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Innovation for the Next 100 Years



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Transforming cities: Foresight needed for a better urban world

Building bridges across sectors for innovative and enduring solutions

MANY OF US live in cities, in sprawling, dense and socially diverse places that are the fabric of our work, families and communities. Within our nations, cities form the urban hub linking us with the rural environments that provide the vital food and water systems on which we depend. Across the world, some 600 cities form the backbone of today's global economy.

A hundred years ago, we city dwellers were a minority in the global population. But in just a few decades, that balance will tilt as we grow to become nearly three-quarters of the world's people. This transformative shift began a century ago in Europe and North America. But it is now happening at lightning speed in Asia and Africa, regions that are adding millions to their already stretched urban enclaves. In fact, to meet basic city needs, urbanizing countries will have to build the equivalent of a city of a million every week for the next 40 years, according to Rockefeller University demographer Joel Cohen.

What will these cities look like? As the *Economist City* articles suggest, if urban growth follows its current path, the future will be bleak. They will offer neither prosperity for all nor be resilient—two widely held aspirations. Today, newly burgeoning cities are destinations for the poor. They are packed with leftover tin and cardboard dwellings, and an insufficient supply of water or toilets amid a daily struggle to meet basic human needs like food.

Unsurprisingly, they are the gathering place for protest by newly minted middle classes frustrated by the lack of public parks, poor municipal governance or escalating transport costs. These dense urban enclaves—many in coastal areas—are expanding along with their vulnerability to natural and human-made disasters, flooding with each storm, crumbling from earthquakes or drought-induced fires, suffocating under a cloud of air pollution.

All too often the urban affluent abandon these

areas, pushing the undesirable facets of urban living on others. They are replicating the North American model, with their sprawling, energy-intensive, auto-dependent and oft-gated settlements, leaving concentrated poverty and weak infrastructure behind.

Cities do offer enormous promise. They are engines of prosperity and freedom. Broadly speaking, city dwellers are better off than their country brothers and sisters, the World Bank reports. They are both wealthier and live longer, relatively speaking, than their rural peers. But as the rapid industrialization pace of the last century shows, this prosperity comes at a price—of environmental degradation, unsafe workplaces and the exclusion of many from the rising tide. Packed factories pumping out exports assembled by the low-cost labor of rural migrants, often women, are a typical scenario, one that enriches some groups but also deepens the economic divide.

Those outside the virtuous circle include youth and unskilled workers, among many others. Lured by the promise of the metropolis or forced to move because of rural hardship, many pour into cities. Others are born urbanites but lack access to schooling. This absence of education and the poor formal job prospects that follow push many men, women and children to tap their ingenuity and innate entrepreneurial instincts to survive.

Pulitzer Prize-winning journalist Katherine Boo vividly portrayed this harsh but hopeful reality in her book *Behind the Beautiful Forevers: Life, Death, and Hope in a Mumbai Undercity*. It tells the story of Annawadi, where 3,000 residents occupy 335 huts in a half-acre slum abutting a luxury hotel, the international airport and a lake of sewer. Here, young boys gather and resell trash, mothers turn to prostitution to pay for necessities, the police shake down small businessmen, and a housewife plays fixer for the local politician, who pockets government funds meant to relieve social ills. The situation is

rife with horrors, the slightest fallback plunging the residents into life-threatening catastrophes.

Is this inevitable? Certainly not. Such settlements are also hotbeds of innovation and improvement. People, advocacy organizations, government and businesses of all sizes offer thousands of incremental but potentially transformative solutions, if linked and leveraged. Fueling and fostering these changes are public- and private-sector investment in key public services like mass transit, low-cost housing schemes and slum upgrading programs. Providing community water fountains, basic sewer lines, community health centers or even (famously) ski lifts to provide transportation from inaccessible areas can make a profound difference in urban dwellers' lives, and unleash more prosperity.

The *Economist City* articles discuss a few notable success stories; others abound. But, ultimately, these approaches do not address basic structural problems nor offer appropriately scaled solutions. Only rethinking the very organization of a city can help meet these goals.

Every city is shaped by its local context and inhabitants' culture and customs. But stripped to its bare bones, a city has two key characteristics: it is rooted on land and it is a system of systems. Consider it a spatial entity. A city occupies its space well, it is livable and sustainable. If it runs rampant over the landscape, it is inefficient and destructive.

Consider a city's complex and interlocking systems: engineering arrangements, social organizations, economic structures and environmental components. If like a Swiss watch these systems work in sync, they boost human prosperity and quality of life. But if like a machine run amuck they malfunction, these systems heighten human frailty, particularly among the poor and vulnerable. Government, business, and civil society provide and support these systems. Their global challenge, then, is to come together to identify and implement creative cross-sectoral solutions that will yield 21st century cities marked by sustainable and socially inclusive urban growth.

This issue of the *Economist City* was prepared as background reading for participants sharing insights and planning collective action in the "Future of Transforming Cities" meeting at the Rockefeller Foundation Bellagio Center. We chose the most compelling, provocative pieces from recent issues of *The Economist* magazine. We hope it will inspire heavy lifting among that meeting's participants, and critical thinking and action on the future of cities among readers around the world.



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Urbanisation

The city triumphs, again

Reprinted from The Economist, June 6th 2013

HUMANITY is crowding into ever smaller portions of the planet. In *Triumph of the City* Edward Glaeser notes how 243m Americans squish together into only 3% of the country's area. Such concentration has always made cities engines of innovation. Florence spawned the Renaissance and Birmingham the Industrial Revolution.

This makes sense: innovation speeds up because smart people are connected to each other, and because they are gateways to finance, markets and other things that spur economic growth. A larger percentage of people lives in cities than at any point in human history simply because cities work. The paradox of the modern metropolis is that urban proximity has become ever more valuable even as the cost of connecting across long distances has fallen, whether through long-distance travel or telecommuting.

Cities tend to be ranked according to the size of their population, and comparisons between them made accordingly. The rate of innovation, childhood mortality, graduation or crime figures are converted to per capita indicators. The underlying assumption is that urban characteristics increase linearly with population size. Which, as it turns out, they do not.

Instead, as the work of Luis Bettencourt and colleagues showed in 2010, such characteristics show "nonlinear" behaviour. For example, for each doubling of a city's population you typically find that inhabitants are 15% wealthier and 15% more productive (and 15% more vulnerable to violent crime). This is an example "superlinear scaling", where metrics do not increase proportionally with population.

Instead, they grow faster.

Understanding this relationship lets researchers tease apart the benefits a city affords merely by virtue of its size, and those caused by some interesting features that make it special. But they would also like to know what creates these strong, superlinear relationships.

Some have suggested social networks, the diffusion of technology, diversity or hierarchies. Wei Pan, from the Massachusetts Institute of Technology, and colleagues have now proposed a model, just published in *Nature Communications*, that links such patterns to a city's density. They have shown that, mathematically at least, many urban regularities arise from of the fact that high population densities, as opposed to size alone, give residents greater opportunities for face-to-face interactions. The economic dominance of cities (as well as their crime rates) are emergent properties of these physical social networks. In other words, something special really does happen when you pack people closer together.

The measure that predicts everything from how many patents a city will produce to how a contagious disease such as AIDS will spread is "social tie density", which in turn is highly correlated with population density. Interestingly, some cities with the same population densities as those in Europe or America appear not to be as innovative as the model predicts. That could be because those urban areas have such poor transport links as to make them, in effect, a series of smaller unconnected towns.

This will all be grist for the mill of urban planners, who now have an equation to support their efforts to boost growth. The model might, conceivably, be invoked to justify investments in

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transportation or public spaces. Already, many strategies are being pursued to improve urban development that, viewed through this new lens, are in some ways attempts artificially to ramp up density, of the physical or social-tie variety. These include things like new bike paths, technology incubators, science parks, zoning (planning permission) and tax credits for clusters of particular businesses.

The implications are broad. The model suggests that the right response to urban sprawl is to focus spending on a hot inner core, which ought to do most to boost output. This is the approach favoured by planners in Detroit, who have had some success in creating a tiny hot new city inside the decaying hulk of a former low-density one (or in Boston, as we report in last week's issue). It might also lead to a new way of looking at rapid transit between cities.

Finally, Dr Pan's findings imply that any group which raises the rate of face-to-face interactions within a city is actually doing something that carries economic value, as well as the purely social sort. Work done by local charities and churches, walking groups and even parent networks fall under this category. Such groups' regular face-to-face meetings, by fostering social ties, are providing a tangible benefit to their city. Margaret Thatcher, the former British prime minister, famously said "there is no such thing as society". There is. And it scales superlinearly. ■

Cities

Concrete jungles

Reprinted from The Economist, Sep 29th 2012

A mainly rural country is ill-prepared for its coming urban boom

SAVDA GHEVRA IS a township of narrow, poorly built brick houses with beaten tin doors, west of Delhi. Flies swirl over open sewers. In the absence of piped water, 55 tankers bring in supplies daily. Only a minority of homes, "pukka" ones, have toilets. ▶▶

A few trees have been planted, but overall the feel is little better than that of a shanty town.

In theory, Savda Ghevra represents progress—of a minimal, unsatisfactory sort. The area was set aside for some of the estimated 500,000 slum-dwellers displaced when Delhi hosted the 2010 Commonwealth games: fish-sellers from beside the stinking Yamuna river, tailors, rickshaw-wallahs and hawkers who saw their shacks flattened. Some were taken to Savda Ghevra, given plots and told to build.

Now they have homes and electricity, but many families have been split: the father sleeping somewhere back in Delhi, the rest of the family in the new home. Some have sold their plots, illegally, to dodgy property traders. A corner house is for sale at a scarcely believable 2.7m rupees.

India's cities, by and large, are charmless and badly put together. That is one reason why the country remains mostly rural (see chart). Two-thirds of the population, some 833m, are living in 640,000 villages. Politicians such as A.P.J. Abdul Kalam, a former Indian president, or Narendra Modi, Gujarat's chief minister (who talks of "rurban" life), want people to stay out of cities, and would like the internet, electricity, schools and jobs to go to rural areas instead.

Since rural voters collectively have clout, much public spending flows to the sticks. Farmers get subsidised diesel to run pumps. The NREGA scheme creates low-paid make-work jobs. The government also pays inflated prices for most wheat and rice, then sells much of it back to villagers as cheap rations. That

people of low caste, women and members of religious or other minorities. Villages are usually the places with the worst schools and health care and the least productive work.

Putting off urbanisation can also mean postponing prosperity. When farmers leave the land to work in factories, call centres or almost anywhere else, their incomes and consumption almost always go up, lifting assorted development indicators. In China just over half the population is now urban.

Aromar Revi, director of the Indian Institute for Human Settlements (IIHS), says that India's 100 biggest cities, with 16% of its total population, contribute 43% of its national income. Even slum-dwellers are often productive manufacturers and traders. Yet many urban spaces, like Savda Ghevra, have a legacy of poor planning and management.

Gurgaon, a business district near Delhi, has plenty of glass towers but falls short on sewerage and power supplies and is only slowly acquiring public transport. Gridlocked Mumbai can appear to be falling to bits, especially in heavy rains.

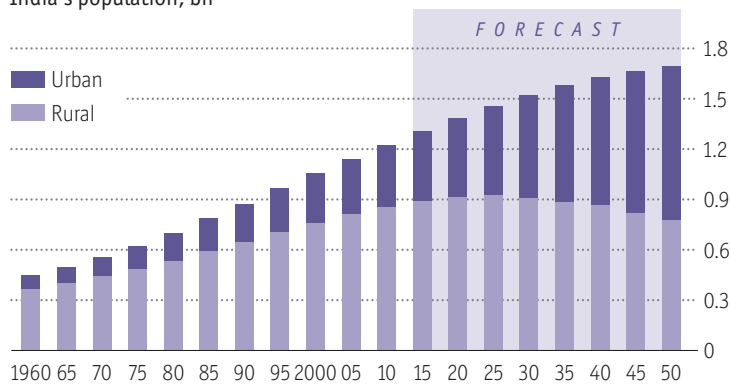
The number of town-dwellers, currently 377m, is growing by around 5m a year. Historically most urban growth has been due to natural increase, not migration. That is changing as country-dwellers see opportunities. So in future India's urban population will rise much faster, doubling by mid-century.

Some urban centres will become megacities. According to one vision, India's entire western seaboard could turn into a single conurbation, stretching from Ahmedabad in



The slow road to the city

India's population, bn



Sources: World Bank; UN Population Division

discourages migration, and in many states it also encourages corruption. An official estimates that 44% of state-managed food vanishes as "leakage".

Some states, such as Kerala and Tamil Nadu, have good public services and social indicators despite slow urbanisation, but resisting it also comes at a price. Village life is often hard for

Gujarat in the north, past Mumbai and south to Thiruvananthapuram in Kerala. Inland, Delhi and its environs could be a hub for 60m-70m people, provided there is enough water. Within two decades India will probably have six cities considerably bigger than New York, each with at least 10m people: Ahmedabad, Bangalore, Delhi, Mumbai, Hyderabad and Chennai.

