FARA
Forum for Agricultural Research in Africa

Zentrum für Entwicklungsforschung
Center for Development Research
University of Bonn
ZEF Bonn

MALAWI

Potentials and Possibilities for German Collaboration in Agriculture

PARI

Program of Accompanying Research for Agricultural Innovation

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This report is work in progress and continuously being updated. Any feedback and suggestions for further improvement are welcome and can be sent to pari@uni-bonn.de.

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1. General background information of the agricultural and food sectors

Agriculture remains the predominant sector of the Malawian economy. It accounts for 37% of GDP and 85% of export revenues (Mucavele, 2013). Two main subsectors characterize Malawian agriculture: the small-scale farmers and the large scale farmers (estates). Smallholder farmers are estimated to be about 2 million highly subsistent farming households each cultivating an average 0.5 to 2 ha (FAO, 2003). These smallholder farmers produce about 80% of Malawi's food (mainly maize) and 20% of its agricultural exports (Thomas, 2003). On the other hand, the estate subsector is the main foreign exchange earner – providing more than 80% of agricultural exports mainly from tobacco, sugar, and tea. Tobacco is the dominant cash crop accounting for approximately 63% of the country's total export earnings while tea and sugar account for about 8% and 7% of export earnings, respectively (WTO, 2002).

1.1 Pan-African policies and strategies

Malawi is a member of regional economic blocks including COMESA and SADC each of which has set some development targets.

a. CAADP

Malawi signed the Comprehensive African Agriculture Development Program (CAADP) Compact on April 19, 2010. The goals of CAADP include achieving a 6% agricultural growth and allocating at least 10% of budgetary resources to the agricultural sector (NEPAD, 2012). CAADP comprises four mutually reinforcing pillars namely (i) sustainable land and water management, (ii) improved market access and integration, (iii) increased food supplies and reduced hunger, and (iv) research, technology generation, dissemination and adoption which is a cross-cutting pillar supporting and reinforces the other three pillars.

b. SADC Action on Food Security

Being a member of SADC, Malawi also follows the Food Security Program and the Regional Indicative Strategic Development Plan which is implemented by the Food, Agriculture and Natural Resources (FANR) Directorate of SADC (FANR, 2008). FANR operates through the following units:

- Agricultural Information Management System (AIMS);
- Crop Development Unit;
- Livestock Sector Unit.

c. The SADC Multi-Country Agricultural Productivity Programme (MAPP)[1]

The Multi-Country Agricultural Productivity Program (MAPP) is a 15-year program, being implemented in three five-year phases (FANR, 2008). The MAPP is derived from the CAADP and focuses on its fourth pillar, agricultural research, and seeks to strengthen technology development, technology dissemination, and linkages among agricultural institutions in the SADC region (Johnson *et al.,* 2014). MAPP aims at ensuring sustainable access to safe, nutritional and adequate food at all times.

[1] http://www.sadc.int/themes/agriculture-food-security/food-security/

1.2 National (and regional) policies and strategies

After signing of the CAADP Compact, Malawi launched the ASWAp which outlines the state priorities and harmonizes the development agenda in the agricultural sector. The three focal areas of ASWAp are: food security, commercialization of agriculture and agro-processing and sustainable agricultural land and water management (Matchaya *et al.,* 2014). "The Malawi Agriculture Sector-Wide Approach (ASWAp) shares the principal elements and priorities of CAADP and closely mirrors its emphasis on agricultural productivity meant to achieve agricultural growth and poverty reduction goals of the Malawi Growth and Development Strategy (MGDS) ASWAp, offers a strategy for supporting priority activities in the agricultural sector to increase agricultural productivity and make Malawi a hunger free nation, enabling people access to nutritious foods and increase the contribution of agro-processing to economic growth. The development of the ASWAp was highly participatory and consultative involving the central government ministries and local councils, civil society organizations, non-governmental organizations, development partners, cooperating partners, private sector, academia and the general public " (Mapila *et al.,* 2012).

The National Agricultural Policy

In an attempt to harmonize policies, the government has recently reviewed the various national development strategies, agricultural strategies and agricultural-related legislation and policies and produced a National Agricultural Policy 2010-2016 (NAP). The NAP is a synthesis and summarizes the objectives of agricultural development, strategies and policies that will be pursued to achieve both stated and commonly perceived agricultural objectives. The purpose of the NAP is to promote agricultural productivity and sustainable management of land resources to achieve national food security (GoM, 2012).

1.3 Data on food and nutrition security in Malawi and AIC-region

The following section includes information about important socio-economic indicators, production and trade data and data on consumption and nutrition status.

Table 1: Selected national economic and health-related data

Indicator	Data	Year
Population, total	16,829,144	2014
Population growth (annual %)	2.8	2014
Rural population (% of total population)	84	2014
GDP per capita, PPP (constant 2011 international $)	778	2014
GNI per capita, PPP (constant 2011 international $)	12,576,955,347	2014
Poverty headcount ratio at $2 a day (PPP) (% of population)	88	2010
Poverty headcount ratio at $1.25 a day (PPP) (% of population)	72	2010
Poverty headcount ratio at national poverty lines (% of population)	51	2010
Rural poverty headcount ratio at national poverty lines (% of rural population)	57	2010
Agricultural land (% of land area)	61	2012
Agricultural irrigated land (% of total agricultural land)	0.5	2008
Agriculture value added per worker (constant 2005 US$)	253	2014
Agriculture, value added (% of GDP)	33	2014
Access to electricity, rural (% of rural population)	2	2012
Employees, agriculture, female (% of female employment)	no data	
Employees, agriculture, male (% of male employment)	no data	

Employment in agriculture (% of total employment)	no data	
Literacy rate, adult total (% of people ages 15 and above)	61	2010
Ratio of female to male secondary enrolment (%)	91	2013
Mortality rate, under-5 (per 1,000 live births)	68	2013
Malnutrition prevalence, weight for age (% of children under 5)	15	2010
Malnutrition prevalence, height for age (% of children under 5)	48	2010
Maternal mortality ratio (modeled estimate, per 100,000 live births)	510	2010

Source: World Bank, http://data.worldbank.org/country

1.4 Data on most relevant crops and Value Chains

The main farming systems in Malawi are subsistence-based rain-fed agriculture and large-scale cash crop production with improved technologies and inputs. The three main important crops produced (by volume) are cassava, maize and potatoes while tobacco and tea are the most valuable export crops. For the period 1994 to 2013, cassava production increased by 692.3%, while maize increased by maize 41.6%, and potatoes by more than 86%. The vast majority on legumes are grown by smallholder farmers in the country and the National Export Strategy (NES) promotes value addition of these crops (legumes) and sugar and sugar products as potential agricultural exports in view of the world's campaign against tobacco production and utilization. Production and consumption data are provided below.

