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Education for Rural People: A neglected key to MDGs

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Overall objectives

- To explore and measure the relations between education and food security
 - in the general case
 - with a special attention to rural areas

Theoretical foundations /1

- The capability approach (Sen, 1985, 1999)
 - The life of a person can be described as a set of *functionings*, that are the various things that a person manages to do or to be. Functionings may vary from elementary ones, such as being free from avoidable disease, to complex activities, such as taking part in the life of the community.
 - «A person's *capability* refers to the alternative combinations of functionings that are feasible for her to achieve. Capability is thus a kind of freedom».

Theoretical foundations /2

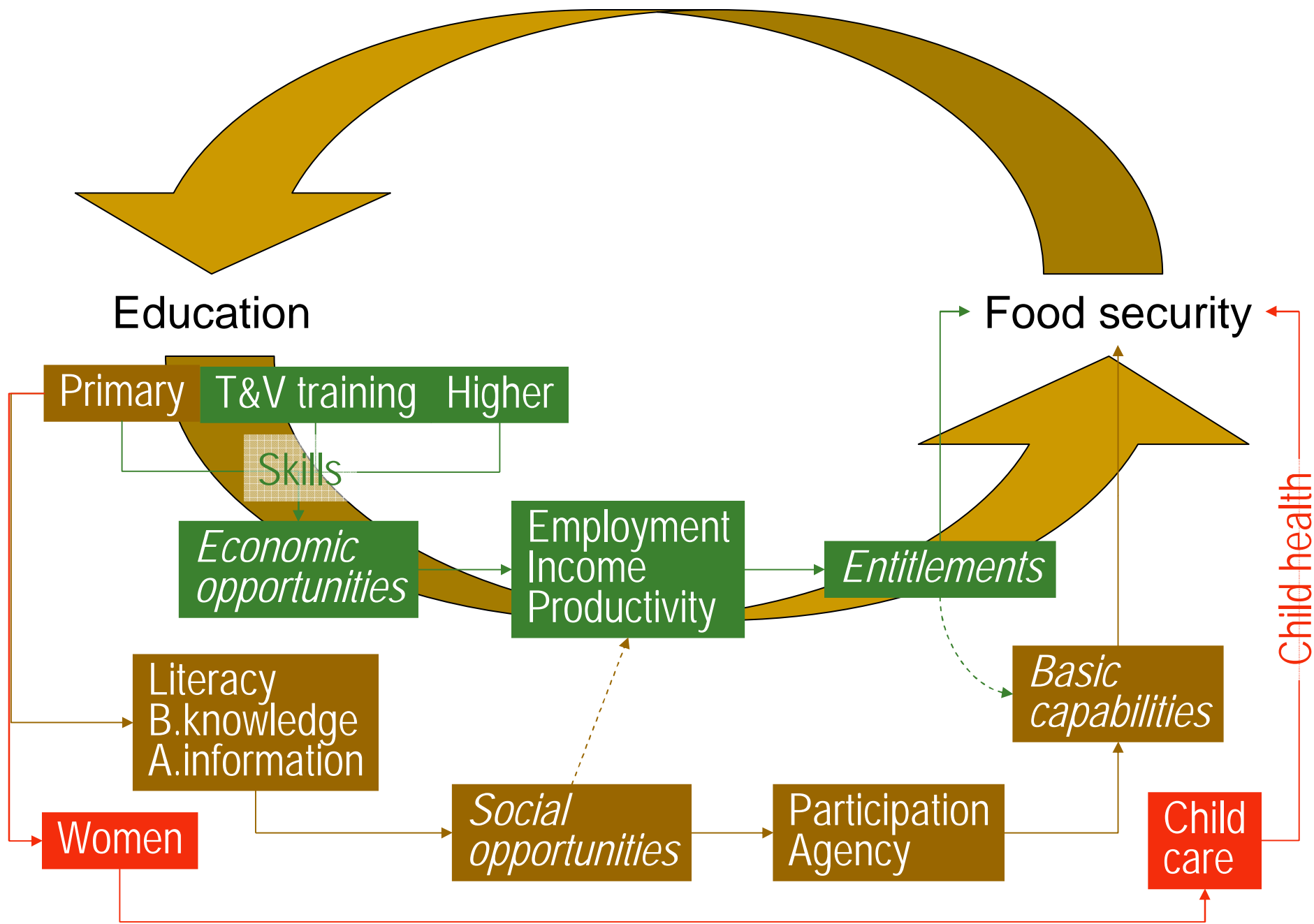
- “Being adequately nourished” and “being educated” are two *basic functionings* (among others).
- A relevant feature of any basic functioning –and corresponding capability– is that they can be considered both as (primary) *goals* and as (principal) *means* of development.
- The *Human Development* strategy (UNDP) is based on the capability approach, that is on the expansion of human substantial freedoms.

