



# Achieving Food Security in SSA through Food Value Chains

IFPRI Policy Seminar  
8<sup>th</sup> of June 2015



Federal Ministry  
of Food  
and Agriculture



Federal Ministry  
of Education  
and Research



Federal Ministry  
for Economic Cooperation  
and Development





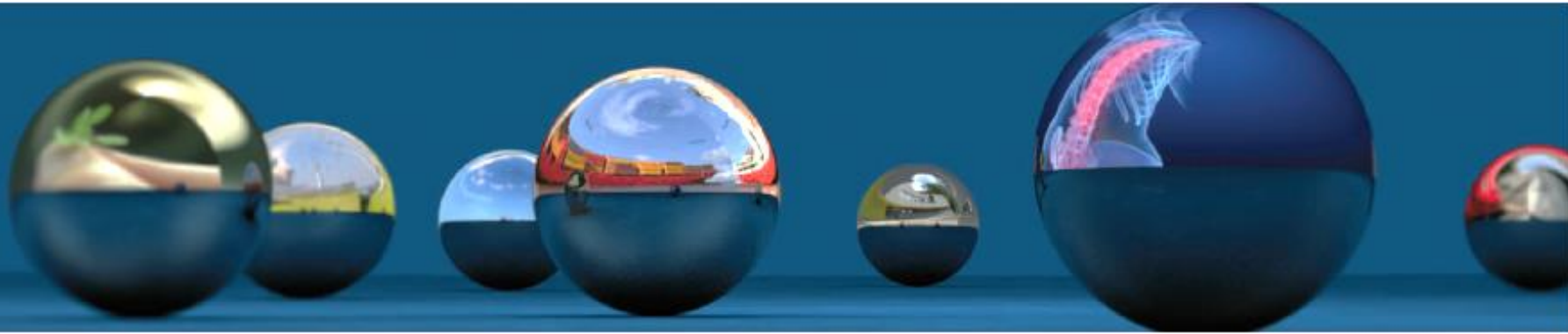
## GlobE – Global Food Security



Federal Ministry  
of Education  
and Research



Federal Ministry  
for Economic Cooperation  
and Development



Initiative of the

Federal Ministry of Education and Research (BMBF) in  
cooperation with the

Federal Ministry for Economic Cooperation and  
Development (BMZ)

Total budget: approx. 50 M Euro



# BMBF funding initiative within the National Research Strategy „Bioeconomy 2030“

November 2010 started by the German Government:  
5 key challenges of Bioeconomy 2030 to transform the oil-based to a biomass-based industry and society:

- **securing global nutrition**
- ensuring sustainable agricultural production
- producing healthy and safe foods
- using renewable resources for industry
- developing biomass-based energy





## Topics of the systemic approach of Food System

Topics	Objectives
Agricultural production / nutrition / health	German-African research networks which focus on the food system
Soil / water / material flows	Identifying and solving central problems related to food systems
Reducing of losses along the value chain	Developing regionally adapted research solutions
Rural and gender-specific structures / local solutions	Research capacities in Germany and in Africa
Plants / plant breeding	
Biomass / bioenergy	
Animals in the system	





## Regional focus of the six „GlobE“ projects



Name	Countries	Focus
Trans-SEC	Tanzania	Entire FVC
Urban Food+	Burkina Faso, Ghana, Mali, Cameroon	Urban agriculture
Wetlands	Kenya, Uganda, Rwanda, Tanzania	Wetlands
Hortinlea	Kenya, Tanzania, Ethiopia	Vegetables
Biomass Web	Ghana, Nigeria, Ethiopia	Biomass
Reload	Ethiopia, Uganda, Kenya	Post-harvest losses

## SCALE-N

Scaling-Up Nutrition: Implementing Potentials of nutrition-sensitive and diversified agriculture to increase food security



