BACKGROUND NOTE

Bottom of the Pyramid Innovation in Asia

Jungsuk Kim and Cynthia Castillejos-Petalcorin

DISCLAIMER

This background paper was prepared for the report *Asian Development Outlook 2020: What Drives Innovation in Asia?* It is made available here to communicate the results of the underlying research work with the least possible delay. The manuscript of this paper therefore has not been prepared in accordance with the procedures appropriate to formally-edited texts.

The findings, interpretations, and conclusions expressed in this paper do not necessarily reflect the views of the Asian Development Bank (ADB), its Board of Governors, or the governments they represent. The ADB does not guarantee the accuracy of the data included in this document and accepts no responsibility for any consequence of their use. The mention of specific companies or products of manufacturers does not imply that they are endorsed or recommended by ADB in preference to others of a similar nature that are not mentioned.

Any designation of or reference to a particular territory or geographic area, or use of the term "country" in this document, is not intended to make any judgments as to the legal or other status of any territory or area. Boundaries, colors, denominations, and other information shown on any map in this document do not imply any judgment on the part of the ADB concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

BOTTOM OF THE PYRAMID INNOVATION IN ASIA

Jungsuk Kim[1]
Professor, Department of Economics and Trade, Sejong University, Republic of Korea
kim@sejong.ac.kr

and

Cynthia Castillejos-Petalcorin[2]
Economic Research and Regional Cooperation Department, Asian Development Bank
cpetalcorin@adb.org

[1] Jungsuk Kim is a Professor in Department of Economics and Trade, Sejong University, Seoul, Republic of Korea and Cynthia Petalcorin is a Senior Economics Officer in Economic Research and Regional Cooperation Department, Asian Development Bank.

[2] The authors are grateful to Donghyun Park for insightful guidance in the writing of this paper. The workshop participants at the Asian Development Bank (ADB), Manila last November 2019 also offered very useful suggestions. The views expressed in this paper are those of the authors and do not necessarily reflect the views and policies of ADB or its Board of Governors or the governments they represent. ADB does not guarantee the accuracy of the data included in this paper, and accepts no responsibility for any consequence of their use.

I. INTRODUCTION

The sustained rapid growth of Asian countries has seen hundreds of millions of people in the region move out of poverty within a generation. While there has been an overall improvement, how to effectively reduce extreme poverty, while pursuing an inclusive growth agenda, is still an important policy objective for governments in the region. The proposed chapter will examine the bottom of the pyramid (BOTP) innovation, also interchangeably referred to as "base of the pyramid", which refers to creating solutions to support more than 4 billion poor people around the world and improving their standard of living. We reviewed some case studies and suggested policies that could be implemented to promote BOTP innovation in Asia. The basic structure of the proposed box chapter is (i) define the concept of BOTP innovation; (ii) provide selected real life examples of BOTP innovation in Asia, and an assessment of effective strategies and relevant policy options; and (iii) discuss how BOTP innovation contributes to inclusive growth in Asia.

A. What Constitutes the Bottom of the Pyramid?

The term "bottom of the pyramid" (BOTP), refers to the poorest two-thirds of the group in the economic pyramid that are living in absolute poverty. These are the people in dearth of economic opportunities, limited or no access to finance, health, or services. The current concept of BOTP was first presented by Prahalad and Hart (2002) and has been included in a series of subsequent academic studies (Prahalad 2005, 2006, and 2012). He estimates that the total population of those at the BOTP is more than 4 billion people, the likes of which live on less than $2 per day or have a per capita income less than $1,500 per year as seen in Table 1 (Prahalad 2005, 2006, and 2012).

Table 1: The World Economic Pyramid

Annual Per Capita Income	**Tiers**	**Populations (million)**
More than $20,000	1	75~100
$1,500~$20,000	2&3	1,500~1,750
Less than $1,500	4	4,000

Note: Based on purchasing power parity in United States dollar
Source: Prahalad and Hart (2002) "Exhibit 1: The World Economic Pyramid".

Prahalad and Lieberthal (1998) explained the concept of purchasing power parity (PPP) threshold to identify the size of the BOTP population. There have been active discussions as to what constitutes the BOTP, and the threshold of BOTP by many researchers. Prahalad (2005) estimated that the BOTP potential market size is $13 trillion at PPP, but Kernani (2007b)[3] criticized this as way too much overestimated figure and argued that the BOTP market size of $1.2 trillion. According to the World Bank, it pegs the amount at $5.0 trillion. The Millennium

[3] Kernani (2007b) stated that even $1.2 trillion could have been overestimated figure.

