Generating consumer demand for clean cookstoves in base-of-pyramid markets

Insights for donors and charitable organizations
About the authors

**Kathleen O’Dell**, PMP and certified Carbon Reduction Manager, is a senior manager with Deloitte Consulting LLP’s Emerging Markets group. She has 15 years of experience in clean energy, energy efficiency, and private sector development. O’Dell is currently project manager for the USAID Catalyzing Clean Energy in Bangladesh project, which aims to scale up adoption of clean cookstoves and industrial energy efficiency, as well as a USAID program that is driving investment into sub-Saharan Africa in the energy, health, and agriculture sectors.

**Onni Irish** is an analyst with Deloitte Consulting LLP, supporting a project management team in the procurement of security technology. In addition, she supports the Emerging Markets group with a variety of energy projects. She holds a BS from Georgetown University’s School of Foreign Service in Science, Technology, and International Affairs, with a concentration in Energy and Environment.

**Sarah Jane Maxted** works for Deloitte Consulting LLP’s Federal Energy and Resources practice with a focus on the US Department of Energy (DOE) and its 17 national laboratories. She has a diverse background in energy ranging from energy policy to clean energy technology commercialization, and has worked in both the private and public sector over the past six years.

**Sophia Peters**, a consultant within the Emerging Markets Segment of Deloitte Consulting LLP, supports a variety of energy efficiency, clean energy policy, and infrastructure and power project development programs for international and domestic public sector clients. She specializes in statistical, economic, and policy analyses for climate change and clean energy-related projects, and has worked extensively in Latin America, the Balkans, Southeast Asia, and East Africa as well as on federal-level US domestic policy for the EPA and DOE.
A Point of View—Deloitte Consulting LLP

This Point of View addresses the challenge of marketing clean cookstoves to low income segments around the world. With approximately two-thirds of the biomass-using population yet to adopt a clean cookstove, the potential market for these products is large. Meaningful adoption, however, has remained elusive despite 30 years of efforts by donor agencies and charitable organizations to push clean cookstoves into rural households to mitigate the debilitating health and environmental impacts of traditional cooking. Drawing from examples of other socially beneficial consumer durable goods that have been sold to base of pyramid (BOP) populations, this Point of View highlights principal takeaways for donor agencies and charitable organizations to enhance market-based approaches around demand stimulation for clean cookstoves, rather than supplant them.

Over 2.5 billion people—more than one-third of the world’s population—rely on traditional biomass for cooking. This practice has far-reaching consequences for deforestation, carbon emissions, productivity, and health. The Institute for Health Metrics and Evaluation’s Global Burden of Disease Study estimates that indoor air pollution results in more than 4 million premature deaths annually, about as many as tuberculosis and malaria combined. Governments, charitable organizations, international donors, and the private sector have invested in creating a range of technologies that burn biomass cleaner and more efficiently. However, after more than 30 years of effort, only an estimated 166 million households, approximately 828 million people, have adopted an improved cookstove. This leaves approximately two-thirds of the total market, or 1.6 billion traditional consumers of biomass, who have yet to adopt one.

While the interlocking challenges are well documented—lack of affordable options, customer-centric technologies, quality standards, access to financing, scalable distribution models, and after-sale support, among others—this Point of View focuses on the fundamental lack of demand for this product in target low-income populations living on $2 per day, i.e., the base of the pyramid (BOP).

Weak demand is likely driven by a variety of factors, mainly a lack of perceived value of the stoves’ health, efficiency, productivity, and environmental benefits and a misalignment with cultural and taste preferences. It can be argued that, without addressing demand generation, cookstove programs will continue to miss the mark.

As such, this Point of View provides stakeholders—particularly donor agencies and charitable organizations seeking to accelerate clean cookstove adoption—with important considerations related to demand generation. Recognizing that this sector may not ever be purely market-based, we aim to highlight how funders can use their investments to be impactful and enhance market-based approaches without hindering commercial activity.

