Green Digital Finance Alliance

Scaling Citizen Action on Climate

ANT Financial's Efforts Towards a Digital Finance Solution

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Inquiry: Design of a Sustainable Financial System

The Green Digital Finance Alliance

The Green Digital Finance Alliance has been created to address the potential for fintech-powered business innovations to reshape the financial system in ways that better align it with the needs of environmental sustainability. The Alliance's participants comprise innovative financial institutions committed to using digital technology to advance green finance in lending, investment and insurance. The Alliance draws in allies from across the worlds of environment and finance, who, through their expertise, insights and networks can contribute to collaborative actions with timely and scaled potential.

More information is available at: info@greendigitalfinance.org and www.greendigitalfinance.org.

Ant Financial Services Group

Ant Financial Services Group is a related company of Alibaba Group and parent company of Alipay, a leading online and mobile payment platform. It is focused on serving small and medium enterprises as well as individuals. With the vision "bring small and beautiful changes to the world," Ant Financial Services Group is dedicated to building an open ecosystem of Internet thinking and technologies while working with other financial institutions to support the future financial needs of society. Businesses operated by Ant Financial Services Group mainly include Alipay, Ant Fortune, Zhima Credit and MYbank.

The UN Environment Inquiry

The Inquiry into the Design of a Sustainable Financial System has been initiated by the United Nations Environment Programme (UN Environment) to advance policy options to improve the financial system's effectiveness in mobilizing capital towards a green and inclusive economy—in other words, sustainable development. Established in January 2014, it published the first edition of 'The Financial System We Need' in October 2015, with the second edition launched in October 2016. The Inquiry has worked in 20 countries and produced a wide array of briefings and reports on sustainable finance.

More information on the Inquiry is at: www.unep.org/inquiry and www.unepinquiry.org or from: Ms. Mahenau Agha, Director of Outreach mahenau.agha@unep.org

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Foreword

The world faces daunting environmental challenges. Increasing pressures on the environment are causing serious damage to ecosystems and threatening the lives of millions of people. As a global economic force, China itself faces similar challenges. The world is fighting back. Widespread consensus for action has been reached. Some top-down approaches, such as the promotion of green bonds, can and must be effective.

Emerging digital technologies are opening up a bottom-up approach, which offers a measurable, tradable and allocable venue to shift citizen's daily behaviour towards a low-carbon lifestyle. Such bottom-up approaches that engage citizens directly in green financing and behavioural shifts need to be encouraged as a necessary complement to top-down action.

Among various efforts to protect the environment, I believe **there is great potential in using digital technologies in finance to address global environmental challenges.** With this in mind, Ant Financial launched the Ant Forest Programme late last August. Simply put, it is an effort to promote green digital finance and a green lifestyle to our pool of 450 million users in China. The success of the programme, which registered over 200 million users in just six months, is a sign of the powerful change we can create when people are provided with the opportunity to live a greener life.

We can make more achievements through joint efforts. A famous Chinese saying holds that 'many hands make light work' (人多力量大). Our intention with the Green Digital Finance Alliance that we launched with UN Environment in January 2017 is to encourage people to contribute their ideas and help harness digital technologies to catalyse financing that will addresses global environmental challenges. We sincerely hope more nations and citizens will join the efforts in promoting green digital finance and, more broadly, sustainable development. Everyone's contribution and suggestion to solving environmental problems will be greatly appreciated.

Eric Jing, CEO of Ant Financial Services Group

Summary

The Paris Agreement on climate action affirmed the collective nature of the historical challenge of reducing carbon emissions. National commitments and policy action set in a framework of international cooperation are essential to achieve this goal, as are actions by the business community. However, the need to reach scale quickly requires that citizens are directly engaged as part of the solution. New ways must be found to encourage and empower citizens to act now, especially as consumers.

Efforts to mobilize citizens to voluntarily reduce their carbon footprints have had limited success, but have not yet reached scale. However, citizens are increasingly aware of the risks of climate change, as well as its links to air pollution and other visible impacts. The challenge is to move beyond the actions of existing, committed citizens in engaging far greater numbers in contributing practically to addressing the climate challenge.

Finance has a key role in the transition towards a low-carbon, climate-resilient future, but despite progress, green finance has to date remained marginal in global finance. Notably, green finance has been focused largely on top-down approaches to mobilizing funds for green investment by firms and governments, with only modest attention paid to greening citizens' behaviour.

Citizens' action in addressing environmental challenges has a long history, as consumers, investors and broader social engagement. Absent to date, however, has been a means by which a broader landscape of individual citizens can be engaged with at scale, including measurement, communication and incentives.

Digital finance, or 'fintech', can shape citizens' behaviour, but has not been widely used to green decisions and outcomes. Potential is demonstrated by experiments for example in the use of mobile payment platforms to empower poorer, more isolated communities to access distributed solar, but scaled and wider applicability has not been attained.