Development Goals adopted by the United Nations uses the $1 per day measure (Sachs 2005) while according to Hammond et al. (2007), the base of the economic pyramid is defined as having four billion low-income people, with incomes falling below $3,000 in local purchasing power, and therefore live in relative poverty. Based on the 2015 estimates from the World Bank, 10% of the world's population[4] lived on less than $1.90 a day, a reduction from the 11% recorded in 2013 and the nearly 36% less than 1990. In sum, the most feasible range of PPP of BOTP lies somewhere in a range of annual income of $1,500–$2,000 or between $1 and $2 on a per day income basis. According to World Bank projections, the population at the bottom of the pyramid could reach to more than 6 billion people over the next 40 years.

Table 2: Some Estimates of BOTP

Source	**Per Capita Income Threshold**	**Market Size** (PPP)
Prahalad (2005, 2006, and 2012)	Less than $1,500 per year	$13 trillion
United Nations, Sachs (2005)	$1 per day measure	
World Bank (2015)	$1.90 a day	$5 trillion
Hammond et al. (2007)	Below $3,000 in local purchasing power	
Kernani (2007b)		$1.2 trillion

BOTP = bottom of the pyramid, PPP = purchasing power parity.
Note: Based on PPP in United States dollar.
Source: Authors' compilation.

With the threshold in mind, it is crucial that, when designing innovation-orientated policies serving the poor, one must also be aware of its characteristics and behaviors. First, only a small percentage of those at the BOTP possess a bank account, while the majority of them have no access to financial services. Second, the people at the BOTP have little knowledge and lacks proper market access in which they can fairly sell their labor and goods. Because of this, they have no other option but to sell their goods and services to unscrupulous local employers or so-called intermediaries who then exploit and take an advantage of them. Third, as they are mostly engaged in subsistence, small-scale farmers, or fishermen, they are particularly vulnerable to the threats posed by the devastation of the natural resources they rely on, and to human rights exploitation as well (Hammond et al. 2007).

Last, BOTP consumers usually pay more as percentage of their income, than richer consumers for the basic goods and services, with these items often also being of a lower quality as well. Chenge et al. (2019) mentioned that informal settlers in the urban areas on developing countries spend more than 60% of their income on food. They face excessive fees from the loans they are

[4] Almost 700 million of the population according to 2018 World Bank estimates.

forced to take or for the remittance fees they pay for making overseas money transfers. Making basic goods services cheaper will mean that more budget can be freed up for use in education or investment that have future productive gains for the poor. When designing innovation-orientated policies within BOTP, it is therefore important to analyze the entire BOTP market in a particular economy, focusing on BOTP consumption (Kuo 2016), before developing strategies that can be effectively implemented as BOTP innovation.

B. Innovation at the Bottom of the Pyramid

Compared to 20 years ago, there has been substantial progress in alleviating poverty at the BOTP, with both large commercial companies and local innovators contributing to its improvement. Despite their unfortunate conditions and constrained resources, the poor can be a vast source of innovation. With unmet needs by traditional markets, the poor are also driven to be creative in solving the problems besetting their communities. There are many examples of successful innovation projects that were designed to suit local conditions and needs at the fraction of the cost. Since the solutions are homegrown, the implementation costs tend to be lower, and the impact to the lives of the poor, while localized, are more visible.

Commercial enterprises have traditionally viewed the BOTP market not as a potential business opportunity because of low demands from the poor people, difficult, and inefficient to penetrate. For other commercial enterprises, a newer method that has emerged in recent years inspired the learning from the local and indigenous knowledge in developing their product or service. Termed as reverse innovation, or trickle-up innovation is any innovation that is adopted first in the developing world (Trimble 2012) and may be later adopted in developed countries. The focus of this kind of innovation is the customers, what it particularly demanded by the poor. This runs contrary to the usual business strategy that newest innovations come from developed countries, revise slightly to address local conditions, then eventually trickle down and export to target poor and developing countries. Rangan, Chu, and Petkoski (2011) suggested that, for commercial enterprises to succeed in BOTP markets, they need to scale up from the beginning in order to create a virtuous cycle of economic development, which drives demand for products and services.

