

Grass Roots War on Poverty

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Abstract

Sub-Saharan Africa's failure to slay the dragon of poverty is due to a logical flaw in its policies: the remedies to reduce poverty don't address the causes. Poverty is caused by unemployment, owing to a scarcity of jobs that pay above bare subsistence, but grass-roots poverty alleviation measures are exclusively designed to make job-seekers more capable although no jobs are available. The 'appropriate' technologies of the grass roots movement that dominates anti-poverty policies are oriented towards consumption, ignoring production jobs. Poverty persists from low productivity in agriculture or outright landlessness. Irrigation and rural electrification are required to facilitate economic diversification into non-agricultural work. Yet irrigation and electrification require central political coordination and application of modern science and technology. Centralized decision-making is low on the agenda of the anti-poverty movement, with deep roots at the local level. To create employment requires capital investments to expand entrepreneurial opportunities and increase productive jobs. The most successful countries to grapple with poverty have 'scaled up,' not down; Big, not Small, is Beautiful. The statistical evidence for a large number of developing countries strongly supports the hypothesis of a trickle down effect, not a bottom up effect as the best way to beat poverty.

Key words: poverty, grass roots, Africa

1. Introduction

Sub-Saharan Africa's failure to slay the dragon of poverty is due to a logical flaw in its policies: the remedies to reduce poverty don't address the causes. Poverty is caused by unemployment, owing to a scarcity of jobs that pay above bare subsistence, but grass-roots poverty alleviation measures are exclusively designed to make job-seekers more capable (healthy, educated, mobile), although no jobs are available. Employment might rise if wages fell, but wages are already at the subsistence level and cannot fall much further, if at all. The 'appropriate' technologies of the grass roots movement that dominates anti-poverty policies are oriented towards consumption, ignoring production jobs altogether if only out of ignorance of what industries could be created in the global South. Poverty persists from low productivity in agriculture or outright landlessness, requiring at minimum irrigation and rural electrification to facilitate economic diversification into non-agricultural work, and to lower production costs. Yet both projects, irrigation and electrification, require central political coordination and application of modern science and technology. Centralized decision-making is low on the agenda of the anti-poverty movement, with deep roots at the local level.

To create employment requires action on the demand side, in the form of capital investments to expand entrepreneurial opportunities and increase productive jobs. Yet the anti-poverty programs that have swept through Africa take a 'Capabilities Approach'. They focus exclusively on the individual's supply side, as though a greater supply of better-qualified job-seekers (in terms of education, consumption, mobility housing and human rights) will automatically stimulate the demand to employ it, as in the Eighteenth-century 'law' of the conservative French economist Jean Baptiste Say. The expectation that more job seekers who are qualified will

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generate the demand to employ them, based on Say's Law, is irrational in the presence of soaring unemployment and underemployment rates among people that already have schooling and access to modern infrastructure but cannot find remunerative work. Volunteers from the global North – people of faith, students, scientists and engineers – strive to invent appropriate technologies for Africans to consume, ie. use, like the corn shucker, not to produce in large volumes for export or for a mass domestic market; this is in spite of the fact that Africa's gravest long-term problem is unemployment, not costly consumption. Compared to investment rates, consumption rates are already high, so why the irrational focus on consumption?

In fact, the most successful countries to grapple with poverty – China is key given its huge population – have 'scaled up,' not down; Big, not Small, is Beautiful². The statistical evidence for a large number of developing countries strongly supports the hypothesis of a trickle down effect, not a bottom up effect as the best way to beat poverty, although the same GNP growth rate may serve the poor more in some economies than in others. Far Eastern manufacturers and Middle Eastern energy suppliers drastically decreased poverty with top-down approaches that created new industries and professionally managed firms, which then moved beyond the micro-enterprise and cultivated small- and medium-size firms as subcontractors. In the Twentieth Anniversary issue of the *Human Development Report*, for 2010, the greatest progress over a 40-year period in health and education was found in Asia. Algeria, Morocco, Oman, Saudi Arabia and Tunisia – blessed either with oil or with remittances from workers linked to the oil business – ranked in the top ten in terms of progress. "Life expectancy in the Arab countries generally increased from 51 years in 1970 to almost 70 today, the greatest gain of any region in the world, while infant mortality rates plummeted from 98 deaths per 1,000 live births in 1970 to 38 in 2008, below the current world average of 44 per 1,000. School enrolment in the Arab states nearly doubled over the past four decades, rising from 34 percent in 1970 to 64 percent today. The average years of education for the current adult population of the Arab countries is now estimated at 5.7 years; less than the world average of 7.4 years, but significantly above the levels of sub-Saharan Africa and South Asia, with 4.5 and 4.6 years, respectively" ([UNDP 2010](#), p. 3362).

2. Internal inconsistencies

Africa's grass roots poverty movement operates with two internal inconsistencies that undermine its effectiveness in peasant export economies. In such an economy, there is a delicate balance between land and labor, and units of production may be clustered in villages, but these are spread out geographically. This formation has suffered from rapidly rising populations and a weak capacity to absorb foreign knowledge in the form of technological change. The way private and public incentives for innovation are structured, these incentives, in the form of prizes and awards, are irrationally biased in favor of inventors who focus on small-scale 'appropriate technologies' for consumption using cheap local labor and materials. If incentives were neutral, and did not serve to keep such inventors afloat, more resources would probably be invested in technologies for mass-produced public goods. Rural electrification is emblematic of this set of goods, and is also democratic; it tends to be high on the list of local consumer preferences. Graffiti in a poor Pakistani village read: "Give us electricity and we'll give you a vote" ([Tavernise 2010](#)). The World Bank's Independent Evaluation Group observed "The people who live in rural areas greatly appreciate the benefits [of electrification] and are

² Scaling-up has become a preoccupation of grass roots movements. An assessment on the scaling-up of community efforts notes: "Limited research has been conducted into the nature of scaling-up efforts undertaken by community groups and initiatives and there is no single definition that clarifies what scaling-up means to, or for, communities. At a broad level, scaling-up refers to efforts 'to bring more quality benefits to more people over a wider geographical area more quickly, more equitably, and more lastingly' (there is no mention of costs). At a finer level of resolution, however, four distinct types of scaling-up have been identified – quantitative, functional, organizational and political." Quantitative refers to the expansion of an organization or program by enlarging itself or increasing its membership base (economies of scale). Functional refers to expansion in the types of an organization's activities (economies of scope). Organizational refers to the expansion of an organization's efficiency and effectiveness (economies of restructuring?). Political refers to a grass roots movement forging relations with a national state ([Hooper and Jafry 2009](#)).

willing to pay for them at levels more than sufficient to cover the costs”³. But the evaluation of these and other benefits is “sparse” ([World Bank 2008](#))⁴. Big projects, with broad environmental impact and little participatory democracy tend to be denigrated by the grass roots as dinosaurs.