Delhi gets plenty of public money, and even Japanese donor funds, which have helped pay for a newish metro. Several other cities, including Bangalore and Ahmedabad, are also getting metros. Any big metropolis can tap a central fund, the Jawaharlal Nehru National Urban Renewal Mission, for new infrastructure. But there is plenty of growth in smaller places too. Already 53 cities have at least 1m inhabitants. Some are seeing improvements, but many are grim and badly run.

Gorakhpur is a sprawling city near the Nepalese border in eastern Uttar Pradesh, notorious for thuggish religious politics, gangsters and smugglers. It has 670,000 inhabitants, poor public health and a broken and clogged road system. A cricket field on the city's edge is so thickly strewn with rubbish you can hardly see the ground beneath. Cows munch on plastic bags in the streets.

India is ill-equipped to make such places attractive drivers of growth and better living. "I see no improvement in thinking about ▶▶

cities,” says a senior figure in construction and retailing. Much land is privately held, but markets are opaque and development too often depends on cronies with political connections.

Mumbai is especially bad. “Property in the city has run riot,” says Mr Guzder, the Parsi businessman. Towers shoot up, especially around the Sea Link, a bridge connecting the southern part of the city to the north. “But we have no urban infrastructure, no widening of roads, no provision of police.” Prithviraj Chavan, the chief minister of Maharashtra, blames the city’s woes on a “deep nexus of property and political funding”.

Municipalities also need planning skills. Mr Guzder says the entire Mumbai metropolitan region is overseen by a single town planner (“and she is retiring soon”). Mr Revi estimates that by 2031 India will be short of 100,000 professionals—planners, engineers and the like—to manage cities. He heads a new university that will train people to fill the gap.

Some rich folk are trying to get round the problem by starting a city from scratch. Called Lavasa, it is now being built on 25,000 acres of hilly private land by a reservoir near Pune in Maharashtra. It looks pleasant enough: a town to walk in, good infrastructure, a sanctuary for 300,000 inhabitants. But it is mired in controversy and hardly offers an urban model for one-sixth of the planet’s population.

What it takes

A far more encouraging example can be found farther up the coast. Surat, a city in Gujarat of 4.5m people, is a flourishing trading hub that not long ago was a wretched dump like Gorakhpur. In 1994, after a reported (but never confirmed) outbreak of pneumonic plague, it became famous for squalor, gridlock, slums and rotten management. Since then it has been transformed. Effective managers cleaned up. Rubbish was collected and transport improved, streets were swept and public services delivered. Miraculously, the improvements were sustained. Some 96% of residents pay their municipal taxes on time. Manoj Kumar Das, who now runs the city, says that over the past decade the growth in Surat’s population averaged 5% a year, among the fastest of any city in the world. According to his planners, by 2031 it could have 9.3m people, overtaking London.

It helps that the local economy is thriving, with diamond polishing, textiles and petrol products doing particularly well. The boss of a diamond firm says his home town has been reshaped and feels great. Investors like its reliable power, traffic that flows and the can-do culture of Surtis. Even the grimier end of town is uplifting. On a sweltering monsoon day the lack of smell, flies, dust or noise at the municipal dump is strangely thrilling. It is efficiently run by private contractors, a model that other cities could copy tomorrow. Even the rubbish is being put to work: soon about 1,200 tonnes will be burned daily in German-built incinerators.

The city’s sewage works are similarly impressive: efficient, computerised and run largely on electricity from a biomass plant fired by methane. Over 90% of households are said to be connected to sewerage. The municipal engineer says the entire city has clean piped drinking water. Slums are being cleared and parks being created by the river. Next on the list is a rapid bus transport system, more flyovers and a Bollywood theme park modelled on Disneyland. There are posh car showrooms, and retailers like Jimmy Choo, Burberry, Armani and Gucci are due to open soon.

What made Surat work? An assortment of businessmen, the boss of a jewellers’ association, the local chamber of commerce and a prominent city journalist all give the same answer: governance. When residents felt able to trust officials and their plans, they happily contributed to the city’s success. This year firms planted 200,000 trees to help make the place greener.

Mr Das says given the right motivation and belief in officials, others cities are capable of similar improvements. For instance, many people in Patna, Bihar’s capital and his home town, are now connected to the grid. When he was a boy, he had to study by lantern light. ■

common are misplaced. But their economic cost is rising relentlessly

THE world’s industrial supply chains were only just recovering from Japan’s earthquake and tsunami in March when a natural disaster severed them again in October. An unusually heavy monsoon season swelled rivers and overwhelmed reservoirs in northern Thailand. The floodwaters eventually reached Bangkok, causing a political crisis as residents fought over whose neighbourhoods would flood. But before that the economic toll was being felt farther north in Ayutthaya province, a manufacturing hub. The waters overwhelmed the six-metre-high dykes around the Rojana industrial estate, one of several such parks that host local- and foreign-owned factories.

Honda’s workers rescued newly built cars by driving them to nearby bridges and hills. The factory ended up under two metres of water and is still closed. Honda was hardly alone: the industrial estates that radiate out from Bangkok are home to many links in the world’s automotive and technology supply chains. Western Digital, a maker of computer disk drives which has 60% of its production in Thailand, had two of its factories closed by the floods, sending the global price of drives soaring.

Thailand is no stranger to floods. Europeans once called Bangkok the “Venice of Asia”. But rarely have they done so much economic damage. October’s deluge cost \$40 billion, the most expensive disaster in the country’s history. J.P. Morgan estimates that it set back global industrial production by 2.5%.

Such multi-billion-dollar natural disasters are becoming common. Five of the ten costliest, in terms of money rather than lives, were in the past four years (see map). Munich Re, a reinsurer, reckons their economic costs were \$378 billion last year, breaking the ▶▶

Natural disasters

Counting the cost of calamities

Reprinted from The Economist, Jan 14th 2012

Death rates from natural disasters are falling; and fears that they have become more



previous record of \$262 billion in 2005 (in constant 2011 dollars). Besides the Japanese and Thai calamities, New Zealand suffered an earthquake, Australia and China floods, and America a cocktail of hurricanes, tornadoes, wildfires and floods. Barack Obama issued a record 99 “major disaster declarations” in 2011.

Acts of God, or man?

Although deadly quakes are rarely blamed on human activity, it is fashionable to blame weather-related disasters on global warming. It does seem plausible: warm air worsens droughts and lets tropical air hold more moisture, the fuel for cyclones (weather formations that include hurricanes and typhoons). However, a recent study by the Intergovernmental Panel on Climate Change, which represents the consensus among thousands of scientists, expressed little confidence in any link between climate change and the frequency of tropical cyclones.

The world has succeeded in making natural disasters less deadly, through better early-warning systems for tsunamis, better public information about evacuation plans, tougher building codes in quake-prone areas and encouragement for homeowners to adopt simple precautions such as installing tornado-proof rooms in their homes. Annual death tolls are heavily influenced by outliers, such as Haiti’s earthquake in 2010 (which killed more than 200,000) or the Bangladeshi cyclones in 1970 (300,000). But, adjusted for the Earth’s growing population, the trend in death rates is clearly downward.

However, even if natural disasters may be no more common and no more likely to kill people than before, there is no doubt that their economic cost is rising. This is because a growing share of the world’s population and economic activity is being concentrated in disaster-prone places: on tropical coasts and river deltas, near forests and along earthquake fault lines.

Thailand is an example of this. Since its last serious floods, in 1983 and 1995, the country’s export-oriented industrial base has grown rapidly in the provinces around Bangkok and farther north along the Chao Phraya River. Ammar Siamwalla, a Thai economist, notes that the central plain where many industrial estates now sit was once heavily cultivated for rice precisely because it floods regularly. Although dykes (called levees in America) protect these estates and central Bangkok, they may raise water levels, and thus the risk of flooding, elsewhere.

Wildfires, which destroyed thousands of homes in Texas in 2011 and in Australia in 2009, were more destructive than hitherto because, as populations have grown, new housing has been built in wooded areas. Throughout America’s west and south-west, encroaching suburbia has put pressure on forest managers to suppress fires as quickly as possible. Yet repeated fire suppression allows forests to accumulate more fuel which can lead



to more intense and devastating fires later on.

Australia’s “Black Saturday” bushfires, which killed 173 people and destroyed 2,298 homes in 2009, were said to be the country’s worst natural disaster. But a study by Ryan Crompton of Macquarie University and others found that 25% of the destroyed buildings were in bushland and 60% were within ten metres of it, and thus exposed to the threat of fire. The study concluded that if previous fires had occurred with people living so close to the bush as today, a 1939 outbreak of wildfires would have been the deadliest while Black Saturday’s would rank second, and only fourth by number of buildings destroyed.

In harm’s way

America’s coasts may be a microcosm of where the world is headed. Florida’s population has grown from 2.8m in 1950 to 19m now. Howard Kunreuther and Erwann Michel-Kerjan, disaster experts at the Wharton business school in Pennsylvania, reckon there are now nearly \$10 trillion of insured and hurricane-prone assets along the coast from Maine round the Florida peninsula to Texas. Roger Pielke of the University of Colorado at Boulder reckons that the Great Miami Hurricane of 1926, which cost \$1 billion in 2011 dollars, would cause \$188 billion of damage now.

Whether the economic toll of disasters is rising faster than global GDP is unclear, since a wealthier world naturally has more wealth at risk. Still, the incidence of spectacular, multi-billion-dollar catastrophes seems certain to rise. A 2007 study led by the OECD reckoned that by 2070, seven of the ten greatest urban concentrations of economic assets (buildings, infrastructure and the like) that are exposed to coastal flooding will be in the developing world; none was in 2005. In that time, assets exposed to such flooding will rise from 5% of world GDP to 9%. A World Bank study led by Apurva Sanghi estimated that between 2000 and 2050 the city populations exposed to tropical cyclones or earthquakes will more than double, rising from 11% to 16% of the

world’s population.

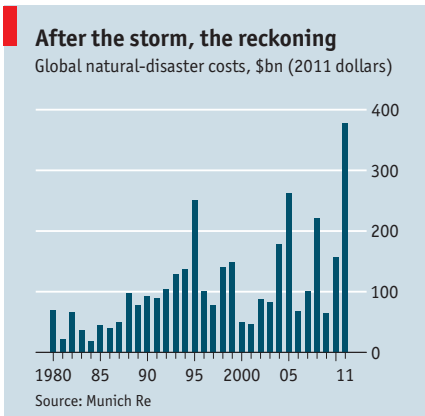
Development by its nature also aggravates risks. As cities encroach on coasts, wetlands and rivers, natural barriers such as mangrove swamps and sand dunes are obliterated and artificial ones—dykes and sea walls—are erected to keep the water out. The result is to put more people and property in harm’s way if those barriers fail. After the second world war Japan embarked on a vigorous programme of building seawalls and dykes to protect its cities against storm surges and tsunamis. That in turn encouraged cities’ growth and industrialisation, but for the same reason exposed them to damage if a tsunami overwhelmed their defences, as it did in March.

As cities on river deltas extract groundwater for industry, drinking and sanitation, the ground subsides, putting it further below sea level and thus requiring even higher dykes. Since 1980 Jakarta’s population has more than doubled, to 24m, and should reach 35m by 2020. Land that once absorbed overflow from the city’s 13 rivers has been developed, and is now subsiding; 40% of the city is now below sea level.

Perverse incentives

People originally settled in river deltas precisely because regular flooding made the land so fertile. Those cities have continued to grow because of the natural economic advantages such concentrations of human talent hold for modernising societies. Even when poor people moving to cities know they are increasing their risk of dying in a mudslide or flood, that is more than compensated for by the better-paying work available in cities. And in rich countries, coasts are gaining population simply because people like living near water.

Perverse incentives are also at work. In America, homeowners on floodplains must have flood insurance to get a federally backed mortgage. But federal insurance is often subsidised and many people are either exempt from the rule or live in places where flood risks have not been properly mapped. Some do not buy ▶▶



disaster insurance, assuming they can count on federal aid if their home is destroyed. Once the government declares a disaster, it pays 75-100% of the response costs. Presidents have found it increasingly hard to turn down pleas from local leaders for assistance, especially in election years. Matt Mayer of the Heritage Foundation, a conservative think-tank, says the government routinely takes charge of local disasters that should be well within a state's capability. The result is that state disaster-management atrophies and disaster funding ends up subsidising disaster-prone places like Florida at the expense of safer states like Ohio.

As a consequence of these skewed incentives, people routinely rebuild in areas that have already been devastated. Bob Meyer of the Wharton School gives the example of Pass Christian, a resort town in Mississippi, where an apartment complex was destroyed by Hurricane Camille in 1969, killing 21 people who had taken refuge inside. A shopping centre and condominiums were later built in the same area, only to be wiped out by Hurricane Katrina in 2005, since when more new condominiums have gone up nearby.

This is not all because of incentives. As Mr Meyer says, people have a tendency not to price rare, unpredictable events into their decisions, even if these may have catastrophic consequences. Leo "Chipper" McDermott, the mayor of Pass Christian, notes that more than three decades elapsed between Camille and Katrina. "Life is a chance. And let me tell you something else: water sells."

If human nature cannot be changed, government policy can be. That might mean spending more on preventing disaster so as to cut its costs. Roughly 20% of humanitarian aid is now spent responding to disasters, whereas a paltry (but rising) 0.7% is spent on preventive measures taken to mitigate their possible consequences, according to the World Bank.