Ant Financial Services Group, in association with UN Environment, has initiated the world's first, large-scale pilot in greening citizens' consumption behaviour through the use of mobile payment platforms, big data and social media. The 'Ant Forest' encourages Ant's users to reduce their carbon footprint

through a three-part approach: (a) providing individualized carbon savings data to peoples' smartphone, (b) connecting their virtual identity and status to their earnings of 'green energy' for reduced carbon missions, and (c) providing carbon offset rewards through a physical tree planting programme.

The Ant Forest pilot has far exceeded expectations in attracting large numbers of users in a short period of time, and elicited significant behavioural change. Over the first six months from August 2016 to January 2017, 200 million people across China have voluntarily joined the programme, about 44% of Ant's user base in China, or about 20% of China's adult population or 3% of the world's total population. Behavioural change over the period has resulted in an estimated 150,000 tons of cumulative avoided carbon emissions and over 1 million trees planted by January 2017.

These large-scale, positive results need to be better understood and stress-tested to identify which are the success drivers that could ensure continued and scaled success. Further piloting will reveal, for example, whether large-scale use of the platform and related emissions reductions can be sustained, contextual conditions that may be relevant, and which incentives, virtual or otherwise, are most effective.

Such early results do, however, indicate the potential to use digital finance in collective efforts to safeguard the planet for ourselves and future generations. The Ant Forest pilot could be extended in collaboration with other digital finance companies to encourage billions of people to reduce their carbon footprint. Digital finance innovations, as part of a wider digital eco-system, could be deployed in addressing many other environmental challenges, in collaboration also with governments and other stakeholders.

The Green Digital Finance Alliance provides a basis for such ambitious innovation-in-action. Co-founded by UN Environment and Ant Financial Services Group and launched in Davos in early 2017, the partnership enables engagement with other fintech companies, policymakers and regulators, and experts and other stakeholders in leveraging digital finance to advance environmental sustainability.

1. The Need for Citizen Engagement in the Climate Challenge

The landmark adoption of the 2030 Agenda for Sustainable Development[1] and the Paris Agreement on climate change[2] in 2015 proved that countries around the world are increasingly ambitious to work together to transform their economies and ensure that tomorrow's development is more inclusive, prosperous and sustainable. Such developments are critically important and offer reason for optimism.

Yet our environmental challenges are daunting. Increasing pressures on stocks and flows of natural resources, unabated pollution, and the local and global challenges posed by climate change are causing serious, often irreversible damage to ecosystems, and in so doing threaten the livelihood of millions of people and the very existence of communities and nations. Time is running short, as four out of nine "planetary boundaries" have been crossed: climate change, loss of biosphere integrity, land-system change and altered biogeochemical cycles.[3]

Natural capital has declined in **116 out of 140** countries.[4]

21 of the world's 37 largest aquifers have passed their sustainability tipping point.[7]

One-third of the world's arable land is jeopardized by land degradation, triggering economic losses of **US$6.3 to US$10.6** trillion per year.[8]

6.5 million premature deaths result every year from air pollution linked to the energy system.[5]

THE URGENT NEED TO ACCELERATE ACTION

2015 surpassed 2014 as the hottest year on record due to the combined influence of long-term global warming and an exceptionally strong El Niño event.[9]

Greenhouse gas emissions add energy to the Earth's system at a rate equivalent to the detonation **of 4 nuclear bombs** every second.[6]

An average of **26.4 million people have been displaced** from their homes by natural disasters every year since 2008 – equivalent to one person every second.[10]

Source: UN Environment Inquiry (2016)[11]

China itself faces great challenges in the fields of energy, environment and natural resources. Despite a rapid deployment of renewable energy technologies, China's energy system still relies for a great part on fossil fuels, especially coal, and has low energy efficiency. As a result, its CO_2 intensity is the highest among G20 countries.[12] Reducing air, water and soil pollution is a major government priority. Resource utilization efficiency must dramatically increase for China to make the transition to a sustainable development pathway, especially as the focus shifts towards consumption-led growth.

Much needs to be done, and all actors need to be involved. Positively, there is widespread consensus of the urgency to act, especially on climate. Countries are advancing climate action plans, and international organizations are providing political encouragement and technical support where needed. An increasing share of the business community is supportively engaged – with many major global firms committing to support the green economy transition through investments in clean technology, actions to improve resource efficiency, and by implementing sustainable business strategies.

Citizens have to be part of the solution, as consumers in particular. Yet in the main thrust, citizens are not yet fully empowered as part of the solution. Of course, a growing body of citizens seek to consciously integrate climate and environmental issues and priorities as part of consumer preferences, including when making investment decisions. Similarly, certain groups of citizens are becoming more active in social and political engagement on environmental issues. Yet these numbers are comparatively small compared with the scale of the challenge – and degree of citizen action necessary to make a significant change in carbon emissions reductions.