The World Bank Institute (2008) pointed out that large companies can have a larger impact on the poor not only by selling goods and services to them but also through creating more efficient markets and complementing market institutions. Global companies such Unilever and its Indian subsidiary—Hindustan Lever Ltd—have shown that innovations on their production process and distribution system can foster entrepreneurship and empower women, which is abundant labor force in rural India.

For BOTP communities, health and access to clean water and sanitation are difficult and costly. When affected with a disease, vulnerable groups mostly took the toll. But affordable and creative solutions can be the right intervention, as shown by the development of insecticide-treated mosquito nets by Sumitomo Corporation to prevent the spread of malaria disease. The availability of safe potable water for poor communities was the objective Water Health International Incorporated, which came up with an affordable clean water using ultraviolet light that could disinfect one ton of water for five cents, when universal access is limited. Reaching out to the

urban poor dwellers, Manila Water provided flexible payment options where the poor can get connected to 24-hour clean water service at the fraction of the cost.

Financial services is considered an important element to help alleviate extreme poverty for million poor families, as illustrated by the successful programs of BRAC and Grameen Bank. Having access to microfinance have been an impetus for many BOTP communities to engage in entrepreneurial activities, which gave them better opportunities and promote resilience, in turn create more jobs, and enable them to escape the poverty trap. (Financial services being recognized as key driver to inclusive growth). Solar Electric Light Fund helped bridge the provision of solar technology that helped off grid communities produce electricity, water, refrigeration, and many other essential services. The flexible payment options of Manila Water brought clean water to millions of poor city dwellers.

The strongest and most dramatic BOTP success stories come from the mobile phone service industry, whether measured by market share, the proved beneficial to low-income consumers, or by the cost reduction of the companies. Until very recently, access to phone services in most developing countries was not possible for the vast majority of poor communities. However, the entry of mobile phone companies changed this phenomenon. The high level of technology can address important concerns for BOTP consumers: convenience, accessibility, safety, and transferability. A mobile phone-based transaction system delivers much more convenience than traditional offerings. Electronic forms of money are safer than cash, easy to keep and transfer, especially to and from overseas.

By employing new technologies and creating more inclusive business models, it became possible to generate innovative new commercial opportunities with tremendous potential to improve the quality of life for those at the BOTP. We further illustrate several interesting cases where Asian countries can learn from to achieve inclusive growth outcomes for future innovations:

(i) **Product innovation and grassroot employment of Hindustan Lever Ltd (HLL)**, a subsidiary of Unilever PLC in the United Kingdom and well-known to be a high-performing company in India, has begun exploring bottom of the pyramid markets. HLL's new detergent called "Wheel" was produced by heavily reducing the amount of oil residue contained in the product in consideration of the fact that poorer communities in India often wash their clothes in rivers and other public water systems. HLL also reorganized the process of production, marketing, and distribution of the product to fully utilize the abundant labor force in rural India, forming sales groups using the thousands of small outlets where the majority of the BOTP consumers shop. HLL also amended the cost structure of its detergent business so "Wheel" can be introduced at a low-price range. In 2019, HLL reported a gross sales value of about ₹377 billion ($5.3 billion) up from about ₹346 billion in the previous fiscal year. Not only changing its production process, but Unilever explored the potential of tapping women in Pakistan as its main sales force in the village level. The scheme has provided incomes for women who have few opportunities to make money and cannot freely travel outside of their homes (Mahajan 2016), covering a market potential of 4.5 million women in 5,000 villages.

(ii) **Long-lasting insecticide-treated nets (LLIN) against malaria**. Many poor communities in Asia, Africa, and Latin America are most affected by malaria disease caused by *Anopheles* mosquito vector that can cause death especially on children under 5 years old. These LLIN-treated Olyset Plus mosquito net produced by Sumitomo Chemical Company of Japan, was cited as one of the most effective means to prevent malaria. Each net costs about $2.00, lasts for 3 years–4 years, and protects, on average, two people (Malaria Consortium 2019). It is cheap and affordable to the poor as well as durable and effective for long-term use, alleviating this deadly disease among vulnerable groups. The use of LLIN mosquito net is now the standard intervention of the World Health Organization and the United Nations Foundation in the worldwide fight against malaria. Sumitomo has been manufacturing its life-saving Olyset LLIN in Africa since 2003 and have provided employment to around 7,000 local people (Cision PRWeb 2018).

