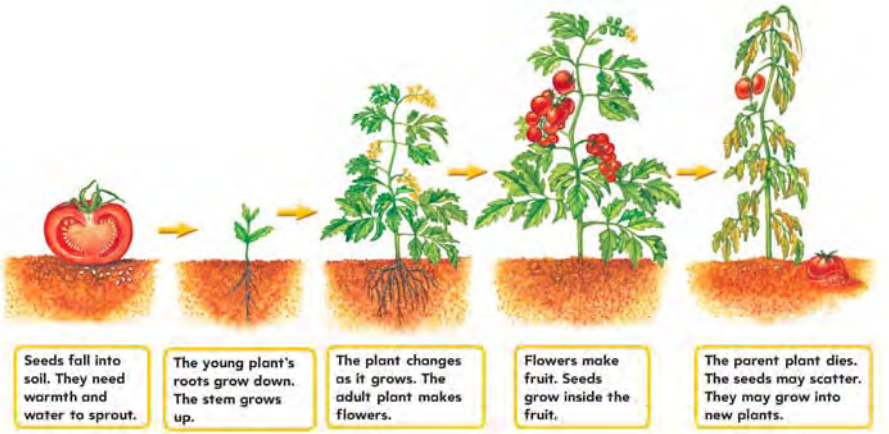
Crops	Average Duration
Tomato	_____ months
Sweet Pepper	_____ months
Eggplant	_____ months
Cabbages	_____ months
Onion	_____ months
Watermelon	_____ months
Carrot	_____ months
French Beans	_____ months

CR 8: Cropping plan and horticulture crop management

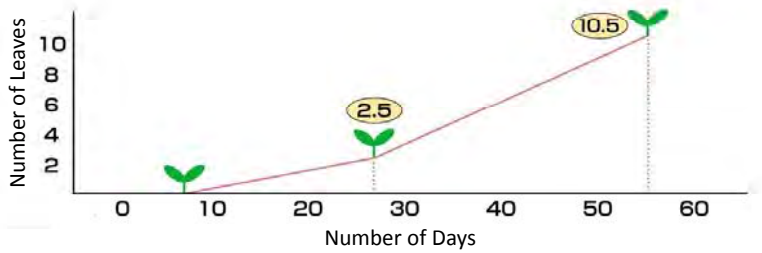
Crops	Average Duration
Tomato	4.0-4.5 months
Sweet Pepper	4.0-4.5 months
Eggplant	4.5-5.0 months
Cabbages	3.0-3.5 months
Onion	4.0-4.5 months
Watermelon	3.5-4.0 months
Carrot	3.5-4.0 months
French Beans	1.5-2.0 months

CR 8: Cropping plan and horticulture crop management

CR 8: Cropping plan and horticulture crop management
Tomato life cycle

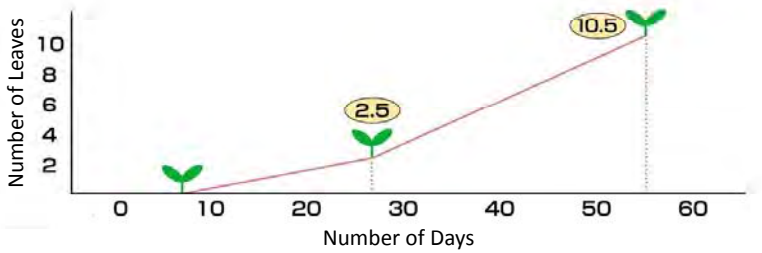


CR 8: Cropping plan and horticulture crop management
Tomato Life Cycle



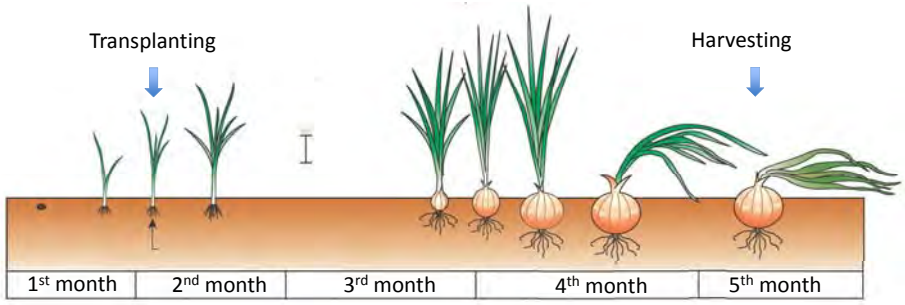
In case of nursery raising, seedlings are transplanted at _____ leaves stage (about _____ days from germination).

CR 8: Cropping plan and horticulture crop management
Tomato Seedling



In case of nursery raising, seedlings are transplanted at _____ leaves stage (about _____ days from germination).

CR 8: Cropping plan and horticulture crop management
Tomato Seedling



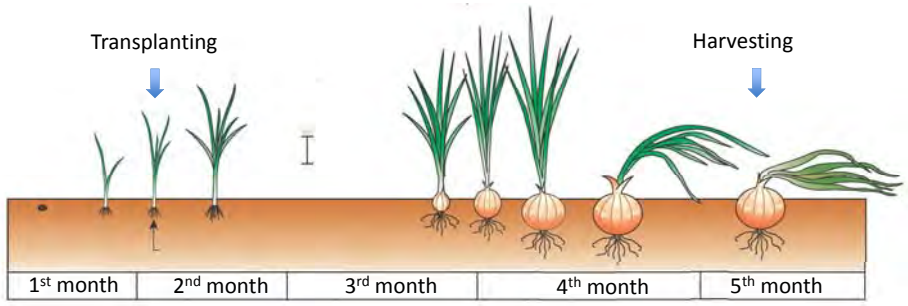
Basal: _____, top dressing: 10 to 15 g per m^2

Sowing time: _____ to _____

Growth period: _____ months (or more by variety)

Transplanting: ___ month (3 to 4 leaves) after germination

CR 8: Cropping plan and horticulture crop management Onion Growth



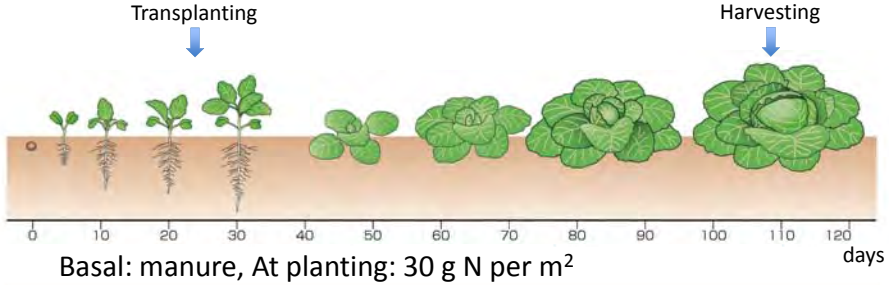
Basal: manure, top dressing: 10 to 15 g per m^2

Sowing time: February to May

Growth period: 4 to 4.5 months (or more by variety)

Transplanting: 1.5 month (3 to 4 leaves)

CR 8: Cropping plan and horticulture crop management Onion Growth



Basal: manure, At planting: 30 g N per m^2

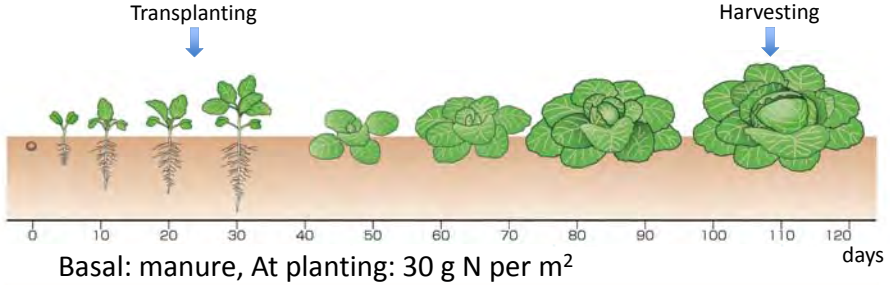
Top dressing: 50 g N per $m^2$of, 3 weeks from germination

Sowing time: cold season, planting ____ to _____

Growth period: ___ to ____ months (or more by variety)

Transplanting: 1 month (_____ leaves)

CR 8: Cropping plan and horticulture crop management Cabbage Growth



Basal: manure, At planting: 30 g N per m^2

Top dressing: 50 g N per $m^2$of, 3 weeks from germination

Sowing time: Cold season, planting April to June

Growth period: 3 to 3.5 months (or more by variety)

Transplanting: 1 month (5 to 6 leaves)

CR 8: Cropping plan and horticulture crop management Cabbage Growth

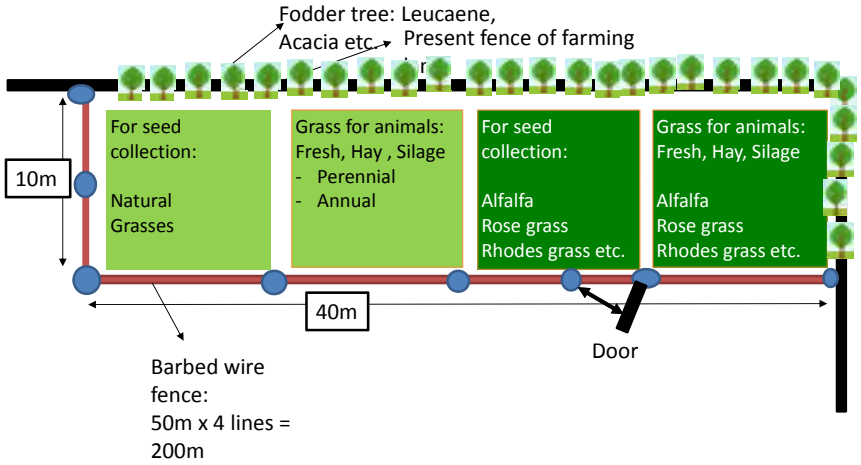
Livestock Production

Cattle - LS 1, 2, 5, 6, 7

LS Technical Measures (Cattle)

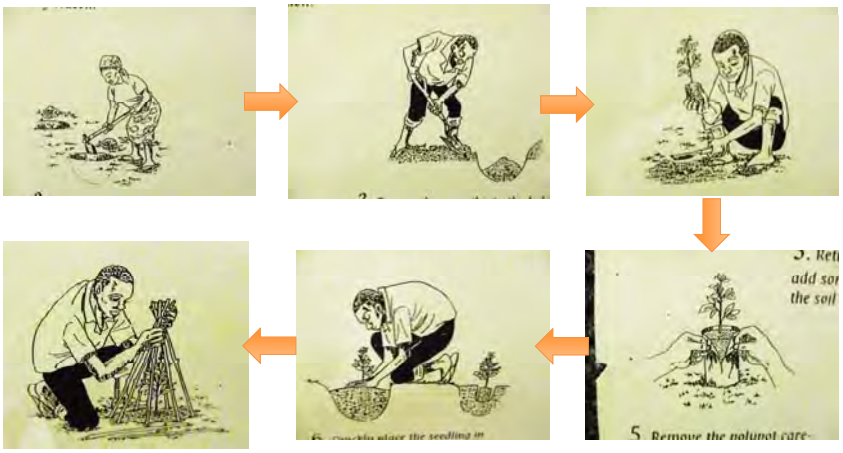
- LS 1: Fodder production
- LS 2: Range management
- LS 5: Disease control
- LS 6: Large and small stock fattening
- LS &: Periodical production

