

A New Golden Age of Agriculture?

Birnie & Associates Consultancy

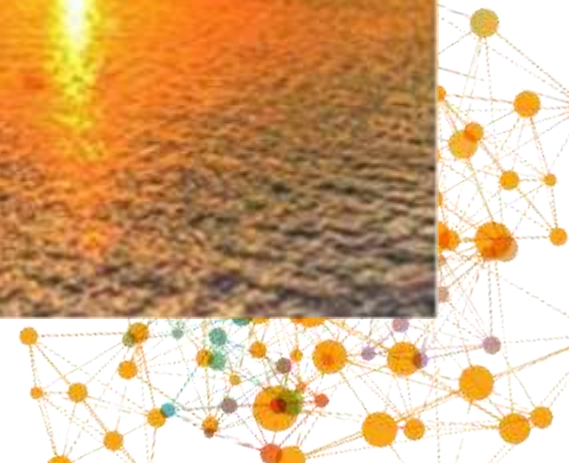
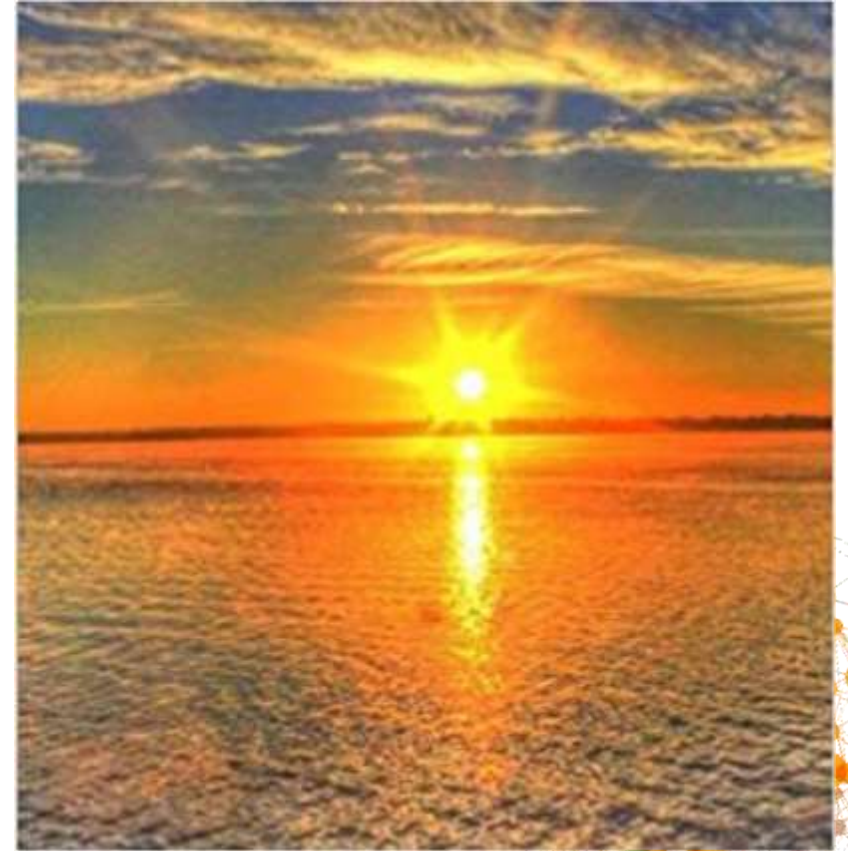
Food Chain Development

A New Golden Age for Agriculture?



Agenda

- Supply and demand
- Climatic changes & effects on production
- Opportunities
- Preparation



What does a Golden Age look like?

- High demand for food
- Significant market development
- Recognition of importance of agriculture
- Transformational technology
- Growing businesses
- World leading productivity





Global Peace

depends on

Food Security





A Vision for UK Agriculture



UK Agriculture in 2035



Profitable

Sustainable

Enjoyable

Brexit

A threat or an
opportunity?



New Zealand post-subsidy



- 1984 - New Zealand Government in Financial Crisis
- Decision to remove farm subsidy almost overnight
- Exit grant organised - 1% of farmers took this up
- Over next 10 years, 8% of farmers withdrew from the industry
- 1984: 71 million breeding ewes: 400,000 tonnes sheepmeat/year
- 2016: 29 million breeding ewes: 420,000 tonnes sheepmeat/year
- Compelled to get better or get out - most farmers proved highly resourceful



N.Ireland Pig Industry



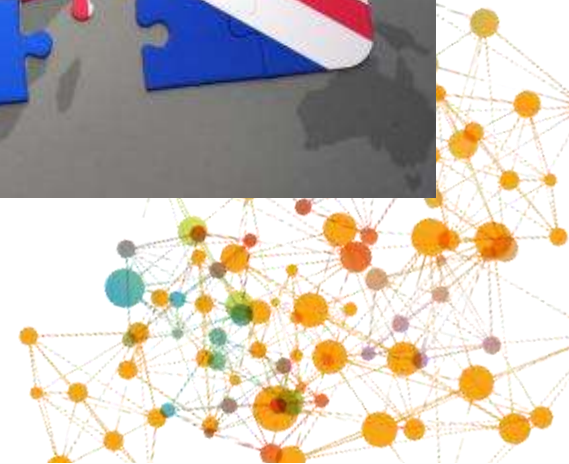
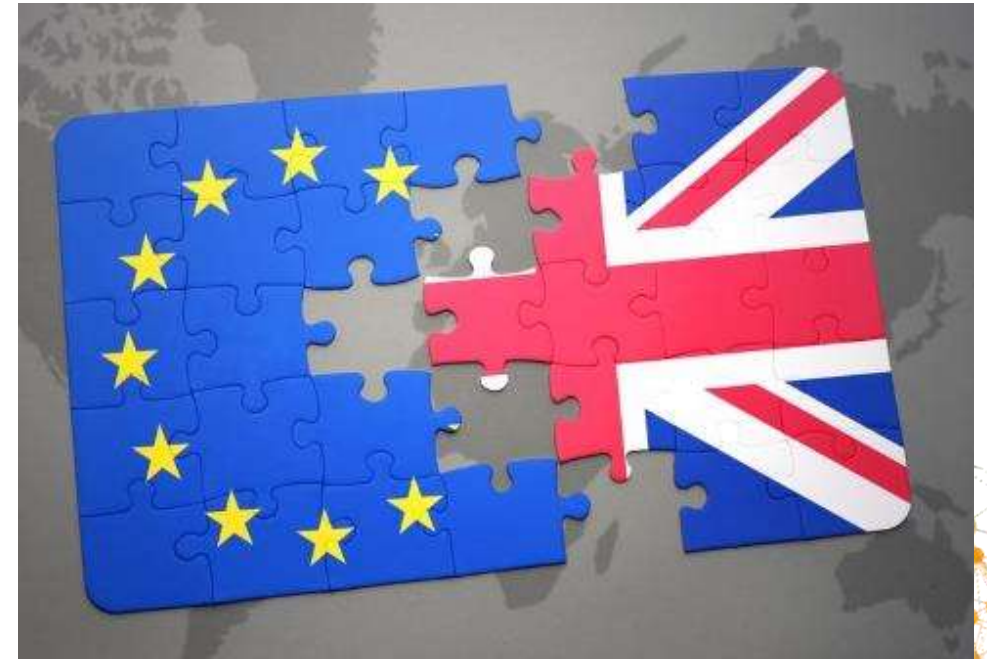
- Through severe crisis around the year 2000
- Approximately 50% of pig farmers left the sector
- Continues to face higher feed costs and lower prices than GB
- Now the 3rd most efficient pig sector in world (just behind Netherlands)
- Heavy focus on data collection and management against this
- Attention to detail in every area
- Great technology transfer and knowledge exchange
- A culture of improvement



