# Trans-SEC

Innovating pro-poor Strategies to safeguard Food Security using Technology and Knowledge Transfer

## Status Conference 2015, Potsdam Germany

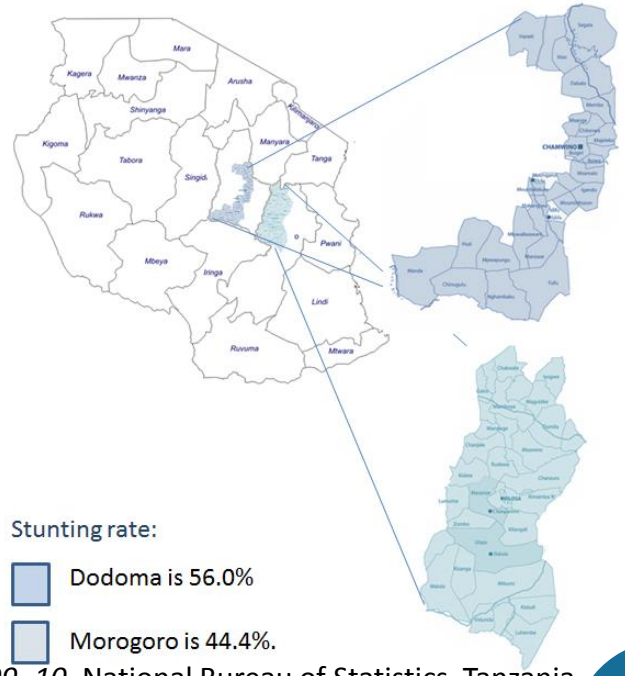
# A people-centered Approach

# Advisory Board


## National Department of Food Security of the Ministry for Agriculture, Food and Cooperatives in Tanzania

# Problem

- Definition Food Security
  - Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO),
    - **Access** income to purchase food or to grow its own food
    - **Availability** food supplied through production, distribution, exchange
    - **Utilization** to the metabolism of food by individuals.
    - **Stability** ability to obtain food over time.
- Undernourishment, Malnutrition, Stunting
  - 1000 days windows of opportunity
  - Reversible effects




National Bureau of Statistics and ICF Macro, 2010. *Tanzania Demographic and Health Survey 2009–10.* National Bureau of Statistics Tanzania.

# Trans-SEC Consortium

| | | | |
|---|---|---|---|
| | ZALF | **Coordinator:** Leibniz-Centre for Agricultural Landscape Research | **Management:** Dr. Stefan Sieber, stefan.sieber@zalf.de<br><br>**Scientific Coordination:** Dr. Frieder Graef, graef@zalf.de |
| | PTJ<br>BMBF<br>BMZ | **Funding Organization:** Project Management Jülich (PTJ) on behalf of the Federal Ministry of Education and Research (BMBF) Federal Ministry for Economic Cooperation and Development (BMZ) | |
| | UHOH | University of Hohenheim | Prof. Dr. Folkard Asch, fa@uni-hohenheim.de |
| | IUW | Leibniz University Hannover | Prof. Dr. Ulrike Grote, grote@iuw.uni-hannover.de |
| | HU | Humboldt-University Berlin | Prof. Dr. Wolfgang Bokelmann, w.bokelmann@agrar.hu-berlin.de |
| | DIE | German Development Institute | Dr. Michael Brüntrup, michael.bruentrup@die-gdi.de |

| | | | |
|---|---|---|---|
| | PIK | Potsdam Institute for Climate Impact Research | Dr. Christoph Müller, cmueller@pik-potsdam.de |
| | DITSL | German Institute for Tropical and Subtropical Agriculture | Dr. Brigitte Kaufmann, b.kaufmann@ditsl.org |
| | IFPRI | International Food Policy Research Institute (USA) | Dr. Ephraim Nkonya, e.nkonya@cgiar.org |
| | ICRAF | The International Centre for Research in Agroforestry (Kenya) | Anthony Kimaro, a.kimaro@cgiar.org |
| | SUA | Sokoine University of Agriculture (Tanzania) | Dr. Khamaldin Mutabazi, khamaldin@yahoo.com |
| | ARI | Agricultural Research Institutes (Tanzania) | Bashir Makoko, brmakoko@yahoo.com<br><br>Elirehema Swai, eyswai@yahoo.com |
| | TFC | Tanzania Federation of Cooperatives (Tanzania) | Janet Bitegeko, jbitegeko@hotmail.com |
| | ACT | Agricultural Council of Tanzania (Tanzania) | Gloria Mazoko, mazokogloria@yahoo.com |
| | MVIWATA | Network of Small-Scale Farmers' Groups (Tanzania) | Nickson Elly, nikisoelly@yahoo.com |

