

# **Smallholder agriculture and food security: diversifying and sustaining rural livelihoods in sub-Saharan Africa**

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**SMART VILLAGES**  
New thinking for off-grid communities worldwide

# Agricultural Production and Poverty Reduction

- Agriculture is an important engine of growth and poverty reduction in developing countries by generating income and employment in rural areas and providing cheaper food for urban areas.
- The source of agricultural growth also matters for its impact on poverty reduction
  - gains achieved with technologies increasing productivity have generally led to increases in wealth
  - growth arisen from expansion of land under cultivation tends to correlate with low levels of poverty reduction (de Janvry and Sadoulet 2009).

# African Food Production

- various restrictions imposed on African agricultural production by input constraints: poor soils, too little irrigation, not enough high-yielding seed, and inadequate inorganic fertiliser, draught power, and credit
- the productivity growth of 37 African countries was 1.68 percent from 1981 to 2001 (Evenson and Dias Avila 2007)
- the regional aggregate productivity declined by an average of 0.9 percent in countries in SSA in the 1980s (Trueblood and Coggins 2003)

# Constraints on food production

- fertilizer use in Africa is less than 10% of that in Asia and increases in fertilizer has increased yields, also resulted in very large increases in water consumption (Henao and Bannante 2006)
- Limited success in transferring models from other regions to the African agricultural environment (Diao et. al. 2006).
- differences in ecologies, types of agrarian relations and land ownership (Dorward 2002).

# Obstacles in Agricultural Production

- an increasing dependency on information that is essential for improving productivity through appropriate production planning, use of improved seeds and planting materials, suitable cultivation practices, effective post-harvest management, storage
- smallholder farmers in developing countries face large-scale information asymmetry that generates inefficiencies in production and can result in the exploitation of the farming community (Ali & Kumar, 2011; Nakasone et al., 2014)
- Women farmers are particularly penalised by information asymmetries as they typically also have reduced access to resources and lower decision making-power over economic activities than their male counterparts (Fischer & Qaim, 2012; Negin *et al.* 2012)



# Small holder farmers

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- Globally there are 450 million smallholder farmers
- Africa has about 63 million such farmers
- Income ranges between \$170 - \$570 per annum
- Many farm on less than 2 hectares
- Many only market produce within their locale
- Less than 10% have entered lucrative export value chains