Fodder production



Land preparation

Seedlings



Hay making

Keep green colour
Keep in shadow
Dry rapidly

Hay table

Hay preparation

1. Cutting

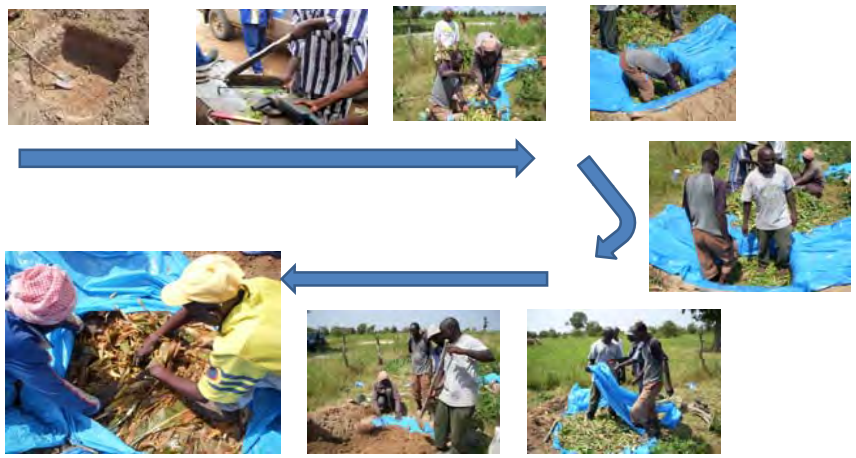
3. Storing

2. Drying

Seed collection

Top of fodder grass

Silage making



Damaged silage - Causes

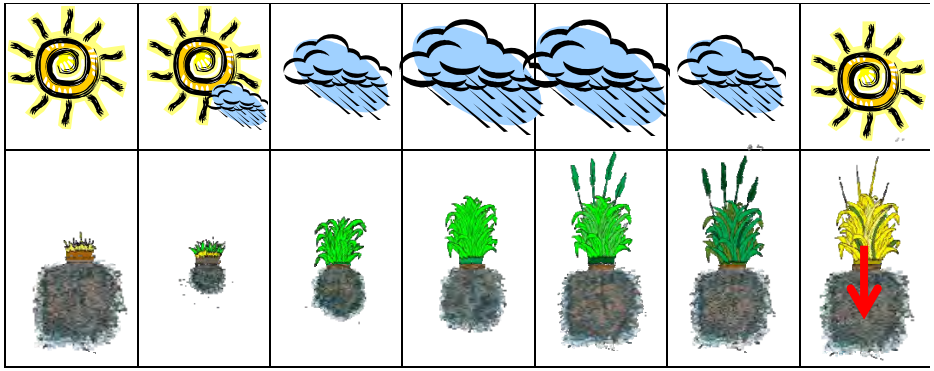
- Insufficient moisture control of silage stuffs
- Insufficient water discharge from silo
- Low pressure during process of silage making
- Imperfect sealing of silage top
- Improper silage materials
- Contamination

LS 2: Rangeland management

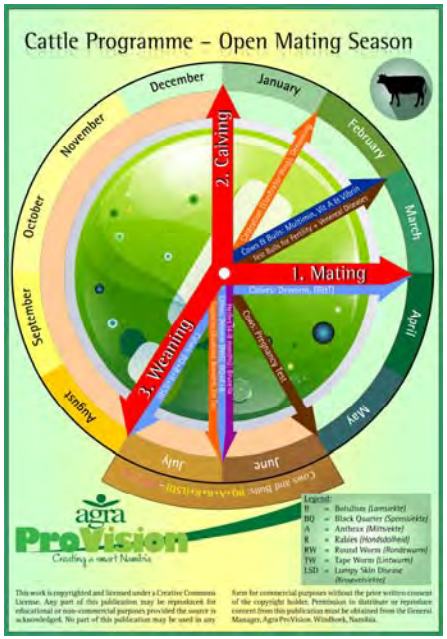
Rangeland management

- Overgrazing
- Overstocking

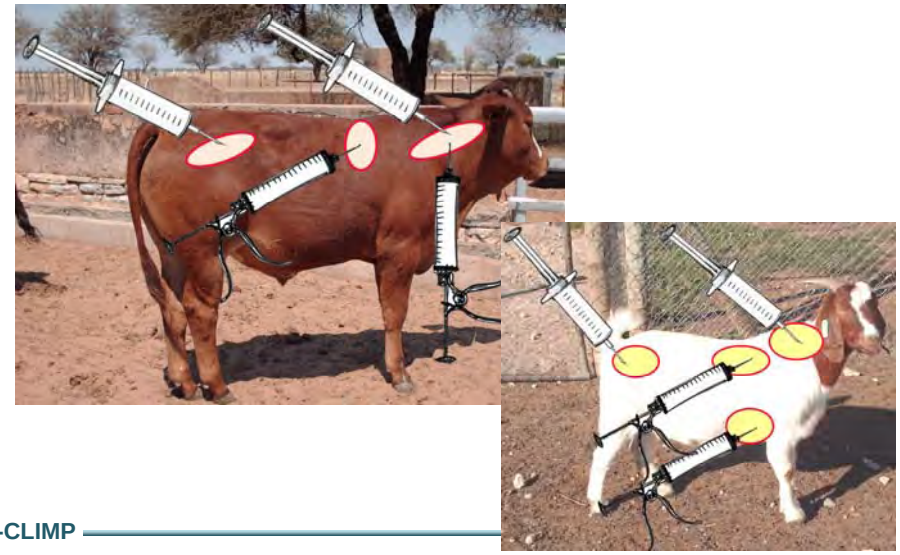
Prevent overgrazing – The perennial grass plant Rangeland must rest 6 weeks after grazing to allow regrowth



LS 5: Disease control



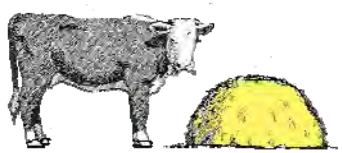
Subcutaneous and intra-muscular injection places for cattle and goats



LS 6: Large and small stock fattening

Daily food and water requirements

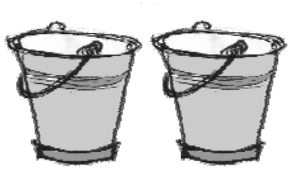
10% of body weight/day



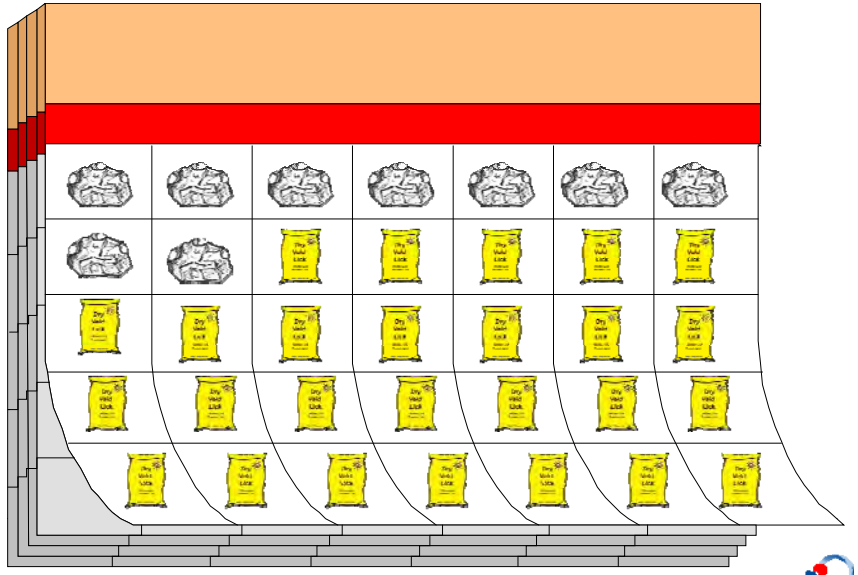
450kg

= 45 liter of water per day

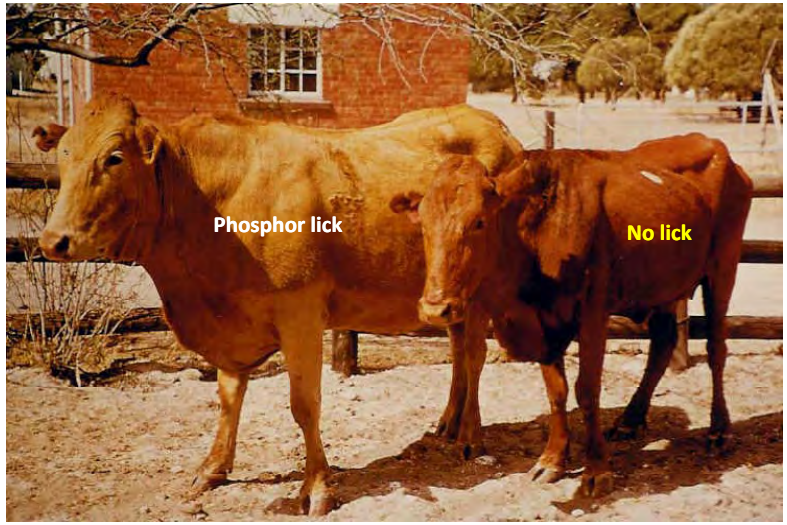
(note: 1 liter = 1 kg)



*If **NO** lick was provided for a long period …….*



Impact of not providing phosphor: condition and weight



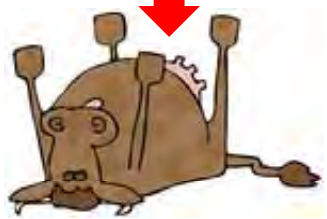
Phosphate
= contains phosphorus (P), calcium and trace elements / micro minerals

P6 (6%)
(mixed with salt = lick)

P12 (12%) / P14 - Futterfos

P18 (18%)

P21 (21%)

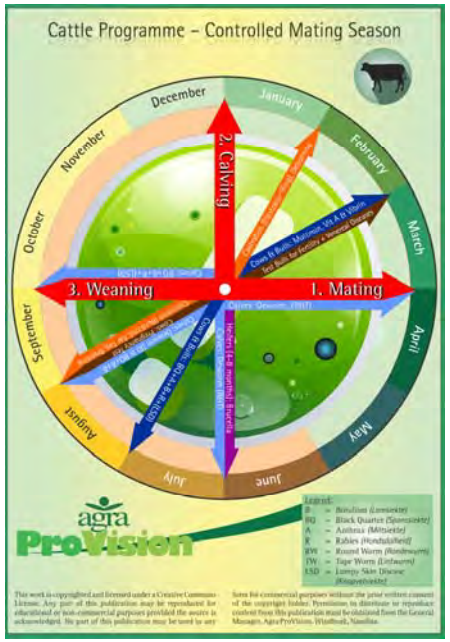


Providing any CONCENTRATE without mixing will kill cattle !

Mixing a CONCENTRATE with SALT will make cattle fat !

Wheel: Cattle Programme

LS 7: Periodical production



Livestock Production (LS)

Goats & Chicken: LS 1, 4, 5, 11, 13

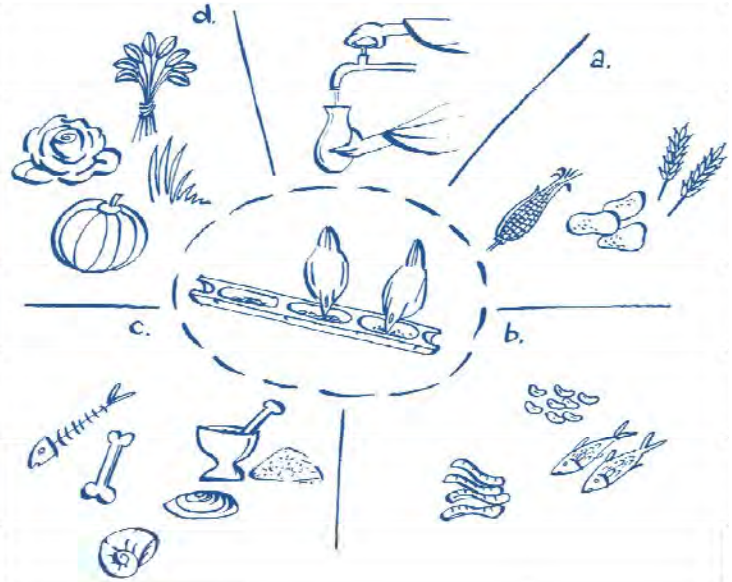
LS Technical Measures (Goats & Chicken)

- LS 1: Fodder production
- LS 4: Nutritious food supply for pig and chicken
- LS 5: Disease control
- LS 11: Goat production
- LS 13: Chicken production (indigenous)

LS 1: Fodder production

- Same as for cattle

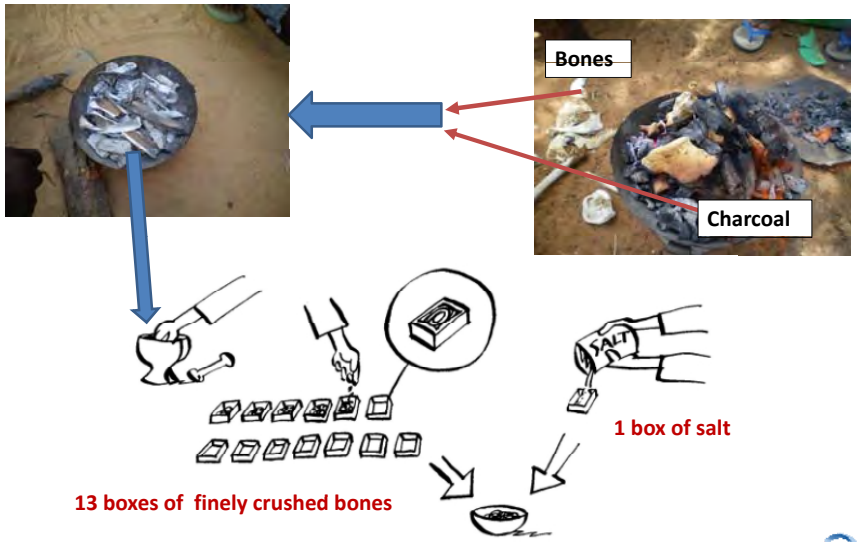
LS 4: Nutritious food supply for pig and chicken