UK post-Brexit



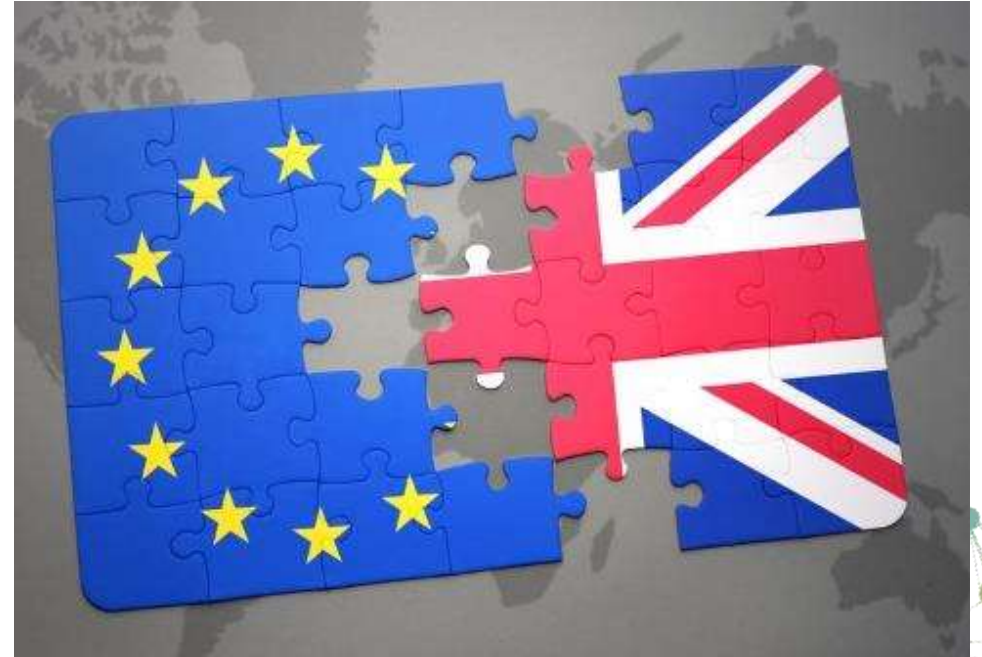
- Market rebalancing
- All product will sell
- May take time to find ideal market
- Price impacts will be felt
- Longer term positivity



UK post-Brexit



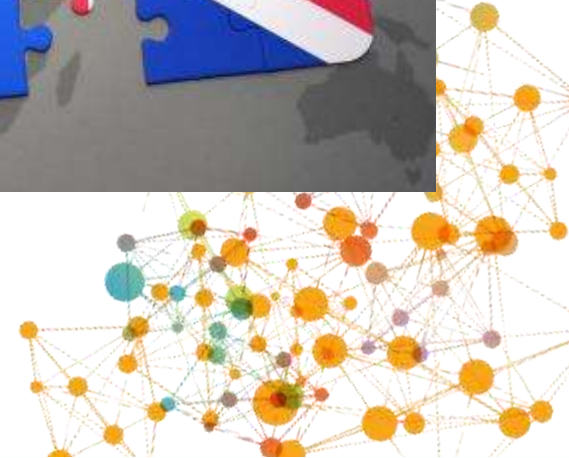
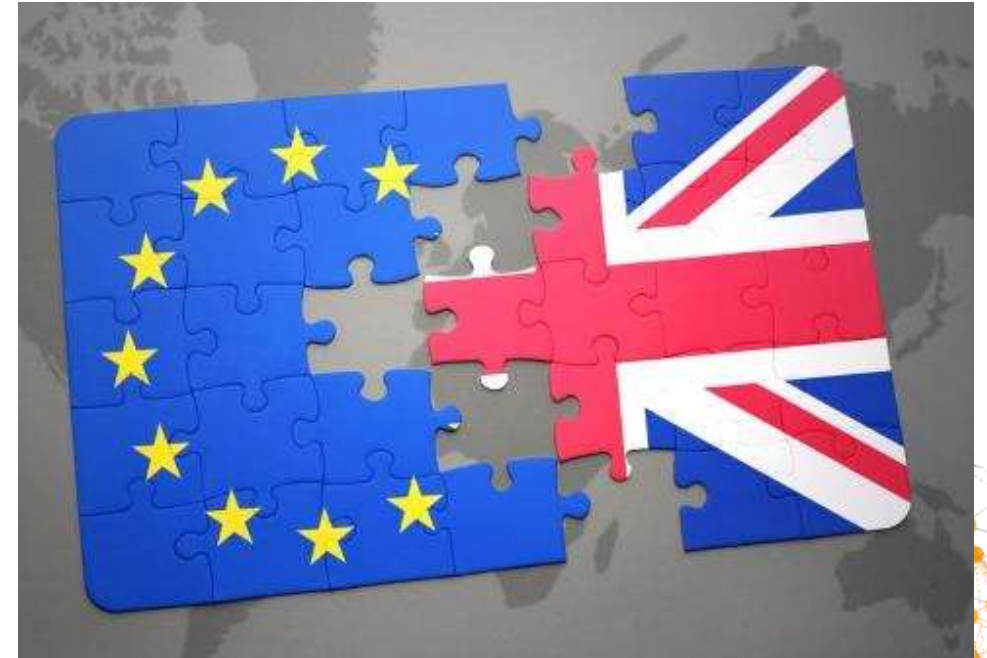
- Agricultural Funding will continue
- Public money for public goods
- Debate over what a public good is
 - Food security
 - Access to land
 - Enhanced biodiversity
 - Flood control



