
Financial Inclusion in the Anthropocene

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Achieving climate justice requires changes in long-evolved modern practices and institutions that systematically discount human predation on nature and on poor people.

A central pillar of these outdated practices is cognitive exclusion. Nearly 1 billion adults, of whom two-thirds are women, can't read or write in any language. In the modern world this amounts to a life sentence to extreme poverty. Yet, distaste for text is also a logical adaptation in oral communities, where livelihoods depend on nature, not formal economic or financial systems. Oral communities dominate the rural areas of Asia, Africa, and much of the Americas, and inhabit much of Earth's land. They are critical to effective stewardship of nature and offer a unique perspective, tied intimately to the natural world, that our educated and technocratic elite can't replace.

Financial inclusion, along with its digital offshoots, has been a major project of the past five decades, with the avowed aim of ending global poverty. But its impact has been limited by a focus on moving money and delivering credit and payments. Shifting the emphasis towards the delivery of information, savings, and financial ownership can empower oral communities and individual agents within them, while accelerating and enabling meaningful dialogue between the modern and oral worlds on strategies for sustainable resource stewardship and climate adaptation.

Brett Matthews founded and directs My Oral Village, a Canadian NGO building trusted, usable financial solutions for “oral” (illiterate and semi-literate) adults. Based on direct field research with oral adults in Asia, Africa, and the Pacific, Brett has designed, tested, and documented solutions that span multiple retail interface types and financial services. These include passbooks, savings group records, and microenterprise record-keeping systems, as well as an Android cash calculator for market vendors, and a financial numeracy indicator for the global financial inclusion multilateral agency (CGAP). He is currently launching Orali Mobile, a social fintech, to further extend the oral-digital frontier. In 2019, his work was recognized by Ashoka, an international network of social entrepreneurs, with a lifetime fellowship.

In a village in central Tanzania, I was talking to Lela, a farmer in her thirties, with short hair and a practical demeanor. She had never attended school.

“Can you show me where you would record a savings deposit?” I asked her, referring to the graphical passbook in front of her. She was a member of the local credit union. In collaboration with the credit union staff, we had integrated explanatory graphics into the passbook to accompany the row and column headers, and we provided her with a brief explanation of these.

She pointed to the correct cell. There were 220 cells in the open spread; her choice could scarcely have been an accident.

“Brilliant!” I exclaimed. I presented her with a pen, holding it carefully with both hands: a gift (not an afterthought).

She accepted with a nervous smile.

“Can you write a deposit of 6,000 shillings?” I asked her.

Very slowly, thoughtfully she tracked a small, jerky ‘6’ into the thousand’s column in the deposit section.

In 2014, I had begun to study how well financially “included” adults understood their written transaction records. In half a dozen countries in Africa, Asia, and the Pacific the answer soon became clear: they didn’t expect to understand them. What they *did* understand—very well—was the currency of their nations, and how to count and calculate in it.

Many could read and even write single-digit numbers. Where they ran into trouble was in reading multi-digit numbers (like 4,200 or even 50). Yet, their financial records were primarily composed of rows and rows of multi-digit numbers.

In spite of this, women like Lela accepted the pens I offered. No matter their age, no matter if they had used a pen in decades or ever, their willingness to learn was evident everywhere.

They often succeeded on their first or second effort.

THE MEANING OF FINANCIAL INCLUSION

The financial inclusion industry has always seen itself as in the business of moving money. Financial inclusion results from including more and more previously unbanked people in these flows of money. But genuine financial inclusion is not just about the movement of money; it is about the movement of information as well. Currently the information being moved is coded for the convenience of suppliers.

It is precisely the “financially excluded” people we claim to be trying to reach who are least likely to have the keys to this code.