The relations between education and food security / 1

- Usually, education and food security are considered only as development *goals* (e.g. MDG1 and MDG2)
- Sometimes, food security (or adequate nutrition) is considered a *mean* to achieve better or wider basic education, especially for children (e.g. School Feeding programmes, Food for Education-WFP)
- Although «acclaimed as one of the most powerful engine for reducing hunger» (FAO, SOFI 2005), education is rarely considered in practice also as a *mean* to achieve food security

The relations between education and food security /2

- There are good reasons to assume that the strong relations between education and food security are *bidirectional*
- In our paper we investigate in the less explored direction, that is *the causal link from education (as a mean) to food security (as a goal)*



Quantitative Analysis: Objective

To find empirical evidence of the impact of education, both basic and higher, on food insecurity among rural people.

Data and Sources

- Source: Measure Demographic and Health Surveys (DHS) Programme, rural surveys.
- Observations: 48 countries (29 African, 11 Asian, and 8 Latin American).
- Model type: cross-section.

Variables (1)

Education: “basic”, “advanced”, and “higher”.

1. School attendance rate of children with a different age.
2. Maximum level of education attended by the individual.

NB: there are no available data for rural areas concerning literacy, school enrolment or quality of education.

Variables (2)

Household Food Insecurity:

An indicator based on nutritional and survival data.

While the FAO uses a supply and production- based indicator of food security, which addresses the phenomenon at national level (“process indicator”, Maxwell and Frankenberger 1992), here we use an “outcome indicator” (Maxwell and Frankenberger 1992) that focuses on “access” to food at household and individual level. This indicator better explains the functioning “being adequately nourished”.