# Project(s) network for CC

## New projects in Trans-SEC case studies

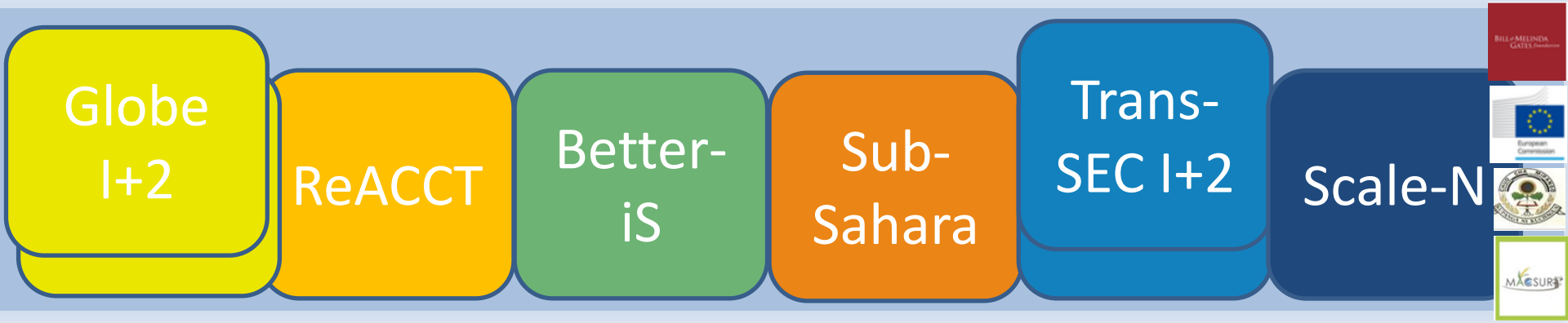
| | | | |
|---|---|---|---|
| | Trans-sec | Trans-sec – ZALF is a major flagship of the Trans-sec imitative. | Dr. Stefan Sieber Leibniz-Centre for Agricultural Landscape Research e.V. Eberswalder Straße 84 15374 Müncheberg |
| Scale-N | Scale N | Scale N is a projects in the Trans-SEC case studies and up-scales the nutrion UPS | Dr. Stefan Sieber + Constance Reif Leibniz-Centre for Agricultural Landscape Research e.V. |
| European Commission | New Project: EU Commission IPTS | Trans-SEC - ZALF is for the country Tanzania official partner of the IPTS EU-Commission Project "Technical and scientific Support to agriculture and Food and Nutrition Security sectors" financed by DEVCO-JRC. This project aims at 1. improving information systems, 2. Policy & economic analysis for decision-making processes and 3. scientific advice. | Contact person is Dr. Sergio Gomez Y Paloma at IPTS. European Commission, Joint Research Centre, Institute for Prospective Technological Studies. C/ Inca Garcilaso, s/n 41092 Seville, SPAIN; Tel.: +34 954 48 8318 Fax: +34 954 48 8300. |
| | Institute of Rural Development Planning (IRDP) | IRDP is the main Institute for Rural Development in Tanzania and was the lead partner in implementing Chololo Ecovillage project in | IRDP P.O.Box 138 Dodoma, TZ Phone: +255 762926426 Fax: +255 26 230 1341 Email frabe59@gmail.com |
| MACSUR | New Project: Macsur I | The Knowledge Hub FACCE MACSUR brings together the excellence of research in modelling grasslands, livestock, crops, farms, and agricultural trade in order to illustrate to political | Dr. Stefan Sieber Leibniz-Centre for Agricultural Landscape Research e.V. Eberswalder Straße 84 15374 Müncheberg Germany P +493343282125 |
| Bill & Melinda Gates Foundation | STAR Project | Unmanned Are | Jan Dempehof Michigan University USA |

= Funding involved (total 1,6 M Euro)

## New institutes within consortium

| | | | |
|---|---|---|---|
| Europa-Universität Viadrina Frankfurt (Oder) | New Partner: Institute for Conflict Management | A Memorandum of Understanding was completed between the Institute for Conflict Management (IKM) at European University Viadrina Frankfurt (Oder) and the Leibniz-Centre for Agricultural Landscape Research (ZALF e.V.) in order to formalise bilateral cooperation, which focuses on the research on "Development and implementation of a conflict prevention and moderation system" for large international research projects. | Dr. Christian Hochmuth Managing Coordinator Institute for Conflict Management European University Viadrina Frankfurt (Oder) Große Scharrnstraße 59 15230 Frankfurt (Oder) Germany Tel: +49 (0)335-5534-5304 Fax: +49 (0)335-5534-5310 Email: ikm@europa-uni.de |
| SLE | New Partner: Centre for Rural Development | The Centre for Rural development (SLE) is involved in Trans-SEC as a partner of the Humboldt University of Berlin. SLE researchers will conduct studies analysing the food security relevant innovation systems in Tanzania. Using SLE approaches and tools the researchers will conduct a baseline and an impact study at different levels before and after implementing the Trans-SEC upgrading strategies. | Dr. Susanne Neubert / Emil Gevorgyan Humboldt-Universität zu Berlin Landwirtschaftlich-Gärtnerische Fakultät Seminar für Ländliche Entwicklung (SLE) Hessische Str. 1-2 10115 Berlin Telefon : 030-2093-6900 Fax : 030-2093-6904 E-Mail: sle@agrar.hu-berlin.de http://www.sle-berlin.de/index.php/en/homen1-2/sle-start |
| WRBWO | New Partner: Wami/Ruvu Basin Water Office | Wami/Ruvu Basin Water Office is the main stakeholder for water resources in the project region and provides information, contacts and | WAMI/RUVU Basin Water Office (WRBWO) Ms. Praxeda P. Kalugendo, Director of WRBWO Address PO Box 826 City: Morogoro Phone: +255 23 260 0019 Fax: +255 23 260 0019 |

