

SPECIAL EVENT ISSUE: GLOBAL AGINVESTING ASIA 2019

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GROWING PROTEIN OPPORTUNITIES IN CHINA

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Volume 6, Issue 3 - SEPTEMBER 2019
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**RAPID URBANIZATION AND GROWING PE INVESTING:
AFRICAN AGRICULTURE SET TO RISE P17**

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WHERE ARE THE INVESTMENT OPPORTUNITIES IN THIS BURGEONING REGION?

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Welcome

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Dear Friends and Colleagues,

Welcome to the 9th annual Global AgInvesting Asia – the 40th Global AgInvesting event since the conference series was launched in 2009.

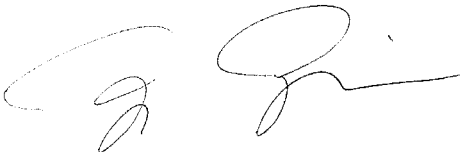
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In our presentation, Investing in the Sun-Based Economy for the 21st Century and Beyond, we will showcase our research-based analysis of the recycling ecosystem and its effect on society, cities, and nations, as well as its social impact. We look forward to sharing our comprehensive vision of the 21st century energy evolution.

KUAM believes alternative investments and investing in Sustainable Development Goals (SDGs) and Environmental, Social, and Governance (ESG) goals are one and the same. This comes from our view that SDGs/ESG are necessary conditions for alternative investment. Agriculture investment shares much of this investment philosophy and as such, one of our broader goals is to have the investment community view Ag investment as alternative investment. At Kuni Umi Asset Management, we are committed to integrity, social impact, and sustainability.

We welcome you to the 9th annual Global AgInvesting Asia at the Tokyo American Club.

Please join us for a stimulating and productive conference.



Yasuyo Yamazaki
CEO
Kuni Umi Asset Management
Platinum Sponsor for the 9th annual Global AgInvesting Asia

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THE GROWING PROTEIN OPPORTUNITY IN THE EMERGING CHINESE MARKET

By Matilda Ho of Bits x Bites

Sixty years ago, at the start of industrial farming, the idea that mainstream American consumers could choose burgers made out of peas and potatoes might have been more far-fetched than sending a man to the moon.

Fast forward to 2019 where Beyond Meat's popular veggie burgers, oozing beetroot-based "blood", are on backorder in the U.S.! The company has been expanding Asia Pacific (APAC) distributions throughout Singapore, South Korea, Taiwan, and Hong Kong.

And when Beyond Meat successfully completed its IPO this May and its value grew more than fivefold over the next month², more and more investors began to wake up to the value of emerging protein alternatives and the larger agrifood tech opportunities.

So what has been driving investor interest in meat alternative innovations? Is it just hype created by this IPO, or is there any fundamental basis to sustain this interest in the protein investment sector? And what opportunities does a massive market like China offer to protein startups and investors?

From our seat as a China-focused food tech VC, protein food tech investments are far from a passing fad. In fact, we have made four startup investments to help bring these innovations to the Chinese market. The reason is simple: As the world's population grows and China's middle class expands, the demand for more efficient, sustainable, and healthier protein is sure to accelerate. Plant-based consumer products like Beyond Meat are a mere sliver of this multilayered opportunity.

What follows is our perspective on the investing opportunity in livestock production and protein alternatives—the innovation category to reduce our reliance on animal agriculture. We also discuss the macro forces and unmet market needs that food tech disruptors are fighting to fill.

A SECTOR RIPE FOR MEAT ALTERNATIVES

Meat consumption in China soared by 300 percent between 1990 and 2013.³ Since then the pace of growth has slowed. But with 20 percent of the world's population, its meat demand remains massive in absolute terms.

Farming industrialization has improved access to meat. Yet it has simultaneously introduced environmental and health risks. The production gain from intensive farming has only partially satisfied the market. China is the main focus for meat exporters globally; its total meat imports are expected to reach over 6 million tons in 2020.⁴ But the U.S. – China trade war has made it clear that it is not sustainable to rely on imported food, feedstock, and meat. In 2018, the Chinese Feed Industry Association declared its goal to limit the use of crude protein in feed to reduce its dependence on soybean imports.⁵

While such import measures are helpful for food security, they cannot defend China against domestic issues such as the recent outbreak of African swine flu. While the viral disease doesn't infect humans, it threatens the animal protein supply, which is central to national stability and economics. China's Ministry of Agriculture and Rural Affairs is projecting a 70 percent increase in pork prices in the second half of 2019.⁶

These macro reasons lay the groundwork for animal protein investment opportunities — innovations that enable safer, more efficient, and sustainable ways to supply animal protein.

NEW SOLUTIONS FOR A NEW SUPPLY CHAIN

A vibrant flow of agtech startups are bringing new solutions to market to challenge how substitutions for animal meat will be produced. One small class of startups does so by adapting advances from the biomedical field.

In 2013, Dutch scientist Mark Post produced the first lab-grown burger at a cost of \$325,000. This was the first clean meat produced by culturing animal cells without an animal.⁷

This event unveiled cellular agriculture to the world, and showed how this disruptive biotech solution could transform the ways animal protein is produced and harvested. Because the protein is produced in a sanitized bioreactor environment, it can provide a viable defense against growing epidemics fueled by intensive animal farming.

Cost is inevitably a hurdle to investors, and scientist-led startups are engineering the inputs and processes to make cellular agriculture cost-competitive.



Uncooked Plant Based Protein

Israeli startup Future Meat Technologies applies a distributed manufacturing platform to produce non-GMO meat products. Since its founding, the company has significantly brought down its costs. It does so by advancing a closed-loop system that allows for media recycling, and by using a distributed manufacturing model with smaller cost-efficient bioreactors.

Before lab-grown meat will appear on restaurant menus, other agritech innovations are taking shape to boost animal farming efficiency today.

Some startups are adapting automation, data sciences, and artificial intelligence to optimize animal farming management. These technologies also help address the shrinking rural labor force caused by aging and urbanization.

Feed startups are working to improve the feed-to-food conversion ratio, animal health, and sustainability. Companies are developing alternative feeds made by processing insects or by fermenting natural gas and bacteria.

A growing class of agritech startups are helping address future epidemics by developing disease detection and prevention measures. Beijing Compass Biotechnology is a company that helps breeders detect animals with desirable traits such as growth and disease resistance, using genes and markers to identify animals with the best breeding values.

OPPORTUNITIES LIE IN CREATING HEALTHIER ALTERNATIVES

Investments in animal protein today are largely driven to fill the missing links on the supply side. In animal-free protein—including plants, fungi, and algae—consumers hold the reins.