Humans have always had an impact on the environment, but it is only in recent times that our species’ behavior began to trigger significant impacts on Earth’s climate and ecosystems. In a ground-breaking publication by the International Geosphere-Biosphere Programme (IGBP) in 2004, the authors provide strong evidence of a ‘great acceleration’ of planetary stressors beginning around 1950 that encompassed a broad range of human-induced impacts from fossil fuel emissions to intensification of land use, deforestation, and nitrogen production. “In terms of fundamental element cycles and some climatic parameters, human-driven systems are pushing the Earth System well outside of its normal operating range. ... There is no evidence that the Earth System has previously experienced these types, scales and rates of change; the Earth System is now in a no-analogue situation, best referred to as a new era in the geological history of Earth, the Anthropocene.”¹

In the Anthropocene, it is more important than ever that financial inclusion be about savings and ownership. Consistent with the focus on accelerating GDP growth, consumer spending, and increased monetary incomes that characterized the “great acceleration,” the entire orientation of the industry for the past half-century has been first towards credit, and then payments. Savings products were sidelined in this process. Yet, households and communities *save* money—beyond saving other vital livelihood supplies like livestock and grains—they are much better prepared for a climate disaster than when they have no savings—or, even worse, are burdened with debt.

Financial inclusion requires users to understand the sorts of records that allow them to save money and build financial ownership. Not only does this increase individual resilience, but it also allows users of financial products to practice effective and accountable natural resource stewardship at a scale that can help avert the worst consequences of climate change.

Early in the “microfinance revolution,”² during the 1970s and 1980s, its leaders chose to go after the low-hanging fruit: microcredit. This could be packaged in bigger sums than microsavings so suppliers could make money. It didn’t matter if their customers could read. The rules could be explained, thumbprints could be taken on written contracts, and cash put in their hands. That instant cash, which customers could count and check for accuracy, sealed the deal.

Formal sector savings and ownership were far more complicated. Money had to flow from poor people into a common pool and, in many

cases, they had to manage it together. All they received for their money was writing. The ability to read and write was essential.

As a result, savings and ownership were quietly dropped from the financial inclusion agenda. Decades into the digital revolution, if financial inclusion is to mean anything, it must be about more than moving money: it must also be about moving information.

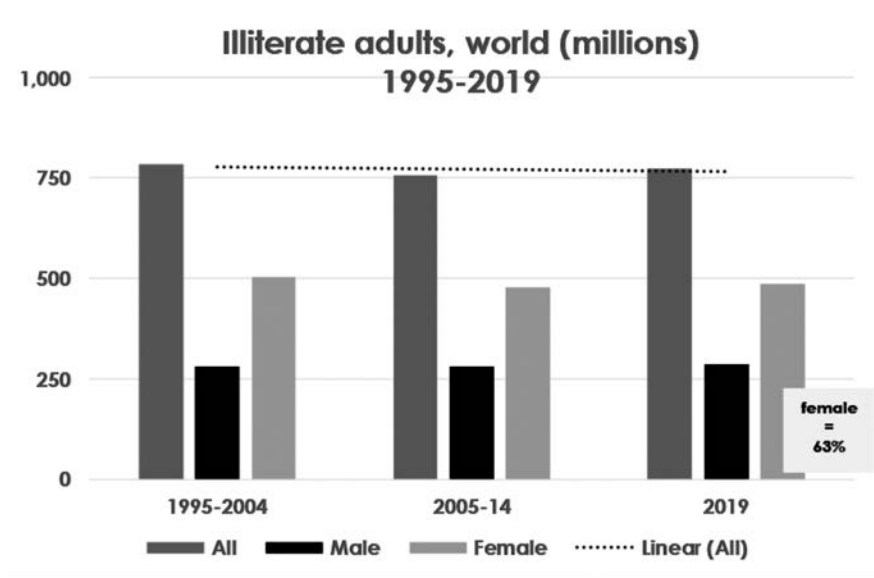
COGNITIVE JUSTICE

We have constructed a human-made world. It is this world more than nature to which modern humans adapt, and that is both a risk and an opportunity.

