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Investment Requirements in Extension to Achieve Zero Hunger and Adapt to Climate Change

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ORGANISED BY:

Framework and objectives of the Investment Assessment (R&E)

- Part of a global investment assessment project (FAO/IAP, 2011)
  - Objective: identify current levels and marginal increase of investments to eradicate hunger and meet national nutritional needs by 2025
  - Activities:
    - data collection exercise
    - analysis of the country investment situation / country briefs
    - projections of future investment needs (2010-2025)
- Research and Extension Branch additional work:
  - Development of a new country specific formula for estimating investments into extension
  - Identification of climate change indicators related to extension; calculation of zero hunger and climate change scenario

Investment targets for EXTENSION

- Earlier target estimates
  - 2% of AgGDP (Worldbank, 1981)
  - 1% of AgGDP (Roseboom/FAO, 2004)
  - 1000 agricultural labor per extension agent (Roseboom, 2004)

- A **country specific formula** developed
  - Basic equation

Extension investments =

No of Extension agents * average cost per agent
(country specific) (country specific)

Number of extension advisors

- **Definition of Active rural population per extension advisor (ratio): interval [500-2000]**

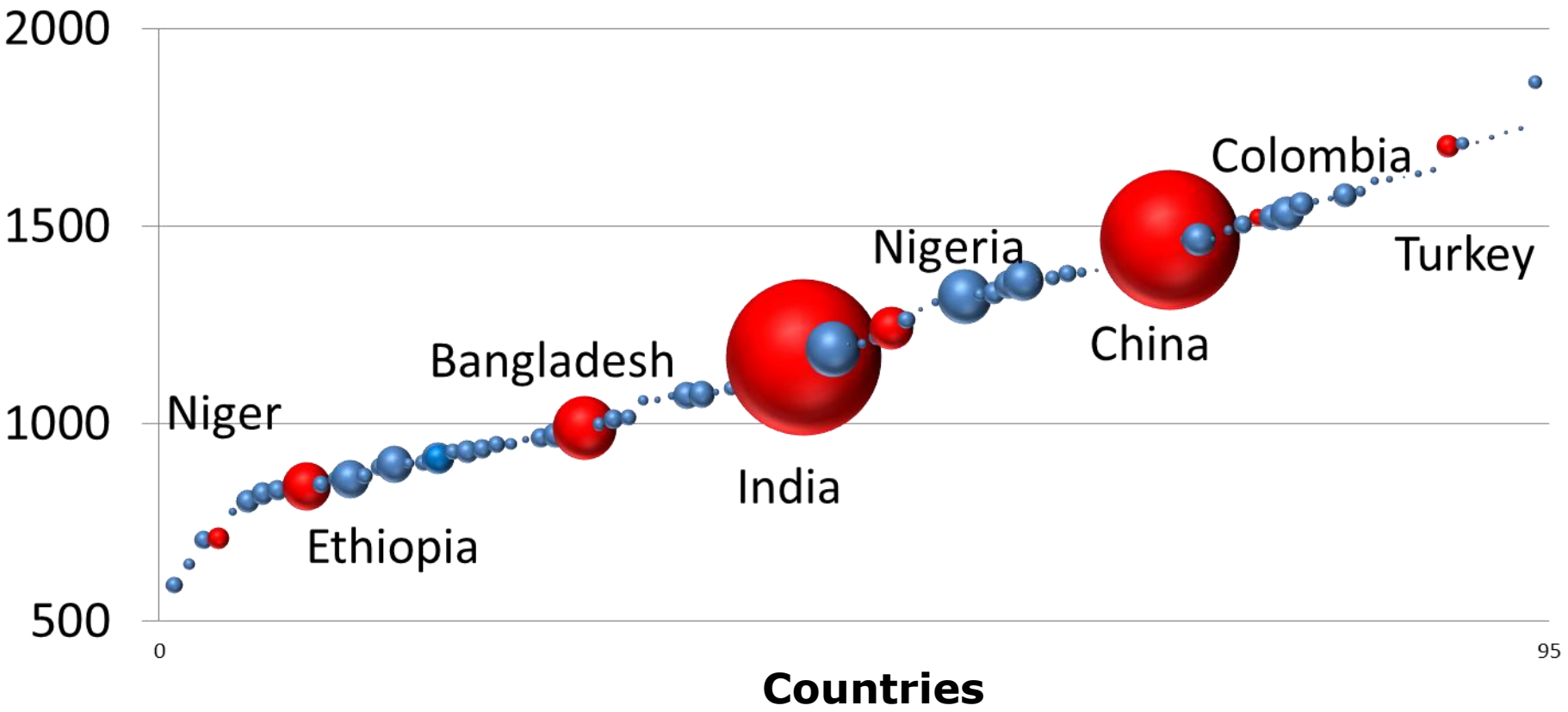
- **A country specific definition of**
  - based on socio-economic macro indicators (= baseline scenario)
    1. **rural population density** (WB)
    2. **poverty and malnutrition** (FAO, WB)
       - poverty headcount ratio at $2 a day (% of population, WB)
       - prevalence of undernourishment (% of population, WB)
       - GNP/capita (PPP) (WB)
    3. **access to information**
       - radio, mobile, internet (World Resources Institute, WB)

