

Reimagine the future

Innovation for **every** child



How are innovators creating a better world?

Will rapid change accentuate or diminish the extremes that separate children who want for almost nothing and those who are deprived of almost everything?

In an increasingly connected world, problems cross borders – and solutions must do the same, linking global and local problem solvers to push the boundaries of the possible, try out unconventional approaches in new places, and accelerate progress towards a future in which all children can enjoy their rights.

As the global development community plots its course for the post-2015 era beyond the Millennium Development Goals, the choice is ours to make.

Reimagine the future

Innovation for **every** child



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November 2014

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The State of the World's Children 2015: Reimagine the Future: Innovation for Every Child digital report is available at <http://sowc2015.unicef.org>. The 'Stories' essays included in the report and summarized in the present Executive Summary represent the personal views of the authors and do not necessarily reflect the position of the United Nations Children's Fund (UNICEF).

For latest data, please visit www.childinfo.org.
ISBN: 978-92-806-4780-8

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ABOUT THE REPORT

As the world marks 25 years of the Convention on the Rights of the Child, *The State of the World's Children* calls for brave and fresh thinking to address age-old problems that still affect the most disadvantaged children. In particular, the report calls for innovation – and for the best and brightest solutions coming from communities to be taken to scale to benefit every child.

The Convention itself was an innovation that recognized children as people with rights that must be respected equally to the rights of adults. It has helped drive remarkable progress for millions of children, but far too many are still being left behind.

The report highlights how new ways of solving problems – often emerging from local communities and young people themselves – can help us overcome age-old inequities that prevent millions of children from surviving, thriving and making the most of their potential.

To finish unfinished business, we need to innovate. This means creating interconnected systems and new networks of problem-solvers that cross sectors, generations and geographies. It means scaling up local solutions to solve global challenges – and adapting them in new contexts. It means shaping new markets and spurring the private sector to design for development. It means creating solutions together with communities, and with a view to including all their members – preventing innovation from widening gaps. It means doing things differently, to drive change for children.

In that spirit, this year's *State of the World's Children* is different. It is inspired by the remarkable work unfolding in countries and communities around the world. It is guided by the principles for inclusive innovation that UNICEF is helping to develop. And much of its content is crowdsourced – emerging out of the experiences and insights of people who are actively working to make the world better for every child.

Over the past year, UNICEF has convened a continuing series of Activate Talks, global symposia that are bringing together young inventors, innovators, business people, artists and others to talk about the innovation they see, need and are helping to drive. Many of their stories are included in the essays and ideas presented here. In fact, this year's report includes the greatest number of essays – by the greatest number of young people – since UNICEF published the first *State of the World's Children* in 1980.

This is also the first fully digital *State of the World's Children*, with interactive, multimedia and traditional content. Users are invited to personalize their experience by browsing through categories or by tailoring the content with a series of tags, allowing them to engage with the ideas that mean the most to them. The digital platform also connects them to an innovation community and a constellation of open-source ideas through an interactive world map.

We invite you to join this conversation, share your own ideas and experience, and create connections that might just bring about exponential change for the most disadvantaged children. Who knows what ideas you might inspire, what actions you might inform, what collaborators you might find, what change you might make.

Don't think of this as UNICEF's report. Think of it as yours.

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PART 1

Shaping change to benefit all children

The world is changing rapidly. Where there were around 5 billion people in 1990, by 2050 there will nearly 10 billion – more than 2.6 billion of them younger than 18. Many children born today will enjoy vast opportunities unavailable 25 years ago. But not all will have an equal chance to grow up healthy, educated and able to fulfil their potential and become fully participating citizens, as envisioned in the Convention on the Rights of the Child.

The magnitude of change and the scope of new ideas we witness today are remarkable – but they also often represent extreme disparity.

Consider this: today, Internet giants can instantly identify you, predict your likes and dislikes, and build a detailed profile of who you are by using sophisticated algorithms. Yet, one child in three doesn't have a

legal identity – because the simple process of registering her or his birth did not occur.

In some places, cars operate on electricity alone – or even without a human being behind the wheel. Yet, elsewhere, critical medical forms must be filled out by hand – and a lack of infrastructure means the forms can take 30 days to travel from a rural clinic to a laboratory in the capital.

As the global development community plots its course for the post-2015 era beyond the Millennium Development Goals, it must ask: will rapid change accentuate or diminish the extremes that separate children who want for almost nothing and those who are deprived of almost everything?

The answer to this question is not predetermined; there is a choice to be made. Will governments, the development and humanitarian communities, and partners in civil society, business and academia continue on the same path, recording incremental improvements in the situations of children but not closing the gaps? Or can we be bolder, trying out unconventional approaches and looking for solutions in new places to accelerate progress towards a future in which all children can enjoy their rights?

Children are being born into an increasingly connected world where lines between local and global problems are blurred. Global warming brings flooding to coastal towns even as it afflicts inland farms with drought. Disease and conflict spill over international borders. Curbs on migration or remittances rob migrant workers' children in faraway countries of the means to eat well and go to school.

Solutions, too, are increasingly interwoven. In our hyper-connected, globalized world, people, technologies and ideas move more fluidly than ever before, generating unprecedented opportunities for collaboration to create large-scale change. Indeed, a global infrastructure of exploration is beginning to emerge – with innovators sharing ideas across borders and among groups of people previously excluded from the marketplace of knowledge and ideas.

These innovators are pushing the boundaries of the possible, often starting with small solutions to local problems that have the potential to spark change and help more children gain access to the services and opportunities that are theirs by right – but not always in reality.

To expand the impact of these innovations, we need to unleash systems that can help bring the most promising new ideas to scale. Greater interconnectivity is already facilitating broader collaboration between the private sector, with its speed, agility and drive to reinvent, and the development world, with its ability to convene partnerships, inform policies and implement solutions on the ground. The same connectivity needs to be accessible to grass roots problem-solvers – helping create a truly global collaborative workspace capable of forging solutions that bring more equal access to goods, services and opportunities to millions of people.