Our modern world expresses itself in arithmetic and geometric abstractions, in mechanical and digital technologies, and in formal economic, social, and political sectors. Over a century ago, Max Weber articulated the “ideal” principles of formal organization; text was central: “...decisions and rules are recorded in writing, even if discussion is mandatory.”³

Illiteracy is a bit of a dirty secret these days. Affected governments minimize or understate it, while philanthropists prefer an “optimistic” stance in which they assume it will vanish soon. But a large population—conservatively estimated at 773 million adults worldwide, of whom 63 percent are women—are unable to read a simple sentence in any language. Worse, in spite of the Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs), progress has stalled in the past two decades. Referring to the MDG target of halving illiteracy from 18 percent of the world’s population to 9 percent by 2015, UNESCO reported actual illiteracy as 14 percent in 2015, and added that out of 73 countries with literacy rates below 95 percent, only 17 reached the goal.⁴

Figure 1: Illiterate adults, world (millions) 1995-2019⁵



Source: UNESCO GEMS Reports, Various Years

Inability to read and write digits may be a larger, more widespread challenge than inability to read and write words. My Oral Village’s field testing has repeatedly shown that fewer people can read a “long” number (worth between USD 10 and USD 99 in their own currency) than a simple sentence in their own language. In a nationally randomized survey of three thousand respondents in Myanmar, we collaborated with the multilateral Consultative Group to Assist the Poor (CGAP) to test numeracy. While 90 percent of respondents were classified as literate, only 64 percent could read a six-digit number worth USD 78 in *kyat* (the national currency).⁶ While school enrollment has increased massively around the world in recent decades, it is too common for children to complete primary school without being able to read “long” numbers.⁷

Optimists notwithstanding, the motivation to learn to read and write, and to keep these skills throughout adult life, depends on the availability of formal sector employment. As of 2019, there were about 1.3 billion formal sector jobs to meet the needs of 5.8 billion adults worldwide.⁸ The International Labor Organization (ILO) estimates that the shortfall is made up by about 2 billion informal sector jobs. Jeffrey Sachs remarks that at a country-level globally “there is a strong correlation ... between the level of GDP per capita and the performance [of students] on standardized international tests.”⁹ How many decades will it take to create enough formal sector employment to fill this gap?

Universal literacy is likely some decades away. If justice is to mean anything today, it must include a fair chance for everyone to understand writing that affects them, whoever writes or prepares it. It is increasingly rare today that avoiding text and written numbers altogether is a viable option. Every community swarms with people ready to exploit illiteracy, and governments are delivering increasingly large volumes of vital written documentation to every citizen. Achieving universal financial numeracy – the numeracy skills required to carry out financial transactions with understanding, in real time, without help from a third person – in this generation would be a useful first step.¹⁰ A person who can do these things can read long numbers and date stamps, which are ubiquitous on virtually every official or formal document they will encounter. By helping illiterate individuals adapt to the increasing prevalence of money in the communities, financial numeracy also boosts their prospects of passing literacy to their children.

For centuries we have been trying to force people into a formal sector that can't provide for them. In the Anthropocene we should provide, as a matter of cognitive justice, safe and effective bridges across this informal-formal divide, so that formal sector systems are available—but not obligatory—for everyone.

COGNITION: THE GREAT BARRIER TO FINANCIAL INCLUSION

Cognitive exclusion is the largest social issue we face in the Anthropocene because it fuels and sustains all other forms of inequality. Think of Lela, who could not read numbers longer than two digits or a timestamp on a cash receipt. People deprived of these skills are endlessly vulnerable to predation by those with more cognitive assets. They have no sustainable path out of poverty.

Much of Earth's land mass is in rural and semi-inhabited areas, from the Amazon to the Arctic, to the Eurasian steppes and the vast stretches of subsistence farmland in Asia and Africa. In addition to the land under cultivation by some 2 billion "small-holder" farmers worldwide,¹¹ UNESCO estimates that "[a]t least a quarter of the global land area is traditionally owned, managed, used or occupied by indigenous peoples."¹² In many of these contexts, modern schooling is of little value for securing livelihoods, which are still shaped by oral cultures and practices.

