SOLVING THE WATER, FOOD & AIR CRISIS FOR 1.3 BILLION PEOPLE

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*Over last 20 years, normal rainfall has been rare across India **(Livemint, 2019).** From Punjab to Madhya Pradesh, the gravity of the water crisis is no different. **Punjab (the Food Bowl of India)** has witnessed a depletion of groundwater to such a great degree, that it's **certain for it to go dry by 2040.***

Nowhere across the globe does agriculture demand as much water, as it does in South Asia. In the present time, it could be viewed as a bittersweet reality because agriculture in India demands as much as 80% of water's total consumption.

We surely may not find new sources of water. But, here's what we can do - Replenish the India's water reserves, and utilize its water for a better business model. A business model where we lease lands, grow value added crops, never cold store them, and deliver them straight to the consumers. A business model where we're not slaughtering buffaloes and emitting 405 billion kilograms of CO_2 Emissions into India's atmosphere.

India has a rich culture, a diverse geography Plus, its agricultural needs require this much from the supply is because India has, since for ever, thrived on cultivation of a vast array of vegetables, fruits, herbs and seasonings.

*Now, **its 21 cities are at the verge of going waterless by 2030.** In the future, where will India get its agri-water from?*

INDIA'S BEEF WITH THE WORLD

India's exporting beef to other countries in the world. It's doing it at the expense of the 22 trillion litres of water annual average & 405+ billion kilograms of annual CO_2 emissions. These two faces of the problem are of the same coin - beef exports.

We can persuade the government to ban beef exports, lease land, and do a **"grow-move-sell business".** As the **"buy-store-sell"** model faced nationwide protests along with government's MSP bill, we can keep peace by farming our own product and eliminating people's worries of vegetables and fruits being sprayed, injected, or grown in non-optimal water.

IT'S EMITTING 405,168,900,000 KILOGRAMS OF CO_2 EACH YEAR

WHICH MEANS

Every km^2 of India

gets 123,254 kg CO_2

every year due to it

BECAUSE INDIA'S AREA IS ONLY 3,287,263 km^2



WATER CONSUMPTION BY THE FOOD TYPE

Quantity	Food Type	Water Consumption (Litres)
1 kilograms	Beef	17196
1 kilograms	Sheep meat	15415
1 kilograms	Pork	5988
1 kilograms	Butter	5553
1 kilograms	Chicken Meat	4325
1 kilograms	Cheese	3178
1 kilograms	Olives	3025
1 kilograms	Rice	2497
1 x 250 grams	Cotton	2495
1 kilograms	Pasta	1849
1 kilograms	Bread	1608
1 kilograms	Apple	822
1 kilograms	Banana	790
1 kilograms	Potatoes	287
1 litre (250ml x 4)	Milk	1020
1 kilograms	Cabbage	237
1 kilograms	Tomato	214
1 whole egg	Egg	196
1 x 250ml glass	Wine	109
1 x 250ml glass	Beer	74
1 x 250ml cup	Tea	27

Statistics (Source: IME)

In the list of things, beef tops it due to it being the most water intensive. However, the water required to grow most plant based and whole foods is much less than that for meat products.