To minimize the risks of change and maximize its benefits for the most disadvantaged children, we need new products and processes, new partners and new models of partnership. These must be accessible to and influenced by disadvantaged and vulnerable people, and grounded in a better understanding of their realities and needs. For innovation alone is not enough; we need innovation that both embodies and advances inclusion and opportunity for all children.

The good news – as shown in this year's *State of the World's Children* – is that innovation is already happening, in places you might not always imagine, delivering solutions today that have the potential to change the lives of millions of children for years to come. The future is already present. What we make of it is up to us.



PART 2

An unfairly distributed future

Twenty-five years ago, the United Nations General Assembly adopted the Convention on the Rights of the Child.

Since then, millions of children have benefited from progress. When governments, their international partners, businesses and communities have matched their obligations under the Convention with money and energy, they have saved and improved the lives of hundreds of millions of children. While the magnitude of progress has been profound in key areas – child survival, education, access to clean water – too many children still confront the future with their needs unaddressed, their rights unrealized and their potential thwarted.

The world's low-income countries remain home to concentrations of poverty and disadvantage, but many impoverished children live in middle-income countries – countries plagued with large income inequalities. Here, as elsewhere, deprivation is disproportionately concentrated in urban slums and remote rural areas and among such marginalized groups as ethnic minorities and people with disabilities.

Even the safety of a child's arrival in this world remains subject to the lottery of where she was born and whether her family is well off – and the inequity extends throughout childhood and beyond.

- ▶ The richest 20 per cent of the world's women are 2.7 times more likely than the poorest 20 per cent to have a skilled attendant present at delivery. In South Asia, the richest women are nearly four times more likely than the poorest to have this benefit.
- ▶ Worldwide, 79 per cent of the richest children under the age of 5 have their births registered but only 51 per cent of the poorest enjoy the right to an official identity. And while 80 per cent of children living in cities are registered, this is true for only 51 per cent of those living in the countryside.
- ▶ The poorest 20 per cent of the world's children are twice as likely as the richest 20 per cent to be stunted by poor nutrition and to die before their fifth birthday. Children in rural areas are at a similar disadvantage compared to those who live in urban areas.
- ▶ Nearly 9 in 10 children from the wealthiest 20 per cent of households in the world's least developed countries attend primary school – compared to only about 6 in 10 from the poorest households. The gap can be dramatic even in lower-middle-income countries. In Nigeria, for example, 94 per cent of children in the wealthiest households attended school, compared to 34 per cent of children in the poorest households.
- ▶ Regardless of wealth, girls continue to be held back from schooling. For every 100 boys enrolled in primary school in West and Central Africa, only 90 girls are admitted. The exclusion is worse in secondary school, where only 76 girls are enrolled for every 100 boys.
- ▶ Adolescent girls are more likely to be married or in union by age 19 than their male counterparts, and less likely than boys to have comprehensive knowledge of HIV. In South Asia, boys are almost twice as likely as girls to have this knowledge with which to protect themselves.
- ▶ Nearly three quarters (or around 1.8 billion) of the 2.5 billion people around the world who still have no access to improved sanitation live in rural areas. Data from Bangladesh, India and Nepal, for example, show little progress between 1995 and 2008 in improved sanitation coverage among the poorest 40 per cent of households.

Too many children remain excluded from the progress of the past 25 years. The cost of these inequities is paid most immediately – and most tragically – by children themselves. But the long-term impact affects generations to come, undermining the strength of their societies. So addressing these inequities and reducing disparities is not only the right thing to do – honoring the spirit of the Convention on the Rights of the Child – it is also the strategic thing to do, yielding practical gains.

As the global community begins to shape – and act on – the post-2015 agenda, dismantling the financial, political, institutional and cultural barriers that stand between children and their rights must be a central priority.



PART 3

Innovating for Equity

For all children to have an equal chance to make the most of their potential, innovation must not only benefit those who can afford it the most. It must also meet the needs and advance the rights of those who have the least.

We call this innovating for equity, and it is already happening: in tech studios and university laboratories; in government, business and development organizations; and in kitchens, classrooms and community centres around the world. Innovators are drawing on unconventional sources of knowledge and collaboration, disrupting established processes and structures, and using available resources creatively to produce practical solutions that deliver higher quality or greater impact at lower cost. But how

is one to determine whether an innovation, and the process of innovation itself, serves to advance equal opportunity for all children, regardless of the circumstances into which they were born?

UNICEF and partners in governments, businesses, philanthropic organizations and the United Nations system have endorsed principles of innovation for equity. In our experience, this kind of innovation is:

- ▶ Targeted to reach children not reached by traditional approaches.

- ▶ Designed with and for the user to address the specific needs of marginalized and vulnerable children and families, and priced so they can benefit from it.
- ▶ Anchored in the principles of children's rights, including non-discrimination, so that all children and their families have an equal chance to enjoy high-quality goods and services.
- ▶ Participatory – engaging children, young people and their communities as agents of change.
- ▶ Rooted in local social, cultural, economic, institutional and political circumstances – and adaptable to differing contexts.
- ▶ Based on sound evidence and subject to rigorous monitoring, evaluation and revision to increase the benefit to the most deprived and vulnerable children and families.
- ▶ Sustainable within countries' or communities' financial and environmental constraints; not reliant on subsidies or on the degradation of natural resources.
- ▶ Scalable, to bring benefits to as many as possible within each specific context. Since circumstances vary between settings, not everything will be appropriate everywhere.
- ▶ Unafraid to fail, because failure is both a natural consequence of testing new ideas and a critical part of creating successful innovations.



Depending on who gets to use it, and how the wealth and other benefits it generates are distributed, technology can help reduce inequality or can make it worse.

– Thomas Woodson, Assistant Professor at Stony Brook University,

More is at stake than the need to provide high-end consumers with the latest gadgets. Innovating for equity aims to change the lives of children in need. So innovators must strike a different, more delicate, balance – accepting the degree of risk required to break through to new solutions while safeguarding the hopes and well-being of children. So, how to put these principles into practice?