Growing maggots

Growing termites

Preparing bone-meal for chicken



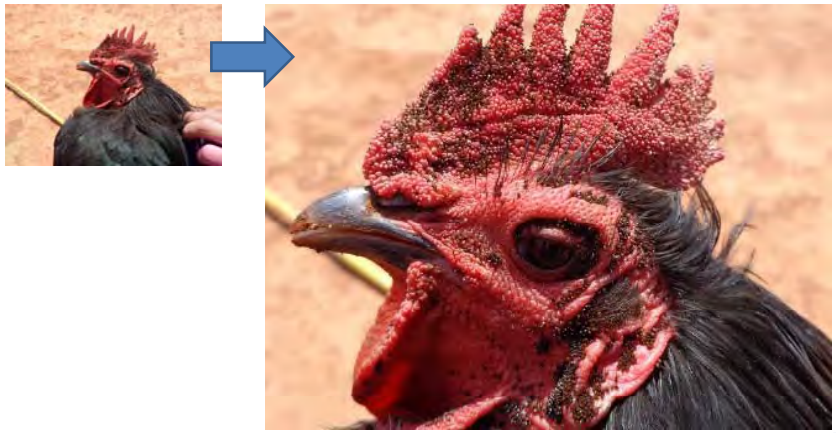
Only chicken, goats use the wheel to demonstrate

LS 5: Disease control

Disease control schedule - chicken

	Month	1	2	3	4	5	6	7	8	9	10	11	12
Spray	VECTOCID	O		O		O		O		O		O	
Oral	PROMECTINE		O		O		O		O		O		O
Vaccination	Lasota (* n1)			O						O			
Injection	KELAMECTIN	O			O				O			O	
	*n1:For hatched chicks within 2 weeks old												
	For all fowls in Sept. & March												
	VECTOCID: Add once more at the beginning of rainy season												

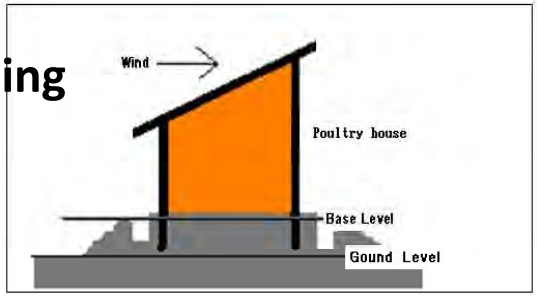
The eye shadow parasite in chicken



LS 11: Goat production

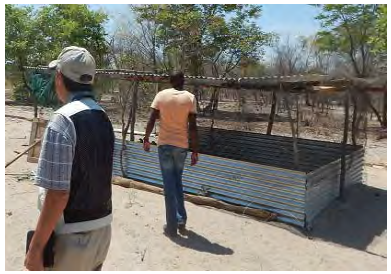
LS 13: Chicken production (indigenous)

Chicken Housing



Important points of housing	
Wind direction	Strong wind blows away hutch
Shadow	Death by heat
Rain prevention	Blown away by flood, drowning by heavy rain
Warming	Death by coldness
Predator	Be eaten or attacked by predator such as dog, cat, snake
Feeding	Slow growth, lack of food
Watering	Lack of water, thirsty
Laying box	Broken eggs, no hatching, egg eater chicken

Many types of chicken housing


Feeding and watering





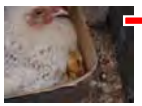


Hatching nests









Laying nests











Farm Management

FM 1, 5, 6, 10

FM Technical Measures

- FM 1: Book keeping (Farm records)
- FM 5: Group formation / group strengthening
- FM 6: Group account management
- FM 10: Market information access improvement

FM 1: Book keeping (Farm records)

FM 5: Group formation / group strengthening

Livestock cooperatives

To form livestock cooperative:
- **Member fee**
- **Opening of bank account**
- **Governing board: Chair person**
- **:Vice chair person**
- **: Accountant**
- **Advisory committee**

Auction

Local market penetration & to gain in market share

Livestock Cooperative

To develop marketing contact with: MeatCo. , Local abattoir, Brokers and Speculators

To prepare farmer members to improve livestock quantity and quality:
1. Improvement of livestock production
2. Sustainable rangeland management
3. Understanding of livestock marketing
4. Appropriate utilisation of veterinary medicine

FM 6: Group account management

FM 10: Market information access improvement

Training Material 4

4th AT Training, April 2016

Phase 2

N-CLIMP

Republic of Namibia
Ministry of Agriculture, Water and Forestry

N-CLIMP

NORTHERN CROP AND LIVESTOCK DEVELOPMENT MASTER PLAN STUDY IN THE REPUBLIC OF NAMIBIA

Pilot Project Activities

4th Training for Agricultural Technicians

March 2016

JAPAN INTERNANATIONAL COOPERATION AGENCY (JICA)

NIPPON KOEI CO., LTD.

N-CLIMP

Northern Crop and Livestock Production Master Plan Study in the Republic of Namibia

4th Training for Agricultural Technicians
Implementation of Pilot Projects

30th and 31st March 2016

at the Board Room of AMTA Fresh Produce Business Hubs, Ongwediva

Draft Agenda

Time	Subject	Presenter
08:45-09:00	Registration	-
09:00-09:10	Opening Remarks	◆ Chairperson: Acting Deputy Director, DAPEES, or representative
09:10-10:00	Introduction ◆ Schedule of training for farmers groups ◆ Review of the previous trainings	◆ Mr. Morioka, Dr. Joho, Mr. Michael Dege, JICA Team
10:00-11:00	Training by sector ◆ Crop sector ◆ Livestock sector ◆ Farm management sector	◆ Mr. Morioka, Mr. Orita, Dr. Joho, Mr. Michael Dege, Ms. Bernadette Erago, JICA Team
11:00-11:20	Coffee Breaks	
11:20-12:00	Training by sector (Continue) ◆ Crop sector ◆ Livestock sector ◆ Farm management sector	◆ Mr. Morioka, Mr. Orita, Dr. Joho, Mr. Michael Dege, Ms. Bernadette Erago, JICA Team
12:00-13:10	Training Coaching ◆ Rehearsal & role play	◆ Dr. Joho, Mr. Michael Degé, Ms. Bernadette Erago, JiCA Team
13:10-13:20	Assessment & Schedule ◆ Assessment & evaluation ◆ Confirmation of schedule	◆ Dr. Joho, Mr. Michael Degé, Mr. Morioka, Ms. Bernadete, JICA Team
13:20-13:30	Closing	◆ Chairperson: Acting Deputy Director, DAPEES, or representative
13:30-14:30	Lunch	

Japan International Cooperation Agency (JICA)

Ministry of Agriculture, Water and Forestry (MAWF), Namibia

N-CLIMP

Northern Crop and Livestock Development Master Plan Study

4th Training for Agricultural Technicians

March 2016

JICA Team Member

Position / Designation	Name
Experts	
Team Leader	Otsuka Shigeya, Mr.
Deputy Team Leader / Crop	Morioka Naoto, Mr.
Livestock	Orita Iwami, Mr. Dr.
Farm Management / Training	Joho Yukiko, Ms. Dr.
Resource Persons	
Training / Facilitation	Michael Dege, Mr.
(Livestock	Fonnie Bruwer Mr. Dr.)
Staff	
Farm Management / Training	Bernadette Erago, Ms.
Administrative Officer	Johanna Ekandjo Ms.
Field Assistant (Livestock)	Daniel M. Imalwa Mr.
Field Assistant (Crop) Field Assistant (Crop) new	Aini Amukoto, Ms. Benyamin Shikesho, Mr.

Agenda of the 4th Training for ATs

Time	Subject	Presenter
08:45 – 09:00	Registration	
09:00 – 09:10	Opening Remarks	Chairperson
09:10 – 10:00	Introduction	Mr. N. Morioka
10:00 – 11:00	Training by Sector - Crop sector - Livestock sector - Farm Management	Mr. Morioka, Dr. Orita, Dr. Joho, Mr. Michael Dege, Ms. Bernadette
11:00 – 11:20	Coffee Breaks	
11:20 – 12:00	Training by Sector (continue)	- Do -
12:00 – 13:00	Training Coaching - Rehearsal & role play	Dr. Joho, Mr. Morioka, Dr. Orita, Mr. Michael Dege, Ms. Bernadette
13:00 – 13:20	Assessment & Schedule	
13:20 – 13:30	Closing	Chairperson
13:30 – 14:30	Lunch	

Introduction

1. Outline of the Study and Pilot Site Activities
2. Confirmation of the date of trainings for farmers groups by ATS
3. Review of the 1st, 2nd & 3rd Trainings
4. Technical measures applied to each pilot sites

1. Outline of the Study

1. Outline of the Study (1)

- Objective:
  to improve current situation of crop and livestock production of small-scale farmers in northern Namibia
- Scope :
  to identify technical measures to improve farming,
  to examine and verify technical measures, and
  to compile technical measures into the Master Plan
- Target Area:
  4 regions of Oshikoto, Oshana, Ohangwena & Omusati in NCD
- Study Period:
  3 Phases from August 2014 to July 2017
  Phase 1: Aug. 2014 – May 2015
  Phase 2: July 2015 – May 2016
  Phase 3: May 2016 – July 2017

1. Outline of the Study (2)

Capacity Development by SHEP Approach

Principle: Encourage…

- farmers to have business mind in agriculture,
- farmers to think it possible to increase profit from agriculture,
- farmers to increase their motivation by series of training, and
- ATs to recognize value of duties to enhance their motivation.

Namibia-type SHEP approach

- Application of SHEP approach to overall study activities, and
- Appropriate target for each type of farmers: (i) market promotion for surplus farmers and (ii) home accounts (income and expenditure) improvement for self-consumption farmers

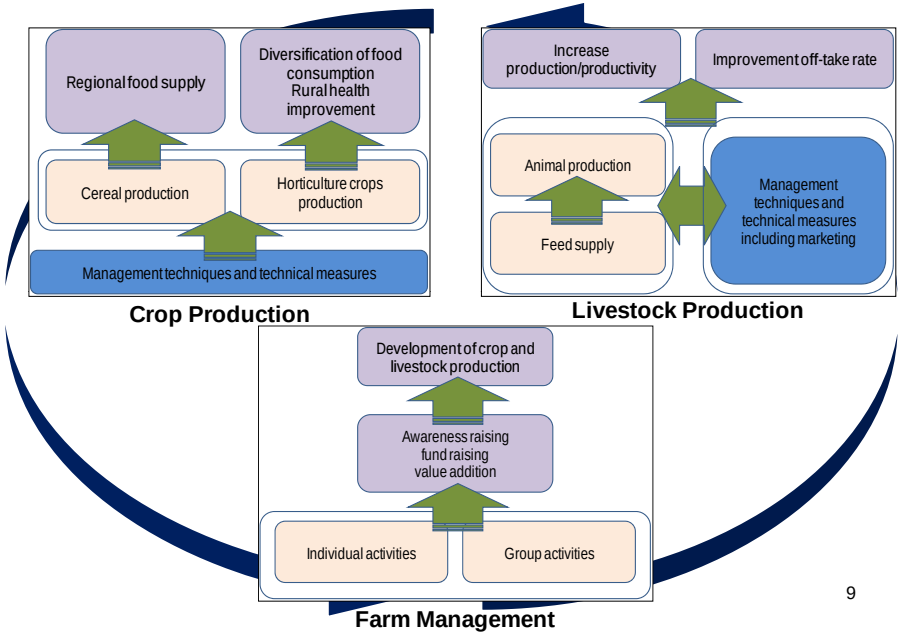
- Namibia-type SHEP approach
  SHEP: *Smallholder Horticulture Empowerment and Promotion Approach*

1. Outline of the Study (3)

Technical Measures & Pilot Site Activities

- Phase 1: Sept. 2014 to May 2015
  - Total 35 technical measures identified, consists of crop: 9, livestock: 16, farm management: 10
  - Framework of Master Plan to apply technical measures
- Phase 2: July 2015 to May 2016
  - Examination and verification of 27 technical measures through Pilot Site Activities (Pilot Projects: 16 sites)
  - Results to be incorporated into Draft Master Plan
- Phase 3: July 2016 to July 2017
  - Expansion of Pilot Site Activities (through MAWF budget)
  - Results and effects to be incorporated in the Master Plan (target year: 2030)