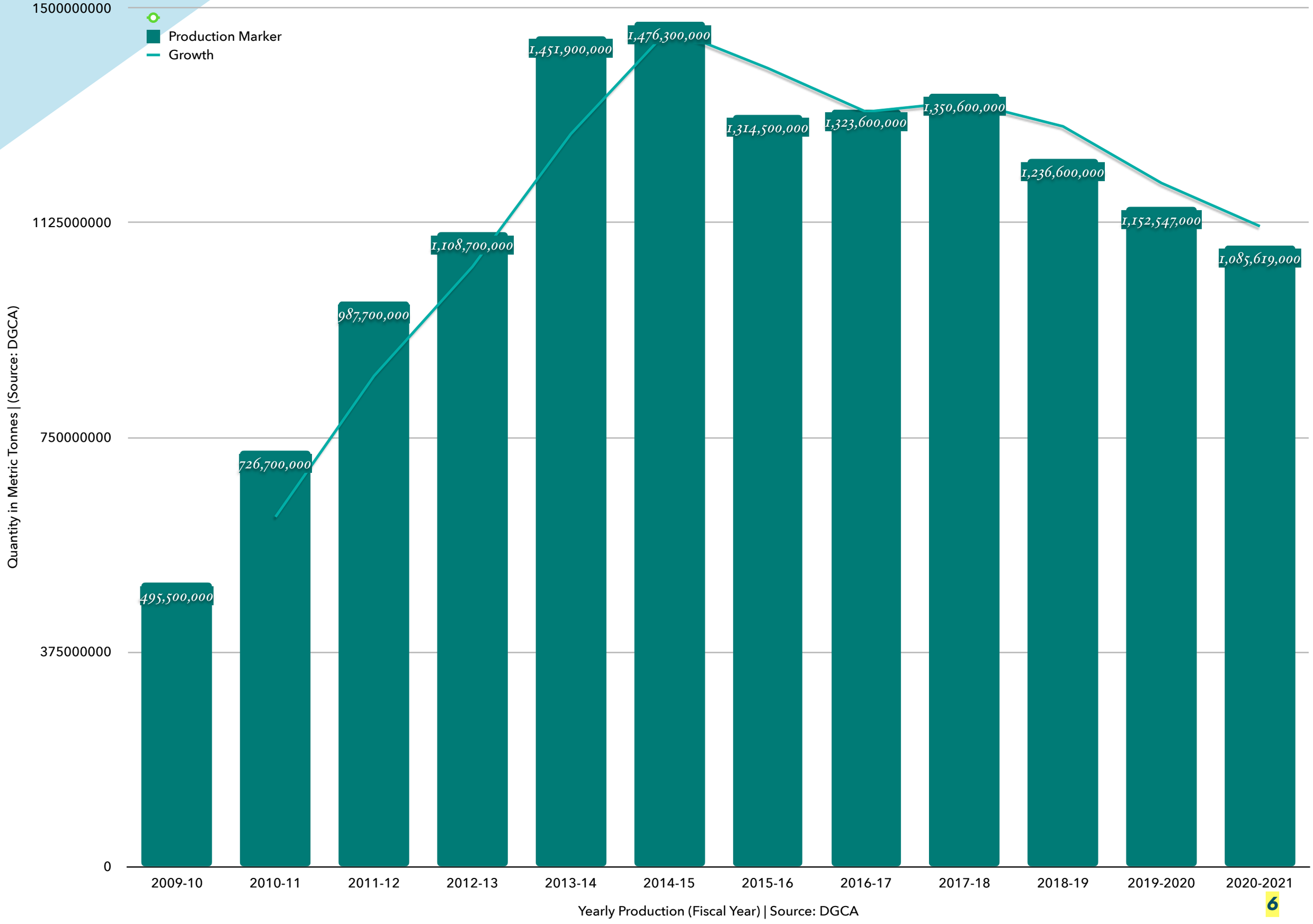
Consumption of high water content foods enables water to recycle in the surrounding environment.

For example, Humans consuming plant based foods derives his/her daily water needs from the food itself. So, they drink less water. Plants (mostly being high in water content) supply the body with adequate vitamins, minerals and nutrients. Thus, keeping the stomach feeling fuller for longer and enhancing hydration. In addition, when a billion people shall perspire day in and out, it will recycle about 3 billion litres of water into the environment daily.

However, meat items such as beef are dry, greasy, and may contain harmful hormones that disrupt the insulin levels, raise cholesterol and cause an array of health diseases; of which a few are: coronary heart disease and arthritis (due to high acidic content) etc.

The health issues are well known and the world is making a switch and it's time that they have an array of high quality plant based options to choose from.

India's Beef Exports



IT'S HELPING KEEP INDIA A LOW-INCOME FOOD-DEFICIT COUNTRY

*According to the **United Nation's Food and Agriculture Organization**, the three countries that graduated out of the LIFDCs list are: Nigeria, Papua New Guinea and Pakistan. However, India still stands on the list. A deeper look into the gravely problematic case reveals numerous possibilities. In spite of such harsh times as an LIFDC country, India has progressed towards becoming the world's largest beef exporter. Shouldn't it do something else? According to the APEDA, the projections for India's export of beef are:*

A. *FY (2016-17) = 1,323,576 (metric tonnes)*

B. *FY (2017-18) = 1,350,563 (metric tonnes)*

C. *FY (2018-19) = 1,236,600 (metric tonnes)*

The math is simple:

Conversion into Kilograms

FY (2016-17)

= 1,323,576 (million) x 1,000 (kg)

= 1,323,576,000 (kgs)

Water Consumed for Production

= 1,323,576,000 x 20,000

= *26,471,520,000,000 litres*

Conversion into Kilograms

FY (2017-18)

= 1,350,563 (million) x 1,000 (kg)

= 1,350,563,000 (kgs)

Water Consumed for Production

= 1,350,563,000 x 20,000

= *27,011,260,000,000 litres*

Conversion into Kilograms

FY (2018-19)

= *1,236,600 (million) x 1,000 (kg)*

= *1,236,600,000 kgs*

Water Consumed for Production

= *1,236,600,000 kgs x 20,000 litres*

= *24,732,000,000,000 litres.*

Total Water Lost In 3 Years (Pre-Pandemic)

= **FY (2016-17)** + **FY (2017-18)** + **FY (2018-19)**

= ***78,214,780,000,000***

We've lost more than we've gained. We have lost about ***78 trillion litres of water in 3 years before COVID-19 pandemic,*** *just to the vice of buffalo slaughter alone.*

And yet, India still has the lowest unit value of beef in the world, since since the year 2000. That's not awesome news.

