

How is China able to provide enough food to feed its population of over 1 billion people? Do they import food or are they self-sustainable?



Janus Dongye, Interested in Chinese history and geography

[Updated 13h ago](#)

Seeing is believing. Open your Google Earth and have a look at what is really going on in China from above. Western media won't normally tell you about this.

I will guide you through and point you where to look at.

Here are the coordinates:

Location 1: Ningde Bay, Fujian, China (26°43'02.8"N 119°57'45.2"E)

Our first destination is the coastal area in Fujian province.



If we zoom in, we can find millions of floating houses and cages on the sea surface.



If you look around the coastline from Zhejiang province to Guangdong province along the 1000 miles, you can see those floating cages are virtually “everywhere”.

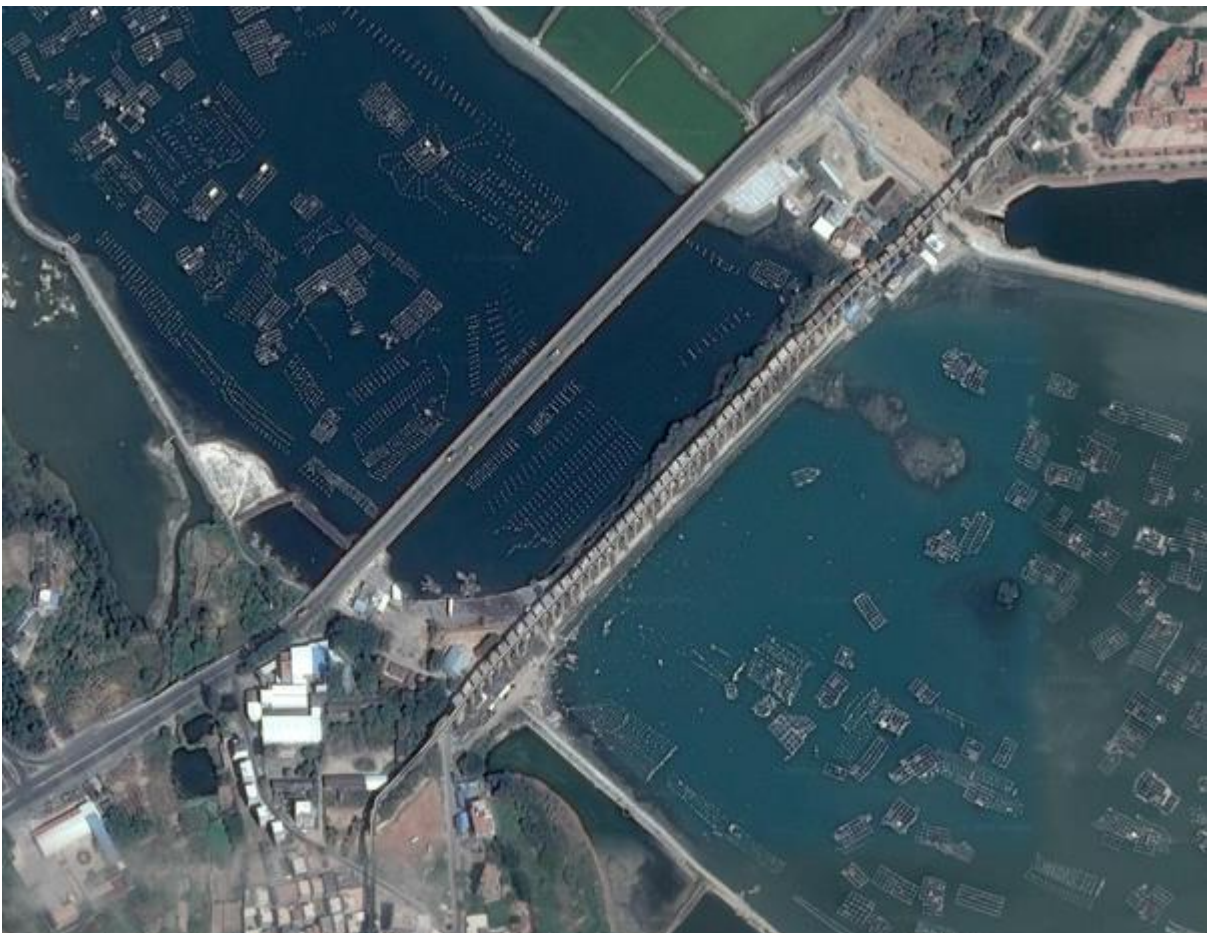


What are those? They are actually Chinese “seafood farms”.



Instead of going out to the oceans and catching wild seafood, why not stay in the same place and raise your own seafood? And you can actually make more money with much less effort from raising fish, shrimps, crabs, lobsters, clams, etc.

It is not just sea or ocean waters that are being farmed, Chinese farmers find any possible open water such as reservoirs, rivers, lakes for farming their seafood/freshwater food.



Imagine each of the cages contains tens of fishes and crabs. That's A LOT of FISH!

So how much seafood does China consume?

It is estimated that the global demand for seafood consumption is 143.8 million tonnes per year and China alone has the largest seafood consumption (**65 million tonnes**, 45% of global consumption), followed by the European Union (13 million tonnes), Japan (7.4 million tonnes), the United States (7.1 million tonnes) and India (4.8 million tonnes). (Source: [EU SCIENCE HUB](#))

As we know, both China and India have a similar population but China consumes **12 times more** seafood than India, despite the fact that India is in a better geographical position surrounded by warmer oceans in a tropical fishing-rich region.

Among the 65 million tonnes of seafood consumed in China, only 15 million tonnes are caught from the wild, the rest of 50 million tonnes are all raised by aquaculture "farming". In contrast, 90% of Japanese seafood consumption is from wild catch. Thanks to seafood farming, normal Chinese families can afford cheap seafood in their daily meal. This is a typical family get-together dinner settings: You can see lots of them are seafood!