# Trans-SEC History




| Globe I+2 | ReACCT | Better-iS | Sub-Sahara | Trans-SEC I+2 | Scale-N |
|---|---|---|---|---|---|
| Up-Scaling of Good Agricultural Practices | Resilient Agro-landscapes to Climate Change in Tanzania | Biofuel evaluation for Tanzanian Technological Efficiency using Renewables – integrated Strategies | Strategies for Adapting to Climate Change in Rural Sub-Saharan Africa: Targeting the Most Vulnerable | Innovating pro-poor strategies to safeguard Food Security using technology and knowledge transfer | Scaling-Up Nutrition: Implementing Potentials of nutrition-sensitive and diversified agriculture to increase FS |
| Coordinator: ZALF 0,2 M BMELF/GIZ | Coordinator: ZALF 1,3 M GIZ | Coordinator: ZALF 1,1 M GIZ | Coordinator: IFPRI 1,3 M GIZ | Coordinator: ZALF 7,5+0.1 M BMBF/GIZ | Coordinator: ZALF 1,5 M BML |

# Trans-SEC Strategy

2006 2013 2015 2018 2020

Globe I+2

ReACCT

Better-iS

Sub-Sahara

IPTS

M&B Gates

Eco-village (EU)

MACSUR II

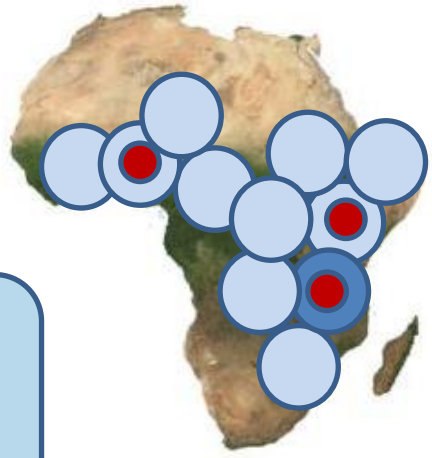
Trans-SEC I+2

BMEL SCALE-N

Embrapa

EU Horizon 2020

**From national up-scaling cases to Smart Up-Scaling Centres**



# Trans-SEC CPM System

- The **CPM System** (Conflict Prevention and Moderation System) is a support system helping to ensure that Trans-SEC organizational structures and processes function adequately.

**=> To ensure efficiency & effectiveness of outputs and outcomes**

- Team: 8 professionals and 15 conflict contact points
- Services: Supervision, Reflection, Coaching, Conflict Awareness Training, Mediation
- CPM provides approved decentralized structures to deal timely and appropriately with issues where they originate

**=> Facilitation system**

# Objective of Trans-SEC

- Improvement of **food situation** for the most-vulnerable rural poor
- **Identification/testing** of successful upgrading strategies along FVC to site-specific, sustainable settings
- **Dissemination/implementation** for national outreach, policy, extension, research

# Objective of Trans-SEC

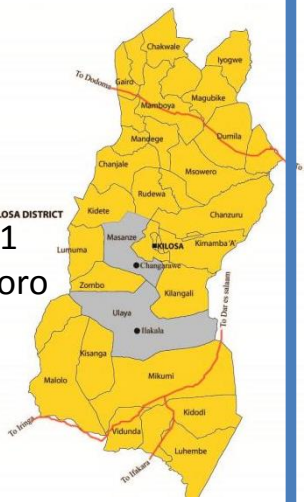
Improvement of **food situation** for the most-vulnerable rural poor

4 Villages

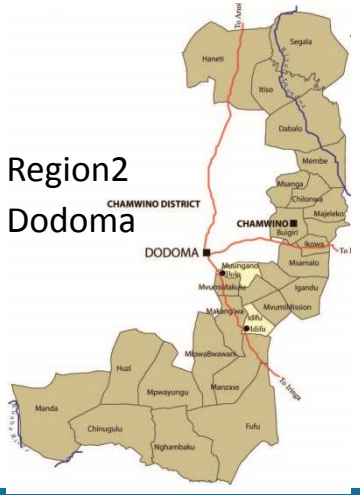




Region1
Morogoro




Region2
Dodoma




**Identification/Testing** of successful upgrading strategies along FVC to site-specific, sustainable setting

Inventoring
Sets of Success Stories and typologizing food value chains in 4 case study sites