UK post-Brexit



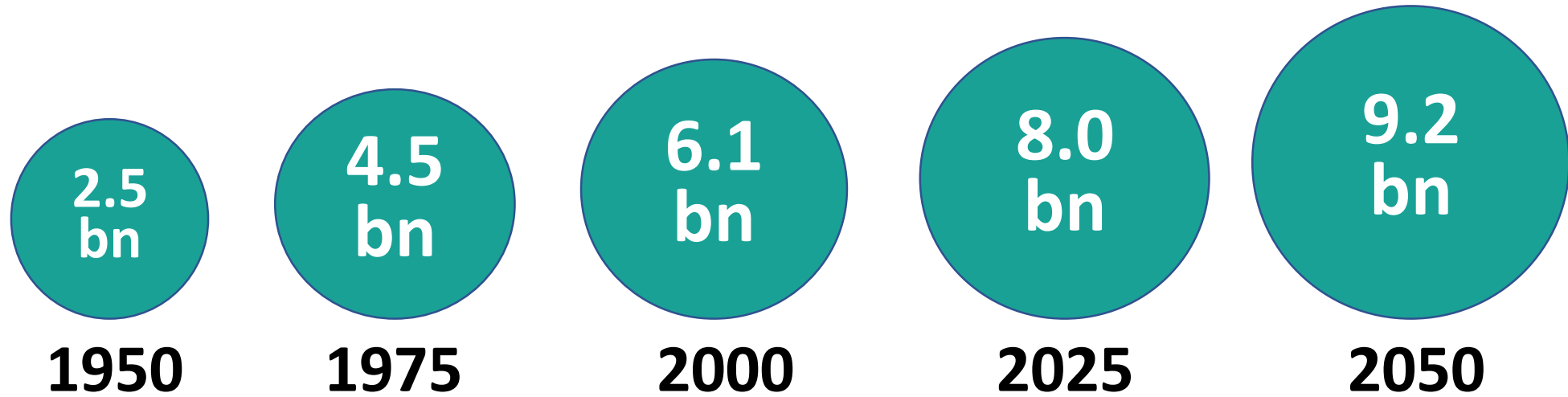
- There will be regulation change
- Efficiency in farming will be encouraged
- Frameworks will be put in place to enable more effective uptake of best practice
- Frameworks will be put in place to enable more effective R&D
- Frameworks will be put in place to enable more effective uptake of new technology
- It will have a positive impact on the industry



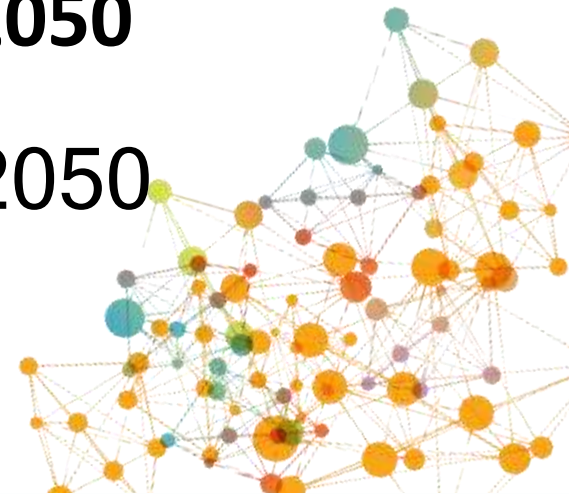
Demand vs Consumption



Demand for Food Grows with Population



- Food consumption to double from 2000 to 2050
- 50% from population growth
- 50% from economic growth