This vlog shows how a bigger Chinese family enjoys steamed seafood. The whole table only costs around \$120 US dollars.

Location 2: Nanxun, Huzhou, Zhejiang, China (30°46'14.5"N 120°09'02.9"E)

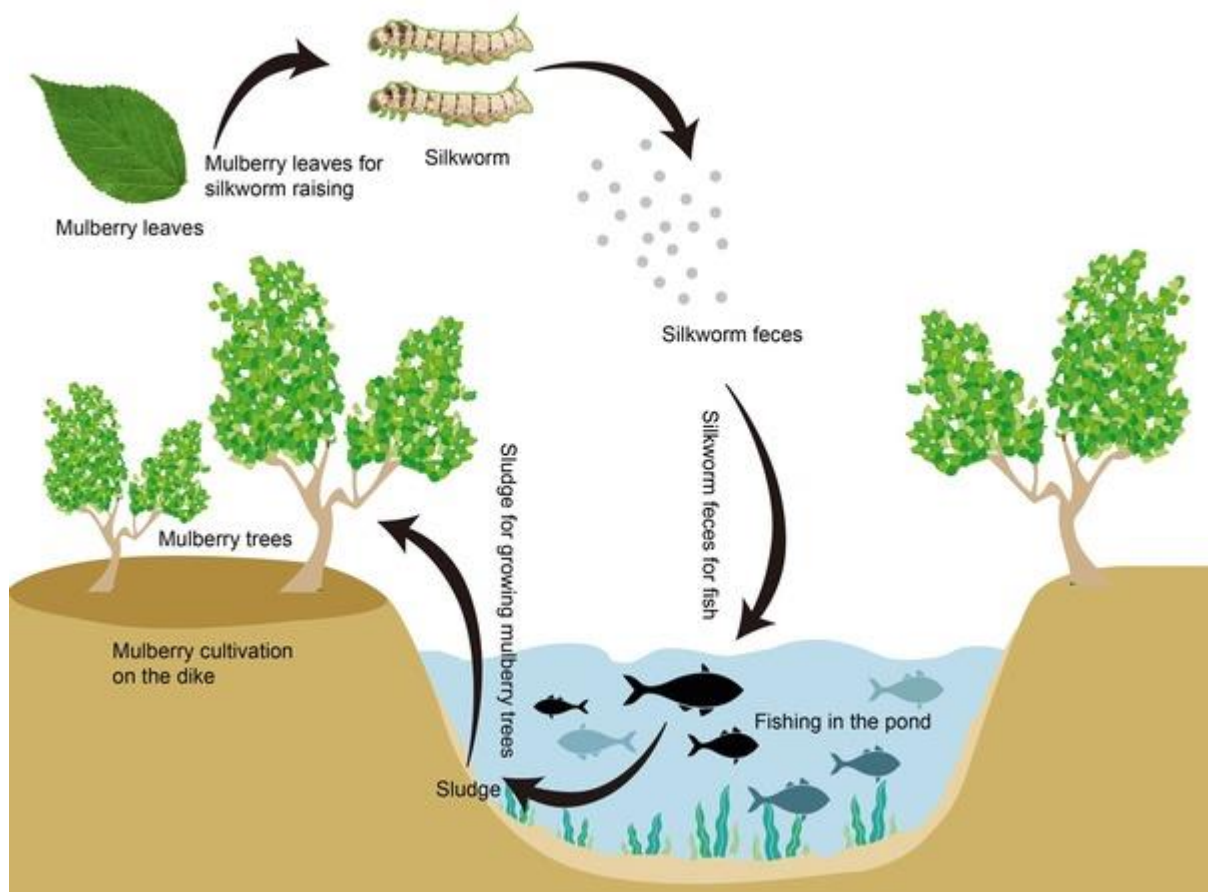
Our next destination is the vast flood plain of between the Yangtze River, Taihu Lake, and Qiantang River. Thanks to the abundance of fresh water carrying nutrients from the river upstream, this area is so productive that it has raised over 100 million people here. And it is one of the most densely populated areas of China. This area is very similar to the flood plains in Bangladesh, West Bengal in India, Saigon in Vietnam etc.

What have the Chinese done differently compared to other densely populated flooded plains in India and Bangladesh?

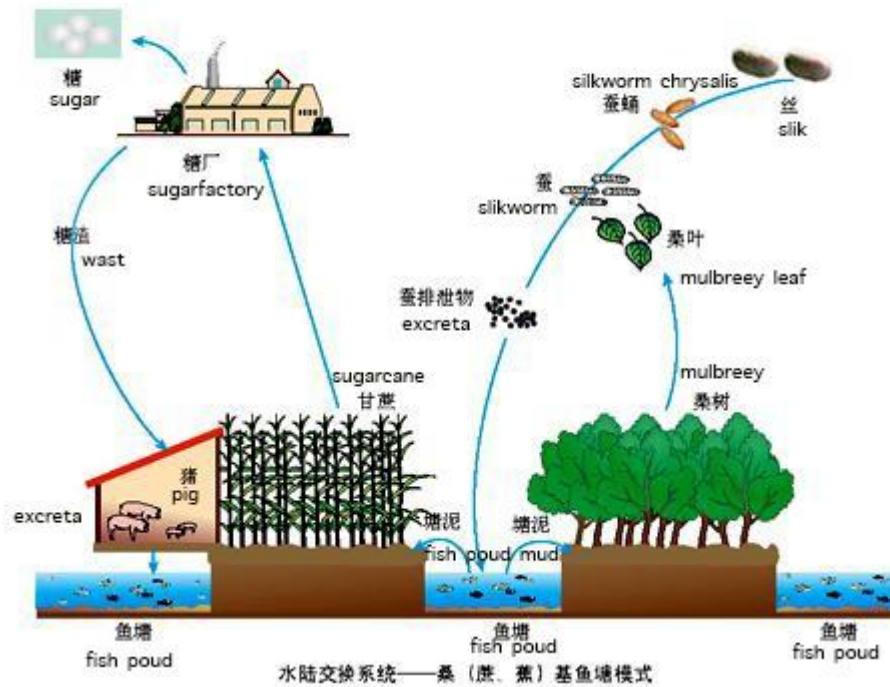
Instead of growing rice, the Chinese have been growing a variety of “water food” that can sell at higher prices and makes them become richer than if they were growing rice. If you zoom in, you will find millions of fish ponds instead of rice fields. Besides the fish ponds, you might identify lots of green trees grown around them.