Incentives are also irrational in economies with high unemployment because they do not reward inventions ‘to be made’ but rather ‘to be bought’. Sub-Saharan Africa is regarded by inventors as a market for a new product to raise welfare by improving consumption, not as a manufacturing base for a new product that increases jobs. This is because prizes reward inventors’ knowledge. Since most inventors operating in Sub-Saharan Africa are foreign-born, their knowledge of local consumption problems is greater than their knowledge of local production possibilities, satisfied through import-substitution or export promotion in small- or medium-size firms. As a general rule, most innovations fail, but most appropriate technologies that fail carry no warranty or after-sales service. If bought with microcredit, they create debt⁵. Instead of doing good, or causing no harm, they “ambush the community’s spare change” (the term is Thorstein Veblen’s), especially if equally well-designed and cheaper products are available from foreign markets, usually emerging markets, as in the case of wheelchairs from war-torn Vietnam.

In sum, inside the market economy incentives are irrational because they encourage innovation but not necessarily ‘economic development’ – defined as a trend towards full employment, rising productivity and stability in the balance of payments. Like the Enlightenment movement of the eighteenth century, the grass roots anti-poverty movement idealizes the entrepreneur, but he or she is fettered by exposure to only ‘appropriate’ technology and consumer wants (or supposed wants, since some technologies – the corn shucker, for example – save time rather than money, although time is not in scarce supply at the grass roots).

The grass roots movement has also failed to reduce poverty, let alone to trigger a growth momentum, because it embraces the defunct eighteenth century market law (of Jean Baptiste Say, discredited by Keynes), to the effect that supply creates its own demand ([Amsden 2010](#)). Here the Enlightenment movement and the anti-poverty bottom-up movement overlap. Grassroots activists fall into the lap of Say’s Law in believing that if the poor can secure their individual human rights broadly construed – to include better healthcare, housing, education and training – then they can attract the demand necessary to earn a living wage, either by working for others in paid employment or employing themselves as small entrepreneurs. Human development supposedly emerges from the gentle market laws marveled at by Enlightenment thinkers like Adam Smith. Yet in the presence of historically unprecedented rates of educated unemployment and underemployment; characteristic of the de-colonized generation’s poverty, it is a leap of faith to move from better-qualified job-seekers on the supply side to above-subsistence job-holders on the demand side. If costs could be reduced and profits increased by more qualified job seekers, there would be no unemployment. Investment in new industries has to be undertaken on the demand side to create more jobs and entrepreneurial opportunities, but the grass roots is generally hostile to government interference. Investments in education create more educated unemployment and underemployment, or brain drain from rural to urban areas or abroad.

Estimated rates of youth unemployment for Egypt (see Table 1) tell a story that appears to be applicable to other developing countries: urban unemployment is higher than rural unemployment, total unemployment is higher for the better-off than the poor (who are too indigent to sustain open unemployment),

³ For centrally organized electricity projects that join the grassroots, see [ASADI 2010](#).

⁴ According to a World Bank study, “lighting alone brings benefits such as increased study time and improved study environment for school children, extended hours for small businesses, and greater security. But electrification brings more than light. Its second most common use is for television, which brings both entertainment and information” ([World Bank 2008](#)) Available from: [inweb90.worldbank.org/oed/oeddoclib.nsf/DocUNIDViewForJavaSearch/EDCCC33082FF8BEE852574EF006E5539/\\$file/rural_elec_full_eval.pdf](http://inweb90.worldbank.org/oed/oeddoclib.nsf/DocUNIDViewForJavaSearch/EDCCC33082FF8BEE852574EF006E5539/$file/rural_elec_full_eval.pdf)

⁵ A study of 1,800 households in Bangladesh found only ‘very marginal improvements’ for borrowers. For a review of microcredit, see Chowdhury (2009). Given a typical rate of return, a \$250 one-year loan would raise a borrower’s income by \$2.50/year, or about \$0.03/day. For someone living on \$2/day, this is a 1.5 percent increase ([Roodman and Queshi 2006](#)).

unemployment rises as education rises, and on average it is as high as nearly 20 percent for all youths actively seeking work⁶.

Table 1. Egypt, youth unemployment rate (15-24), by education and poverty, 2005 (%)

Education	Urban		Rural		All Egypt	
	Better-off	Poor	Better-off	Poor	Better-off	Poor
Illiterate	1.8	4.9	0.5	1.1	0.8	1.7
Read & write	1.9	10.1	0.7	1.6	1.2	3.6
Basic education	7.1	9.3	2.1	4.0	4.3	5.5
Secondary*	31.9	37.2	21.1	25.7	25.4	28.6
> Secondary**	36.8	48.8	32.2	34.2	35.1	39.3
University+***	45.3	53.0	42.1	37.9	44.2	43.4
All	26.0	24.9	13.7	13.5	18.7	16.1

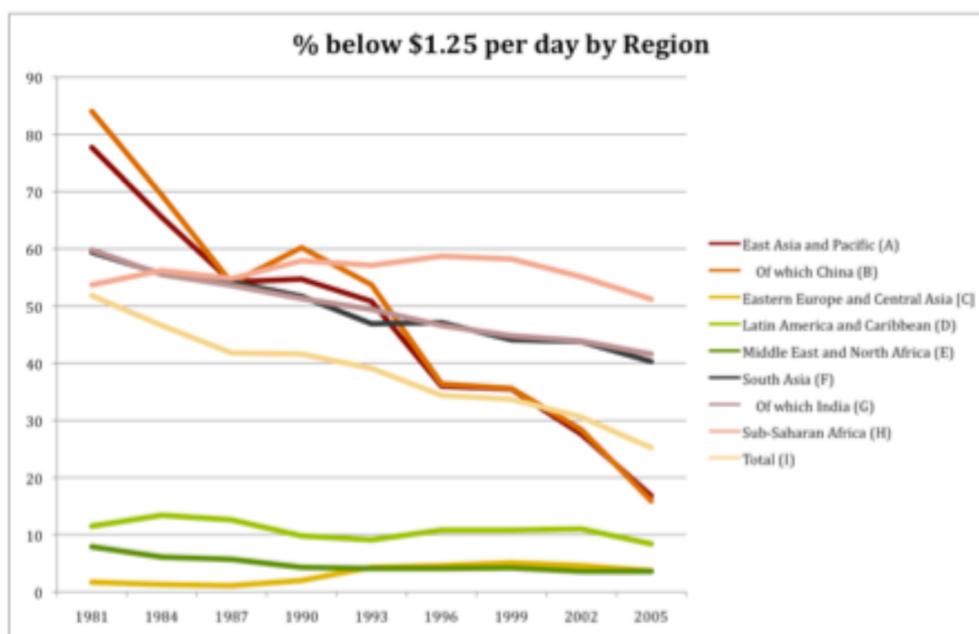
(*Secondary degree or equivalent, **Higher than secondary degree but below university degree ***University degree and higher)