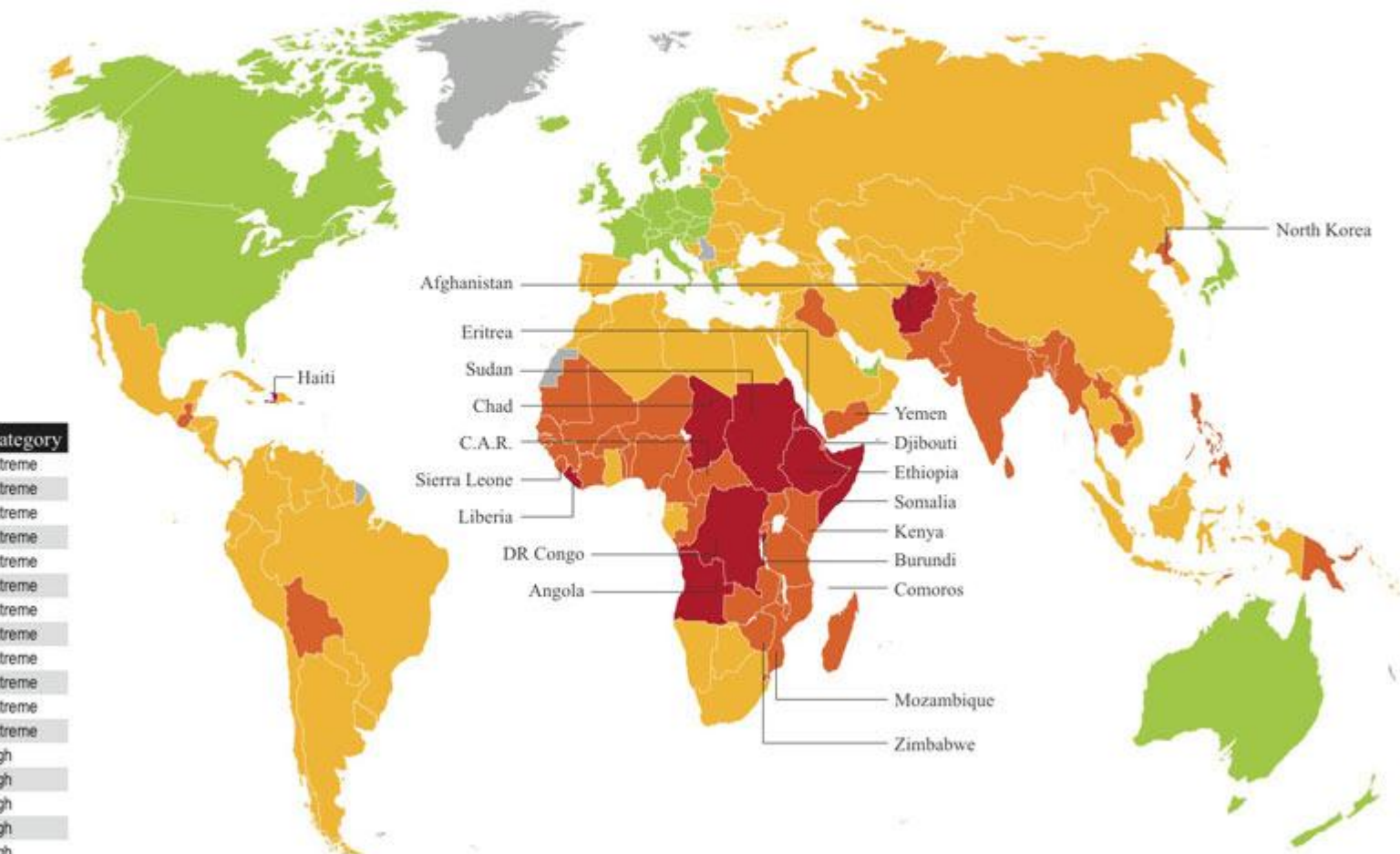
# Agricultural challenges

- African peasants in more remote locations and with a smaller scale of production are finding it more difficult to meet delivery market specifications of regularity and product standardization (Gibbon and Ponte 2005)
- large international players tip the power balance against African agriculture and undermine the position of the small farmer (Rosset, 2006)
- Those who control critical points along the agricultural value chain, own established brand names or have access to shelf space in supermarkets make most of the profits in global value chains. (UNCTAD 2008: 51).



# Obstacles to growth

- contribution of smallholders to agriculture innovations has tended to be overlooked (Haggblade 2005)
- the imposition of a technological fix should not strait-jacket African agriculture into a ecologically unsustainable production system (Scoones 2005)
- a new programme under the current philanthropic effort can only succeed if it is able to take on board the harsh lessons of the first Green Revolution's failure (Holt-Gimenez 2006)