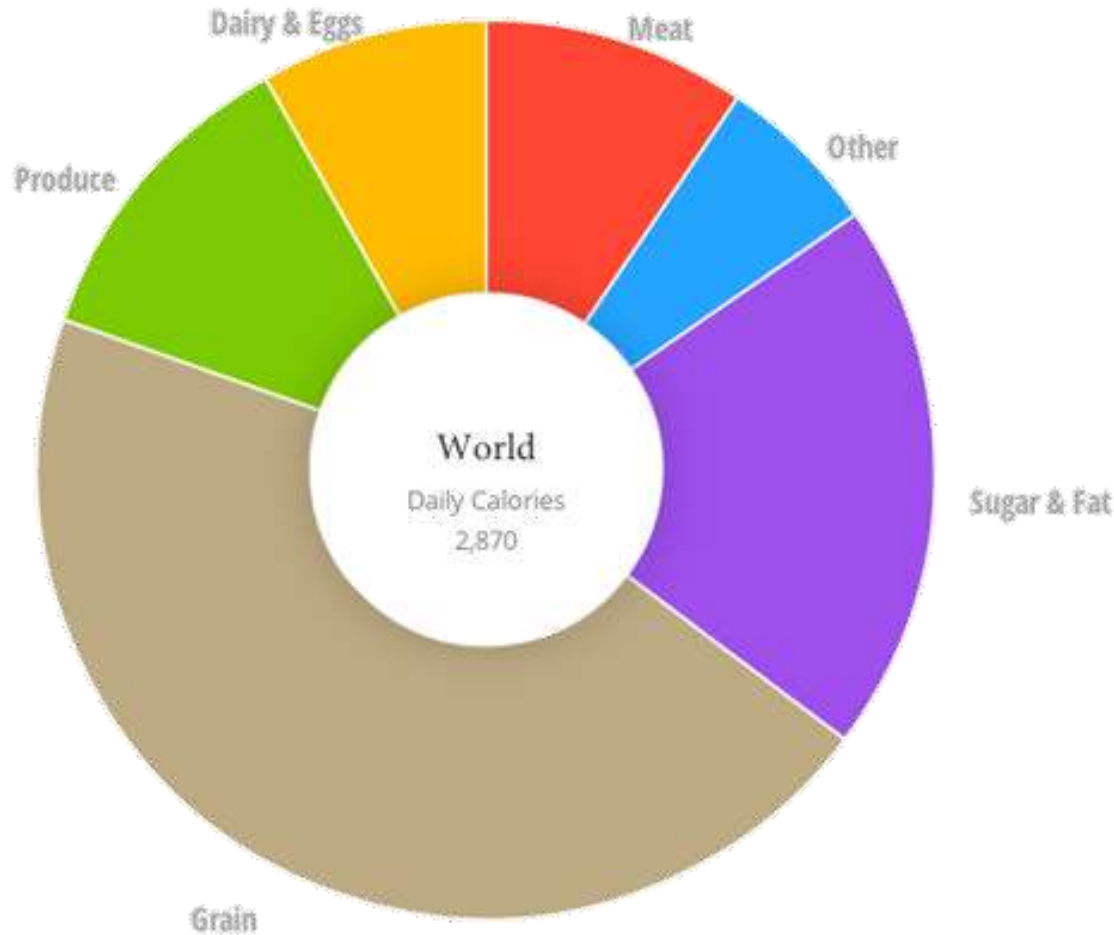
Demand Driver



- World Bank estimated that the number of people in developing countries living in households with incomes above \$16,000 per year will rise from 352 million in 2000 to 2.1 billion by 2030
- The number of currently low income consumers are lifted out of poverty is the most important determinant of future global demand for food



Where do the calories come from?



- Grain
- Sugar & fat
- Produce
- Dairy and Eggs
- Meat
- Other



Per Capita Food Consumption



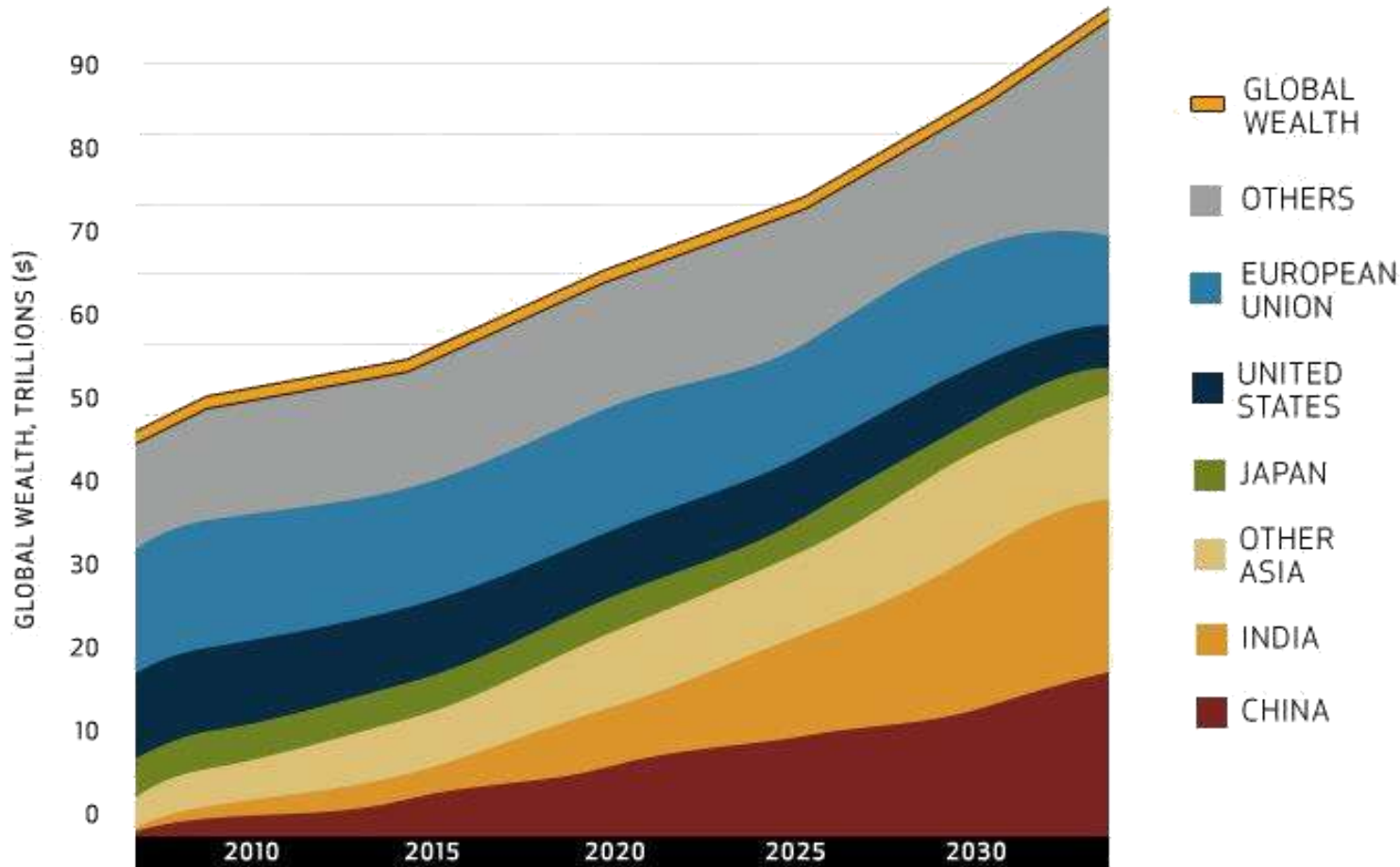
By 2030, average per capita food consumption in developing countries is expected to grow, with only one in seven people consuming less than 2500 calories per day.