A Dutch rethink

The Netherlands, whose existence has long been at the mercy of nature, may be at the forefront of rethinking how to cope with it. Some 60% of the country is either under sea level or at risk of regular flooding from the North Sea or

the Rhine, Meuse and Schelt rivers and their tributaries. In 1953, a combination of a high spring tide and severe storm over the North Sea overwhelmed dykes, flooding 9% of its farmland and killing 1,800 people. The country responded with a decades-long programme of "delta works" to guard estuaries from storm surges, while raising and strengthening dykes.

The success of those defences has, perversely, made the consequences of failure even greater, says Piet Dircke of Arcadis, a Dutch engineering firm specialising in water management. Protected by the delta works and dykes, the land stretching from Amsterdam to Rotterdam has heavily industrialised and now provides most of the country's output. "The northern and southern parts of the Netherlands are far more safe but are economically less attractive. People are moving to the western part of Holland because it's where the economy grows."

In 1993 and again in 1995 heavy river flooding inundated the countryside and nearly rose above dykes in population centres, forcing the evacuation of more than 250,000 people. Katrina was the final wake-up call, making the Dutch face up to both the unreliability of forecasts of once-in-a-century events and the impossibility of their repeating the American feat of evacuating a million people.

The country's philosophy of flood control has as a result pivoted from building ever higher dykes to instead making its cities and countryside more resilient to floodwaters. In 2007 it launched its €2.3 billion "Room for the River" project. At 39 locations along the Meuse, Rhine, IJssel and Waal rivers, dykes are being moved inland, riverbeds deepened and fields now occupied by farms and households deliberately exposed to floods. The Dutch invented the word "polder" centuries ago to describe dry land created by enclosing floodplains (or shallow waters) with dykes. They are now "depolderising", removing or lowering the surrounding dykes and turning land back into floodplains. The Rhine's maximum flow without causing disaster will be raised from 15,000 cubic metres a second to 16,000 and, eventually, 18,000.

The Noordwaard polder south-east of Rotterdam was floodplain until 1973, when the delta works made it suitable for cattle and vegetables. It is now being turned back into floodplain to absorb floodwaters that might otherwise inundate cities upstream. To do so, the government had to persuade 18 farmers to move or have their farmhouses raised. Wim de Wit, who raises 75 cattle on the farm his father started in 1979, chose the latter. Near his farmhouse, earthmoving equipment is building a mound, or "terp," on which a new one will sit, safe from the periodic floods that will follow. It will not be pleasant, Mr de Wit acknowledges, "but it's only once every 25 years." And if he loses any crops or cattle to floods, the government will compensate him.

The Dutch are building an industry of promoting their water-management philosophy around the world. Deltares, a research institute,

recommends that the Thai government emulate "Room for the River" by moving dykes farther back where possible, limiting floodplain development and unifying water management so that safety is no longer subservient to irrigation and electricity generation.

But the Dutch approach has limits. For one thing it is costly. Farmers were paid market value to leave the polders. To do this in a more densely populated city or industrial area would be prohibitively expensive. In America and China, the government has long had the right to breach dykes and periodically inundate occupied land to relieve extreme flooding. Jaap Kwadijk of Deltares notes that the Dutch government has previously rejected doing the same thing. If a flood comes along that exceeds even the very high designed capacity of the dykes, "we don't have a plan B."

If cities cannot be moved, they must, like the polder farms, be made more resilient to disaster. Rather than rely on dykes to keep water out, Rotterdam is also trying to mitigate the consequences if water comes in. A 10,000-cubic-metre tank was built into a new car park, big enough to catch roughly 25% of the water from a once-in-a-century flood. A public plaza has been designed to turn into wading pools when it fills with rainwater.

In the city's harbour sits a floating pavilion shaped like three halved footballs built on huge blocks of foam. It is a model for the floating communities the city hopes might one day repopulate the docklands, whose traditional shipping activities are moving elsewhere. Pieter Figdor, one of the pavilion's architects, says floating buildings can be up to seven storeys tall, are inherently floodproof and can easily be moved.

Wealth protection

Making cities more resilient involves starker trade-offs in the developing world. On the one hand, urbanisation strips cities of their natural defences against disaster and exposes more people to loss of life and property when an earthquake or cyclone hits. On the other hand, urbanisation makes poor people richer. The density and infrastructure of cities makes people more productive and more able to afford the measures needed to keep them safe. So mitigation measures should not discourage people from crowding into vulnerable cities but rather establish incentives for cities and their inhabitants to protect themselves better.

Many cities have tough building codes but fail to enforce them. The World Bank study argues that giving more urban dwellers title to their property would encourage investment in their safety, and lifting rent controls would encourage landlords to comply with building codes, since they could then recoup the cost. Ordinary infrastructure can be designed to double as disaster protection, ensuring that it will be properly maintained when the time comes. Two examples the World Bank gives are schools built on higher ground that double as cyclone shelters and a road ▶▶

tunnel in Kuala Lumpur that doubles as a flood-containment tank.

As societies develop they can afford the human and physical infrastructure needed to protect against, and respond to, natural disaster. In time, last year's earthquake and tsunami and floods will be mere blips in the GDP of Japan and Thailand, thanks to the rapid reconstruction made possible by the same wealth that meant the disasters were so costly to start with. The lesson for poorer countries is that growth is the best disaster-mitigation policy of all. ■

The protests around the world

The march of protest

Reprinted from The Economist, Jun 29th 2013

A wave of anger is sweeping the cities of the world. Politicians beware



A FAMILIAR face appeared in many of the protests taking place in scores of cities on three continents this week: a Guy Fawkes mask with a roguish smile and a pencil-thin moustache. The mask belongs to "V", a character in a graphic novel from the 1980s who became the symbol for a group of computer hackers called Anonymous. His contempt for government resonates with people all over the world.

The protests have many different origins. In Brazil people rose up against bus fares, in Turkey against a building project. Indonesians have rejected higher fuel prices, Bulgarians the government's cronyism. In the euro zone they march against austerity, and the Arab spring has become a perma-protest against pretty much everything. Each angry demonstration is angry in its own way.

Yet just as in 1848, 1968 and 1989, when people also found a collective voice, the demonstrators have much in common. Over the past few weeks, in one country after another, protesters have risen up with bewildering speed. They have been more active in democracies than dictatorships. They tend to be ordinary, middle-class people, not lobbies with lists of demands. Their mix of revelry and rage condemns the corruption, inefficiency and arrogance of the folk in charge.

Nobody can know how 2013 will change the world—if at all. In 1989 the Soviet empire teetered and fell. But Marx's belief that 1848 was the first wave of a proletarian revolution

was confounded by decades of flourishing capitalism and 1968, which felt so pleasurably radical at the time, did more to change sex than politics. Even now, though, the inchoate significance of 2013 is discernible. And for politicians who want to peddle the same old stuff, the news is not good.

Online and into the streets

The rhythm of protests has been accelerated by technology. V's face turns up in both São Paulo and Istanbul because protest is organised through social networks, which spread information, encourage imitation and make causes fashionable. Everyone with a smartphone spreads stories, though not always reliable ones. When the police set fire to the encampment in Gezi Park in Istanbul on May 31st, the event appeared instantly on Twitter. After Turks took to the streets to express their outrage, the flames were fanned by stories that protesters had died because of the police's brutal treatment. Even though those first stories turned out to be wrong, it had already become the popular thing to demonstrate.

Protests are no longer organised by unions or other lobbies, as they once were. Some are initiated by small groups of purposeful people—like those who stood against the fare increases in São Paulo—but news gets about so fast that the organising core tends to get swamped. Spontaneity gives the protests an intoxicating sense of possibility. But, inevitably, the absence of organisation also blurs the agenda. Brazil's fare protest became a condemnation of everything from corruption to public services. In Bulgaria the government gave in to the crowd's demand to ditch the newly appointed head of state security. But by then the crowd had stopped listening.

This ready supply of broad, fair-weather activism may vanish as fast as it appeared. That was the fate of the Occupy protesters, who pitched camp in Western cities in 2011. This time, however, the protests are fed by deep discontent. Egypt is suffering from the disastrous failure of government at every level. Protest there has become a substitute for opposition. In Europe the fight is over how to shrink the state. Each time the cuts reach a new target—most recently, Greece's national broadcaster—they trigger another protest. Sometimes, as in the riots of young immigrants in Sweden's suburbs in May and of British youths in 2011, entire groups feel excluded from the prosperity around them. Sweden has the highest ratio of youth unemployment to general unemployment in the OECD. Too many young Britons suffer from poor education and have prospects to match. In the emerging economies rapid real growth has led people to expect continuing improvements in their standard of living. This prosperity has paid for services and, in an unequal society like Brazil, narrowed the gap between rich and poor. But it is under threat. In Brazil GDP growth slowed from 7.5% in 2010 to only 0.9% last year. In Indonesia, where GDP is still below \$5,000 a head, ordinary families will keenly feel the

loss of fuel subsidies.

More potent still in the emerging world are the political expectations of a rapidly growing middle class. At the end of last year young educated Indians took to the streets of several cities after the gang rape of a 23-year-old medical student, to protest at the lack of protection that the state affords women. Even bigger protests had swept the country in 2011, as the middle class rose up against the corruption that infests almost every encounter with government officials. In Turkey the number of students graduating from university has increased by 8% a year since 1995. The young middle class this has created chafes against the religious conservatism of the prime minister, Recep Tayyip Erdogan, who wants large families and controls on alcohol. The 40m Brazilians who clambered out of poverty in the past eight years are able for the first time to scrutinise the society that their taxes finance. They want decent public services, and get overpriced sports stadiums instead.

Trouble in Brussels and Beijing

How will this year of protest unfold? One dark conclusion is that democracy has become harder: allocating resources between competing interest groups is tougher if millions can turn out on the streets in days. That implies that the euro zone's summer will surely get hotter. The continent's politicians have got off lightly so far (the biggest demonstrations in Paris, for instance, were when "Frigide Barjot" led French Catholics in a bid to stop gay marriage). Yet social instability is twice as common when public spending falls by at least 5% of GDP as when it is growing. At some point European leaders must curb the chronic overspending on social welfare and grapple with the euro's institutional weakness—and unrest will follow.

Happily, democracies are good at adapting. When politicians accept that the people expect better—and that votes lie in satisfying them—things can change. India's anti-corruption protests did not lead to immediate change, but they raised graft up the national agenda, with the promise of gradual reform. To her credit, Brazil's president, Dilma Rousseff, wants a national debate on renewing politics. This will be neither easy nor quick. But protest could yet improve democracy in emerging countries—and even eventually the EU.

Democrats may envy the ability of dictators to shut down demonstrations. China has succeeded in preventing its many local protests from cohering into a national movement. Saudi Arabia has bribed its dissidents to be quiet; Russia has bullied them with the threats of fines and prison. But in the long run, the autocrats may pay a higher price. Using force to drive people off the streets can weaken governments fatally, as Sultan Erdogan may yet find; and as the Arab governments discovered two years ago, dictatorships lack the institutions through which to channel protesters' anger. As they watch democracies struggle in 2013, the leaders in Beijing, Moscow and Riyadh should be feeling uncomfortable. ■



Upwardly mobile Africa

Boomtown slum

Reprinted from The Economist, Dec 22nd 2012

A day in the economic life of Africa's biggest shanty-town

MEN in patched overalls and women in freshly washed blouses walk down a narrow lane just after six in the morning. They are packed in tightly like spectators leaving a sports stadium, but this is their life, their every morning. Backs are straight; trousers and sleeves rolled up, exposing mottled yet able limbs. They crush discarded wrappers of quick-fry breakfasts under foot, corn and oil dripping from mouths. Banana skins are ground to dust by thousands of feet.

Everyone is moving in one direction, jostling and shoving, out of a maze of low-strung shacks, past shops selling shoes and phones that have already been open an hour, out into the high-rise centre of Nairobi, where factories and offices pay salaries—everyone, that is, except a limp male figure huddled in a corner strafed by the first delicate rays of the sun. He seems to wait for the crowd to pass or at least thin before he dares to swim upstream. His hair is short and shiny as if sanded down rather than cut; his shirt is in pieces. He tells your correspondent that he has just arrived from the countryside. This is not his home, he says. He does not sound convinced it ever will be.

His name is Jonah Kasiri and he is 23 years old. He came to Nairobi on an overnight minibus with his worldly possessions—a battered alarm clock and an additional pair of cotton trousers—packed into a canvas bag that smells of ripe fruit. His village in Kenya's west, as he describes it, sounds like many: a verdant clump of trees and animals where man eats what he can hunt or gather but has little chance of betterment.

For that one has to come to the city. His cousin went to Nairobi two years ago and returned for a visit last week, wearing two mobile phones in a leather pouch on the belt of a brand new pair of pleated trousers. That made an impression on Mr Kasiri. When his cousin offered to help him follow suit, he jumped at the chance.

The crowd eases and we walk into the maze of shacks. Mr Kasiri says he must relieve himself but cannot afford to. In the city nothing is free. We come to a cement floor divided into seven stalls, each with a hole. "Is it clean?" asks the customer in front of us. The proprietor, Teresia Ngusye, seated on a stool, handing out tissue paper, says she cleans every hour, pointing down the alley to similar looking shacks. "See the competition I have." She charges us ten shillings (12 cents), which she says will go toward building a second set of toilets. Mr Kasiri nods. Everything in the city is an opportunity. He too might one day like to run such an establishment. In parting, the newly minted city boy hears a warning, "Bowel problems are expensive."