Federal Ministry  
of Food  
and Agriculture





# Trans-SEC

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

## Innovating Strategies to safeguard Food Security using Technology and Knowledge Transfer: A people-centred Approach

8 M Euro, total Budget

5 Years, total period





# Trans-SEC

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

## 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, Availability, Utilization, Stability

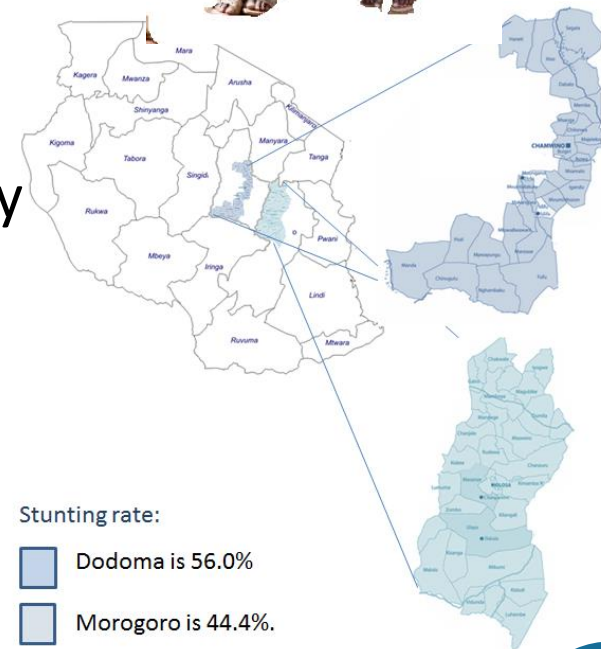


## Undernourishment, Malnutrition

- Stunting, 1000 days windows of opportunity for reversible effects

## Sustainable project implementation

- Sustaining project success incl. up- and outscaling







## Objectives

- Improving the **food situation** for the most-vulnerable rural poor
- **Identifying** and **testing** successful upgrading strategies along FVC to site-specific, sustainable settings
- **Implementation** and **dissemination** for national outreach, policy, extension, research



## Six rules for our action research

	Characteristic	Specification
1	Using existing local knowledge	Not to reinvent the wheel
3	Incentive structure fosters scaling up/out of success	Micro-credit innovation funds & round table of up-scaling
4	Research as guiding role	Tools minimize the risk, Support of decision processes Translation of findings
2	Holistic, system analysis focuses on gaps, bottlenecks for success	Empiric evidence on requirement criteria (Scala)
5	Participation leads to local ownership and thus adoption	Cost-efficient in the long term
6	Conflict Prevention and Management System	Training, supervision intercultural sensitization

# Objective of Trans-SEC



waste management, nutrient cycling

Natural Resources

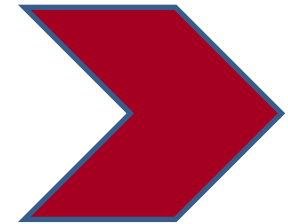
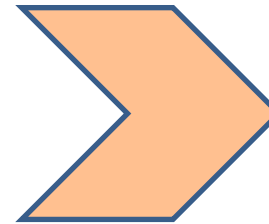
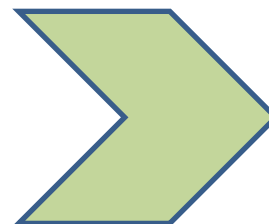
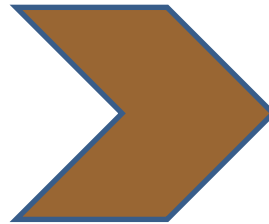
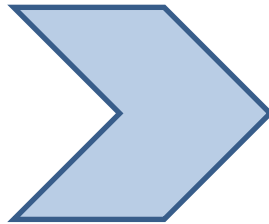
Crop Production

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



# Trans-SEC: 15 partners









	ZALF	<b>Coordinator:</b> Leibniz-Centre for Agricultural Landscape Research	<b>Management:</b> Dr. Stefan Sieber, stefan.sieber@zalf.de  <b>Scientific Coordination:</b> Dr. Frieder Graef, graef@zalf.de		PIK	Potsdam Institute for Climate Impact Research	Dr. Christoph Müller, cmueller@pik-potsdam.de
	PTJ BMBF BMZ	<b>Funding Organization:</b> Project Management Jülich (PTJ) on behalf of the Federal Ministry of Education and Research (BMBF) Federal Ministry for Economic Cooperation and Development (BMZ)			DITSL	German Institute for Tropical and Subtropical Agriculture	Dr. Brigitte Kaufmann, b.kaufmann@ditsl.org
	UHOH	University of Hohenheim	Prof. Dr. Folkard Asch, fa@uni-hohenheim.de		SUA	Sokoine University of Agriculture (Tanzania)	Dr. Khamaldin Mutabazi, khamaldin@yahoo.com
	IUW	Leibniz University Hannover	Prof. Dr. Ulrike Grote, grote@iuw.uni-hannover.de		ARI	Agricultural Research Institutes (Tanzania)	Bashir Makoko, brmakoko@yahoo.com  Elirehema Swai, eyswai@yahoo.com
	HU	Humboldt-University Berlin	Prof. Dr. Wolfgang Bokelmann, w.bokelmann@agrar.hu-berlin.de		TFC	Tanzania Federation of Cooperatives (Tanzania)	Janet Bitegeko, jbitegeko@hotmail.com
	DIE	German Development Institute	Dr. Michael Brütrup, michael.bruentrup@die-gdi.de		ACT	Agricultural Council of Tanzania (Tanzania)	Gloria Mazoko, mazokogloria@yahoo.com
					MVIWATA	Network of Small-Scale Farmers' Groups (Tanzania)	Nickson Elly, nikisoelly@yahoo.com