1.4.1 Production

Table 2: Top 10 crops produced by area, volume and value

		Production volume (tons)		Production value*	
Top 10	Share of Total	Top 10	Share of Total	Top 10	Share of Total
Maize	41.2	Cassava	25.1	Cassava	31.2
Groundnuts	8.4	Potatoes	22.4	Maize	20.6
Beans, dry	7.4	Maize	19.9	Groundnuts	5.4
Potatoes	6.0	Sugar cane	14.9	Beans, dry	4.5
Cassava	5.1	Bananas	2.0	Tobacco	3.9
Pigeon peas	5.1	Plantains	2.0	Pigeon peas	3.8
Seed cotton	4.1	Groundnuts	2.0	Meat indigenous, pig	3.2
Chick peas	3.0	Pigeon peas	1.4	Meat, pig	3.2
Tobacco	2.9	Fruit, fresh nes	1.3	Bananas	2.8
Soybeans	2.4	Vegetables, fresh nes	1.2	Rice, paddy	2.6
Rank 22: Sunflower seed	0.3	Rank 17: Soybeans	0.5	Rank 15: Soybeans	1.7
		Rank 28: Sunflower seed	0.1	Rank 26: Sunflower seed	0.1

* Gross Production Value (constant 2004-2006 million US$);
Note: AIC value chains are marked in red; nes refers to Not elsewhere specified
Data: Average 2011-2013, FAOStat, accessed 9 July 20145

Table 3: Yield of Major Commodities

Year	Commodity Yield (Kg/ha)			
	Maize	Cassava	G/nuts	Soya
1993	1,532.7	2,878.1	901.7	862.3
1994	920.9	3,466.0	321.6	443.6
1995	1,351.7	3,466.9	355.0	645.0
1996	1,443.3	4,587.5	563.3	790.4
1997	1,095.9	5,724.9	707.5	722.9
1998	1,371.1	5,493.9	720.3	702.0
1999	1,810.9	5,456.3	771.4	621.1
2000	1,742.8	15,460.5	723.2	639.4
2001	1,184.5	16,941.6	855.8	658.1
2002	1,046.0	14,963.5	767.4	649.4
2003	1,225.9	15,745.3	826.6	759.3
2004	1,046.0	16,164.4	703.6	644.7
2005	809.3	14,299.5	568.2	579.7
2006	1,481.4	17,311.6	830.3	763.9
2007	2,654.7	18,772.2	1,014.3	897.2
2008	1,649.8	19,076.0	913.9	872.2
2009	2,226.5	20,291.2	1,030.8	980.4
2010	2,015.6	20,431.1	1,007.6	975.7
2011	2,207.9	21,540.8	1,055.6	997.7
2012	2,193.2	22,388.3	1,042.2	1,043.3
2013	2,170.8	22,804.1	1,049.5	979.1
2014	2,333.9	23,579.4	1,057.2	1,084.3
2015	1,656.3	22,504.0	792.9	870.1

Source: FAOSTAT (In most of the cases yield data are not recorded but obtained by dividing the production data by the data on area harvested).

Table 4: Overall Agricultural Growth

Year	National GDP (billion U.S. dollars)	Agricultural GDP (billion U.S. dollars)	Contribution of Agriculture to GDP (%)
1994	1.18	0.296	25.1
1995	1.40	0.426	30.4
1996	2.28	0.791	34.7
1997	2.66	0.867	32.6
1998	1.75	0.623	35.6
1999	1.78	0.674	37.8
2000	1.74	0.688	39.5
2001	1.72	0.667	38.8
2002	2.67	0.981	36.7
2003	2.42	0.852	35.2
2004	2.63	0.919	34.9
2005	2.75	0.911	33.1
2006	3.12	0.985	31.6
2007	3.65	1.153	31.6
2008	4.28	1.272	29.7
2009	5.03	1.569	31.2
2010	5.40	1.599	29.61
2011	5.63	1.750	31.1
2012	4.24	1.293	30.5
2013	3.71	1.232	33.2
2014	4.26	1.419	33.3

Source: The World Bank[2]

[2] http://data.worldbank.org/indicator/NV.AGR.TOTL.ZS; www.theGlobalEconomy.com

Table 5: Agricultural Total Factor Productivity (TFP)

	TFP Annual Growth Rate
1994	0.154
1995	-0.018
1996	0.052
1997	0.086
1998	0.032
1999	0.061
2000	0.020
2001	0.049
2002	-0.046
2003	-0.027
2004	0.013
2005	0.037
2006	0.032
2007	0.093
2008	-0.009
2009	0.041
2010	-0.011
2011	0.022
2012	.
2013	.
2014	.
2015	.

Source: USDA Economic Research Service (ERS)[3]

Note: TFP growth (output growth minus input growth) takes into account all of the land, labor, capital, and material resources employed in farm production and compares them with the total amount of crop and livestock output. If total output is growing faster than total inputs, we call this an improvement in total factor productivity.

From 1998, the Malawi government with support from bilateral donors introduced the farm input subsidy program (FISP) for resource poor smallholder farmers to boost the agriculture sector. The budget allocation for agriculture rose to 10.9% from 4.7% allocated in the previous financial year. Over the years, the government limited the FISP to the poorest of the poor and focused on food crops only to enhance food security. In 2003, African governments (including Malawi) committed to achieving agricultural growth of at least 6% through the CAADP framework and consequently signed the AU Maputo Declaration in which they agreed to increase national budgetary resources to the agriculture sector to at least 10% of their respective national budget. CAADP's goal is to use agriculture-led growth to achieve the first MDG of halving poverty and hunger by 2015. Malawi has performed favourably well particularly between the 2005/06 and 2015/16 financial years, with budgetary allocations to agriculture ranging from 11.3% in the financial year 2010/11 to 18.8% in the 2014/15 growing season.