(iii) **Multipronged approach to poverty alleviation of the Bangladesh Rural Advancement Committee (BRAC).** BRAC is a Bangladesh-based nongovernment organization, considered as one of the world's largest nongovernment organization. It employs about 120,000 local staff, majority of whom are women. BRAC's programs are focused on fighting poverty via integrated development approach lifting the socioeconomic condition of the poor towards their empowerment and development (Minj and Khakshi 2015). Its signature innovations are inclusive micro financial services and to grassroots empowerment targeting the ultra poor (TUP). BRAC caters to the TUP by addressing their specific needs through a graduation approach. For those who are living under chronic extreme poverty and climate change-related destitution, a grant-based approach was used. For the other targeted ultra poor, those who are poor but comparatively better-off, a grant-plus-credit approach program was implemented. BRAC's TUP program has been implemented in TUP households including indigenous peoples in 40 out of 64 districts in Bangladesh (Minj and Khakshi 2015). BRAC espouses that the poor needs a period of intensive support until progress is achieved, where they start to be productive and can invest in the future. Only after that they are required to payback their microloans. What is encouraging is, according to Davis (2015), that participants of the TUP program are leaves within 2 years, but they even remain on an upward trajectory even 4 years after receiving direct benefits.

(iv) **Microfinancing for the poor**. Grameen [5] Bank Ltd pioneered the introduction of microcredit in commercial banking, which started in Bangladesh. Founded by Muhammad Yunus,[6] it is a means of providing small loans to poor individuals, extending credit opportunities for often poor borrowers, living in remote underdeveloped rural villages and many of whom had never acquired any money and depended on a barter economy to meet their basic needs. The microcredit approach was unique as the loans provided to the poor were by members of the borrower's community and, because of the pressure within

[5] om/introduction/

[6] In 2006, Grameen and Yunus were awarded the Nobel Prize for Peace.

the group, the borrowers were encouraged to return the loan in a timely manner. As of December 2018, it has 9.08 million members, 97% of whom are women. With 2,568 branches, Grameen Bank offers services in 81,677 villages, more than 93% of the total villages in Bangladesh.[7] The success of microcredit program in Bangladesh encouraged the launch of similar programs in other developing countries, including Bolivia and Indonesia. Today, by products of Grameen Bank, including Grameen Telecom[8] and Grameen Shakti[9] are supporting Grameen Bank by building technological infrastructure to automate its processes, both innovative spin-offs.

(v) **Water Health for accessible water purification**. This company developed an inexpensive water disinfection process for rural areas of developing countries, when a mutant cholera outbreak happened in India, Bangladesh, and Thailand in 1992. Poor families in these areas spend 3 hours on average each day to fetch and prepare their drinking water (Berkeley Lab 2009) often from unsafe sources. The ultraviolet wave technology method was developed Ashok Gadgil, where the device contains a germicidal ultraviolet lamp that kills waterborne bacteria and viruses, three times higher than required by industry standards. The water purification system can disinfect four gallons of water per minute, with an estimated cost of $0.20 per person per year for drinking water disinfection. It can even safely purify a water supply with high contaminant load. The ultraviolet-disinfecting systems are now installed not only in India, but also in Africa, Mexico, and the Philippines. It is estimated that the system benefits five million people daily and saves thousands of children from gastrointestinal diseases.

(vi) **Flexible payment options to access basic services**. For Manila Water, a water company covering the east service zone of Metro Manila, Philippines, it devised effective delivery schemes with various menu of service delivery and flexible payment options for the poor (de Ayala 2008). The company's established pipes and metering points made it easy for the Manila Water to absorb additional 2 million low-income city dwellers. The poor, who subsisted on more costly vended water that were delivered by tanks, were finally connected to a 24-hour clean water, which prevented a lot of health issues and freed more time for the poor to pursue productive work. The strategies and programs targeted towards low-income communities enabled the company to drastically reduce nonrevenue water or system losses from over 63% in 1997 to 11.4% in 2018. The Solar Electric Light Fund (SELF) creatively implemented technology and introduced microcredit financing to provide electrical services to people in remote villages in Africa and Asia that are off-grid. Without this service, consumers in these areas only had the option to buy kerosene, candles, wood, or dung in order to cook or have lightening in their homes. SELF's rural electrification system is built with small-scale on-site power generating system operated by renewable resources. SELF has launched hybrid projects in the Brazil, India, Indonesia, Nepal, People's Republic of China, Solomon Islands, South Africa, Sri Lanka, Tanzania, Uganda,

[7] http://www.grameen.com/introduction/.
[8] Village phone service provider.
[9] Developer of renewable energy sources.

and Viet Nam.