Source: Adapted from World Bank and Ministry of Economic Development of Egypt 2007.

3. The persistence of poverty

The ineffectiveness of the grass roots anti-poverty movement, centered on technology and entrepreneurship, is suggested by country data on abject poverty, defined as the equivalent of an individual’s consumption of \$1.25 or less a day, or the size of its shortfall with that of an average income earner (see Figures 1 and 2).

Figure 1. Percentage below US\$1.25 per day by region

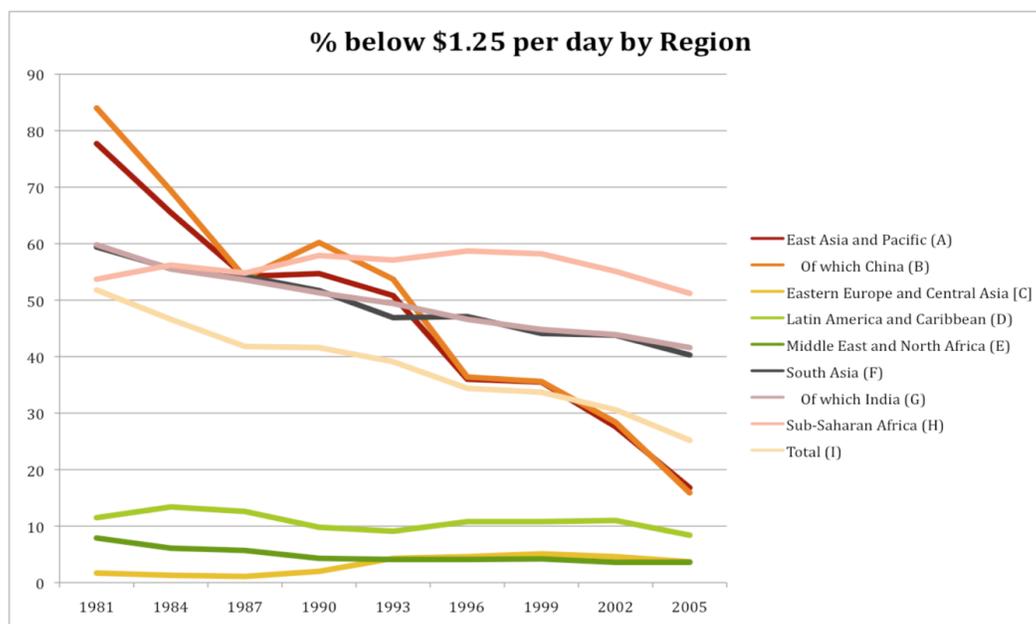


Source: All data are adapted and taken from Chen and Ravallion 2010

⁶ Duflo (2001) has primary school data for Indonesia that indicate that primary school is positively correlated with (small) wage increases; no information is presented on secondary or tertiary education.

Despite bottom-up initiatives, despite social enterprises and heroic entrepreneurs, despite movie stars who publicize the human plight, the percentage of Africa's population consuming the equivalent of \$1.25 a day or less remained roughly the same in 1981 and 2005, at around 55 percent. If the share of the population in abject poverty fell thereafter, this was largely due to large export commodity price increases (Beny and Cook 2009)⁷. There was no poverty reduction at the bottom-most end of the income ladder for twenty-five years, and no probing into the mere possibility that the grass roots approach was partly to blame.

Figure 2. Poverty gap index (x100) by region

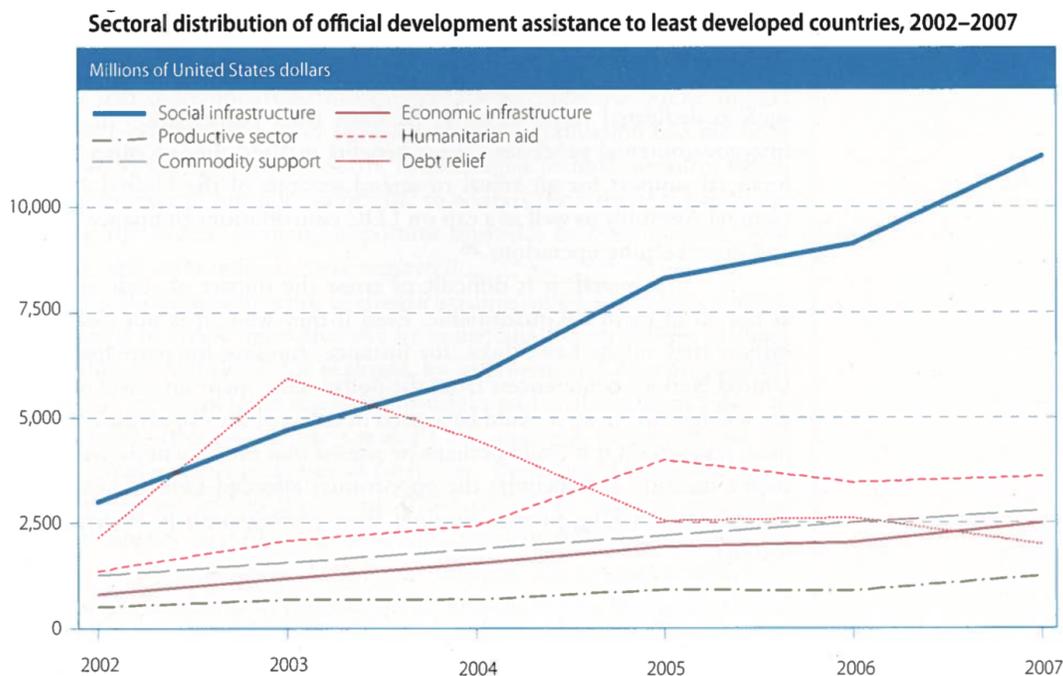


Source: All data are taken from Chen and Ravallion 2010

Note: Poverty gap index = mean distance below the poverty line as a proportion of the line where the mean is taken over the whole population, counting the non-poor as having zero poverty gaps.

