LIVELIHOOD OPTIONS AND AGRICULTURAL DEVELOPMENT IMPACT ON HOUSEHOLD FOOD SECURITY IN RWANDA

IPAR, 4th Annual Research Conference, 2015

by

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Outline

- Background
- Methodology
- Findings and discussion
- Conclusion
- Recommendation

Household Food Security in Rwanda

National Agricultural Development

- Production (proxy for development)
  - 33% GDP
- Import & export
- Employment
  - 77% of Rwandans work in agiculture
  - 80% of HH income is from agriculture

Household Livelihood Options

- Employment
  - 23% work in non-agiculture
  - 20% HH income non-agricutlure

Government Policies

- Coop Initation
- EDPRS1 (2008-12)

Household Food Security

- Availability
- Access
- Utilization
- Stability

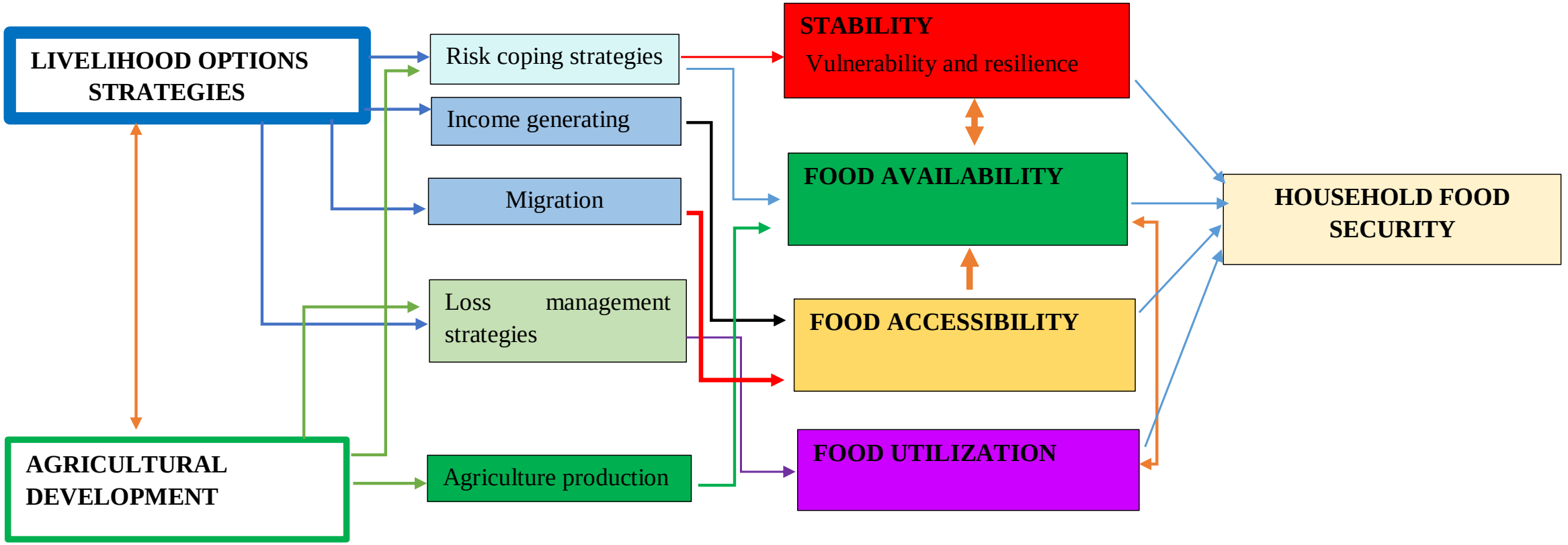
Challenges

- It seems that agriculture diminish its role to sustain the food security at household level;
- Climate change  agri.practices due rainfed

  Result to decline the land productivity
- Population growth  small plots;
- High unemployment rate face to educated people;
- Low creation of new opportunity to replace the gaps for securing the food;
- Income diversity at household level often pose problems for socio-econ. Into policy prescriptions about household income, availability,...

1. What was the contribution of national agricultural production to household food security between 1980 – 2010?
2. What was the contribution of livelihood options to food security in 2014?

Conceptual framework



Methodology

The study employed two kind of data : **Time series data analysis** and **cross sectional data analysis**

- **Time series data**: data collected during the 1980-2010 Rwanda from WDI

  Granger Causality was used to confirm the causes of the main determinants affecting food security at household level after performing long run and short run dynamics between variables

  Data analysis was conducted using E-views 8

- **Cross sectional data:** Primary data collected during July 2014 using close-ended questionnaires in Nyamagabe District as the case study.

  Logit model regression was used to assess and analyse the main determinants affecting food security at household level

  Data analysis was conducted using Stata 13.0

Findings and discussion

1. **What was the contribution of national agricultural production to household food security between 1980 – 2010?**

- The estimated coefficients have the expected positive sign, indicating a positive long run relationship between: food exports, and food security.

Further, the **long run relationships** between food security, food exports, food imports and agricultural production are statistically significant, but the income per capita was not associated to the outcome for a period of time.

- The **error correction term** of our short run model is also statistically significant with a negative sign.

With a very low speed of convergence towards equilibrium of only 2.1% for correction. This indicates that given any disturbance in the system in the long-run.