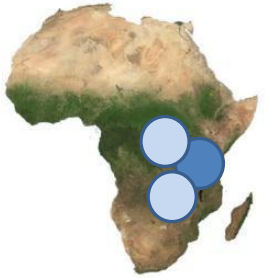
1 2 3 4 5

Sub-humid region:
Maize, Sesame, pigeon pea
Ilakala/Changarawe

Semi-arid region:
Millet, Sunflower, groundnut
Ilolo & Idifu

**Dissemination/ Implementation** for national outreach, policy, extension, research

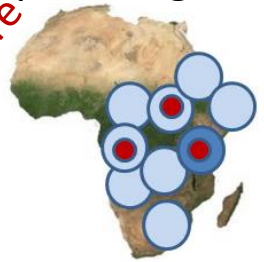
National Up-scaling Centre



Research
Policy
Extension
Region

Up-Scaling Centre-Network

Future



Cross-country
Approach

# Objective of Trans-SEC

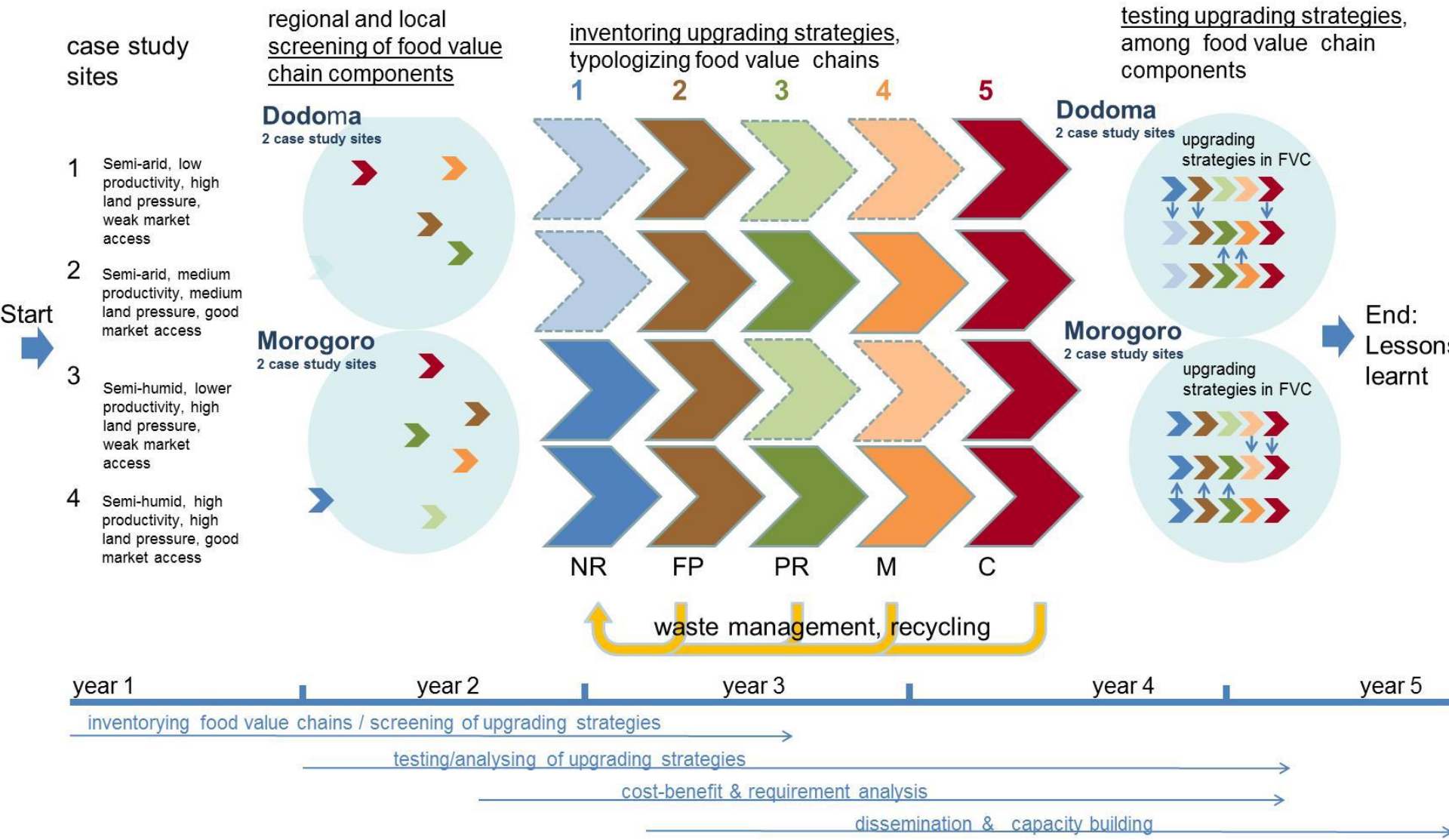
waste management, nutrient cycling

| | Natural Resources | Crop Production | Processing | Markets | Consumption |
|---|---|---|---|---|---|
| **FVC** | How manage resources sustainably? | How produce crops more efficiently ? | How add value though processing? | How add value / income through markets? | How improve consumption patterns / diets? |
| **UPS** e.g.: | **water harvesting, erosion prevention** | **inter-cropping, fertiliser** | **less energy, efficient PH processing and storage** | **certification, better market integration** | **nutrition education** |