These trees are mulberry trees used for silkworm farming. Over the past two thousand years, the Chinese have developed many sophisticated and sustainable agriculture ecosystems around these areas. One most famous eco-cycle is the fish-mulberry tree-silk cycle as shown in the following graph:



Chinese farmers have been exploiting the ecosystem in fish, silk farming for thousands of years without knowing the concept of “sustainable development”. Nowadays, it is evolved into multiple cycles of “recycling” on the same land:



However, in order to raise more fish in the ponds, you need an **aerator** that pumps air into the water, otherwise, the fishes would not have enough oxygen to breathe. In the following picture, the aerator is the white dot in the centre of each pond.



Having an aerator requires every fish pond to be connected to electricity. How to generate electricity for the aerators? Yes, you are right: have solar panels.



From Google Earth, you can see that solar panel fish ponds are already taking over some of the traditional mulberry fish ponds in China. Some of the areas in Huzhou area have already installed solar panels.



Above picture: The left is the traditional mulberry fish ponds. The right is the latest solar power fish ponds.

Local fishermen and farmers are actually forced to learn the latest solar technology and sustainable techniques provided by professionals from the local Chinese government.

Why are the local Chinese governments so eager to promote high tech to the local farmers? In order for an official to gain promotion to the next rank, he *or she* has to demonstrate their

“government performance”. Solar panel fish ponds is one of the best indicators for “promotion” as it fits well in the sustainable development initiative.

From this, you might understand why China has dominated the world’s silk production (84%), and freshwater fish production (66%) and solar energy generation (25.8%). In the Zhejiang, Jiangsu area, rural people eat fish almost every day. Some say that’s why people from these regions are more clever than other regions of China.

Eco-cycle option 2: lotus root - fish

In some fish ponds, you can also grow other kinds of vegetables while raising fish. One of the most widely grown vegetables is the **lotus root**. China lotus root production is 11 million tonnes which accounts for 90% of world production and 60% of the world export. Not only Chinese people like to eat them, but most of the lotus root production is exported to Korea, Japan, and Vietnam.





Lotus roots are one of my favourite vegetables too, I hope China can promote this delicious root for the rest of the world to enjoy as well.

Eco-cycle option 3: canola oil - bee- fish & crab

You can also grow rapeseed using the same principle. Instead of using fertilizers, at each winter, Chinese farmers dig the “nutrient mud” from the bottom of the water and stack on the bank. And then they grow different plants such as rapeseeds or taros on the mud. After thousands of years of continuous cultivation, the field has become something like this:



Location: Duotian(垛田镇), Xinghua, Jiangsu, China 32°56'51.9"N 119°51'50.4"E

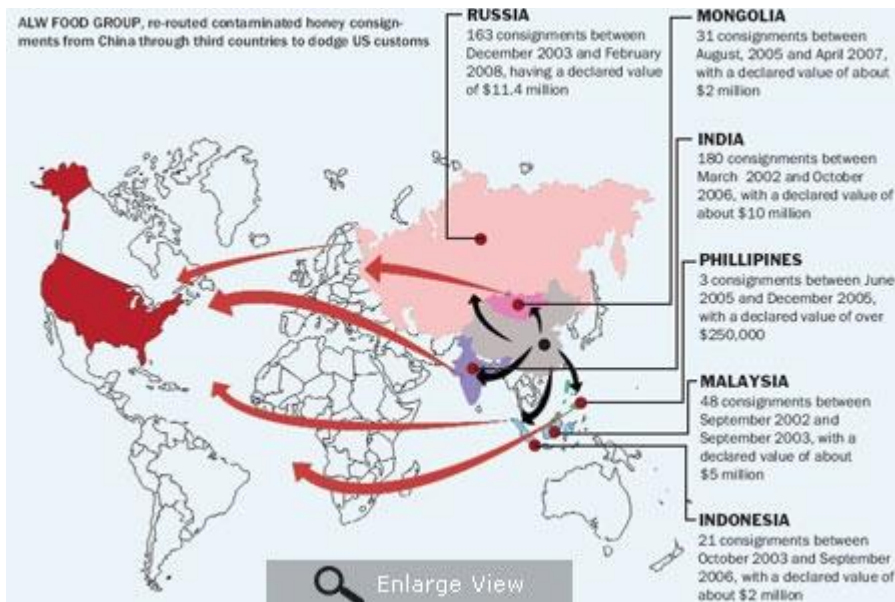
There are no roads. You can only navigate around using boats. Of course, that is why China is also the leading world producer of rapeseed oil (22% of global production).

Not to mention the massive **beekeeping** industry that thrived on the rape flowers in China, China takes over 30% of the global honey production.



Production of natural honey – 2017	
Country	tonnes
 China	543,000
 Turkey	114,471
 Iran	69,699
 United States	66,968
 Ukraine	66,231
 Russia	65,678
 India	64,981
World	1,860,712
Source: FAOSTAT ^[36]	

Actually, one-third of the honey consumed in the US are directly or indirectly from China. To avoid tariffs from the US, Chinese honey exporters would first export their honey to India, Philippines and Malaysia. Then they change labels and alter them to domestic production and sell them to the US. I'm sure this happens to other products too.