Agent Ratio * active rural population
= country specific no of extension agents

Calculating the number of required extension agents

	Number of active rural population per 1 agent (ratio)	Active rural population (15-65) (in millions)	Number of extension agents required
Somalia	592	3.01	5,096
Ethiopia	842	36.32	43,129
Bangladesh	991	75.36	76,050
Cameroon	1,016	4.58	4,509
Bolivia	1,203	1.96	1,630
Uruguay	1,625	0.16	99
Turkey	1,704	15.51	9,103

Number of active rural population per extension agent ratio [500-2000]



The bubble size depends on the required number of extension agents in the country.

Country specific cost per extension agent

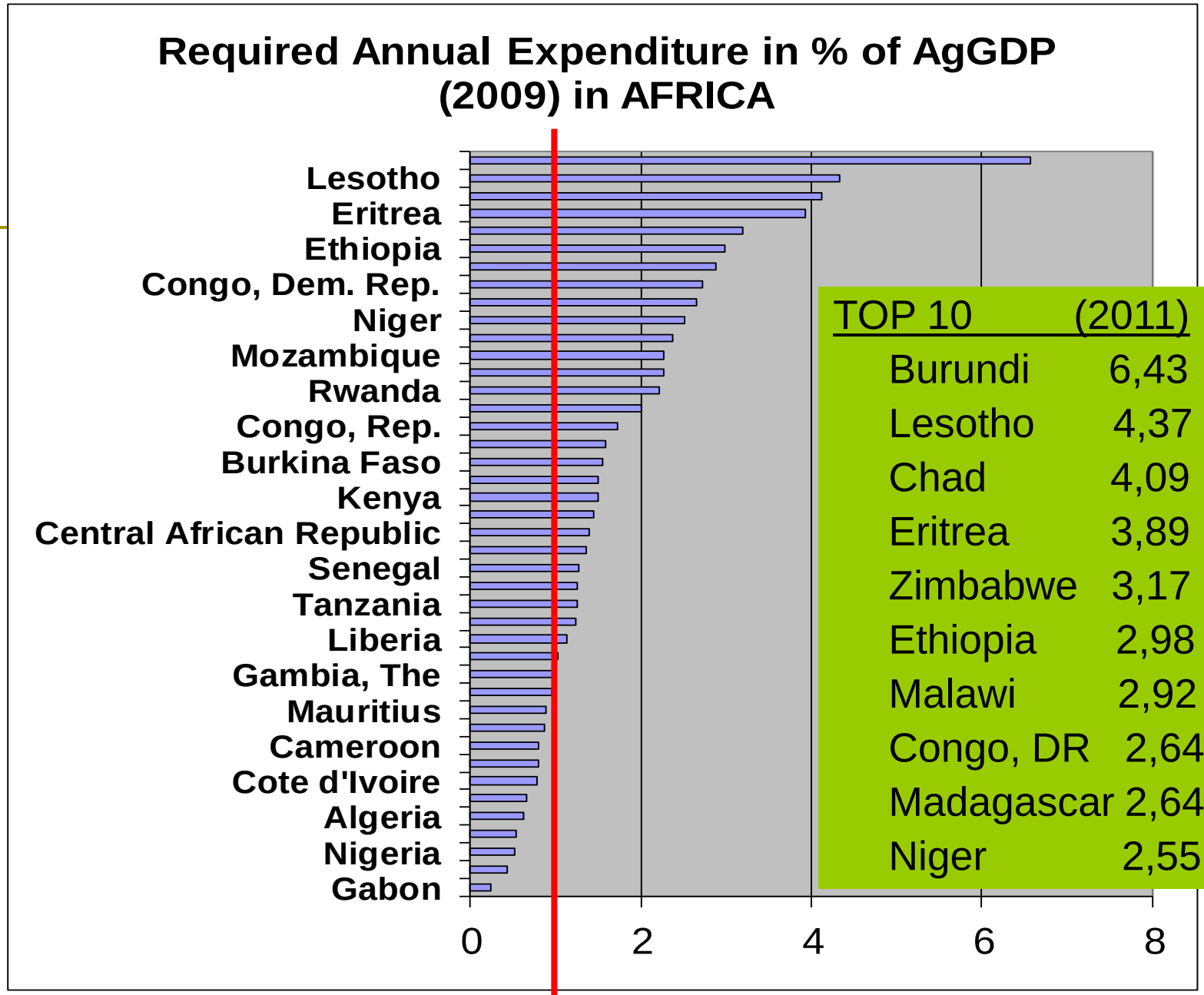
Countries	GNI/capita Atlas method (USD)	Average Cost per Extension Agent (USD)*	40% interval for average cost used for rescale, based on GNI/capita
Low income	1 - 995	5000	4000 - 6000
Low middle income	996 - 3945	8000	6000** - 9600
Upper middle income	3946-12195	12000	9600 - 14400

