Measuring Up: How Do We Align Aid With Priorities?



David Wheeler Center for Global Development

Allocation Calculus

Objective Function

$$W = \omega_0 \prod_{i=1}^N R_i$$

Vulnerability Reduction $R_i = \alpha_0 S_i^{\alpha_1 V_i p_i}$ S = Scale of donor activity V = Scale of vulnerability p = Project success prob.

Budget Constraint

$$\sum_{i=1}^{N} c_i B_i = I_T$$

c = Unit cost of donor activity I = Total sectoral budget

Welfare Function

$$W = \omega_0 \prod_{i=1}^N \alpha_0 S_i^{\alpha_1 V_i p_i}$$

First-Order Conditions

$$\frac{S_i^*}{S_j^*} = \frac{V_i p_i}{V_j p_j}$$

Allocating Resources: Where? How Much?

Main Ideas

- Some Representation for All Countries
- Policies and Institutions (PI) Affect Project Outcomes
- Likelihood of Project Success is Proportional to PI
- Valuation of Impacts is the Same Everywhere

Allocating Resources: Where? How Much?

If we expect all projects to succeed:

Country Share of Total Investment Country Share of Total Problem

To account for different success rates:

Country Share of Total Investment Country Share of Total Problem, Weighted by Success Rate

Measuring Up: World Bank Investment Priorities 2000-2004



Deaths From Waterborne Disease

Water Mortality 0 - 843.8 843.8 - 2340.6 2340.6 - 18343.2 18343.2 - 73257.4 73257.4 - 336819.1 Country

Effectiveness of Policy and Institutions: CPIA Ratings



Country

Probability of Project Success: OED Ratings

OED % of satifactory 0 - 50 53 - 60 63 - 76 77 - 89 90 - 100 Country

Optimal Water and Sanitation Investment



Actual Water Supply and Sanitation Loans*

Water Investments 0 0 - 55.4 55.4 - 55.5 55.5 - 613.5 613.5 - 2029.8 Country

*Investments included are the environmental components, including non-bank co-financing of currently active World Bank water supply and sanitation projects and urban environmental projects and a fraction of environmental institutional development projects.

Overall Impressions

- Problems Have Very Different Patterns
- Big Gaps Between Actual & Optimal
- Actual Loans Are Too Concentrated
- Some Regional Imbalances Are Clear

Measuring Up: GEF Resource Allocation 2004-2005



Combined Biodiversity Threat Areas



Biodiversity areas Birdlife international, WWF200, Conservation International combined n.a.

WWF Ecoregions



Measuring Up: Allocating Adaptation Assistance 2011



Sea-Level Rise, 2007 - 2100

LDC Population Displaced (Millions)



Sea-Level Rise (Meters)

Agricultural Productivity Loss: 2008-2080 (IPCC Model A2)



Impact Estimates by Country William R. Cline CGD, 2007

Projected Agricultural Productivity Through 2080 Developing-Country Regions and Sub-Regions*



* William R. Cline, Global Warming and Agriculture (2007)

Flood Risk Damage Index, 1960-2000 Distribution of Developing Countries*



* Wheeler, Center for Global Development (2007)

Global Climate Risk, 1970-2008: Probability of Being Affected by an Extreme Weather Event* (Per 100,000)



* 11-Year Centered Moving Average

% of Countries With Extreme Weather Impacts 1970-2008*



* 5-Year Moving Average

Adaptation to Climate Change: Three Views of Assistance Priorities

(1) Physical Impacts*



^{*}Extreme Weather Sea Level Rise Agricultural Productivity Loss

Adaptation to Climate Change: Three Views of Assistance Priorities

(2) Vulnerability*



*Extreme Weather Sea Level Rise Agricultural Productivity Loss

Adaptation to Climate Change: Three Views of Assistance Priorities

(3) Project Factors*



^{*}Extreme Weather Sea Level Rise Agricultural Productivity Loss

Select below	The World	Ranking
Overall	South Ame	rica 1 China
Climate Drivers	Central Am	erica 2 India
Climate	Caribbean	3 Bangladesh 4 Philippines
Vulnerability	All of Africa	5 Vietnam
Project Concerns	Central Afri	6 Hong Kong SAR, Ca China
Extreme	South Asia	7 Somalia
Weather		8 Macao SAR, China
Climate Drivers	Asia - Pach	9 Sudan
Climate	Asia - Cent	ral 10 Ethiopia
Vulnerability	Middle Eas	t 12 Honduras
Project Concerns	Eastern Eu	rone & 13 Kenya
Sea Level Rise	North Africa	14 Madagascar
	Filter	BV 15 Bolivia
Climate Drivers		17 Uganda
Climate Vulperability	Rank Income	18 Colombia
	·	19 Thailand
Project Concerns		20 Indonesia
Agricultural	Link to this chart http://www.cgdev G tweet this + Share	21 Nicaragua
Productivity		22 Djibouti
Loss		23 Mozambique
		24 Myanmar
Climate Drivers		25 United States
Climate		26 Mexico
Vulnerability		27 Tanzania
Project Concerns		28 Costa Rica
		29 Nepal
		30 Burundi



Select below		The World	Ranking
		South America	1-61 [62-124] 124-186
Overall		Central America	2 Bahrain
		Caribbean	3 Djibouti 4 Travelu
Climate Vulnerability		All of Africa	5 Monaco
Project Concerns		Central Africa	6 Turks and Caicos Islands
Fytreme			7 St. Pierre and
Weather		South Asia	Miquelon 8 Greenland
Climate Drivers		Asia - Pacific	9 Cayman Islands
		Asia - Central	10 Cook Islands
Vulnerability		Middle East	11 Suriname 12 Marshall Islands
Project Concerns		Eastern Eurone &	13 Wallis and
Sea Level Rise		North Africa	Futuna 14 British Virgin
Sed Level Hise			Islands
Climate Drivers		Filter By	15 Bermuda
Climate	Rank	Income Status	16 Maldives
Vulnerability	1 185	•	17 Pitcairn
Project Concerns	Non-coastal countries are excluded in this vie	w.	18 Guyana
			19 Japan
Agricultural	Link to this chart intp://www.cgdev		20 Liberia
Productivity			21 Vietnam
LOSS			(U.S.)
Climate Drivers			23 Anguilla
			24 Gabon
Vulnerability			25 Latvia
			26 Kiribati
Project Concerns			27 Nauru
			28 Belize



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