Techniques and Technical Measures



1. Outline of the Study (4)

Technical Measures (27 measurs)

CR: Crop (8)	LS-6: Large & Small Stock Fattening
CR-1: Fertilizer Application	LS-7: Periodical Production
CR-2: Cropping Pattern & Crop Management	LS-11: Goat Production
CR-3: Conservation Agriculture	LS-12: Pig Production
CR-4: Rice-Mahangu Mixed Cropping System	LS-13: Chicken Production
CR-5: Water Source / Water Harvesting (horticul.)	LS-16: Strengthening of Livestock Cooperative
CR-6: Water Saving Cultivation (horticulture)	FM: Farm Management (8)
CR-7: Crop Selection (horticulture)	FM-2: Record Keeping
CR-8: Cropping Plan & Crop Management (hort.)	FM-3: Post Harvest
LS: Livestock (11)	FM-5: Group formation & Strengthening
LS-1: Fodder Production	FM-6: Group Accounting Management
LS-2: Range Management	FM-7: Formation of Water Users Association
LS-3: Water Harvesting / Water Source Facilities	FM-8: Collective Selling & Purchasing
LS-4: Feed Supply for Small Stocks	FM-9: Rural Finance Accessibility Improvement
LS-5: Disease Control	FM-10: Market Information Access Improvement

Image of Pilot Site Activities (1/2)

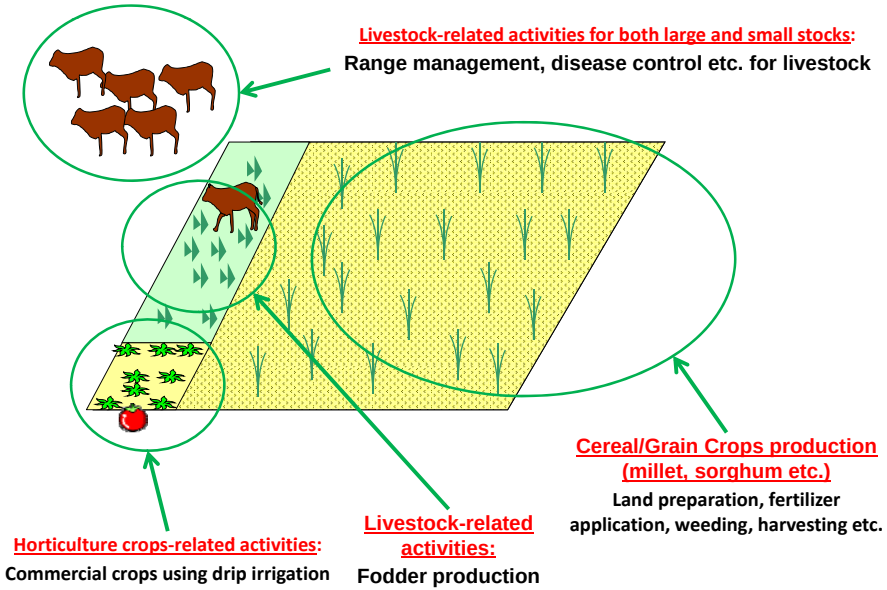
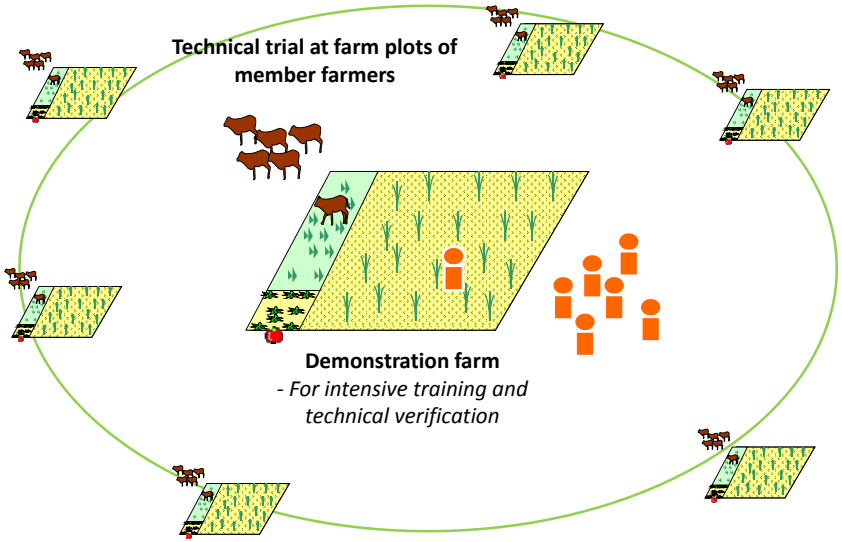


Image of Pilot Site Activities (2/2)



1. Outline of the Study (5)
Process for Preparation of Pilot Site Activities

- Stakeholder Meeting 1: early Aug. 2015
  Selection of pilot sites
- Preparatory Training for Farmers' Group: Aug. to Sept. 2015
  Preparation of the action plan by farmers to enhance farmers motivation (issues and tech. measures)
- Stakeholder Meeting 2: early Sept. 2015
  Preparation of action plan by ATs based on the results of the Preparatory Training and the list of key farmers

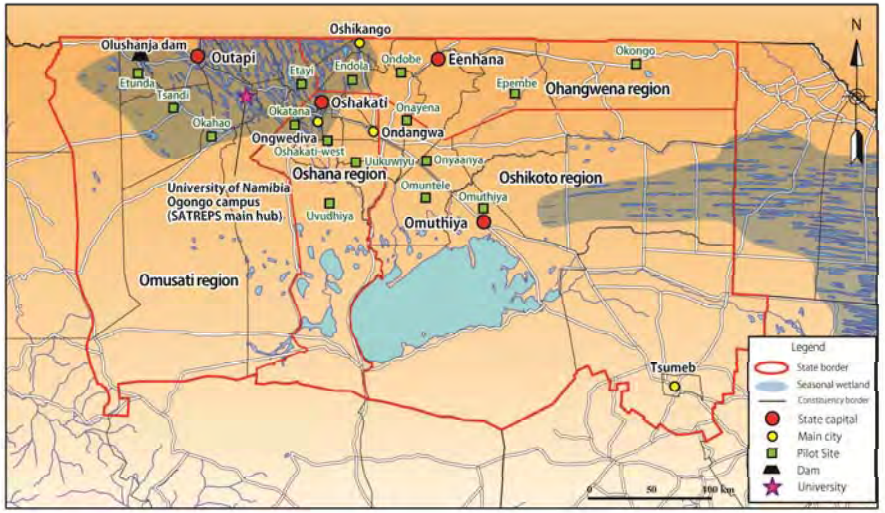
1. Outline of the Study (6)
Process for Preparation of Pilot Site Activities

Region	Stakeholder Meeting (1)	Preparatory Training for Farmers Group	Stakeholder Meeting (2)
Ohangwena	Aug. 04 (Tue)	Aug. 20 (Thu)	Sept. 02 (Wed)
Omusati	Aug. 05 (Wed)	Aug. 24 (Mon)	Sept. 03 (Thu)
Oshana	Aug. 17 (Mon)	Aug. 27 (Thu)	Sept. 08 (Tue)
Oshikoto	Aug. 25 (Tue)	Sept. 09 (Wed)	Sept. 09 (Wed)

1. Outline of the Study (7)
Pilot Site Activities by ADC (Constituency)

Region	Crop Cereal Grains	Horticulture	Cattle	Small Stock
Ohangwena	Ondobe (Ondone)	Epembe (Epembe)	Okongo (Okongo)	Endola (Endola)
Omusati	Etayi (Etayi)	Etunda (Ruacana)	Okahao (Okahao)	Tsandi (Tsandi)
Oshana	Okau-Kamasheshe (Oshakati-West)	Uukwangula (Okatana)	Engombe (Uuvdiya)	Uukwiyu-uushona (Uukwiyu)
Oshikoto	Okashana (Omuthiya)	Onayena (Onayena)	Omuntele (Omuntele)	Onankali (Onyaanya)

1. Outline of the Study (8)
Location of Pilot Project Sites



Location Map of Pilot Site Activities

1. Outline of the Study (9)
Training Process for ATs & Farmers Groups

✓ 1st Training of ATs : 1st week of Nov. 2015

→ Training of Farmers Groups by ATs: 2nd–3rd Weeks of Nov.

✓ 2nd Training of ATs: 4th week of Nov. 2015

→Training for Farmers Groups by ATS: 2nd–3rd Weeks of Dec.

✓3rd Training of ATs: 1st week of Feb. 2016

→ Training for Farmers Groups by ATs: 2nd–3rd Weeks of Feb.

✓ 4th Training of ATs: 5th week of Mar. 2016

→ Training for Farmers Groups by ATs: 1st Week of Apr.

Outline of the (10)
Trainings of ATs (TOT)

- One day training at Ongwediva:
  - ATs in charge, inviting the MAWF officers, relevant agencies: DVS, DARD, Meat Board, AMTA, AgriBusDev, etc.
- Exercise through role play by rehearsal for training for famers.
- Before training, ATs discuss with farmers to decide the date of farmers training.

1. Outline of the Study (11)
Trainings of Farmers Groups

- Half day trainings for 15 key farmers at <u>demonstration farms</u> by AT with support of JICA Team.
- Other ATs may participate for training.

	Crop Team	Livestock Team
Morning Session	Cereal Grain	Cattle
Afternoon Session	Horticulture	Small Stock

2. Confirmation of Date
Training for Farmers Groups by ATs

2. Confirmation of Date (1)

4th Training for ATs & Farmers Group by ATs

Region (AT Training)	Cereal Grains (Farmers Training)	Horticulture (Farmers Training)	Cattle (Farmers Training)	Small Stock (Farmers Training)
Omusati Mar. 31 (Thu)	(09;30) Etayi Apr. 6 (Wed)	(13;00) Etunda Apr. 6 (Wed)	(13:00) Okahao Apr. 6 (Wed)	(09:00) Tsandi Apr. 6 (Wed)
Oshana Mar. 30 (Wed)	(14;00) Okaukamasheshe (Oshakati-West) Apr. 4 (Mon)	(09;30) Uukwangula (Okatana) Apr. 4 (Mon)	(14;00) Engombe (Uuvudhiya) Apr. 4 (Mon)	(08;30) Uukwiyu-uushona Apr. 4 (Mon)
Oshikoto Mar. 30 (Wed)	(13;00) Okashana (Omuthiya) Apr. 5 (Tue)	(09;00) Onayena Apr. 5 (Tue)	(13;00) Omuntele Apr. 5 (Tue)	(09:00) Onankali (Onyaanya) Apr. 5 (Tue)
Ohangwena Mar. 31 (Thu)	(09;30) Ondobe Apr. 7 (Thu)	(14;00) Epembe Apr. 7 (Thu)	(10;00) Okongo Apr. 7 (Thu)	(14;00) Endola Apr. 7 (Thu)

•Joint Stakeholder Meeting on Draft Master Plan: Tentative date of April 12 (Tue) .
•Ask farmers to bring the farm records.