[3] http://www.ers.usda.gov/data-products/international-agricultural-productivity.aspx

Table 6: CAADP Performance

Financial Year	Government Budget ('000,000 MK)	Budget Allocated for Agriculture ('000,000 MK)	Agriculture Budgetary Allocation (%)
1994/95	2,045	90	4.4
1995/96	5,446	162	2.97
1996/97	6,797	389	5.7
1997/98	12,524	590	4.7
1998/99	16,685	1,818	10.9
1999/2000	23,042	1,495	6.5
2000/01	32,825	1,675	5.1
2001/02	40,912	2,542	6.2
2002/03	45,263	2,526	5.6
2003/04	58,081	2,588	4.5
2004/05	89,888	7,027	7.8
2005/06	119,499	15,171	12.7
2006/07	139,896	18,537	13.3
2007/08	172,839	20,970	12.1
2008/09	229,524	30,803	13.4
2009/10	256,769	32,127	12.5
2010/11	297,084	33,537	11.3
2011/12	303,714	37,715	12.4
2012/13	408,390	65,021	15.9
2013/14	638,151	118,674	18.6
2014/15	748,129	140,665	18.8
2015/16	901,594	133,687	14.8

Source: All data were compiled by The Budget Section of the Ministry of Finance, Economic Planning & Development (September 2015). MK = Malawi Kwacha

1.4.2 Consumption and nutrition status

Table 7: consumption and nutrition status

Food supply quantity (tons)		Food supply quantity (kg/capita/yr)		Food supply (kcal/capita/day)	
Top 10	**% of total**	**Top 10**	**kg**	**Top 10**	**kcal**
Maize and products	23	Maize and products	131	Maize and products	1140
Potatoes and products	20	Potatoes and products	111	Roots & Tuber Dry Equiv	359
Cassava and products	14	Cassava and products	80	Potatoes and products	208
Roots & Tuber Dry Equiv	8	Roots & Tuber Dry Equiv	46	Cassava and products	151
Bananas	4	Bananas	23	Sugar, Raw Equivalent	109
Plantains	4	Plantains	20	Sugar (Raw Equivalent)	108
Fruits, Other	4	Fruits, Other	20	Sugar, Refined Equiv	108
Vegetables, Other	3	Vegetables, Other	16	Pulses, Other and products	95
Beverages, Fermented	3	Beverages, Fermented	15	Groundnuts (in Shell Eq)	73
Sugar, Raw Equivalent	2	Sugar, Raw Equivalent	11	Groundnuts (Shelled Eq)	73

Data: average 2009-2011, FAOStat, accessed 22 July 2015

1.4.3 Trade

Table 8: AIC value chains: AIC value chains: Groundnut, soy, sunflower, cassava

Import volume (tons)		Import value (US$)	
Top 10	**Share of Total**	**Top 10**	**Share of Total**
Wheat	57.3	Wheat	31.0
Tobacco, unmanufactured	8.2	Tobacco, unmanufactured	24.3
Oil, soybean	6.0	Oil, soybean	9.1
Cottonseed	3.6	Food prep nes	3.5
Fatty acids	2.6	Fatty acids	2.8
Maize	2.5	Milk, whole dried	2.1
Cake, soybeans	2.4	Oil, palm	1.9
Malt	1.8	Cigarettes	1.9
Food prep nes	1.5	Sugar confectionery	1.7
Oil, palm	1.2	Cake, soybeans	1.4
Sunflower, Oil	0.8	Sunflower, Oil	1.1
Groundnut (shelled)	0.4	Groundnut (shelled)	0.1

Data: average 2010-2012, FAOStat, accessed 31 Oct 2015
Note: AIC value chains marked in red; nes refers to Not elsewhere specified

Table 9: Top 10 Export and Imports in Malawi

Export volume (tons)		Export value (US$)	
Top 10	**Share of Total**	**Top 10**	**Share of Total**
Sugar Raw Centrifugal	23.8	Tobacco, unmanufactured	61.4
Tobacco, unmanufactured	22.5	Sugar Raw Centrifugal	11.6
Maize	19.2	Tea	8.4
Groundnuts, shelled	7.3	Maize	3.1
Tea	6.6	Groundnuts, shelled	3.0
Peas, dry	3.1	Cotton lint	2.8
Cotton lint	2.2	Nuts, nes	1.3
Sugar refined	1.8	Rubber natural dry	1.1
Bran, wheat	1.7	Peas, dry	1.1
Wheat	1.5	Sugar refined	0.9
Sunflower Seed	0.2	Sunflower Seed	0.1
Soybeans	0.9	Soybeans	0.4
Cake, soybeans	0.1	Cake, soybeans	0.0

Data: average 2010-2012, FAOStat, accessed 31 Oct 2015
Note: AIC value chains marked in red; nes refers to Not elsewhere specified

Wheat accounts for more than 57% of the export volume, but only 31% of the export value. Tobacco accounts for only 8% of the import volume, but for more than 24% of the import value. Tobacco also plays an important role in export trade, where it accounts for more than 60% of the export value. The AIC value chains groundnut, soy, sunflower and cassava account for only small shares in trade, or do not play a role at all. Groundnut is the most important export good among them and accounts for around 7% of the export volume.

1.5 National (and regional) innovation system

1.5.1 Research system and organizations

1.5.1.1 International

The international organizations actively conducting agricultural research and coordinating efforts to support agricultural growth in Malawi include:

- The United Nations Food and Agriculture Organization (FAO);
- The United Nations Development Program (UNDP);
- Future Earth – a major international research platform providing the knowledge and support to accelerate our transformations to a sustainable world;
- The Consultative Group International Agricultural Research (CGIAR):
- International Center for Tropical Agriculture (CIAT);
- International Potato Center (CIP);
- International Maize and Wheat Improvement Centre (CIMMYT);
- International Livestock Research Institute (ILRI);
- International Institute of Tropical Agriculture (IITA);
- International Crops Research Institute for the Semi-Arid Tropics (ICRISAT);
- World Agroforestry Centre (ICRAF).