Expanding international trade could, in theory, extricate small producers from poverty. Yet the situation in Africa in recent decades is particularly worrisome, where farmers have lost 25 per cent of their purchasing power due to relative declines in their export prices; average yearly farm incomes have fallen to below \$200 per head (UNCTAD 2010). The percentage in world trade of the 49 'least developed countries,' a UN category established in 1971, has since then shown a downward drift from 1.6% to 0.47% in 1995. The percentage hovered around only 0.33% for the entire time period if oil exports are excluded (Cornia 2010). This is not surprising given that only the smallest proportion of aid to the least developed countries (2002 to 2007) was allocated to the 'productive sector', where new export products might have been created (see Figure 3).

⁷ During the period 2002-2007, according to an UNCTAD report, the 'least developed countries' as a group experienced high gross domestic product (GDP) growth rates, surpassing 7%. However, about a quarter of the LDCs continued to experience very sluggish growth or economic regression. Moreover, even in the more successful countries, growth was associated with a pattern of insertion into the global economy based on high commodity export prices, low-skill manufactures and tourism, which meant that they were highly vulnerable to external shocks. Omitting oil-exporting countries, there was little improvement in domestic investment and savings, and very slow technological progress in the LDCs. Agricultural productivity growth lagged and there was widespread de-industrialization rather than a progressive structural transformation. Most significantly, the form of economic growth was not associated with broad-based improvements in human well-being, but rather very slow poverty reduction. In 2008 and 2009, there was a sharp though very heterogeneous slowdown in growth in the LDCs. The LDCs did not fare as badly as other developing countries, partly because commodity prices recovered in 2009 and partly because multilateral institutions provided increasing official flows (TWN 2010).

Figure 3: Distribution of official development assistance

Source: Based on the Organization for Economic Cooperation and Development *Development Cooperation Report 2009* (Paris, OECD, 2009).

In poor countries where the average farm size is less than two hectares (1 hectare = 2.5 acres), “boosting production in these units is hampered by imperfect factor markets, high input prices, poor infrastructure, restricted access to credit and inadequate research and development (R&D). These farms, moreover, are among those most vulnerable to climate change” (UNCTAD 2010). Africa’s newest exports, such as fresh-cut flowers for European markets, are grown in Kenya and Ethiopia, on large-scale commercial farms⁸. In the absence of scale, which would require a land reform to consolidate rather than sub-divide holdings and possibly worsening rather than improving income distribution, risk of experimentation is high, technological change is slow, and expanding exports is difficult. When Sub-Saharan Africa was opened to trade with Europe in the late nineteenth century, Africans were quick to specialize in cash crops for export but not to introduce new production technologies (Myint 1964/1995, p. 312). New technologies were slow to diffuse partly because of minimal amounts of European immigration. Later, of all Third World regions, Africa participated the least in the Green Revolution (Myint 1964/1995). In its heyday in the mid-1970s, the Green Revolution’s investments in high-yielding varieties catered to the big staple crops, the wheat fields of the Near East and Latin America and the rice paddies of Asia. Africa, with fragmented markets, small-holdings and multiple types of staple foods other than wheat and rice, was least transformed (see Table 2). Because appropriate technologies cater almost exclusively to local consumers, small-holder exports are unlikely to expand.

⁸ The importance of scale for agricultural exports was recognized as early as the nineteenth century, in the Middle East, for example. “The great increase in sea-borne trade with Europe involved a fundamental restructuring of many parts of the Middle East economy. In some cases such a restructuring was necessary if the area developed to the production of cash crops was to expand in the first place. Lines of credit had to be established to provide producers with working capital, methods of transport improved and new systems of irrigation introduced where necessary. Later, the growth in trade itself began to produce important effects in many areas, leading to an intensification of monetary relations, an increase in agricultural specialization, and important changes in the relations between producers and those who controlled the cultivated land” (Owen, 1981).

Table 2. The Green Revolution: High-Yielding Varieties of Wheat and Rice, 1976/77
(Estimated Area and Proportion of Crop Area Planted to High-Yields, (1000s Hectares, %))

Region	Wheat ('000 Hectares)	Rice ('000 Hectares)	Total ('000 Hectares)
Asia (South & East)	19,672.3	24,199.9	43,872.2
Near East*	4,400.0	40.0	4,440.0
Africa**	225.0	115.0	340.0
Latin America	5,100.0	920.0	6,020.0
Total	29,397.3	25,274.9	54,672.2
Region	Wheat (%)	Rice (%)	Total (%)
Asia	72.4	30.4	41.1
Near East	17.0	3.6	16.5
Africa	22.5	2.7	6.5
Latin America	41.0	13.0	30.8
Total	44.2	27.5	34.5

(*West Asia and North Africa, **Sub-Saharan Africa)

Source: Dana G Dalrymple, Development and Spread of High-Yielding Varieties of Wheat and Rice in the Less Developed Nations, as cited in Rockefeller Foundation 1979

Starting from furthest behind, poverty has fallen the fastest in China and the rest of East Asia, and at an impressive rate in India, where bottom-up and top-down approaches co-exist (see Figure 2)⁹. As a share of the world's absolute poor in 1980, one out of every 10 persons lived in Sub-Saharan Africa, compared with one in three in 2000, the lowest incomes in 1980 were found in Asia. In Latin America and the Middle East, abject poverty by 1981 was already low, but in the next 25 years it still more than halved in the Middle East.