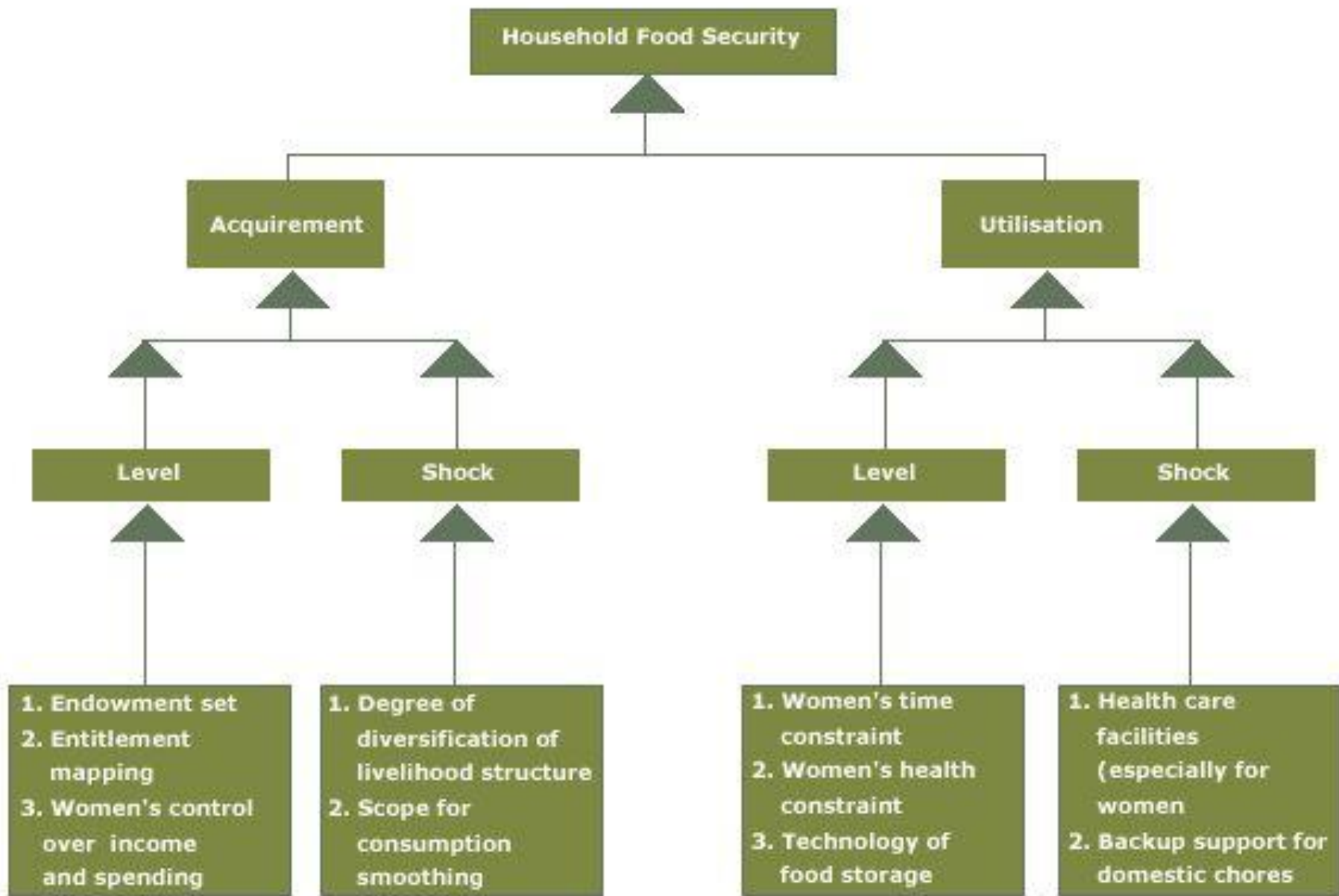
Rank	Country	Category
1	DR Congo	extreme
1	Somalia	extreme
3	Burundi	extreme
4	Eritrea	extreme
5	Angola	extreme
6	Chad	extreme
7	Ethiopia	extreme
7	Haiti	extreme
9	Afghanistan	extreme
9	Liberia	extreme
11	Comoros	extreme
12	Sudan	extreme
13	C.A.R.	high
14	Djibouti	high
15	Zimbabwe	high
16	Yemen	high
17	Sierra Leone	high
18	Mozambique	high
19	North Korea	high
20	Kenya	high

Afghanistan  
 Eritrea  
 Sudan  
 Chad  
 C.A.R.  
 Sierra Leone  
 Liberia  
 DR Congo  
 Angola  
 Yemen  
 Djibouti  
 Ethiopia  
 Somalia  
 Kenya  
 Burundi  
 Comoros  
 Mozambique  
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# Food insecurity

- Ghana was the only country in Sub-Saharan Africa that has reduced its GHI by a significant level: between the GHI 1990 and GHI 2008 it reduces its levels by more than 40 percent; no country in the SSA region is among the 10 best performers in improving the GHI since 1990 (GHI 2008 Report)
- political opposition and conflict impact directly on the fragility of states, they also make people more vulnerable in emergency situations, such as humanitarian crises and famine (Pantuliano 2007).