Innovation is about moving beyond boundaries and refusing to accept the status quo. And so a principled approach to innovation starts with, and is guided by, questions throughout the process – from identifying problems to developing and scaling up solutions to evaluating their impact.



Key questions for innovators and facilitators of innovation to consider include:

Assessing the context

- ▶ What barriers are keeping the poorest children and families from the goods, services and opportunities they need to realize their rights?
- ▶ What has been tried before? Why hasn't it worked?
- ▶ Are there potential home-grown solutions available that could be developed with support? What kind of support do local innovators need?
- ▶ How can communities – and especially their most marginalized members, like women and girls or ethnic minorities – be engaged in developing and implementing solutions?

Developing solutions

- ▶ Does the solution meet applicable quality standards?
- ▶ Will the poorest be able to afford it?
- ▶ Will it be equally accessible to children with disabilities or those from other disadvantaged groups?
- ▶ Is the solution appropriate to the intended age group and prevailing social and cultural norms?
- ▶ Do the institutions, infrastructure, legal framework, resources and capacities needed to make the solution work exist? How can gaps be filled?
- ▶ Is the solution financially sustainable or will it need more money to keep going?

Evaluating solutions

- ▶ Is the solution environmentally and financially sustainable?
- ▶ Will all users have an equal voice in providing feedback?
- ▶ What risks are involved in implementing the solution? Are they acceptable?
- ▶ What happens if it fails? What kind of support will communities get to help them deal with the failure?
- ▶ How will lessons from the failure inform future efforts?

Scaling and adapting solutions

- ▶ How do you know if a solution is scalable?
- ▶ What will it take to bring the solution to scale?
- ▶ If a solution is not scalable, what is its value?
- ▶ When adapting a solution to a new context, what needs to be changed?

Engaging children and young people

- ▶ How can children and young people be engaged in the process of innovation?
- ▶ What measures must be taken to protect children involved in the process of developing and implementing solutions? How should children be compensated for their time and effort?
- ▶ What kinds of education or training can help foster children's creativity and critical thinking? How to ensure that the poorest and most marginalized children are not excluded from such opportunities?

Many voices, many stories



In countries and communities across the globe, people are doing remarkable things to make the world better for every child – by pushing boundaries, challenging assumptions and sharing their creative solutions. The 2015 *State of the World's Children* presents many of these innovators' experiences and insights, in their own words. Using the categories below, readers of the online report can explore their work.

The following pages present some of the stories included in each category in the digital report.



Engaging youth

Young people are finding new ways to participate and claim their rights.



Sparkling creativity

Young people need support and quality education to foster their potential as innovators.



Working with communities

Inclusive and sustainable solutions, by and for local people, are emerging.



Adapting solutions

Innovators around the world are closing gaps and crafting solutions tailored to local needs.



Reaching all children

Reorienting innovation towards greater equality and the needs of the poorest takes deliberate effort.



Rethinking structures

What are the nuts and bolts of delivering innovation to the world's poorest children?

INNOVATION MAP

The interactive 'Innovation Map' lets you explore what others are doing to solve challenges affecting children around the globe.

We want to hear from you too – tell us about something innovative that you're doing, or that people you know are doing. Put those innovations on the map – and help us discover the next big idea that could change the world for children.

Engaging youth

<<http://SOWC2015.unicef.org/topics/engaging-youth>>



Young people are finding new ways to participate and claim their rights.



Around the world, children and young people are enjoying unprecedented opportunities to connect with each other and share experiences and information. Innovative projects, some initiated or implemented by young people themselves, are helping to turn these connections into change. Young people are using the Internet and mobile technologies to track issues they are concerned about and speak directly to decision makers. Children living and working on the streets are finding resources to help themselves plan for the future.

Meanwhile, adults are beginning to realize that it's important to listen to children. Designers of technologies recognize that children's input is critical to making products that speak to what children actually need and want – and that draw on children's imagination and creativity to expand the realm of the possible. Humanitarian initiatives, though slower on the uptake, are also starting to consult children to make complex and intimidating bureaucratic processes respond better to their needs. Asking children what they want and need simply leads to better results.

Affordable Internet-enabled mobile phones are allowing more Kenyans to go online.



Stories



Engaging Youth



Sparking Creativity



Working with Communities



Adapting Solutions



Reaching all Children



Rethinking Structures

NATHANAEL CHRISTENSON, 19, KEVIN CHOW, 17, and LUKE SCHUSTER, 18, recount how they developed Seeing Eye Pad, a navigation assistance app for the visually impaired. They started out wondering how to make computer experiences more realistic – and concluded that the results of their research had potential to aid people with visual impairments in moving about the world. The software uses a tablet’s camera to scan the environment and plays sounds to alert the user to doors, stairs, drop-offs and other common hazards. They designed the software to work on lower-powered machines that those in need are more likely to have access to.

ALISON DRUIN, Chief Futurist and Director of the Future of Information Alliance at the University of Maryland, describes her work with children as partners in research and development of new technologies. As a 9-year-old boy involved in the research explained, designing technologies for children without giving them opportunities to express their unique perspectives is “like making clothes for someone you don’t know the size of.” Druin’s process of ‘cooperative inquiry’ gives rise to all sorts of ideas, some outlandish and others practical – and from these, innovation is born.

RITA PANICKER PINTO, Founder and Director of Butterflies, describes the Children’s Development Khazana, a cooperative bank run by and for working children, including those living on the street. The bank empowers clients to save their money, earn interest, and finance their own businesses and education. To help children raise themselves out of poverty, it also provides life skills education, teaching them how to set priorities, manage their money in ways that help them achieve their goals and operate their businesses effectively and ethically.

VIRAJ PURI, 14, explains how he created Bullyvention, a way to leverage the power of people and technology to track and advocate against cyberbullying. Based on algorithms that analyse social media messages, the bullying heat map raises awareness by showing, in

real time, where bullying is happening – while partnerships with members of government help turn awareness into action.