We draw on illustrative examples of socially beneficial consumer durable goods for insight, such as water filters, electric burners, and purified water sachets, which have been marketed to BOP populations around the world. This
Point of View illustrates the transferrable ideas and innovative methods that companies and their partners are using to stimulate market demand for these types of goods. A table is included in the appendix to provide a snapshot of these product examples. While it is not intended to be exhaustive, it does highlight notable cases. These strategies offer guidance on moving the market from one that pushes cookstoves onto consumers from the supply side (“push”) to one that pulls the product in from the demand side (“pull”). While these examples are certainly not cookie-cutter approaches, reviewing effective, and ineffective, socially beneficial durable goods models can inform those interested in supporting the scaling up of clean cookstoves on how to play a meaningful role in the transformation of this market.

Servals increased adoption of its modern burners by carefully understanding what its target market wanted—a low-maintenance and long-lasting product. They sealed the deal by providing distributors with a healthy margin to not only want to sell the product, but also put on product demonstrations to ensure consumers knew the burners fit their needs.

Main takeaways for generating BOP demand

So what works? Our review of past examples found several innovative strategies that increased the uptake of consumer durable goods in BOP markets, as well as marketing missteps that led to product flops. What is clear is that there are no silver bullets—selling products to low-income segments is riddled with challenges.

The positive consumer durable strategies we reviewed transformed from strategies oriented around aiding beneficiaries to ones oriented around targeting customers, an important shift. Manufacturers thought deeply about what motivated their customers to buy, use, believe in, and advocate for the product to others. Furthermore, effective manufacturers worked innovatively with a funding partner—whether a commercial entity, government agency, or donor—to make their business model more sustainable and locally relevant. With this in mind, we highlight the following takeaways to guide funders of clean cookstove programs on their next steps.

1. Conduct a dynamic, multifaceted customer segmentation to understand the target market

Consumer preferences, needs, ability, and willingness to pay are variable depending on history, cultural preferences, availability of substitutes, location, socioeconomic background, and many other factors that companies often take into account.
in marketing strategies for typical middle-income markets. BOP markets should be no different. These populations are similarly multidimensional, but made up of consumers with less disposable income—making it even more critical to understand who is willing to pay and based on what motives. Customer segmentation should be multifaceted and multilayered to truly capture what will drive demand. With water filters, a manufacturer found that these segmentations should not be executed across just one metric, even if it is willingness to pay, because getting the price right doesn’t matter if customers are not attracted to the look, feel, or taste of the product. On the other hand, Sercals Automation Pvt. Ltd’s research on its Venus Burner product showed that, above all, customers valued an easily understandable, low-maintenance product. As such, the company shifted to accommodate that consumer preference and offered responsive maintenance and product demonstrations.

Pioneers in mobile banking have taken the lead in slicing and dicing specific target BOP markets to orient their assumptions about customer behavior, match improved customer design to consumer preference, and mitigate market entry risk. Donors in this space have assisted financial institutions in executing customer segmentations for specific BOP markets—helping banks understand the particular

Bangladesh’s Total Sanitation Campaign utilized creative marketing that spoke directly to local consumer choice and leveraged cultural pressures. The campaign targeted local, well-respected change agents as early adopters, who in turn convinced the broader community at large to use modern latrines.

family type, education level, and/or labor category that might be more apt to adopt the service. For example, the Consultative Group to Assist the Poor found that middle-income formal salaried workers in Mexico preferred to conduct bank transactions at big brand stores and were hesitant to use cell phones; on the other hand, informal entrepreneurs in the same income segment were more apt to use flexible, mobile-based services. At the specific durable product level, these analyses need to incorporate a wide variety of indicators, recognizing that regions and even municipalities have different customer segments. This is particularly true for clean cookstoves, where regional differences result in specific biomass fuel input differences.
Target early adopters to build a critical mass of consumer demand

Once different consumer types within the market are well understood, market entry strategies focusing on early adopters have oftentimes built enough consumer demand to eventually flip the whole market. Integral to this approach is a thoughtful understanding of the product characteristics that appeal to early adopters so that messaging can highlight those factors. Women’s health advantages, environmental benefits, or other public good-oriented messages typically do not generate demand. Instead, this segment tends to be moved by the product as a symbol of modernity, wealth, or sophistication, among other socially sensitive variables.