3. Review of Trainings

1st, 2nd, and 3rd Training

3. Review of 1st – 3rd Trainings (1)

1st Training for ATs & Farmers Group by ATs

Region (AT Training)	Cereal Grains (Farmers Training)	Horticulture (Farmers Training)	Cattle (Farmers Training)	Small Stock (Farmers Training)
Omusati Nov. 03 (Tue)	Etayi Nov. 19 (Thu)	Etunda Nov. 06 (Fri)	Okahao Nov. 06 (Fri)	Tsandi Nov. 19 (Thu)
Oshana Nov. 17 (Tue)	Okaukamasheshe (Oshakati-West) Nov. 18 (Wed)	Uukwangula (Okatana) Nov. 18 (Wed))	Engombe (Uuvudhiya) Nov. 18 (Wed)	Uukwiyu-uushona Nov. 19 (Thu)
Oshikoto Nov. 04 (Wed)	Okashana (Omuthiya) Nov. 12 (Thu)	Onayena Nov. 12 (Thu)	Omuntele Nov. 12 (Thu)	Onankali (Onyaanya) Nov. 12 (Thu)
Ohangwena Nov. 04 (Wed)	Ondobe Nov. 10 (Tue)	Epembe Nov. 10 (Tue)	Okongo Nov. 10 (Tue)	Endola Nov. 16 (Mon)

3. Review of 1st – 3rd Trainings (2)

2nd Training for ATs & Farmers Group by ATs

Region (AT Training)	Cereal Grains (Farmers Training)	Horticulture (Farmers Training)	Cattle (Farmers Training)	Small Stock (Farmers Training)
Omusati Nov. 23 (Mon)	Etayi Dec. 01 (Thu)	Etunda (Nov. 26 (Thu))	Okahao Nov. 26 (Thu)	Tsandi Nov. 26 (Thu)
Oshana Dec. 08 (Tue)	Okaukamasheshe (Oshakati-West) Dec. 09 (Wed)	Uukwangula (Okatana) Dec. 09 (Wed)	Engombe (Uuvudhiya) Dec. 09 (Wed)	Uukwiyu-uushona Dec. 09 (Wed)
Oshikoto Nov. 24 (Tue)	Okashana (Omuthiya) Nov. 26 (Thu)	Onayena Nov. 25 (Wed)	Omuntele Nov. 25 (Wed)	Onankali (Onyaanya) Nov. 25 (Wed)
Ohangwena Nov. 24 (Tue)	Ondobe Dec. 07 (Mon)	Epembe Dec. 07 (Mon)	Okongo Dec. 07 (Mon)	Endola Dec. 07 (Mon)

3. Review of 1st – 3rd Trainings (3)

3rd Training for ATs & Farmers

Region (AT Training)	Cereal Grains (Farmers Training)	Horticulture (Farmers Training)	Cattle (Farmers Training)	Small Stock (Farmers Training)
Omusati Feb. 2 (Tue)	Etayi Feb. 4 (Thu)	Etunda -	Okahao Feb. 4 (Thu)	Tsandi Feb. 8 (Mon)
Oshana Feb. 2 (Tue)	Okaukamasheshe (Oshakati-West) Feb. 9 (Tue)	Uukwangula (Okatana) Feb. 10 (Wed)	Engombe (Uuvudhiya) Feb. 9 (Tue)	Uukwiyu-uushona Feb. 10 (Wed)
Oshikoto Feb. 3 (Wed)	Okashana (Omuthiya) Feb. 11 (Thu)	Onayena Feb. 12 (Fri)	Omuntele Feb. 11 (Thu)	Onankali (Onyaanya) Feb. 12 (Fri)
Ohangwena Feb. 3 (Tue)	Ondobe Feb. 18 (Thu)	Epembe Feb. 17 (Wed)	Okongo Feb. 16 (Tue)	Endola Feb. 17 (Wed)

3. Review of 1st, 2nd, & 3rd Trainings (4)

Issues & Lesson Learnt

- Crop Sector in General
  - Rainfall situation
  - Grains
  - Horticulture
- Livestock in General
  - Cattle
  - Small Stock

- Baseline Survey, Monitoring, Field Day, etc.
- Sign Board at Pilot Project Sites

4. Modification of Technical Measures at each Pilot Site

4. Modification of Technical Measures (1)

- Preparatory Training for Farmers Groups
  - Technical measures were selected for each pilot site by the representatives from selected farmers groups.
- 1st and 2nd Trainings for Farmers Groups
  - Technical measures to be applied were explained and discussed among key farmers, ATs and JICA Team at the demonstration farm.
  - Based on the discussion at the site, technical measures at each site were modified.
  - For example, CR-7: “Crop Selection and Marketing” is essential for horticulture under the SHEP Approach, and additionally included in list of technical measures at each site of horticulture.

4. Modification of Technical Measures (2)
Omusati and Oshana

List of Techniques and Technical Measures for each pilot site

		Region	Omusati								Oshana							
		ADC	Etayi		Etunda		Okahao		Tsandi		Oshakati West		Okatana		Uuvudhiya		Uukwiyu	
		Activity	Cereal		Horticulture		Cattle		Small Stocks		Cereal		Horticulture		Cattle		Small Stocks	
		No.	1-1		1-2		1-3		1-4		2-1		2-2		2-3		2-4	
			Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual
Crop Production																		
	Cereal																	
	CR-1	Fertilizer Application	○									○						
	CR-2	Cropping Pattern	○	○							○	○						
	CR-3	Conservation Agriculture									○	○						
	CR-4	Flood- and drought- adaptive cropping system (rice-mahangu mixed	○	○														
	Horticulture																	
	CR-5	Water source / Water harvesting			○								○	○				
	CR-6	Water saving cultivation			○	○							○	○				
	CR-7	Crop selection and Marketing			○	○							○	○				
	CR-8	Cropping plan and horticulture crop management			○	○							○	○				
Livestock Production																		
	Cattle																	
	LS-1	Fodder production					○	○							○	○		
	LS-2	Range management					○	○							○	○		
	LS-3	Water harvesting and/or construction of water resource facilities for					○								○			
	LS-5	Disease control					○	○							○	○		
	LS-6	Large and small stock fattening					○	○										
	LS-7	Periodical production																
	LS-16	Establishment and strengthening livestock cooperatives													○			
	Small Stocks																	
	LS-1	Fodder production																
	LS-2	Range management																
	LS-3	Water harvesting and/or construction of water resource facilities for							○								○	
	LS-4	Nutritiuos food supply for pig and chicken							○	○							○	○
	LS-5	Disease control							○	○							○	○
	LS-6	Large and small stock fattening							○									
	LS-7	Periodical production																
	LS-11	Goat production																
	LS-12	Pig production																
	LS-13	Chicken production (indigenous)							○	○							○	○
	LS-16	Establishment and strengthening livestock cooperatives																
Farm Management																		
	FM-2	Book keeping (Farm Record)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	FM-3	Post harvest									○		○					
	FM-5	Group formation/ Group strengthening			○	○	○		○	○				○	○		○	○
	FM-6	Group account management	○		○	△	○		○		○			○	○		○	
	FM-7	Formulation of WUA															○	
	FM-8	Collective selling/ Purchasing							○				○				○	
	FM-9	Rural finance accessibility improvement							○				○					
	FM-10	Market information access improvement	○		○	○	○		○	○				○	○		○	○
Total number of techniques			6	3	8	7	9	5	11	6	5	4	8	8	9	4	10	6

P: Plan, A:Actual

4. Modification of Technical Measures (3)
Oshikoto and Ohangwena

List of Techniques and Technical Measures for each pilot site

		Region	Oshikoto								Ohangwena							
		ADC	Omuthiya		Onayena		Omuntele		Onyaanya		Ondobe		Epembe		Okongo		Endola	
		Activity	Cereal		Horticulture		Cattle		Small Stocks		Cereal		Horticulture		Cattle		Small Stocks	
		No.	3-1		3-2		3-3		3-4		4-1		4-2		4-3		4-4	
			Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual
Crop Production																		
	Cereal																	
	CR-1	Fertilizer Application		○							○	○						
	CR-2	Cropping Pattern	○	○							○	○						
	CR-3	Conservation Agriculture	○	○							○	○						
	CR-4	Flood- and drought- adaptive cropping system (rice-mahangu mixed																
	Horticulture																	
	CR-5	Water source / Water harvesting			○													
	CR-6	Water saving cultivation			○	○							○	○				
	CR-7	Crop selection and Marketing				○								○				
	CR-8	Cropping plan and horticulture crop management			○	○							○	○				
Livestock Production																		
	Cattle																	
	LS-1	Fodder production					○	○							○	○		
	LS-2	Range management					○	○							○	○		
	LS-3	Water harvesting and/or construction of water resource facilities for					○								○			
	LS-5	Disease control					○	○							○	○		
	LS-6	Large and small stock fattening					○											
	LS-7	Periodical production													○	○		
	LS-16	Establishment and strengthening livestock cooperatives					○											
	Small Stocks																	
	LS-1	Fodder production															○	○
	LS-2	Range management															○	
	LS-3	Water harvesting and/or construction of water resource facilities for															○	
	LS-4	Nutritiuos food supply for pig and chicken							○	○								
	LS-5	Disease control							○	○							○	○
	LS-6	Large and small stock fattening																
	LS-7	Periodical production																
	LS-11	Goat production															○	○
	LS-12	Pig production																
	LS-13	Chicken production (indigenous)							○	○								
	LS-16	Establishment and strengthening livestock cooperatives																
Farm Management																		
	FM-2	Book keeping (Farm Record)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	FM-3	Post harvest	○										○					
	FM-5	Group formation/ Group strengthening			○	△	○		○		○	○	○	○	○		○	
	FM-6	Group account management	○		○						○		○		○			
	FM-7	Formulation of WUA					○						○		○			
	FM-8	Collective selling/ Purchasing			○		○		○									
	FM-9	Rural finance accessibility improvement	○						○									
	FM-10	Market information access improvement	○			○	○		○	○	○			○	○			
Total number of techniques			7	4	7	6	11	4	7	6	7	5	7	6	10	5	8	4

N-CLIMP

Northern Crop and Livestock Development Master Plan Study

Thank you!

Water harvesting – Calculation of roof catchment

- Estimation of potential volume:

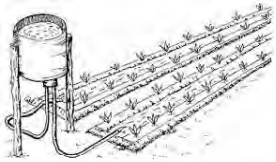
Roof catchment:

- Formula:
  Area in square metre x annual rainfall x 50%
- Example: Roof is 8 m x 5 m = 40 m^2
- Annual Rainfall = 400 mm
- Calculation:
  40 x 400 x 50%
  = 8,000 litre of water

Low pressure drip irrigation using a tank

- Larger tank (more than 200 lit.) is to be installed for larger area, at 1.5 m to 1.8 m high.

Low pressure drip irrigation using a bucket (no tank or tap)



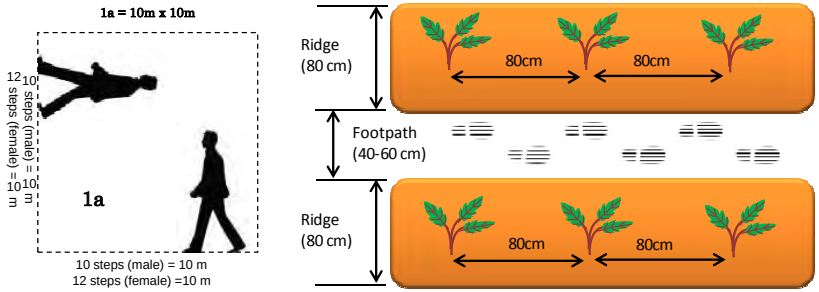
- Bucket (20 lit. to 50 lit.) is to be installed for smaller area, at 1.5 m to 1.8 m high.

Low pressure drip irrigation using a tap (no tank)

- Low pressure drip irrigation kit can be connected directly to water tap. This is not recommendable because water will be wasted (not saving water).

Drip irrigation maintenance

- Clear filter weekly
- Check daily for pipe leakages
- Check daily for nozzle blockages



Interval of ridge: about 1.0 -1.2 m, in order to maintain the space for smooth work and ventilation among plants.

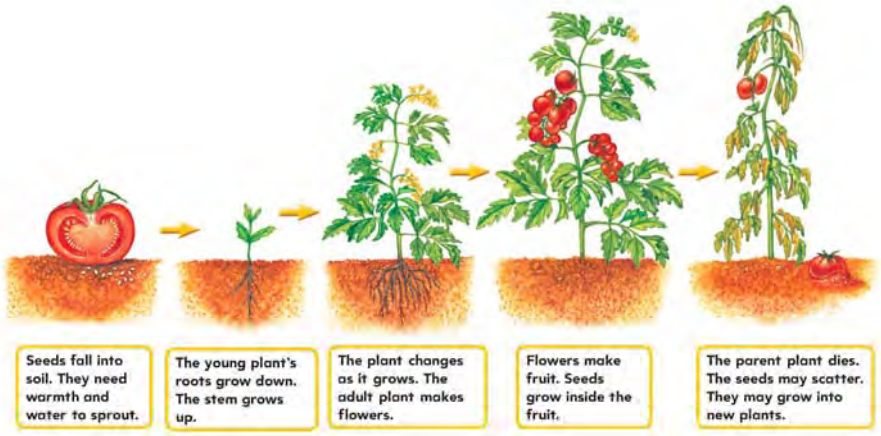
CR 8: Cropping plan and horticulture crop management Field preparation (1)

Planting and transplanting on the ridge of 15 to 20 cm high, well mixed soils with manure.