# Network platform: Model Region



## New projects in Trans-SEC case studies

	Trans-sec	Trans-sec – ZALF is a major flagship of the Trans-sec initiative.	Dr. Stefan Sieber Leibniz-Centre for Agricultural Landscape Research e.V. Eberswalder Straße 84 15374 Müncheberg
		the Trans-SEC case studies and up-scales the nutrition UPS	Constance Reif Leibniz-Centre for Agricultural Landscape Research e.V.
	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	IRDP P.O.Box 138 Dodoma, TZ Phone: ☎ +255 762926426 Fax: +255 26 230 1341 Email
	New Project: Macsur I	The Knowledge Hub FACEE 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
	STAR Project	Unmanned Aere	Jan Dempehof Michigan University USA

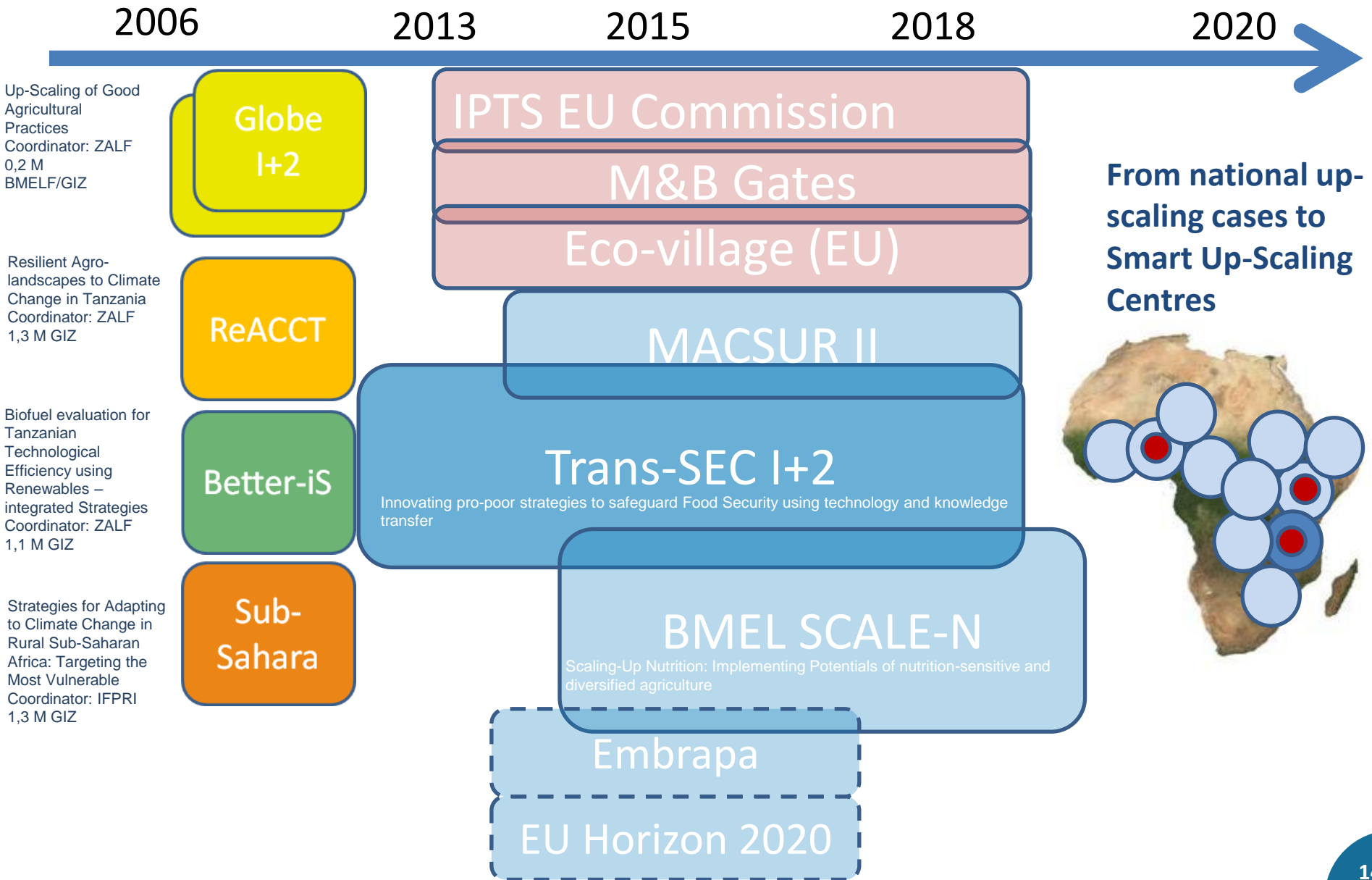
## New institutes within consortium

	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
	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@agr.ar.hu-berlin.de http://www.sle-berlin.de/index.php/en/homen1-2/sle-start
	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