* Roseboom (2004)

** Lower interval larger than 20% to ensure continuity.

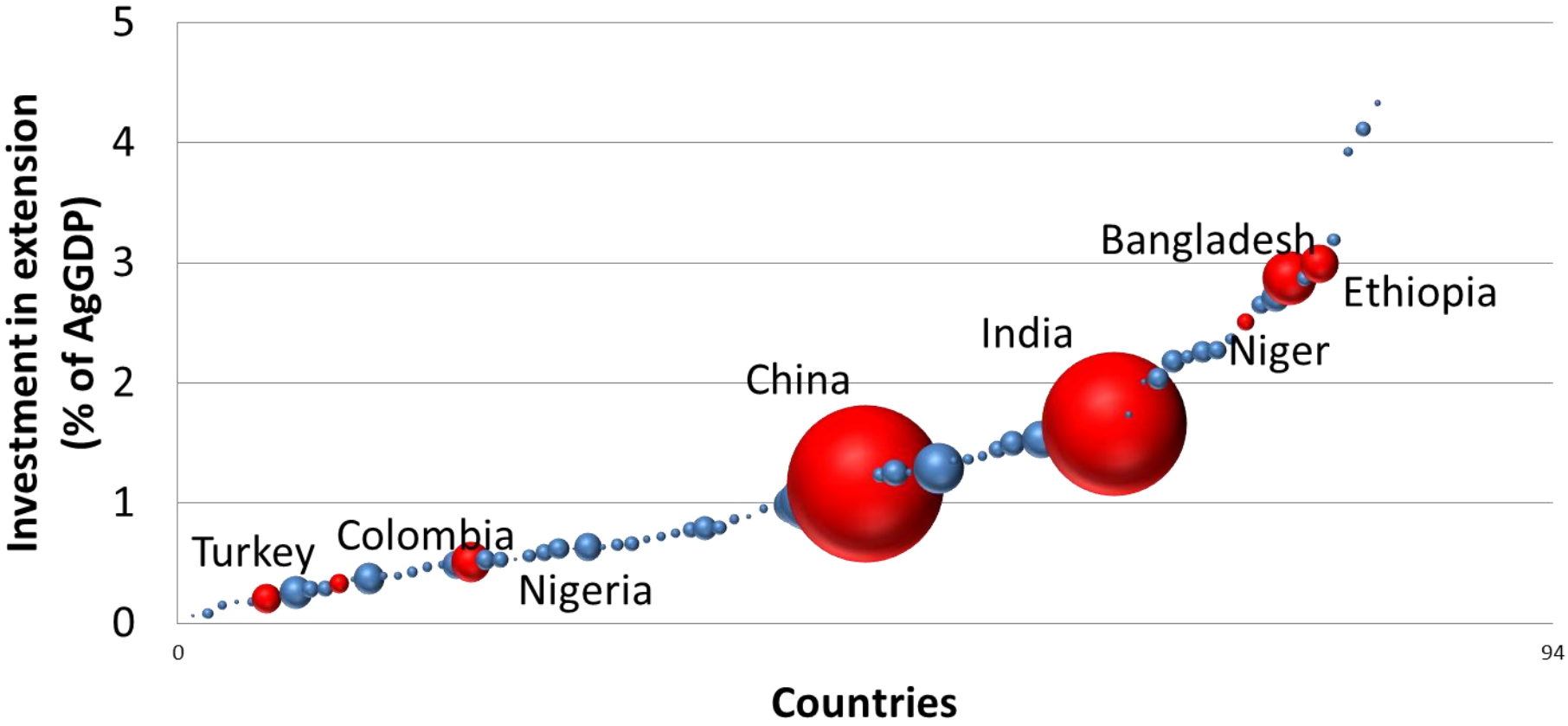
Selected Country Results

Countries * All figures for 2009	Number of extension agents required	Average Cost per agent (USD)	Annual Required Extension Investment (mill USD)	In % of AgGDP
Burundi	5,099	4302	21.93	6.57
Ethiopia	43,129	4663	201.12	2.99
Bangladesh	76,050	5812	394.39	2.87
Cameroon	4,509	6212	28.01	0.80
Morocco	6,140	8190	50.28	0.53
China	367,678	9167	3370.37	1.16
Turkey	9,103	12384	112.73	0.20
Uruguay	99	12750	1.26	0.06



FAO target, Roseboom (2004)
1% of AgGDP

Annual required investment in extension (in % of AgGDP)



The bubble size depends on the monetary value of the investment in the country.

Scenario including Climate Change