Cognition involves the working of the mind, and the purpose of cognitive technologies, such as the alphabet, or the base-ten numerical notation system, complete with the concept of arithmetic zero, is to make

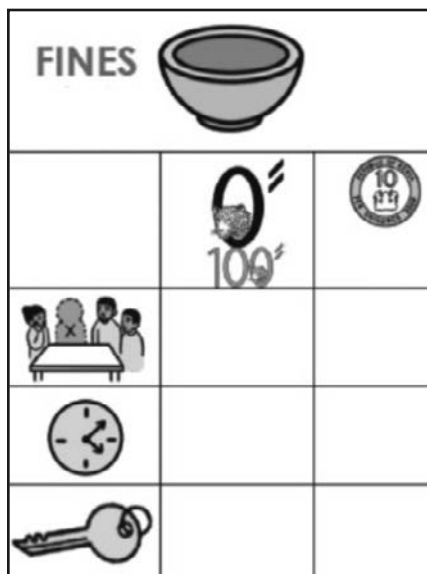
it easier for humans to communicate with each other and solve problems through collaboration. At points where financial services are delivered, customers face a long series of cognitive challenges that seem easy to a schooled person.

Schoolchildren learn many things that economize on “working memory,” the conscious attention used to store and process information in real time. We become fluent in Indo-Arabic numerals and place value notation. We learn to re-code numbers from spoken to written and back again. We memorize multiplication tables, practice calculating, and use calendars.

Since time is money, there is pressure on financial customers to conduct transactions quickly, especially in microfinance due to the very small transaction sizes. But numbers in working memory are forgotten in seconds, and time pressure triggers math anxiety that can last a lifetime among schoolchildren.¹³ In a microfinance office or banking hall, schooling pays huge dividends for customers. Working memory is not overwhelmed because most of the concepts on a deposit receipt, or a mobile money interface, are familiar already.

Development projects are also driven by text. Project staff must depend on written procedures and records. It is not essential that text define relationships with communities filled with illiterate people—but, unfortunately, it often does. This can reinforce patriarchal norms by forcing women to depend on (better-schooled) men for decoding services—an ironic outcome for NGOs focused on empowering women.

Figure 2: Savings group record



At My Oral Village, we cultivate a practice and have developed a scientific research agenda related to “oral information management” (OIM). OIM has two parts. Figure 2 is from a savings group record we designed in collaboration with the BOMA Project, with funding from Global Affairs Canada.¹⁴ First, localized mnemonic iconography is designed and then densely sown throughout the rows and decision points of transaction records to support awareness by unschooled users. Second, the OIM approach supports adaptation to essential literate or formal sector components of the records, like large written numbers,

tabular format, and numeric dates. The column headers reference local currency units such as ten Kenyan shillings, while the row headers reference penalties that incur fines, such as being late or forgetting the key to the cash box. The design goal is to increase the confidence and motivation of users so that they can learn to decode what matters to them.

Financial services are a perfect context for acquiring skills with written numbers because users transact frequently. Think of how often a village mother may receive mobile payments or a micro borrower might make loan repayments. They want to understand these interfaces better. That is why financial inclusion is ripe for a revolution in interface design and why it can still play a critical role in the adaptation of our species to the environmental changes we have wrought in the past century.

Oralization of financial interfaces is entirely consistent with digitization. In spite of the virtually universal practice today, there is no reason why a mobile money transfer has to depend on a person to be able to read text and Indo-Arabic notation.

RIGHT RELATIONSHIP

Finding a right relationship with nature starts with finding a right relationship with oral cultures and poorly-schooled populations. Relating to them through a few literate people living among them opens the door to burnout, subversion of local accountability systems, and corruption. Instead, we must shift to safer ground by tapping local management and accountability systems with meaningful iconography and empirical research.

The adaptation of oral cultures to the modern world has been hesitant, selective, and far from complete. They observe us and—given very limited resources—adapt parsimoniously. Mobile phones, entrepreneurship? Sure. Clocks and calendars? Not so much. Natural time works better for their purposes.

Oral cultures have no panaceas for our problems. Most have never operated on a scale sufficient to do the kind of damage our species now causes annually.