Others include:

- U.S. Agency for International Development (USAID);
- Department for International Development (DFID);
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ);
- Alliance for a Green Revolution in Africa (AGRA);
- Forum for Agricultural Research in Africa (FARA);
- Australian Centre for International Agricultural Research (ACIAR);
- CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS);
- Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN);
- Norwegian University of Life Sciences.

1.5.1.2 National

The agricultural research and extension in Malawi is underinvested. There is need for increased investments to revitalize the research and extension services, and raise agricultural production. There is also need to integrate and diffuse the international, regional, national and private technology to farmers. The National Agricultural research Services in Malawi is managed by Agricultural Research Council (ARC) which was created in November 1985. The main objective of this council is to oversee research priorities in the public sector in Malawi. The Department of Agricultural Research Services (DARS) is the main organization of NARS. DARS alone constitute more than half the total research potential in Malawi. DARS is within the organizational chart of the Ministry of Agriculture, Irrigation and Water Development. DARS mandate covers crop and livestock production, natural resources, agro-forestry, farming systems and agricultural engineering.

Other organizations make up the NARS in Malawi include:

- Department of Animal Health and Industry (DAHI);
- Forestry Research Institute of Malawi (FRIM);
- Tobacco Research Institute of Malawi (ARET);

- Universities working with DARS;
- The Tea Research Foundation of Central Africa (TRF);
- Sugar Research Foundation.

1.5.2 Innovation platforms

Below is a list of some of the innovation platforms operating in Malawi which have been initiated through interventions by the Forum for Agricultural Research in Africa (FARA).

Table 10: FARA innovation platforms

Name of Platform	Location of Platform	Commodities of the platform
Thyolo Vegetable IP	Thyolo District, five research villages in four EPAs	Improved vegetable seed, improved vegetable production, improved producer-buyer linkages, diversity in vegetables, improved access to inputs and loans
Zomba Vegetable IP	Zomba District, five research villages	Improved vegetable seed, improved vegetable production, improved producer-buyer linkages, diversity in vegetables, improved access to good quality inputs
Balaka	Balaka District	Maize, Tomatoes, Pigeon pea
Machinga	Machinga District	Pigeon pea, Maize.

Source: FARA

1.5.3 Extension system and organizations

For a long time, agricultural extension service in Malawi was the prerogative of the government through its Ministry of Agriculture and the Department of Agricultural Extension Services (DAES). Political changes in 1990s leading to a subsequent adoption of democratic principles necessitated a paradigm shift in provision of agricultural extension and advisory services (Chowa, 2010; Chowa *et al.,* 2013). Decentralization and the presence of other agricultural extension service providers in the field dictated a review of the agricultural extension delivery system that was followed by a decree in 2000 to launch a policy to promote pluralistic and demand-driven extension system. This is summarized in the policy document entitled "Agricultural Extension in the New Millennium: Pluralistic and Demand-driven Services" (Masangano and Mthinda, 2011). Apart from government ministries, players in the pluralistic extension policy include NGOs (which are in majority), Farmer-Based Organization (FBOs), multilateral organizations, private sector organizations and semi-autonomous organization to some extent.

Major Institutions Providing Extension/Advisory Services in Malawi[4]

Public Sector

The public sector is represented by the Ministry of Agriculture and Food Security and its various departments including the Department of Agricultural Extension Services (DAES), the University of Malawi and other education and research institutions around the country. These institutions provide extension services through various departments and institutes some of which are listed below:

Public Extension Institutions:

- Ministry of Agriculture, Irrigation and Water Development (MoAIWD);

[4] More information available at: http://www.worldwide-extension.org/africa/malawi/-malawi

- Department of Agricultural Extension;
- Farm Income Diversification Program;
- Agricultural research & Extension Trust (ARET);
- Malawi Rural Finance Company (MRFC).

Public Research Institution:

- Department of Agricultural Research Services (DARS).

Higher Education Institutions:

- Lilongwe University of Agriculture and Natural Resources (LUANAR);
- Mzuzu University;
- Chancellor College, University of Malawi.

Farmer-Based Organizations and Cooperatives

In, Malawi, sections of farmers in specific geographic area have organized themselves into local level membership-based associations, unions, and/or cooperatives. These farmer-based organizations focus on promoting production and marketing of a particular crop or livestock product and representing the interests of its members. Some other organizations such as NASFAM operate at the national level with local groups and associations across the country.

Farmers' associations:

- National Association of Smallholder Farmers of Malawi (NASFAM);
- Malawi Organic Growers Association;
- Mpoto Dairy Farming Association (MDFA);
- Shire Highlands Milk Producers Association (SHIMPA).

Unions:

- Mzuzu Coffee Planters Cooperative Union Ltd.;
- Farmers Union of Malawi (FUM).

1.5.4 Private R&D activities

Private Sector Firms

Private sector organizations in Malawi play an important role in promoting development and marketing of particular commodities. Private firms collaborate with government extension officers in their work such as identifying producers, administering contracts, monitoring production according to meet the set standards. Some of the private organizations that provide support in form of inputs and technical advice to farmers in Malawi are:

- Alliance One International;
- Malawi Bio Energy Resources LTD.;
- Land O'Lake.