This is Kibera. Often, and probably rightly, described as Africa's biggest slum, it is home to perhaps a million people. Nobody knows for sure, since Kibera is left to its own devices. Government is absent: it offers the residents (regarded as squatters) no services, opens no schools, operates no hospitals, paves no roads, connects no power lines and pumps no water into homes.

And yet Kibera, wedged in between ornate embassies and a well-tended golf course, is an integral part of Nairobi. Its residents live

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in a dozen villages on a piece of land half a mile wide and two miles long, draped like a bath mat on a tub across a slope falling into a man-made lake. Once the slope was wooded and each village had only a few houses. In the past 30 years they have fused to become one of the world's most densely populated places, garnering a measure of first-world notoriety. Kibera features in the film "The Constant Gardener", based on the eponymous John le Carré novel, as well as in a music video by Sarah McLachlan, a Canadian pop singer, representing the epitome of poverty.

Kibera's origins are Western. A century ago British colonial rulers gave small plots of land on the edge of Nairobi to Nubian soldiers serving in the King's African Rifles. They built mud huts below the road leading to the farm of Karen Blixen—made famous in the film "Out of Africa", based on the Danish writer's life. The land was later nationalised but the Nubians stayed put and rented parts of it to newcomers. Today most homes are made of ragged tin and reused timber. Walking in the warren of narrow lanes that divide them, some only shoulder-wide and all of them devoid of cars, one is reminded of a medieval European city.

At seven in the morning Cecilia Achieng leads the children in her school in prayer and song. They chirp like birds; not all have had breakfast. When lessons begin at eight, she inspects a well-thumbed ledger that records who has paid school fees. We don't expel kids who cannot afford class," she insists. They may be asked to rear chickens in the schoolyard and sell the eggs.

Ms Achieng has frizzy hair that forms a tall bulb and is partly dyed red. She wears large silver earrings with a baby-blue two-piece suit. The 36-year-old has given birth to four children, adopted a further two and also looks after a niece. With no public schools to send them to, she started her own four years ago. Other mothers helped her rent an empty church hall and hire teachers. She was soon inundated with children. Asking parents to pay 7,500 shillings (\$87) in annual fees enabled her to move to a bigger hall. Two years later she had saved enough money to erect half a dozen primitive classrooms: cement holds in place sturdy ▶▶

sheets of corrugated iron known as *mabati*. Yellow paint gives them an uncomplicated cheerfulness.

With her charges settled in, Ms Achieng takes a mid-morning stroll. She navigates lanes that look like dry river beds. When it rains, Kibera floods. Open sewers are covered with planks worn smooth by water and constant trampling. Scavengers rake over debris before it is washed downhill. Residents burn the rest, enveloping homes in acrid smoke. Laundry on washing lines is covered in soot.

"This street was much wider a few years ago," says Ms Achieng. Vendors line both sides, selling fresh fruit and vegetables, soap, sweets, cigarettes. They have encroached on what once was a thoroughfare, building stalls ever farther into the throng of customers. The economy is booming and incomes are rising in Kibera. "What's playing?" Ms Achieng asks Tyson Muigai, who rents out a 600W sound system for parties, weddings and wakes, charging 5,000 shillings (\$58) a day. "Happy or sad?"

We pass a shack with a sign saying, "Load music on iPods", and another, "We do not write any local material.". Ms Achieng explains, "They make [counterfeit] copies of Jay-Z or Beyoncé songs, but not of rappers from Kibera. We protect our own." Around the corner John Mwangi runs a cinema with 70 plastic seats, which he fills six times a day. Ms Achieng

marvels at the orange clock face on his gold watch. "I tell you, people have money," he says.

Kibera is a thriving economic machine. Local residents provide most of the goods and services. Tailors are hunched over pedal-powered sewing machines. Accountants and lawyers share trestle tables in open-air offices. Carpenters carve frames for double beds along a railway line. Whole skinned cows hang in spotless butcher shops. "Give me 30 bob," says a customer to a paraffin seller, who has just taken delivery of several jerry cans from a porter with a steel-frame wheelbarrow. All day long, sweaty porters cart supplies along filthy lanes, hissing to shoo people out of the way.

Life in Kibera can be harsh. Disease is rife, food is short for some, and death can come suddenly. Just after eleven o'clock an explosion thunders past the paraffin seller. Lights in the shops along the lane expire instantly, then a mob charges past, accompanied by sharp screams and a sizzling, dancing power cable that has blasted off a faulty transformer overhead. The cable eventually goes limp and the crowd disperses. Minutes later the lights come back.

The transformer, like all power in Kibera, is run by shady types who tap into the city grid. They are less than scrupulous when it comes to safety and they charge heavily. But at least Kibera has power, unlike many other parts of Africa. Soft drinks sold in shops are

chilled. Rooftops are awash with TV aerials and mobile phones are as ubiquitous as in the West.

The key to making it in Kibera is access to capital. A market of one million potential customers crowds in on entrepreneurs, but raising the money to start a business is hard. Most banks won't lend to them because they have no collateral, perhaps not even a fixed address. Those who manage to borrow face high interest rates. Moses Mwegu pays 25% a year and considers himself lucky. Over the years he has built up a cosmetics shop selling creams, wigs and shampoos. The bank recently accepted his stock, a television set and a second-hand sofa, including lace doilies, as collateral. He got 350,000 shillings (\$4,000) to expand his business.

But first the 53-year-old had to join a savers club—a cross between a support group and a control organ. Late in the morning Mr Mwegu sets off to attend the group's weekly meeting, wearing black shoes as polished as his bare forehead. His skin is smooth and his hands shiny, proud testament to his choice of products, he says. He joins a dozen men and women in a dank shack to receive instructions on record-keeping. Then they inspect each other's books—no secrets. Mr Mwegu takes in 15,000 to 20,000 shillings a week and pays 7,000 shillings to the bank. He will be done in 15 ▶▶



months. "Then I will get a proper loan," he says.

After the meeting we have lunch at the Katulani café, a bare room with an anaemic roof that lets in daylight and fresh air. Guests sit on wooden benches and talk over each other. Most are penniless students who call this "the campus". Boniface Ngewa, the owner, serves chapati bread and *sukuma wiki*, a leafy vegetable whose name translates as "push the week", which is how long it is said to last. He goes through 100lb of flour a day, serving 3,000 customers.

In Kibera everyone eats out, Mr Ngewa says. Home-cooking is a luxury. The poor have no capital and cannot buy food in bulk. A single portion of charcoal to cook a meal costs at least 20 shillings (23 cents). Employing cooks, on the other hand, is cheap (300 shillings a day) and café prices are low. Mr Ngewa charges 30 shillings for a meal. An hour later when we leave the café, as if to prove his point, the lane outside resembles a food court: countless stalls have fired up pots and pans; vendors fan grills laden with *nyama choma* (cooked meat) and throw potatoes into roiling fat.

In the afternoon, school is out and Ms Achieng turns to her second career. She is in the food business too, but as a caterer. She regularly cooks for private functions attended by 500 people, and has served as many as 1,600. "Funerals are a good business," she says. Couples getting married are too picky. They do not want plastic plates and Ms Achieng cannot yet afford to buy her own ceramic ones. "I have bid for a few weddings but didn't win the tender."

Kibera may be the most entrepreneurial place on the planet. Residents have no choice but to look after themselves. If they want to escape poverty—and have the necessary drive—they will try to strike out on their own. Ms Achieng has a third career as a hairdresser. When she has a free moment she goes from door-to-door and braids, earning 250 shillings (\$3) in two hours. Regular clients call on her by mobile phone. At the annual Miss Kibera beauty pageant she is the lead stylist.

Does Mr Kasiri, the new arrival, have what she has? He finally finds his cousin after wandering the dusty lanes for hours. Kibera is bigger and denser than he had imagined. Every speck is in use. Residents have started building second storeys to expand upwards. In the Nubian language, *kibera* means forest, but there are no trees left.

The country boy stands at an intersection and looks left and right and left again. His cousin has arranged for him to meet a man about a job. But where is he? Mr Kasiri looks tired. His luxuriant hair is covered with flakes of ash from a rubbish fire. At least he no longer waits for crowds to thin; he plunges straight in and gropes his way past wheelbarrow porters, careful to jump out of the way when their sharp-edged carts swivel around. Talking about jobs he would like to do, a note of excitement creeps into his voice. "I could repair stoves. I saw a man do that," he says. His cousin



There is no free education, children often have to work to help pay for school fees

whistles and shakes his head. "Where will you get tools? Who will pay for them?"

Around six in the evening Kibera fills up to bursting point. The tents, or perhaps hundreds, of thousands who left in the morning for faraway offices and factories are returning. To save money, prim secretaries and exhausted labourers walk back rather than take a bus. Their wages are meagre and yet in compound several million dollars walk into the slum every night.

Kibera is an African version of a Chinese boomtown, an advertisement for solid human ambition. Like Guangzhou and Xiamen, it acts as a magnet for talent from rural areas, attracting the most determined among young farmers. To equate slums with idleness and

misery is to misunderstand them. Two out of three Nairobians live in one, half of them in Kibera. Officials occasionally try to evict squatter-residents but many fight back, with the help of Muungano wa Wanavijiji, their own lobby group. In "Shadow Cities", a book that describes a tour of slums across the globe, Robert Neuwirth recalls that New York's Upper East Side was once a shantytown and suggests that all bright shining cities start as mud. Slums are far from hopeless places; many are not where economic losers end up, but rather reservoirs of tomorrow's winners.

The pace of commerce on Kibera's streets picks up with the setting sun. Jane Nzemi sells cereals to mothers cooking dinner; she holds cobs of corn with both hands and ▶▶

twists them in opposite directions to strip off the husks. Ruth Chesi refills buckets of charcoal as soon as they are empty. Carolina Awuor's electric maize mill—rented for 15,000 shillings (\$175) a month—runs nonstop to make flour for ugali buns.

When the vendors eventually close down around eight o'clock they deliver their cash receipts to nearby mobile-phone stores. Kenyan phone companies double up as banks; they take deposits and transfer funds. After decades of being excluded from banking, slum-dwellers now move their money fast and often; they no longer keep it under a mattress.

Mr Mwega, the cosmetics man who took out a loan, closes his store at nine, having eaten already at his counter. Through a curtain he slips into his windowless living room at the back of his streetside shack. An electric Christmas tree is perched on a stereo. He removes his polished shoes and rests them on a low table. He is halfway through reading "The Last Don" by Mario Puzo but says he prefers the thrillers of James Patterson. He keeps a thick dictionary by his side.

The room is immaculate, as are those of many neighbours. Kibera only looks like a slum from the outside. Mr Mwega's wife fetches water from a privately run street tap, paying a few shillings to fill a 20-litre jerry can, and does the washing up. Mr Mwega says in the wealthy parts of Nairobi the residents get municipal water and pay a tenth of what it costs here. "But still I'm not moving. My friends and my business are here."

The evening is reserved for leisure, and leisure is good business. Barber chairs are never empty more than a few seconds. Ogola Simenon, whose salon is five feet high and about as wide, calls this the rush hour. Customers keep coming through his diminutive door. "Pray, why not in daytime?" He charges about 40 shillings (46 cents) to snip, shear, crop and clip. Economists define the African middle class as people earning at least \$100 a month—that is many of his customers. They have a little money left over after paying for food, rent and school fees.

All manner of paid entertainment is available in Kibera. Some residents drink *changaa*, a moonshine made in backyard stills. Blindness is one of the lesser side effects. One step up is *busaa*, a fermented maize drink made on site in bars like Mama Sarah's. The bar uses half-litre tin cans instead of glasses to serve customers. Many are cost conscious, says a waiter, John Wasilwa. When the price of maize goes up the bar owner cuts a strip of tin from the top of each can. The punters prefer that to higher prices. And it does not seem to slow their consumption. Around ten o'clock several of them have bedded down blearily on the mud floor next to a plastic sheet filled with roasted maize. Others throw empty tin cans at waiters. Mr Wasilwa fires them back.

Better-off residents congregate at beer taverns with cement floors and cushioned seats. The aspirationally named Pentagon features a

large poster of Barack Obama, celebrating his Kenyan origins. Talk is of politics and sport. This could be almost anywhere. One group of patrons is drinking draft beer and debating why *busaa* joints are so rowdy. Often those people have not eaten, says one. "Straight to their head," crows a carpenter with more than a hint of superiority.

During the day, Kibera is a rough place but a safe one. Guns are rare. No tolls are charged, no protection fees paid. Most of its markets are free of cartels. The slum is so vast and diverse that no ethnic group dominates it. But what is a virtue during the day turns into a danger at night. With nobody ruling the roost, muggers and thieves have a free rein. Some residents have installed metal gates at the entrances to their alleys and lock them at midnight.

Leaving the Pentagon, your correspondent is persuaded by concerned patrons to hire a watchman as an escort. He is summoned by mobile phone and turns up in minutes, dressed in red-and-white beads and a red cloth and carrying a spear and a torch. Most watchmen in Kibera are Masai. They have a reputation for fearlessness and loyalty—for which they are paid 50 shillings (58 cents).