2. Progress on Green Finance

Achieving the 2030 Agenda for Sustainable Development and the Paris Agreement requires an unprecedented mobilization of both public and private finance, estimated as much as US$90 trillion by 2030. Critical flows of finance are required for example, for infrastructure, access to clean energy and food security, and to establish low-carbon, climate-resilient ways to deliver everything from water and sanitation to mobility and decent jobs.

Positively, the green finance agenda has made great progress in recent years. Momentum in greening financial and capital markets, in particular, has been an important development – given that public finance will only provide a small fraction of total financing needs. UN Environment's inquiry into the topic has highlighted the leadership taken by China and other countries in aligning financial market development with sustainable development. Such leaders are taking steps to develop national roadmaps to align capital markets with sustainability and climate goals, blending market innovation such as green bonds with the power of financial policy, regulation and standards. Elsewhere, leading countries are using central bank balance sheets and instruments to leverage private capital for green investment, and in some cases building a new generation of green-focused financial institutions.

Importantly, the green finance agenda has been taken up as a critical priority within established mechanisms of international cooperation. China led the way under its G20 Presidency in 2016 by introducing the topic of green finance into the G20 finance track, establishing the Green Finance Study Group (GFSG). The GFSG Synthesis Report[13] released at the Hangzhou G20 Leaders Summit in September 2016 confirmed that the mobilization of green finance through the development of the financial system was indeed a legitimate topic for finance ministers and central bank governors. In addition, the Financial Stability Board has established a high-profile, private sector-led Task Force on Climate Related Financial Risk Disclosures, expected to release its final report in June 2017.

Such developments must be applauded and further encouraged in all ways possible. Important to recognize, however, are the challenges in rapidly scaling such approaches, for example, because of the slow pace at which policy and regulatory measures are enacted and major market actors reset their business models. Indeed, such top-down approaches will take even longer if citizens' economic choices – such as consumption patterns – are hard to shift. Therefore, there is a clear need to encourage bottom-up approaches that engage citizens directly in green financing and

behavioural shifts as a necessary complement to top-down action.

Engaging citizens in addressing environmental challenges has a long history. Adjusting consumption patterns by 'buying green' has been the most prevalent experience. Civil society groups have mobilized for change within the financial system, including by demanding that pension funds and endowments are invested along "ethical" or "socially responsible" lines, as well as supporting policy action for a rapid low-carbon transition. Most recently, we have seen the emergence of an 'impact investing' community of high-net wealth individuals and foundations that collectively have a growing voice in financial markets, as well as a civil society movement calling for the investors to divest from coal, fossil fuels and other carbon-intensive assets.

Absent to date, however, has been a means by which a broader landscape of individual citizens can be engaged with at scale. Furthermore, there has been no cost-effective means for measuring their individual environmental footprints, or communicating or rewarding on the basis of this information in ways that could shift citizens' behaviour. That is, until now.

3. Green Digital Finance

Digital finance – or 'fintech' – is defined by the Financial Stability Board (FSB), as: "technologically enabled financial innovation that could result in new business models, applications, processes or products with an associated material effect on financial markets and institutions and the provision of financial services".[14] This includes, for instance, digital payment solutions, e-commerce, crowd lending and aggregation platforms, equity crowdfunding, internet-based services in the insurance industry, roboadvisors and gamification in the investment space and peer-to-peer lending. Moreover, digital finance is part of a wider digital eco-system that includes artificial intelligence, big data, the internet of things and a wide range of non-financial applications of blockchain.

Digital finance has the potential to deliver environmental outcomes and support a transformation in financing for sustainable development. As Ambassador Peter Thomson, currently President of the UN General Assembly, remarked: "Implementing the SDGs will not be possible without adequate financing. We have to be creative in mobilizing finance from every possible source and ambitious in exploring how to work together in aligning our global financial system with sustainable development."[15]

UN Environment has undertaken an initial scan of the green digital finance landscape, and in so doing has highlighted the growth of practice and of opportunities. For example, the Kenya based M-KOPA, the Swedish start-up Trine and US-based Solar Coin are using combinations of crowd-sourcing, payment platforms, crypto-currencies and clean technology to deliver distributed solar energy options to remote communities in sub-Saharan Africa and elsewhere. By 2015, over 800,000 farmers in Kenya, Tanzania and Rwanda were insured by the Agriculture and Climate Risk Enterprise and similar vehicles against a variety of weather risks. Scaling this technology through a combination of IoT, blockchain and artificial intelligence could help provide risk coverage to an estimated 1.5 billion smallholder farmers in the developing world against increasing weather volatility.