Non-Governmental Organizations and other donors

In Malawi, the NGOs are the largest grouping in the extension system with a substantial number of extension service providers in various agricultural activities. Some of NGOs are associated with a particular commodity or are identified with a particular church or religion funding them. A list of some of the NGOs operating in Malawi is as follows:

- ActionAid, www.actionaid.org/malawi;
- Africare, http://www.africare.org;

- Catholic Development Commission, CADECOM-Chikwawa, http://www.caritas.org/worldmap/africa/malawi.html;
- CARE, http://www.care.org;
- Church of Central African Presbyterian, CCP Development Department;
- Community Youth Development Activities, www.covida.org;
- Eagles Relief and Development Program;
- Emmanuel International, http://www.ei-malawi.org;
- Evangelical Association;
- Fair – a Joint Rural Livelihood Program;
- FAO, www.fao.org;
- Good Samaritan, www.gsmalawi.org;
- Heifer International, www.heifer.org;
- Japan Overseas Cooperative Association, JOCA, www.joca.or.jp;
- Maranatha Ministries;
- NASFAM, www.nasfam.org;
- Plan International, www.plan-international.org;
- Small-Scale Livestock Production Program, SSLPP, www.smallscalelivestock.org;
- Sustainable Rural Growth and Development;
- The Hunger Project;
- Total Land Care, TLC, www.totallandcare.org;
- World Alive Commission for Relief and Development, www.wordalive.mw.

1.6 Key challenges, emerging needs and potentials in the agricultural sector

There are several key constraints in the agricultural sector. The constraints include:

- Low and stagnant yields;
- Over-dependence on rain-fed farming which increases vulnerability to weather related shocks;
- Low level of irrigation development;
- Small land holding sizes, land fragmentation and land degradation;
- Low uptake of improved farm inputs;
- Weak links to markets and high transport costs, and lack of market information;
- Efficiency and effectiveness of agricultural input subsidies;
- Few farmer organizations;
- Poor quality control;
- Limited value addition;
- Adverse climatic conditions;
- Institutional and Capacity Challenges such as:
  - Weak and poor coordination among implementing institutions;
  - Weak implementation and management capacities;
  - Past and ongoing support to institutional development and capacity building.

Based on the general approach (see Africa-wide study Chapter 4) and in pursuit of efficiency and effectiveness, investment by Germany into the agricultural and food sector are suggested in those African countries, which

- Show actual progress in sustainable agricultural productivity driven by related innovations, as indicated by comprehensive productivity measurement and innovation actions on the ground;
- Have a track record of political commitment to foster sustainable agricultural growth, as indicated by performance under CAADP, and
- Prioritize actions for hunger and malnutrition reduction and show progress, but where agricultural and rural development and nutrition interventions are likely to make a significant difference, as indicated by public policy and civil society actions.

Based on this approach, investments into the agricultural and food sector of Malawi can be expected to have significant effects on the food and nutrition security situation in the country.

Table 11: Country level Performance Indicators

Indicators	Index	Performance (%)
1. Number of Years with more than 6% agricultural growth (2005 to 2014)	5	50
2. Percentage point change in TFP index between 2001 and 2008	47	100
3. Number of years with more than 10% government expenditure (2005 to 2014)	9	90
4. Average share of agricultural GDP spent on R&D (2005 to 2011) in %	0.8	78
5. Steps in CAADP completed	7	88
6. Percentage point improvement in undernourishment between 2001 and 2011	5.7	30
7. Global hunger index (2014)	13.6	30
Total score (weighted)		63

Source: Own computation based on World Bank (2015), FAO (2015), ASTI database and von Grebmer *et al.* (2014)
Note: the % performance (rounded) is defined as follows for the respective indexes: 1. % out of 10 years; 2. classes: if <1, or negative= 0; 1 – 7= 30, 8-15= 60, > 15= 100; 3. % out of 10 years; 4. % of the AU target value of 1% spent on R&D; 5. % of the desired 8 steps; 6. classes: if < 2 = 0; if 3-5.7= 30; if 6-10=60, if>10=100; 7. classes: if < 12= 0; 12-16: = 60; 17-20: = 60; > 20= 100.
Total score (weighted) performance and need to invest: (sum of (1.+2.)/2 (expected growth performance); + sum of (3.+4.+5.)/3 (expected government commitment); + sum of (6.+7.)/2 (performance in food and nutrition security and need)) divided by 3.

Results of assessment (Table 11):

Expected agricultural growth performance:

- Malawi has modestly increased its agricultural growth by having five years more than the annual 6% agricultural growth target defined by CAADP between 2005 and 2014 (www.resakss.org);
- Total factor productivity in Malawi had improved by 47% between 2001 and 2008 (Fuglie and Rada, 2011) indicating that Malawi´s commitment to research and development into the agricultural and food sector is significant.

Government commitment:

- Malawi has track record of strong political commitment to foster sustainable agricultural growth by being active in the CAADP process and having completed seven of the eight steps in the CAADP process (www.resakss.org);