The general population is increasingly aware of the health impact of their food choices. Those in China have long enjoyed a wide range of plant-based food and beverage products, from soy-bean milk to Buddhist vegetarian alternative meat. The options are still expanding. In the past few years, the largest dairy and soda companies have all added at least one plant-based product line.

But upon closer examination, many plant foods and beverages are not necessarily healthier. Take a popular walnut protein beverage in China as an example: one 240 milliliter serving contains 8.5 grams of sugar—close to a third of the recommended daily sugar intake—and only 1.4 grams of protein, which is only one-sixth of the protein found in centuries-old soybean milk.

A large food tech opportunity is in upgrading the health value of animal-free protein offerings. Through new ingredient sourcing and processing, they can help hold healthy food and beverage products to higher standards on their nutritional value.

A small group of companies are applying machine learning, systems biology, genomics, and other technologies to unlock the nourishing powers of botanicals in the form of bioactive peptides and other health-benefiting natural compounds. These platforms will allow more under-explored nutritious plant sources to be incorporated into food, beverages, and supplements.

Synthetic biology startups are creating animal-free substitutes for existing products, from eggs to meat replacements. Impossible Burger is a plant-based company that has genetically engineered soy to produce leghemoglobin, its recipe to deliver the flavors that mimic meat. Biotech company Wild Earth is developing clean protein pet food by fermenting koji.

Other companies are advancing novel plant-based ingredients to diversify the palette for food and beverage companies. Israeli company InnoPro is developing a neutral-tasting chickpea protein ingredient for this growing category.

IPO BRINGS TURNING POINT FOR PROTEIN FOOD TECH

This year has been a bumper year for protein innovations. It has seen a wave of plant-based launches from multinational conglomerates, from Nestle to Tyson. Beyond Meat tops it off with what is possibly this year's best performing IPO, hitting a market cap larger than many S&P 500 companies.⁸ And yes, we have yet to see whether this enthusiastic support from the public market can sustain. What is certain is that investors can no longer look away from the food tech opportunity that was under their radar until recently.

With more startups growing to scale, it is safe to say the protein space will grow increasingly diverse from here on. Chinese consumers are likely to see protein alternatives not just in burgers but in dumplings, meatballs, and sushi. And these proteins may be produced anywhere -- from algae and mushroom farms, to fermentation tanks.

Our protein aisle will be anything but boring. 🌱

ABOUT THE AUTHOR



Matilda Ho is a serial entrepreneur and investor with a passion to create more sustainable food systems. She founded and manages Bits x Bites, a food tech VC investing in startups tackling food system challenges in China. In addition, Ho founded Yimishiji, one of China's first online farmers markets, to bring organic and local produce to families.

With a mission to shape the future of good food, Bits x Bites has invested in companies advancing nanoscale contaminant detection, gene editing for high-performing crops, as well as a company advancing non-GMO meat production directly from animal cells without an actual animal. Learn more at www.bitsxbites.com.

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Yasuyo Yamazaki

President & CEO, Founder
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LESSONS IN CONSUMPTION:

Fresh Water Scarcity and Agriculture's Reliance on Irrigation*

By Jeremy Stroud of Bonnefield, and Michael DeSa of AGD Consulting

"In all affairs it's a healthy thing now and then to hang a question mark on the things you have long taken for granted."




Bertrand Russell

There is every reason for us as consumers to pause and consider something that is far too often taken for granted – water. It has become a truism to say that civilization would not exist without the reliability of our earth’s accessible water resources. Our species’ ability to evolve past a Paleolithic state is a direct result of our advances in freshwater use, from leveraging gravity for flood irrigation, to controlling water flow with aqueducts, to the implementation of digitally-integrated irrigation systems.

Societal reliance on fresh water has been presupposed for so many centuries that many of us overlook the ongoing constraints set to fundamentally alter the way we use this scarce resource. This article aims to review a few of the many water challenges affecting the global agri-food sector and places a spotlight on investable regions which may weather the storm most effectively.

When assessing freshwater availability, it is essential to consider the components of the water system within and beyond human control. The thought of addressing all water challenges may be an overwhelmingly broad topic, so the conversation becomes more actionable when we focus on components that can be changed rather than those that cannot. Of freshwater stores, ‘blue water’ is the most pertinent topic to international agriculture as we have little control over deviation in rainwater occurrence and quantity. Water scientists place particular emphasis on blue water within the context of a changing climate – namely as it pertains to projected increases in the frequency and severity of global drought.¹

COMMON FRESHWATER CLASSIFICATION²

-  **Blue water:** surface & ground waters (by irrigation)
-  **Green water:** rain water, including soil and intercepted moisture
-  **Gray water:** fresh water that has assimilated pollutants & meets quality criteria

Less than 3 percent of the earth’s total water stock is fresh water and nearly four-fifths of the 3 percent are permanently frozen and inaccessible.³ In other words, this equates to about 10,000,000 cubic km of fresh, accessible ground and surface water⁴. After factoring in areas of excessive pollution, acidity, and salinization, we are left with less than one-tenth of a percent of fresh water supply available for human, agriculture, and industry use.⁵ While freshwater is limited in volume, humans are continuing to increase consumption per capita on an annual basis⁶, and at a pace that far exceeds the rate of replenishment.⁷ Here lies the bone of contention. It is not a question of whether we are using scarce water resources at an unsustainable pace, but rather a discussion of what can be done about it.