<https://www.downtoearth.org.in/c...>

One Third Of America's Honey May Be A Dangerous And Illegal Import From China

Besides honey, this area is also where the most famous Chinese mitten crabs are produced. They can sell at \$60 per kilo, therefore only the middle-class Chinese can afford this.



Location 3: Shouguang, Shandong, China (36°44'15.9"N 118°44'14.7"E)

Our third destination is the great plain area in Shandong province.



If we zoom in, we can find millions of reflecting “shiny” houses on the plain area. Try looking around, it is “everywhere”.



What are those? They are greenhouses designed to provide regulated and controlled conditions such as temperatures and humidity for vegetables and fruits to grow.



In the greenhouse, you can grow all kinds of different vegetables and fruits **several times per year** regardless of the time of the year. That means you can get several times more vegetable and fruit yield compared to a normal field.

For example, you need at least **52 days** to grow lettuce from seeds until you can harvest them in a greenhouse. That means you can grow **7 times** each year. That is **7x** efficiency.



Therefore greenhouses can significantly improve agriculture output in a limited space, which sounds perfect to the Chinese. Eager for promotion, local Chinese government officials in Northern China have therefore forced their constituency —the local farmers to install greenhouses with loans from the “*Chinese Rural Cooperative Bank*”.

What’s worse, they also forced them to install IoT based surveillance system in their greenhouses. Farmers are forced to be taught in a “reeducation camp” to use their mobile phones to monitor the status in the greenhouse including CO₂, light strength, soil temperature, etc.



As a result, according to the Food and Agriculture Organization of the United Nation, the vegetable and fruit production and consumption of China is around **700 million** tonnes, which is 40% of the world consumption. Compared to India (180 million), China achieved 3.8x the amount of vegetable and fruit production, despite most of the population in India claim to be vegetarians, and despite the fact that the arable land in China is less than India. **The secret key is the greenhouse.**

[List of largest producing countries of agricultural commodities - Wikipedia](#)

Thanks to greenhouses, Chinese people can enjoy cheaper and a bigger variety of vegetables than any other country in the world all year round. You can check Wikipedia, basically, China **tops the chart in almost every kind of non-tropical vegetable production**, far outpacing second place. There are vegetables that are not ranked because they are only specific to East Asia, such as the “garlic chives” (韭菜).



Similarly, for fruit production, China **tops the global chart in almost every kind of non-tropical fruit production, far outpacing second place as well.**

I was once pranked and called as “racist” when I invited a black friend over for a summer BBQ with lots of watermelons. I proved my innocence by showing him these statistics:

Major watermelon producers, 2018 (millions of tonnes) ^[42]	
 China	79.2
 Turkey	3.9
 Iran	3.8
 Brazil	2.0
World	111.0

In Japan, a watermelon typically costs 2000 yen (\$18) and in China, you can afford a much larger watermelon just in 10RMB (\$1.5). And watermelons in China are sweeter if they’re grown in Xinjiang. If you love watermelons or any other melons, come to China, especially Kumul in Xinjiang.

Location 4: *Lhasa, Tibet, China (29°41'52.3"N 91°09'18.6"E)*

Our fourth destination is also about greenhouses but in Tibet. Use your Google Earth and navigate to any town in Tibet. You will always find greenhouses.



I mean, the Chinese government has also forced Tibetans to build a massive amount of greenhouses on the Tibetan plateau. Those Tibetans have no time to go to temples for worshipping any more, instead, they have to work in the greenhouses taking care of tomatoes. This is why Dalai Lama is not so happy to hear this.



As a result, the average vegetable price in Tibet has reduced by 90% over the past decade and they don't have to import vegetables from nearby provinces anymore. Most of the Tibetans can finally afford to eat watermelons. Who doesn't like eating watermelons?

You know that most Tibetans historically only eat yak meat, milk, cheese, and bread? They couldn't grow anything in such a harsh climate. Only monks could have the luxury to eat vegetables. Now it is the solid proof that the Chinese government didn't just destroy temples in Tibetan culture but helped them eat vegetables and fruits.

Location 5: Kokdala, Ili, Xinjiang, China 43°43'51.2"N 80°35'21.5"E.

Kokdala is a city in northern Xinjiang, China, bordering Kazakhstan's Almaty Region to the west. And here is the satellite image of the border between China and Kazakhstan.



And you can clearly see there are more green farms on the Chinese side. On Kazakhstan's side, there is nothing but barren lands.



And actually, these lands are just wasted land as their soils are too acid and there is limited water to grow any food. You can only count on the water from the melting glaciers in the surrounding mountains. **For people in Kazakhstan, it is too expensive to grow and they don't have a big market to sell their products.** That's why those Kazakhs in Kazakhstan decided not to cultivate on those lands.

On the Chinese side, all the barren lands are cultivated by the special division of the Chinese government: XPCC [Xinjiang Production and Construction Corps - Wikipedia](#). This is a state enterprise with a military background. XPCC has amassed 2.6 million employees and farmers including Uyghurs and Hans and operate as a giant organisation. Therefore due to its scale, the cost of operation can be reduced and their market can be directly connected to the whole Chinese market.

Since the past three decades, XPCC has been sending its agriculture professionals to **Israel** every year to learn Israeli's most advanced agriculture technology in a similar desert climate. Those Chinese students then returned to China and started cultivating those lands using the latest technology such as drip irrigation etc. Once they found those technologies can actually mature into profits, they would sell some of the newly cultivated lands to local Uyghur, Han, and Kazakhs families or hire them directly in the cooperations.

Some of these Uyghurs, Kazakhs are sent to the reeducation camps and they are forced to learn Mandarin Chinese and the latest drip irrigation techniques to save water and reduce costs. Moreover, each village is assigned with one or more communist party members to guide them through to make sure that they don't mess up the newly cultivated land.