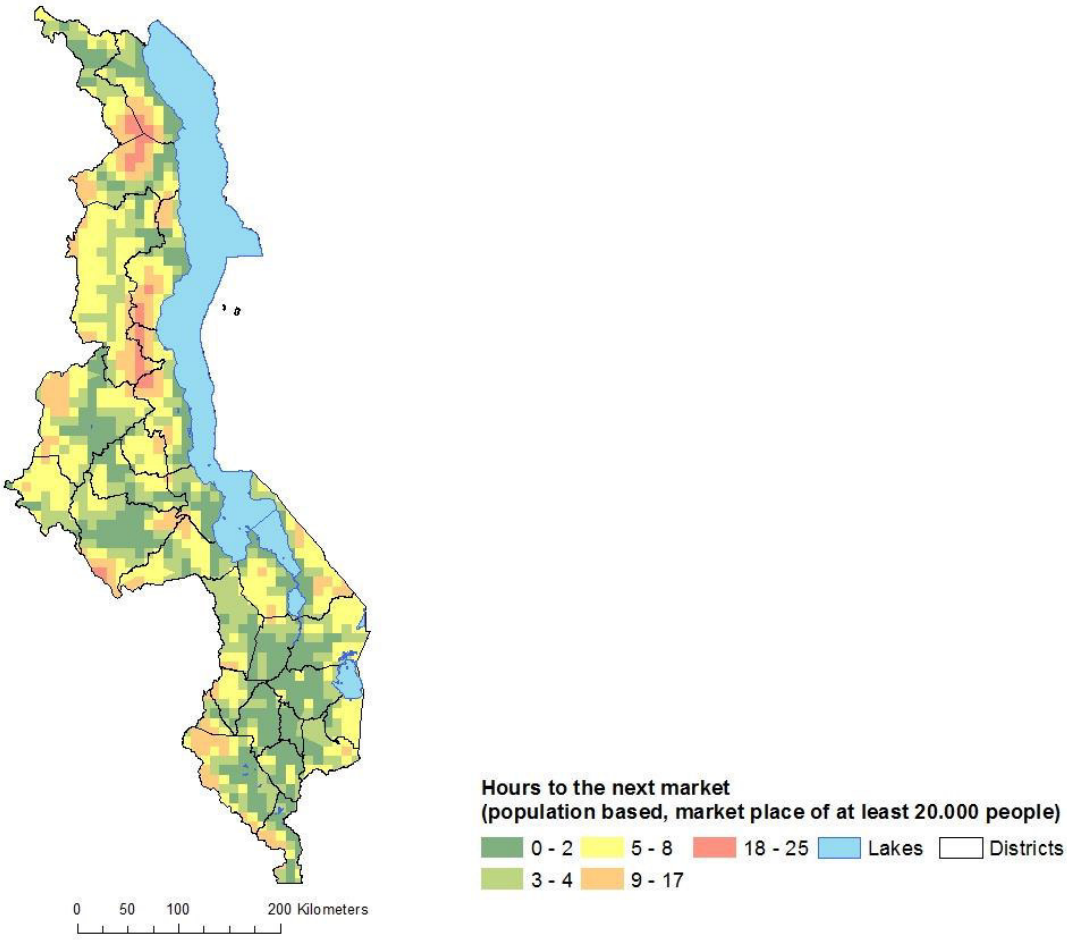
- The Malawi government has also shown a strong willingness to invest in agricultural sector by surpassing the CAADP 10% agricultural expenditure target for nine years between 2005 and 2014 (www.resakss.org);
- However, Malawi spends 0.8 % of its agricultural GDP on agricultural research, which is slightly lower than the AU target value of 1% spent on R&D (www.asti.cgiar.org). This indicates that, even though Malawi´s commitment to research and development into the agricultural and food sector is not yet sufficient, though it is much better than all the other AIC countries.

Food and nutrition security progress and need:

- Malawi seems less prioritize actions for hunger and malnutrition reduction and show only less than 6% improvement in undernourishment between 2001 and 2011, which is lower than the threshold (FAO, 2014);
- In addition, Malawi has the GHI score value of 13.6 reflecting a serious level of hunger (von Grebmer *et al.,* 2014)[5]. This makes investments into the agricultural and food sector in Malawi justifiable to fight the modest numbers of food insecure people.

The economic, political, and social/nutrition framework in Malawi suggests accelerated investment into the agricultural and food sector of the country.

Figure 1: Distance to markets



[5] GHI score Values less than 5.0 reflect low hunger, values from 5.0 to 9.9 reflect "moderate" hunger, values from 10.0 to 19.9 indicate a "serious" level of hunger, values from 20.0 to 29.9 are "alarming," and values of 30.0 or greater are "extremely alarming."(von Grebmer *et al.,*2014)

Data sources: Hours to next market - HarvestChoice, 2015;
Administrative areas: http://www.gadm.org/, accessed 20.9.2015
Inland water bodies: http://www.diva-gis.org/gData (water bodies), accessed 20.9.2015

Transportation intensive products should be promoted in areas indeed are well connected to markets, whereas the remote areas should focus on low volume and livestock value chain segment.

2 Most relevant value chains in the country

Value chains do address the most essential determinant of what farmers will produce within the crops or other farm enterprises that are possible within the physical environment. Once any subsistence needs are met the marketing system controls what farmers emphasize. The key to this marketing link are often the village-based family enterprises, such as CNFA's network of agro-dealers, who provide the producers with inputs and purchase their produce and then forward the produce down the value chain to the processor or consumers, etc. (Ekboir and Rajalahti, 2012). These village-based family enterprises deal with the smallholder producers, who are usually also their neighbours and friends, as the individual private entrepreneurs they are, and avoid trying to convert them to community farmers as with an imposed cooperative business model. Also, given the overall economic environment mentioned above, these local business service providers, with their low overhead costs and razor thin profit margins, usually provide the producers the financially best deal available (Ekboir and Rajalahti, 2012).

2.1 AIC-Value Chains

2.1.1 Groundnuts

Groundnut is one of the most important food and cash crops in Malawi and one of the major foreign exchange earners for the country. It is a good source of protein, vitamins and vegetable oil. The national aim is to improve the yield and quality of both confectionary and oil nuts to meet the local and export demand and provide raw materials to the domestic vegetable oil industry (African Development Bank, 2013). Groundnut is one of the cash and food crops grown in Malawi and will continue to play an important role in the future (Simtowe *et al*., 2012; Sangole *et al.,* 2010) it is an important source of protein, edible oil, fats, energy, minerals, and vitamins (Chirwa, 2009; Longwe-Ngwira *et al.,* 2012).

2.1.2 Soy (Soya)

Soybean is an important and valuable grain legume because of its multiple uses. It has a very high protein content (37%) which can be utilized by both humans and livestock (GoM, 2008). It is used in the production of high-protein, and livestock feeds. It is a good nitrogen fixer and therefore improves soil fertility. The national aim is to encourage the growing and utilization of soybeans and increase yields to meet the high demand in both domestic and export markets (Tinsley, 2009).

Opportunities for soy:

- A blend of maize-soy is used to make breakfast porridge
- Increasing demand for soybean for making infant and baby formula
- Increasing demand for nutrition and relief programs especially by NGOs in hospitals, orphanages, and refugee relief efforts
- Demand for use as feed in animal industry (poultry and dairy productions)

However, there is so far limited value addition done on soybeans.

2.1.3 Cassava Value Chain

Cassava is the food crop in the lakeshore areas of Nkhota-Kota, Nkhata-Bay, Rumphi and Karonga. In some districts such as Mzimba, Kasungu, Lilongwe, Dedza, Dowa, Machinga, and Mulanje, cassava is increasingly becoming a major cash crop. It is also grown in other parts of Malawi as a food security crop. The main advantage of growing cassava is that it is drought tolerant, its ability to yield well on marginal soils, it is tolerant to pests and diseases, requires minimum labour, has low yield fluctuations compared to grains, and its leaves are used as relish. The national aim is to increase yield and production in all areas.