Early adopter strategies can lead to market penetration. These strategies might include early outreach to small-scale restaurants/food stalls, where more efficient products have a strong economic value proposition, or other well-regarded enterprises in the community that consumers frequent and hold in high esteem. In the case of Cool Pacs—purified packets of water sold by street vendors—Voltic positioned them as a premium product with early adopters, making it aspirational for wider segments. Likewise, Bangladesh’s Total Sanitation Campaign created social and cultural pressure to use latrines because turnkey early adopter players were using the product.

Utilize creative social marketing techniques—based on social values and tailored to the target customer base

The importance of using social marketing and awareness building campaigns in driving product adoption should be emphasized. Given the widespread penetration of communication mediums at the government’s disposal, this is often an area where the government can be of effective use. Consumer education, awareness campaigns, and product demonstrations are areas in which funders frequently work with developing country governments and where cookstove collaborations could be possible. Social marketing outreach programs should be driven by the preferences of the target market segment, including understanding who has the power of the purse. This is especially salient in the cookstoves sector, as the purchaser is often the paternal figure in the household who does not necessarily use and/or benefit from the product directly. The following marketing approaches helped drive sales in our review of past examples.

Co-brand with a recognized consumer brand to gain consumer trust

Oftentimes, with push products, manufacturers selling to BOP markets have co-branded their product with a well-known commercial brand to increase customer recognition and willingness to buy. This approach can increase buy-in and trust in a new product that consumers may not be fully convinced merits the investment. Fenix International, a solar-powered battery charging station manufacturer,
partnered with the MTN Group Ltd., Africa’s largest telecom with 176 million subscribers, to push its products out to rural Ugandan markets. A recognizable brand that inspires consumer confidence, is regularly used by the target market, and is related in some way to the push product has made for very effective co-branding synergies. In the cookstoves market, this might manifest itself as an innovative public-private partnership or similar cost-sharing relationships with private sector companies that have a larger reach and broader appeal to BOP market segments than might a traditional co-branding with government agencies.

Engage community leaders and leverage local popular culture

Several leading examples engaged community luminaries, such as the community doctor or religious leader, in live product demonstrations or marketing outreach to help with product buy-in, while others promoted their products using cultural icons, pop stars, and popular programs. Bangladesh’s Total Sanitation Campaign provides another example in this case, as marketing efforts tied using a modern latrine into folk songs that consumers were regularly exposed to at the village level. Evidence from Rwanda confirms that including social messaging in popular radio shows can affect behavior change and reshape cultural norms. While none of this is new to companies operating in developed markets, manufacturers have been less apt to leverage these approaches in BOP markets—instead opting for health-oriented “it’s good for you” messaging.

Exhibit products

Product demonstrations that show the customer base not only how to use the product, but also explain how it can benefit them directly have driven sales in other consumer goods markets. With the availability of low-cost substitutes, consumers with small margins should be convinced of how the new product will meet their requirements and merit their investment. International Development Enterprises (IDE) India’s investment in in-person and video demonstrations when introducing treadle pumps helped drive sales in a market full of lower-cost, but lower-quality irrigation pump substitutes.

Leverage existing, trusted distribution networks

In order to make products accessible and easily purchasable, manufacturers have strategically placed products within already established distribution networks. This helps generate demand for the product, especially if outlets are trusted by the community, i.e., public health centers, town halls, or shops where consumers buy other staple goods, and brings the product within the consumer’s everyday routine.

Voltic’s promotion of Cool Pacs through the already established vast network of informal

Voltic effectively entered the BOP market by embracing the informal sector and marketing its Cool Pacs (purified water sachets) through informal vendors and food stalls, where the target segment was most likely to encounter them. Entering the market this way helped sell 500,000 water sachets daily.
stalls molded the product’s outreach to its target market, as these informal sellers were where BOP consumers were already purchasing products. Several companies, such as Essilor eye glasses in India and Grameen-Danone yogurt in Bangladesh, that tried to market and distribute their products through completely new channels—i.e., creating a network of door-to-door sellers and deploying vans to sell to rural markets—have tended to fall short in the longer term. Even though these products were meaningfully disseminated in other parts of the world, the companies failed to assess what was mandatory for uptake in the new community’s specific distribution channels and created unwieldy models. More effective is when partners—donor or commercial—assist companies in scaling up distribution systems they already have in place, similar to how Fenix International leveraged MTN’s mobile phone distribution network to market and sell its new battery charging station product.