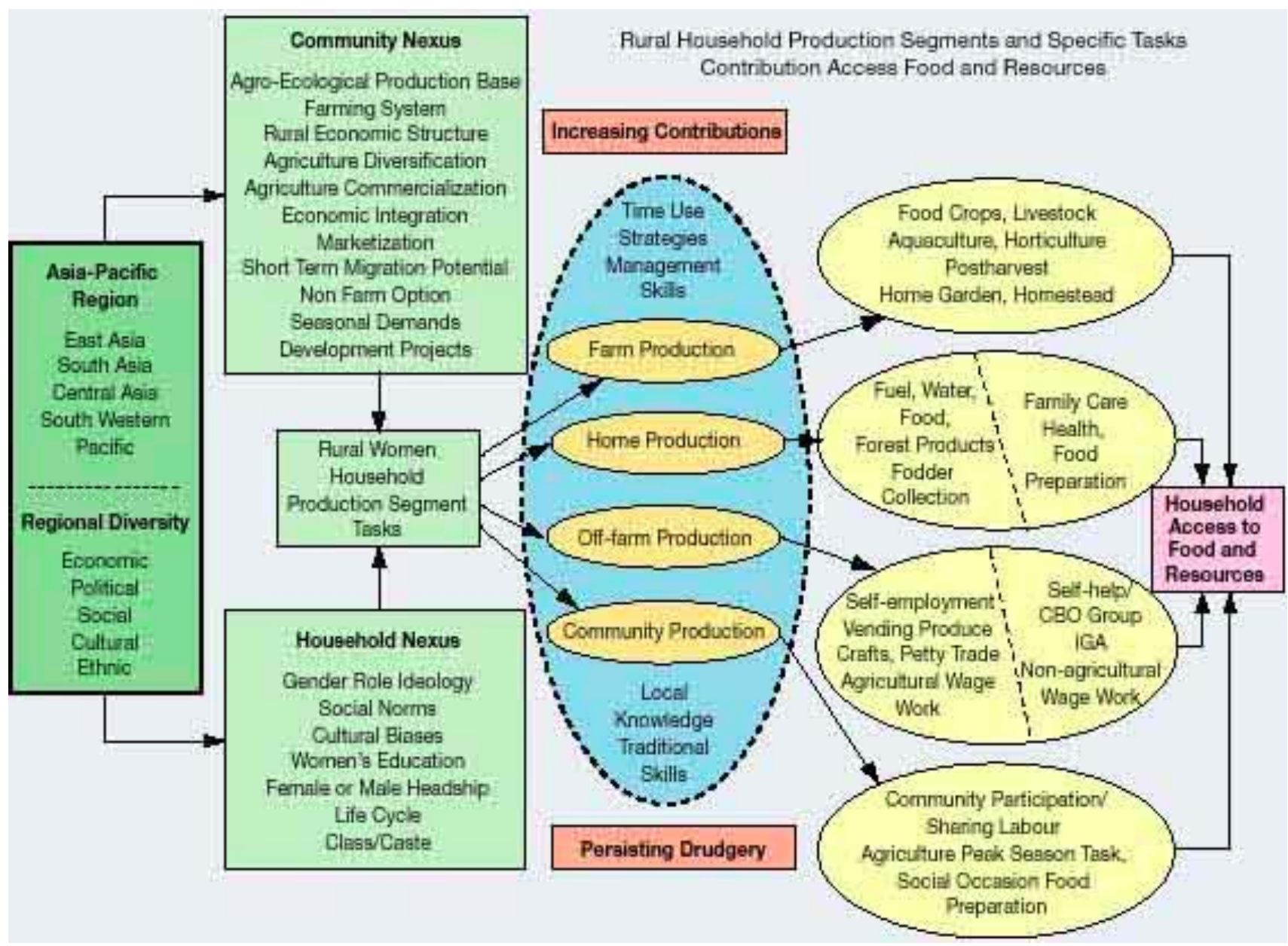
# Agricultural Trade

- Agricultural export crops account for only 8 percent of total agricultural production (Peacock, Ward, and Gambarelli 2007)
- these countries simultaneously face erosion of price preference as well demand erosion and demand substitution for their exports (Badiane 2006)
- 40 per cent of SSA rely on food imports to meet its total requirement (Gayi 2006).

# Current concerns

- low income countries in sub-Saharan Africa cannot remain indifferent to the opportunities for multilateral trade liberalisation in agriculture (Anderson 2008)
- the record of technical interventions in Africa has been largely poor and unsuccessful extension programme failures (World Bank 2007)
- the under-investment in the agriculture sector of African countries is linked to both shifts with domestic elite politics as well as donor perceptions of the poor success of investing in African agriculture (Odhiambo 2007)

Rural Household Production Segments and Specific Tasks  
Contribution Access Food and Resources



# Smallholders dominate the livestock sector: Are means to achieving twin goals

- Small and medium enterprises dominate the livestock sector (70% of current production)
- Small and medium livestock enterprises can be made competitive with large ones – some already are competitive
- Attention to the smallholder livestock sector contributes not only to attaining *food and nutrition security* but also to *reducing rural poverty*, achieving twin goals







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## Smallholder livestock keepers are competitive

### East African dairy

- In Kenya, 1 million smallholders keep the largest dairy herd in Africa (larger than South Africa)
- The lowest-cost milk producers globally are found in Uganda
- Small-scale Kenyan dairy producers get above-normal profits of 19-28% in addition to non-market benefits (finance, insurance, manure, traction) of a further 16-21%



# Role of ICTs in improving agricultural information

- Mobile phones have been used to provide agricultural information to farmers in Sub Saharan Africa since 2007, partly in response to the decline in the provision of traditional extension services but also in recognition of the potential for mobile phones and tablet devices to revolutionize the provision of information to farmers
- By the end of 2019, there will be over 930 million African mobile subscribers, with 75% of these having access to the internet, and with 557m smartphones (Ericsson, 2015).