A deeper view

1) India specializes in the beef of the culled water buffalo. The particular type of buffalo is used in India for dairy purposes. It has a reputation of being a low-quality, low-price product that appeals to lower income consumers mostly from developing countries.

2) India does not yet host the mechanisms that can ensure that its beef exports meet the stricter and more disease free standards as demanded by the West, for prospective imports. ("From Where the Buffalo Roam: India's Beef Exports", 2016)

The real cost

India exports its beef at a meagre price that is just north of $3,000 per metric tonne; as compared to American Beef that sells for as much as $6,500 per metric tonne. Needless to mention, the amount of water extracted from the ground in both countries remains the same = +/- 20,000 litres per kilo of beef produced.

Price Per Kg of Indian Beef

** $1 = -/+₹70*

** $3,100 = ₹2,10,000*

=> ₹2,10,000/1000 (1 tonne)

=> ₹210/ kg

The Price We've Paid

For the price we've paid, we've suffered equally. Beef production demands 20,000 litres of water for just 1 kilogram of product, and we've allowed it to go to Vietnam, Malaysia, Indonesia, Iraq and Myanmar at a meagre $3 per kilogram.

Conclusion

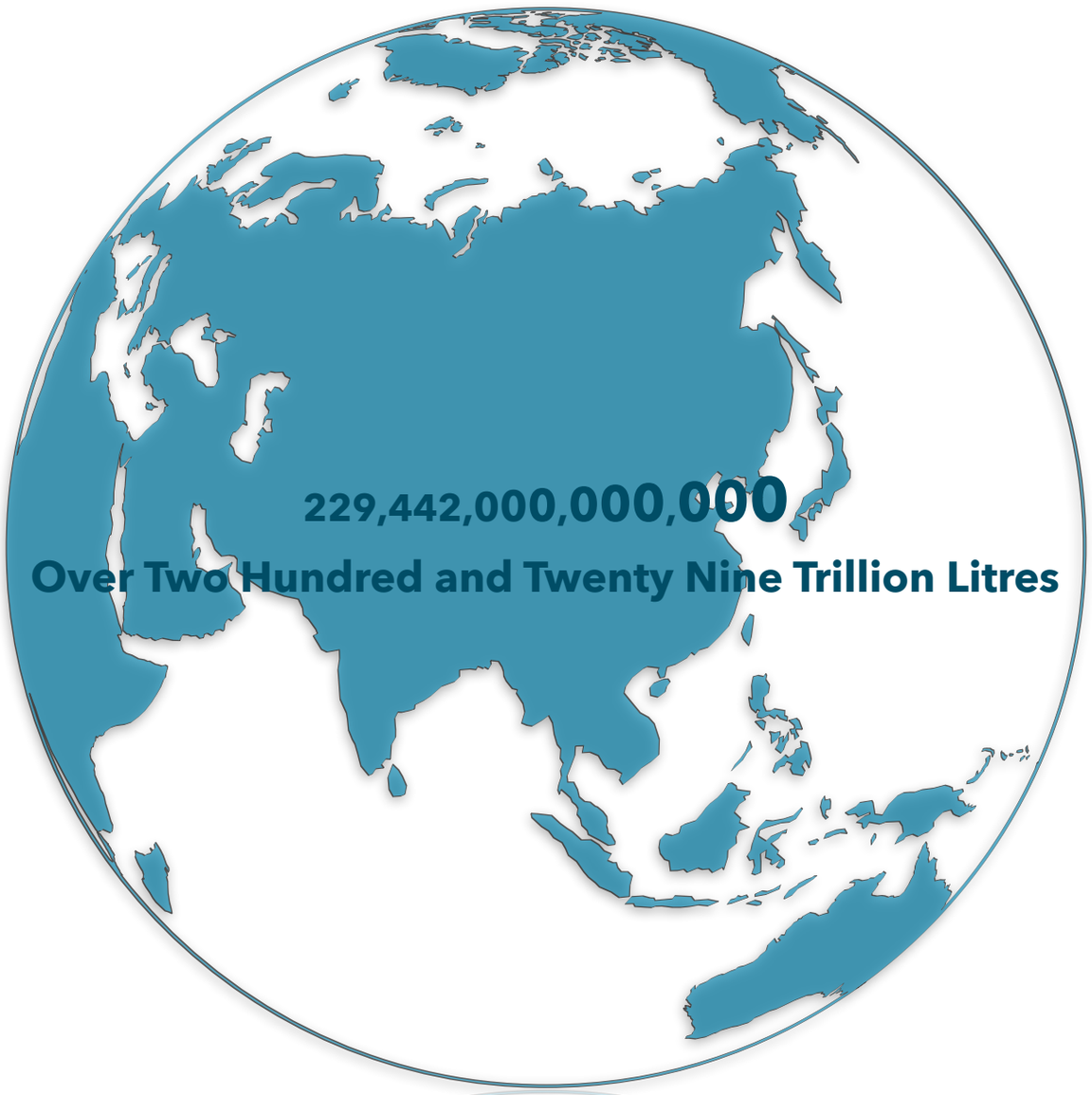
We are running out of water, and time. So let us put this problem; the root of drought and our suffering, behind us.