5. Connect the end consumer with innovative financing and payment options

Like many other markets, those wishing to promote cookstoves’ adoption should study the customer base’s willingness and financial capability to purchase the product. In many cases, working directly with end customers to create specific financing schemes for different groups lends itself to higher adoption (and usage) rates than using that same capital to subsidize manufacturers to sell products at a lower price. Providing customers with the means to buy the product is the bridge linking demand generation to product sale, but can be very challenging. Innovative financing mechanisms that might be leveraged include mobile-enhanced banking services, microcredit schemes, tailored subsidies, and pay-as-you-go or pay-per-use schemes, among others. Particularly salient are those catering to BOP-specific consumer market needs (fast loans, small amounts, virtual infrastructure as consumers are far from banks) and are readily and easily available. Donor support of the Bangladeshi National Infrastructure Development Company Ltd.’s (IDCOL) financing system for solar home systems—tailored to the BOP market by providing options around loan size, reasonable tenors, and extending the offer of credit at time of purchase—has led to the installment of close to 2 million solar home systems in Bangladesh despite relatively high upfront prices for the system. Purely commercial models work as well and can be tailored to timing and size requirements. M-Pesa Pesa Pap! mobile banking micro quick loans allow bank customers to apply for an instantaneous loan by SMS on their mobile phone, which, if approved, is immediately credited to their M-Pesa account. M-Pesa credit is accepted by most merchants in the country and allows Kenyans access to financing for larger ticket purchases despite irregular cash flows. Helping BOP buyers gain access to payment options and assisting to extend banks’ customer reach could be a strategic area for donor support. By taking this approach of coupling demand creation with affordable financing options, a clearly navigable channel from the consumer to the product is established.

IDCOL’s Rural Electrification and Renewable Energy Program utilizes a financing mechanism that enables poor households of all sizes to choose the right solar home system that fits their budget and household needs and is available to the consumer at time of purchase through the distributor.
What’s next?

After 30 years of attempting to diffuse clean cookstoves into rural markets, these problems certainly won’t solve themselves in “five easy steps.” This is an extremely challenging and complex issue. What we have seen, however, is that concentrating in these five areas has helped increase adoption rates in other consumer durable sectors. Generating demand will likely be different in varying target markets, due to regional differences in fuel inputs, variations in taste preferences, and other specific cultural factors that play into how households cook and make purchasing decisions. Tailoring the message and the product to this dynamic set of circumstances is integral to scaling up clean cookstoves adoption.

The extra challenge of the cookstoves market in particular is not only stimulating demand for the initial sale, but maintaining interest in the product throughout its lifetime so that it achieves the intended health and environmental benefits. Thus, sustaining demand for cookstoves requires a bifurcated approach, first targeting the initial purchase and then, equally important and often involving other household members, targeting sustained usage over the product’s lifespan. It should be a multifaceted, evolving, and iterative process that should not end once the product gets over the doorstep.

What is also clear is that, while market-based approaches can provide more commercial approaches for socially beneficial goods, it is unlikely the clean cookstoves market will ever be a purely profit-driven, private sector business venture. Considering the significance of the public health and environmental benefits, the public, donor, and charitable sectors should continue to be involved at some level. Leveraging carbon financing will likely be a critical piece in making the numbers work. Donor agencies and charitable organizations should find those gaps and provide assistance where budding entrepreneurs and SMEs with tight profit margins may not be able to expend resources; in doing so, they can begin to enhance market-based approaches rather than displace them.
Appendix

The table below summarizes an array of well-publicized, illustrative consumer durable goods examples that have entered low-income markets to sell socially beneficial goods to low-income populations. While not exhaustive, the table provides a snapshot of well-known products and companies attempting to bring their products to BOP markets.