However, oral cultures all have one great strength: their survival still depends on the foundational human experiences that predate humanity's addiction to large scale consumption of fossil fuels and wanton species extermination. They have not built the institutions, nor internalized the practices, that are dependent on these suicidal behaviors. Having had the privilege of working closely with unschooled villagers and pastoralists for

two decades, my trust in my schooled and modern “institutions” laden with print culture has been shaken. The first time I conducted a focus group with the goal of developing a graphical financial statement was in rural Cambodia. I was deeply worried that abstract financial concepts like interest would be impossible to translate into sensible graphics. But solving this challenge took the group no time at all. The Khmer word for “interest” sounds very similar to the word for “flower,” and soon a sketch of a flower was heading the interest column. “As soon as we see it, we will remember,” they told me.

We who are the product of literate cultures, and have been reading and writing fluently since we were children, have much to learn from this living and resilient form of diversity in the human species, present in almost every country on Earth, if we can form the right relationships and the right forms of dialogue and collaboration.

But our posture in this relationship has been predatory. And it is time to recognize that our first line of exploitation has not been guns; it has been text.

We have rewritten laws without consultation, expropriated livelihood lands and waters, and trivialized oral cultures in our textbooks, newspapers, and social media feeds. We have forced oral cultures to use our scripts, and write in our languages, even when these are irrelevant for their livelihoods. Modern cognitive psychology makes it clear that bilingual literacy is founded on a solid foundation of confidence in one’s own identity and literacy in a natal tongue. In a famous study, adult Vai-speaking learners were known to generally advance from complete unfamiliarity with the Vai script to a working knowledge of 60-80 characters, sufficient for writing daily personal and business correspondence, within 60-100 hours of study.¹⁵ Male literacy among the Cherokee is also believed to have progressed extremely rapidly after the introduction of Sequoyah’s syllabary.¹⁶ There is increasing reason to wonder if our slow progress on global literacy has been influenced by the alien and unintuitive ways that tribal languages have been encoded in Latin script.

ORAL INFORMATION MANAGEMENT

Responsible environmental stewardship at scale among the oral population (for example, in the case of management of rangelands to avoid overgrazing, or sustainable management of rainforest ecosystems and livelihoods) requires universal storage and management of information in paper-based or digital format.

Ideographic communication systems have existed since the first hieroglyphs and are far easier to learn than a foreign language dressed in a foreign script that references foreign concepts. Project activities—and, most critically, the cash components of them, whether paper-based or digital—can be successfully and accountably managed by the local population, with the right tools. To date, practitioners in financial inclusion have failed to provide them. OIM is one approach, but there can be many others. Humans have known how to keep records without writing for five thousand years.

Financial inclusion must shift from microcredit and payments to stimulating savings and community ownership. Both paper-based and digital formats enhance resilience. But they require that everyone—whether schooled or not—be able to read a personal account statement as well as one from their water management group, funeral society, self-help group, credit union, or local NGO project.

Digital solutions can work, but smart phone interface designs have demonstrated a startling lack of both empathy and imagination, holding back the transition from feature or “button” phones. Perhaps this is because even today, the high costs and limited availability of electricity and wireless and internet connectivity in many of these areas makes the investment in such designs seem unappealing. But the digital evangelists who dominate our development conversation today have also shown a deeper failure of empathy: they have given up on illiterate adults like Lela. They are incorrect to claim that illiteracy is rapidly vanishing, and far too optimistic in their claim that attempting to send every child to school will quickly close the digital divide. If the immediate path forward seems light on technology, it would be well to remember that spoken and written languages are technologies. Today’s digital world would be unthinkable without them.