Findings and discussion

Dependent Variable: LFS
Method: Least Squares
Date: 10/02/14 Time: 14:49
Sample (adjusted): 1982 2010

Long-run relationship

Variables	Coefficient	Std. Error	t-Statistic	Prob.
LFS(-1)	**1.433107**	**0.197676**	**7.249787**	**0.0000**
LFS(-2)	-0.368689	0.203060	-1.815664	0.0861
LAP(-1)	**-0.424865**	**0.177505**	**-2.393547**	**0.0278**
LAP(-2)	0.198773	0.213473	0.931138	0.3641
LFM(-1)	**-0.042897**	**0.019732**	**-2.173944**	**0.0433**
LFM(-2)	0.048935	0.019290	2.536784	0.0207
LFX(-1)	**0.039990**	**0.014697**	**2.720924**	**0.0140**
LFX(-2)	-0.016501	0.015331	-1.076291	0.2960
LPGDP(-1)	0.171993	0.093141	1.846595	0.0813
LPGDP(-2)	0.181017	0.115060	1.573245	0.1331
CONSTANT	-2.798000	0.933181	-2.998346	0.0077

R-squared	0.997749	Mean dependent var	3.885030
Adjusted R-squared	0.996498	S.D. dependent var	0.682096
S.E. of regression	0.040367	Akaike info criterion	-3.299936
Sum squared resid	0.029330	Schwarz criterion	-2.781307
Log likelihood	58.84908	Hannan-Quinn criter.	-3.137508
F-statistic	797.6793	Durbin-Watson stat	1.517209
Prob(F-statistic)	0.000000		

Dependent Variable: D(LFS)
Method: Least Squares
Date: 10/02/14 Time: 15:04
Sample (adjusted): 1983 2010
Included observations: 28 after adjustments

Short-run relationship

	Coefficient	Std. Error	t-Statistic	Prob.
ECM	**-0.021287**	**0.007239**	**-2.940456**	**0.0107**
D(LFS(-1))	0.012650	0.393828	0.032121	0.9748
D(LFS(-2))	-0.246230	0.189467	-1.299591	0.2147
D(LFM(-1))	-0.192714	0.063396	-3.039836	0.0088
D(LFM(-2))	-0.184945	0.080830	-2.288061	0.0382
D(LAP(-1))	-0.346065	0.252639	-1.369800	0.1923
D(LAP(-2))	-0.018032	0.244647	-0.073707	0.9423
D(LFX(-1))	-0.062811	0.030708	-2.045442	0.0601
D(LFX(-2))	-0.049101	0.016970	-2.893427	0.0118
D(LPGDP(-1))	-0.111589	0.155084	-0.719536	0.4836
D(LPGDP(-2))	-0.046302	0.115255	-0.401732	0.6939
CONSTANT	0.063903	0.023562	2.712154	0.0169

R-squared	0.860610	Mean dependent var	0.082768
Adjusted R-squared	0.731177	S.D. dependent var	0.064143
S.E. of regression	0.033257	Akaike info criterion	-3.662241
Sum squared resid	0.015485	Schwarz criterion	-2.996138
Log likelihood	65.27137	Hannan-Quinn criter.	-3.458607
F-statistic	6.649068	Durbin-Watson stat	2.152782
Prob(F-statistic)	0.000592		

Findings and discussion

2. What was the contribution of livelihood options to food security in 2014?

- Accordingly, variables assumed to have influence on household food security in different contexts were tested in the model and out of nine variables five of them were found to be significant.
- Among variables fitted into the model and associated with the outcome, **age** of household head, **education** for household head, **off-farm/ non-farm income**, use of chemical **fertilizer**, and **livelihood options** activities in determining household food security.

Findings and discussion

Variables	Coefficient	Std. Err.	z-value	P>|z|	Marg. Effects (dy/dx)
Hsize	0.0305	0.1032	0.34	0.698	0.0094
Sex	0.33291	0.5808	0.57	0.351	0.1268
Age	-0.1057	0.0183	-5.76**	**0.000**	-0.0269
Education	-1.3942	0.4304	-3.24**	**0.000**	-0.3617
Land	-0.01989	0.123	-0.16	0.981	0.0007
Credit	0.5839	0.4348	1.34	0.215	0.1292
Options	1.06811	0.8017	1.33*	**0.028**	0.1981
Fertilizer	1.0349	0.4809	2.15*	**0.022**	0.2677
Income	-0.4861	0.2286	-2.13*	**0.040**	-0.1120

Conclusion

The analysis for the implications of livelihood options and agricultural development on household food security proved that:

- Agriculture sector continue to dominate other alternative activities vis-a-vis on household food security but it decline progressively its role.
- The contribution of livelilihood options determinants show more impact for food security on future generation in Rwanda.

Recommendation

- ✓Make an intervention in employment program in rural areas regarded to generate cash income;
  - Ubudehe/VUP
  - Marshland preparation
- ✓Expend mechanization, not land, for production
  - Intercropping methods
- ✓Expand the partnership with foreign industries for increasing migratory wage labor or for creating the new opportunity for the young proffessionals program;
- ✓Introducing funding for food security, and linking health and agriculture

THANK YOU FOR YOUR KINDLY ATTENTION