= Funding involved (total 12 M Euro)



# Strategy (total 12 M Euro)

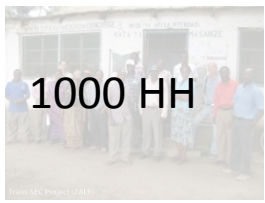




# Steps of Trans-SEC

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

4 Villages



1000 HH



1000 HH



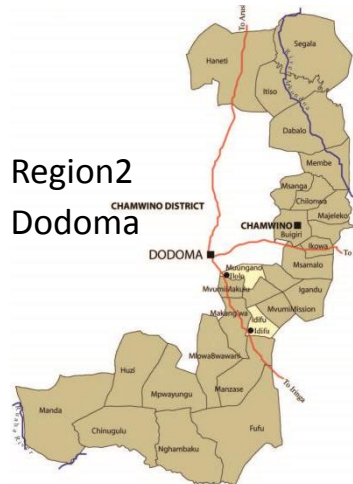
1000 HH



1000 HH



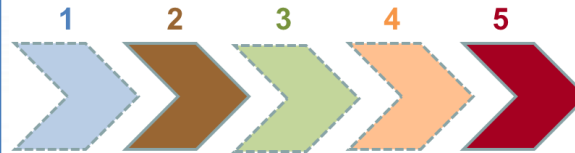
Region1  
Morogoro



Region2  
Dodoma

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

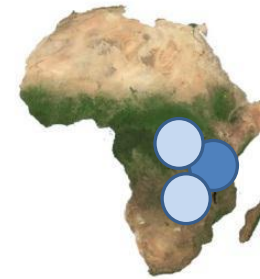
Inventing Sets of Success Stories and typologizing food value chains in 4 case study sites



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

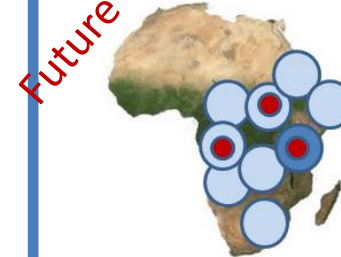
Dissemination/Implementation for national outreach, policy, extension, research

National Up-scaling Centre



Research  
Policy  
Extension  
Region

Up-Scaling Centre-Network



Cross-country  
Approach

Future



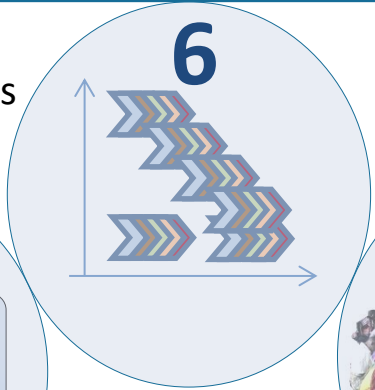
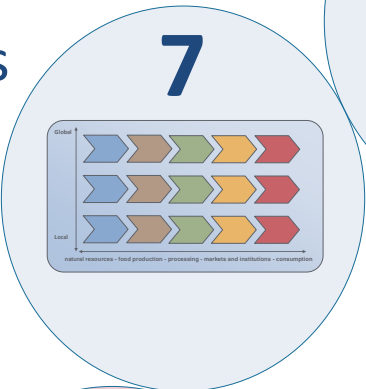
# Procedure of Trans-SEC