Let us make a fresh start and explore innovative solutions that will pave the way for India's journey into a hopeful future that is green, rich and in harmony with the immediate needs of the planet.

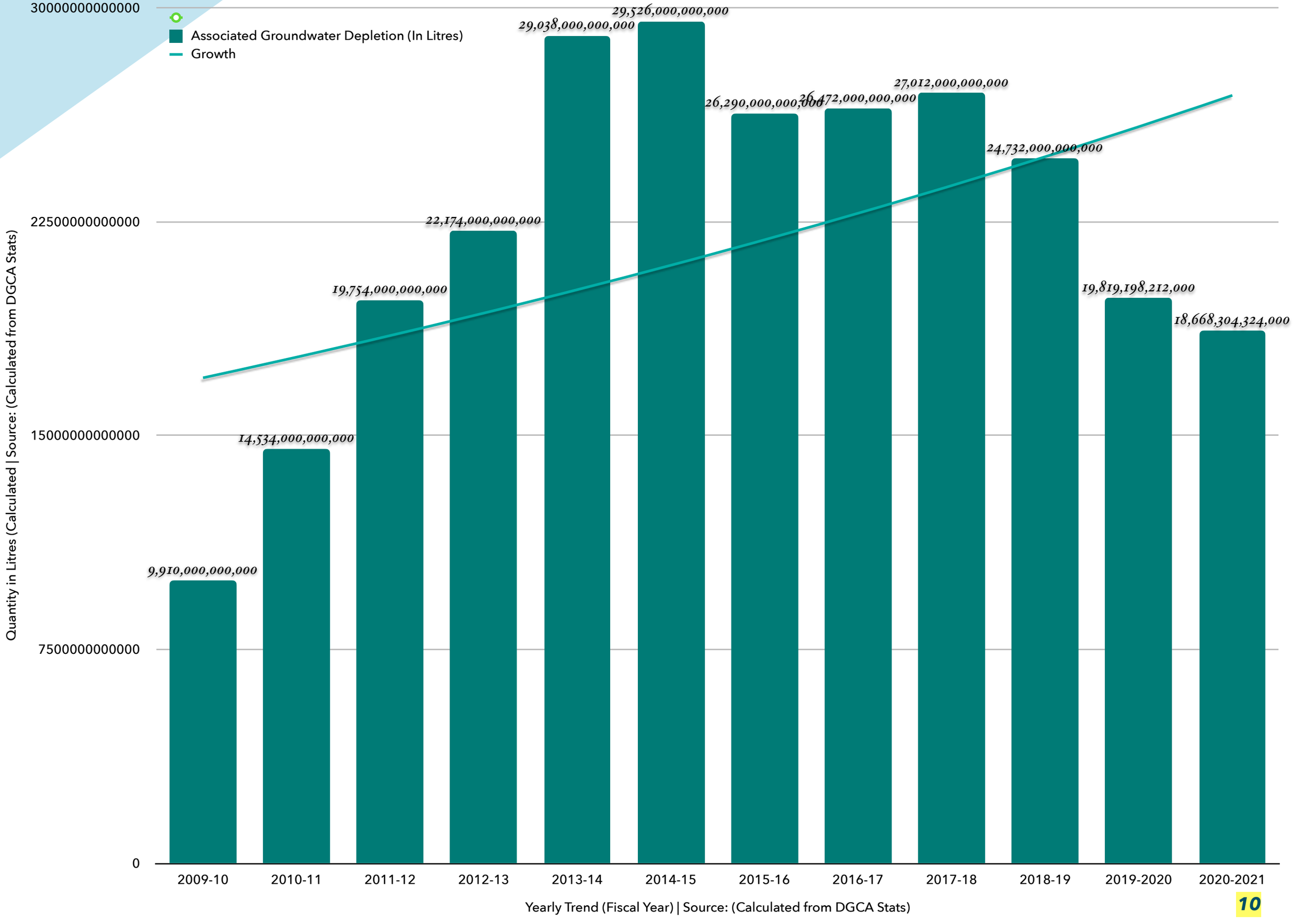
TOTAL WATER LOST DUE TO BEEF PRODUCTION OVER 10+ (2)* YEARS

YEAR	WATER LOST	IN WORDS
2009-10	9,910,000,000,000	09.910 Trillion Litres
2010-11	14,534,000,000,000	14.534 Trillion Litres
2011-12	19,754,000,000,000	19.754 Trillion Litres
2012-13	22,174,000,000,000	22.174 Trillion Litres
2013-14	29,038,000,000,000	29.038 Trillion Litres
2014-15	29,526,000,000,000	29.526 Trillion Litres
2015-16	26,290,000,000,000	26.290 Trillion Litres
2016-17	26,472,000,000,000	26.472 Trillion Litres
2017-18	27,012,000,000,000	27.012 Trillion Litres
2018-19	24,732,000,000,000	24.732 Trillion Litres
2019-20*	19,819,198,212,000	19.819 Trillion Litres
2020-21*	18,668,304,324,000	18.668 Trillion Litres

Source: (DGCA)



Trend of Groundwater Lost to Beef Exports



According to the **World Health Organization (WHO)**, "A higher quantity of about 20 litres per capita per day should be assured to take care of basic hygiene needs and basic food hygiene."

Example = $\frac{24,732,000,000}{365 \text{ (days)} \times 20 \text{ (Litres)}}$ ***FY (2018-19)***

= ***3,387,945,205 Indians***

According to this calculation, beef export consumed the yearly water requirement of 3,38,79,45,205 ***(Three Billion+)*** Indians in **[Fiscal Year (2018-19)]**
Excluding laundry needs

(According to 20L per person x 365 Days)

2009-10: 1,357,534,246

2010-11: 1,990,958,904

2011-12: 2,706,027,397

2012-13: 3,037,534,246

2013-14: 3,977,808,219

2014-15: 4,044,657,534

2015-16: 3,601,369,863

2016-17: 3,626,301,369

2017-18: 3,700,273,972

2018-19: [3,387,945,205]

2019-20*: 2,269,923,287

2020-21*: 2,496,915,616

As seen, that much water loss is impacting 3.3 billion people. But as Indians, we're only 1.3 billion people. How about we recalculate the numbers on the basis of 50 litres per capita per day i.e. 2.5x of the quantity recommended by the WHO?

2.5x

The numbers are astonishing:

(According to 50L per person x 365 Days)