For generations, the problem of poverty has been regarded as “primarily an industrial one” (Atkinson 1887 in Tawney 1913). Yet like the benefits of electrification, the relationship between poverty alleviation and employment creation in ‘industry’ (modern manufacturing, services and agriculture) remains obscure. Despite championing the cause of poor people around the world and dramatizing the human condition, the United Nation’s Millennium Development Goals make no mention of employment generation as a means to battle poverty; there is silence on using economic policies — employment, fiscal industrial, monetary and trade — to create more industries that could provide additional jobs above the subsistence level. A World Bank history that starts in 1944 and covers over half a century mentions employment only seven times in a total of 1234 pages (Kapur et al 1997). A popular book on poverty by Paul Collier (2007), *The Bottom Billion*, is highly praised by Larry Summers, George Soros and the Economist magazine but it fails in its nine-page, small-print index to make any reference to employment, unemployment, self-employment, jobs, or work. In India, to be self-employed in informal services like auto-rickshaws, transport portage, and ready-food stalls is to earn less than an agricultural worker, although the self-employed entrepreneur is idealized compared to the wage earner, who may be disparaged as being part of a ‘labor aristocracy’ that enjoys government support (Banerjee 2010).

⁹ China’s Minister of Commerce in 2010, Chen Deming, noted China’s strategy towards “livelihood-related undertakings.” First in order was “a more proactive employment policy...to create more jobs and expand employment in every possible way.” Second mentioned was a social security system, then investment in social services, and finally an improved social safety net ([UNIDO 2010](#)).

Africa's sectoral distribution of employment as late as the 2000s was highly skewed, with roughly 65% in agriculture (mostly small-scale), 25% in services (mostly traditional) and only 10 percent in manufacturing (mostly the processing of raw materials such as sugar refining, beer brewing and flour milling). This minimalist modern-sector employment compares with a 38% average manufacturing share for East Asia (ILO 2008). In what follows, we argue that Sub-Saharan Africa is poor because few paid jobs have been created in modern industry; financial incentives tend to reward appropriate technologies *for use*, to make the lives of the poor easier, rather than *for production and export*, to make the incomes of the poor sustainable.

4. Population

Because rural areas tend to have higher population growth rates than urban areas, a lack of urban jobs perpetuates underdevelopment by indirectly sustaining a high population growth rate (Easterlin 2004). The 30 countries out of 223 with the highest estimated population growth rates in 2005-2010 included 24 small producer-type economies (see Table 3). At the other extreme, the slowest-growing populations tended to be in the former Soviet Union's mass production societies, whose peasantries at one time were large.

Fast population growth rates have destroyed the peasant economy's delicate equilibrium – a fragile balance of land and labor. W. Arthur Lewis noted that in the early stage of this type of economy, de-colonization and incipient growth created conditions for higher living standards, especially in rural areas. True enough, unemployment in Lewis' example, Nigeria, became the “most serious social problem due to the excessive drift away from agricultural employment, mainly by school leavers”. But Lewis goes on to recognize an important fact about the countryside's high-wage potential that no longer holds: “the co-existence of *labor shortage* in rural areas (with its promise of higher wage incomes) with unemployment in the towns” (Lewis 1967). With rising population growth rates, unemployment and underemployment spread everywhere, and the peasant-export economy drifted into becoming a labor surplus economy, but one without Asia's competitive labor costs or large domestic markets.

In the 1970s, “the World Bank's population advocacy had done much to legitimize the developmental significance of family planning” (Kapur et al 1997, p. 344-5). But this stopped after negative fall-out from Indira Gandhi's forced sterilization program and China's one-child family, the two countries where poverty has fallen the most. As the importance of participatory democracy in grass roots anti-poverty programs rose, the World Bank took a more “roundabout” approach to population, one in which “family planning was integrated with and partly disguised by health and nutrition projects” (Kapur et al 1997, p. 344-5).

**Table 3: Estimated population growth rate
(highest 30 and lowest 30 of 230 countries, 2005-2010)**

Highest Rank	Country	Population Growth Rate (%)	Lowest Rank	Country **Former Soviet Union	Population Growth Rate (%)
1	Liberia*	4.50	201	Slovakia**	0.03
2	Burundi*	3.90	202	Grenada	0.02
3	Afghanistan*	3.85	203	Slovenia**	0.01
4	W. Sahara	3.72	204	Aruba	0.01
5	East Timor	3.50	205	Pitcairn Isl.	0.00
6	Niger*	3.49	206	Cuba**	-0.01
7	Eritrea*	3.24	207	Japan	-0.02
8	Uganda*	3.24	208	Tokelau	-0.03
9	DR Congo*	3.22	209	US Virgin Isl.	-0.03
10	Palestine Terr.	3.18	210	Czech Rep.**	-0.03
11	Jordan	3.04	211	Germany***	-0.07
12	Mali*	3.02	212	Croatia**	-0.09
13	Benin*	3.02	213	Poland**	-0.15
14	Guin.-Bissau*	2.98	214	Armenia**	-0.21
15	Yemen	2.97	215	Guyana	-0.22
16	Somalia*	2.92	216	Montenegro**	-0.27
17	Burkina Faso*	2.89	217	Dominica	-0.29
18	Chad*	2.88	218	Hungary**	-0.29
19	UAE	2.85	219	Estonia**	-0.35
20	Angola*	2.78	220	Romania**	-0.45
21	Rwanda*	2.76	221	Russia**	-0.51
22	Madagascar*	2.66	222	Latvia**	-0.52
23	Kenya*	2.65	223	Lithuania**	-0.53
24	Togo*	2.65	224	Belarus**	-0.55
25	Gambia*	2.63	225	Bulgaria**	-0.72
26	Malawi*	2.57	226	Ukraine**	-0.76
27	Mauritania*	2.53	227	Georgia**	-0.79
28	Syria*	2.52	228	Moldova**	-0.90
29	Ethiopia*	2.51	229	Niue	-1.85
30	Tanzania*	2.47	230	Cook Isl.	-2.23

(*Peasant economy with a majority of the working population engaged in small-scale agriculture or herding.

Former Soviet Union *East Germany only)

Source: Adapted from United Nations World Population Prospects (rev.), 2006.
Estimates for the period 2005-2010 using medium variant.

With fast increases in population and its redistribution to urban areas, the economic structure of the peasant export economy has collapsed, becoming a hybrid of fragmented markets co-existing alongside mass markets, the latter largely ignored by the grass roots technology movement except to approve widespread use of the 'cell' (according to World Bank estimates for January 2000, the number of internet hosts per 10,000 people was

higher in Sub-Saharan Africa (2.73) than in the Middle East and North Africa (0.55), South Asia (0.22) and even East Asia and the Pacific (2.73), where it was the same (World Bank 2000/2001, cited in Huff 2003).