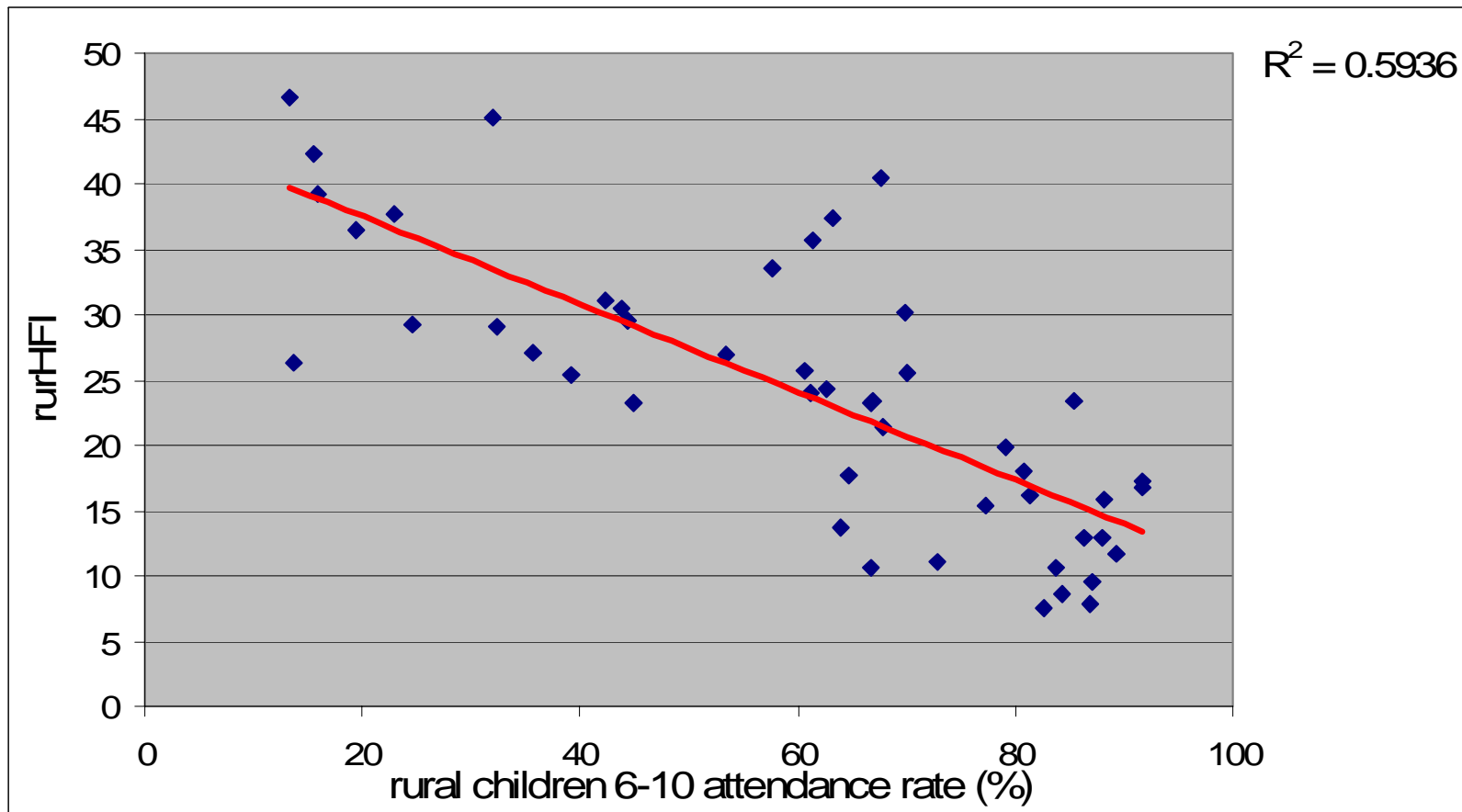
HFI Indicator as an “outcome” indicator

Component 1: “adequate survival status”, which is measured by mortality rates among rural children

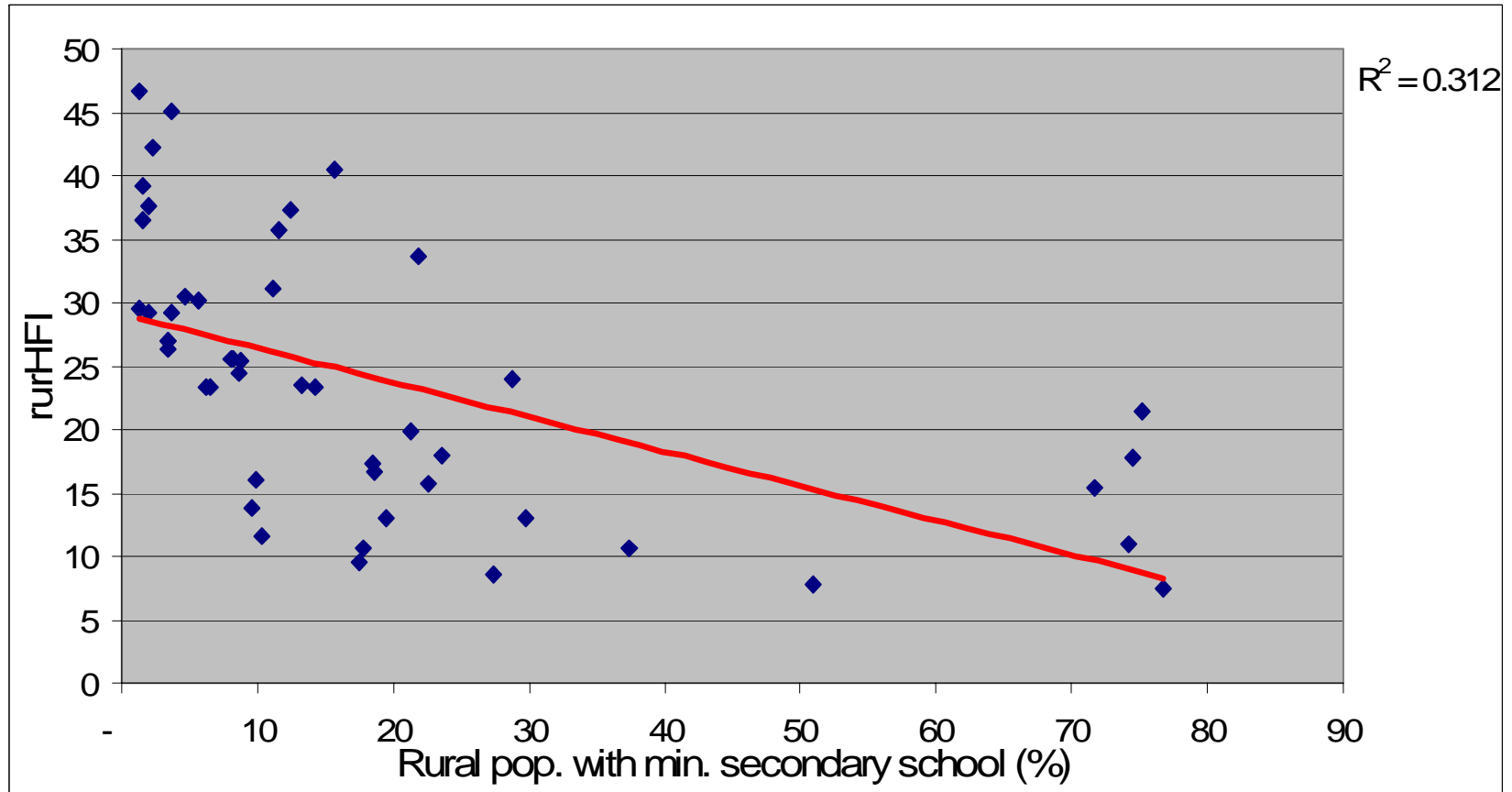
Component 2: “adequate nutritional status” and “food adequacy”, through anthropometric measures of rural children (Avg: stunting, underweight, and wasting)