2.2 Other relevant Value Chains

- pending further information -

3 Innovations in value chains in the past 20 years

3.1 The most crucial limiting factors in Malawi / AIC-region / in AIC-Value Chains

3.1.1 Groundnut Value Chain[6]

Constraints: The main constraints for groundnuts are limited access to improved seed varieties, poor husbandry practices, pest and disease control, and poor linkages to markets.

A number of reasons are attributed to low groundnut production in the country including the following:

- Erratic rainfall and dry spells during critical periods of the plant growth;
- Reliance on small-scale traditional groundnut farming husbandry practices;
- Poor access to improved seed materials and low adoption of improved technologies;
- Limited availability of basic seed for multiplication and especially low involvement by the private sector in improved groundnut seed multiplication;
- Poor crop husbandry practices resulting into declining soil fertility levels;
- Pest and diseases.

A number of constraints affecting post harvesting handling of groundnuts include the following:

- Continued use of traditional methods of harvesting;
- Limited knowledge in groundnut grading and value addition, and on proper groundnut handling during drying and shelling;
- Shelling methods render nuts susceptible to aflatoxin;
- Use of unimproved storage facilities that increases chances of post-harvest losses from pest and disease attach;
- poor collective bargaining power due to individual sales by farmers;
- High storage costs and transportation and lack of skills for commercial farming and aflatoxin management;
- Poor road and market infrastructure and dishonest traders (tamper with weighing scale);

[6] Source: http://www.scribd.com/doc/136427694/Groundnut-Value-Chain-in-Malawi#scribd

- Absence of price differentiation for quality
- There is very little value addition amongst the processor;
- Weak partnership and linkages between the private sector and government on groundnuts as it is in the tobacco industry;
- Lack of accredited laboratories for groundnuts quality certification in the country (Stepman, 2013).

3.1.2 Cassava Value Chain

Cassava production is mainly constrained by limited use of improved varieties, poor husbandry practices, including pest and disease incidence, lack of processing to add value and poor linkages to markets for processed cassava products.

3.1.3 Soy bean Value Chain

The main constraints include limited access to improved seed varieties, poor use of *Rhizobium* inoculum to increase yield, poor husbandry practices, and poor linkages to markets.

3.2 The most important / beneficial innovations in the relevant Value Chains of Malawi

3.2.1 AIC Value Chains

Opportunities in the groundnut value chain

There are a number of opportunities which could proof effective in improving the groundnut value chain in Malawi:

- Existence of various trading opportunities in the regional SADC and COMESA trading blocs;
- Persistent problems in tobacco value chain present opportunities for smallholder farmers to switch to groundnuts and other high-value legumes;
- The Government of Malawi Growth and Development Strategy (MGDS, 2011-2016) seeks to diversify agricultural production of high value commodities for exports to promote food security, economic growth and wealth creation;
- The possibility to expand agro-processing and market development as prescribed I the Agricultural Sector-wide Approach (ASWAp, 2009).

Opportunities in the soybean Value Chain

Over the past two decades soybeans have become a fairly established crop within the Malawi farming systems that is well synchronized with demand.

3.2.2 Other VCs and cross-cutting innovations

USAID/Malawi Integrating Nutrition in Value Chains: Feed the Future (FTF)[7] is a U.S. Government global initiative to sustainably reduce poverty and hunger. USAID/Malawi's flagship FTF activity, Integrating Nutrition in Value Chains (INVC), strengthens the competiveness of the soy and groundnut value chains, improves the nutritional status of women and children, and builds the capacity of Malawian agriculture and nutrition organizations" (FTF, 2011).

[7] http://www.feedthefuture.gov/country/malawi

Key achievements

- More than 320,600 rural households benefitted from Feed the Future activities, such as technical assistance on improved agronomic practices, access to improved seed varieties, linkages to market opportunities including warehouse receipt commodity marketing and nutrition education aimed at increasing consumption of nutritious crops;
- Nearly 215,000 households improved their food security thanks to an integrated package of activities that included nutrition, health, hygiene and sanitation, conservation agriculture, irrigation, agribusiness and disaster risk management assistance;
- Through support for the New Alliance for Food Security and Nutrition, Feed the Future helped the Government of Malawi develop an inter-ministry and country-owned policy agenda to drive the commercialization and growth of the agriculture sector;
- Private sector companies made investments of US$ 23 million in Malawi's agriculture sector related to their original New Alliance commitments;

Reasons for success:

- Strong relationships with key government counterparts and U.S. Government leadership in development partner coordination were instrumental in securing high-level support for New Alliance for Food Security and Nutrition commitments.

3.3 Most promising approaches for farmer and small business related Value Chain innovations

Below are some approaches derived from the cassava and soy value chains:

Cassava

- Promote early field preparation and timely planting and timely harvesting;
- Encourage farmers to follow recommended planting technology to achieve optimal plant population;
- Promote use of improved and high quality planting material;
- Encourage farmers to control pests and promote IPM;
- Encourage cassava processing and use of good storage facilities;
- Link farmers to markets for processed cassava.
- Increase access to improved cassava varieties, by:
- Conducting community awareness, facilitating the formation of farmers groups, providing improved high quality, clean and disease-free planting material etc.

Soy bean

- Promote early field preparation and timely planting;
- Encourage farmers to follow recommended planting technology to achieve optimal plant population;
- Promote use of improved and high quality seed;
- Encourage seed inoculation and use of fertilizer (Inoculation and Fertilisers);
- Encourage farmers to control pests and promote IPM;
- Promote timely harvesting;
- Promote use of good storage facilities;

- Link farmers to markets;
- Improve access to OPV Soya Bean seed through community seed multiplication.