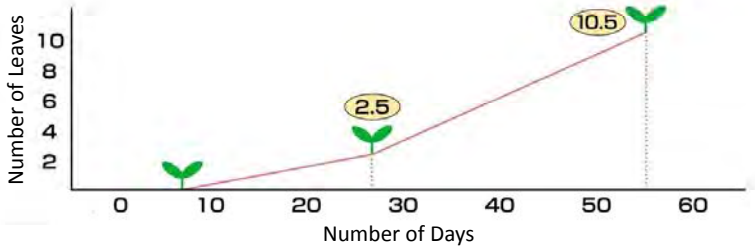
CR 8: Cropping plan and horticulture crop management Field preparation (3)

Crops	Average Duration
Tomato	4.0-4.5 months
Sweet Pepper	4.0-4.5 months
Eggplant	4.5-5.0 months
Cabbages	3.0-3.5 months
Onion	4.0-4.5 months
Watermelon	3.5-4.0 months
Carrot	3.5-4.0 months
French Beans	1.5-2.0 months

CR 8: Cropping plan and horticulture crop management

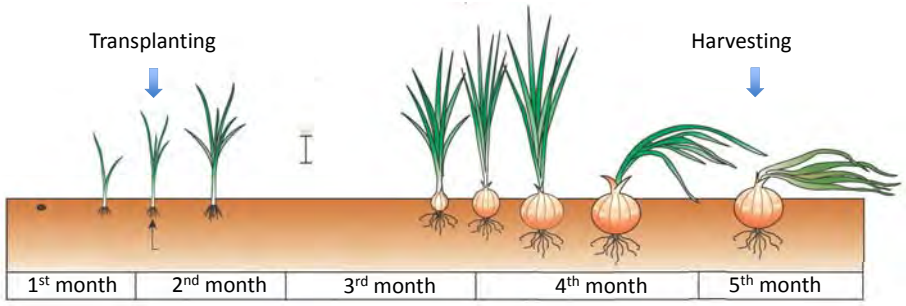


CR 8: Cropping plan and horticulture crop management
Tomato Life Cycle



In case of nursery raising, seedlings are transplanted at _____ leaves stage (about _____ days from germination).

CR 8: Cropping plan and horticulture crop management
Tomato Seedling



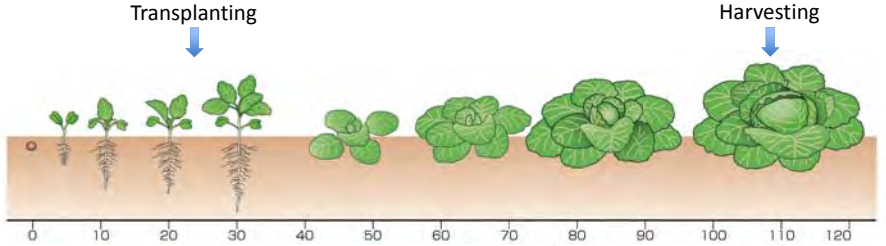
Basal: manure, top dressing: 10 to 15 g per m^2

Sowing time: February to May

Growth period: 4 to 4.5 months (or more by variety)

Transplanting: 1.5 month (3 to 4 leaves)

CR 8: Cropping plan and horticulture crop management
Onion Growth



Basal: manure, At planting: 30 g N per m^2

Top dressing: 50 g N per $m^2$of, 3 weeks from germination

Sowing time: Cold season, planting April to June

Growth period: 3 to 3.5 months (or more by variety)

Transplanting: 1 month (5 to 6 leaves)

CR 8: Cropping plan and horticulture crop management
Cabbage Growth

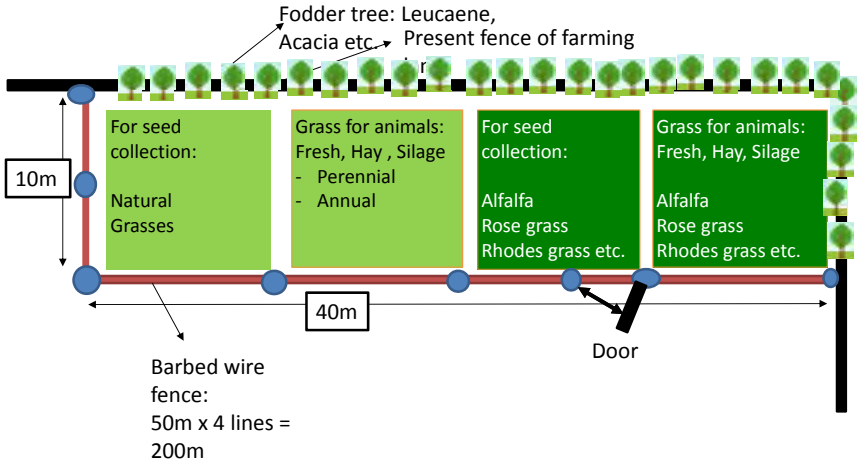
Livestock Production

Cattle - LS 1, 2, 5, 6, 7

LS Technical Measures (Cattle)

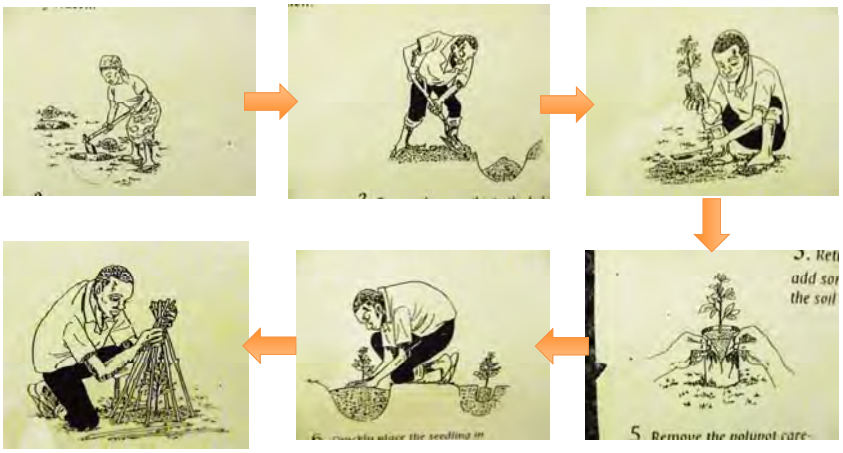
- LS 1: Fodder production
- LS 2: Range management
- LS 5: Disease control
- LS 6: Large and small stock fattening
- LS &: Periodical production

Fodder production



Land preparation

Seedlings



Hay making

Keep green colour
Keep in shadow
Dry rapidly

Hay table

Hay preparation

1. Cutting

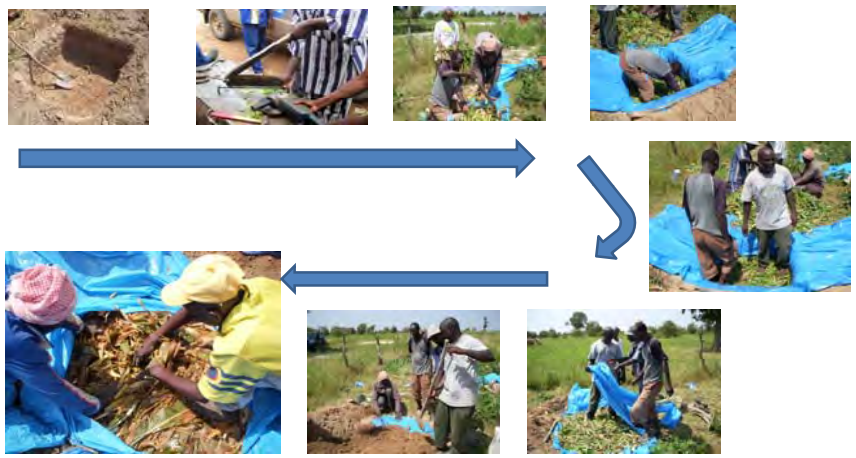
3. Storing

2. Drying

Seed collection

Top of fodder grass

Silage making



Damaged silage - Causes

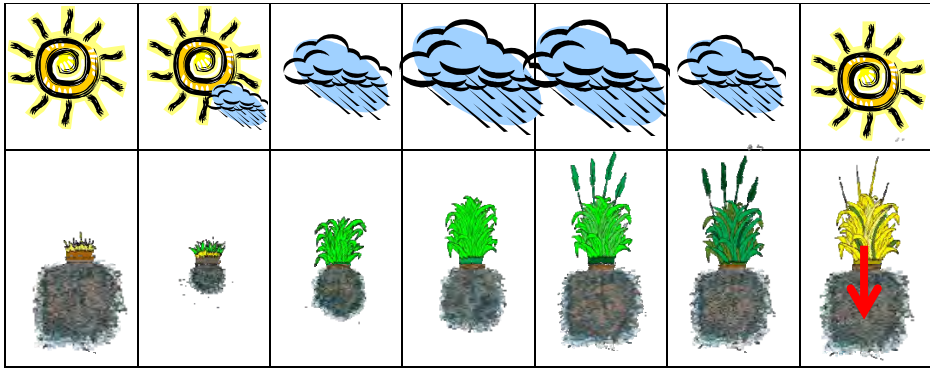
- Insufficient moisture control of silage stuffs
- Insufficient water discharge from silo
- Low pressure during process of silage making
- Imperfect sealing of silage top
- Improper silage materials
- Contamination

LS 2: Rangeland management

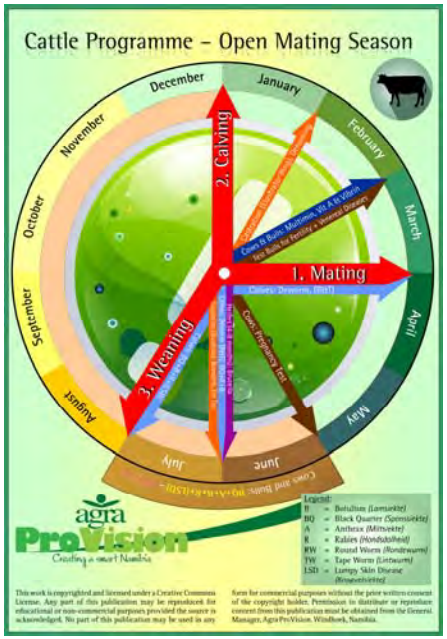
Rangeland management

- Overgrazing
- Overstocking

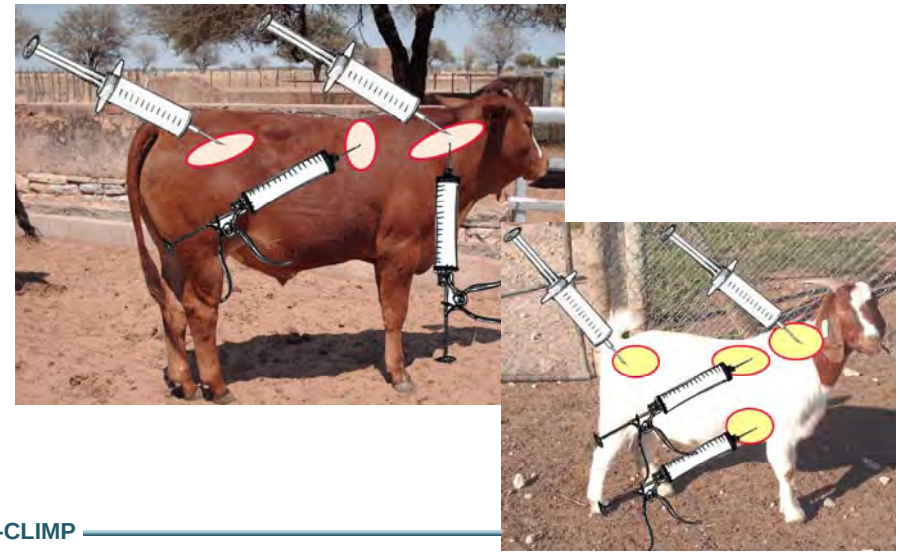
Prevent overgrazing – The perennial grass plant Rangeland must rest 6 weeks after grazing to allow regrowth



LS 5: Disease control



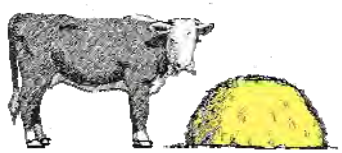
Subcutaneous and intra-muscular injection places for cattle and goats