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| Latrines and modern sanitation devices & Bangladesh’s Total Sanitation Campaign | Total Sanitation Campaign disseminated modern toilets and latrines into rural communities to address serious public health risks. Implemented through municipalities, the campaign increased willingness to invest by over 200%, and increased sanitation coverage to almost 90%.<sup>24</sup> | Demonstrated results! Creative marketing that spoke directly to local consumer choice and leveraged cultural pressures. | • **It pays to go local:** A locally driven approach (municipal government ownership) enabled leaders to utilize effective messaging channels to reach the target population.  
• **Government involvement ain’t all bad:** Leveraged the government’s specific ability to sponsor mass social mobilization and marketing. |
| Treadle pumps & International Development Enterprises (IDE) | IDE India, a non-profit that manufacturers and distributes irrigation pumps, created a treadle pump that significantly improves yields for small share farmers, but costs more than lower-quality substitutes readily available on the market.<sup>25</sup> | Demonstrated results! Invested almost one-third of the final price of its marketing and sales outreach strategy, which centered around product demonstrations. | • **Convince the consumer:** Dedicated marketing efforts to product demonstrations, including video vans, live shows at farmer meetings, and promotional materials.  
• **Use donor funds creatively:** Utilized donor funding exclusively for marketing outreach, illustrating that the public sector can play a role where it has a comparative advantage. |
| Efficient kerosene burners & Serval Automation Pvt. Ltd | Servals changed its pricing strategy to redistribute production costs, bringing higher margins to the retail dealers and allowing the product to match consumer preferences.<sup>26</sup> | Demonstrated results! Provided healthy margins for its distributors by driving sales and increased adoption through customer demonstration to confirm to the buyer that the product was low maintenance and long lasting. | • **The price is right:** To gain greater market penetration, margins to both the wholesaler and the retailers were improved by decreasing wholesale price.  
• **Customer is king:** Understood what customer preferences and needs were in order to design a low-maintenance and efficient product. |
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<td><strong>Water sachets &amp; Cool Pacs Voltic</strong></td>
<td>Voltic launched Cool Pacs as a premium product, highlighting the water’s quality, targeting low-income consumers. With a slightly higher price, Cool Pacs beat informal rivals, by making itself an aspirational product.27</td>
<td>Demonstrated results! Tapping customers’ preference for quality and the finer things (and willingness to pay for it), Voltic overcame products of equal value.</td>
<td>• Quality matters: Launched a marketing campaign that emphasized the product’s quality, and thus commanded a higher price than rival products.</td>
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<td><strong>Solar home systems &amp; IDCOL: Rural Electrification and Renewable Energy Development Program, Government of Bangladesh</strong></td>
<td>IDCOL supports the government of Bangladesh in providing electricity to rural populations through solar home systems. The financing aspect of the program enables poor households along the size spectrum to choose the appropriate system that fits their budgets and household preferences.28</td>
<td>Demonstrated results! Matched its product offering to its consumer lending preferences, offering inventive financing schemes that can be tailored to households.</td>
<td>• Everyone likes choices: Introduced a financing mechanism that offers customers options and fits their budgeting needs and cash flow constraints.</td>
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<td><strong>Pesa Pap! &amp; Safaricom’s M-Pesa mobile banking</strong></td>
<td>M-Pesa is a mobile banking program started by Safaricom and catering to low-income customers. Linked through a commercial bank, M–Pesa accounts allow customers to undertake banking functions through their mobile phone, including sending and receiving money. Pesa Pap! is a program that allows customers to apply for and receive microloans through their phones on the spot.29</td>
<td>Demonstrated results! Pesa Pap! tailored its offering to the needs of the low-income segment in Kenya, providing loans instantaneously, without requiring a trip to the bank or paperwork, and accommodating irregular cash flows.</td>
<td>• Bring the bank to the customer: Provided rural populations with access to finance when they needed it through a service provider that almost everyone in the country has access to and that most vendors accept.</td>
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<td><strong>Solar battery ReadySet &amp; Fenix International</strong></td>
<td>The Fenix ReadySet is an intelligent plug-and-play energy system that can power mobile phones, lights, water purifiers, and even medical applications. More than 2,000 ReadySet energy systems have been sold across East Africa, each empowering an entrepreneur to become a micro-utility to their communities.30</td>
<td>Demonstrated results! Fenix joined forces with MTN, a mobile service provider ranked as Africa’s most valuable brand at $9.3 billion; MTN has co-branded the ReadySet with its logo and is leveraging its sales, marketing, distribution and after-sales service network to extend the reach of the product.</td>
<td>• People believe it when they see it: Fenix’s business relationship with a big, well-known commercial brand, MTN, enabled the product to not only access the company’s distribution network but also become a well-known product for consumers.</td>
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## The product