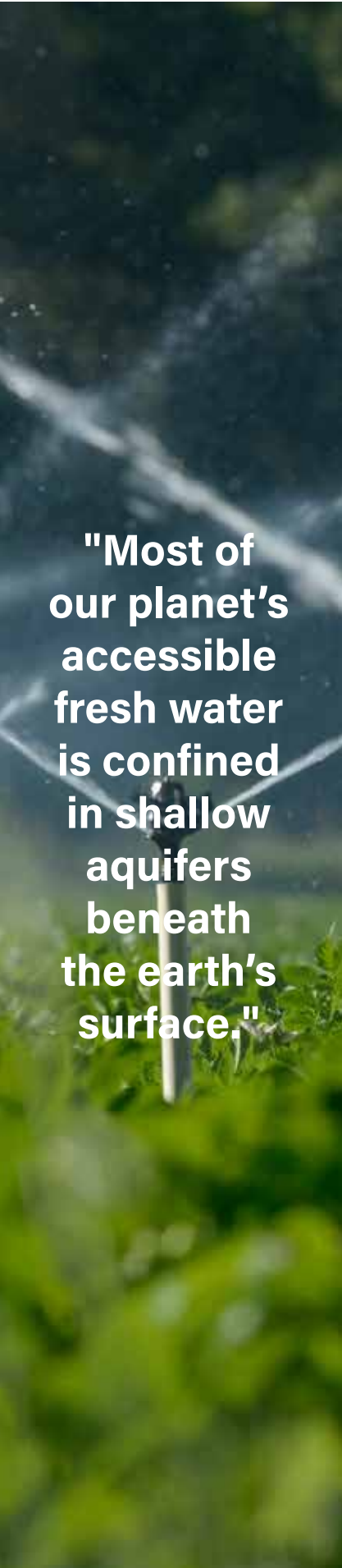
BLUE WATER - CONSUMABLE AND IRRIGATABLE

Water use for irrigation is among the most heavily contested aspects of the modern agricultural system. Agriculture and blue water depletion are inextricably linked. According to a recent report from Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), nearly 75 percent of the world’s accessible freshwater consumption is dedicated to crop and livestock production and nearly 40 percent of the planet’s current food supply is reliant on irrigation.⁸ This issue becomes further pronounced when we consider that nearly half of the world’s population is living within immediate proximity to river basins and aquifers with the ‘severe water stress’ classification.⁹ Evidence suggests that overuse and maltreatment of accessible freshwater resources could cause a contraction in global productivity growth, and therefore a potential decline in living standards.¹⁰

Most of our planet’s accessible fresh water is confined in shallow aquifers beneath the earth’s surface. A high proportion of these non-renewable aquifers are reaching critical points of depletion, and they are commonly located in areas which fall beneath the world’s most populous and important agricultural regions. A study from the Proceedings of the National Academy of Science estimates that up to 100 million irrigated acres may be unable to draw sufficient water resources to support production by the end of the century.¹¹ This could lead to drastic decreases in crop yields if rainfall averages cannot make up the difference. The Ogallala aquifer beneath the U.S. Corn Belt, for example, is particularly threatened by overuse and pollutant contamination. A reversal of irrigated land to dryland is expected to occur in



"...nearly 75 percent of the world’s accessible freshwater consumption is dedicated to crop and livestock production and nearly 40 percent of the planet’s current food supply is reliant on irrigation."



"Most of our planet's accessible fresh water is confined in shallow aquifers beneath the earth's surface."

regions such as California's central valleys, the U.S. Midwest, the North-China Plain, and the Arabian Basin. In each of these regions, non-renewable groundwater is a primary source of irrigation. It is not coincidental that each of these regions have been subject to significant water stress in the past decade.

Blue water depletion is a complex issue that demands collective action – not solvable by implementing any single policy, action, or framework, but rather it requires a cooperation between all levels of business, government, and society. Irrigated farms that source their water from continually measured, renewable deposits (such as sustainably disbursed lakes and river systems) may be the most productive, economical, and sustainable solution to the forthcoming water scarcity challenges.

VIRTUAL WATER

Consumers may look at food-induced water depletion as a direct product of farm activity, while the reality is more complex and integrates all facets of society. Farmers, like any other business, are economic entities that aim to optimize output, scale, and profitability. In the agri-food sector this is accomplished by efficiently fulfilling the needs of consumers. With a growing population and an increasing appetite for high-quality proteins, fruits, and vegetables, consumers tend not to realize the macro-effects of their individual purchasing decisions, but rather focus on the needs of the household or community.

As it stands, we have a developed consumer base that is unaware that we effectively outsource water depletion through our demand for high water-footprint foods.¹² An often cited example is China's import of water-intensive soybeans from areas such as Brazil, which has led to indirect pressure on deforestation of the Amazon.¹³ We have historically been able to purchase food and industrial products with the cost of water extraction embedded in the price, but often not the true cost of water depletion. This distinction is vital to the topic of global water management, where governments often subsidize industry water use as a regular cost of doing business in order to provide consumers with food options that meet their demands.

Most experts believe these consumer trends towards high-footprint foods are firmly established, although as shoppers begin to realize the increased demands on water is a result of their decisions, they too may begin to search for more sustainable and renewable ways to use the available water supply. It is here where we see a long-term investable opportunity.

FARMLAND INVESTING: GO WHERE THE RENEWABLE WATER FLOWS

The pursuit of a sustainable and profitable agricultural investment portfolio may be achieved through consideration of macro-climatic indicators, strategic selection, and rigorous due diligence. While this article refers to agricultural investing from a farmland perspective, there also is a case to be made for investments in agricultural technology, including efficient irrigation, wastewater reuse, soil moisture sensing, and seed resilience technologies.

A structural decline in crop production is expected to create supply shocks in the future, potentially raising agricultural commodity prices in the long term. The Intergovernmental Panel on Climate Change (IPCC) estimates that crop yields could decline by up to 12 percent as a consequence of water scarcity in the next three decades.¹⁴ The thesis of investing in 'water-rich' regions is predicated upon their capacity to weather an incoming storm of potential water issues:

~ Invest where irrigation is less necessary for productive agriculture: Less than 4 percent of Canada, Brazil, Russia, and Australia's farmland is irrigated compared to about 10 percent in the United States and 37 percent in India¹⁵ (See Figure 2). Productive agricultural regions that are less dependent on irrigation tend to hedge the risk of groundwater depletion and/or pollution.

FIGURE 2: PERCENTAGE OF FARMLAND UNDER IRRIGATION¹⁶

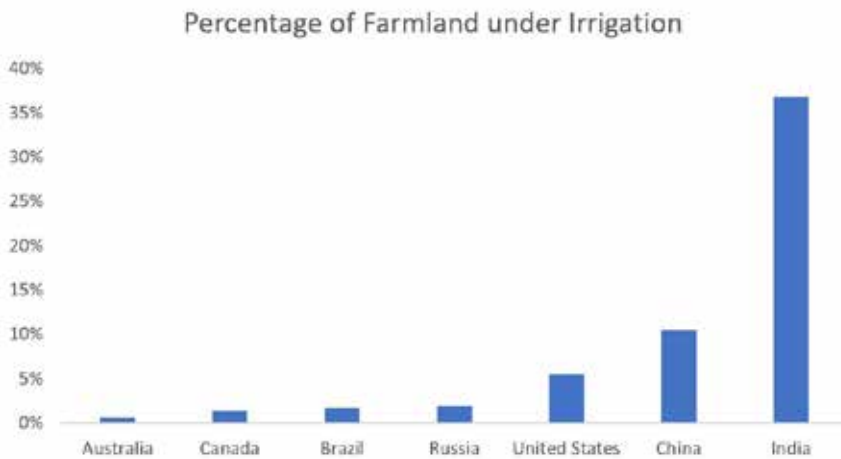


Figure 2: Percentage of Farmland under Irrigation¹⁶
Source: The World Bank World Development Indicators, 2015

Source: The World Bank World Development Indicators, 2015

~ Analyze metrics to determine where water shortages are expected to fall: Statistics such as renewable fresh water per capita are helpful in determining where water crises are expected to occur. Other helpful statistics include aquifer replenishment rates, variable on-farm water requirements, and the legal parameters of water resource allocation. While Canada, Russia, Australia, and Brazil use relatively little water for irrigation compared to the rest of the world, they hold the most fresh water reserves per capita of all agricultural exporters with 80,200 cubic meters.¹⁷ Further projections suggest that warm-climate regions are likely to experience decreasing precipitation levels in the next century while polar and continental regions may encounter more rainfall.¹⁸ Although each country's water rights laws and natural precipitation levels may vary, the thesis holds over a long-term geographic perspective while political frameworks may change. This sentiment should be further examined at a regional level to assess where irrigating farmland may be achieved most sustainably.