ANNA SKEELS, Project Manager for Measuring Separation in Emergencies, hosted by Save the Children, discusses refugee children’s participation in designing child protection programmes. Current procedures pay little attention to children’s particular needs and can be overly formal and intimidating to kids – creating barriers that prevent them from sharing their concerns openly. When asked, children have come up with simple ways to make these procedures more child friendly – for instance, peer support for newly arrived children or opportunities for play while waiting for interviews.

[VIDEO] In Chile, the annual ‘fiiS’ festival of social innovation is about showcasing how everyone – not just experts – can solve problems. At its core is the belief that solving pressing social ills makes sense when done hand-in-hand with those most affected and with diverse partners focused on concrete results. At the festival, young people see popular music bands and participate in sessions in which people from different walks of life imagine and begin building solutions together.

[VIDEO] The story of Josephine, a bright 21-year-old young woman from Lusaka, Zambia, is one of bravery and innovation. Born in the slums of Lusaka into a family of 10 siblings, Josephine managed to get herself into and through school, and is now on a mission to change the world. As one of Zambia’s 65,000-plus U-Reporters, she is part of a community that uses rapid SMS to provide adolescents and young people with confidential, free-of-charge counselling on sexually transmitted diseases and HIV. In addition to the SMS counselling, periodic polls gather the opinions of young people and allow them to participate in their country’s future.

Sparking creativity

<<http://SOWC2015.unicef.org/topics/sparking-creativity>>



Young people need support and quality education to foster their potential as innovators.

Children and young people are natural innovators. They are also acutely aware and deeply concerned about the challenges facing their communities. Nurturing their creativity and critical thinking is key to helping them develop their potential to address these problems. Similarly, expanding access to quality education equips them with concrete knowledge and skills in disciplines like science and engineering, which are in demand in this technologically driven world. It's especially important that the children whom society has kept at a disadvantage – because of gender, disability, ethnic minority status or poverty – have equal opportunities to learn and participate.

Around the world, innovators are trying out unconventional approaches to education – like using simple toys to illustrate principles of science, or setting up innovation labs to give children a space in which to tinker with models and machines. Such initiatives impart critical knowledge and skills, while giving children opportunities to build their confidence as thinkers, makers and problem solvers. These experiences can change children's lives – and children, in turn, have the potential to change the world.



A boy who previously lived on the streets paints at the UmidYeri ('Place of Hope') Children's Shelter and Rehabilitation Centre in Baku, Azerbaijan.

Stories



Engaging Youth



Sparking Creativity



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Adapting Solutions



Reaching all Children



Rethinking Structures

SHUBHAM BANERJEE, 13, recounts his creation of Braigo, a Braille printer made from Lego bricks that costs \$350 (compared to \$2,000 average). To make a Braille printer for the masses, do-it-yourself assembly is key. The young inventor built seven different models before settling on one that was able to print the six dots in a desired sequence according to Braille grade 1 standards. “I always closed my eyes and used my fingers to feel the bumps on the paper,” he writes. The building instructions and software are open source, which will provide a low-cost solution for the visually impaired community.

OSAMA BROSH, young inventor, talks about how he and classmate Omar Turk designed a mobile phone application that uses vibration to alert deaf people to loud sounds. Their ‘eureka’ moment was inspired by a scene Osama had seen on TV as a young kid, in which a hearing-impaired character could not hear a knock at the door. That tiny spark, he relates, spawned ideas upon ideas. The essay recounts the exhilarating process of developing the idea into a software application with the support of their mentors and presenting it at StartUp Weekend, where their prototype won first place.

EMILY CUMMINS, young inventor, describes her experience as an inventor and advocate for young people, especially girls, to become engineers, scientists and technologists. She writes about her decision to open source all her designs – including a water carrier that can transport multiple containers in a single trip and a sustainable refrigerator powered by dirty water and solar heat – and makes the case that providing free access to the design plans is key to ensuring that poor people benefit from the products she has created.

ARVIND GUPTA, science educator and inventor at the University of Pune, describes how simple, everyday objects – from bicycle tubes and broken slippers to straws and match-boxes – can be wrought into simple machines that captivate children, and in the process teach them fundamental principles of science. In many countries, science education focuses on rote learning – but Gupta’s active, concrete and creative approach has much greater potential to capture children’s imagination and get them excited about science.

DESMOND MITCHELL, CEO of Cornerstone Innovation and board member of Global Minimum, talks about how innovation labs are enhancing education through active learning. Offering opportunities for tinkering, making and modeling, the innovation labs’ curriculum promotes children’s cognitive development, creativity and critical thinking as well as building self-confidence and empowering them to imagine, experiment with and build solutions to the problems they see in the world around them.

DAVID SENGEH, President and Co-Founder of Global Minimum, describes the experiences that shaped his life as a young innovator – from fleeing rebels during Sierra Leone’s civil war, flanked by columns of child soldiers, to talking with amputees in a camp in Freetown and later incorporating the insights he gleaned there into designs for cutting-edge prosthetics at MIT’s Media Lab. Children and young people, he argues, have the potential and passion to innovate and solve the problems that plague their communities – but they need to be not only equipped with the right tools, platforms and skills, but also taught to question the status quo and feel empowered to do something to change it.

Sparking creativity

BALAZS ZSOMBORI, young inventor, talks about developing PictoVerb, an application for tablets and smartphones that transforms universally recognizable symbols into audio sentences, helping people with speech impairments communicate. Balazs was inspired to create his application after meeting a woman who lost her voice due to disease and seeing how not being able to speak cut her off from human connections. Down the road, he plans to expand his invention into a family of products to help adapt the world to meet the needs of people with disabilities.

[VIDEO] Education is more than just exam results and grades on paper. Nowhere is that more clear than in Jamaica, where the prevailing teaching method is known as 'chalk and talk'. **MARVIN HALL**, a former mathematics teacher, believes there's a better way to teach children. Since 2008, he has conducted a series of summer camps and workshops known as Lego Yuh Mind. The workshops involve building robots from Lego, but they encompass much more than that, including inspiring creative thinking and problem solving, encouraging financial intelligence, developing skills in buying and selling, profit and loss, entrepreneurial thinking and participation in a market economy.