# Objective of Trans-SEC



# Procedure of Trans-SEC

## Out and up-scaling
- Local, regional, national Policies
- Farmer field groups & schools

## Model Systems
- Scenario framework
- Future simulation
- Climate proofing

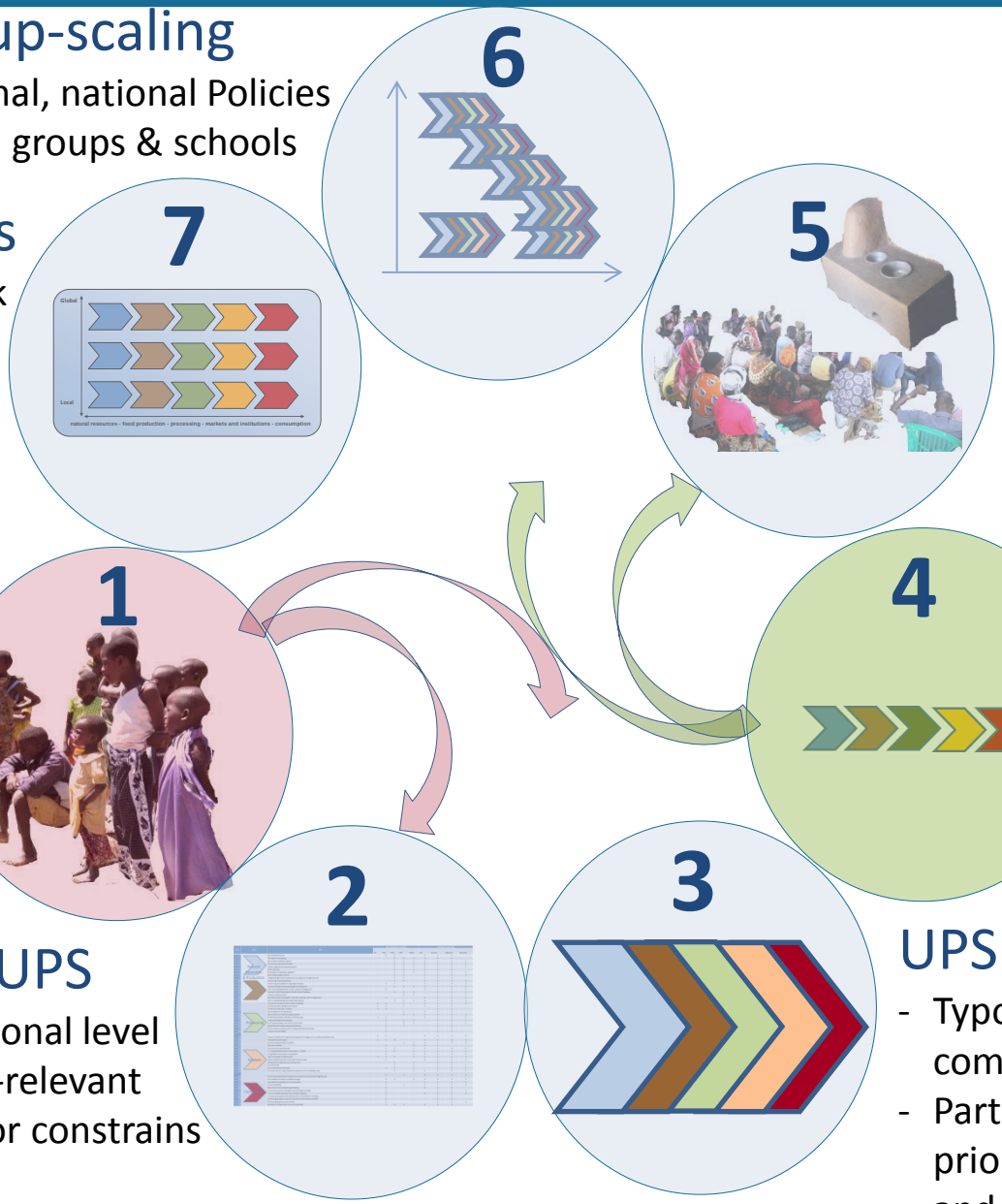
## Stakeholders along FVC
- Mixed groups
- Local ownership
- Mapping
- Gender
- Pro-poor

## Inventory UPS
- 52 ups at national level
- food security-relevant
- Defining major constrains

## UPS Selection
- Typologizing the FVC and their components in the CSS
- Participatory selection & UPS prioritizing based on inventory and within given capacities