Ref: Farmingfirst.org



Regional Food Demand

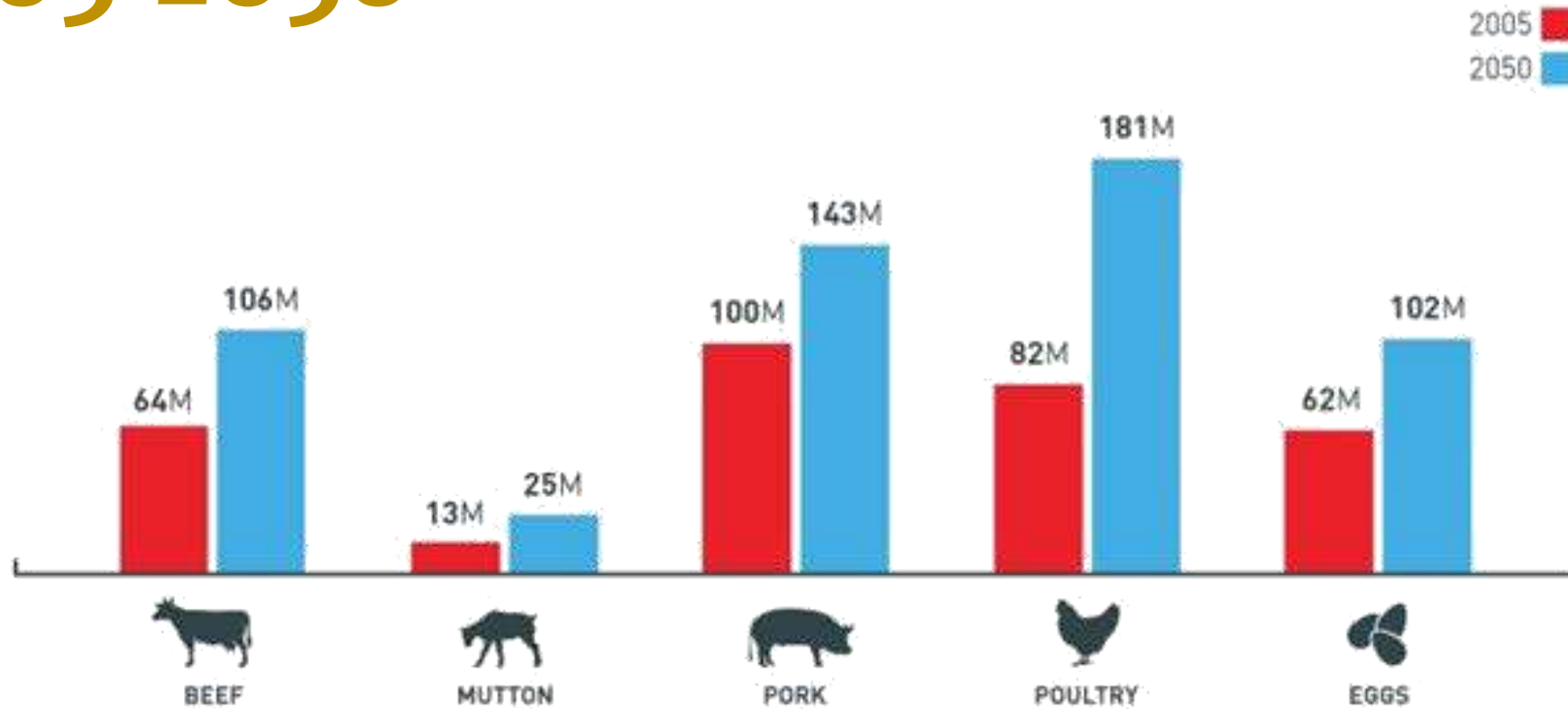


By **2030**, the global economy could double in size, and India and China will swell to represent around 40% of global middle-class consumption, up from less than 10% in 2010. This will significantly alter the composition of global diets.