YEAR	INDIANS AFFECTED	IN WORDS
2009-10	543,013,698	*Five Hundred and Forty Three Million+*
2010-11	796,383,561	*Seven Hundred and Ninety Six Million+*
2011-12	1,082,410,958	*One Billion, Eighty Two Million +*
2012-13	1,215,013,698	*One Billion, Two Hundred Fifteen Million+*
2013-14	1,591,123,287	*One and a Half Billion+*
2014-15	1,617,863,013	*One Billion, Six Hundred Seventeen Million+*
2015-16	1,440,547,945	*One Billion, Four Hundred Forty Million+*
2016-17	1,450,520,547	*One Billion, Four Hundred Fifty Million+*
2017-18	1,480,109,589	*One Billion, Four Hundred Eighty Million+*
2018-19	1,355,178,082	*One Billion, Three Hundred Fifty Five Million+*
2019-20*	907,969,315	*Nine Hundred Seven Million+*
2020-21*	998,766,246	*Nine Hundred & Ninety Eight Million+*

**speculation(s)*

A FUTUREPROOF APPROACH TO AGRICULTURE

- A Way to Rebound from the COVID-19 pandemic
- Holistic Partnerships with Farmers And Millions of New Jobs
- Entry Into Key Markets Across The Globe Through a High Quality Product Offering.

Let's avow to protect the interest of our farmers with this new kind of business, which redefines India's identity as a global superpower

MEAT DOESN'T GROW ON TREES, AND THAT'S THE POINT

Food Type	Quantity	Water Consumption (Litres)	Translation -> Tonnage	Water Consumption/ 1 million metric tonnes. (1,000,000 x 1,000 x litre(s)
Apple	1 kilograms	822	1 million metric tonne	822,000,000,000
Banana	1 kilograms	790	1 million metric tonne	790,000,000,000
Orange	1 kilograms	559	1 million metric tonne	559,000,000,000
Lemon	1 kilograms	582	1 million metric tonne	582,000,000,000
Avocado	1 kilograms	1176	1 million metric tonne	1,176,000,000,000
Tomato	1 kilograms	214	1 million metric tonne	214,000,000,000
Grapefruit	1 kilograms	461	1 million metric tonne	461,000,000,000
Peach	1 kilograms	825	1 million metric tonne	825,000,000,000
Apricot	1 kilograms	1165	1 million metric tonne	1,165,000,000,000
Strawberries	1 kilograms	189	1 million metric tonne	189,000,000,000
Pineapple	1 kilograms	189	1 million metric tonne	189,000,000,000
Total				6,972,000,000,000
World's Total Fruit Production			-Stats Unavailable-	