[VIDEO] Think 'innovation space' and what comes to mind? Perhaps an incubator in Silicon Valley, or a high-tech hacker space in Berlin. Lusaka, Zambia probably doesn't spring readily to mind – but that's just what is happening in a small house on a quiet, tree-lined street behind one of the capital's main shopping malls. In 2011, four local entrepreneurs founded **BONGOHIVE** to bring young people together to learn technology skills, share co-working space and be part of a community dedicated to the ideals of innovation, creativity and sustainability.



Existing assistive technologies are either too expensive or difficult to obtain for normal people without a government or non-profit sponsorship. Technological advances should help humanity and not become a burden due to cost.

– Shubham Banerjee

Working with communities

<<http://SOWC2015.unicef.org/topics/working-with-communities>>



Inclusive and sustainable solutions, by and for local people, are emerging.

Children, families and communities are autonomous agents, and acknowledging them as such is key to respecting their human rights – and to creating solutions that succeed and can be sustained. Ventures that spring from the initiative of community members and proceed with their participation are more likely to address their needs in ways that are acceptable and sensitive to local social, cultural and political factors that outsiders may well miss.

A variety of innovative projects are achieving results by putting local participation and agency at the centre. In some countries, social protection programmes stimulate demand for goods and services by providing cash in exchange for changes in behaviour, like buying more nutritious food and visiting the doctor regularly. Rigorous evaluations have shown that when parents are empowered to invest in their children, the children reap lasting benefits. This lesson has been borne out also by humanitarian initiatives that focus on demand, directly giving parents the goods they need to help their own children. When scientists partner with communities, the resulting exchange of knowledge enriches both sides and can lead to more effective solutions. And community members' ownership and empowerment give interventions a greater chance of creating change that endures.



The Child Welfare Project in China uses community-based social workers to reach poor and remote children in a cost-effective and efficient way.

Stories



MOHAMED BANGURA, young inventor, tells of inventing a low-cost sharpening machine for his community's craftsmen after noticing that the tools they used would regularly wear out. Mohamed put himself in their shoes, imagining how he would feel if the circuit boards he needed to pursue his passion for building electronics were always breaking down. He developed his machine in close consultation with the craftsmen, and seeing them use the finished product boosted his confidence in his own abilities to create solutions.

STEVE COLLINS, Co-Founder and Director of Valid Nutrition, discusses his pioneering development of the community-based management of acute malnutrition (CMAM) – a model of care that moved away from the traditional, expensive and low-coverage model of inpatient therapeutic feeding centres run by aid agencies, to treating people in their homes with the support of local clinics and using ready-to-use therapeutic foods. By empowering parents with the tools to care for their own children, CMAM revolutionized the treatment of acute malnutrition.

KAREN MACOURS, Associate Professor at the Paris School of Economics and Researcher at the French Agricultural Research Institute, surveys innovative conditional cash transfer programmes that bypass the traditional supply-side approach focusing on service provision, to instead address the demand side by providing families in poor and vulnerable communities with cash in exchange for changes in nutrition- and health-related behaviours. Such social protection initiatives empower families to invest in their own children. And they work: rigorous, randomized evaluations have shown that they produce sustained improvements in young children's cognitive development.



Fostering an environment that promotes the use of evidence and transparency to provoke change is an important challenge to which we must all rise.

– Steve Collins

OLIVIER NYIRUBUGARA, Lecturer in Journalism and New Media at Erasmus University Rotterdam and Senior Coach at the Voices of Africa Media Foundation, discusses his experience training young people in eight African countries to use mobile phones to produce audiovisual reports about issues that undermine the realization of children's rights – from child labour to violence to lack of access to quality education. The young reporters show the videos to local administrators and decision makers, voicing their concerns and trying to find solutions. Voices of Africa also trains them in journalistic ethics – especially regarding any potential risks to the children featured in their stories.

Stories



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Reaching all Children



Rethinking Structures

The question of how to deliver solutions to places where the need is greatest and assure acceptance and uptake there remains sorely underexplored, with grave consequences for vulnerable children.

— James Radner, Karlee Silver and Nathaniel Foote



JAMES RADNER, Assistant Professor at the School of Public Policy and Governance, University of Toronto; **KARLEE SILVER**, Vice President of Targeted Challenges for Grand Challenges Canada; and **NATHANIEL FOOTE**, Senior Fellow at the Harvard University Center on the Developing Child, write about collaboration between scientists and communities to generate local solutions that reduce poverty and improve children's lives. We need innovation to create delivery strategies that respond to local needs by bringing to bear the knowledge and capacity of all relevant actors, from village mothers to multinational businesses. 'Integrated innovation' engages social, scientific and business innovators for better, sustainable results at scale.

[VIDEO] THE CHILD WELFARE PROJECT was started in 2010 in five rural provinces of China to reach poor and remote children in a cost-effective and efficient way. This video follows 8-year-old Panpan, who lives with her elderly grandparents, and Mei Hongfang, a 'barefoot social worker' trained to offer assistance to families like Panpan's. Mei monitors the family's use of a monthly government subsidy, ensuring that guardians and caregivers spend it as intended.

[VIDEO] TENDEKAYI KATSIGA, Director of Operations at Deaftronics, produced Solar Ear, the world's first solar hearing-aid battery charger. The device lasts for 2–3 years and can be used in 80 per cent of hearing aids on the market today. It was developed to meet the needs of communities lacking regular access to electricity; it can be charged via the sun, household light or a cell phone plug. The technology has spread to Brazil and Jordan, and the product is being sold in at least 40 African countries. In Zimbabwe, it is benefitting children who would otherwise be missing out on education because of their hearing impairment.

When the sun is shining, 17-year-old Tapiwa Mtisi likes to sit outside and read romance novels while she waits for her Solar Ear to charge.

Tendekayi Katsiga



Adapting solutions

<<http://SOWC2015.unicef.org/topics//adapting-solutions>>



Innovators around the world are closing gaps and crafting solutions tailored to local needs.