Walking through empty streets we hear music doodling behind thin walls. Life happens indoors now. Most people are too scared to even visit a public toilet at night. Those who need to instead use a plastic bag at home and throw it over a wall. This is known as a "flying toilet". Anyone out walking late is advised to look up as well as down.

We bump into Edith Nyawate, a vegetable seller escorted by another Masai watchman. She sets off to the wholesale market in the city centre every night around this time to buy produce when it opens and bring it back to Kibera at daybreak. She is tired, she says, but does not want a daytime job in a factory. "Maybe they pay you 50 bob but that's not enough for school fees."

Slum business runs around the clock. An electrical workshop is finishing a rush order at three o'clock. A lone baker's face is illuminated by the earthy glow of his cavernous wood-fired oven. A tithe-hunting preacher, Augustus Omiti, is holding an all-night vigil at a shack church with a sturdy gate. His congregation is locked in until morning, singing and dancing—for their own safety, he cackles. They have nowhere to sit because he has rented out the church's plastic chairs for 1,000 shillings (\$12) to a wedding that is taking place nearby. Nonetheless he has high hopes his flock will donate generously.

The Masai watchman, who alone among residents refuses to divulge his name, takes your correspondent to where many of his nightly journeys end. We knock on the door of the Stage Inn, a spot for revellers to bed down for a few hours—for 300 shillings (\$3.50). A dimly lit corridor bordered by sheet-metal walls leads to two dozen rooms with sagging beds, many of them unmade and recently vacated. Who would depart at this hour? The

Masai and a hotel porter exchange glances. A young woman in a light dress passes us on the way to the communal washroom.

Emmanuel Mukhoa, the 35-year-old porter, hears a knock on the front door and walks over to a peephole, then opens up and hands a room key tied to a black shingle to a drunk, older businessman with a girl in tow. "I know most of the guests. They come at all times," he says, and adds wistfully, "wish I was one."

Mr Mukhoa is a rarity, a salaried worker employed within the slum. He is paid 5,000 shillings (\$60) a month. His hours are long but regular, his financial risk minimal, yet he dreams of running a business, like his guests.

The new day in the slum starts by five o'clock. Alarms echo down dark streets, drowning out what little music is left from the night. Ms Achieng rouses herself and then the brood of children that surrounds her on the floor, washes them and erects her frizzy dome of red and black hair. She can afford to feed her children but mornings are always chaotic and some of the older ones miss breakfast.

Heading to school, they join the ranks of workers walking to one of Kibera's eight exits and on to jobs in Nairobi proper where buildings rise higher than just one or two floors. The shoving and jostling resumes. The lanes are bursting with people by six, all heading in one direction. Among them is Mr Kasiri, the new arrival. He has been promised work on a construction site and is following a foreman through a world that has yet to fully reveal itself to him.

Mr Kasiri is amazed that among the people surrounding him is not one face he recognises, not one man who would lend him a few bob. Yet nor would any of them tell on him if he spent his wage on a bottle of *changaa* and got drunk tonight after his shift. They do not care. There are just so many of them squeezing through the gate; they crowd in as if celebrating a festival, yet few talk to each other or even look up. They are not unhappy, at least most of them are not. They have jobs to do and things to buy. Last night he talked to a man who sells stoves and learned that broken ones are cheap and easy to repair. Soon he will try his hand. He finds the idea of going back to the village hard to imagine. ■

Kenya's slum dwellers

Tangles over tenure

Reprinted from The Economist, Sep 22nd 2012

Deciding who owns shantytowns would help their residents

EVANS OMONDI JACK was born 60 years ago in a labour camp in Nairobi, Kenya's capital, a precursor to a present-day slum known ▶▶

as Mukuru kwa Reuben. It was named after a British veteran of the second world war who got the land from colonial authorities. After Kenya's independence in 1964, ownership passed to the state and was eventually parcelled out, often in return for political favours, to wealthy or well-connected individuals. Since then Mr Omondi has been forcibly evicted from his birthplace on four occasions. Each time he returned and rebuilt.

Descendants of the original Reuben work-camp residents, augmented by new arrivals, number more than 100,000 today. They make up part of Nairobi's 2.5m slum dwellers, some 90% of whom have no rights to the land on which they live. Mr Omondi, with the help of a local NGO, Muungano wa Wanavijiji, has launched a legal bid to unravel the area's murky ownership and expose dodgy titles. His petition names some of Kenya's most powerful people.

Paul Muite, the plaintiffs' lawyer, says a coming court battle could establish an "explosive precedent" in a city where two-thirds of the population lives on less than 2% of the land, typically in ten-foot by ten-foot shacks. Under Kenyan law the land at issue should have been sold at public auction and then developed within two years or handed back to the state.

The petitioners argue that in Mukuru both laws were ignored. Some owners held on to the land for decades, using it as collateral for loans; others sold it on the sly. Undeveloped land was often rented by new arrivals, for whom developers, locally known as "slumlords", built shanties.

Nairobi is now home to nearly 4m people—and some of the sharpest inequalities in Africa. Leafy suburbs like Muthaiga, near the UN's regional head office, have one household per acre compared with an average of 318 in slum areas.

Shantytowns are the norm in Africa's big cities. World Bank research suggests that legal tangles over land tenure hobble efforts to upgrade them. Only where residents have secure tenure will they invest in their homes. The Mukuru petition, if it succeeds, could make a huge difference. ■

Property in Mumbai

The minimum city

Reprinted from The Economist, Jun 9th 2012

Is the world's weirdest property market strangling the city that hosts it?

IN THE minds of Mumbai residents, whether they sleep on streets or silk sheets, property developers loom large. In films and novels, skyscraper-erecting baddies bring wealth and renewal—and often misery and violence. Yet in reality, buildings do not loom as large as you might think in Mumbai.

Take the view from one of the towers clustered in midtown, owned by Abhishek Lodha, a razor-sharp American-educated tycoon making billion-dollar bets on transforming the city. The odd skyscraper erupts out of low-rise clutter. There are pockets of tall buildings on old mill land and along the city's west coast. But much of Mumbai—supposedly a rival to Hong Kong, London and New York—looks flat and knackered. To the east the vista is of derelict factories, rotting low-rise rent-controlled buildings and the odd slum. To the south lies the ossifying old city centre, with its ageing port, colonial showpieces and Soviet-style offices and bureaucrats' flats. The nearest green spaces are a racecourse and a club on whose ample lawn members feed stray dogs buttered toast.

Mumbai has perhaps the most extreme statistics of any metropolis. Its land mass is small, stuck like a crooked blade into the Arabian Sea. It has poor transport links, so people who work in the city live near it. That in turn means it has the highest population density of any big city. But it is also low-rise. Panama City has a taller skyline.

The result is tiny living spaces of 4.5 square metres (48 square feet) per person, compared with 34 square metres in Shanghai. And prices are high. Mid-town flats cost \$1m-3m. The average price of a 1,000-square-foot pad in the city is perhaps \$250,000, or 90 times GDP per head.

With flats out of reach, the share of people in slums has risen to perhaps 60%, compared with 20% in Rio de Janeiro and Delhi. Of the rest, about half live in rent-controlled digs, sometimes propped up by wooden staves, or flats for public-sector employees.

Other cities confined by the sea, from New York to Hong Kong, have soared upwards. Many think Mumbai has had an epic building boom. There has been dense activity on old mill land and in some suburbs where rules are laxer. But the city has 31 buildings over 100 metres high, versus more than 200 in Shanghai and more than 500 in Hong Kong and New York. Perhaps \$10 billion-20 billion has been spent on land and building in the past decade, not much given that the population has risen to 12m. At the current rate it will take over six decades to build everyone a home.

Much of the building has targeted the well-off with often magnificent complexes. But are there enough wealthy people? "It's hard to find homeless millionaires," says a developer. At the current pace of sales it would take three years to clear the stock of 28,000-odd unsold flats in the city which are complete or being built, according to Ashutosh Limaye, of Jones Lang LaSalle, a property-services firm. Pankaj Kapoor, of Liases Foras, a research firm, puts the figures at 38,000 and four years.

So inefficient and cartelised is the market that prices are still rising, despite the overhang, a weak economy and the debt troubles of some builders. (Listed Indian firms which make public their accounts, and are about a fifth of the industry, are often in poor shape.) One builder, from his private drinking den in the city's north, is full of foreboding about his trade. "All the bad karma is coming back. All the Porsches and Lamborghinis, all the bodyguards and security details; it's all coming back."



Flat-packing humans

Three things explain Mumbai's predicament: regulations, financing and graft. The city, reckons Edward Glaeser of Harvard University, has "some of the most extreme land-use restrictions in the developing world", designed to deter new migrants but which have backfired. In ▶▶



So who's the real owner?



much of the city the ratio of a new building's floor space to the plot it is built on is capped at 1.3 times (compared with over five times in New York and Hong Kong). Rules inhibit new construction near the coast. Because of the thicket of red tape and litigation, only 3% of 15,000 rent-controlled buildings have been redeveloped, says Subodh Kumar, who retired as Mumbai's top official in April. Bits of idle land, including the old port, lie stranded because of vested interests. Rare free plots can command staggering prices.

Finance also plays a role. Mortgages are common but banks cannot fund land purchases. Developers finance construction by forcing customers to pay upfront, often without redress if the project stalls. The industry says it has cleaned up its act and attracted institutional investors. Still, it is not unusual to make an under-the-table cash payment of at least 20% in addition to the stated price. The limited role of banks protects financial stability, but has other costs. If builders are nervous about demand or short of cash, they can halt construction, having already got customers' cash. And non-bank finance is not always kosher. One fraud expert reckons 80% of money-laundering in India uses property.

In Navi (or "New") Mumbai, across the bay from the city, lots of newish flats have empty balconies and no air-conditioning units—clues they are vacant. Local agents say they are

held as investments. Without banks breathing down their necks, developers and owners sit on empty flats, rather than cut prices; this is a housing market where more borrowing might be helpful. And if illicit money is involved, there is little impulse to sell since the only thing it can easily be recycled into is more real estate.

Corruption adds a final twist. Many firms say times have changed and things are above board. But it is clear that some builders still bribe officials and politicians. The prizes range from being allowed bigger balconies to the support of politicians with "vote banks" in slums being redeveloped. Mr Kumar tried to clean things up after finding that "builders and architects worked the system". Another official says, "politicians and all kinds of manipulators are made sleeping partners" in projects. One boss says the height rules are "the biggest mafia scam in India" and are a vital source of funding for political parties.

The only way is up

The textbook solution for Mumbai is better transport and many more high-rises, to increase the supply of flats and lower prices. It might help if the city had more political autonomy, as Delhi does. (At the moment Mumbai is part of Maharashtra, a giant, partly rural state.) That is some way off. Still, there are rays of hope. The first overhead metro line, in the north of the city, and a short stretch of monorail

running north-to-south, should open in a couple of years. Ajay Piramal, who began the redevelopment of mill land two decades ago and who is re-entering the industry, says graft has fallen since Mr Kumar's crackdown. Officials say they are trying to spur pockets of redevelopment. And a new national property regulator is in the works.

Yet, says P.K. Das, an urban planner, the system is just too rotten to allow a Hong Kong-style building frenzy. The industry is "feudal", has "subverted" the law and may need to be nationalised. While the city needs more skyscrapers, an unregulated building spree would be counterproductive unless the state gets cleaner, and better at planning and providing infrastructure such as roads, sewage and water. Already many feel the city is falling behind Delhi and Bangalore.

Great cities are not built by prudes—New York had its share of crooks and fat cats once. But Mumbai is already four times more populous than New York in 1900, and is in a hurry. The conspiracy theory, held by the man on the street and captains of industry, is that transport projects are delayed and arcane rules survive because a small elite finds the status quo lucrative, even while the city's development is strangled. If Mumbai is to become a global hub and offer more people a decent life, its politicians, officials and builders must prove the conspiracy theory wrong. ■



France's troubled suburbs

Forgotten in the banlieues

Reprinted from The Economist, Feb 23rd 2013

Young, diverse and unemployed

WHEN the director of a job centre organised a visit to the Louvre for unemployed youngsters, she knew it would be a rare event. Sevrans is one of France's poorest places, north-east of the Paris *périphérique*. The jobless rate is 18%, and over 40% among the young. Yet the director was taken aback by how exceptional the visit proved. Of the 40 locals who made the 32km (20-mile) trip, 15 had never left Sevrans, and 35 had never seen a museum.

Sevrans is one of France's 717 "sensitive urban zones", most of them in the *banlieues*. In such places unemployment is over twice the national rate. More than half the residents are of foreign origin, chiefly Algerian, Moroccan and sub-Saharan African. Three-quarters live in subsidised housing; 36% are below the poverty line, three times the national average.

In 2005, after three weeks of rioting that ended in a government-imposed state of emergency, there was talk of a "Marshall plan" for the *banlieues*. Over €44 billion (\$55 billion) was set aside in a nine-year programme. Tower blocks have been blown up in clouds of dust and replaced with lower-rise buildings lined with freshly planted saplings. Jean-Marc Ayrault, the prime minister, has just visited Clichy-sous-Bois, to the east of Paris, where the riots began, to say "we can no longer accept that areas feel abandoned". He announced another, 27-point plan, but no more cash.