FIGURE 4: GLOBAL FRESHWATER RESOURCES PER CAPITAL¹⁹

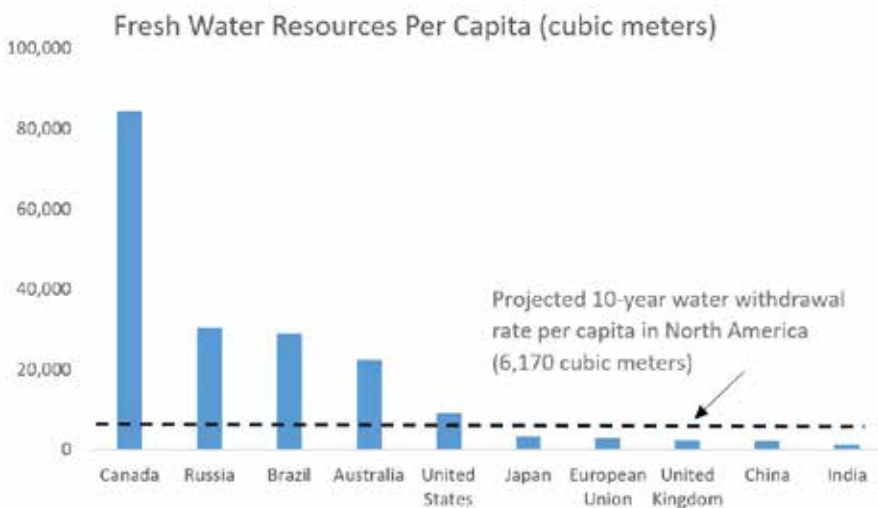
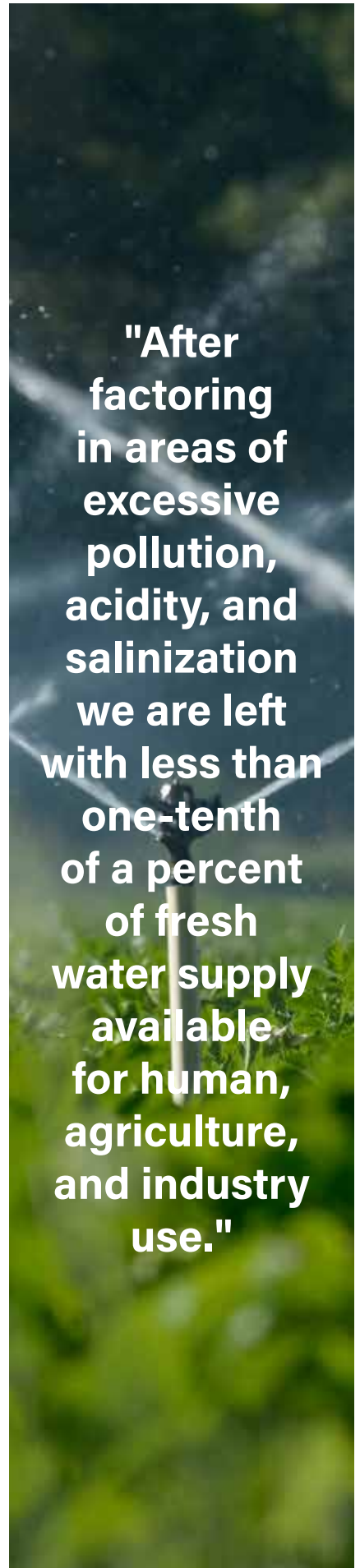


Figure 4: Global fresh water resources per capita¹⁹
Source: The World Bank, 2014

Source: The World Bank, 2014



"After factoring in areas of excessive pollution, acidity, and salinization we are left with less than one-tenth of a percent of fresh water supply available for human, agriculture, and industry use."

"Agricultural investors have a distinct opportunity to allocate capital towards efficient irrigation and farmland portfolios in regions that have the replenishing capacity to withdraw water resources sustainably."

For as long as humans inhabit the planet, unpolluted, fresh water will be a finite resource with limited supply and consistent demand. Although specific water reserves appear to have promise over the next several decades, it is a responsibility for farm owners, governments, consumers, and investors to responsibly regulate withdrawal and avert contamination. Freshwater depletion is an agricultural issue just as much as it is an environmental one. Here lies a rare circumstance where economic returns may be matched by environmental impact. Agricultural investors have a distinct opportunity to allocate capital towards efficient irrigation and farmland portfolios in regions that have the replenishing capacity to withdraw water resources sustainably. 🌱

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WITH SPECIAL THANKS TO:

- Kelly Bridges, Water2020
- Jeffrey Conrad, Agis Capital
- John Lionel, Private Wealth Management

*NOTE: This article was first published in GAI News, a sister publication of GAI Gazette. It is the third article in a monthly series that examines eight existing trends set to alter the structure of the global food system. Visit GAI News at www.gainews.com for past contributions.

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EXECUTIVE PROFILE: Tai Lin

Managing Director at Proterra Investment Partners

By Michelle Pelletier Marshall, GAI Media



Tai Lin is a managing director at Proterra Investment Partners, the \$2.4 billion private equity firm that was spun off from Cargill's Black River Asset Management in 2016. Proterra – which has offices in Minneapolis, Shanghai, Singapore, Mumbai, Sydney, Sao Paulo, and London – focuses primarily on investments in food and agriculture.

Working out of offices in Shanghai and Singapore, Lin directs the company's food sector investments across China and Southeast Asia, and has been instrumental in building Proterra's growth across Asia. In 2017, Proterra had over half of its total assets under management invested in China, Indonesia, India, Thailand, and the Philippines.