As much as innovation is about breaking boundaries and reimagining the possibilities around us, it is also about solving problems within the constraints of the local context. Innovators can only work with what they have – and in low-income countries and communities, there is never quite enough.

Constrained circumstances can inspire ingenious solutions. Where flooded roads can't take children to school, a fleet of solar-powered boats can bring the school to them. Where bombs and rubble make the journey to school perilous, text messages can help keep children safe. Where frequent blackouts keep families dependent on generators that burn costly fuel and emit toxic fumes, urine – free, safe and sustainable – could provide an alternative.

The parameters differ from country to country, and from one community to the next. Local innovators can't help but know what's feasible and what's not. A whole range of factors play into whether a solution is likely to work within a particular context – from social and cultural norms to features of the environment and infrastructure, to people's education levels and skills. Something that works wonders in one place may well fail in another. How effective, acceptable and sustainable an innovation will be hinges on how well it fits into the lives and environments of the children and communities who use it.

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Architect Mohammed Rezwan developed floating schools as a way to ensure year-round access to education in flood-prone communities.

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ABIOLA AKINDELE, 16, ZAINAB BELLO, 17, ADEBOLA DURO-AINA, 16, and **OLUWATOYIN FALEKE, 17,** recount how they created a urine-powered generator to provide an affordable and safe alternative for Nigerians who do not have access to a reliable power supply. After initial setbacks, the young inventors presented the generator at the 2012 Maker Faire Africa, where their invention was celebrated. Since then they have showcased it nationally and internationally, won awards and are now working with the Lagos State Government to develop the generator further for large-scale production.

ISAMAR CARTAGENA, 18, recounts her invention of Vibrasor, a device she and her classmate Katherine Fernandez developed to help people with hearing impairments navigate safely through busy urban areas. Hearing impaired themselves, Isamar and Katherine know firsthand the difficulties faced by the deaf community in such areas. Their device translates loud noises into vibrations and lights, and it's specially calibrated to respond to sound frequencies of car and motorcycle horns. While a lack of resources has kept them from moving past the prototype stage, they are continuing to conduct research in the hopes of further developing their product.

BISMAN DEU, 16, talks about developing GreenWood, a building material made from unwanted rice waste, which is often burned, causing air pollution, killing crop-friendly insects and making the topmost layer of soil partially infertile due to loss of nutrients. GreenWood creates affordable, waterproof particle-boards that can be used in low-cost, environmentally sustainable housing as well as sturdy school furniture – helping to reduce air pollution and improving rural livelihoods by creating a market for rice waste.

GUNTHER FINK, Assistant Professor of International Health Economics at Harvard University, and **STEPHANIE SIMMONS ZUILKOWSKI,** Assistant Professor of Comparative Education and International Development at Florida State University, talk about creating a new, culturally appropriate metric to evaluate children's cognitive development in Zambia. The motivation for the project came when researchers realized that tests developed in Western countries were useless – simply because they asked children to answer questions about things they had never seen before, like chemistry sets or igloos, or to perform wholly unfamiliar tasks, like analysing two-dimensional pictures. The new assessments, using objects and tasks familiar to Zambian children, produced more accurate results.

Bisman Deu, 16, is one of the inventors of GreenWood – a substitute for wood made from unwanted rice waste that can serve as a building material for low-cost housing.



Adapting solutions

NICOLA JACOBS, 17, tells of inventing Lumo Board, a board made of reflective material on which house numbers are printed to allow emergency personnel working at night to locate specific homes in informal settlements. In developing her project, Nicola interviewed residents of informal settlements in South Africa and learned that they often waited hours before emergency personnel showed up. Working with affected communities, she argues, is essential to creating a culture of innovation that can be passed on from one generation to the next.

DEAN KARLAN, Professor of Economics at Yale University and President of Innovations for Poverty Action, and **NATHANAEAL GOLDBERG**, Senior Director for Policy at Innovations for Poverty Action, discuss the importance of sensitivity to the local context in programmes that aim to benefit the poor. The same programme implemented in Ethiopia, Ghana, Honduras, India, Pakistan and Peru had dramatically different impacts on household consumption. Successes and failures alike show the value of experimentation complemented by rigorous evaluation. New implementers have learned much from the early adopters and are incorporating lessons from the pilots as they scale up programmes aiming to develop livelihoods, encourage people to save and advance children's long-term welfare.

JACOB KORENBLUM, Co-Founder and CEO of Souktel Mobile Solutions, writes about using mobile technology to create an alert system to warn children and parents living in the Gaza strip, State of Palestine, of danger happening near local schools. Because internet access is highly unreliable and there are no high-speed wireless networks, the system relies on basic text messaging – a simple and widespread technology that allows school administrators, teachers and parents to communicate quickly and effectively, helping keep schoolchildren safe amidst emergency conditions.



The school boat first serves as a school bus, collecting children from riverside stops; then it docks and class begins.

– Mohammed Rezwan

MOHAMMED REZWAN, Founding Executive Director of Shidhulai Swanirvar Sangstha, writes about the floating schools that ensure year-round access to education for children living in flood-prone regions in Bangladesh. As a 9-year-old student says, “We study on school boats. It comes to us six days a week even if it rains heavily and flood comes. So much fun to learn here, I learn computer and [my little brother] learns about river, fish and birds of our village.” Started with one boat in 2002, Shidhulai now operates a fleet of 54 floating schools, libraries, health clinics, adult education centres and solar workshops for communities stranded by the monsoons. Education and renewable energy supply are always free for all children.



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Physicians working in developing countries must recognize that serving the other 90 per cent – the global majority – requires connecting our most vulnerable patients directly to doctors, wherever they are.

– Catherine Wong

[VIDEO] In a remote part of Uganda, a simple innovation has improved the lives of school children. Where previously girls had to spend hours collecting firewood, now the energy comes right to them by way of the school's latrines. In an underground biogas digester, decomposition of waste takes places under airless conditions, eventually producing a combination of methane and carbon dioxide that powers the stoves in the kitchen.