## UPS Impact Assessment
- Household survey 900 HH in 4 CSS, 2 control villages
- Participatory ex-ante IA

## Participatory Testing of UPS
- Implementation
- Monitoring
- Evaluation



# Inventory on Upgrading Strategies

| LIST | FVCC | UPS | FVC Component Linkage | | | | | Relevant Scale Level | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NR | PRD | PRO | MKT | CONS | CSS | District | Regional | National |
| 1 | | Secured land tenure | | X | X | | | X | X | X | |
| 2 | | Fertilizer microdosing | | | X | X | X | X | X | X | |
| 3 | | Optimised weeding program | | | X | X | X | X | X | X | X |
| 4 | | Promoting improved varieties | | | X | X | X | X | X | X | X |
| 5 | | Insecticides/herbicides/vaccination | | | X | X | X | X | X | X | X |
| 6 | | Early planting | | | X | X | X | X | X | X | |
| 7 | | Rainwater harvesting (ridge/pit) | | | X | X | X | X | X | X | X |
| 8 | Natural Resources and Production | Participatory pest control | | | X | X | | X | X | X | X |
| 9 | | Integrated agronomic practices (in drought prone agriculture) | | | X | X | | X | X | X | |
| 10 | | Improving cultural practices | | | X | X | | X | X | X | X |
| 11 | | Improving soil quality through agro-forestry | | X | X | | | X | X | X | X |
| 12 | | Promote fodder tree technologies and pastures | | | X | X | X | X | X | X | X |
| 13 | | Train new approaches for water use and management | | X | | | | X | X | X | X |
| 14 | | Promote cattle fattening and better animal feeding | | | X | X | X | | X | X | X |
| 15 | | Improve cattle breeds | | | | X | X | | X | X | X |
| 16 | | Blending local knowledge for decision making in NR management | | X | | | | X | X | X | X |
| 17 | | Micro-credits/saving and credit associations | | | X | X | X | X | X | X | X |
| 18 | | Crop by-products (on-farm and processing) | X | X | | X | | X | X | X | X |
| 19 | | Collection and utilization of manure | X | X | | X | | X | X | X | |
| 20 | | Production and use of biogas | X | X | | | | | X | X | |
| 21 | | Optimization of oil extraction | | | | X | | X | X | X | |
| 22 | | Optimization of cereal storage systems | | | | X | X | X | X | X | X |
| 23 | | Processing residue utilization for Bioenergy | X | X | | | | X | X | X | X |
| 24 | | Improved cassava processing | | X | | X | X | | X | X | X |
| 25 | Processing | Alternative energy source for poultry feed | | X | | X | X | | X | X | X |
| 26 | | Establish de-hulling machine (sunflower) | | X | | X | | | X | X | |
| 27 | | Milk collection centers with cooling facilities/cold chains | | X | | | | | X | X | |
| 28 | | Improve animal feeds | | X | | | | | X | X | |
| 29 | | Waste utilization through hybrid system (for biogas, soil nutrients and electricity) | X | X | | | | X | X | X | X |
| 30 | | Improved wood supply | X | X | X | | | X | X | X | X |
| 31 | | Solar/kerosene based incubator | | | | X | X | X | X | X | X |
| 32 | | Periodic markets | | X | | | X | X | X | | |
| 33 | | New product development | | X | X | | X | X | X | X | X |
| 34 | | m-Integrated Market Access System (m-IMAS) | | X | X | | X | X | X | X | X |
| 35 | | Integrated rural poultry-crop system | | X | | | X | X | X | X | X |
| 36 | | High value agro-forestry trees | X | X | X | | X | X | X | X | X |
| 37 | | Organizing farmers for improved market access | | X | | | | X | X | X | X |
| 38 | | Establish min-laboratory (sunflower oil) | | | X | | X | | X | X | |
| 39 | Marketing | Crop banking | | | X | | X | | X | X | X |
| 40 | | Rural markets construction | | X | X | | X | | X | X | X |
| 41 | | Promote use of weigh scales and quality control in selling crops | | | X | | X | X | X | X | X |
| 42 | | Enhancing marketing through harmonization of policies and regulations | | X | | X | | X | X | X | X |
| 43 | | Profitable and market oriented storage | | X | X | | X | X | X | X | X |
| 44 | | Household centered nutrition education | | X | | | | X | X | X | X |
| 45 | | Kitchen gardens | | X | | X | | X | X | X | X |
| 46 | | Mobilize milk drinking/breast feeding | | X | | | | X | X | X | |
| 47 | | Improved nutrition through improved bean varieties | | X | | | | | X | X | X |
| 48 | | Train on dietary diversity and nutrition-hygiene | | X | | | | X | X | X | X |
| 49 | | Influence perceptions and demand for milk (behavior change) | | X | | | | | X | X | |
| 50 | Consumption | Improving access to and consumption of animal source foods | | X | | | | | X | X | |
| 51 | | Promoting quality protein maize | | X | | | | | X | X | X |
| 52 | | Storage of indigenous fruits and vegetables | | X | X | X | | X | X | X | |