Lin has over 16 years of private equity investment and M&A experience, which includes a managing director post with Black River Asset Management. He spent multiple years in M&A investment banking in Hong Kong, London, and New York, during which time he worked on various transactions involving Asian markets and companies.

Lin currently serves on the board of numerous companies in the food and agriculture sector, including NR Instant, FKS Food & Agri, Guilin Seamild, PFI Foods, Golden Maple, Phoenix Eggs, and Riverstone Farms. He is a graduate of Vienna University of Economics in Austria.

GAI Gazette caught up with Lin during his recent visit to Boston.

Global M&A totaled \$3.6 trillion in 2016 with Asian and European countries favored as the epicenter due to a pro-deal receptive environment. Have you seen this hold true for agriculture, and what are the micro and macro-economic driving forces?

Overall, it appears that the global agribusiness sector is increasingly becoming a more corporatized business. Over the last 10 to 15 years we've seen – especially in emerging Asia and countries like China, India, and most in Southeast Asia – increased professionalism where families and farmers are handling more corporate-like activities. We believe the reason this is happening is the growth of population and demand, which in turn makes for larger companies that ultimately need a way to operate in a more structured manner. Further, the market is becoming more sophisticated as is the consumer, and agribusinesses are faced with a more competitive environment. Many of these traditional family businesses are now quite interested in partnering with larger overseas or Asian companies because they can provide additional value via brands, networks, or capital.

Additionally, Asia in general is an agri-commodity deficit region, and imports much of its soft commodities and food products. We believe the gap that has been created by the consumer demand for food and the inability or increased cost of producing those products, makes companies in Asia seek overseas options to procure their raw materials or food products. As they do this, it increases their partnerships with foreign groups, leading to M&A opportunities.

With this rising confidence in mergers and acquisitions in ag, where does Proterra see the most potential for M&A in Asia, as far as region and ag category?

With regards to the activities of the Food Strategy, which is focused on meeting food demand, we see emerging Asia as the biggest, strongest driving force in the growth for food globally. The areas we are focused on are China, India, and Southeast Asia.



"...we see emerging Asia as the biggest, strongest driving force in the growth for food globally. The areas we are focused on are China, India, and Southeast Asia."

China is a crowded market when it comes to foreign investments and M&A. If you look back 20 years within the food space in China, the focus was on food security and quantity – more was better; 10 years ago the focus was food safety. Today, the focus has appeared to move on to premiumization of foods, which means higher quality, more nutrition, more transparent as to where it comes from and how it's made, more convenient, and more value-added. This change in consumer play means that many companies need to shift their strategy – where you were once a pure producer, now you need to think more about how to market, package, and make your product more convenient. In our opinion, this shift creates additional opportunities in M&A where you see a midstream player team up with a downstream company, and more joint ventures formed. You see big retail platforms team up with agricultural companies to help them sell their product better. We believe that this is driving M&A in the agribusiness space for China.

In Southeast Asia, we also foresee increased M&A opportunities. There we see most businesses run by families, built up over generations. There's a changing of the guards where the next generation – the older millennials – are taking over, and they have different ideas for the business. They want to professionalize it, make it more attractive, and move more to B2C, which fuels M&A activities because this new generation is very open to input from the outside. They want foreign strategic or financial player input, which is very different from the traditional businesses of this area.

In India, our local investment team sees a strong consumer growth story driven by millennials. Surveys show that India is expected to have one of the fastest growing economies for the next 10 years, and even though they won't reach the levels of China in terms of size and GDP, the growth in food consumption will still be a major growth driver for the consumption bucket of the overall economy for the next decade or more.

Proterra has its hand in many deals, such as last year's divestiture of Goondiwindi Aggregation in Australia, 2017's \$100 million investment in Indonesia's FKS Food & Agri, and the sale of the company's stake in India's Dodla Dairy Ltd. in 2016. How does Proterra go about evaluating these opportunities?

I can't comment on the Australia divestiture as I was not directly involved, but it's a positive event for Proterra and a nice achievement for the company and the team.

As far as the investment of FKS in Indonesia, it was relatively big for the country and the sector. If you think about Indonesia – where most studies predict it will be the fourth largest economy in the world very soon – we are seeing a "curious" situation. Curious in that it is a country that is huge – 268 million people – and it has many natural resources such as oil, gas, copper, gold, and more, but for ecological reasons doesn't have the ability to produce enough of its own food. FKS is the company who has leading market positions in origination, logistics, import handling, and distribution of most food commodities – soybeans, soymeal, sugar. It is the only company with a nationwide footprint of warehouses,

providing, in our opinion, the best platform for the Indonesian supply and demand deficit for food and agri.

With Dodla Dairy, we took them to visit dairy farms in China where certain funds had made investments, and both parties were impressed with each other, so we decided to partner. Dodla has seven factories where they process the milk, purchasing it from tens of thousands of villages and farmers, oftentimes in very small volumes. This company provides an important livelihood for thousands of families, which is one of the reasons that when we exited Dodla, the buyer was a leading global impact investor. We are very proud of the financial and societal returns with Dodla.

Our strategy for our growth private equity Food Strategy sees us being more than just a shareholder – we need to be a driver of progressive change.

Has the U.S-China trade war affected food sector investments in the regions Proterra serves? If so, how, and what is the market doing to counter this?

Yes, there has been an impact from the trade war, however, there are good and bad things happening.

The trade war has certainly created havoc with commodity prices. Soybean prices are up and as a result in China, for example, feed prices for livestock are up so you would figure the cost of production would go up as well. But what companies are doing to counter this is to reformulate their feed and procure soybeans from



other places, such as Argentina. There are all sorts of counter-measures being used. The net/net of it is that you can counteract the increase in soybean prices somewhat but you cannot remove the whole negative impact (for livestock).

My more important point is that this trade war is not as big of a deal. What makes the Chinese economy or a company perform well or not – is determined by 100 factors – and the trade war fallout is just one of them. The media currently talks about the U.S. trade war nine out of 10 times when it talks about things that matter to the Chinese economy, but it's just not true that this trade dispute represents 90 percent of what impacts China's economy overall. Ninety-nine other factors determine whether the economy or a company does well or not, and soybean prices are just one of these. In short, we believe it doesn't matter as much as you would think to the individual company, and when it does, it could actually be a good thing as well.

The primary impact of the trade discussions is that U.S. farmers can no longer sell their soybeans as well, and the Chinese livestock farmers are suddenly faced with higher prices, so no one is happy. The secondary impact is that in countries like Argentina and Brazil, they have seen their soybean prices go up 20 percent and they should be jumping for joy and cultivating more and more acreage and investing in logistics and the supply chain. China has a strategy now to diversify away from the U.S. and create new procurement relationships. So even if the trade war settles

down in the next 90 days, you might not return to a previous normal because the landscape might have shifted somewhat. China might try and buy less from the U.S. and more from other areas going forward and that might shape the global soybean trade in the longer term. Livestock farmers in China too will likely have figured out more alternative substitutes.