MANUSHI NILESH SHAH and **MISHA PATEL, 17**, invented Think Green, Go Blue, a device that uses cactus mucilage to purify water, instead of the toxic alum currently in use. They detail their journey as young inventors, highlighting the role of the teachers and mentors who inspired them and the long and painstaking process of experimentation to get everything exactly right. Next steps? Further research to refine the process – and then hopes for implementation at scale. Whatever happens, Manushi and Misha will always treasure the experience of developing their project: it turned them from budding science students to passionate researchers.

CATHERINE WONG, **young inventor**, built two prototypes for wireless, mobile phone-based telemedicine devices – a Bluetooth-enabled stethoscope and an electrocardiograph that sends real-time digitized EKG results to a phone. She discusses the parameters of designing technological solutions for regions of the world where the latest gadgets, like smartphones, are usually unavailable. Innovators must work with what people have access to – in this case, basic feature phones.



Reaching all children

<<http://SOWC2015.unicef.org/topics/reachingallchildren>>



Reorienting innovation towards greater equality and the needs of the poorest takes deliberate effort.



When the goal is a world in which every child can exercise her human rights without discrimination, can innovation really break down the barriers that exclude so many from what they need to survive and thrive?

It can, but it won't happen by itself. The way the world works now, the most spectacular products of innovation – trendy gadgets, state-of-the-art medical devices, nanotechnologies – benefit people whose basic needs are already covered.

Some say the benefits of innovation will eventually trickle down, but this is not a foregone conclusion. As innovation tends to be directed to areas of relative advantage, so we need to work harder to bring it to those most disadvantaged – whether by wealth, gender, race, religion, ability or age. Reorienting innovation towards greater equality and the needs of the poorest takes deliberate effort.

Sisters Jhan and Jani Perales live in Macharetí, the Plurinational State of Bolivia, an area affected by severe drought.

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SHARON DETRICK, Head of International Programmes – Africa and the Middle East at Defence for Children

International, discusses the innovative nature of the Convention on the Rights of the Child, which transformed children's status from mere object of the rights of others and of charity, to full-fledged subjects of their own. Twenty-five years on, further work is needed, and currently the Committee on the Rights of the Child is working to promote children's access to justice, to ensure that children in all countries have fair, rights-respecting and child-friendly processes to obtain remedy when their rights are violated.

BEN RAMALINGAM, Chair of the Humanitarian Innovation Fund, calls for the development community to go beyond incremental innovation that adapts existing business models, to embrace disruptive innovation that transforms the relationship between aid agencies and beneficiaries. He argues that the needs, interests and agency of end users belong at the centre of innovative solutions to problems faced by poor people, and examines several key endeavours that are creating change by empowering children, families and communities.

DIANE RAVITCH, Education Historian and Research Professor of Education at New York University, offers a critical appraisal of two education policy innovations in the United States – standardized testing and charter schools – that are applying market-based principles of consumer choice and competition to try to improve the quality of public education. But evaluations of student performance show that the achievement gap between poor children and their better-off peers persists. Ravitch, who was instrumental in launching these very initiatives, argues that they are failing because they do not address the underlying causes of the disparities – namely, poverty and inequality.



Innovation is sometimes presented by way of a dichotomy: modern, science-based innovation for affluent markets, and ingenious, cheap innovation for poor communities.

– Judith Sutz

SMITA SRINIVAS, Assistant Professor of Urban Planning and Director of the Technological Change Lab at Columbia University

takes a close look at some high- and low-tech breakthroughs – vaccines, prosthetics and toilets – by and for people in developing countries. Innovations developed under conditions of scarcity, she argues, have great potential to yield inclusive solutions, because they speak directly to the demands of the world's poor people and also fit into the contexts in which they live.

JUDITH SUTZ, Professor of Science, Technology and Development at Universidad de la República, Uruguay, considers how to align research and policy so that innovation can advance equity for children. Innovation policy, she argues, should be considered a branch of social policy – and the criteria for success should be based not on making profits or meeting demand arising from high-income populations, but on producing high-quality public goods and services that meet the needs of the world's poorest people.

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THOMAS WOODSON, Assistant Professor at Stony Brook University, offers insight into how the diffusion of technology can increase or decrease inequality between rich and poor, and between various groups in society. All this depends on the characteristics of the technology, how it is used, who gets to use it, and how the wealth and other benefits it generates are distributed. To make technology work for equity, scientists and policymakers must develop pro-poor technologies that directly address the needs of vulnerable children and fit the contexts in which they live.

[VIDEO] DIANA MARUSIC, a 16-year-old girl from Moldova, is passionate about computer programming. She is also visually impaired, and her impairment makes it difficult to spend extended periods of time in front of the computer. So she developed an application that allows visually impaired people to use computers simply using voice commands. She foresees eye-related problems among children and young people becoming more common as young people increasingly use computers and the Internet and are not protected against possible side effects. She wants her application to help prevent these kind of problems.

[SLIDESHOW] GIORGI DEMETRASHVILI, a psychologist with the First Step Centre in Tbilisi, Georgia, notes that children with disabilities are often not attracted to the toys around them, or use them in the 'wrong' way. So he creates toys from used household items and engages the children in the toy-making process to make it attractive, interesting and fun for them as well.



Rethinking structures

<<http://SOWC2015.unicef.org/topics/rethinkingstructures>>



What are the nuts and bolts of delivering innovation to the world's poorest children?

Innovation is about more than just new technologies – however groundbreaking, they won't change the lives of the world's poorest children, families and communities on their own. Putting innovation to work for a fairer world involves dealing with laws, infrastructure, institutions, cultural values, social norms, markets, money and people – and it often means challenging the status quo.

A range of initiatives are supporting innovation that benefits the poorest children and families. Prominent thinkers are devising new incentives for drug manufacturers to develop treatments for child killers like tuberculosis, which disproportionately affect people who can't pay high prices. Open source product development and copyright exceptions are breaking down intellectual property restrictions to build a new system that promotes collaboration and adaptation and expands access to information and technologies. Partnerships that combine businesses' technical capacities, resources and distribution networks with the development community's knowledge and experience are creating new markets geared towards the needs of underserved communities. Synergies between public and private, global and local are helping to boost the impact of local innovations and surmount the obstacles that bar the poorest children from realizing their rights.