For all the schemes and money, the *banlieues* are a world apart. From 2008 to 2011 the gap widened between unemployment rates in "sensitive urban zones" and in surrounding areas. Schools have a high turnover of often-

inexperienced teachers, gaining merit by doing time in the *banlieues*. Job centres are understaffed. The unemployed say their postcode stigmatises them. Drug dealers compete with careers advisers to recruit teenagers. "Here, drug trafficking has always helped circulate money," says Stéphane Gatignon, Sevrans's Green mayor. "It's how people scrape by, despite the crisis."

Last year Mr Gatignon took his troubles to parliament, literally: he planted his tent outside the building to stage a hunger strike meant to extract more subsidies for Sevrans and other places. He got an extra €5m. He is a keen promoter, against the odds, of his town's virtues. He argues that Sevrans's youthful multicultural vitality is its greatest asset, and hopes it can be channelled into entrepreneurship. Qataris are investing in businesses in the *banlieues*, he says, because the French will not. He does not place much hope in grand plans devised by bureaucrats on high.

The sense of isolation in a place like Sevrans is social as much as physical. Too many teenagers grow up with little connection to the world of work. Manuel Valls, the interior minister, who cut his teeth as mayor of the multicultural *banlieue* of Evry, talks of de facto "apartheid" in France. Over 70 different nationalities, and many faiths, crowd into Sevrans; new migrants from Africa's poorest corners are joined by more recent arrivals from Spain and Italy. Even today in France, according to new research by Yann Algan and colleagues at Sciences-Po university, somebody called Mohamed, Ali or Kamel is four times more likely to be unemployed than

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somebody named Philippe or Alain.

Sevrans's disconnection is rich in paradox. The town has good railway links, yet Paris feels a world away. At the dimly lit Sevrans-Beaudottes station, where the halal butcher and Rotisserie Couscous trade beneath advertising for Vita Malt African bottled drinks, fast trains tear through, carrying travellers from the airport direct to Paris. "We have to wait for the slow trains that stop at the stations in-between," says a woman from Sevrans who commutes to the airport for work each day. "There's too much theft here, and they want to keep the tourists away." ■

Factory women

Girl power

Reprinted from The Economist, May 11th 2013

As the supply of female factory-workers dwindles, blue-collar women gain clout

SITTING around a restaurant table, six workers discuss the progress of their labour action. Five of them are women, as are most of their several hundred colleagues who have been occupying the toy factory since mid-April. They have been sleeping on floors, braving rats and mosquitoes, to stop the owner shutting down the factory without giving them fair compensation. Those at the table are all migrants from the countryside. A couple are tearful. All are angry and determined not to give way.

In Guangdong province, where nearly 30% of China's exports are made, women usually far outnumber men on labour-intensive production lines such as those at the toy factory in the city of Shenzhen, next to Hong Kong. Rural women are hired for their supposed docility, nimble fingers and attention to mind-numbing detail.

But in recent years Guangdong's workforce has changed. The supply of cheap unskilled labour, once seemingly limitless, has started to dry up. Factory bosses are now all but begging their female workers to remain. At the same ►►

time the women who have migrated to the factory towns have become better-educated and more aware of their rights. In labour-intensive factories, stereotypes of female passivity are beginning to break down.

Over the past three decades the migration of tens of millions of women from the countryside to factories in Guangdong and other coastal provinces has helped to transform the worldview of an especially downtrodden sector of Chinese society (the suicide rate among rural women is far higher than for rural men). Conditions in the factories have often been harsh—poor safety, illegally long working hours, cramped accommodation, few breaks and little leave—but for many it has also been liberating and empowering, both personally and financially. Leslie Chang, an American journalist, spent three years reporting on women workers in Dongguan, a city near Shenzhen. In her 2008 book “Factory Girls” Ms Chang wrote that, compared with men, the women she encountered were “more motivated to improve themselves and more likely to value migration for its life-changing possibilities.”

They are still not as well-educated as men (about a year less in school on average, with most having only primary- or junior secondary-school education). But the gap has been narrowing.

Crucially, China’s changing demography has been shifting in their favour. Labour shortages that began to hit low-skilled manufacturing in the second half of the past decade have driven up wages and forced factories to improve working conditions. Once all but unthinkable (for both sexes), strikes have become increasingly common. Anecdotally at least, women appear as likely to take part as men.

Strikes in 2010 affecting factories in Guangdong owned by Honda, a Japanese car firm, helped to galvanise labour activism. One of them occurred in the city of Zhongshan, where the workers were mostly female. The unrest there resulted in pay concessions and set a precedent for collective bargaining led by representatives chosen by the workers

themselves, rather than government-controlled trade unions. At the Shenzhen toy factory, the workers have chosen five representatives to negotiate with management. Three of them are women. A male worker says the women are more aware of their rights.

China Labour Bulletin, a Hong Kong-based NGO, reported on March 19th that about a fifth of strikes in Guangdong since the beginning of the year had been in factories and other workplaces with largely female staff. It said that women were also “some of the most active workers posting information online about strikes and protests, and in seeking out legal assistance for problems at work.” The protesting toy-workers offer evidence of this. They have posted photographs on microblogs of protesting female workers clad in red jackets opposite lines of police. One of their slogans reads: “Bad boss—give us back our youth”.

Wiggle room for NGOs

Guangdong is a little more forgiving of protest than many other parts of the country, but still not that tolerant. In July the authorities relaxed controls on the registration of NGOs. But those involved in labour issues rarely get official approval, apparently because of fears that they might help organise strikes. Only a handful of such groups in the province is openly engaged in work to help the female labour force. The leader of one, who asked that she and her organisation not be named, is herself a former migrant worker. She and a few dozen volunteers (mostly women from factories) give advice on collective bargaining. They recently helped some 60 female workers at a jewellery factory secure better severance pay. Negotiations took just a week. She says it would have been “very difficult” to achieve that through government channels.

In the coming years Guangdong’s industrial transformation is likely to even out the sex ratio in some cities where it has been skewed towards women. In the township where the NGO works, there are about 30,000 female

workers and few men. But the group’s leader says this is changing fast as labour-intensive manufacturing moves out and gives way to an emerging logistics hub. Dongguan, a city once highly unusual in China for having many more women than men, had a male majority by 2010.

So desperate have some factories become for cheap labour that they are allowing men to work on production lines once exclusively reserved for women. But this does not mean China’s factory women are giving up and going home. The toy workers, many of them in their 30s or 40s, who have been working at the factory since it opened some 20 years ago, are typical of their generation of migrants. They have become urban and their children know nothing else. “We can’t plant fields now”, says one. No, agrees another, “We can’t go back”. ■

Poverty and food

The nutrition puzzle

Reprinted from The Economist, Feb 18th 2012

Why do so many people in poor countries eat so badly—and what can be done about it?

IN ELDORADO, one of São Paulo’s poorest and most misleadingly named *favelas*, some eight-year-old boys are playing football on a patch of ground once better known for drug gangs and hunger. Although they look the picture of health, they are not. After the match they gather around a sack of bananas beside the pitch.

“At school, the kids get a full meal every day,” explains Jonathan Hannay, the secretary-general of Children at Risk Foundation, a local charity. “But in the holidays they come to us without breakfast or lunch so we give them bananas. They are filling, cheap, and they stimulate the brain.” Malnutrition used to be pervasive and invisible in Eldorado. Now there is less of it and, equally important, it is no longer hidden. “It has become more visible—so people are doing something about it.”

If Eldorado’s slum children today eat better, it is partly thanks to José Graziano da Silva. He ran Brazil’s *Fome Zero* (zero hunger) campaign, a policy that has helped to cut hunger by more than a third in Latin America’s largest country. Now Mr Graziano wants to apply the lessons he has learned more widely: he recently took over as head of the United Nations’ Food and Agriculture Organisation (FAO). And he stands a better chance of success than his predecessors. His appointment coincides with a shift in the world’s approach to fighting hunger.

Governments around the world are paying increasing attention to nutrition. In 2010 donors, charities and companies drew up a how-to policy guide called SUN (which stands for scale up nutrition). Britain’s Department for ▶▶



International Development and other aid agencies are devoting more of their money to nutritional projects. The World Bank has nailed its colours to the mast with a book called "Repositioning Nutrition as Central to Development". Save the Children, an international charity, talks about "galvanising political leadership" behind the effort. Underlying all this is a change in thinking about how best to improve nutrition, with less stress on providing extra calories and food and more on improving nutrition by supplying micro-nutrients such as iron and vitamins.

A damning record

In the 1960s and 1970s, ending hunger and malnutrition seemed relatively simple: you grew more crops. If the harvest failed, rich countries sent food aid. But the Ethiopian famine of 1984 undermined this approach. Here was a disaster of biblical proportions in a country where food was available. It was a reminder of what an Indian economist, Amartya Sen, had long taught: what really matters with food is not the overall supply, but individual access.

So in the 1990s and early 2000s the emphasis switched to helping people obtain food. This meant reducing poverty and making agricultural markets more efficient. Between 1990 and 2005 the number of people living on less than \$1 a day in poor countries (at 2005 purchasing-power parity) fell by a third to 879m, or from 24.9% of the total population to 18.6%.

Yet the food-price spike of 2007-08 showed that this approach also had limitations. Prices of many staple crops doubled in a year; millions went hungry. The world remains bad at fighting hunger. Experts argue about exactly how many people are affected, but the number has probably held flat at just below 1 billion since 1990.

Even where there is enough food, people do not seem healthier. On top of 1 billion without enough calories, another 1 billion are malnourished in the sense that they lack micro-nutrients (this is often called "hidden hunger"). And a further 1 billion are malnourished in the sense that they eat too much and are



obese. It is a damning record: out of the world population of 7 billion, 3 billion eat too little, too unhealthily, or too much.

Malnutrition is attracting attention now because the damage it does has only recently begun to sink in. The misery of lacking calories—bloating bellies, wasted limbs, the lethargy of famine—is easy to spot. So are the disastrous effects of obesity. By contrast, the ravages of inadequate nutrition are veiled, but no less dreadful.

More than 160m children in developing countries suffer from a lack of vitamin A; 1m die because they have weak immune systems and 500,000 go blind each year. Iron deficiency causes anaemia, which affects almost half of poor-country children and over 500m women, killing more than 60,000 of them each year in pregnancy. Iodine deficiency—easily cured by adding the stuff to salt—causes 18m babies each year to be born with mental impairments.

Malnutrition is associated with over a third of children's deaths and is the single most important risk factor in many diseases (see chart). A third of all children in the world are underweight or stunted (too short for their age), the classic symptoms of malnourishment.

The damage malnutrition does in the first 1,000 days of life is also irreversible. According to research published in *The Lancet*, a medical journal, malnourished children are less likely (all things being equal) to go to school, less likely to stay there, and more likely to struggle academically. They earn less than their better-fed peers over their lifetimes, marry poorer spouses and die earlier.

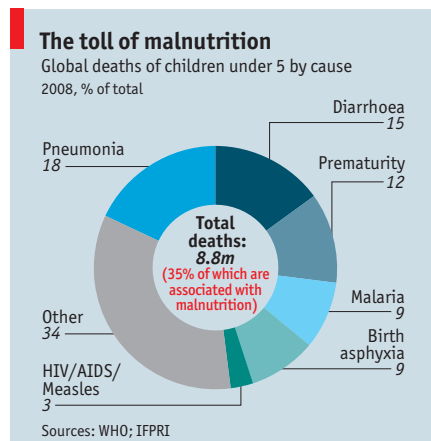
Paradoxically, malnutrition can also cause obesity later in life. In the womb and during the first couple of years, the body adjusts to a poor diet by squirrelling away whatever it can as fat (an energy reserve). It never loses its acquired metabolism. This explains the astronomical obesity rates in countries that have switched from poor to middle-income status. In Mexico,

for instance, obesity was almost unknown in 1980. Now 30% of Mexican adults are clinically obese and 70% are overweight. These are among the highest rates in the world, almost as bad as in America. India has an obesity epidemic in cities, as people eat more processed food and adopt more sedentary lifestyles. And with obesity will come new diseases such as diabetes and heart disease—as if India did not have enough diseases to worry about.

Nutrition is also attracting attention because of some puzzling failures. In a few big countries, notably India and Egypt, malnutrition is much higher than either economic growth or improvements in farming would suggest it should be. India's income per head grew more than fourfold between 1990 and 2010; yet the proportion of underweight children fell by only around a quarter. By contrast, Bangladesh is half as rich as India and its income per head rose only threefold during the same period; yet its share of underweight children dropped by a third and is now below India's. Egypt's agricultural value-added per person rose more than 20% in 1990-2007. Yet both malnutrition and obesity rose—an extremely unusual combination.

The good news is that better nutrition can be a stunningly good investment. Fixing micro-nutrient deficiencies is cheap. Vitamin supplements cost next to nothing and bring lifelong benefits. Every dollar spent promoting breastfeeding in hospitals yields returns of between \$5-67. And every dollar spent giving pregnant women extra iron generates between \$6-14. Nothing else in development policy has such high returns on investment. In 2008, as part of a project called the Copenhagen consensus, eight prize-winning economists listed the projects they thought would do most good (they had an imaginary \$75 billion to spend). Half their proposed projects involved nutrition.