It is only by bridging the cognitive divide that we will bridge the digital one, and enter into a true partnership with our oral neighbors to save a spot for our civilization on Earth. *f*

ENDNOTES

- 1 Will Steffen et al, *Global Change and the Earth System: A Planet Under Pressure*. Springer, IGBP Series on Global Change (Berlin, New York, 2004) p. 81.
- 2 The real microfinance revolution was begun by FW Raiffeisen in the 1860s in Germany, and spread all over Europe and North America by the early 1920s. It emphasized a full range of financial services beginning with ownership and including savings, credit, insurance, and payments. See for example, Henry W. Wolff, *People’s Banks: A Record of Social and Economic Success*. (P.S. King & Son, Orchard House, Westminster, 1910).
- 3 Max Weber, *The Theory of Social and Economic Organization* (New York: *The Free Press*,

- 1964), 324-429.
- 4 *Global Monitoring Report, 2015: Education for All 2000-2015: Achievements and Challenges*, (Paris: UNESCO, 2015, p. xiii).
 - 5 Because national literacy statistics are often drawn from decadal census data (self-testimony at the doorstep) or national curriculum standards (“our government deems that all students who successfully complete x years of primary schooling are literate”), UNESCO uses ten-year ranges as a proxy for annual data. That is ‘1995 to 2004’ is treated by a UNESCO as a proxy for ‘2000’, etc. Data for 1995 to 2004 is from Global Education Monitoring Report Team, *Global Monitoring Report, 2015: Education for All 2000-2015: Achievements and Challenges*, (Paris: UNESCO, 2015, Table 2, pp. 330-31). Data for 2005 to 2014 is from Global Education Monitoring Report Team, *Global Monitoring Report, 2016: Education for People and Planet: Creating Sustainable Futures for All*, (Paris: UNESCO, 2016, Table 10, p. 456). Data for 2019 is from Global Education Monitoring Report Team, *Global Monitoring Report, 2021/22: Non-State Actors in Education: Who Chooses? Who Loses?* (Paris: UNESCO, 2021, Table 4, p. 434).
 - 6 Brett Hudson Matthews, *Measuring Numeracy for Financial Inclusion: Results of a Pilot Test, Report of My Oral Village, Inc.*, Working Paper #4, 2019.
 - 7 See: Lance Pritchett, *The Rebirth of Education: Schooling Ain't Learning* (Washington, D.C.: Center for Global Development, 2013), 13-51.
 - 8 International Labor Organization, *Women and men in the informal economy: a statistical picture*, Geneva, 2018, https://www.ilo.org/global/publications/books/WCMS_626831/lang-en/index.htm.
 - 9 Jeffrey Sachs (2022), “Education and inequality,” In Suárez-Orozco, Marcelo and Carola Suárez-Orozco (eds, 2022) *Education: A Global Compact for a Time of Crisis*, (Columbia University Press New York, 2022), p. 33.
 - 10 Matthews, 2019, p. 3.
 - 11 A ‘small-holder’ is generally defined as cultivating less than 2 hectares of land. HLPE, 2013, *Investing in Smallholder Agriculture for Food Security*, A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome, pp. 27-8.
 - 12 Diaz, S et al (eds), *Summary for Policymakers of the IPBES Global Assessment Report on Biodiversity and Ecosystem Services*, (IPBES Secretariat, Bonn, Germany, 2019), p. 14, <https://doi.org/10.5281/zenodo.3553579>.
 - 13 Alan Baddeley, “Working Memory,” *Science* 255 (5044) (Spring 1992): 556-59; Jo Boaler introduces Mathematical Mindsets with an extensive discussion of “math trauma” and anxiety among schoolchildren. See *Mathematical Mindsets* (San Francisco: Jossey-Bass Wiley), 2016.
 - 14 Formally, the project was funded by the Fund for Innovation and Transformation, funded in turn by Global Affairs Canada. The BOMA Project is a charity with offices in Nairobi and Washington D.C.
 - 15 Fieldwork for this study was conducted in the 1970s. Although about 20 percent of the Vai were literate in their own language, very few learned the Vai syllabary as children. The Latin alphabet, and the English language, were featured in primary school literacy classes. See Sylvia Scribner and Michael Cole, *The Psychology of Literacy* (Cambridge: Harvard University Press, 1981), 65-68.
 - 16 April Summitt, *Sequoyah and the Invention of the Cherokee Alphabet* (Santa Barbara: Greenwood, 2012), 60-61.