LS 6: Large and small stock fattening

Daily food and water requirements

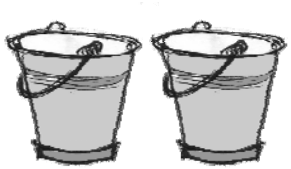
10% of body weight/day



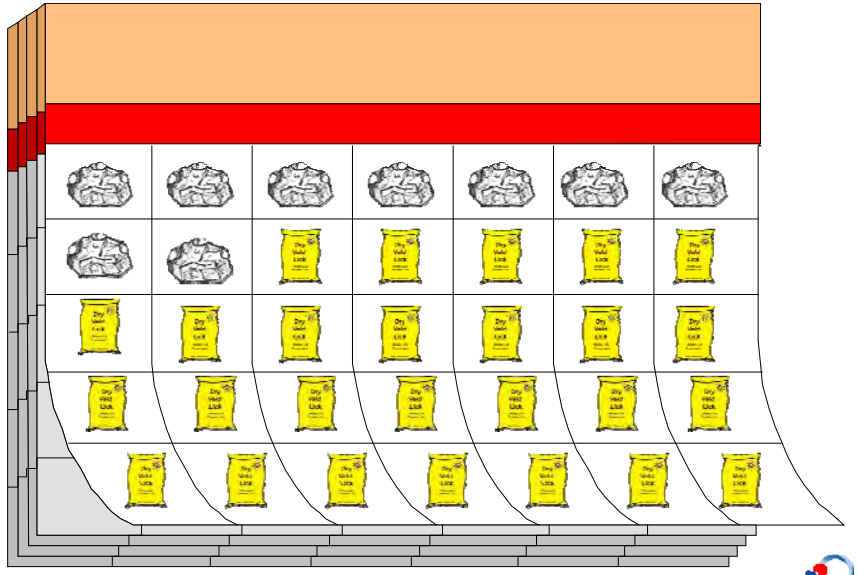
450kg

= 45 liter of water per day

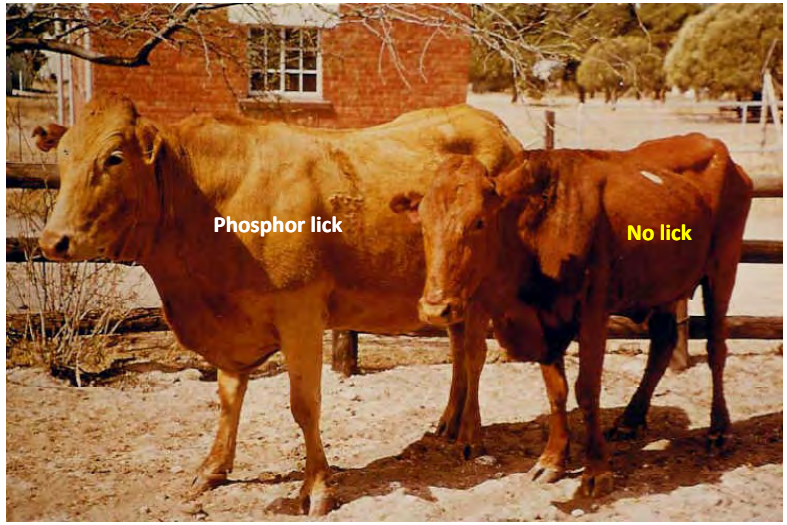
(note: 1 liter = 1 kg)



*If **NO** lick was provided for a long period …….*



Impact of not providing phosphor: condition and weight



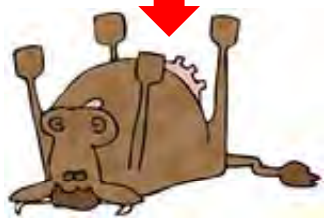
Phosphate
= contains phosphorus (P), calcium and trace elements / micro minerals

P6 (6%)
(mixed with salt = lick)

P12 (12%) / P14 - Futterfos

P18 (18%)

P21 (21%)

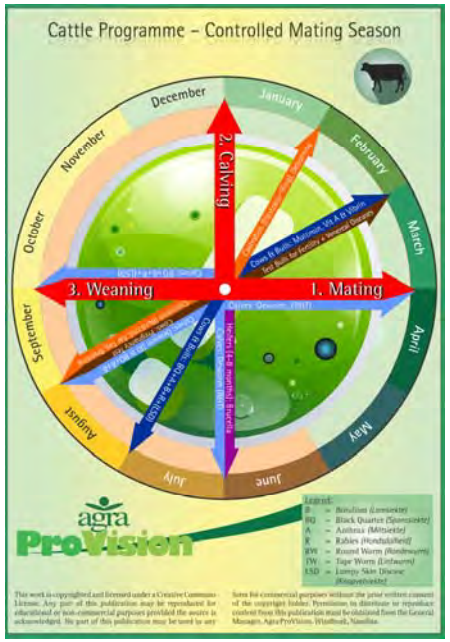


Providing any CONCENTRATE without mixing will kill cattle !

Mixing a CONCENTRATE with SALT will make cattle fat !

Wheel: Cattle Programme

LS 7: Periodical production



Livestock Production (LS)

Goats & Chicken: LS 1, 4, 5, 11, 13

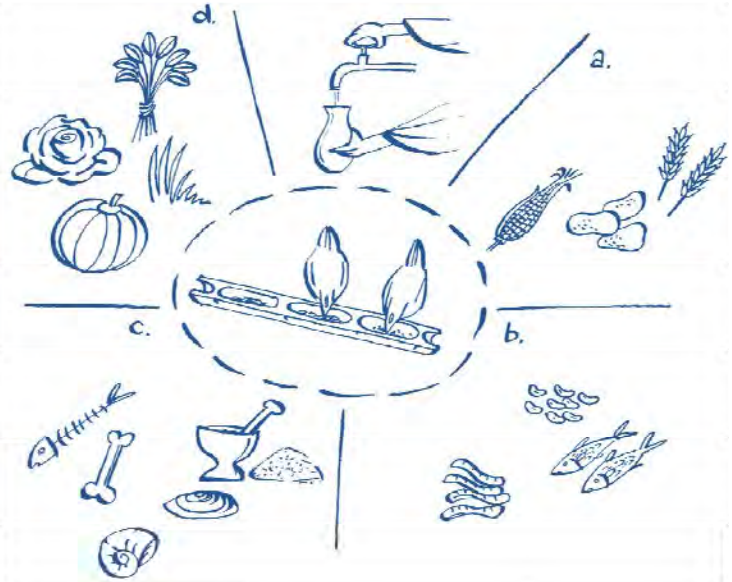
LS Technical Measures (Goats & Chicken)

- LS 1: Fodder production
- LS 4: Nutritious food supply for pig and chicken
- LS 5: Disease control
- LS 11: Goat production
- LS 13: Chicken production (indigenous)

LS 1: Fodder production

- Same as for cattle

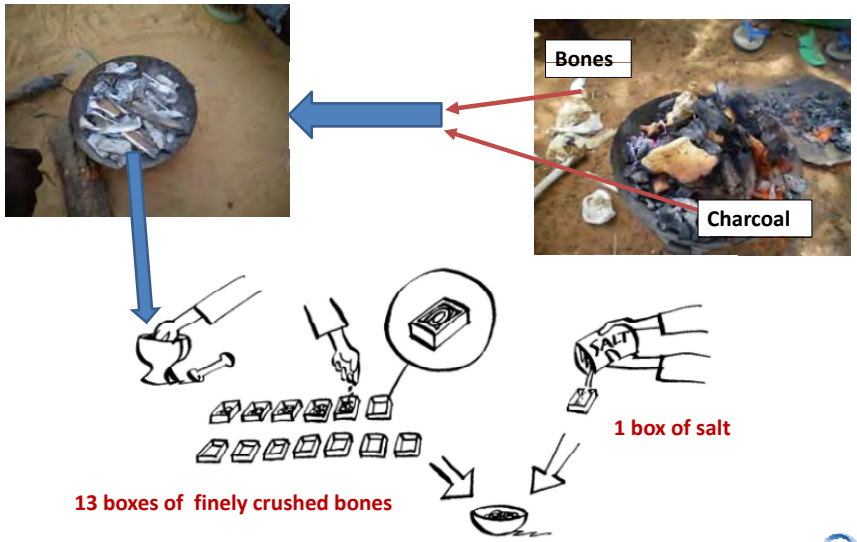
LS 4: Nutritious food supply for pig and chicken



Growing maggots

Growing termites

Preparing bone-meal for chicken



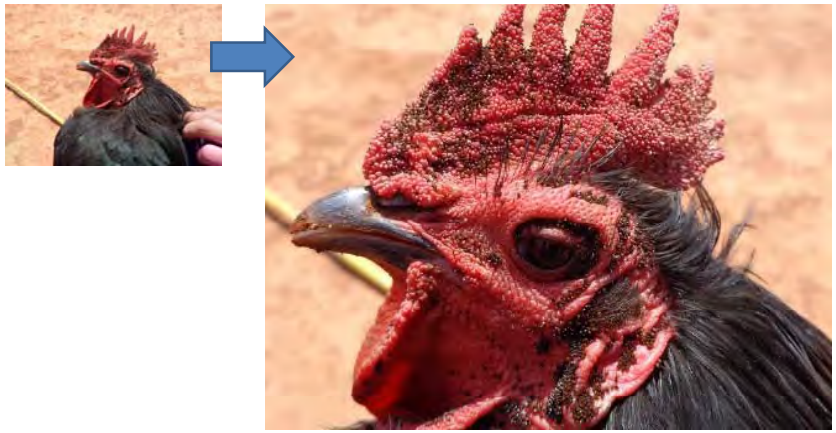
Only chicken, goats use the wheel to demonstrate

LS 5: Disease control

Disease control schedule - chicken

	Month	1	2	3	4	5	6	7	8	9	10	11	12
Spray	VECTOCID	O		O		O		O		O		O	
Oral	PROMECTINE		O		O		O		O		O		O
Vaccination	Lasota (* n1)			O						O			
Injection	KELAMECTIN	O			O				O			O	
	*n1:For hatched chicks within 2 weeks old												
	For all fowls in Sept. & March												
	VECTOCID: Add once more at the beginning of rainy season												

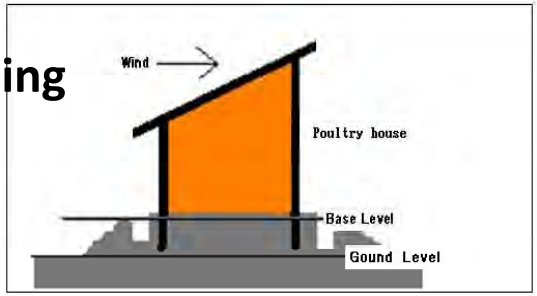
The eye shadow parasite in chicken



LS 11: Goat production

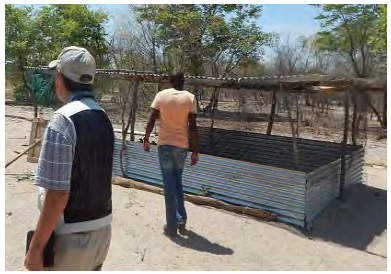
LS 13: Chicken production (indigenous)

Chicken Housing



Important points of housing	
Wind direction	Strong wind blows away hutch
Shadow	Death by heat
Rain prevention	Blown away by flood, drowning by heavy rain
Warming	Death by coldness
Predator	Be eaten or attacked by predator such as dog, cat, snake
Feeding	Slow growth, lack of food
Watering	Lack of water, thirsty
Laying box	Broken eggs, no hatching, egg eater chicken

Many types of chicken housing


Feeding and watering





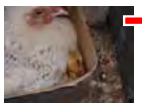


Hatching nests









Laying nests











Farm Management

FM 1, 5, 6, 10

FM Technical Measures

- FM 1: Book keeping (Farm records)
- FM 5: Group formation / group strengthening
- FM 6: Group account management
- FM 10: Market information access improvement

FM 1: Book keeping (Farm records)

FM 5: Group formation / group strengthening

Livestock cooperatives

To form livestock cooperative:
- **Member fee**
- **Opening of bank account**
- **Governing board: Chair person**
- **:Vice chair person**
- **: Accountant**
- **Advisory committee**

Auction

Local market penetration & to gain in market share

Livestock Cooperative

To develop marketing contact with: MeatCo. , Local abattoir, Brokers and Speculators

To prepare farmer members to improve livestock quantity and quality:
1. Improvement of livestock production
2. Sustainable rangeland management
3. Understanding of livestock marketing
4. Appropriate utilisation of veterinary medicine

FM 6: Group account management

FM 10: Market information access improvement

Farm Management
Crops

FM 1, 5, 6, 10

FM Technical Measures

- FM 1: Book keeping (Farm records)
- FM 5: Group formation / group strengthening
- FM 6: Group account management
- FM 10: Market information access improvement

FM 1: Book keeping (Farm records)

Annual Rainfall Records in mm

Rainfall at: _____ (Name of Farmer, ADC, Constituency)

	2015			2016								
Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												

Farm Record for Water

Name of Farmer (Group)
ADC, Constituency:

Date of Reading	By whom	How much?	Price?
		_____ Units	_____ N$
		_____ Units	_____ N$
		_____ Units	_____ N$
		_____ Units	_____ N$
		_____ Units	_____ N$
		_____ Units	_____ N$
		_____ Units	_____ N$

Farm Record for Fuel (Running Pumps)

Name of Farmer (Group)
ADC, Constituency: _____

Date of Fuel Purchased	By whom	How much?
		_____ litres _____ N$
		_____ litres _____ N$
		_____ litres _____ N$
		_____ litres _____ N$
		_____ litres _____ N$
		_____ litres _____ N$
		_____ litres _____ N$
		_____ litres _____ N$

Farm Record for Electricity

Name of Farmer (Group)
ADC, Constituency: _____

Date of Electricity Purchased	By whom	How much?
		_____ Units _____ N$
		_____ Units _____ N$
		_____ Units _____ N$
		_____ Units _____ N$
		_____ Units _____ N$
		_____ Units _____ N$
		_____ Units _____ N$

Farm Record for Cereal Grains		
Name of Farmer ADC, Constituency: _____		
Standard Action	**Date / By whom?**	**Remarks**
Basal Fertiliser: 2nd last week November (to be procured and applied by farmer)		Dosage: _____ kg/ha of manure in _____ kg/ha of fertiliser in treatment of plot
Land Preparation: Last week of November (to be arranged by AT, to be conducted by service provider		Treatment plot: Ripper furrowing Control plot: Usual method
Planting: After rainfall of more than 20 mm in 3 days		Seed volume _____ kg / ha Seed treatment, Pregermination
2nd Planting: (Replanting)		
3rd Planting: (Replanting)		
1st Thinning: 10 days to 2 weeks after germination		Selection of healthy seedlings, removal of weak seedlings. Plant density: 7 to 8 plants / m 3 to 5 plants / m
1st Weeding: 2 to 3 weeks after germination		Depending on weed growth.
Top Dressing:		3 weeks after germination.
2nd Thinning:		Selection of healthy seedlings, removal of weak seedlings.
2nd Weeding: 4 to 6 weeks after germination		Depending on weed growth.

Farm Record for Horticulture Crops		
Crop type: _____		
Name of Farmer (Group) ADC, Constituency: _____		
Standard Action	**Date / By whom?**	**Remarks**
Seed Preparation:		
Seedbed Preparation:		Depth of ploughing: _____ Fungicides and pesticides applied before sowing/transplanting:
Seedlings in nursery:		
Direct sowing in seedbed:		Plant Spacing: _____ Row Spacing: _____
Seedlings Transplanting:		Plant Spacing: _____ Row Spacing: _____
Sunlight Protection:		Young plants must be protected, not completely covered
Fertiliser application:		Type: _____ How much: _____
Pest Control:		Type: _____ How much: _____
Mulching:		Mulching in rows between seedlings and between plants
1st Weeding:		Depending on weed growth.
Top Dressing:		
2nd Thinning:		Selection of healthy seedlings, removal of weak seedlings.
2nd Weeding:		Depending on weed growth.
3rd Weeding:		Depending on weed growth.
Pest Control:		

FM 5: Group formation / group strengthening

Type of Groups

Constituency	Ondobe	Okatana	Epembe
Activity	Cereal	Horticulture	Horticulture
Characteristics	Well established group with 41 members, working together in group owned land for mahangu production	8 years experience with 11 members but at present they have internal conflict and re-constructing by changing some members	Newly established and no experience for horticulture production. Number of members growing (50 members as of January)

FM 6: Group account management

Group accounting

- General rules:
  - Appoint a treasurer/accountant
  - Open a separate bank account
  - Keep record of all income and expenditure
  - Budget for maintenance
  - Budget for replacement of equipment
  - Review income/expenditure at member meetings
  - Plan for profit
    - Use portion of profit to purchase seeds, fertiliser, equipment

FM 10: Market information access improvement - Crops

Market survey for Horticulture Production

Prior to 3rd training, market surveys for horticulture were conducted in Epembe and Okatana.

-Determine the markets to be visited (by AT)
-Prepare the survey questionnaire (by N-CLIMP Team)
-Carry out the survey

Crop selection and farming schedule will be done based on market survey information at 3rd training

Result of Market survey (Epembe)

Market Survey Questionnaire

Date: 27 Jan 2016
Name of Dealer:Johannes Ndapandula
Contact of the Dealer: 0813741177

Name of Market:
Name of team members:Turiki k,Nanghalu L,Soini Nekongo,Felepa Hashiko,Krist Nghimulitete

Crop & Variety	Product's Quality of Market Requirements	Months of Peak Demand	Quantity (kg) of Supply	Supply Frequency (daily/weekly, etc.)	Place of Production & Distance	Purchasing Unit Price (NAD/kg)	Mode of Payment	Time for Payment	Marketing Challenges	Dealer Willingness to Purchase Production from the Team
Tomato Roma	Good round	Anytime	7 tomatoes	Everyday	Oshikango 45km	220/kg	Cash	Immidiately	They get rotten easly	willing to support
Green pepper		Every month	3 Green pepper	Everyday	Oshikango 45km	210/kg	Cash	Immidiately	likely to get rotten	willing to support
Onion		Anytime	3-4 Onions	Everyday	Eenhana		Cash	Immidiately	likely to get rotten	willing to support

Sample for Crop Selection Sheet

Crop Selection Sheet

Date: **2 February 2016**

Name: **Bernadette**

Crop & Variety	Experience in cultivating the crop	Maturing period	Month of planting	Major production challenges	Main market(s)	Marketing condition	Remarks	Ranking
Tomato Roma	**Yes**	**3 months**	**6,12**	**Late blight disease**	**Ongwediva towm market Ongwediva hub**	**10kg 50kg 1000kg**	**A need to avoid damage while transportation**	**1**
Carrot	**No**	**3 months**	**7,8,9**	**Termite damage**	**Ongwediva hub**	**1000kg**	**A need to spray insecticide**	
Onion	**Yes**	**4 months**	**11,5**	**None**	**Ongwediva towm market Ongwediva hub**	**150kg 300kg 2000kg**		**2**
Cabbage	**Yes**	**3 months**	**6,12**	**Pests difficult to get controlled**	**Ongwediva towm market Ongwediva hub**	**300kg 500kg 2000kg**		
Brinjal (Eggplant)	**No**	**4 months**	**6,12**	**None**	**Ongwediva hub**	**1000kg**	**A need to avoid damage while transportation**	

Sample for Farming Schedule

Farming schedule

Date: **2 February 2016**

Name of Crop: **Tomato**

Name: **Bernadette**

	Month	February				March				April				May				June				July			
	Week	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Purchase of Inputs			✔																					
2	Land Preparation			✔																					
3	Nursery Sowing				✔																				
4	Transplanting									✔															
5	Top Dressing/ Fertilizer Application												✔			✔									
6	Pest Disease Control										✔		✔		✔										
7	Weeding										✔		✔		✔										
8	Harvesting																✔		✔		✔				
9	Marketing																✔		✔		✔				
10																									
11																									
12																									
13																									
14																									
15																									

Farm Management
Livestock

FM 1, 5, 10

FM Technical Measures

- FM 1: Book keeping (Farm records)
- FM 5: Group formation / group strengthening
- FM 10: Market information access improvement

FM 1: Book keeping (Farm records)
Livestock

Annual Rainfall Records in mm

Rainfall at: _____ (Name of Farmer, ADC, Constituency)

	2015			2016								
Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												

Farm Record for Water

Name of Farmer (Group)
ADC, Constituency:

Date of Reading	By whom	How much?	Price?
		_____ Units	_____ N$
		_____ Units	_____ N$
		_____ Units	_____ N$
		_____ Units	_____ N$
		_____ Units	_____ N$
		_____ Units	_____ N$
		_____ Units	_____ N$

Farm Record for Fuel (Running Pumps)

Name of Farmer (Group)
ADC, Constituency: _____

Date of Fuel Purchased	By whom	How much?
		_____ litres _____ N$
		_____ litres _____ N$
		_____ litres _____ N$
		_____ litres _____ N$
		_____ litres _____ N$
		_____ litres _____ N$
		_____ litres _____ N$
		_____ litres _____ N$

Farm Record for Electricity

Name of Farmer (Group)
ADC, Constituency: _____

Date of Electricity Purchased	By whom	How much?
		_____ Units _____ N$
		_____ Units _____ N$
		_____ Units _____ N$
		_____ Units _____ N$
		_____ Units _____ N$
		_____ Units _____ N$
		_____ Units _____ N$

Cow Record Card

ID (FANMEAT No.)	Name:
Birth date:	Describe:
Mother:	Father:
Date first to bull:	Bull(s):

	Calving date:	Sex:	FanMeat No:	Wean date:	Wean age:	Wean kg:	Comment
1							
2							
3							
4							
5							
6							
7							
8							
9							

Ewe Record Card

ID (FANMEAT No.)	Name:
Birth date:	Describe:
Mother:	Father:
Date first to ram:	Ram(s):

	Lambing date	Sex:	FanMeat No:	Wean date:	Wean age:	Wean kg:	Comment
1							
2							
3							
4							
5							
6							
7							
8							
9							

Farm Record for Vaccination

Name of Farmer (Group)

Date of Vaccination	Kind of Vaccination	By whom	Small/Large Livestock

Farmer name: ____________________

Cattle

	Activity	No. of					Price
Date	S D B C	Cows	Heifers	Bulls	Oxen	Calves	(N$)

Activity	
S	Sold
D	Dead
B	Bought
C	Calving

Farmer name: ____________________

Disease control

Cattle, Goat, Poultry

Date	Activity T DH C V	Heads	Name: Used Medicine	Medication I O P S	Used Volume (ml)	Name Buying Medicine	Medicine Price N$

Activity	
T	Treatment
DH	Dehorning
C	Castration
V	Vaccination

Medication	
I	Injection
O	Oral
P	Pour on
S	Spray

Farmer name: ____________________

Fodder Production

	Date	Action	Unit(kg, Number, a/ha)
Example	30/Dec/'15	LP S	400m2 Alfalfa Plot1
	02./Feb/'16	H	35kg Fresh grass Plot1
	05/Feb/'16	H	8kg Dry hay from Plot1
	16/Feb/'16	TT	Acacia seedling 20
	15/Feb/'16	F	Manure 20 kg Plot1

	Action
LP	Land Preparation
S	Sowing
TT	Transplanting Trees
H	Harvesting
SC	Seed Collection
F	Fertilizer

Farmer name: ____________________

Goat

	Activity	No. of				Price
Date	S D B K	Goat(♀)	Goat (♂)	Kids	Kidding	(N$)

Activity	
S	Sold
D	Dead
B	Bought
K	Kidding

Farmer's name: ____________________

Fattening of Cattle

Date	Items	Kg	Price(N$)

From market
Licks
Phosphate
Hay
Salt

Home-made
Grains
Hay
Silage
Others

Farmer name: ____________________

Nutritious food for chicken

Date	Activity	Kg	Price(N$)

PF	Feedmaster Poultry Feed	From market

	Basic simple feed mix ration in NCA (0-6weeks)	
CS	Crushed sorghum/millet grain or maize	1 tin can (1 kg tomato tin)
MB	Crushed sorghum bran or millet bran (mahangu)	1 tin can
BM	bone meal/salt mix	1 match box (1 salt with 13 bone meal)
A	Alfalfa (Lucerne)	2 match boxes
M	Maggots	Ad-lib
T	Termites	Ad-lib

1. Farmers produce this basic ration by themselves
2. Mixed ration should be given within a few weeks
3. Over 6 weeks, farmers can give soughum and millet directly without crushing

Farmer's name: ____________________

Poultry

Month		No. of Chickens	Cocks	Chicks	Eggs

Date	S,L,D,B,H	Chickens	Cocks	Chicks	Eggs	Price(N$)

S	Sold
L	Lost
D	Died
B	Bought
H	Hatched

FM 5: Group formation
Group strengthening - Chicken

Group formation - Chicken

- Appoint an accountant to assist with the finances
- Open a bank account
- To assist in planning for vaccinations
- Appoint “vaccinators”
- Create smaller groups for vaccination purposes
- Keep record of vaccinations

FM 10: Market information access improvement - Chicken

Market survey for Chicken Production

Market survey for Chicken will be done before 4th Training

-Determine the markets to be visited (by AT)
-Prepare the survey questionnaire (by N-CLIMP Team)
-Carry out the survey
-Analysis and Selection of mode of selling (egg, chicks, young chicken, matured chicken, so on)

Production based on market demand is very important to get better profit!