Yes, the drip irrigation technique can significantly reduce water usage and cost. Thanks to the Israeli and domestic Chinese technology, they make the barren land in Xinjiang more and more fertile and productive.



So what are those people growing on the new land?

Tomatoes, chillies, melons, grapes, and cotton. All of them can sell higher prices than wheat.



Thanks to the strong sunlight and cold nights in Xinjiang, those products are normally sweeter and tastier, so that they can sell for higher prices to the markets in China and the world. In China, people prefer to buy fruits from Xinjiang than the rest of China because of its great taste and quality.

Actually, agricultural efficiency is so high in Xinjiang that it produces much more than the Chinese market actually needs. Instead of relying on the “free market” causing the prices to drop and hurt those Uyghur farmers, XPCC, as a state enterprise, is pushing to sell those products to the rest of the world at higher prices.

What if the rest of the country doesn't want to buy the products?

The communist XPCC is relying on China's “superpower” to force those customers from the rest of the world to buy using some terms and conditions that you can't refuse. **This strategy is learned from the U.S. agricultural business model.** This is exactly what the US has been doing. And this is what “state capitalism” is about. Whenever Xi Jinping is visiting a country, he is also in charge of selling those products to the country by signing “free trade” agreement using carrots and “implicit sticks”.

If you are not convinced, let us move to the next location for more proof:

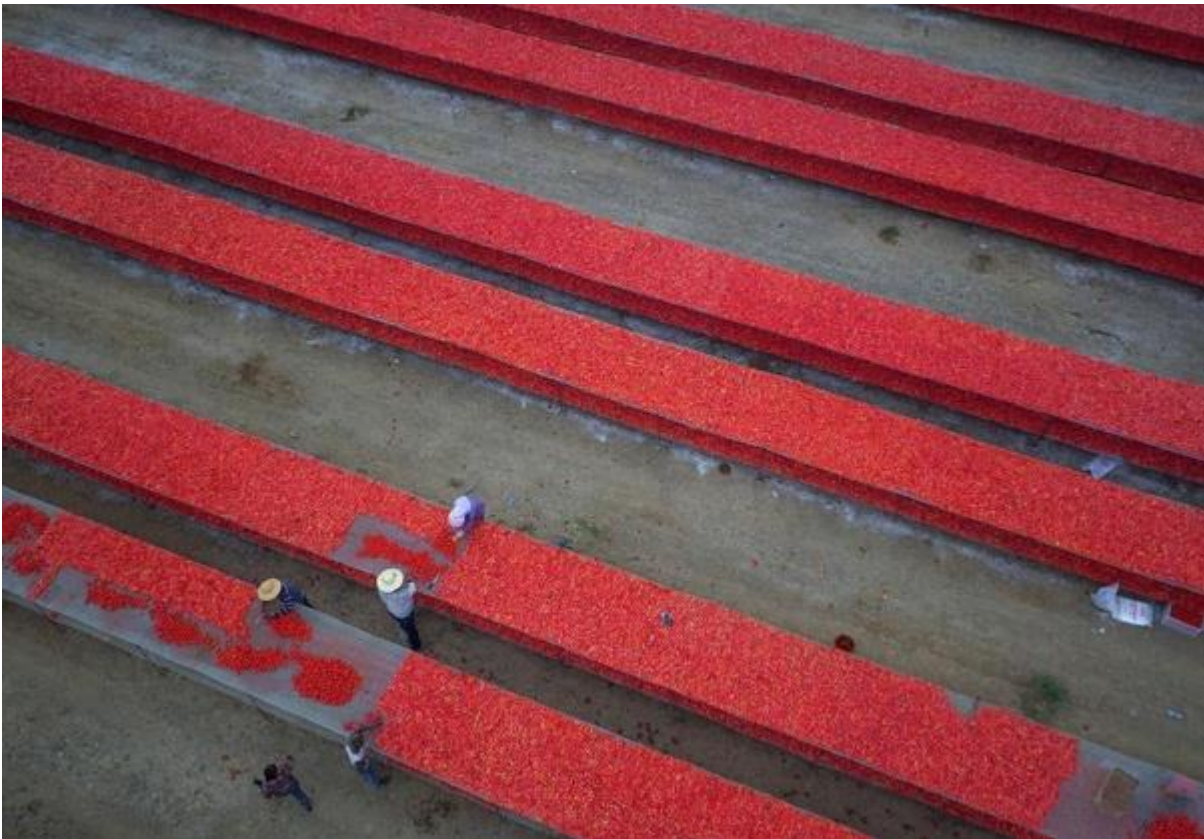
Location 6: Hejing, Bayingol, Xinjiang, China 42°18'36.1"N 86°36'15.4"E



What are those “red” lands in the middle of the desert?



If we zoom in, you can see it is actually the land of “tomatoes” — billions of tomatoes. You can imagine the amount by measuring the total area.



Rank	Country	Production millions of tonnes
1	 China	56.3
2	 European Union	24.2
3	 India	18.4
4	 United States	13.0
5	 Turkey	12.6
6	 Egypt	7.9
	World	177.0
	Source: FAOSTAT, United Nations ^[42]	

Next time you enjoy Italian spaghetti, Turkish kebab, or spreading Heinz ketchup on your chips, think about that, you might be eating tomatoes from Xinjiang. It might not directly say the tomatoes are from Xinjiang. These tomatoes might be first exported to a third country and get rebranded just like the honey.