- Baseline scenario with same weighting of indicators
- Uneven distribution in the scale [1-94]
- [1-94] ranking converted in a reduced predefined AGENT ratio (Bx) interval of [500-1500]
- Increase of cost per extension agent based on Climate Change Vulnerability Index

Climate Change Vulnerability Index

Countries	Extremely vulnerable
Mauritius	633
Benin	464
Nigeria	464
Sierra Leone	464
Burundi	458
Tunisia	455
Ethiopia	455
Rwanda	455
Morocco	445
Malawi	445
Togo	445
Uganda	442
Swaziland	440
Ghana	425

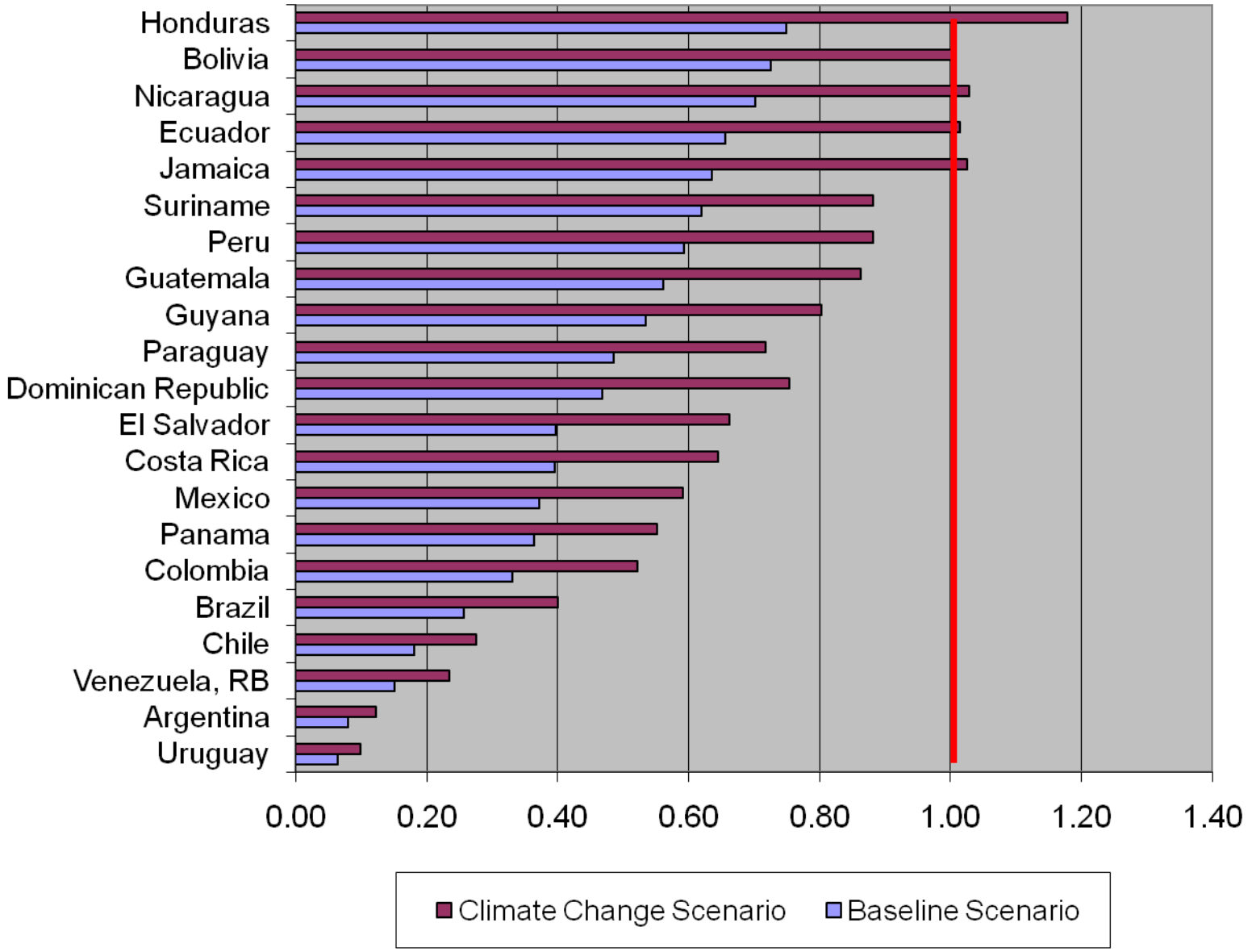
Countries	Highly vulnerable
Eritrea	411
Kenya	409
Liberia	409
Tanzania	409
Burkina Faso	408
Madagascar	408
Egypt	400
Lesotho	400
Algeria	391
Senegal	383
Mauritania	373
Mali	367
Cote d'Ivoire	364
Cameroon	358