Across the web, there are varying statistics about world's total fruit production. *Although, the aforementioned commodities are only a few, putting these figures into perspective elucidates how* ***India could boost its total fruit production by 12.19% in just one year, if it were to produce 11 million metric tonnes for 6.9 trillion litres of water.*** *Despite that, it would still be left with* ***17 trillion litres (17,760,760,000,000) of water per year*** *to provide for citizens' needs and other ventures. The possibilities are endless, if India just bans beef export.*

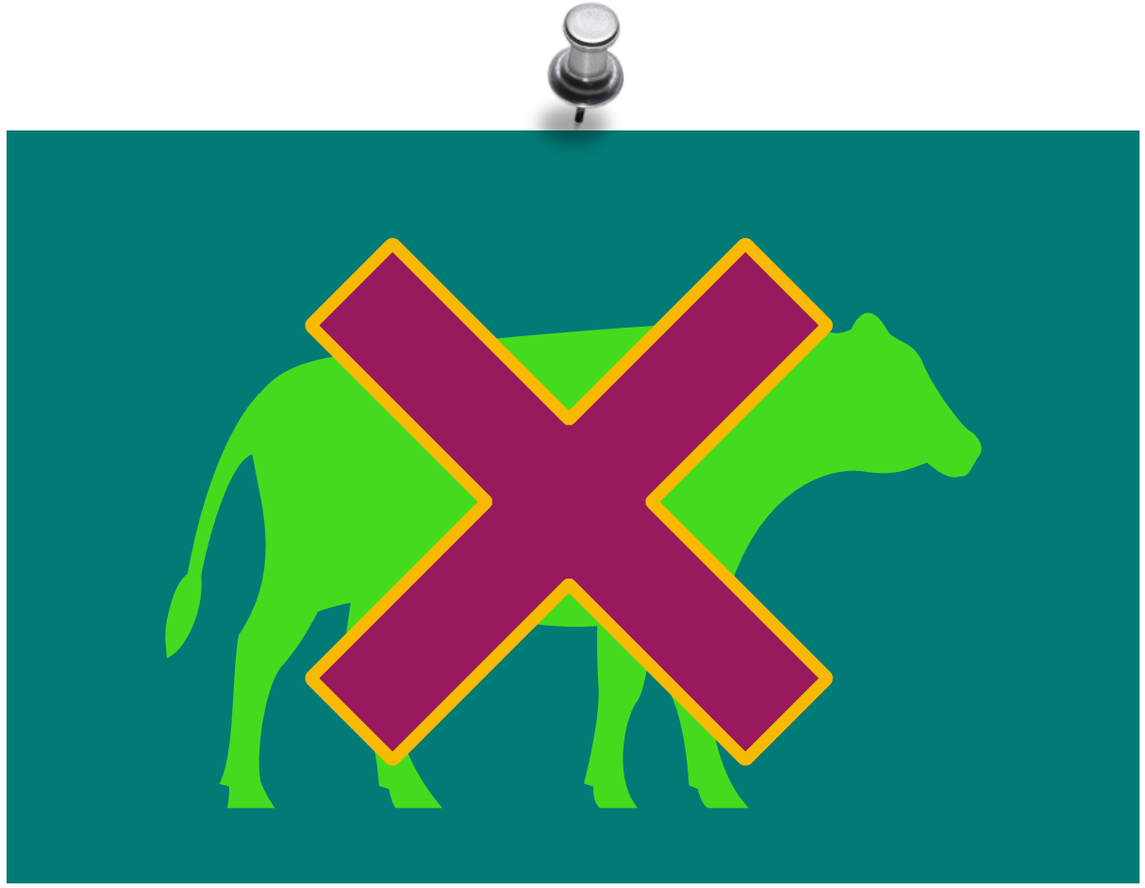
Math*:*

24,732,760,000,000 (Water consumed by India's beef export) ***(FY 2018-19)***

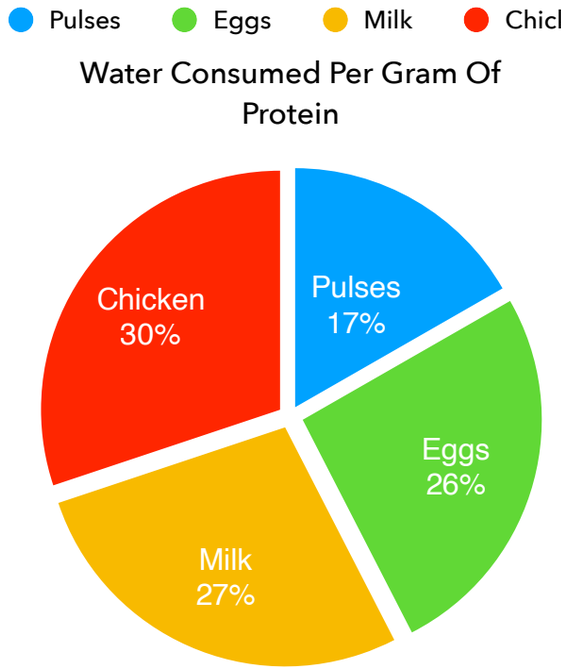
(-) 6,972,000,000,000 (Water consumed by fruit alternatives)