(vii) **Mobile technology for the poor.** According to a 2019 Mobile Economy report, by the end of 2018, 5.1 billion people had subscriptions to mobile phone services around the world. In the next 7 years, 710 million people are expected to subscribe to mobile services for the first time and around half of them will come from the Asia and Pacific region. The value of mobile technologies and services generated $3.9 trillion in 2018.[10] These developments were possible thanks to the innovation of business models, such as prepaid voice and prepaid text-messaging services, available in ever-smaller units as a response to the poor's budget constraints. For example, the Philippines' Smart Communications has a growing, profitable business serving about 58.7 million Filipinos and 95% of the country's cities and municipalities providing mobile communications services, high-speed internet connectivity, and access to digital services.

As more and more poor get connected via mobile phones, financial inclusion have also been on the rise too. Individuals as well as micro, small, and medium-sized enterprises who are previously financially excluded now have access to affordable and relevant financial products and can pursue their financial plans. Low-income populations have clearly benefited from access to mobile phones, which makes it easy to access education, jobs, medical care, and financial services. Ride-hailing apps that are popular in Asia such as Uber and Grab have adjusted to local needs by providing ride transportation services such as ride-sharing and utilizing local and affordable means of transportation (tutktuk, remorque, and motor bike) which are accessible to the poor.

As reviewed through the BOTP cases, applying market-based approach in BOTP communities, reducing poverty, and improving the lives of billions of people were possible not only by selling affordable products and services to low-income groups, but also by giving them employment and working opportunities (Simanis and Hart 2008). Poverty eradication is reconcilable with a profit-maximizing objective within a market-based market system. In the volumes of research that has shared this notion, multinational corporations are often viewed as potential tools for wealth creation in poor communities. Using local knowledge to its fullest potential and listening to the demands of the poor, these will enrich the culture of innovation at the grassroots level.

C. Bottom of the Pyramid Innovation and Inclusive Growth in Asia

Developing Asia has achieved remarkable progress in raising prosperity and reducing poverty, with more than 611 million people have been lifted out of extreme poverty from 2005 to 2015 (Asian Development Bank 2019). The People's Republic of China, India, and Viet Nam have achieved high economic growth in recent decades. In spite of this incredible economic progress,

[10] In 2018, mobile technologies and services generated $3.9 trillion of economic value (4.6% of gross domestic product) globally which is estimated to be around $4.8 trillion (4.8% of gross domestic product) by 2023 because countries increasingly benefit from the improvements in productivity and efficiency resulting from increased mobile services (The Mobile Economy, 2019).

Asia is the still home to nearly half of the world's poorest people, thus reducing poverty is an essential policy target that needs to be addressed. According to a 2018 World Bank report, among the 783 million extremely poor, and of the people living below the poverty line of US$1.9 a day, around 33% are in South Asia, and 9% live in East Asia and the Pacific.

Most of the BOTP schemes that were in place at present were initiated by big, market-oriented institutions. In recent years, thanks to the availability of subsidized credit, local innovators are finally catching up and being recognized as source of impetus for change. The poor themselves has to be partners in the process (Prahalad 2019). Local innovators should be provided with new incentives and funding support for innovation development. As such, finding possible solutions to the BOTP problems will be more inclusive and help give rise to entrepreneurial culture in the region.

In the BOTP projects, lowering cost structures is one of the most important factors to consider when attempting to reduce investment risks. Naturally, the use of information technology to modernize production and distribution systems becomes an important option. Creating better employment as a result of improved quality and quantity of workforce is important. For example, the creative use of information technology emerges as a tool to significantly lower the costs associated with the production of goods and services, logistics, and the financing of the projects themselves, which is now enhancing communication and creating economic improvement for the poor living in rural areas.

For developing Asia, the importance of co-creating products and convincing that the value adds on underserved groups by innovation from the bottom–up is imperative. This targets that enhancement of environmentally sustainable technology, and development of new set of mechanism by implementing new technology which are fit to the features of the undiscovered market space (Hart et al. 2016). Many of the economies in the region are exposed to environmental risks arising from effects of non-sustainable production processes. Exploring and expanding the use of environmentally sustainable technology to provide the need and functionality for customers that are in the far-flung areas will enable them to participate and contribute productively in the economy without harming the limited natural resources for the next generation.