Countries	Vulnerable
Congo, Dem.	350
Sudan	350
Niger	345
Gambia	342
Guinea	333
Zambia	333
Chad	325
Zimbabwe	309
Angola	283
Mozambique	282
Central Afr. Rep.	275
Congo, Rep.	275
Gabon	250
Botswana	246

BASED ON EVI INDEX, SOPAC/UNEP (2005)

Comparison between Baseline Scenario and Climate Change Scenario

Investment Intensities in Latin America (% of AgGDP)



Comparison of actual and required extension investments (2009)

% of AgGDP	Current public Investment	Baseline Scenario	Climate Ch. Scenario
Bangladesh	0.31	1.64	2.44
Bolivia	0.13	0.73	1.01
China	0.71	1.16	1.95
Egypt	0.01	1.02	1.67
Ethiopia	0.47	2.99	3.95
Pakistan	0.33	1.29	2.04
Turkey	0.03	0.20	0.33

Target Investments – Regional averages (2009)

in percentage of AgGDP

	Zero Hunger Baseline	Zero Hunger with Climate Change
Sub Saharan Africa	**1.91**	**2.59**
South East Asia	**1.45**	**2.16**
Near East and North Africa	**0.54**	**0.88**
Latin America and the Caribbean	**0.44**	**0.68**

Potential saving in annual extension expenditure

Improved information access:

Ethiopia (7 million USD)

- Increased mobile subscription from 37 to 160; Internet access from 4 to 10; Radios from 185 to 200 per 1000

Bangladesh (48 million USD)

- Increased mobile subscription to 400, Internet access to 60 and radios up to 200 per 1000 people

Reducing poverty and hunger:

Bangladesh (25 million USD)

- Reducing poverty headcount ratio by about half to 40%

Angola (3 million USD)

- Reducing undernourishment by half to 20%

Use of results

- The upcoming online database provides country factsheets with all data (required investment and projections, data on population, GDP/capita…etc.)
- Model provides an overall investment target (public and private sector) on extension
- Results can be used as an ex-ante assessment tool for targeting international development funds
- For the poorest countries where the required annual extension exceeds substantially 1% of the AgGDP: 1 to 2 international aid dollar could be contributed to every national dollar invested

Discussion

- Discrepancy between real and estimated investments ⇒ more investment required
  - Some small countries may have higher investments (do not benefit from economies of scale)
- The quality of spending is as important as the overall spending targets
- What should be the Priority investment areas?
  - Reform of extension - institutional/org. innovations
  - Research and extension human capacity
  - Demand side financing of extension and programme benefiting FOs
  - Programme management efficiency/effectiveness
  - Technology, information access, infrastructure

Recommendations

- Need for more reliable data and for sustainable data collection in the countries
- Methodology could be improved with the results of a current WB extension impact assessment project (Waddington et al., 2010)
- Testing of how investments can be done in a more efficient and effective way
- Innovation and testing of new financial mechanisms, particularly pull mechanisms

Thank you for your attention!