If malnutrition does so much damage and the actions against it are cheap and effective, ►►



why is the affliction only now being taken seriously? Some countries have successfully tackled it. Brazil cut the number of underweight people by 0.7% a year between 1986 and 1996 and reduced stunting by 1.9% a year. Bangladesh reduced both rates by 2% a year in 1994-2005.

But in many countries the problem of “hidden hunger” is hidden from victims themselves, so there is no pressure for change. If everyone in a village is undernourished, poor nutrition becomes the norm and everyone accepts it. This may also explain the reluctance of poor, ill-fed people to spend extra money on food, preferring instead to buy such things as televisions or a fancy wedding. When asked about his spending choices, an ill-fed Moroccan farmer told Abhijit Banerjee and Esther Duflo of the Poverty Action Laboratory, a think-tank: “Oh, but television is more important than food.”

Education can help change attitudes by persuading people they would benefit from a better (if more expensive) diet. But people in rich countries consume vast quantities of junk food knowing full well that it is bad for them. It is unrealistic to expect consumers in poor countries to behave differently. Hence the idea of doing good by stealth.

Just push all the buttons at once

HarvestPlus, a research group, breeds staple crops with extra nutrients and distributes the “bio-fortified” seeds. It released a vitamin A-rich cassava in Nigeria in 2011. This year it will bring vitamin A-rich maize (corn) to Zambia and iron-rich beans and pearl millet to Rwanda

and India. Companies do something similar with processed foods: Kraft’s Biskuat biscuits (sold in Indonesia) have nine vitamins and six minerals added.

But education or fortified foods alone will not overcome the most intractable barrier to better nutrition, which is the sheer complexity of the task. Some problems of development are relatively straightforward. You can improve education by building schools and paying teachers. Nutrition is not like that.

In many countries nutritional standards vary according to the season. Often both the amount and quality of food drop alarmingly in the months before the main harvest. Nutrition varies also within households. Mothers eat less in bad times to leave more for their older children, which harms the suckling child. Culture adds to the problem. In rural Bangladesh an attempt to improve nutrition by educating young mothers backfired, because the family diet turns out to be determined not by mothers, but by mothers-in-law.

And nutrition can also be improved in all sorts of ways, including by better sanitation, which reduces intestinal diseases and enables people to absorb more nutrients; by investing in smallholder farming, to increase dietary variety; by vaccinating children against diseases; by educating women to breastfeed babies for longer, to improve immunity. Marie Ruel, of the International Food Policy Research Institute in Washington, DC, ticks off some of the tasks: focus on the first 1,000 days of life (including pregnancy); scale up maternal-

health programmes and the teaching of good feeding practices; concentrate on the poor; measure and monitor the problem.

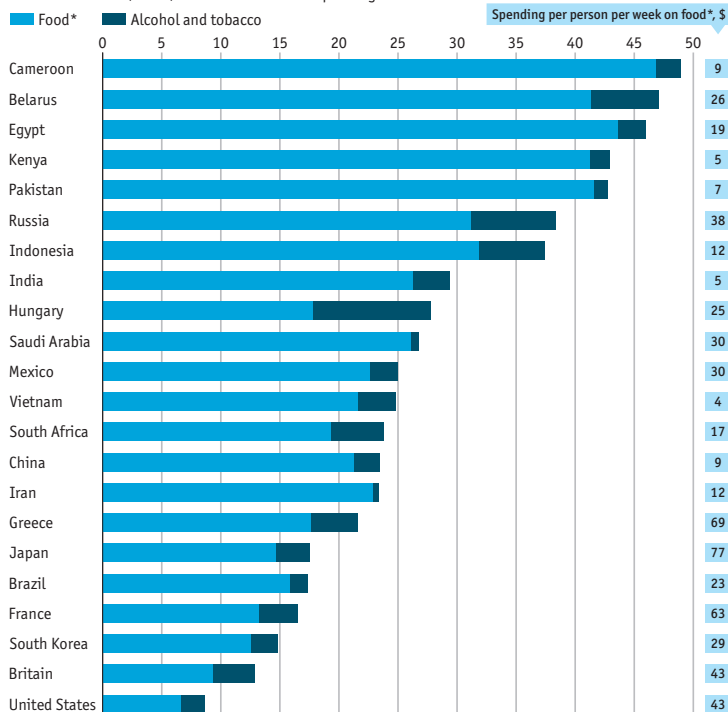
All this implies that a successful effort to improve nutrition has to push all the buttons at once. Brazil’s *Fome Zero* has 90 separate programmes run by 19 ministries. It embraces everything from a conditional cash-transfer scheme, called Bolsa Família, to irrigation projects and help for smallholders. Such an effort is hard to organise and cannot work unless politicians support it. “Malnutrition reduction needs powerful champions who know how to get things done across government, avoid gobbledegook and finish the story,” says Lawrence Haddad, director of Britain’s Institute of Development Studies.

Hence the importance of Mr Graziano, the FAO’s new boss. Interest in improving nutrition is growing; so is alarm at the failures of fighting malnutrition so far. He will not find it easy to cajole more countries into a large, broad-based effort. Governments are reluctant to change and want clear evidence. And just as the damage from malnutrition builds up over a lifetime, so better nutrition reveals its benefits only over many years, as well-fed mothers pass on good health to well-fed children.

At a recent FAO conference someone was heard to remark that “at the moment nutritionists are in a position similar to environmentalists in the 1990s.” That is depressing, because it means progress will be slow; but it is encouraging, because progress will come eventually. ■

Spending on food and drink

Selected countries, 2011, % of total household spending



Source: US Department of Agriculture

*Includes non-alcoholic beverages



Trains in Nigeria

A slow but steady new chug

Reprinted from The Economist, Feb 9th 2013

A renovated railway line is welcome, but more are still sorely needed

BRAKES let out a deafening screech and steam fills the station as the Lagos-Kano train ends its 30-hour journey. Hundreds of passengers emerge wearily from brightly painted yellow, green and white carriages. It may be sweaty, crowded and very late, but after a ten-year absence this revamped link between Nigeria's two biggest cities is a welcome relief. Travelling the 1,126km (700 miles) at an average speed of less than 50km an hour with endless stops, it is no wonder the trip takes so long. But for most Nigerians the low fares are worth it. A second-class ticket from Lagos to Kano costs around \$12, roughly a quarter of the price of a more treacherous bus ride. "Hundreds of people were waiting at Ilorin [300km north of Lagos] but there wasn't enough space for us all," says a mother trying to appease a screaming child on her hip. "I had to stand the whole way."

The service was relaunched last month after improvements costing \$166m. Nigeria's railways, started in 1898, have deteriorated in the past 20 years owing to those old engines of decay, corruption and mismanagement. Nigerians' domestic travel options are limited. Most cannot afford to go by air, so take to the roads. Overfilled lorries, usually packed with dozens of passengers sitting on cargo, precariously negotiate crater-sized potholes. One stretch of road, nicknamed "Bauchi or Death", after a northern state, is littered with overturned lorries and cars.

As well as being dangerous, Nigeria's woeful transport network slows the economy. A

rejuvenated rail network could unplug one of the biggest business bottlenecks. In the short run, freight trains are the priority. The cost of transporting goods on passenger trains is prohibitively expensive. "The charge is almost impossible," complains Jibrin Bala, a cloth merchant. "On our way here, we had to transfer our goods onto buses."

The success of the Lagos-Kano route, however slow, indicates the demand for a modern rail network. There are plans to invest in rehabilitating lines along the eastern corridor between Port Harcourt in the south and Maiduguri in the north-east. There is even talk of monorails in a couple of cities. As people scramble on board the new train, it is clear that the Nigerian Railway Corporation will be puffing hard to keep up with demand. ■

A continued infrastructure boom

Going underground

Reprinted from The Economist, Apr 27th 2013

Dozens of cities are building a metro system. Some do not need it

NOT many global cities of nearly 9m people lack an underground line, but until the end of last year the eastern city of Hangzhou was one of them. Now city slickers and rural

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migrants squeeze together inside shiny new carriages, checking their smartphones and reading free newspapers like commuters the world over. There is standing-room only in the rush hour and, with tickets at less than a dollar, the metro is revolutionising the way people travel across town.

Two other Chinese cities—Suzhou and Kunming—have also opened their first underground lines in the past year, and the north-eastern city of Harbin is preparing to open one too. Four more cities have just added a new line to their existing systems. At least seven others have begun building their first lines.

If all the metros approved by central officials are built, 38 cities will have at least one line by the end of the decade, with more than 6,200km (3,850 miles) of track (London has nearly 400km.) As with many infrastructure projects in China, including the high-speed rail network above ground, questions abound about the wisdom and potential wastefulness of such ambitions. Many of the underground systems are needed, but some are being built in cities that are too small to justify the exorbitant expense. By some estimates the total bill could approach \$1 trillion, not including the cost of operation.

Zhao Jian of Beijing Jiaotong University reckons that metros in fewer than 20 of the 38 designated cities make sense. He says that perhaps ten of those could be replaced with cheaper light rail, which runs above ground. The minimum core urban population that can qualify a city for an underground system is 3m people, but even a place that big may find the operating costs crippling. Mr Zhao says the systems in Harbin and Kunming are unnecessary.

Shi Nan of the Academy of Urban Planning and Design in Beijing says it is obvious that "we cannot count on private cars" to get around the big cities. But the metro projects mostly rely on government subsidies, and operating them will be a "bottomless pit", says Mr Zhao. He says city officials tend to pursue grand projects that may not even make money because they will not be around to bear the burden. The performance of local officials is evaluated ▶▶

on how much they increase local GDP, not on whether projects they build are needed. Today's leaders get credit for spending money. Tomorrow's must foot the bill.

Even megacities long overdue for more underground tracks—like Beijing, Shanghai and Guangzhou—are building and operating them at a cost that worries planners. Operating the metro lines of Beijing, now up to 442km of track, has cost about \$1.6 billion over the past two years, but passengers pay just 30 cents a ride. The metro has helped to alleviate traffic and pollution, yet Beijing remains one of the world's most jammed and polluted cities; it needs more investment in public transport of all sorts.

In Hangzhou the underground is just one way to get to work; above ground, fleets of red buses, often in designated lanes, form a Bus Rapid Transit network to beat the gridlock. Critics say cities like Hangzhou should be investing more in these cheaper options above ground. But the metro remains an important part of the city's future. It plans at least another eight lines. ■

Pollution in China

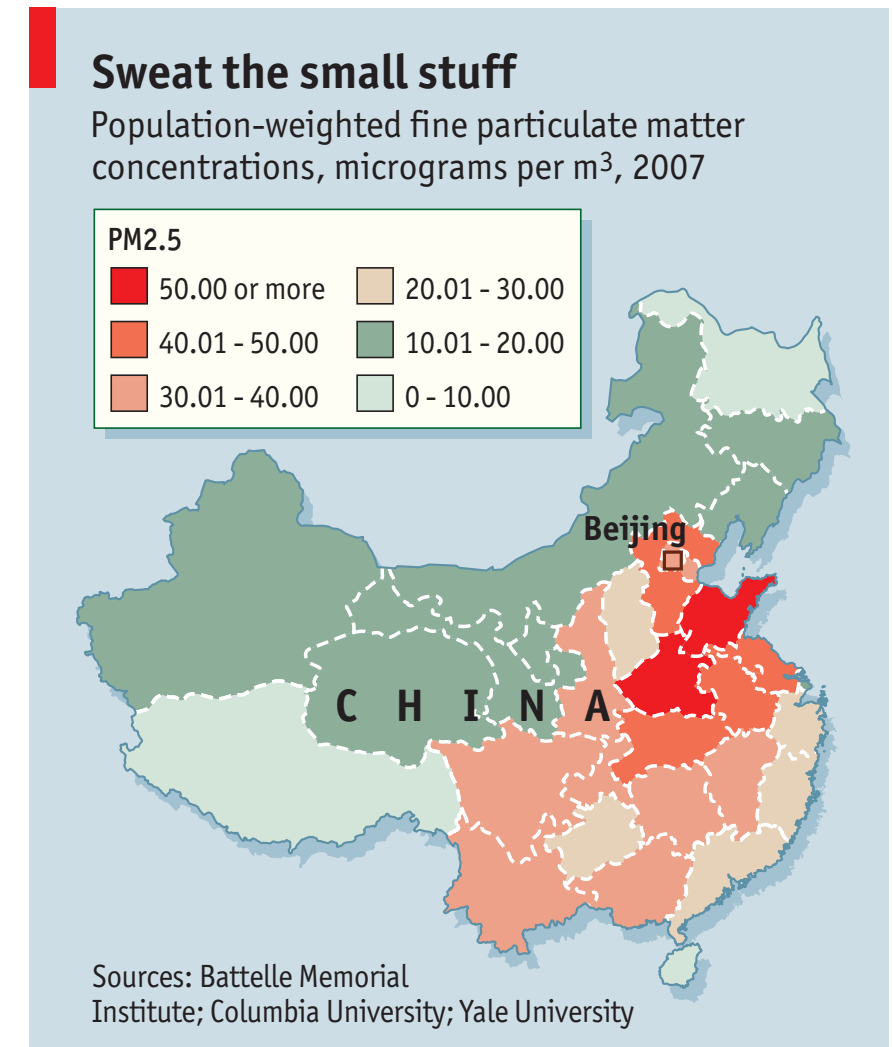
Clearing the air

Reprinted from The Economist, Feb 11th 2012

Satellite data reveal the true scope of China's pollution problem

"PM2.5" seems an odd and wonkish term for the blogosphere to take up, but that is precisely what has happened in China in recent weeks. It refers to the smallest solid particles in the atmosphere—those less than 2½ microns across. Such dust can get deep into people's lungs; far deeper than that rated as PM10. Yet until recently China's authorities have revealed measurements only for PM10. When people realised this, an online revolt broke out. Such was the public pressure that the government caved in and PM2.5 data are now being published for Beijing and a handful of other cities.