How the BOTP will ultimately enhance the living standards of low-income population in Asia will primarily depend on how the BOTP-based projects handle the challenges of scaling small economies, high transaction costs, logistics challenges, as well as cultural and organizational barriers. In this context, classical business models may not work well in the BOTP market. As a consequence, new strategies need to be developed that better address BOTP's specific conditions, and the role of technology that drives innovative BOTP projects will be mostly essential. The suggested policies for Asian countries to ensure innovative BOTP projects should include

(i) redesigning of technology platforms and their supporting system which incorporate a process of innovations, or a mix of high-tech and low-tech solutions;
(ii) producing simpler, more accessible, affordable programs by focusing on functional

needs and services, and not just the quantity of the product;

(iii) identifying new sources of value through a demand-side approach and developing product innovation;

(iv) capital efficiency matters more than labor productivity for BOTP approaches;

(v) using information is very essential; for instance, cell phone services now provide financial service and procurement mechanisms;

(vi) shifting from a scale economy to more distributed small-scale operations; and

(vii) innovation is key; developing new, affordable products and finding unique ways to distribute them through the use of technological innovation is very important

II. CONCLUSION

In poverty reduction, traditional approaches often target to the very poor with the assumption that the poor cannot help themselves, and thus need charity or public support. A market-based approach, popularized by Pralahad and Hart, begins with the recognition that being poor does not exclude market-based processes: after all, even poor households use cash or labor to meet their basic needs.

BOTP approach seeks to address this unmet need by looking for solutions in the form of new products and new business models that can provide goods and services at cheaper prices that the poor can afford to pay, and businesses can sustain. One important aspect is that local innovation should be at the forefront when developing solutions and countries should have a say on which technologies best fit their needs. Those solutions may involve market development efforts such as hybrid business strategies that incorporate consumer education, microloans, consumer finance, or cross-subsidies among different income groups. Franchise or retail agent strategies that create jobs and increase incomes through public sector and/or nongovernment organization cooperation are good examples too.

The most important factor is that, for tackling poverty, the BOTP approach, which bridges the goal of poverty reduction and market-oriented approach, should be given more priority because it provides the kind of sustainable solutions that can address the needs of the BOTP population.

REFERENCES

Asian Development Bank. 2019. *Effective Approaches to Poverty Reduction: Selected Cases from the Asian Development Bank*. Manila.

Arora, S. and H. Romijn. 2012. The empty rhetoric of poverty reduction at the base of the pyramid. *Organization*, *19*(4), pp. 481–505.

Ayala, J. A. Z. 2008. Doing business with the bottom of the pyramid: The Ayala Group experience. *ABS-CBN News*. 13 October.

Banerjee, A. and E. Duflo. 2007. The economic lives of the poor. *Journal of Economic Perspectives*, 21, pp. 141–167.

Bhalla, S. S. 2002. *Imagine there's no country: Poverty, inequality, and growth in the era of globalization*. Washington D.C: Peterson Institute.

Chaudhuri, H. 2010. Everyday life of the subaltern consumers: contexts, realities, and issues for marketing'. *Marketing Review*, 10, pp. 259–267.

Chenge. C., K. W. Sibiko, R. Wanyama, M. Jager, and E. Birachi. 2019. Are consumers at the base of the pyramid willing to pay for nutritious foods? *Food Policy*. Volume 87, 101745.

Cision PRWeb. 2018. *Nothing But Nets Expands Work to End Malaria in Latin America and the Caribbean With Major Commitment from Sumitomo Chemical*. https://www.prweb.com/releases/2018/02/prweb15203576.htm.

Collier, P. 2007. *The Bottom Billion*. Oxford: Oxford University Press.

Davidson, D. 2009. Ethical concerns at the bottom of the pyramid: where CSR meets BOP'. *Journal of International Business Ethics*, 2, pp. 22–32.

Delaire, C., A. Das, S. Amrose, A. J. Gadgil, J. Roy, I. Ray. 2017. Determinants of the Use of Alternatives to Arsenic-Contaminated Shallow Groundwater: an Exploratory Study in Rural West Bengal, India. Accepted by the *Journal of Water and Health* (April).

Davis, S. 2015. An Approach to Ending Poverty That Works. *Harvard Business Review*. 22 January. https://hbr.org/2015/01/an-approach-to-ending-poverty-that-works.