## Out and up-scaling

- Local, regional, national Policies
- Farmer field groups & schools

## Model Systems

- Scenario framework
- Future simulation
- Climate proofing



## Participatory Testing of UPS

- Implementation
- Monitoring
- Evaluation

## Stakeholders along FVC

- Mixed groups
- Local ownership
- Mapping
- Gender
- Pro-poor



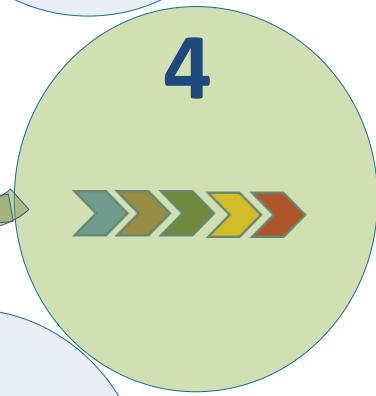
## Inventory UPS

- 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



# Selection of Inventory 52 UPS



## Natural Resources

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

## Crop Production

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

## Processing Waste Management Bioenergy

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)

## Markets Income Generation

## Consumption

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



# 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

Iloilo 53 households

Changarawe 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

Iloilo & Idifu

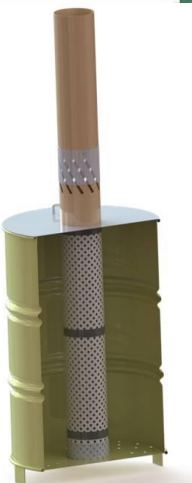




# Selection of Upgrading Strategies

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)**



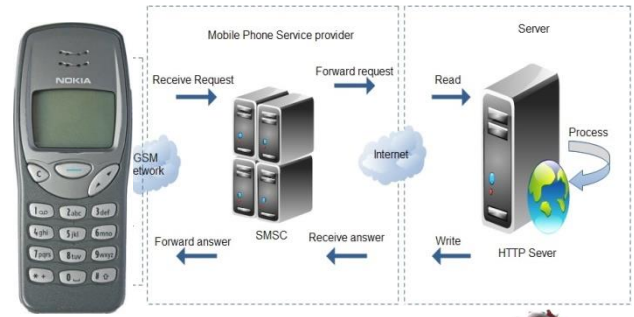




# Selection of Upgrading Strategies

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)
4. Market access system (m-IMAS, mobile based)



### 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 1<sup>st</sup> y and 250 HH per village)
- Poultry breeding incl. a demonstration site for out-scaling - Starting with 27 farmers
- Server-based mobile market system for all mobile users.





# 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 activities)
- Pocket garden
- In each sub-village 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

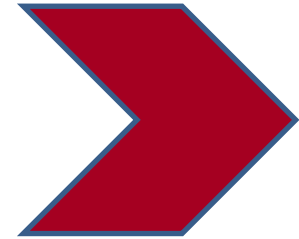
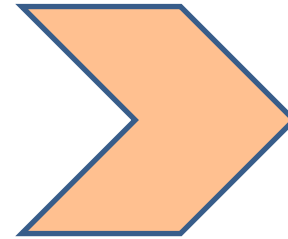
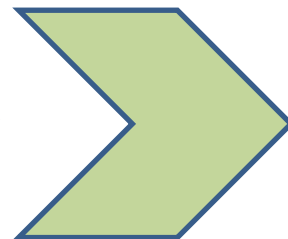
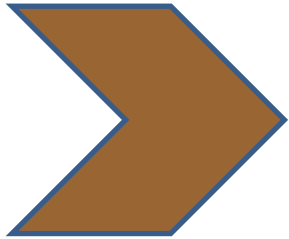
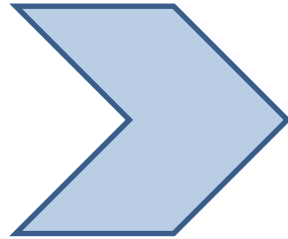
**3**