Green digital finance is a comparatively new frame to tackle the emerging opportunities and

> "Innovations in financial technologies (fintech) offer the greatest hope for aligning the world's financial systems with the urgent twin objectives of sustainable development and deepening financial inclusion. Further progress requires the close cooperation of all – innovators, regulators, financial institutions."
>
> **Patrick Njoroge, Governor, Central Bank of Kenya**[16]

challenges in this space. The Green Digital Finance Alliance (GDFA) was established to realize the potential for digital finance to help deliver environmental sustainability, through deepening understanding, stimulating innovation and facilitating collaboration. Launched in Davos in January 2017 by UN Environment and Ant Financial Services Group, the GDFA will seek to include other digital financial institutions, policymakers and regulators, and experts and other stakeholders.

"Access to affordable, clean energy can transform the livelihoods of millions of people around the world. At M-KOPA we're harnessing the latest mobile and machine-to-machine technology to connect low-income homes to solar power, as well as productive assets and services."

Nick Hughes, Chief Product Officer and Co-Founder, M-KOPA[17]

"Getting finance at the right price to the right people at the right time will be critical in both securing clean energy access for all and meeting the climate change challenge. Digital finance can be a powerful tool for unlocking barriers to investment and empowering people to meet the challenge and seize the opportunity of clean, affordable future. This Alliance will I hope help to catalyse finance so that we transform lives, create jobs, clean air, provide energy, and restore landscapes at the speed and scale needed."

Rachel Kyte, CEO of SE4ALL[18]

4. The Ant Forest

4.1 Ant Financial Services Group

Ant Financial Services Group ("Ant"), a related company of Alibaba, is focused on a core platform that offers basic mobile payment services and a growing range of financial services including SME lending, money market and wealth products. Ant's core market is China, where it has 450 million real-name users and operates at peak at 120,000 transactions a second. More recently, Ant has begun the process of going global, and is expanding through strategic partnerships, such as one with Paytm in India that has over 200 million customers.

Despite its comparative youth, Ant is one of the world's largest pure-play digital finance companies, and is set to be a major actor in the digital-driven transformation of the financial system and its relationship with the real economy. Ant's vision, however, goes beyond scale and commercial success to support diverse initiatives and business approaches consistent with sustainable development goals. Environment is part of this vision, building on the growing importance placed more broadly by and in China on greening the financial system, both domestically and internationally.

> "Ant believes that tomorrow's financial system should help value and manage our common environmental assets. We hope that the Green Digital Finance Alliance will contribute to shaping and accelerating this development."
>
> **Eric Jing, CEO, Ant Financial Services Group**[19]

4.2 Ant Forest – the Basics

The 'Ant Forest' project was launched in August 2016. At its core, Ant Forest encourages Ant users to reduce their carbon footprint through a three-part approach: (a) providing people with individualized carbon savings data direct to their smartphone, (b) connecting their virtual identity and status to their earnings of 'green energy' for reduced carbon missions, and (c) providing carbon offset rewards through a physical tree planting programme.

Ant users get involved by voluntarily signing up to the Ant Forest app available on the Ant mobile platform. Having signed up, Ant then uses the individual's behavioural data to assess their 'avoided emissions'. In other words, the changes in consumer behaviour that result in less carbon emissions being created than the pre-determined benchmark. For example, if a user purchases metro tickets or pays household utilities online rather than

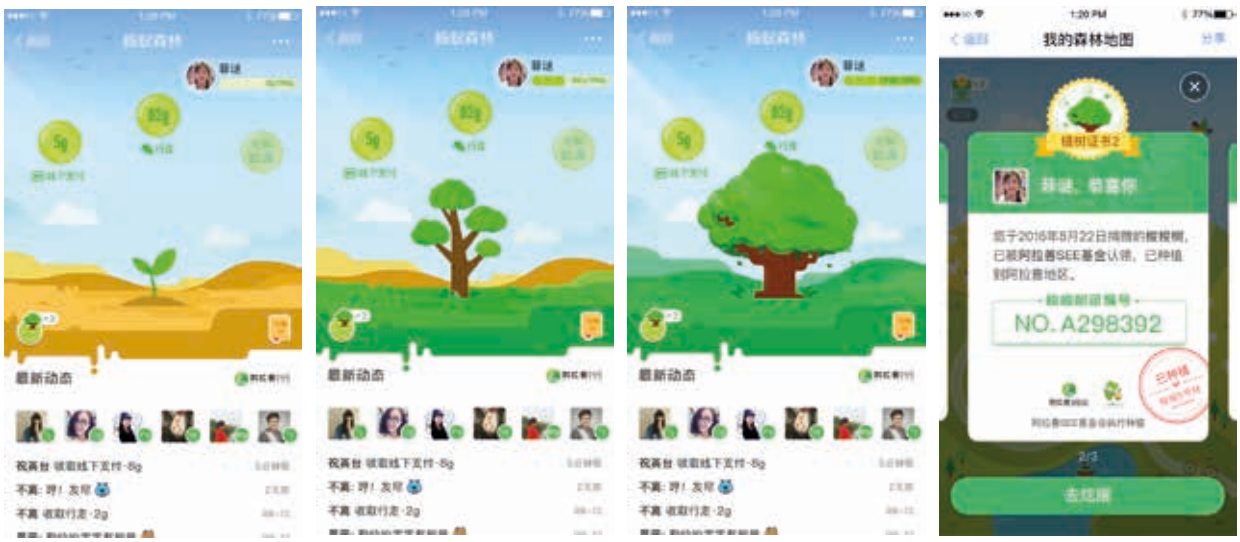
in person, or commutes by walking instead of driving, the avoided carbon emission will be recorded as saved energy.