Hammond, Allen L., William J. Kramer, Robert S. Katz, Julia T. Tran. 2007. *The next 4 billion: market size and business strategy at the base of the pyramid* (English). Washington, DC: World Bank.

Hart, Stuart L, Sanjay Sharma, and Minna Halme. 2016. Poverty, Business Strategy, and Sustainable Development, December 2016, *Organization & Environment* 29(4): pp. 401–415.

Karnani, A. 2007a. Doing well by doing good – case study: “Fair and Lovely” whitening cream. *Strategic Management Journal*, 28, pp. 1351–1357.

Karnani, A. 2007b. The Mirage of Marketing to the Bottom of the Pyramid: How the Private Sector Can Help Alleviate Poverty. *California Management Review*, 49(4), pp. 90–111.

Kuo, Tsai, Jessica Hanafi, Wan Sun, and Rex Robielos. 2016. The Effects of National Cultural Traits on BOP Consumer Behavior. *Sustainability*. 8. 272. 10.3390/su8030272.

Mahajan, V. 2016. How Unilever Reaches Rural Consumers in Emerging Markets. In *Harvard Business Review*. 14 December.

Malaria Consortium. 2019. *Long Lasting Insecticidal Nets*. https://www.malariaconsortium.org/pages/110.htm

Manila Water. 2018. *2018 Integrated Report*. https://reports.manilawater.com/2018/business-review/manila-concession.

Mendoza, R. U. and N. Thelen. 2007. Mapping the base of the pyramid: The BOP heat map as an analytical tool. *United Nations Development Program, Working Paper.*

Minj A. and J. W. Khakshi. 2015. *Mapping BRAC Development Activities Relating To Indigenous Peoples*. Integrated Development Programme, BRAC. http://www.brac.net/images/IDP/IDP-IP%20mapping%20book.pdf.

Prahalad, C. K. and K. Lieberthal. 1998. The end of corporate imperialism. *Harvard Business Review*, *76*, pp. 68–79.

Prahalad, C. K. and A. Hammond. 2002. Serving the world's poor, profitably. *Harvard Business Review, 80*(9): pp. 48–57.

Prahalad, C. K. and S. L. Hart. 2002. The fortune at the bottom of the pyramid. *Strategy+Business*, *26* (First Quarter): pp. 2–14.

Prahalad, C.K. 2005. *The fortune at the base of the pyramid: Eradicating poverty through profits.* New Jersey: Wharton School Publishing.

Prahalad, C. K. 2006. *The fortune at the bottom of the pyramid*. New Delhi: Pearson Education India.

Prahalad, C. K. 2012. Bottom of the pyramid as a source of breakthrough innovations. *Journal of Product Innovation Management*, *29*(1), pp. 6–12.

Prahalad, D. 2019. The new fortune at the bottom of the pyramid. *Strategy+Business*, Issue 94.

Rangan K., M. Chu, and D. Petkoski. 2011. Segmenting the Base of the Pyramid. *Harvard Business Review* June, 6 pages

Sachs, J. 2005. *The End of Poverty*. New York: Penguin Books.

Sarkar, C. 2017. The Non-Profit Marketing Challenge – An Interview with Robert Freling, Solar Electric Light Fund. *The Marketing Journal*. http://www.marketingjournal.org/the-non-profit-marketing-challenge-an-interview-with-robert-freling-solar-electric-light-fund/. 30 August.

Simanis, E. and S. Hart. 2008. The Base of the Pyramid Protocol: Toward Next Generation BoP Strategy, 2nd edition. Ithaca, NY: Cornell University.

Simanis, E. 2012 Reality Check at the Bottom of the Pyramid**,** *Harvard Business Review*, June Issue.

Simanis, E and D. Duke. 2014. Profits at the Bottom of the Pyramid**,** *Harvard Business Review*, 2014 October Issue.

Trimble C. 2012. Reverse innovation and the emerging-market growth imperative. Ivey Business Journal. March–April. Reverse Innovation: Create Far from Home, Win Everywhere, Vijay Govindarajan, Chris Trimble, Harvard Business Review Press, 10 April.

Viswanathan, M. 2007. Understanding product and market interactions in subsistence marketplaces: a study in South India. *Advances in International Management*, 20, pp. 21–56.

World Bank Institute. 2008. Business and Poverty: Opening Markets to the Poor. *Development Outreach*. June.

World Economic Forum, Geneva, 2011.