[Your Ketchup Probably Came from Xinjiang | Xinjiang: Far West China](#)

China produces 56.3 million tonnes of tomatoes and dominates the world's 1/3 tomato exports. Over **14 million** are from Xinjiang. You can verify this by looking at the global top ten ketchup companies [The World's Leading Producers of Tomatoes](#):

- COFCO Group (China) 2nd

- Xinjiang Chalkis Co. Ltd (China) 3rd
- Fuyuan Agriculture Products Limited (China) 6th
- Heinz (United States) 7th
- Xinjiang Tianye Co., Ltd. (China) 15th

These companies are more or less the redistributors from the XPCC and the Chinese government. These companies can actually return most of the profits back to the Xinjiang farmers. And just recently the Chinese government is trying to sell Xinjiang tomatoes to eastern Europe through the one belt one road initiative. As Xi Jinping just visited Italy this March 2019, I am not sure whether Italy is interested in Xinjiang's tomatoes or not after Xi Jinping's visit at this time. The western media will never tell you.

Besides tomatoes and chillis, China is also the largest producer of grapes, accounting for 19.1% of global production. And the most and the best of grapes are from Turpan, Xinjiang. However, China really sucks at making wines from grapes.



Finally, let's talk about the main crops such as **rice**, **wheat**, and **corns** in China. They are the most important food of all, not only to human beings but also to animals such as pigs, chickens, and cattle that produce meat and milk.

Here is a simple comparison between the top four producers across the world:

Arable Land: China 1086 India 1579 EU 1091 US 1631 (1000 km²)
 Rice: China 208.1 India 169.5 EU 3.1 US 9.2 (million tonnes)
 Wheat: China 134.3 India 98.5 EU 150.2 US 47.3 (million tonnes)
 Corn: China 257.3 India 26.0 EU 60.9 US 366.2 (million tonnes)

As you can see, China is an all-around top crop producer compared to the other three regions. However, for a population of 1.4 billion, this is enough to be "filling" but still far from enough if the Chinese want to achieve similar "well-fed" status in per-capita consumption in terms of the developed country standard just like the EU and US.

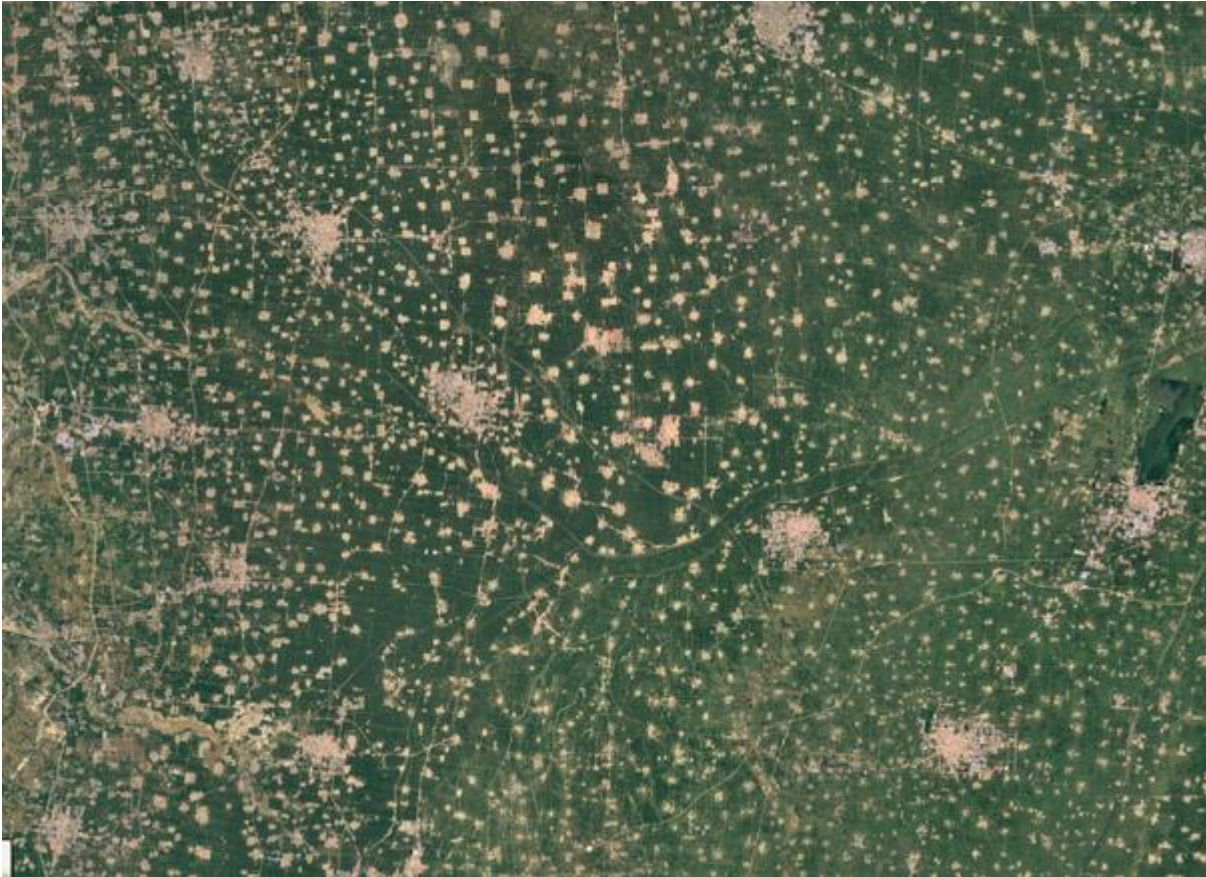
Currently, there is just not enough arable land for China to produce enough crops to raise 1.4 billion people to the well-fed status. And what's worse, **the arable land in China is quickly shrinking** as more and more land has been used for industries and cities.

Location 7: Xingtai, Hebei, China 37°35'54.1"N 114°55'20.8"E

To show you how the Chinese were quickly using up their precious land, our next destination is the great northern plain of China. This is where the most crops are grown in China. (Picture scale: top to bottom 1500km)



If we zoom in to any location in the plain, for example, the Xingtai city, a 4th tier city, a “small” city with 7 million people. (Picture scale: top to bottom 60km).