17,760,760,000,000 (Remainder of water resources)

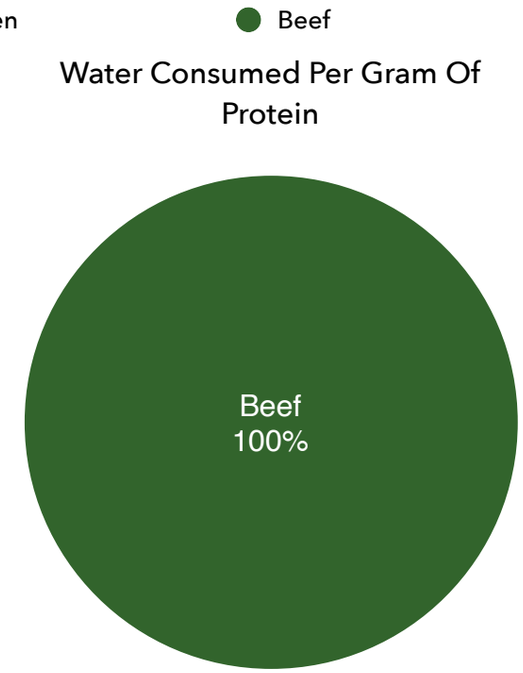
A NECESSARY INSIGHT: WATER CONSUMED PER GRAM OF PROTEIN



Some will argue that the measurement of gallons per pound isn't fair -- we should consider water consumed per gram of protein. In this case, pulses (including beans, lentils, peas, etc.) win out at 5 gallons per gram of protein, followed by eggs at 7.7 gal./gram, milk at 8.2 gal./gram, and chicken at 9 gal./gram. The numbers only go up from there, with beef topping the scale, requiring 29.6 gallons of water per gram of protein. ***("This Is How Much Water It Takes To Make Your Favorite Foods", 2020")***