# Limitations of current provision

- only 32% of the population in Sub Saharan Africa has access to electricity - the lowest worldwide, and nearly 80% of those lacking access to electricity across Sub Saharan Africa are in rural areas (International Energy Agency 2014).
- places immense pressure on public and private institutions in Sub Saharan Africa to develop innovative ways to improve the productive uses and outputs of the little energy that people are provided with (Fan *et al.* 2000; WBCSD 2009).
- government extension services in Sub Saharan Africa are typically underfunded, understaffed, and suffer from poor planning, weak accountability and governance issues (Birner *et al.* 2006; Waddington *et al.*, 2010)

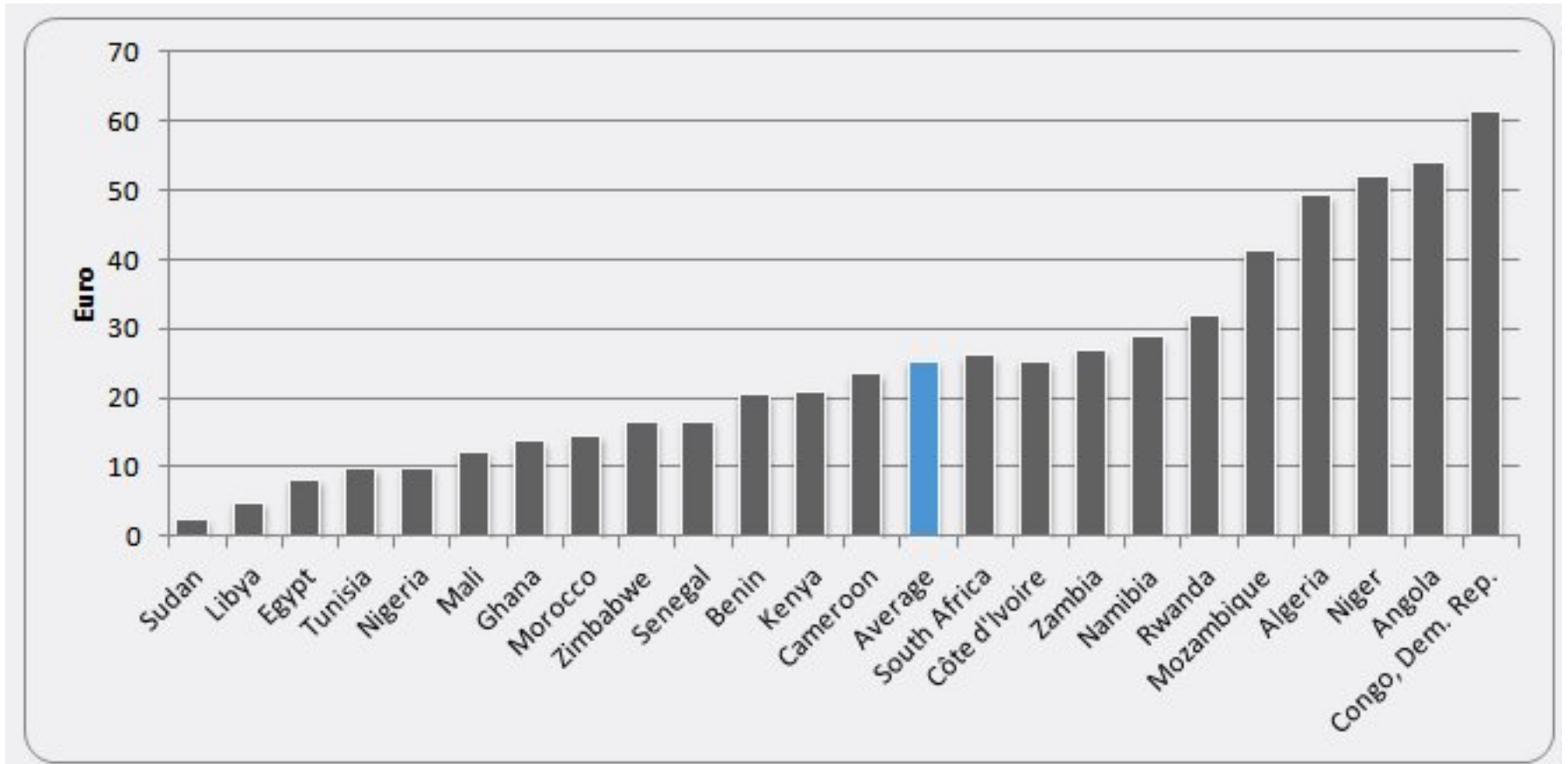


Fig. 2 Average wireless broadband tariffs in Africa in Euros, Q4 2013. Source: Quantum- web (<http://quantum-web.com/africas-broadband-tariffs-decline-in-q4-2013/>)

# Inverted Costs of Mobile Connect

- Mobile Broadband Connectivity in developing countries is less affordable than in developed ones, representing between 11.3 – 24.7 per cent of the monthly GNI p.c., compared to between 1.2 – 2.2 per cent of the developed ones.
- Mobile Broadband Connectivity remains more affordable than fixed broadband subscriptions. As shown in ITU (2013b), post-paid computer-based mobile broadband subscriptions represent 18.8 per cent of monthly GNI p.c., compared to 30.1 per cent for a post-paid fixed broadband subscription on the same data-basis of 1GB downstream.
- In Africa, the average monthly price of wireless broadband tariffs, at €25, was by the end of 2013 lower than the price for fixed broadband, at €42 (Quantum-web 2014).

# Global Internet Use

- By the end of 2013 there were 2.7 billion Internet users, 39 per cent of the world's population.
- Only 31 per cent of the developing world population has access to the Internet, compared with 77 per cent in the developed world.
- Africa comes in last with only 16 per cent of the population being Internet users.
- The existing gender gap (globally 37% of all women are online, compared with 41% of all men ) is more evident in the developing countries, where 16% fewer women than men use the Internet, compared with 2% fewer women than men using the internet in the developed countries

## ICT FOR AGRICULTURE

- ❖ Uganda's communications sector is one of the fastest growing in Africa. As in the rest of the continent, this is largely due to the rapid expansion of mobile telephony.
- ❖ Mobile telephone subscribers rose well over 14 million by the end of 2011— up from more than 9.4 million in December 2009 — which is about one-third of the country's population.