But what of the rest of China? At the moment, only PM10 data are available. However, officialdom's hand may soon be forced here, too. Though pollution data are best collected near the ground, a plausible estimate may be made from the vantage-point of a satellite by measuring how much light is blocked by particles, and estimating from those particles' chemical composition the likely distribution of their sizes. And a report prepared for *The Economist* by researchers at Yale and Columbia universities, and Battelle Memorial Institute,



under the auspices of Angel Hsu of Yale, does just that. It draws on data from American satellites to map out PM2.5 pollution across the entire country.

World Health Organisation guidelines suggest that PM2.5 levels above ten micrograms per cubic metre are unsafe. Ms Hsu has found (as the map shows) that almost every Chinese province has levels above that. Indeed, much of the country's population endures air so foul that it registers above 30 micrograms per cubic metre. Beijing averages 35. Shandong and Henan top 50. And because these readings reflect the average pollution that a typical resident in a province is likely to endure during a given year, they underplay the sharp spikes in pollution seen on particularly dirty days, when spot readings go much higher.

Ms Hsu's approach is not perfect. Satellites are not great at taking readings over bright

surfaces like snow and deserts, and cannot easily distinguish particles high up in the atmosphere from those closer to the ground. And the data also have to be adjusted to take account of the fact that pollution and people tend to coincide, otherwise the uninhabited areas in a province would drag the overall figure down below the real experience of someone living in the region.

Such caveats aside, however, this study shows how far China still needs to go in cleaning up its act. Pollution and development have always marched hand in hand, and the former may even be regarded as tolerable as long as it is only a temporary blip on the road to prosperity. What is intolerable is that it is left to outsiders to lift the lid on what is happening. ■



Housing in Brazil

If you build it

Reprinted from The Economist, Feb 16th 2013

A scheme to promote working-class home ownership is off to a good start

UNTIL 2011 Adriana Palugan, a mother of two, rented a home in Balneário Camboriú, a seaside town in southern Brazil. Now she is buying her own house, one of 166 in Colina do Cedro (Cedar Hill), a new development on a hill overlooking the town. She extols its wonders: bright and spacious with a pool, gym and multi-games court, 24-hour security—and altitude. Her old place was flooded in 2008, and she lost much of what she owned.

Without Minha Casa Minha Vida (MCMV; My House My Life), a federal programme started in 2009 to fund housing for Brazil's poor and middle classes, Ms Palugan, who works for a car dealership, would have struggled to buy such a home. The price was keen: 100,000 reais (\$51,000). Caixa Econômica Federal, a state-owned bank, gave her a subsidised mortgage; the repayments are less than her rent used to be. Caixa has also granted the developers, Abramam, cheap financing for the project's second phase, two apartment blocks. The funding comes from a workers' compensation scheme and the federal budget. Buyers cannot already own homes or make over 5,000 reais a month. The lowest earners get the biggest subsidies.

MCMV is shifting homebuilders' interest away from the rich minority to the middle market. Until recently, mortgages barely existed, since interest rates were too high and evicting defaulters was almost impossible. Old properties would be traded in for new, topped up with cash, a car or even a boat. The poor built on their own without title, often in precarious spots on riverbanks or steep hills. A 2010 census found 11.4m Brazilians living in *favelas* (slums).

Millions more squeeze in with relatives or live in formal but substandard housing.

A change to mortgage rules in 2005 made repossession easier. That made financing housing more attractive, along with falling interest rates, and Brazil's new middle class looked ready to buy. In 2007 17 housebuilders went public. Many went on a land-buying spree—only to run short of cash as construction costs soared.

At first, MCMV looked like a lifeline. But it started slowly, taking until last December to put 1m families in new homes. Bureaucracy was a big part of the problem: between local government, planning rules and Caixa it took Abramam 18 months to get Colina do Cedro's second phase approved. (The paper chase continued: each sale generated a 280-page mortgage contract. Each page had to be signed or initialled.) It only survived by taking out short-term loans at eye-watering rates.

Worse than the paperwork, says Yannick Rault, a Frenchman and one of Abramam's partners, was "managing budgets and schedules in a country where everybody's an optimist." In the past, most Brazilian construction contracts were "cost-plus", meaning builders never learnt to plan. The firm wrote its own project-management software for construction and plans to make money by selling the program to other homebuilders.

Not every MCMV buyer has been as lucky as Ms Palugan. YouTube has plenty of videos of shoddy finishes, dodgy electrics and leaky roofs. Rising land prices mean some developments are miles from anywhere. The worst risk degenerating into the slums they were meant to replace.

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But the government's canny decision to set minimum standards and maximum prices and turn the job over to the private sector means MCMV is easy to tweak. Quality is being raised by tightening standards and certifying builders, says Alexandre Cordeiro of the ministry for cities, which runs MCMV. Since October, big projects can only go ahead if it agrees there are suitable local amenities. And the paperwork has been trimmed, he insists. (Perhaps not enough: approval for Abramam's most recent project took six months.)

The government still needs to work out how to get more homes built for the truly poor. Of the 2.3m past MCMV's approval stage, only 45% are for families earning less than 1,600 reais a month. The target was 60%. Increasing that share would mean persuading states and cities to chip in with land, roads and other services, instead of demanding these from developers. Abramam ended up having to pave roads, build a surface-water drainage system for the area around Colina do Cedro and more, which took a big chunk of already tight margins.

Caixa will also have to encourage less labour-intensive building methods. Abramam says its costs have gone up by 50% in four years. The government is proud of the scheme—the president, Dilma Rousseff, often turns up at completed projects—and the 1.4m jobs it has created. But it must choose between jobs and houses: local labour is now too dear for hand-built mass-market homes. ■



price for water than villagers who have a much smaller disposable income. But Mr Shah says that “water barons”, sellers of bottled-water, have been trying to block Sarvajal’s entry into cities. After many months of efforts, this time not without help from the government, Sarvajal will soon be launching its first filtration plant in Delhi. ■

Civic crowdfunding

Breaking ground

Reprinted from The Economist, May 18th 2013

Online start-ups are rallying citizens to revamp their neighbourhoods

NAMES, wedding dates and declarations of love cover the Luchtsingel, a new pedestrian walkway straddling a busy main road in central Rotterdam, a Dutch city. Asked by a website to help fund the project, locals paid €25 (\$32) each for the right to etch a message on one of its 17,000 wooden planks.

The walkway’s length, they were warned, depended on the volume of donations. Within three months do-gooders had stumped up a third of the cash needed to build its full 350-metre span (a government award has since topped that up). Had they left council bean-counters to plan it, says Kristian Koreman, its architect, Rotterdam’s residents might have waited two decades to get their bridge off the ground.

Civic-minded citizens have long propped up ventures that authorities covet but cannot afford. In 1885 cash from more than 120,000 Americans helped New York build the pedestal for the Statue of Liberty (Joseph Pulitzer, a newspaperman, led the whip-round). Now, as cash-strapped councils slash their budgets, locals are again relying on private gifts to spruce up parks, playgrounds and public loos. Web start-ups inspired by Kickstarter, a crowdfunding site which helps artists, game-designers and gadget-makers find patrons, are helping locals raise cash for improvements to their neighbourhoods.

Spacehive, a British site for urban projects, is one of the busiest of these. In March 2012 citizens of Glyncoch, a former mining village in Wales, used it to collect £28,000 (\$43,000) to finish a community centre. Visitors to the site have shelled out part of the cash to bring free wireless internet to the centre of Mansfield, in England, and helped Edinburgh’s locals convert a disused phone box into a tiny art gallery.

Donors are charged only when the project reaches its funding target. Spacehive then takes a small cut from the money raised. Most patrons receive no return on their pledge, though Neighbor.ly, an American competitor, supplies perks like posters and plaques. Other platforms include Citizinvestor; groundUP, which launches this summer; and UrbanKIT, ▶▶

Social entrepreneurs in India

Water for all

Reprinted from The Economist, Mar 20th 2013

NEARLY three-fourths of all diseases caused in India are due to water contaminants. Despite that, one in eight Indians still lacks access to clean drinking water. The poor now realise that paying for clean water can save much more in health-care costs later. It was this market that Sarvajal, a social enterprise in India, wanted to cater to.

Founded in 2008, Sarvajal—which in Sanskrit means “water for all”—now sells clean drinking water to more than 70,000 people in rural India. In bigger villages, it employs local people to man filtration plants and sell water. In small villages it installs solar-powered water dispensing machines that use prepaid (or pay-as-you-go) smart cards that can be topped up just like a mobile phone. The machines send data to a central server via SMS, which helps Sarvajal ensure regular supply of clean water.

Sarvajal started with some help from the PIRAMAL Foundation, a charity. And it is not alone: Water Health International was launched with an investment from the Acumen Fund

and the Naandi Foundation’s not-for-profit company was backed by a charity with the same name. What sets Sarvajal apart is that it has stayed away from government subsidies while still keeping the price of water low. It sells 10 litres of water for four pence (or six cents), just as much or lower than its competitors.

“Subsidies are not a long-term solution,” says Anand Shah, Sarvajal’s founder, who grew up in America and moved to India to become a social entrepreneur. It took a healthy bit of tinkering to lower the price of installation and maintenance for its water supply infrastructure. It costs on average \$2,500 to install a filtration plant, which is about half the expense of similar projects. Sarvajal claims to recover those costs within three years.

Setting up its project was not easy. Sarvajal needed to deal with things that few businesses in rich countries have to worry about: lack of proper roads in villages, irregularity of power supply, unreliability of water sources and devising a system of money transfer. Having reached a respectable size, Mr Shah is hopeful that scaling up his business further will be less challenging.

Apart from villages, Sarvajal’s other obvious market is the urban poor. Nearly 100m people live in very densely populated slums in India’s cities. They are more willing to pay a higher

based in Chile.

Ventures need careful vetting. Plans to create a park on a vacant lot will stall if neighbours or officials disapprove. Spacehive asks project leaders to seek backing from a charity or trade association to verify that their venture is beneficial and achievable (they earn a fee for their assistance if the money is raised). Citizeninvestor promotes only projects put forward by councils. It has worked with four American cities and is talking to 40 more, says Jordan Raynor, a co-founder.

Mr Raynor dreams of turning ordinary burghers into “Carnegies and Rockefellers”. Projects listed on crowdfunding sites do often rely on big gifts from businesses and foundations to reach their funding targets. But that does not undermine the model: enthusiasm from dozens of small contributors can spur generosity from big ones. Jase Wilson, the founder of Neighbor.ly, says rich companies like to match citizen donations. A meaty catalogue of worthy causes could connect global firms with cheap but important projects in unglamorous places. Corporate support may also save crowdfunding sites from having to take cash from successful projects (in the form of fees) to stay in business.

Making waves

As online crowdfunding matures, its advocates are becoming more ambitious. Three designers want to float the +Pool, an open-air swimming bath in New York’s East River, with clever filters to purify its murky water. In 2011 its creators raised \$40,000 from Kickstarter users in just six days; in June they will ask for \$250,000 more. They hope crowdfunding will cover much of the project’s \$15m price tag.

Critics point out that crowds are easily excited by such novel installations. Boring but functional infrastructure that could most improve an area, such as roads and parking places, will be a harder sell. A deeper worry is that money from crowdfunders will prompt councils to cut spending on public spaces. That will hurt particularly poor neighbourhoods, which mostly lack the spare cash, know-how or time to get involved.

Enthusiasts counter that such sites will improve local government, not just help fund it. Only truly popular ventures get funded, not officials’ pet projects. Boosters think pioneering councils might one day allow citizens to use crowdfunding sites to allocate a portion of their own tax dollars to causes that they support.

Advocates also want to shake up dusty processes. “The only people who go to planning meetings want projects to stop,” says Andrew Teacher of Spacehive. Bryan Boyer of Brickstarter, a civic research project funded by Finland’s



government, would like to “turn NIMBYs into YIMBYs” (Yes In My Back Yard). He hopes crowdfunding will not only help residents plan small developments, but also finance the surveys and audits to persuade governments to consider bigger ones. Rotterdam’s walkway is built to last only about 20 years; but by promoting local regeneration the venture will help future governments find funds for a grander version.

Deloitte, an accounting firm, reckons web users

will plough about \$3 billion into crowdfunded schemes in 2013. About \$500m of that will be given freely to groups that offer no equity or products in return. Urban ventures are still only a sliver of that. But if grumblers accuse the internet of destroying trade on the high street and of blunting interest in local issues, crowdfunding schemes are doing the opposite. An idea to buy into. ■

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