5. The incentive system for prize-giving

The fight against poverty that idealizes local entrepreneurship and foreign technical assistance typically starts with a ‘fact’ without a footnote: three million children die everyday from malnutrition, a billion households lack toilets, 70 million people have water-borne diseases, and 90 percent of the handicapped population has no wheelchair and doesn’t attend school (which may be true). As awareness of the sheer magnitude of these problems spreads, large financial incentives become available to innovators in the global North and South from donors, increasingly private, who believe in technological solutions for sustainable development.

A strong recommendation for prize-giving came out of a high-level workshop in 2003 on Invention and Innovation for Sustainable Development sponsored by the Lemelson-MIT Program and the National Science Foundation. It recommended:

“Awards and prizes with large cash sums should be established to motivate inventors and innovators everywhere to focus on sustainable development. Prizes could be sponsored by well-known institutions, and should be given high visibility through media channels. Prizes should focus on serving as incentives for solutions to *large* problems, and the prize money should also be applied to the commercialization and dissemination of the new solution” (Invention and Innovation for Sustainable Development 2003).

By 2007, Congress had passed the COMPETES Act which amended the Sec.7023 of National Science Foundation Act of 1950 to permit the NSF to receive and use funds donated to the NSF for specific prize competitions for ‘basic research’.

Below the Nobel Prize level, prizes have proliferated for poverty reduction in an age of ‘corporate social responsibility,’ convinced that as long as rich and poor ‘partner’ with each other in ‘social enterprises,’ advanced technologies can be adapted and applied everywhere on planet earth. Professor Abdul Hussam, of George Washington University, was awarded the Grainger Prize for Sustainability for his work on the Sono water filter to remove arsenic from Bangladesh’s well water. The prize included a \$1 million award, “much of which was generously donated to the further development and distribution of the filter”. Pure Home Water, led by an MIT professor, Susan Murcott, also a prizewinner with a simpler technology to remove arsenic from well water in a region adjacent to Bangladesh in Nepal, was threatened with a lawsuit from SONO for infringing on its patent. Later, the 2010 St Andrews Prize for the Environment was awarded to a team from Queen’s University, Belfast, also for an innovative method to remove arsenic from groundwater in West Bengal, next door to Bangladesh.

The Skoll Awards for Social Entrepreneurship, offering an undisclosed sum for three years, support social entrepreneurs whose work has the potential for large-scale influence on critical challenges of our time: climate change, nuclear proliferation, global pandemics, conflict in the Middle East and water scarcity. Goldman Sachs runs a program to help 10,000 women grow their own businesses and reinvest their success back into their communities (for which it won its own prize: a CEPC Excellence in Philanthropy Award). Kopernik awards a \$100,000 grant from ExxonMobil to continue efforts to promote economic advancement for Indonesian women through improved energy access. An INDEX Prize of €500’000 in 2010 is regularly awarded by a Copenhagen-based non-profit network for “designs to improve life”. The UN Development Program awards \$10,000 to winners of the Equator Prize, to communities which approach sustainable development innovatively. Another Equator Prize recognizes local efforts to reduce poverty through the conservation and sustainable use of biodiversity (\$30,000 in 2006). The Tyler Prize for Environmental Achievement made \$200,000 available in

2009 for eco-friendly technologies to supply water in Southeast Asia and to sustain bio-diversity in Latin America. The Ashden Award for Sustainable Energy carries the award of being presented by Prince Charles. The Schwab brokerage Foundation gives an annual award to a “social entrepreneur”, working in a “global social network”, whose innovation has a “social impact”; the form of the award is recognition at the World Economic Forum. One of *Time* magazines “Heroes of the Environment”, Tulsı Tanti, an Indian wind power mogul, captured the spirit of the age: “Yes, green business is good business, but it's not just about making money. It's about being responsible” ([Baker 2007](#)). Three teenage Palestinian girls were selected along with students from 50 other countries to compete in Intel's International Science and Engineering Fair, for a grand prize of \$75,000. The girls made a breakthrough by wiring walking canes to detect pavement bumps (much like laser canes do). The first president of Singapore's public-funded University of Technology and Design, Thomas Magnanti (former dean of MIT's Engineering School), said “we will focus on trying to create what we call technically grounded leaders – people who have technology in their hearts and their soul and who will go out to the marketplace and... lead all of us, economically and socially, in Singapore, the region and beyond, to the future” ([Joomcool.com 2008](#)).

Prize giving for innovation has a long history, and President Thomas Jefferson calculatedly chose Benjamin Henry LaTrobe, an innovative architect to design two fire-proof buildings which depended on vault designs (Wermiel 2000). In 1714, the British government offered cash prizes to develop a way to determine a ship's longitude (as portrayed in a novel and motion picture). Napoleon offered a prize for new methods to preserve food for his army, and the winner came up with the idea of canning in 1809. The Zecker Prize to Louis Pasteur ultimately led to his discovery in 1865 of pasteurization, which raised exports of French wines. Napoleon III offered a prize for an inexpensive substitute for butter (in scarce supply), and a French chemist won it in 1869 with margarine. London's Royal Agricultural Society's nineteenth-century annual exhibition awarded medals for technological innovation ([Bays and Jansen 2009](#)).

Intuitively, medals, awards, appointments, commissions, prizes and other prestigious and lucrative incentives may be expected to enhance competition, creativity and communication among scientists and engineers – however imperfectly (no prize for longitude was ever awarded; “a vaulted loggia that connected the Treasury Building with [President Jefferson's] house collapsed... In 1808, the vaults over the Supreme Court chamber in the Capitol collapsed, killing the clerk of works” (Wermiel 2000)). The \$100 laptop designed by the MIT Media Center was upstaged by India, who unveiled a Rs. 1,500 (around \$30) laptop designed specifically for students and made in India ([India Semiconductor Association 2010](#)). Incentives are especially important for the survival of ‘social enterprises’ in today's developing world because many technologies intended to reduce morbidity and raise living standards have proven to be technically difficult to design, at a low price, with reliable after-sales service.