More and more investors consider ESG standards before choosing investments for their portfolios. How has Proterra aligned itself with this growing sentiment and incorporated it into its target investment search?

ESG is very important to our firm. What I find a little frustrating with the current ESG topic is that everybody talks about it and says it's important, but defining it is more complicated, and whether it makes sense in certain cases, especially when dealing in emerging markets, is a difficult question. For example, we were interested in investing in a banana/cocoa plantation in one of the poorest regions of the Philippines, but we said if we are to invest they would have to remove the under-aged workers. My contact said we will do as you say, but please know that if we send them home, their family will have no income and she and her sisters will have to stop going to school and be forced to do the worst jobs to make money. He asked if this is what we wanted? It's all good intentioned, and it's the right thing to do, but we have more work to do to refine and understand exactly what is good and what is bad when it comes to emerging markets.

Having said that, we conduct ESG due diligence on every potential deal, and we've rejected several deals for not meeting our required standards. We request annual certifications, we pay outside consultants to help our companies, we make periodic ESG reports, and we quantify the benefits of ESG activities of the companies we have partnered with. This is a very important topic that we continue to push and examine.

What sets Proterra apart from other private equity firms?

There are not a lot of sizeable, pan-regional PE firms that are focused on food and agriculture. The focus on the sector makes a difference as we navigate our deals – it's easy for us to find operators, we know people in the right places, and we can easily make the connections.

Another thing we've successfully undertaken several times is to build companies from the ground up. We seek to hire established management teams and then set up legal entities and fund them so that these teams can build up new industry-leading companies. These "greenfield" investments have been quite successful, and we have built industry leaders in this way. This is something we are proud of and is not easily duplicated by financial investors. 🌱



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Rapid Urbanization and Growing PE Investing: African Agriculture Set to Rise

By Chipo Muwowo, Savvy Investor



In recent years there has been a

marked increase in institutional investor interest in farmland and forestry (or timberland) investing. Following the global financial crisis, the race to “real assets” has intensified with investors seeking long-term, stable, low-risk assets in which to invest. It is therefore not surprising that the farmland and timberland asset classes have been receiving closer than usual attention from large institutional investors.

While some large funds have been allocating capital to these sectors for a long time now, the number adding farmland and forestry to their investment portfolios has grown considerably over the last decade. In 2005 fewer than 20 farmland funds were operating globally. By 2017, that number had increased to over 130, with estimated aggregated assets under management of US\$32 billion.¹

The primary attraction for investors are the portfolio diversification benefits that farmland and timberland assets provide, particularly an inflation hedge and above average ROI. According to the U.S. National Council of Real Estate Investment Fiduciaries, during the years 1993-2017, the country’s timberland and farmland sectors provided annualized total returns of 8.4 percent and 11.8 percent respectively.²

In emerging markets, African and Africa-focused investors are in an excellent position to benefit from this global surge in interest. The continent still holds vast swaths of unproductive arable land which, with the right kind of management and planning, can rapidly increase productivity. The continent holds 60 percent of the world’s uncultivated arable land and of that, only 8

percent is currently under managed water and land development.³ In addition, a population of 1.2 billion and fast-growing urban centres provide investors with the opportunity for significant ROI in a classic high risk-high return scenario. In May this year, the introduction of the African Continental Free Trade Agreement (AfCFTA) marked the culmination of a long-standing conversation around the need to lower trade barriers and unlock the potential of intra-Africa trade.⁴

Akinwumi Adesina, president of the African Development Bank, often speaks of how Africa's future millionaires and billionaires will likely be farmers. He's right. In addition, over 60 percent of the continent's population are below the age of 25.⁵ Young people not only need jobs, they're also technologically-savvy and with increasing purchasing power, form an important consumer class.⁶ According to the United Nations, the world's 10 fastest growing cities between 2018 and 2035 will be in Africa. "472m people in sub-Saharan Africa [currently] live in cities," said David Pilling in the Financial Times newspaper. "High birth rates and migration from the countryside mean that by 2040 Africa's urban population will more than double to 1bn, a rate that far outpaces urbanisation elsewhere in the world."

These important investment industry megatrends haven't escaped the gaze of investors. Phatisa, a pan-African private equity firm, is investing in food and agri-focused businesses across the continent. Armed with its US\$300 million Food Fund 2, the firm aims to invest in anything across the food value chain. In 2012, the company bought Zambian poultry business Goldenlay for US\$24 million. "An egg is the cheapest source of protein, so it's got a huge development impact in terms of people coming into the food value chain and starting to move up that," said Stuart Bradley, founding partner. Phatisa does not invest in farmland as an asset class. The firm only invests in land needed for the production of specific products. "Africa's food and beverage markets are projected to be worth US\$1 trillion by 2030," said Duncan Owen, joint managing partner. "They offer the prospect of a three-fold increase, greater prosperity and significantly more opportunity for African farmers to compete globally. There is ample opportunity to invest in relatively early stage investments, where private equity firms can lend governance support, grow business financially and present them to corporate FMCG [Fast-Moving Consumer Goods] companies as an exit play."

To make the most of the opportunity, institutional investors need to find the right way in. According to bfinance, the investment consultant, there are three main strategies: (1) leasing, (2) traditional, and (3) private equity. First, the leasing strategy involves buying land and leasing it to farmers. In some cases, these are cash leases delivering a fixed coupon every year. In other cases, the returns are aligned with the profits of the operating partner who leases the land. Second, the "traditional" strategy is about ownership/direct operation of the land, with involvement in various parts of the value

pc. The World Bank. 2018.


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chain depending on the investment. And third, the PE strategy (as already discussed) involves taking stakes in companies which are involved in various parts of the agricultural value chain.

But what about going for a two-pronged strategy? A report by Manulife, the asset manager, explores what a combined timberland/farmland investment portfolio might look like. It provides a fascinating comparison of the risk/return profile of a combined portfolio to commercial real estate and other financial assets. The report's authors argue that having a broader investment mandate across both sectors enhances an investor's ability to act opportunistically.

It's worth noting however that while farmland and timberland provide huge promise, responsible investing considerations need to be thought through seriously. Deforestation, crop disease, rule of law issues, etc. are just some of the areas that investors should take particular note of.