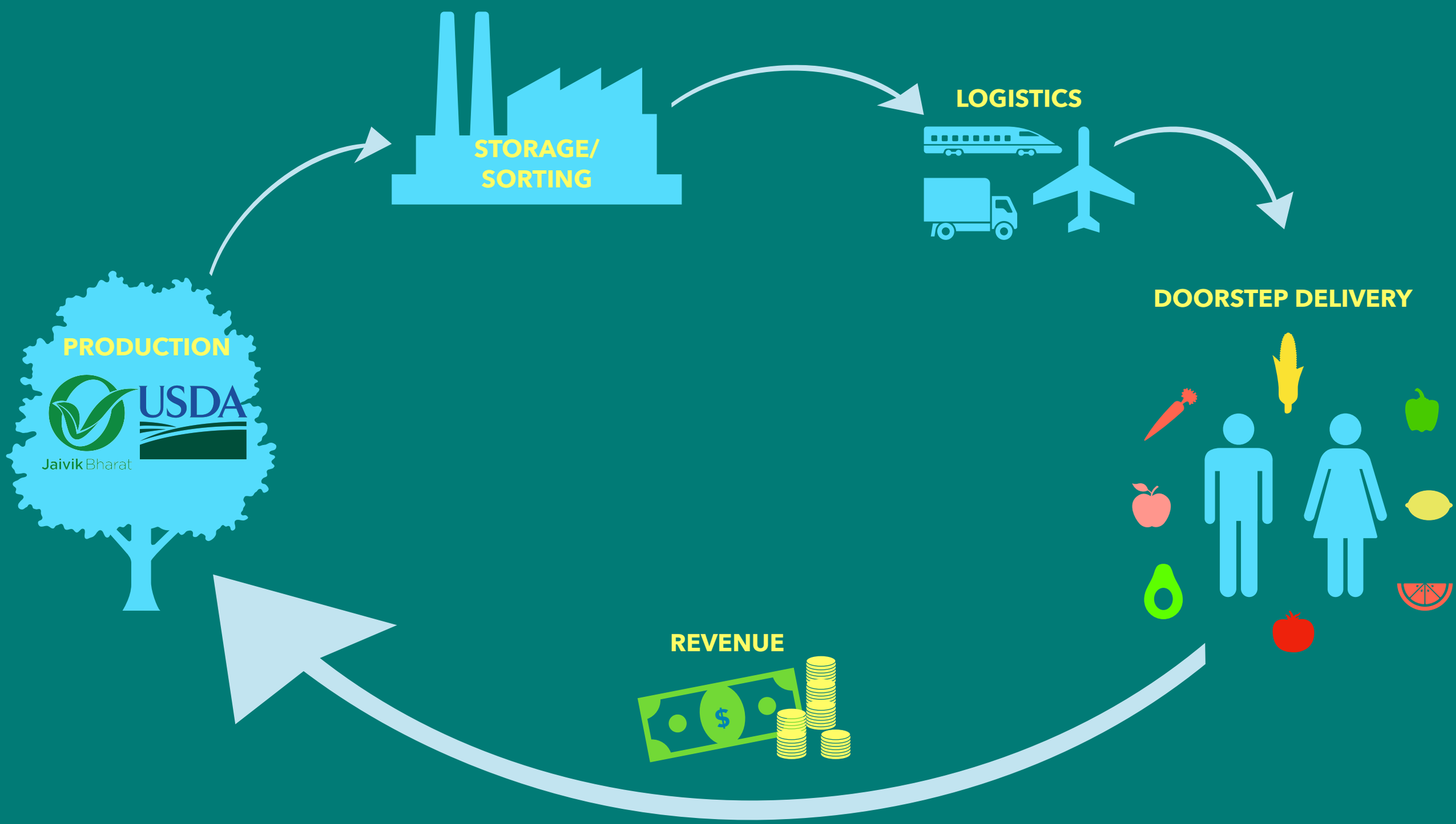


Commodity Type	Litre(s) Consumed
Pulses	18.92
Eggs	29.14
Milk	31.04
Chicken	34.06
Total	113.16



Commodity Type	Litre(s) Consumed
Beef	112.04
Total	112.04

THE BUSINESS MODEL



It is easier said than done. However, if we start doing, we will get to where our fullest potential resides. More freshwater means more productivity and purity for all; the environment, the farmers, the residents and ultimately: The Indian Government.

We could shift our focus from exporting beef to our current customers such as ***Vietnam, Malaysia, Thailand and the Philippines*** *to that of exporting vegetables, fruits, and spices to the likes of* ***Qatar, UAE, Canada, Norway, Switzerland, etc.*** *Countries like Canada are dry, cold and in desperate need of plant products throughout the year.* ***The U.S. market witnessed a surge of 11.3% in 2018 alone, whereas overall food sales only increased by 2%. Plant based food sales skyrocketed to 31.3% from April 2017 - April 2019; totalling $4.5 billion.*** *Needless to say, the plant based options available in the North American market are no match for the tasteful fruits and vegetables India has to offer.*

For instance, let's take mangoes. Indian mangoes are known to be the sweetest and the priciest option at Canadian grocery stores. Grocery stores such as NoFrills and Walmart sell mangoes imported from Africa and Mexico. The hard and pale coloured options are no match for India's Kesar Mangoes that are relatively smaller in size, and retail for as much as $1 (₹684) for just 6 mangoes. The same stores sell pineapples that are not half as sweet as compared to their Indian counterparts. They are imports of Peru and Chile and retail for about $2.67 (₹140.60).

Accompanying such imports are Tomatoes (mostly products of U.S.) that lack the texture and seeds such as the ones found in good quality tomatoes. This may be equated to the hydroponic growing techniques that are prevalent in the West. It renders tomatoes lacking seeds and the aroma that is otherwise found in a local vegetable market in India for a fraction of the price.

Although, the export sphere is vast and ever growing, allocating some production for the domestic population will allow for a greater degree of water recycling within India's ecosystem. For the purpose, the ban on beef export will be the first step. We could help farmers repay their debts just through domestic consumption and ultimately: mitigate healthcare and electricity costs in the long run. Because let's admit it, less water in the supply affects the poor and rich alike.

When there is less for all, prices of commodities go up. Not only this, when the atmospheric temperatures go up owing to the lack of water recycling in the country, people tend to use more Air Conditioners, pulling more electricity from the grid. Thereby, pushing the burden of infrastructural expansion and construction of Hydro Dams on the government.

THINGS WE CAN ACHIEVE TOGETHER

Fully replenished water table throughout India.

FARstrong foundation to revive our holy river: Ganga.

Reduction in Inflation.

Mitigated Incidents of Drought.
Maximized contribution to the Centre's Pool for Food, allowing us to stand with our flood ridden states as well as with our neighbours such as Papa New Guinea, Thailand and South Africa in instances of climatic disasters.

Eradication of Poverty

Revolution in technology for agricultural and related sectors. Thus, transforming India into a food surplus country within 8 years.
Reinvestment in Innovation and Modernization of Packing, Transportation and Storage.

Strengthen ties with countries in demand of imported grains, vegetables, fruits, and spices.

LET'S BEGIN

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