This is actually quite scary to many people. The green fields are the farmlands. These white dots are actually villages. Each “dot” contains around 500 people. The larger white regions are towns with around 10k to 100k people.

As you can see, as more and more people are getting rich and building large houses on the farmlands, those green land would be running out gradually. It is estimated that China is losing around 3,000 km² area of arable land every year. Those arable land would be turned into “white” and dead concrete land. This is obviously a disaster and the Chinese government has been trying every effort to regulate the land uses. However, you just can’t control the huge momentum of “urbanisation” so easily.

Location 8: Qingyang, Gansu, China 35°41'00.7"N 107°40'38.3"E

The lack of arable land has been a “top concern” ever since the CCP has governed China. From the era of Mao Zedong, the CCP has been organising massive cultivations on hilly lands on different parts of China. There are countless examples. Here is the most significant one: **Loess Plateau**



This 640,000 km² plateau is actually not suitable for growing crops. But if you zoom in, you can see all the valleys, all the hills are converted to arable lands. From above, all the cultivated lands appeared like “roots”.



Just zoom in to any place, you would find all the hills are converted to terraces.



However, people have found that creating too much terraced land would cause land degradation and destructive mudslide during the monsoon season. From year 1999, the CCP realised that its previous massive cultivation campaign does not improve crop production significantly but instead has caused many floods and mudslides, then it halted the cultivation and proposed the “Returning Farmland to Forest Program (退耕还林)” campaign.

For those lands with low yield, farmers are forced to give up their land and they have to grow trees on them. **And for the farmers who lost the land, the government would compensate the farmers with a fee that is equivalent to the field earnings.**



The above picture shows the impact of the forestation and afforestation. This is proof that after many lessons, the CCP has gradually grasped the key to sustainable development.

Xi Jinping once said: “China highly values ecological and environmental protection. Guided by the conviction that lucid waters and lush mountains are invaluable assets, the country advocates harmonious coexistence between humans and nature, and sticks to the path of green and sustainable development.”



These are not empty words. Every “word” is backed by actual actions. Many people outside China may wonder why mainland Chinese still prefer Xi Jinping. One of the reasons is that he restructured the old bureaucracy of China to be more “environment focused”. For example, the local environmental officials now have the authority to impeach local mayors if the region has done badly in sustainable development.

The outcome of “Returning Farmland to Forest Program” is definitely causing the reduction of the arable land in China. However, despite the arable land degradation, thanks to the huge investment in agriculture technology, agriculture efficiency still improves, making its domestic crop production still increase.

One example is the new technology that allows you to grow rice using salty sea water.



An 87-year-old scientist may have just unlocked the secret to growing rice in saltwater

Chinese scientists may have just found a new way to feed 200 million people

Despite the domestic crop production increase, China is still not self-sustainable in terms of rice, wheat, and corn. It has to import 10% of its annual consumption from the rest of the world. However, most of them are not directly for human consumption.

Example 1: **Beer and Baijiu production**



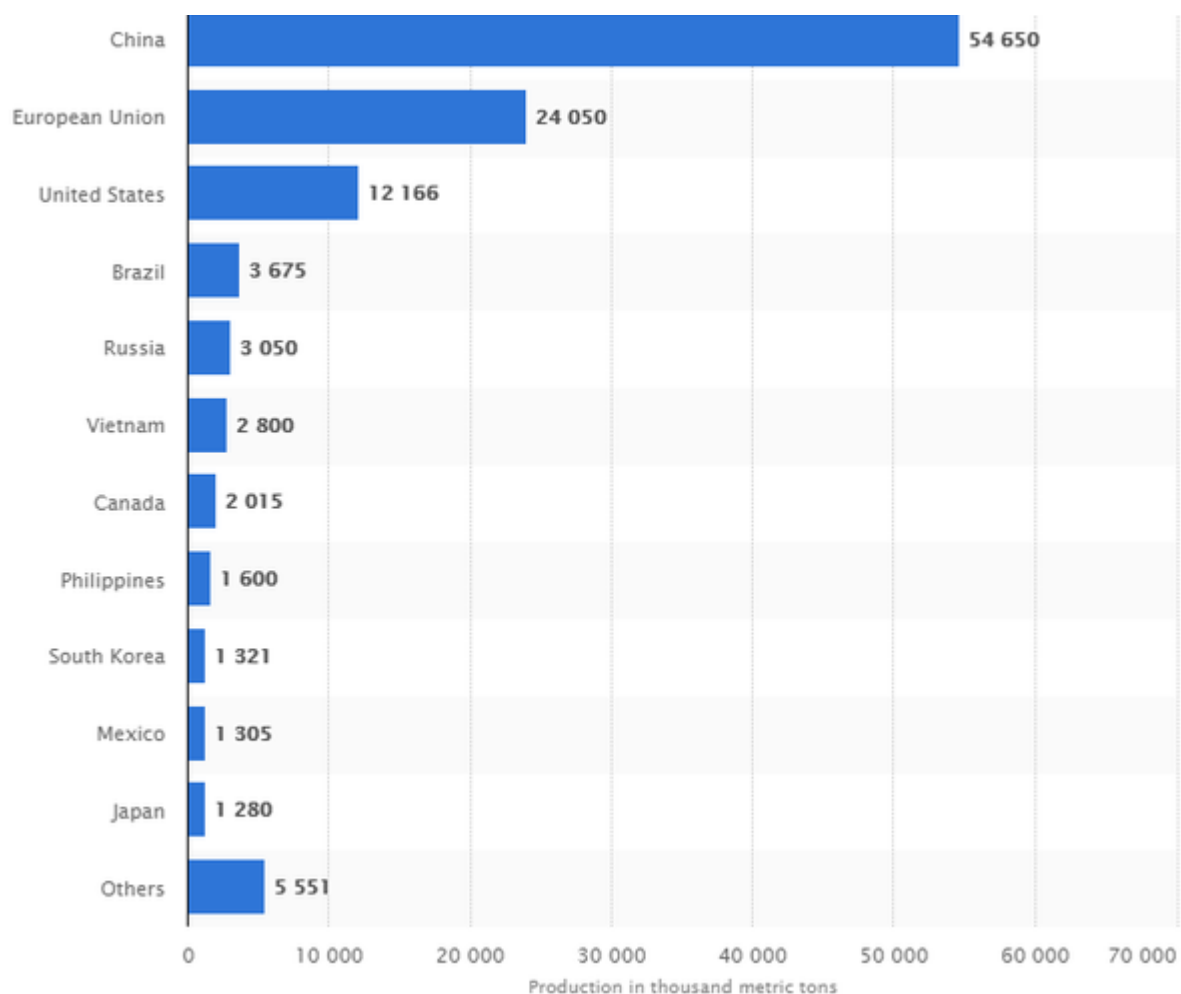
Since 2006, China has become the world's largest producer of beer with 46.5438 million kiloliters, which is more than double that of the US. It has increased production by 4.9% annually. Besides wheat, China has to import most of the hop plant for beers from Germany and the USA.