The 30-year quest for an ecologically friendly cooking stove is illustrative of the difficulties of devising appropriate technology (by comparison the gas and electric stove seem relatively easy to design and use for multiple cuisines). The average wood-burning cooking stove in a developing country produces about as much carbon dioxide as a car, deforests large tracts of land, and kills more people than almost any other environmental hazard, outdoor or indoor. Therefore, in 2009 a short section in the U.S House of Representatives' Waxman-Markey climate bill called on the Environmental Protection Agency to identify ways to provide safe stoves to twenty million households in five years. The stakes were getting higher in Stove Camp, an annual meeting in Oregon of stove hippie-experts (their research center supports itself with sales of their as one that:

1. reduces fuel use by more than 50 percent.
2. reduces black carbon by more than 60 percent.

3. reduces childhood pneumonia by more than 30 percent (all EPA standards).
4. is affordable (\$10 retail or less).
5. is loved by cooks.

Yet “building a good cheap stove (about the size and shape of a stockpot, with a cylindrical combustion chamber and a cooking grate on top) can drive an engineer crazy... Fire is a fickle, non-linear thing, and seems to be affected by every millimeter of a stove’s design”. Moreover, local people like the taste from their own stove. As Stove Camp ended in 2009, an engineer said, “these designs usually take months and you’re still scratching your head”. Earlier, he had flown to London to collect the Ashden Award from Prince Charles (Bilger 2009).

Whatever the virtue of prizes for technologies for sustainable economic development, the way incentives are structured encourages *innovation* but not necessarily *economic development*; the two can easily diverge. An acclaimed innovation may not necessarily be the best available; the best may be buried in fragmented markets that contain imperfect information, making discovery costly (Japan’s international aid agency had worked for years on a stove for Zambia, and one of Japan’s private chemical companies had invented a smokeless briquette). To win a prize, technologists must create a new and better product; no incentive exists for them to search in tens of countries to identify an even better one that already exists, cheaper and more reliable for a poor community. The *appropriate* technologist wins an award for manufacturing an ingenious invention that uses local labor and materials (eschewing foreign trade) – as in the wood burning stove, or the locally made leather sandal, with soles from worn rubber bicycle tires. The aim of economic development, on the other hand, is to create jobs and to make the best products accessible even if they don’t use appropriate technology, as in laying on electricity for an electric stove, or manufacturing a synthetic rubber flip-flop in batches of millions using petrochemicals, not local materials: buyer preferences suggest that in hot humid climates the flip-flop is a cheaper, cleaner and cooler footwear, and in hot arid climates the plastic sandal tends to predominate over the leather sandal. Even interpreting the motives of innovators generously, they win awards in the highest circles despite ineffective search routines.

The Rockefeller Foundation gives credit in its 2008 *Annual Report* to the methodology of ‘Positive Deviance’ in helping to reduce malnutrition in Vietnam. A breakthrough came from a psychologist, Jerry Sternin, who worked in 1970 in Vietnam with the ‘Save the Children’ Fund, an American NGO. The Rockefeller Foundation’s *Annual Report* states:

“We... came to understand that social sector problem solving could achieve tremendous impact if the individuals and communities with the problems are included in the process of developing the solutions, an idea pioneered by a number of private sector and design companies (and many academics)¹⁰. To assess this concept, we partnered with a group called Positive Deviance, which identifies behaviors that enable outliers or ‘positive deviants’ to succeed and then encourages others within the community to adopt these same behaviors. For instance, Positive Deviance initially cast its eyes on malnutrition in Southeast Asia. Researchers visited a low-income Vietnamese village and immediately noticed that children in a scattering of families were in exceptionally good health. Upon closer examination, they discovered that, in these households, providers did not wash away shrimp and crabs found in rice paddies but, instead, cooked them along with their rice – adding protein to a carbohydrate-based diet. This technique

¹⁰ For the role of participatory democracy in a social program’s success, see Tendler (1997).

was embraced in villages across the country. It was a small, user-generated innovation that made a big impact” (Rockefeller Foundation 2008).

In fact, the discovery of the nutritional value of fish in rice paddies spread to Southeast Asia from India 1500 years ago: “Widespread over the world, fish culture in rice fields is mainly concentrated in South East Asia where it has been known for centuries” (Coche 1967). Sternin makes no mention of this body of scientific research in his 2010 book, with a chapter on Vietnam nutrition (Pascale et al 2010).

To reward the positive deviance method rather than the optimum search method probably did Vietnam no harm. But rewarding the second objective, of optimum search, might have helped diffuse the co-farming of rice and fish faster outside South East Asia, through a global network of government officials, agro-engineers and science-trained agronomists. Not to award prizes for ‘due diligence’ also has escalating costs because, as discussed below, a ‘third way’ is increasingly available if only it can be recognized and rewarded. The ‘third way’ involves neither the advanced technology of the developed world, and its high prices, nor the appropriate technology of the destitute world, and its many failures. New ‘appropriate’ products are in demand by poor countries *and* are produced commercially, in large volumes, at highly attractive prices, in these economies. Examples are the pharmaceutical and wind-power industries of India, the sewing machine and bicycle parts industries of China, the bio-fuel and natural plants industries of Brazil, and the aqua-fish and wheelchair industries of Vietnam.

6. Social enterprise: NGO or EGO?

The incentive structure for innovations to reduce poverty distorts economic development further by being biased towards fresh start-ups; usually an innovation (‘new’ locally) entails the establishment of yet another social enterprise, without the advantage of accumulated field experience, a professional staff, and stable employment¹¹. Typically the new enterprise creates competition for a local business already struggling to survive¹². If the social enterprise uses prize money or subsidies from its founder to give away its product for free, then this drives the incumbent out of the market, leading to job losses. A comparable experience occurred in the 1950s, when American aid under Public Law 480 took the form of surplus agricultural crops such as rice. This supply tended to drive down world prices, which then hurt commercial rice farmers in Thailand and Burma.

An incumbent’s survival may be assured by what has become common practice – a new social enterprise is expected to partner with a local individual, university or NGO. Instead of becoming bankrupt, the incumbent becomes part of the new enterprises’ social network. Partnering, however, is threatened in any social enterprise that is struggling. Social enterprises that operate in the red depend for their survival on their founder’s philanthropy or fund-raising skills. In times of crisis, an established NGO (Oxfam) may buy water filters at a given price from a start-up (Pure Home Water) and ‘sell’ them for free to save thousands of lives (and place Pure Home Water’s operations in the black). Alternatively, a founder may himself finance a needy person’s purchase of his product. Frederick K W Day, one of two owners of Chicago-based Sram, the world’s second largest bicycle-components manufacturer, attempted to put “millions of sub-Saharan Africans aboard special heavy-duty bikes designed to withstand the continent’s rugged roads while carrying 200 pound cargos”. After Asia’s tsunami struck in 2004, Day and his wife rushed to Sri Lanka and had 24,450 of his heavy-duty

¹¹ To my knowledge, there is no precise definition of a ‘social enterprise,’ which may or may not be ‘for profit’ versus ‘non-profit,’ or self-financing versus dependent on external contributions. For the confusion, see Acs and Sany (2009). For a discussion of the difficulties of defining a ‘social enterprise’ in Puritan America, see Frey (2010) .