In recent years, "ESG" has become a ubiquitous industry term. "Environmental, Social and Governance" issues are coming to the fore for many fund managers, with vast amounts of ESG and Ethical Investing research being conducted.⁷ The spill-over effects are significant for everyone involved. "Simply put, the more sophisticated investors become regarding ESG, the more sophisticated managers become. And in Africa, where the scope for impact is enormous, the outcome of these developments can have significant consequences that extend beyond investee companies to the communities and countries they operate in," said Paul Boynton, chief executive of Old Mutual Alternative Investments. 


About the Author



Chipo Muwowo is head of content at Savvy Investor, the world's leading "knowledge network" for institutional investors. The Savvy Investor team provides the global institutional investment community with the best white paper research on farmland investing. Visit www.savvyinvestor.net for more details.

10,000 YEARS OF SEED HISTORY THREATENED BY CLIMATE CHANGE

By Gerelyn Terzo, GAI Media

A tall, dark, rectangular structure, possibly a seed vault or a futuristic building, stands in a dark, blue-tinted landscape. The structure's upper section is illuminated from within, showing a dense, glowing mass of green and blue light, resembling a seed bank or a data center. The background consists of rolling hills under a dark, clear sky.

Seed banks harken back to the beginning of agriculture. Farmers have been preserving seeds from the threat of extreme weather and disease to the food supply for thousands of years. Should catastrophe strike, the seed inventory can be accessed to regrow food. While the methods and packaging have evolved over time, the motivation behind seed diversity is the same - to safeguard the world's food source.

Seed banks not only represent the history of agriculture but the promise of the future, as well. That's why it's so frightening that the Arctic town housing the last line of defense for seed banks around the world is warming up.

The Svalbard Global Seed Vault, also known as the Doomsday Vault, is positioned between Norway's mainland and the North Pole. Built by the Crop Trust and the Norwegian government and opened in 2008, it's a global system that holds and protects approximately 1 million varieties of seeds. There are more than 1,750 genebanks around the world and Svalbard is a backup for all of them.

The massive structure is nestled in Norway's mountain permafrost on Spitsbergen Island where it serves as a global backup for the national and international crop collections around the globe.

Only now the permafrost has begun to melt amid warming temperatures gripping the archipelago in which the small Arctic town is located. In fact, the warming here is more severe than anywhere else in the world. As a result, water has begun to seep into the 120 meters of tunnels leading to the doors that hold the precious seeds.

"From 1971 to 2017, a warming of 3 to 5 degrees Celsius has been observed ... with the largest increase in winter and the smallest in summer," according to Inger Hanssen-Bauer of the Norwegian Meteorological Institute as cited in the Washington Post.

The rising temperature is especially acute for Svalbard, where the average temperature is -8.7 degrees Celsius. "We know that the warming in this area has been very fast during the last five decades, seen in a global perspective," Hanssen-Bauer noted.



The Svalbard Global Seed Vault features an illuminated artwork titled "Perpetual Repercussion" by Norwegian artist Dyveke Sanne. The art installation runs the length of the facility's roof and down the front face to the entryway.

Perhaps nobody knows this more than Marie Haga. As the executive director of the Crop Trust, Haga has a front row seat to the reality of climate change in the region. She told us:

"I have sleepless nights over the drama that climate change is. The weather is getting more unpredictable. It's getting rougher -- heat waves, cold waves. We have stronger winds. We have more storms. I think it should worry us a lot more than it actually does. It should worry politicians much more than it seems to."

The U.S.' intentions to withdraw from the Paris Climate deal later this year doesn't help matters.

"The U.S. is a substantial contributor to the Crop Trust. And we appreciate that a lot. Having said that, there is no doubt that a changing climate -- whether it is man-made or God made -- is a tremendous challenge for security. And I think it's fair to say that the main challenge for food security is that the crops that feed us are not able to adjust as fast as the climate is changing," said Haga.

Crop diversity within species is needed to breed new plants to withstand changing weather conditions.

Among the 150,000 varieties of wheat, one variety might withstand higher temperatures while another can tolerate higher salinity in the soil. A third might have a higher nutrition value and a fourth might fight a new pest and a new disease.

"Each one of these varieties has different traits and that's why we need to safeguard all of them," said Haga. "We don't know whether the challenges of today will be the same in five years or in 200 years.

Crop Diversity

Crop diversity is woven into the knitting of the mission of the Crop Trust. While chief among the threats to this mission is climate change, it's not the only worry.

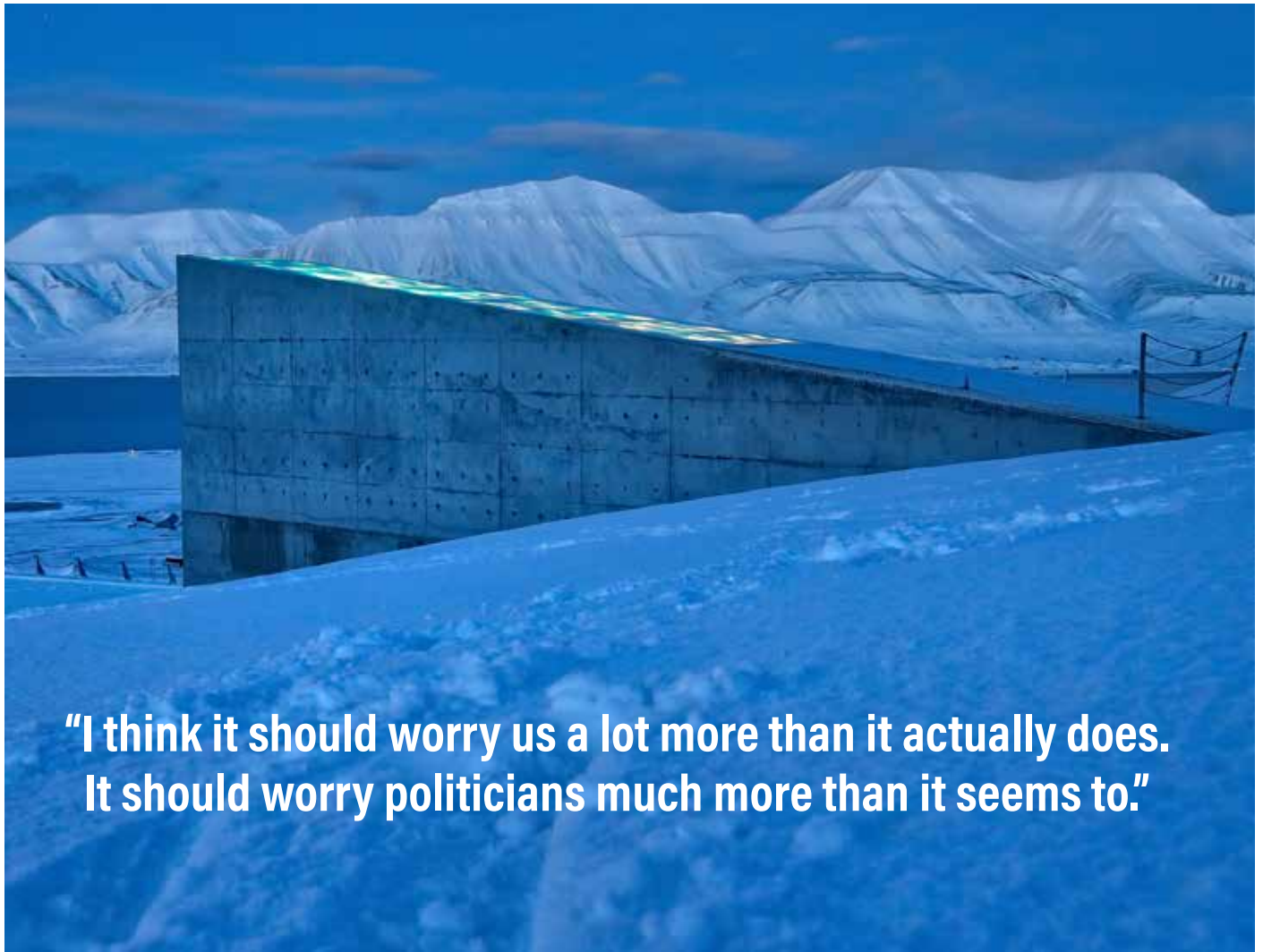
A tremendous amount of diversity has already been lost in the last 100-150 years. In the U.S. alone, for instance, more than 90 percent of the fruit and varieties from 1900 are gone. The reasons are two-pronged, owing to archaic agriculture methods and urbanization.