Ant has worked with the China Beijing Environment Exchange in creating both the benchmark and the basis on which behavioural data enables avoided emissions to be calculated. In its current pilot stage, nine activities are taken into account, including aspects of transport, entertainment and utilities costs.

accounts and comparing across one's virtual community performance in growing trees. So although green energy has no tradable value in financial terms, the pilot is exploring possible bases for it and (avoided carbon emissions) becoming a facet of on-line identity and status.

The third aspect of the Ant Forest experience is that virtual trees have a value in real trees. Once an individual has accumulated enough green energy to grow an entire

Figure 1: From a virtual sapling to a real tree – overview of the Ant Forest app



Based on calculations of avoided emissions, individual users are awarded with 'green energy' points, which in turn form the basis of 'virtual trees' grown on the platform. Socializing the green energy is an active part of the user experience through social media, which includes moving green energy between user

virtual tree, Ant commits to working with its ecological partners,[20] such as environmental non-profit organizations, environmental protection agencies and other entities, to plant a real tree in the desert. At this stage of the programme, the species of tree chosen is haloxylon, which

is distributed in Inner Mongolia Autonomous Region of China to date. It is suited to life in the desert and has environmental benefits, as its deep roots help fight against the erosion of sand dunes, and haloxylon forests reduce the intensity of sand storms.

The Ant Forest offers the user three forms of value – virtual status in their community, more status by being able to point to real trees being planted, and distinct although related to the other two, the fact that carbon emissions have been reduced as a contribution to addressing the climate challenge.

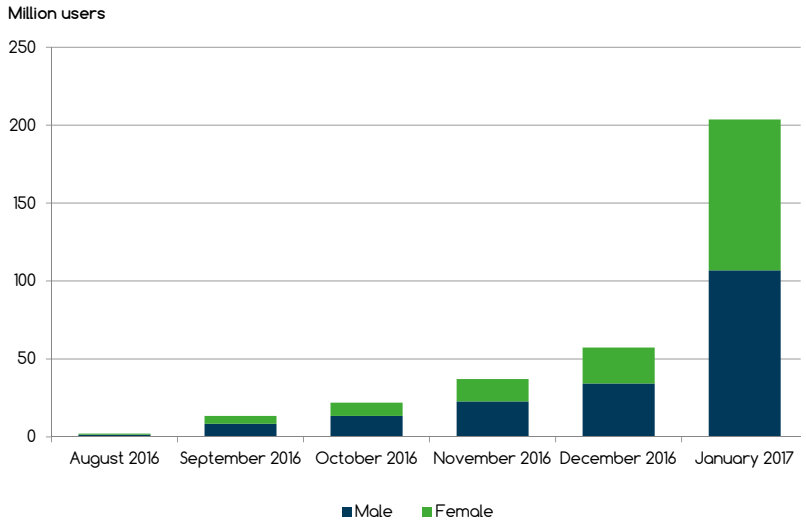
4.3 Ant Forest – Participation

Users of Ant's mobile platform have signed up rapidly and on a large scale to Ant Forest. Since its launch in August 2016 through to January 2017, Ant's users signing up to the Ant Forest app rose to over 200 million. Placing this in perspective, this constitutes over 40% of Ant's total user base of 450 million people, or about 20% of China's total adult population. Although robust comparative statistics are not available, this may be the world's fastest take-up of any single virtual activity excepting one-off participation such as viewers of major sports events.

A demographic review of this aggregate take up reveals interesting facts:

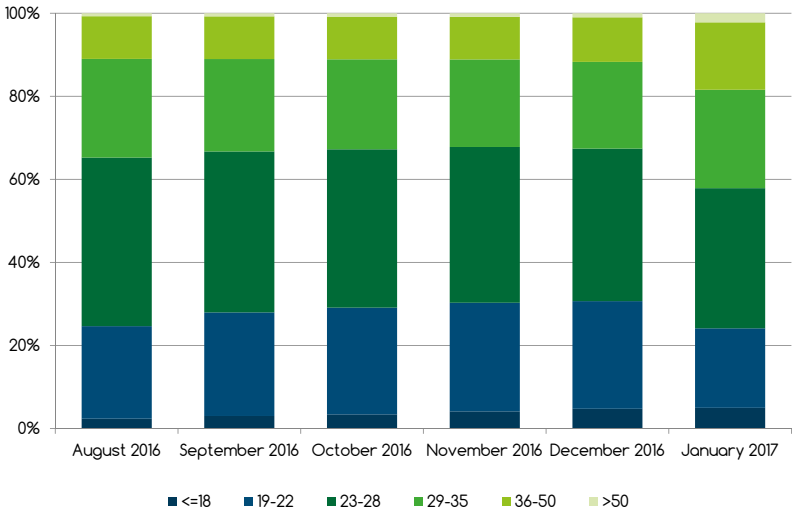
Male participation is noticeably higher than female participation, confirming general trends in virtual participation, especially in game-like activities, but female participation rates have steadily grown over the period to 47% by January 2017[21]