**4**

Natural Resources    Crop Production    Processing    Markets    Consumption

**FVC**





## Sub-Saharan Africa high cost of marketing

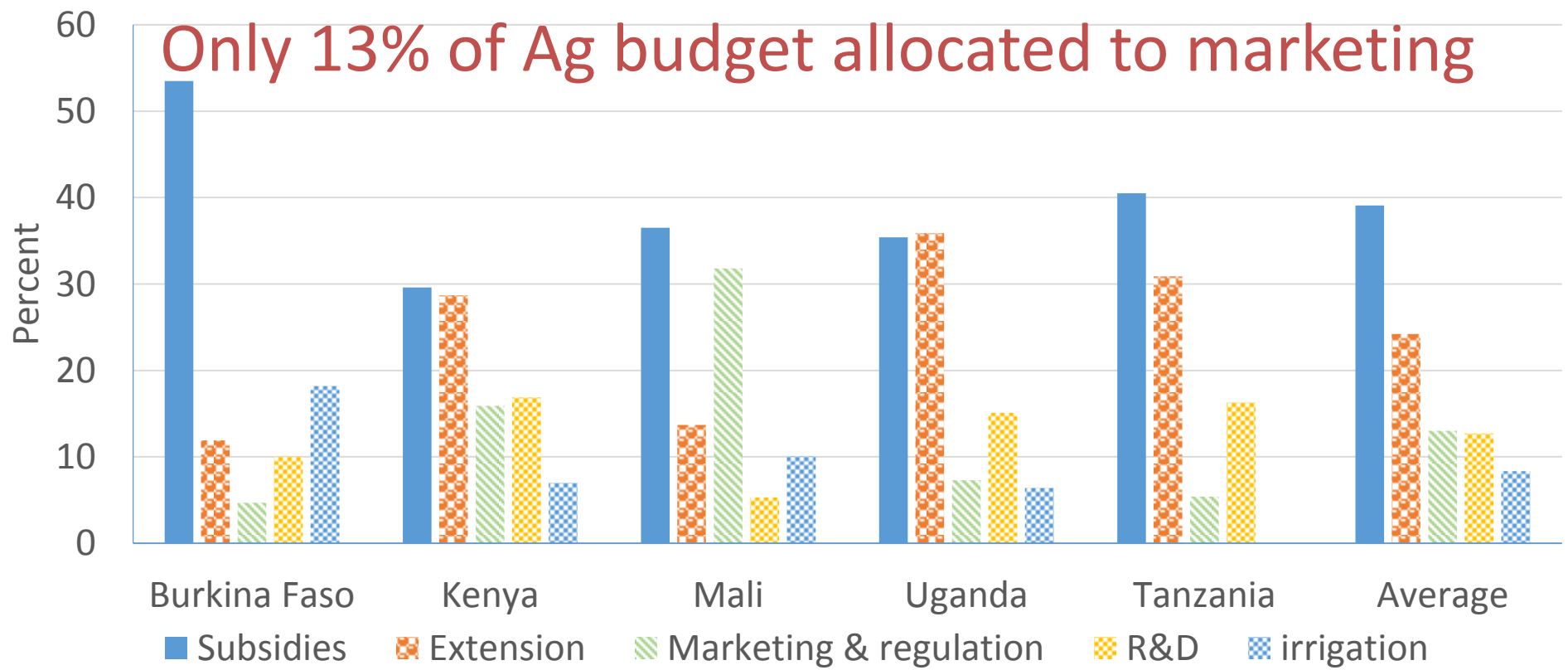
	Africa	Other developing countries
Paved road density (km/km <sup>2</sup> of arable land) <sup>a</sup>	0.34	1.34
Population with access to electricity (%) <sup>a</sup>	14	41
Population with access to improved potable water (%)	61	72
Power tariffs (\$/kwh)	0.02-0.46	0.05-0.1
Transportation cost (\$/ton/km)	0.04-0.14	0.01-0.04
Tariffs of urban potable water (\$/cu m)	0.86-6.56	0.03-0.6

The high transaction costs is a result of low investment in marketing infrastructure.

# Sunflower Case



## Allocation of agricultural public expenditure by function



One solution for addressing high marketing costs is *reinventing* horizontal and vertical linkages that existed during the farmer cooperative movement era, 1930-70





## Reinventing the Horizontal & Vertical Linkages of Smallholder Farmers in SSA

- **The future belongs to the organized & Success belongs to the organized** – Cooperative movement in 1930s-1970s followed well-organized horizontally and vertically linked production, processing and marketing systems, which provided:
  - Input credit & timely delivery
  - Organized transportation, grading, bulking and storage of crop produce
  - Advisory services on **both production & marketing** knowledge
  - Processing of export crops (coffee, tea, cotton, tobacco, pyrethrum, cashew nuts, etc)
  - Marketing services – including direct export of commodity without passing thru a centralized & government controlled body
- Cooperative leaders were democratically elected even during the traditional (chiefs) period – when election was uncommon.