"That is extremely worrisome because for each variety we lose, we lose options for the future. What we do when we safeguard these crops is to safeguard options for the future. And when you lose 90 percent of fruits and vegetables in the U.S., it means you have fewer options."

Developing countries are another concern, for a different reason.

"I am particularly concerned about the areas where many of these crops originate. You always have the greatest diversity from where the crops originate. And most of the crops come from developing countries. They have the least amount of resources to safeguard these materials. We've got to understand that this diversity is a global common good," said Haga.

Funding is a concern, too.



“I think it should worry us a lot more than it actually does. It should worry politicians much more than it seems to.”

“One would think it takes so much money to do this work. It really doesn’t. We have done constant studies. It takes \$34 million a year to safeguard all of this material. Globally, I would say that is a very cheap insurance policy for the world,” exclaimed Haga.

The Crop Trust oversees an endowment fund built through generous financial contributions from many world governments and individuals. But it’s not enough.

“We would really like to see more private companies stepping up, especially those in the food and beverage sector - after all, their entire business models depend on some of these crops!” explained Crop Trust’s Neil Palmer. “The target for our endowment fund is USD\$850 million; we’re currently around one-third of the way there.”

The dream of Svalbard is to have one copy of each unique variety of seeds in the global seed ark.

Entering the Halls of the Svalbard Global Seed Vault

The hope of the Crop Trust is that they never have to use the Svalbard Vault.

“If we have to take material out of it, it’s because something has gone wrong around the world,” said Haga.

For instance, when the Battle of Aleppo was at its peak, the International Center for Agricultural Research in the Dry Areas (ICARDA) withdrew some of its seeds from the Seed Vault.

“When that material is lost, it’s lost forever. Unfortunately, things happen around the globe. And that can be war or it can be a national catastrophe like an earthquake or fire. And that’s why you need to have a backup,” said Haga.

ICARDA established genebank operations in these countries too, so the seeds are grown and conserved there. Some of the seeds they withdrew have since been returned to the Seed Vault.

For Haga, the experience of walking into the highly secure Svalbard Seed Vault is a spiritual one that gives her the feeling of being in a cathedral. She explained:

“I’ve been there so many times. It catches me every time, knowing the seeds behind these doors are the history of agriculture and potentially the future of agriculture. This makes me humble.” 🌱

THE BURGEONING FOOD DELIVERY SECTOR IN ASIA

The online global food delivery market is dominated by Asia Pacific (APAC).

Market revenue for APAC in 2017 was US\$34.31 billion, with a 52.1% share.

Expected revenue for APAC by 2023 is US\$91 billion, with a share of 56.2%.



Online food delivery services in China grew to about 346 million in 2018 - just one-quarter of the country's population.



Singapore's honestbee is a leading provider with services in 16 cities across eight countries.



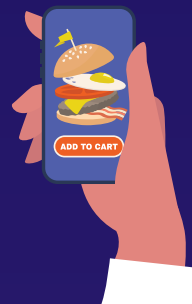
In Japan, revenue is expected to grow at a CAGR of 8.4%, with a market volume of US\$3.74 billion by 2023.

Top five in revenue for global online food delivery: China (US\$40.4 billion), U.S., India, UK, and Japan (US\$2.5 billion).

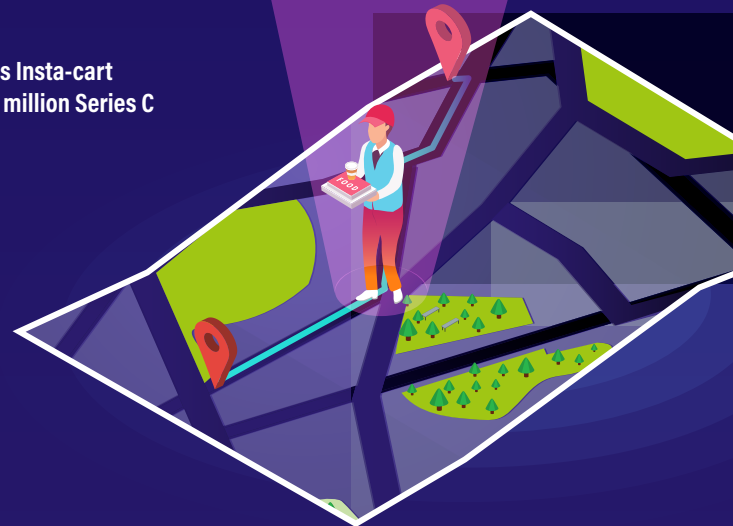


In 2015, HappyFresh raised \$12 million for its Insta-cart grocery deliveries in Southeast Asia. A \$20 million Series C was announced in April 2019.

In Malaysia, grocery delivery app HappyFresh claims more than 40,000 items are available in their app.



Uber Eats has been noted as the top global food delivery service, offering about 127,800 restaurants to order from in over 25 countries.





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