Figure 2: Ant Forest cumulative users by gender



Younger people are more inclined to sign up to Ant Forest, in line with the general age demographics of online participation, with almost 60% of users being 28 years old or younger, while noting that 2% are over 50 years old.[22]

Figure 3: Ant Forest users by age



In terms of regional distribution, the users in Guangdong province represent the largest group (12%) in January 2017, with Jiangsu, Shandong and Zhejiang ranking the second, third and fourth, suggesting a relationship between stage of economic development, use of digital technology and engagement in environmental protection.[23]

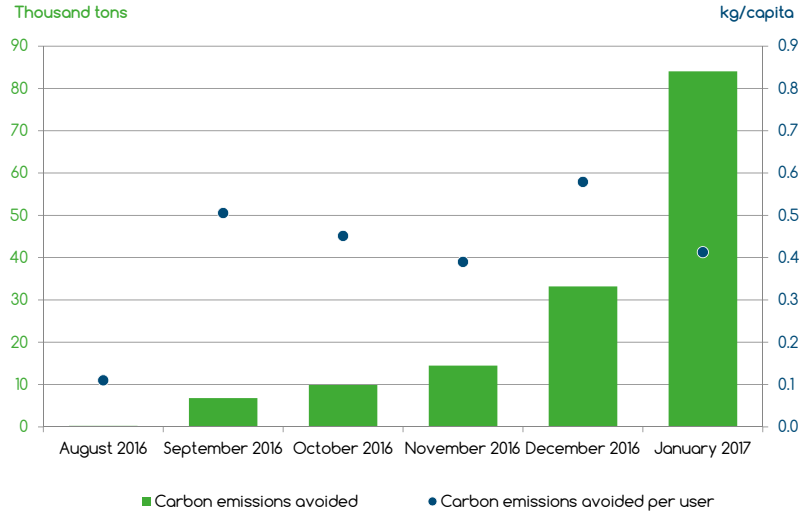
Figure 4: Ant Forest users by region as of January 2017

4.4 Ant Forest – Impacts

Nine months only into the pilot, it is too early to assess its impact. The avoided carbon emissions and the potential carbon sink effect of Ant Forest can be calculated based on commitments to date:

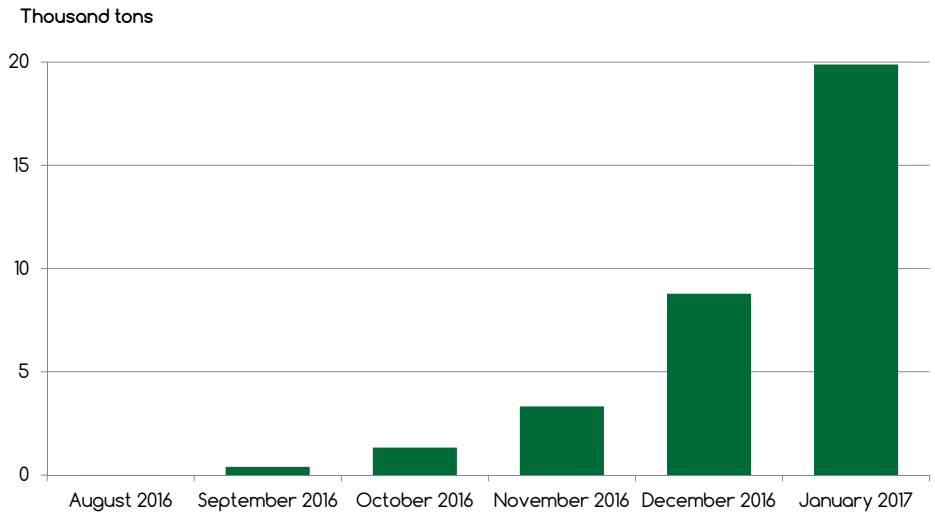
Cumulative avoided carbon emissions are estimated at 150,000 tons to the end of January 2017, that is, over the period since August 2016 based on the limited range of purchases being tracked and counted, and the partial view of users' overall consumption patterns since only some of any single person's purchases take place using the Ant payments service.