¹² For the reasons behind the reluctance of poor consumers to switch products, see [Beaudry and Francois \(2007\)](#) .

prototypes assembled, priced at \$100 but given away free (with donations from Sram customers like Trek Bicycle), the object being “to help people move quickly through the countryside” (Fitch 2010).

Such social enterprises have difficulty attracting capable local partners, who may reasonably doubt their sustainability once the White Man leaves his Burden behind¹³. There is little empirical evidence on local partnering, although many home web pages of social enterprises mention their number and praise their loyalty.

In the case of local partners in start-ups with scarce resources and an uncertain future, it is very difficult for them to afford after sales service, and the more fragmented the market, the more costly it is to provide such service and usually the greater is its need. The problem in poor countries of bad maintenance entangled with bad design is hard to quantify, but is suggested by archaeology: rusty relics of corn shuckers are strewn throughout the African countryside. A carpenter at stove camp admitted: “Here’s the deal. The world is absolutely littered with failed stoves” (Bilger 2009). Frederick K W Day, the bike-parts mogul, recalls his first long car ride in Zambia in 2006. “We’re looking out the window and we keep seeing bike carcasses piled up alongside the road,’ he says. ‘It was like something out of The Andromeda Strain” (Fitch 2010). Pure Home Water, which guarantees the effectiveness of its process, attributes discarded water filters to poor up-keep.

A popular image of the social enterprise is that it does no harm, and in a harsh world miraculously does a little good¹⁴. But if it pays no taxes and ambushes the community’s spare change, then it does a few people harm and a lot of people no good. Little wonder measured poverty rates do not change if their reduction depends on a faulty incentive system and the ‘social enterprise’, whose definition for prize giving should depend on doing a lot of people a lot of good¹⁵. USAID changed its requirements for its Development Innovations Venture grants for 2011 where winners would have to demonstrate an impact of their innovation on at least 75,000 people¹⁶.

7. Conclusion: The Flaw of Failure

With no actual success story to follow, the grass roots anti-poverty movement has been stuck; the poverty rate in Sub-Saharan Africa for 25 years, before an explosion in raw material prices, has remained unchanged. It was no different in 2005 from what it was in 1981. The reason no successful example has evolved, I would argue, is because in the context of the poor peasant export economy, the movement’s working theories are logically flawed. Africa’s entrepreneurial spirit may be alive and well, but with fast population growth and sky-high rates of unemployment and underemployment, the hardiest entrepreneur cannot open a small business because other small entrepreneurs are already exploiting the same idea and making a loss. There is a shortage of opportunities for self-employment and paid employment at above subsistence, but the demand side of the equation is not addressed by the grass roots. The anti-poverty movement suffers from its belief in the fallacious ‘Say’s Law’ that the supply of better educated, healthier workers can create its own demand. Despite a firm faith

¹³ It is interesting to speculate on the response of the South’s own professional elites to grass roots initiatives; it must be multi-faceted. The sour note is sounded by a Kenyan water engineer about a “turning waste into profit” foreign project: “I have read the story and I am shocked. The group installed only one toilet in Kibera (Nairobi’s largest slum) a few months ago and now it is writing about it to the entire World. This toilet is receiving only 10-25 visitors a day. The design and materials used are very wanting. (The entire structure is pre fabricated concrete lads that weigh up to 90 kgs.) The business model is not tested (only dreamt up). I had the opportunity of meeting the team when they were here. My honest assessment is that there is nothing to write home about in this....” (interviewed, November 28th 2010, by S Gulyani, World Bank, Nairobi Office).

¹⁴ Nicholas D. Kristof of the New York Times is responsible for highly favorable editorializing about the social enterprise. See, for example, [Kristof and WuDunn \(2009\)](#) and [Kristof \(2010\)](#).

¹⁵ One of the most successful social enterprises worldwide, Whirlwind Wheelchair International, developed a cheap, comfortable, repairable wheelchair for rugged terrain, crowded streets and tiny dwellings in a business with a reputation for a highly diversified product that caters to a handicapped population with differing individual needs (Krizack and Rogin 2003).

¹⁶ See <http://www.grants.gov>

in the powers of technology, technology is not raising labor demand by inventing better goods and services since most innovators in Africa are foreign, and do not have a deep knowledge about what Africa could produce in modern manufacturing, agriculture or services for overseas trade, or for the mass markets that domestic population growth is creating. Instead, innovators design 'appropriate technologies' which could be bought mostly for consumption, which creates almost no income stream for the poor consumer. Rural electrification is widely in demand at a price that could almost certainly cover costs, and could broaden the scope for entrepreneurship for millions, but the supply and demand of mass-produced public goods is higher up the supply chain and closer to government intervention than the grass roots can stomach. An illogical incentive system for technology and entrepreneurship creates an inefficient use of time, and which has fostered a 'role model failure.' Prizes for new technology have proved their worth over time in different cultures, but incentives in peasant export economies are biased towards solving the consumption problems of small fragmented communities, when the employment problems of mass consumption communities are not being addressed at all.

These debates, however, are being eclipsed by a possibly transformative change: emerging economies are buying more raw materials and world prices are rising. Such economies are also supplying investment capital to new extractive industries, thereby broadening their choice of investor. New discoveries are being commercialized, and these have the potential to make Africa resource blessed, not cursed. The debates among elites about poverty are being overshadowed by debates about how poor countries should manage their natural resources and avoid ecological disasters. The role of teacher, however, is moving away from the old entrepreneurial elite into contested terrain. Should/could oil-rich West Africa follow the OPEC role model of resource nationalism; considering the fact that Angola is OPEC's newest member as of 2007, or should it follow a new Enlightened order, one of foreign multinationals practicing 'corporate social responsibility'? The answer will reveal the relative strengths of a good adaptive role model (OPEC) and a respected age-old theory of the Enlightenment.

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