Component 3: “female malnutrition” expressed by the percentage of rural women whose body mass index is lower than an internationally fixed threshold.

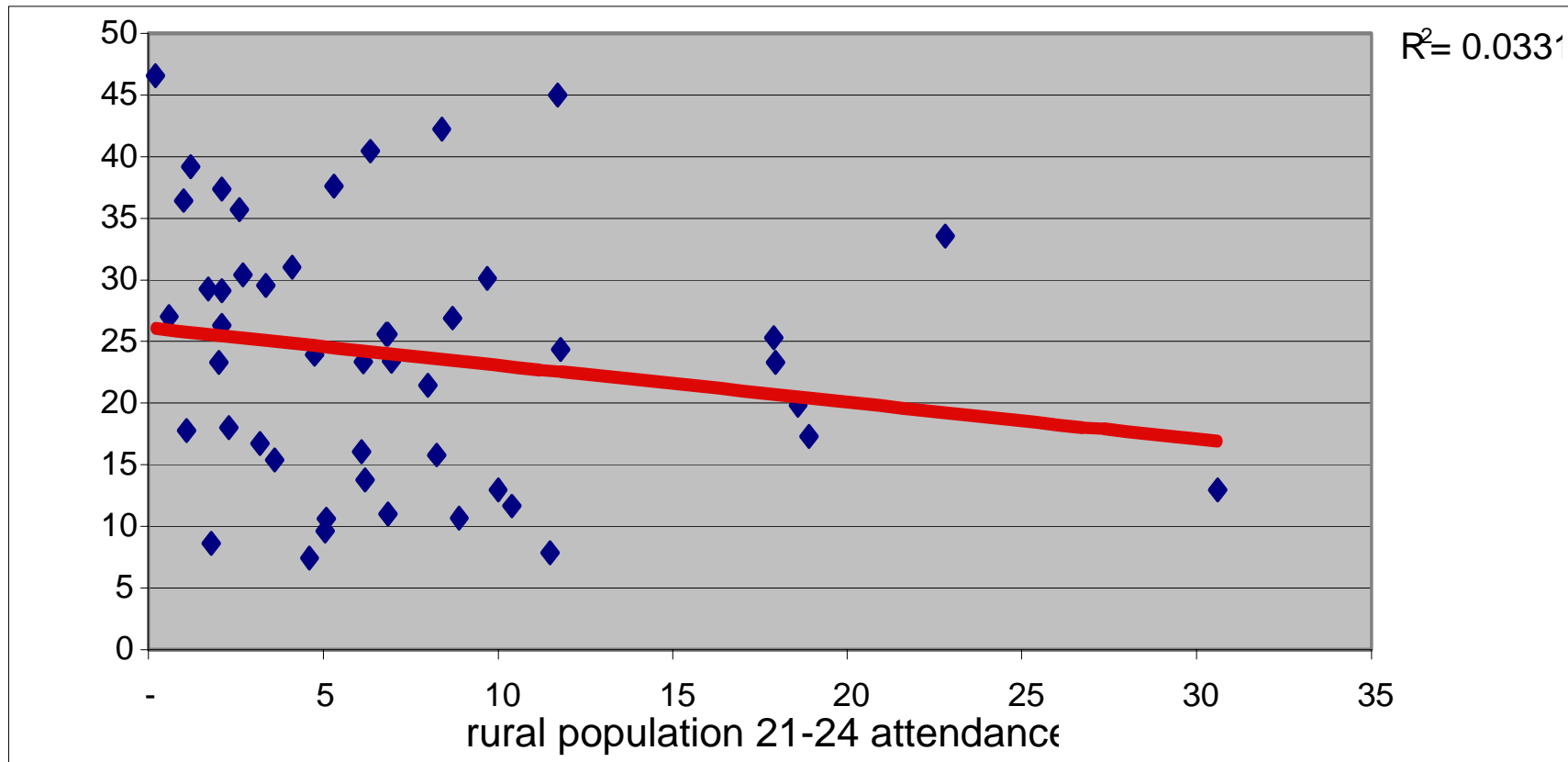
Exploratory Analysis: Basic Education - HFI