Figure 5: Avoided carbon emissions by month



Trees planted as part of Ant Forest amount to over one million by January 2017. Currently, the amount of forest carbon sink arising from a haloxylon planted in the Alashan Desert was estimated to be 17.9 kg. However, aggregate estimates of carbon effects have not been made at this stage, due to the many problems in estimating carbon sink effects, especially when the health and longevity of the trees planted are at this stage unknowable.

Figure 6: Carbon sink estimates – Cumulative



In addition to these observable effects is a range of possible, hopefully positive but unobserved impacts on citizen behaviour towards carbon, climate and more broadly the environment. We return to these briefly below.

4.5 Ant Forest – User Experience

Ant's survey of over 27,000 users shows high levels of satisfaction with Ant Forest. Based on the survey results users highlighted that:

- Over 90% of active users opened an account out of personal interest and without the need of promotion.
- Over 50% of the users like its public nature of promoting environmental protection.
- Almost 50% of active users would recommend Ant Forest to their family members and friends.

The survey also suggests that Ant Forest affects individuals' daily behaviour. Survey results to behavioural effects of "gamification"[24], such as the tree that users receive and watch growing as they reach avoided carbon emissions objectives. The tree planting programme also incentivizes users to seek to earn green energy points, although there is no understanding at present as to the relative importance of these, or other implicit incentives.

4.6 Ant Forest – Success Beyond Climate

Ant Forest is one of the quickest user-gathering applications in the world's mobile application history. The real value of this application is

How Is Ant Forest Changing My Life? A User's Story

I grew up in the Gobi Desert in northern China. Those yellow, dusty and stormy days remain in my memories when windows and doors were tightly closed. When I was a kid, I knew that planting a tree is not an easy task, especially in desert. I still remember my first experience in planting a tree when all the kids were gathered by the kindergarten teacher to learn digging, placing, backfilling, staking and watering. While I can no longer see the tree I planted since I moved to a city in southern China, its image is deeply rooted in my heart. I often ask myself: can I grow a tree again ten years later?

Then Ant Forest comes to my daily life. In order to get the green energy, I walk a lot every day and behave in a way that can reduce carbon emissions. I also wake up early in the morning to prevent my energy from being "stolen". One can hardly imagine how lazy I was before! My first-ever haloxylon tree finally came to life this February. Whenever I look at it on my smartphone screen, I feel I am a king. I have to say that Ant Forest totally changes me. I begin to think about what the true meanings of life are – maybe just to be diligent, to be thankful and to do valuable things as Ant Forest teaches me. This little haloxylon tree will definitely be the best present for my coming 19th birthday.

Source: Ant Financial Services Group: Survey, 2017

beyond planting trees. It exemplifies the bottom-up approach powered by technology. Its success comes from three aspects:

- Making the green economy measurable at the micro consumption level. By taking advantage of digital technology, for the first time in human history, Ant Forest can access hundreds of millions of people and measure their carbon footprint. Similar to the role of money in measuring the value of production inputs, which leads to trade and specialization, Ant Forest makes it possible to measure green behaviour, services and products at the micro consumption level.
- Making green efforts more joyful. It adds the playful elements to the environmental protection efforts. It works with a feature of a game, thus adding the real-life meaning for users.
- Designing a setting for the users to voluntarily make use of their own social network for green purposes. Users can interact and exert peer pressure to stimulate environmental awareness.

5. Next Steps

Ant Forest highlights the potential for using digital finance to advance environmental sustainability. In this particular case, carbon gains are made by combining the use of mobile payments with big data analysis linked to effective communications to individuals, and the smart use of social media to make carbon savings a cool feature of one's virtual status. Ant Forest also demonstrates, even at this early stage, that digital finance can be used to reach the individual in ways not previously achieved, and moreover to move to previously unimaginable scale in very short periods of time.

The experience of Ant Forest to date demonstrates that citizens can be encouraged and empowered to act on climate concerns, but beyond that little is known. Ant Forest is still in its pilot stages, and much needs to be better understood in order to place such citizens' action at scale on a longer-term pathway. Despite the available data, including the user survey, understanding of why people are engaging and what it would take to sustain and further grow such engagement remains weak. It is equally unclear as to whether the same approach could be successful if advanced, for example, in other countries or in seeking to influence other environmental outcomes such as water use, food waste or biodiversity management.

Green digital finance is at a formative stage, offering great potential but requiring active experimentation, learning and collaboration to maximize positive impact. Two related sets of next steps are described below that together can begin to realize such potential.