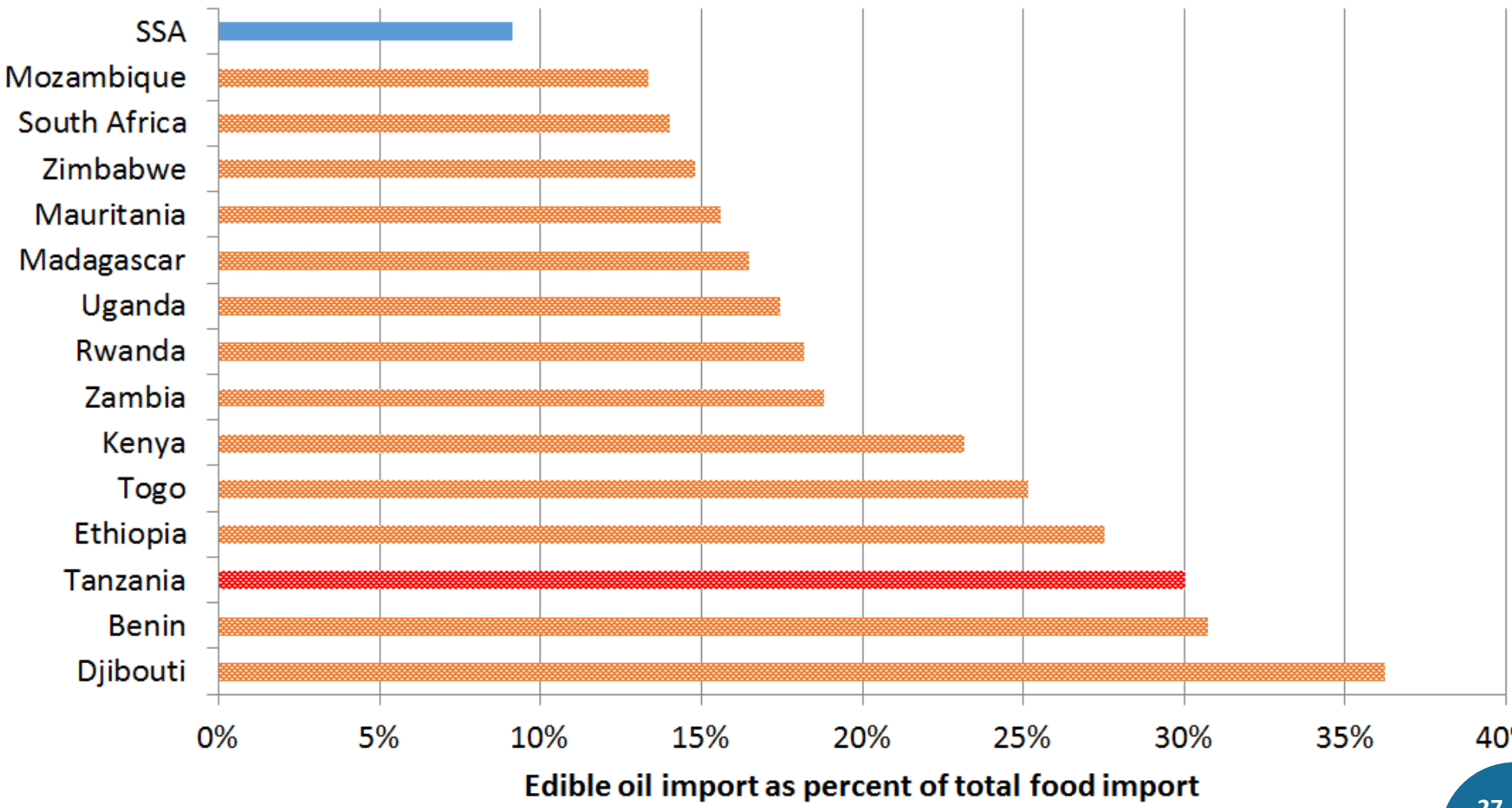
## Deterioration of cooperative development in SSA & potential for their reinvention

- 1980s-2000 – **chaotic period with heavy-handed government operated parastatals** - Crop development Authorities (CDA) – which supplanted the role played by cooperatives interference in the cooperatives
- 2000-todate: **Back to the future**: New locally incorporated companies are now offering promise of re-inventing old successful horizontal and vertical linkage production & marketing.
  - Horticultural companies with outgrower schemes –
  - Large-scale milling and processing companies – Azam, Mt Meru millers etc
  - Fish processing
  - Supermarkets with local and international procurement arrangement
- Our study in Tanzania is working to establish horizontal and vertical linkages of farmers with edible oil processors & chicken