And China is also the world's leading producer of spirit alcohol. Most Chinese people don't favor Whiskey or Vodka, but prefer drinking Baiju, which is more fragrant and rich in flavour. The Baiju production is around 13.6 million kiloliters, which is much more than western people consume. And the local rice wine made by individual Chinese households is not even counted!



As a result, some parts of China has a much heavier drinking culture that the rest of the world is not even aware of. Let me tell you. It is much heavier than the British and the Russians.

Example 2: **Pig and pork production**



Global pork production

The above graph just shows how do the Chinese love pork so much. Some of the pigs raised in China fed on the corns imported from the USA and Brazil. This also applies to the chickens, cattle and other animals raised in China.

Conclusion

China is able to provide enough food more than just plain rice or wheat. The variety of food offered on the Chinese table is much more diverse and cheaper than most developed places in the world. This applies to “poor people” as well. This is based on my personal experiences and observations after traveling from many countries in Europe, the US, and Japan.

For example, in China, a group of eight people can sit at a round table, enjoying 20 different dishes including different meats, vegetables, desserts etc. They don’t have to worry about religious restrictions, allergic concerns, and personal spaces.



In Shandong, the total dinner costs around \$50. The same set of 20 dishes could cost \$150 in Beijing/Shanghai/Taipei or \$300 in California/Japan/Hong Kong etc. And we are not counting the beers and drinks. Actually, most people in California/Japan don't have the luxury to enjoy 20 different dishes at all but it is more than common in China.

After this extremely long post, I hope you learned something new about China and also know how the Chinese can feed themselves more than just "enough".

Thanks for reading :)

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Nancy Xia

Apr 9 · 278 upvotes including Janus Dongye

Fantastic, fascinating read! Thank you for giving such a detailed explanation, as I have never heard of this before. I hope China's policies can really help the environment in the long term!

As an aside, it may also be worth mentioning the amount of food wastage which actually happens in China too...

[\(more\)](#)



Janus Dongye

Original Author · Apr 9 · 54 upvotes including Nancy Xia

That's true. Food wastage is a problem. And it is even worse after the government banning the pig feeding due to the swine fever.



Kokwai Thong

Apr 9 · 54 upvotes

We attended the inauguration of the Family Medicine Practitioners Council of China in 1989 in October and we were invited to dinner. The first eight or ten dishes came along and we swiped them all thinking that was it. Then came the next 8–10 main courses and we looked at each other and said 'uh ...



Parveen Kumar

Apr 10 · 43 upvotes

Excellent! Wish India too can use its full potential but alas Political power more important for most of the parties than the nation. God Bless us!



Lee B Hawes Zeema

Apr 10 · 5 upvotes

Parveen- Yes, fortunately, we do not have that problem in America. Hahahahahaha



Gurudutt Mallapur

Apr 10 · 74 upvotes

What is the distribution network like in China for agricultural produce? Is it totally reliant on giant food corporation? Or are there private companies also?

In India we see huge loss of stored grains etc in state run corporations? Do you have similar problems? Do you have cold chains to prevent ...

[\(more\)](#)



Janus Dongye

Original Author · Apr 10 · 139 upvotes including Gurudutt Mallapur

That's a great question. I will perhaps write something about the infrastructure and logistics in China. Basically, I can buy a box of tropical fruits 2000 km away and got it in maximum of three days.



BJ Raval

Apr 10 · 134 upvotes

With the talent you have in telling the story with visual, geographic and factual evidence, I think a similar story about infrastructure and logistics would be a treat to learn from you. I am sure all the Quorans who read this, would appreciate that as well.



Daniel Shea

Apr 10 · 13 upvotes

Would I be correct in attributing that to the massive rail infrastructure in China? Plus use of refrigerated train transport cars...?

Himanshu Singh: Riverways and lifts on dams, Highways are also important.

[View More Replies](#)



Tianren Ji

Apr 11 · 23 upvotes including Gurudutt Mallapur

Distribution was privatized during 1988 to 1994. However, as all past china implosion started from some form of food crisis, the ccp is very concerned about the topic. what they do is a state run department hoard food that can sustain the country for at least 12 weeks if things went wrong. it is ...

[\(more\)](#)



Michael Gardner

Apr 9 · 37 upvotes including Janus Dongye

Wow that's an eye opener. Here in Australia most of our cheap supermarket tomato paste in jars is Chinese and I often wondered where they grew tomatoes there.

Now I'm a home brewer and ten years ago our club imported about half a tonne of Chinese hop pellets at about a quarter of the price of Amer...



Janus Dongye

Original Author · Apr 10 · 9 upvotes including Michael Gardner

Many thanks for this great information!



C.S. Friedman

Apr 11 · 12 upvotes

Absolutely fascinating. Thank you