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| **“Shoktidoi” strength yogurt & Grameen Danone Food Ltd.** | Grameen Bank created Grameen Danone Food Ltd. (GDFL) and worked with Danone, a French food & beverage company, to sell healthy yogurt specifically designed to alleviate child malnutrition in rural areas of Bangladesh. Originally, GDFL distributed the yogurt packets, selling at 6 takas a serving, through a trained force of female sales representatives, “Shokti ladies,” who were to sell the product door to door in rural communities.31 | Missed the goal… The Shokti ladies were not able to generate enough revenue to treat the position as a full time endeavor, instead using it as supplemental income. As a result of this and several other mismatches to consumer preferences, Shoktidoi yogurt didn’t take off under that business structure. | • All-in approach can make or break: Employees were not full time and could not be fully engaged with the company and the customer. For a small business to thrive and really understand its customer, it should take an all-in approach.  
• Mismatching results in failure: Executives believed that urban sales were integral to offsetting rural sales without fully addressing the rural sales issue. |
| **Eyeglasses & Essilor International** | Essilor International, known for manufacturing and selling optical lenses around the world, teamed up with Indian non-profit eye hospitals Aravind and Sankara Nethralaya. They targeted Indian rural poor by running mobile optician shops that traveled around the country prescribing and selling spectacles (priced between $3 and $4). Essilor only operated a total of 8 vans, yet had aspirations to operate 1,000.32 | Missed the goal… In scaling up operations, Essilor initially attempted to franchise the vans, but ultimately decided to operate them on their own and to limit spending on upgrades for existing vans. | • Franchising doesn’t kick it: The goal of franchising van ownership and salesmanship did not work. It’s important to retain oversight over direct employees until significant penetration is reached within the rural poor.  
• Don’t go big too quickly: While Essilor had demonstrated impacts around the world, they needed to be more prescriptive in BOP markets. Focus on their immediate small business and relationship with non-profits would have slowly built a scalable model for India. |
| **Water filters & Fortune 500 Company Water Filtration Packets** | The company invested $10 million in Water Filtration Packets in preparation to bring to market; however, repeat purchase rates did not exceed more than 5%; the company was forced to make the product a philanthropic endeavor rather than a profit-driven one.33 | Missed the goal… Failure to commercialize underscores the importance of carefully crafting market assessments and picking the appropriate metrics for customer segmentations. | • Give the people what they want: Executed market studies around willingness to pay but neglected to test around taste, repeat usage, and other preference metrics—important indicators when most purchases have real opportunity costs. |
Endnotes

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7. Base of the pyramid (BOP), also known as bottom of the pyramid, is a term coined by C.K. Prahalad and Stuart L. Hart, in their seminal piece, "Fortune at the Bottom of the Pyramid" as a synonym for the global poor living at or near $2 a day. Prahalad, C.K. and Hart “The Fortune at the Bottom of the Pyramid,” Strategy+Business, Issue 26, First Quarter 2002.

8. In this Point of View, charitable organizations refer to non-governmental organizations, foundations, and other philanthropic institutions interested in scaling up clean cookstoves in low-income populations around the world on a non-profit, socially beneficial basis.


12. Ibid.

13. “Early adopter” is a term coined by Everett M. Rogers in his seminal piece on innovation diffusion. Early adopters were characterized in the piece as respected opinion leaders who try out new ideas, but in a careful way. They are an integrated part of the local social system, hold the greatest degree of opinion leadership in most systems, and serve as role models for other members of society.


32. Ibid.

Family Bank. Pesa Pap! http://familybank.co.ke/Info/Pesa%20Pap!

Personal interviews

Dr. Mohammed Khaliquzzaman, World Bank, Bangladesh, January 29, 2013.
Pradeep Pursnani, Shell Foundation, February 20, 2013.
Dr. Bryan Willson, Envirofit, February 21, 2013.
Dr. Douglas Barnes, World Bank, March 6, 2013.
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