# Sunflower Case

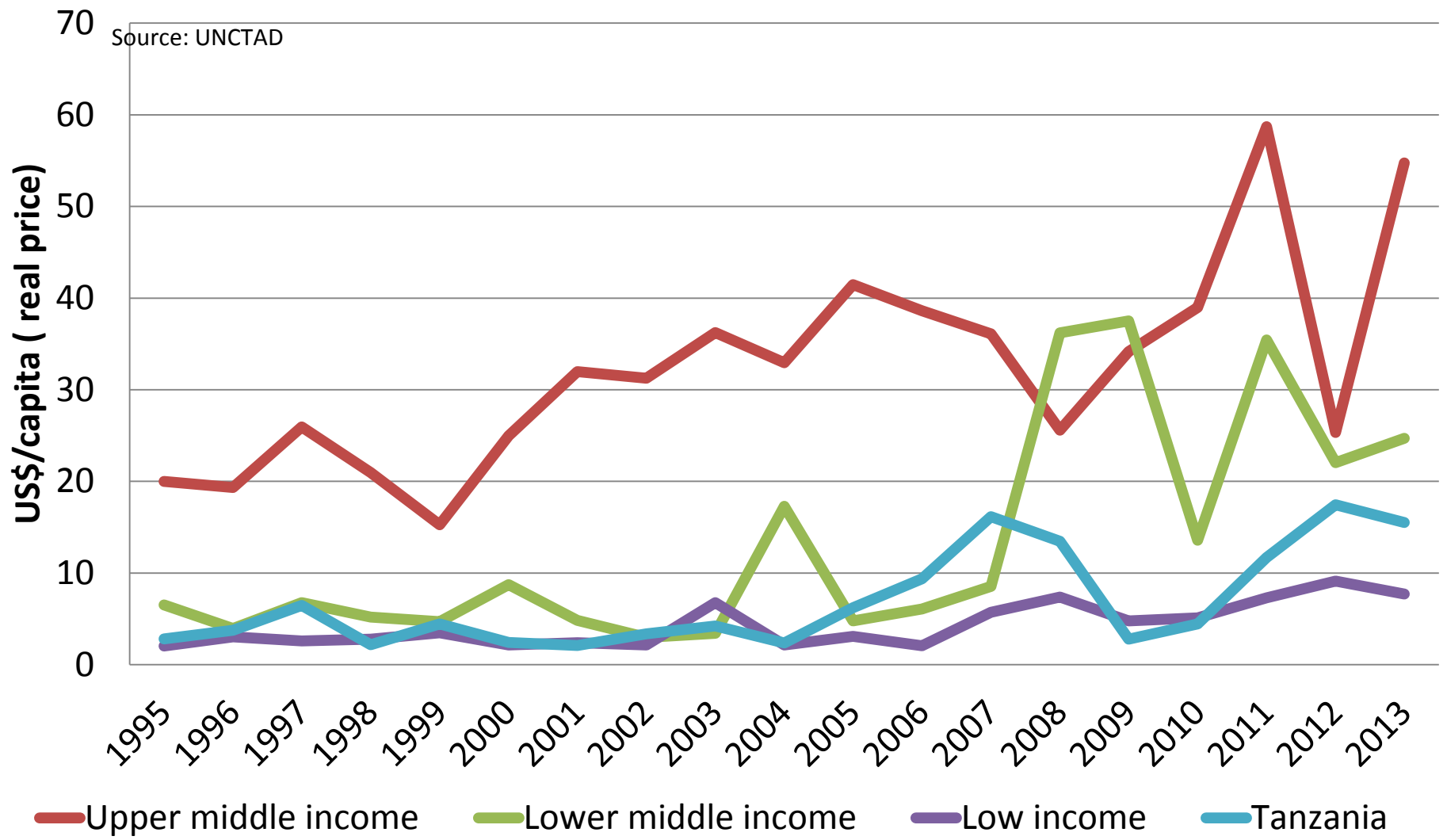


## Edible oil import as share of total food import in SSA & major importing countries





## Net edible oil import per capita by Income groups







**Asante Sana**

**Thank you**

**Dankeschön**