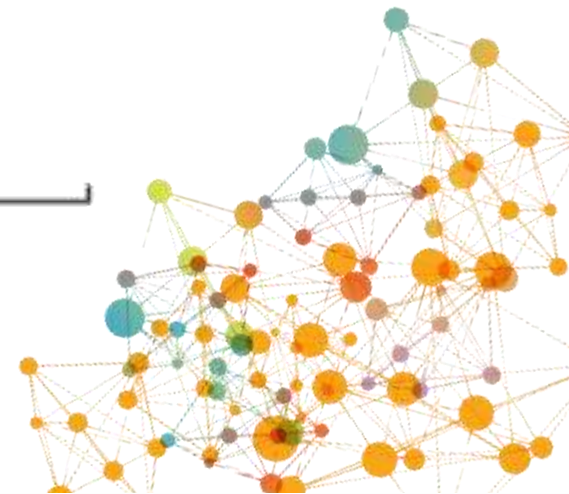
Ref: Farmingfirst.org



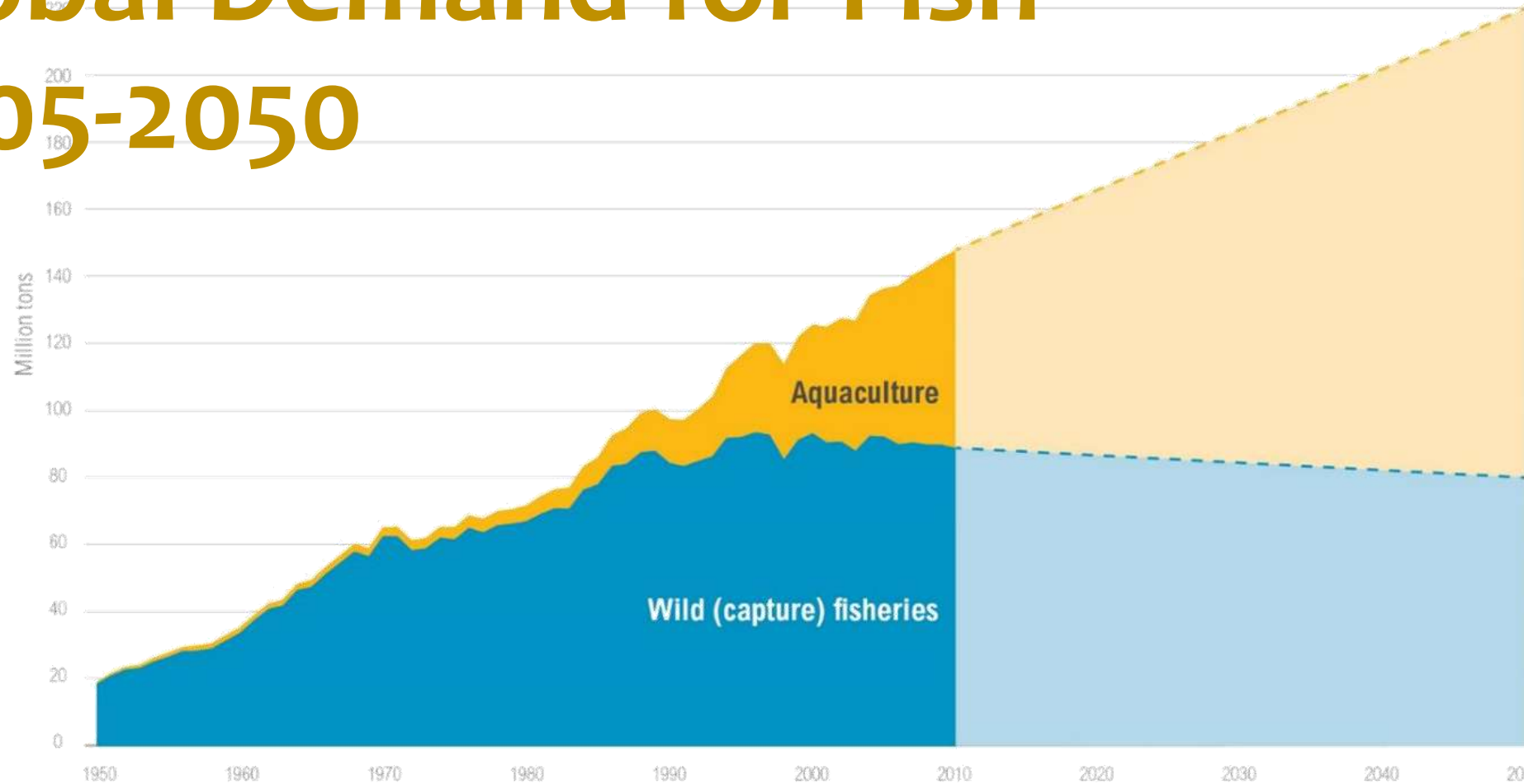
Global Demand for Meat 2005-2050



Source: Food and Agriculture Organization of the United Nations, ESA Working Paper No. 12-03, p. 131

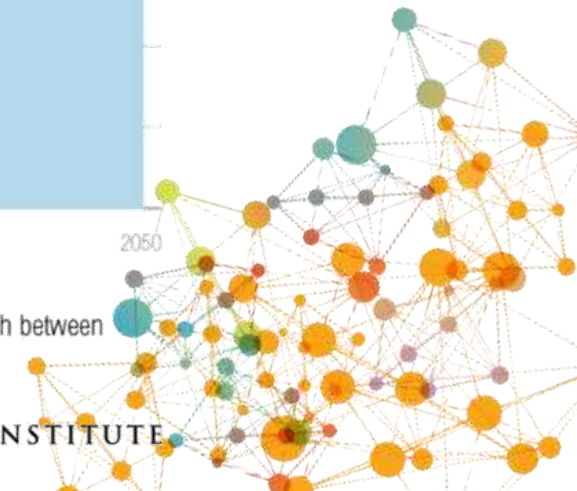


Global Demand for Fish 2005-2050



Source: Historical data 1950–2010: FAO. 2014. "FishStatJ." Rome: FAO. Projections 2011–2050: Calculated at WRI, assumes 10 percent reduction in wild fish catch between 2010 and 2050, and linear growth of aquaculture production at an additional 2 million tons per year between 2010 and 2050.

See www.wri.org/publication/improving-aquaculture for full paper.



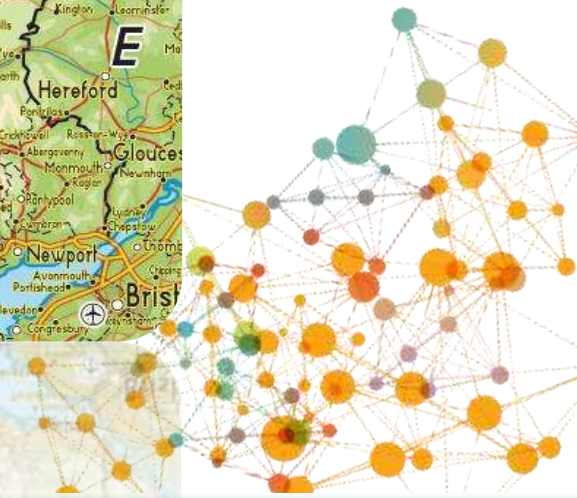
Production factors



First Limiting Factors (Global)



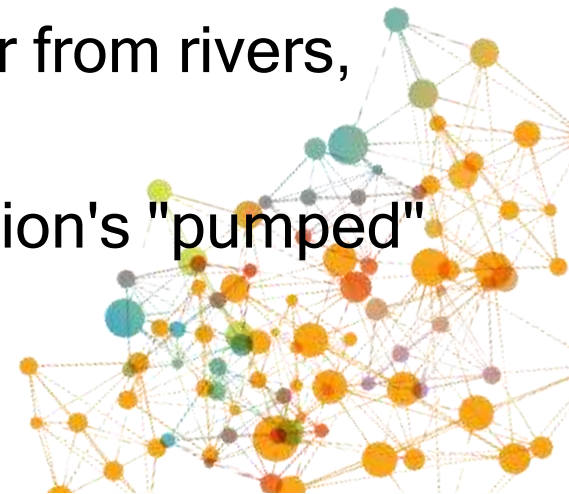
- Water availability
- Temperatures
- Land availability
- Pests
- Disease
- Soil loss