Children play near the Kitmbile Health Post in Oromia State, Ethiopia.

SETH BERKLEY, CEO of Gavi, the Vaccine Alliance, talks about how innovative vaccine development, financing, delivery and production technologies are helping to bring immunization to millions of underserved children. Gavi, a public-private partnership, operates several innovative financing vehicles to drastically lower the prices of vaccines against such child killers as pneumonia and rotavirus. Since it was created in 2000, this endeavour has provided enough vaccines to immunize 440 million children, averting the deaths of approximately 6 million people.

JIM FRUCHTERMAN, Founder and CEO of Benetech, talks about what technology and law can and cannot do to improve access to printed content for children with disabilities. Ebooks make it easy to convert text into accessible formats, and thus can help diminish the achievement gap between students with and without disabilities – but copyright laws and the need to pay royalties to publishers bar poor students and school systems from tapping into the technology's potential.

REBECCA HANLIN, Innovation and Development Specialist at the AfricaLics Secretariat, surveys various partnership models that bring together public and private sector money and know-how to facilitate research and knowledge exchange and create effective delivery mechanisms and innovative financing vehicles to bring vaccines to the poorest children. These endeavours spotlight the key role of social technologies – arrangements of institutions, organization, financing and capacities – in helping physical technologies like vaccines protect children from deadly and disabling diseases.

WADE HOXTELL, Head of Operations at the Global Public Policy Institute, explores how such innovative public-private partnership models as cause-related marketing can promote children's welfare. This model is a win-win for both development organizations – which can get their messages out to a wider audience and raise money for their causes – and businesses, which reap reputational gains from 'doing good' at the same time as they make a profit from the sale of their core products or services. The sustainability of this approach creates high potential for long-term partnerships and, most importantly, for positive and lasting outcomes for children.



Nomadic children wait to receive polio vaccinations in the Moyo region of southern Chad, 2014. Such itinerant populations often exist beyond the reach of health services, and are among the highest-risk groups for vaccine-preventable disease.

MARIA ODEN, Professor in the Practice of Bioengineering and Director of Rice University's Oshman Engineering Design Kitchen; **REBECCA RICHARDS-KORTUM**, Professor of Bioengineering and Director of Rice 360° Institute for Global Health Technologies; and **ELIZABETH MOLYNEUX**, Consultant Pediatrician at Queen Elizabeth Central Hospital in Malawi, describe the Nursery of the Future, a suite of low-cost health-care technologies designed to save newborns in resource-poor settings. Life-saving technologies developed in high-income countries are usually unavailable or simply don't work in such settings – because of harsh conditions or lack of resources, infrastructure and capacity to maintain and repair them. To save the lives of newborns in poorer settings, technologies must be specifically designed to work within such constraints.

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THOMAS POGGE, President of Incentives for Global Health and Director of the Global Justice Program at Yale University; **NARMEEN HAIDER**, Manager for the Health Impact Fund; and **ZAIN RIZVI**, Research Analyst at Incentives for Global Health, discuss the Health Impact Fund, a proposed pay-for-performance mechanism to realign incentives for pharmaceutical companies to meet public health needs, including the development of treatments for neglected diseases – like drug-resistant forms of tuberculosis – that disproportionately affect poor people.

FERNANDO REIMERS, Director of the International Education Policy Program and the Global Education Innovation Initiative at Harvard University, writes about new opportunities for educational innovation. In an era of globalization, educational innovation is ‘glocal’, rather than purely local or global, drawing on global experience and grassroots practices. Improvement networks and professional learning communities help transfer innovative practices across contexts, to accelerate educational inclusion.

ROBERT WEISS, Business Development Analyst, and **KRISTA DONALDSON**, CEO of D-Rev, discuss the company’s user-focused and market-driven business models that enable it to develop – and deliver – innovative, low-cost, quality products designed to improve the lives of people living on less than US\$4 per day in the Global South. These innovations are having a real, measurable impact: since it entered the market in 2012, D-Rev’s LED-based phototherapy device – designed to meet the specific needs of district hospitals in poor countries – has treated 26,630 jaundiced newborns (as of October 2014) from India to sub-Saharan Africa who otherwise would have received no effective treatment. The next challenge: mustering the resources to bring such innovations to scale, to maximize their impact and help more children stay healthy.

[VIDEO] There are an estimated 2 million children out of school in the Sudan. War, drought, extreme poverty and other catastrophes have impacted the country. To integrate them back into school, an out-of-the-box pilot project brings education to remote villages using low-cost tablets preloaded with games that make learning fun.

[VIDEO] More than three years into the Syrian crisis, many of the 3 million displaced children haven’t returned to school. But a solution lies in a low-cost technology – a computer hard drive the size of a credit card called the Raspberry Pi loaded with an Arabic curriculum. Children also have the opportunity to build programmes and games using the Pi’s built-in coding software.



Around the world, an innovation revolution for children is growing – often in the most unexpected places – and increasingly led by young people themselves.

Fueled by creativity, connectivity and collaboration, new ways of solving problems are emerging – in tech design studios and university laboratories, in development organizations and corporations, and in kitchens and community centres.

To mark the 25th anniversary of the Convention of the Rights of the Child, this edition of *The State of the World's Children* highlights the work of remarkable young innovators who are already reimagining the future – and invites the world to join this rising movement to advance the rights of every child.

#EVERYchild

The State of the World's Children 2015: Reimagine the Future: Innovation for Every Child digital report is available at <<http://sowc2015.unicef.org>>

Published by UNICEF
Division of Communication
3 United Nations Plaza
New York, NY 10017, USA
pubdoc@unicef.org
www.unicef.org
<http://data.unicef.org>

ISBN: 978-92-806-4780-8

© United Nations Children's Fund (UNICEF)
November 2014