Exploratory Analysis: Advanced Education - HFI



Exploratory Analysis: Higher Education - HFI



Exploratory Analysis: Correlation

Tab. 1 correlation coefficients: *school attendance - HFI*

Coefficient	rurattendance 6-10	rurattendance 1115	rurattendance 1620	rurattendance 2124
Pearson	- 0.7705	- 0.6443	- 0.4574	- 0.1820 ***
Spearman	- 0.7883	- 0.6430	- 0.4537	- 0.2359 ***

Tab. 2 correlation coefficients: *educational level - HFI*

Coefficient	rurnoedu	rurminsecondary	rurhigher
Pearson	0.7178	- 0.5587	- 0.5478
Spearman	0.7131	- 0.7158	- 0.7101

Impact of Education for Rural People on Food Insecurity

Now we move from an analysis of bilateral relationship between education and food insecurity to a study of causality: what is the quantitative impact of education on food insecurity among rural people?

Rural Model (1)

Dependent variable: rurHFI1	Coefficient	Standard Error
constant	19.82032	5.307448
rurfertility	0.6297012	0.1989238
rurattendance610	- 0.1933505	0.0399088
rurnofacility	0.1177583	0.0273826
R-squared	0.777	

Rural Model (2)

Determinants of food insecurity:

- **Fertility**: high (positive) impact (Sen, 1999; Nussbaum 2003; Streeten 1997)
- **6-10 School attendance**: *ceteris paribus* an increase by 100% causes a decrease of HFI by approximately 19%
- **No toilet facility**: this proxy of lack of HH's hygienic conditions gives a satisfactory (positive) contribution.

Next Steps of the research

- To construct a model for urban areas
- To make a comparison urban - rural areas in order to explore if basic education provides a larger contribution to food security in rural areas.

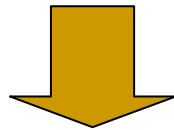
Conclusions (1)

- The quantitative analysis shows that education has a key role in promoting food security in the rural areas of developing countries, confirming what was initially stated in the theoretical framework.
- Moreover it is **basic education** rather than higher education that, through several mechanisms, affects the capacity of rural people to access food.

Conclusions (2)

What is the role of Basic Education for MDGs?

- Intrinsic value: MDG 2 and MDG 3.
- A means to achieve MDG 1: halve the proportion of people who suffer from hunger.



- A means to achieve MDG 4 (reduce child mortality), MDG 5 (improve maternal health), and MDG 6 (combat diseases).

Variables for Education

BASIC EDUCATION

- rural children 6-10 attendance rate (%)
- % of rural people with no education

ADVANCED EDUCATION

- rural children 11-15 attendance rate (%)
- % of rural people with at least secondary education

HIGHER EDUCATION

- rural population 16-20 attendance rate (%)
- rural population 21-24 attendance rate (%)
- % of rural people with higher education

Variables for Food Insecurity

- rural infant mortality rate (%)
- rural under-5 mortality rate (%)
- rural severe stunting rate (%)
- rural moderate stunting rate (%)
- rural severe wasting rate (%)
- rural moderate wasting rate (%)
- rural severe underweight rate (%)
- rural moderate underweight rate (%)

HFI Indicator

Component 1 (Fa) = $\frac{\text{under-5 mortality} + \text{infantmortality}}{2}$

Component 2 (Fb) = $\frac{\text{stunting} + \text{wasting} + \text{underweight}}{3}$

Component 3 (Fc) = female malnutrition (low BMI)

$$\text{HFI1} = \frac{\text{Fa} + \text{Fb} + \text{Fc}}{3}$$

FOOD SECURITY: WFS 1996

“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 preference for an active and healthy life.”