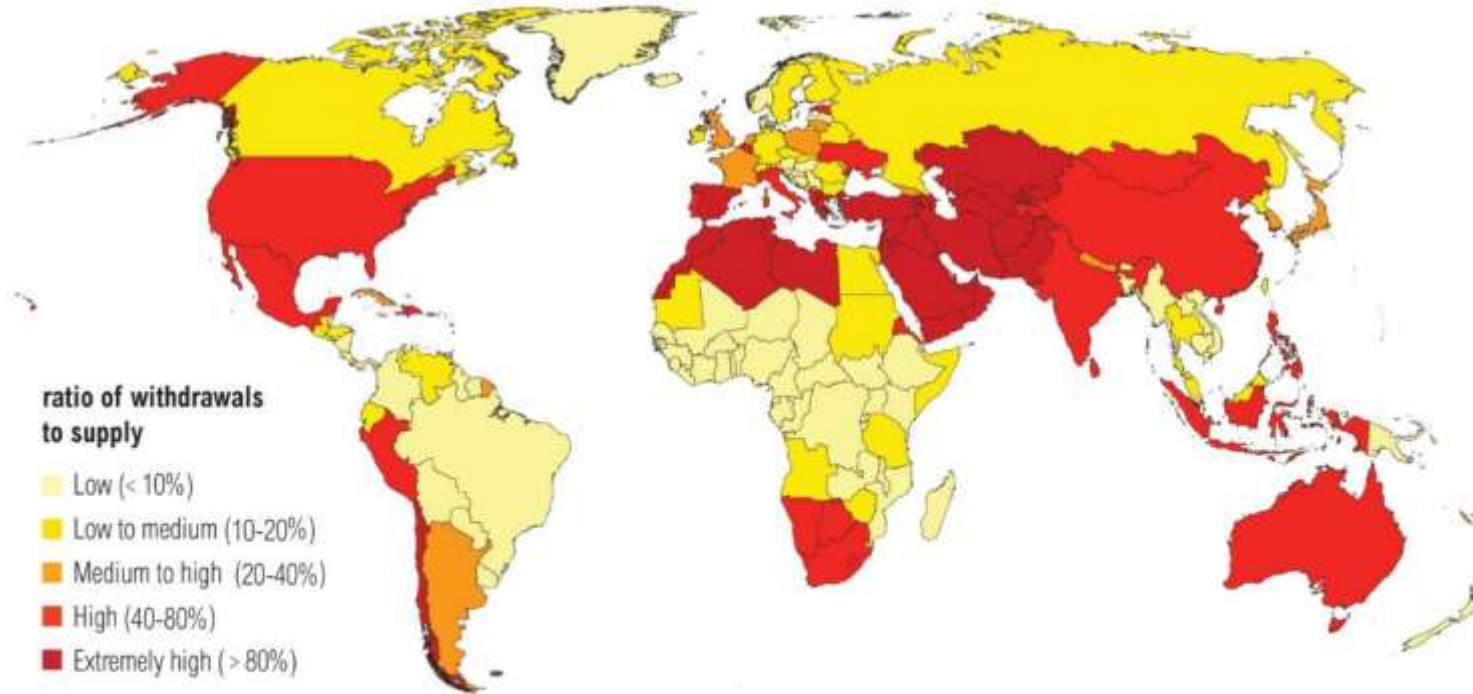
First Limiting Factors (Global)



- By 2030, according to one scenario, atmospheric carbon dioxide concentrations will be double pre-industrial concentrations
- Other greenhouse gases will increase substantially, and temperatures in North America and Africa will rise approximately 2 degrees Centigrade.
- Rainfall is the major limiting factor in the growth and production of crops worldwide.
- Many nations have constructed irrigation systems to pump water from rivers, lakes, and aquifers.
- In the United States, agriculture consumes 85 percent of the nation's "pumped" water; yet, only 12 percent of U.S. cropland is irrigated.