## Strong growth in developing-country crop-livestock systems presents opportunities

- Of the world's almost 1 billion smallholder livestock producers, it's expected that:
  - One-third will find alternate livelihoods
  - One-third may or may not remain part of the transformation of the livestock sector
  - One-third will succeed at market-oriented livestock livelihoods
- The transitions, including consolidation, in smallholder crop-livestock systems that will take place in coming decades present opportunities to increase food production and simultaneously promote positive environment, equity and health benefits

# How can we better position the livestock sector in Africa? Some thoughts

- Focus public-sector attention on enabling environments for large and small producers
- Support local markets and promote continental trade: The value of the market for livestock products in Africa was **US\$33 billion in 2006/7** and will be **\$107 billion by 2050**
- Shift from hazard- to risk-based approaches to food safety, market access & trade policies
- Link rural infrastructure development to the needs of the agriculture sector
- Avoid reckless attempts at 'leap frogging'
- Strengthen research and delivery services – market access promotes a technology demand



# Role of ICT

- To provide scalable and affordable advisory services to **info-poor livestock** keepers
- Accessibility and **reduction of transaction costs** of advisory services
- Improving **farmer decision making** ability- addressing literacy barriers
- Strengthening **expert- farmer linkages**
- Mobile serving as a tool for **women empowerment**



## Target Beneficiaries

- Marginal farmers- less than 1 ha land holding
- Smallholder farmers- between 1-2 ha land holding
- Farmers practicing mixed cropping and livestock farms.



# Smart Villages Initiative

The Smart Villages Initiative aims to provide policy makers, donors and development agencies concerned with rural energy access with new insights on the real barriers to energy access in villages in developing countries – technological, financial, social and political – and how they can be overcome. The focus is on remote off-grid villages, where local solutions (home- or institution-based systems, and mini-grids) are both more realistic and cheaper than national grid extension.

The initiative involves a three year engagement in six regions (East and West Africa, South and Southeast Asia, and Central and South America). These activities bring together the diverse set of players – scientists and engineers, entrepreneurs, villagers and civil society organisations, NGO's, financiers, policy makers and regulators – who are actively involved in addressing the challenges of village energy for development.