4 Suggestions for Collaboration

4.1 Promising Agricultural Products and Value Chains

Besides assessing the returns of investments into institutional innovations in Malawi, analysis to choose the most promising value chains in the country is also undertaken. In compliance with the availability of data and the purpose of the study four criteria that focus on poverty and market potential are used to select the five most promising agricultural products from the long list of agricultural products the country produces and sells. The first indicator, the trade potential (revealed comparative advantage (RCA) index), is computed to identify value chains over which the country has revealed (but not potential) comparative advantage. In the present case, the RCA index compares the share of a given agricultural product in Malawi's export basket with that of the same product in total world exports. The second indicator, yield gap, is used to assess the expected return of the envisaged Germany investment on the given AIC country value chains. A third indicator, average yield growth, is used to examine the Potential of the product for poverty reduction. The production share of total supply is also used to assess the present integration of the poor in the market (relevance).

The summary of the five most promising value chains based on Revealed Comparative Advantage (RCA) index, average yield growth and relative yield gap is reported in table 12 below. The production share, RCA index, actual yield growth and relative yield gap for the GIZ-selected value chain(s) is also reported at the bottom of the table, when they are not included in the list of the first five most promising value chains.

Table 12: Selection of promising agricultural products /value chains

	Rank by RCA		**Rank by Yield progress****		**Rank by relevance of crop**	
Rank	**Name of agricultural Product**	**RCA index (2011)***	**Name of the Crop**	**Average annual Yield growth (2005 to 2012)**	**Name of agricultural Product**	**Production share of supply (2011)***
1	Tobacco, unmanufactured	36	Maize	23	Beverages, Alcoholic	125
2	Cotton, carded, combed	34	Pigeon peas	21	Sunflower seed	110
3	Coffee, substitutes containing coffee	15	Rice, paddy	17	Maize and products	109
4	Cotton linter	10	Seed cotton	12	Rice (Milled Equivalent)	100
5	Tea	9	Potatoes	11	Millet and products	100
GIZ Selected products	Groundnuts, shelled	9	Sunflower seed	17	Soya beans	100
	Sunflower seed	0.03	Groundnuts, with shell	10	Cassava and products	100
	Starch, Cassava	0.01	Soybeans	9	Groundnuts (Shelled Eq)	98
	soybean	0.04	Cassava	7	Sunflower seed Oil	50

Source: * Own computation based on FAO 2015 data.
Note: ** a minimum of 0.5% production (volume) share threshold is used as a screening (crop relevance) criteria.

Results of assessment (Table 12):

- The trade potential (revealed comparative advantage (RCA) index) is very high for unmanufactured tobacco, carded cotton, coffee substitutes, cotton linter, Tea and one of the GIZ selected value chains, groundnuts. This indicates that Malawi has a comparative advantage (in the export) of these commodities. The RCA value for the other GIZ crops, sunflower, cassava and soy, is less than 1 indicating that Malawi has a comparative disadvantage (in the export) of these commodities;
- The yield performance indicating progress suggests that over the CAADP period (2005 to 2012) maize, pigeon peas, paddy rice, seed cotton and potatoes are the five most promising crops. The GIZ selected crops (groundnut, soybeans and cassava) also grow at a higher rate and are ranked as the 8th, 9th and 11th most promising crops. The other GIZ product, sunflower, grows at a very high rate, but its production share is less than 0.5%;
- In terms of relevance (production share of supply) alcoholic beverages, sunflower seed, maize and rice value chains are the leading. The total production of the first three products exceeds the total supply. The total supply of the latter two products and three of the GIZ selected products (soybeans, cassava and groundnut) is domestically produced while only half of the sunflower seed oil supplied in the market is locally produced.

4.2 A systematic assessment of promising partnerships for each promising innovation area

- pending further information -

4.3 Some potential partners for the German collaboration: in science and research, private sector and NGOs and governmental organizations

The tables below provide some suggestions for key partners in the groundnut and soybean value chains.

Table 13: Key partners in the groundnut value chain and their roles

Partner	Role
Department of Agricultural Research Services; Ministry of Agriculture and Food Security	Undertake variety development, evaluation and release; produce breeder and foundation seed; develop integrated crop management technologies; provide Aflatoxin testing services
Seed Services Malawi	Seed systems support to help collaborating NGOs and CBOs with quality seed production monitoring
Department of Crop Production; Ministry of Agriculture and Food Security	Provide guidance in integrated groundnut production technologies and associated packages; facilitate groundnut value chain coordination
Department of Agricultural Extension Services; Ministry of Agric. and Food Security	Undertake farmer education and technology dissemination
Ministry of Industry and Trade	Identify opportunities in regional and international groundnut trade
Farmers	Use products and services
Farmers Union and Associations (FUM,	Capacitate farmers formation of associations for collective

NASFAM, GALA, ASSMAG, MLDA)	production and marketing; facilitate linkages to other agro-industries
NGOs (CISANET, CARE Malawi, Plan Malawi)	Support farming communities by imparting knowledge and skills for increased production; facilitate farmer-friendly agricultural policies
ICRISAT; CGIAR	Provide improved germplasm; Build capacity through training; conduct research on effective methods of technology dissemination
Private sector (market intermediaries, seed enterprises, processors and agro-input dealers)	Facilitate processing and commercialization

Source: Monyo (2013).

Table 14: Key partners along the soybean value chain and their roles

Partner	Role
IITA-Malawi	Soybean breeding, variety development, technical backstopping and training
Ministry of Agriculture and Food Security	Agricultural policies
Department of Agricultural Research Services	Research on varietal development
Lilongwe Agriculture and Natural Resources	Research and training
National Smallholder Farmer's Association of Malawi (NASFAM)	Production of quality declared seeds and linking farmers to markets
Association of Smallholder Seed Multiplication Action Group (ASSMAG)	Farmer owned and controlled rural seed production and marketing organization
Department of Agricultural Extension Services (DAES)	Extension of technologies
Seed Co - Malawi (private seed company)	Production and marketing of seeds
Central Poultry Feeds (CP-Feeds) and Rab Processors	Buy soybean grain from farmers, process soybeans into human food and animal feed
Soybean Association of Malawi (SOYAMA)	Address soybean trading and marketing issues as well as lobby financing institutions to support the soybean industry
Grain Legumes Development and Marketing	Enhance production and marketing of legumes
Department of Crop Development	Provide guidance in crop production

Source: Monyo (2013).

4.4 Needed implementation research

- pending further information -

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