# Stakeholder Involvement

| Project activities | Stakeholder categories<br>Grassroot level stakeh. "GLS"<br>Key informants "KI" | Type of stakeholder involvements |
|---|---|---|
| Mapping stakeholders across FVC | GLS KI | interviews, FGD, workshops |
| Inventorying FVC constraints & UPS | GLS KI | HH-survey, interviews, FGD |
| Identifying food security criteria | GLS KI | interviews, FGD |
| Identifying 3-5 UPS/FVC component | GLS | interviews, FGD |
| Prioritising UPS in CSS for testing | GLS | FGD |
| UPS groups formation | GLS | FGD, workshops |
| UPS implementation, testing, adaptation | GLS (KI) | FGD, trainings, testing UPS |
| UPS monitoring & impact assessment | GLS KI | interviews, FGD, workshops, testing & assessing UPS |
| UPS dissemination | GLS KI | FGD, workshops, trainings |

# Selection of Upgrading Strategies

**Natural Resources / Crop Production**

1. Rainwater harvesting (tie-ridges, infiltration pits)
2. Fertiliser micro-dosing (”deep fertiliser placement”)
3. Optimised weeding

**Processing / Waste Management / Bioenergy**

1. Crop byproducts for bioenergy
2. Improved processing (trainings, business models for purchasing machines)
3. Improved on-farm wood supply (tree planting/integration)
4. Improved cooking stoves

**Markets / Income Generation**

1. New product development (horizontal and vertical coordination, high value crops, surplus cereals, and livestock products)
2. Optimised crop storage (profitable, market oriented, reducing PH losses)
3. Poultry-crop integration (for enhanced rural income and food security)
4. Market access system (m-IMAS, mobile based)

**Consumption**

1. Household nutrition education
2. Kitchen gardens (indigenous fruits and vegetables for dietary diversification

# Selection of Upgrading Strategies

| UPS | Ilakala | Changarawe | Ilolo | Idifu |
|---|---|---|---|---|
| 1 Rainwater harvesting<br>Fertiliser micro-dosing & Optimised weeding | ✓ (tied ridges) | ✓ (tied ridges) | ✓ (infiltration pits) | ✓ (infiltration pits) |
| 2 Byproducts for bioenergy | ✓ | | | |
| 3 Improved processing | ✓ (maize sheller) | ✓ (maize sheller) | ✓ (millet threshing) | ✓ (millet threshing) |
| 4 Improved wood supply | | | ✓ | |
| 5 Improved stoves | ✓ (training) | ✓ | ✓ (training) | ✓ |
| 6 New product development | | | ✓ (sunflower oil pressing) | ✓ (sunflower oil pressing) |
| 7 Optimised market oriented storage | ✓ | ✓ (training) | ✓ (training) | ✓ (training) |
| 8 Poultry-crop integration | | ✓ | | |
| 9 Market access system (m-IMAS) | ✓ | ✓ | | |
| 10 HH nutrition education & Kitchen garden training | ✓ | ✓ | ✓ | ✓ |

# Selection of Upgrading Strategies

Natural Resources

Crop Production

1. Rainwater harvesting (tie-ridges, infiltration pits)
2. Fertiliser micro-dosing (”deep fertiliser placement”)
3. Optimised weeding

**on station ->** **mother plot ->** **on farm baby plot**

**Sunflowers, rice, millet, Sorghum, maize** **all** **all**


**Features:**

**1st year baby plots**

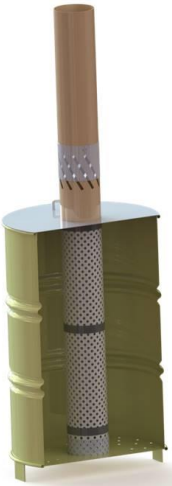
**Idifu 73 households**
**Ilolo 53 households**
**Changarave 43 HH**
**Ilakala 52**
**-> lower doses than recommend (monetary amount equal to 2-4 chicken/ha**

Sub-humid region:
Maize, Sesame, pigeon pea Ilakala/Changarawe
Semi-arid region:
Millet, Sunflower, groundnut
Ilolo & Idifu

# Selection of Upgrading Strategies

Processing
Waste
Management
Bioenergy

1. Crop byproducts for bioenergy
2. Improved processing (trainings, business models for purchasing machines)
3. Improved on-farm wood supply (tree planting/integration)
4. Improved cooking stoves



**Features:**

**Pyroliser (Maize cob charcoal production)**
**Maize shelling**
**Crude oil pressing sunflower oil**
**500 stoves per village Low costs (2-3 Euro/stove)**
**Training for trainers**
**Nurseries (2000 trees, 4 species)**