5.1 Ant's Next Steps

Ant is dedicated to build up a measurable carbon account for its 450 million users, to promote the development of personal avoided carbon emissions, establish the green and open platform, and encourage green and low-carbon activities. It will cover more scenarios of green and low-carbon business, promote green and low-carbon consumption patterns, develop green financial instruments and promote the development of green and low-carbon industry. Working with UN Environment and other partners, Ant proposes to take forward the following:

- Improving and standardizing carbon methodology:
  Working with the China Beijing Environmental Exchange and others, Ant will continue to improve the accounting methodology for translating behavioural data into carbon footprint data. Also working with UN Environment, Ant is committed to turning this method into a generally agreed protocol

or standard, enabling other payment platforms to deploy it in their own particular context, with comparable results and perhaps eventually inter-operable user communities.

- Establishing an open green platform: Building on the experience of Ant Forest, proposed is to establish an open platform to enable the most effective approaches to encouraging avoided emissions and other citizen-focused approaches to reducing carbon emissions, involving enterprises and NGOs. This platform should help with tree planting, water protection as well as other environmental protection projects.

- Driving a multipurpose green financing platform: Beyond an open platform for collaboration, Ant proposes to use its big data and other capabilities to build and operationalize voluntary emission reduction methodologies, including to help SMEs in particular enter the carbon trading market and reward the carbon reduction activities. It will also explore carbon market capitalization and build an OTC exchange platform for SMEs and individual customers. In addition, it can establish a certification system for green products and develop a green industry through promoting green consumption, Moreover, it can develop green financial instruments to support investment and financing of green industry.

5.2 Green Digital Finance Alliance's Next Steps

The GDFA is the world's first platform dedicated to mobilizing digital developments taking place across the financial system, and more broadly in support of the transition to an inclusive green economy. Established as a Swiss Foundation in the Canton of Geneva, it provides an open platform for public and private actors to collaborate in better understanding, experimenting and catalysing and ensuring the scaled deployment of 'green digital finance'. The Alliance's founders, Ant Financial Services Group and UN Environment, see this not as the promotion of niche initiatives, but as a window on to the future of finance and its relationship to sustainable development.

> "The Green Digital Finance Alliance is a unique partnership ensuring that we can align tomorrow's fintech-powered global financial system with sustainable development."
>
> **Erik Solheim, Under-Secretary General of the United Nations, Head, UN Environment**[25]

Over its initial development phase, the Alliance is reaching out to key actors, building capacity and defining activity streams, to include: (a) ongoing mapping of green digital finance activities, (b) collaborative, market-facing initiatives, (c) engagement with non-market actors, including policymakers and regulators. More specifically, the Alliance proposes to take forward the following:

- Mapping green digital finance: unlike financial inclusion, there is as yet no community established in this area, and so the Alliance will focus its energies on ongoing mapping of green digital finance business activities and initiatives, releasing its first status report at the IMF Annual Meetings in October 2017.

- Deepening and extending Ant Forest: as one of the key collaborative initiatives, the Alliance is working with Ant to improve the Ant Forest's underlying methodology, and to draw together other actors including mobile payment platform operators with an interest in extending the application of the approach.

- Supporting national green fintech hubs: deepening outreach to catalyse innovation often requires bringing together national and local clusters, which can most effectively be done through establishing green fintech hubs linked to existing fintech hubs or green finance initiatives, also engaging public actors.

- Greening digital finance challenge: green digital finance needs to be actively promoted, and the Alliance will do this in collaboration with others through co-design, competition such as in Singapore's 'hackcelerator' linked to its annual Fintech Festival, and by drawing in funders and potentially setting up a special financing vehicle.

- Engaging with policymakers and regulators: advancing green digital finance involves policy and regulatory actors as well as a market-facing action, and the Alliance seeks to engage them at a national and also importantly at an international level, including the G20, in linking together the ongoing discussions about fintech and green finance.

6. Concluding Reflections

Ant Forest offers early evidence that the emerging area of green digital finance has great potential. Ant's pilot in encouraging individuals to manage their carbon footprint suggests that such a bottom-up approach can work. Clearly, there is much to do in working out the best mechanics for this, and moreover how to give value to natural capital. Moreover, many real challenges need to be addressed along the way, from data privacy to any natural capital rights and obligations needed to avoid the worst aspects of a free-for-all market for the eco-system within which we all operate.

Green digital finance needs to complement more top-down approaches. Green finance has to date been driven by policy and large-scale financing deployed by concentrated decision-making in banks and institutional investors. Such actors, instruments and decisions are of huge importance, but are struggling to achieve the speed and scale and needed to meet the level of urgency in addressing climate and broader environmental challenges. Green digital finance could both accelerate the scale of their actions, as well as open the door to bottom-up approaches to citizens' action. Indeed, one possible future would be for citizens to manage their own, far broader 'natural capital' accounts.

Green digital finance is a pre-requisite in securing sustainable development. Addressing sustainable development requires that financing take full account of its environmental impacts. At the same time, digitalization lies at the heart of one of this century's core technological eco-systems. Digital finance is a critical element of this eco-system, and will redefine the nexus between finance, value and economy. Green digital finance is essentially the connection between these two historic strands.

Endnotes

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