# Selection of Upgrading Strategies

Markets Income Generation

1. New product development (horizontal and vertical coordination, high value crops, surplus cereals, and livestock products)
2. Optimised crop storage (profitable, market oriented, reducing PH losses)
3. Poultry-crop integration (for enhanced rural income and food security)
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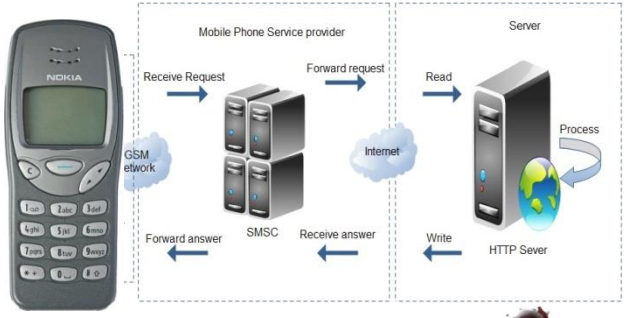



**Features:**

- Sunflower crude oil selling on local, regional markets -> Two entire villages (1000 HH each)
- Market-oriented storage through IRRI super bag 2 Euro + „vihenge“ traditional storage (loam container) -> In all villages (30 1st y and 250 HH per village)
- Poultry breeding incl. a demonstration site for outscaling

- Starting with 27 farmers

- Server-based Mobile market system for all mobile users.

- All for potential use

# Selection of Upgrading Strategies

Consumption

1. Household nutrition education
2. Kitchen gardens (indigenous fruits and vegetables for dietary diversification

**Features:**

- Kitchen garden education (30 HH per village per year with subsequent outscaling acitivities)
- Pocket garden
- In each subvillage 1 demonstration plot
- Implementation during dry season
- Continuous education over year

# Sunflower Case: Entire FVC

**5** Innovation funds
incl. micro credits

**6** Cooperative (TFC)

On station | on farm | pressing | regional, local market | training

mother and baby plots

1

2

crude oil

3

4

Natural Resources | Crop Production | Processing | Markets | Consumption

FVC

# Outputs after 20 months

| | | |
|---|---|---|
| **Science** | • baseline on Food Value Chains– UPS inventory | ✓ |
| | • Surveys, Interviews, Information Systems, DSS | 1 HH (3 waves) |
| | • Model Systems (SWIM, LPJmL, Hermes, DSSAT) | ✓ |
| | • Publications | 4 2 special issue |
| | • Status deliverables and reports | ✓ (10, 8 finalised) |
| | • all UPS presently being implemented | ✓ (3-4 finalised) |
| **Public** | • Policy Briefs, Leaflets, Guides | 3, 1, 1 |
| | • 6 Documentaries on Trans-SEC topics | 3 |
| | • TV, newspapers (ZEIT), press releases | Numerous |
| | • Public, networks, homepage | ✓ |
| **Other** | • CPM-System, Supervision, Mediation, Teamb. | ✓ |
| | • Capacity Building, Exchange PhD, Conferences | 12/30 |
| | • Project applications | 3 (2 successful) |
| | • Policy Programs | Ministry Advisory Board |
| | • Farmers Schools | ✓ |
| | • Village level | ✓ |

# Outreach after 20 months

## Publication

2 Special Issue &
4 Publications

## Public

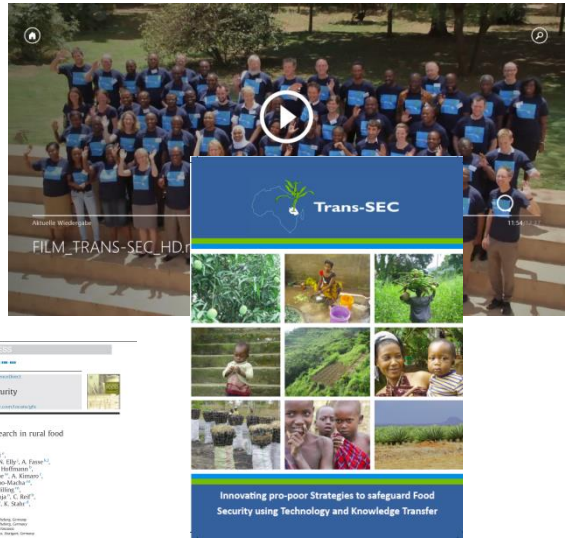
3 Movie / Documentaries
Leaflet

## Homepage

Think Tank
Knowledge base
Email reminder

## Tropentag

ZALF/ HU
Conference
(approx. 50)
= BMBF involved



# Trans-SEC

- **Research Model 1 Hypothesis: Demand driven approach secures local ownership and enhances food security**
  - Assessing impacts of UPS on food security
  - Assessing dissemination methods & strategies for out- and up-scaling of UPS
- **Research Model 2 Hypothesis: CPM-Systems as a new research model increases efficiency and effectiveness**
  - Conflict Prevention and Management System (CPM system) to created awareness on tensions and intercultural conflicts
  - Demand-driven solving mechanisms for upcoming challenges

# Asante Sana

# Thank You

# Danke

# Trans-SEC