Water Stress by Country 2040



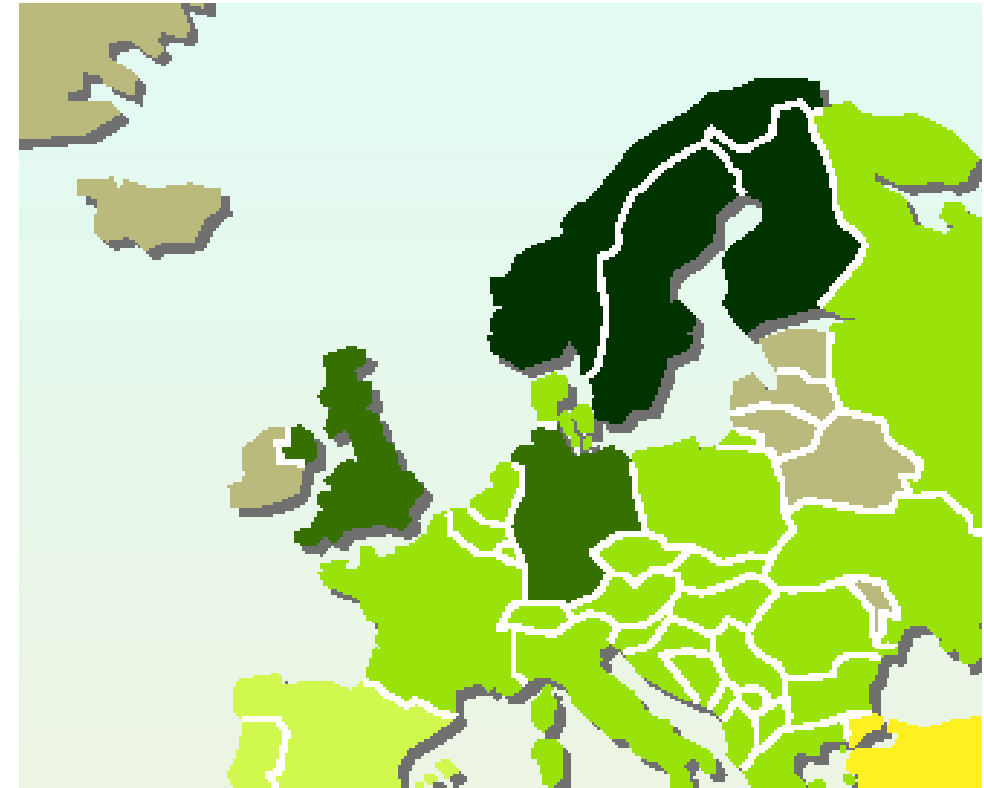
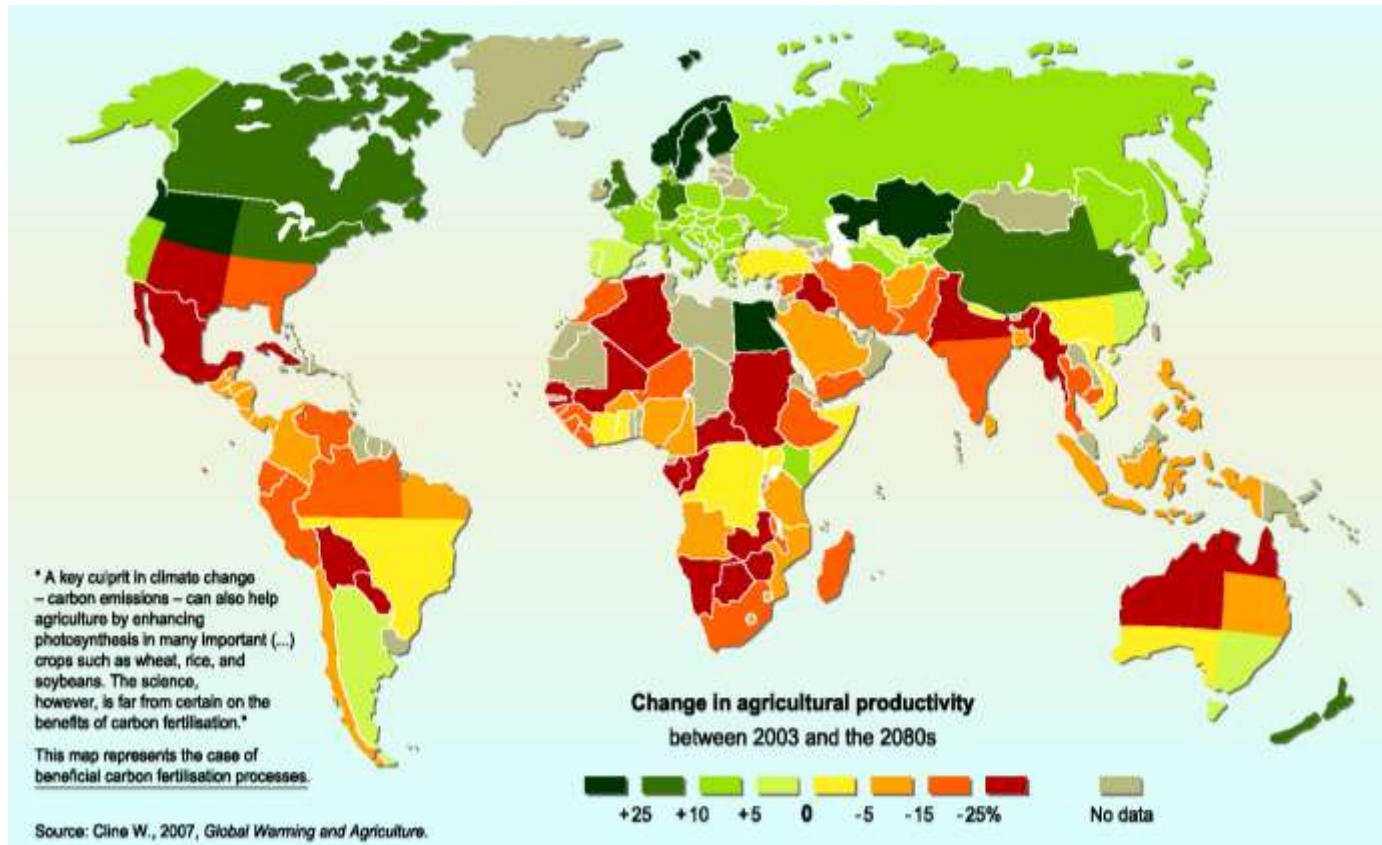
NOTE: Projections are based on a business-as-usual scenario using SSP2 and RCP8.5.

For more: ow.ly/RiWop

 WORLD RESOURCES INSTITUTE



Projected impact of climate change on agricultural yields



Change in agricultural productivity between 2003 and the 2080s



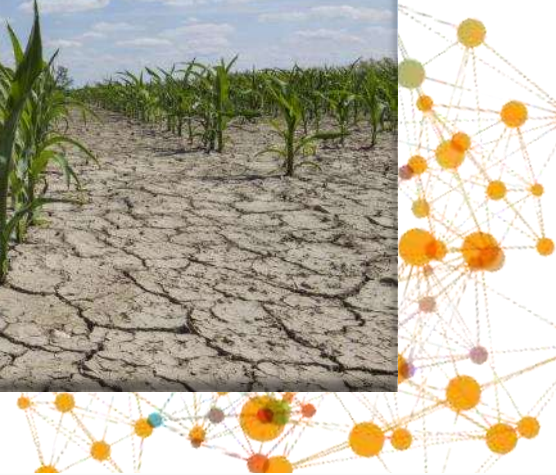
Irrigation Costs

- Large amounts of irrigated water require large amounts of fossil fuel.
- To irrigate one hectare of grain by drawing water from a depth of only 30 meters requires more than twice as much energy as if the same amount of grain is rain-fed.
- Because of its high energy use, irrigation is costly.
- Depending on system and crop, costs range from \$16/Ha to \$268/Ha (FAO)



Soil Loss

- High rates of soil loss in many areas
- Soil erosion considered by many to be as threatening to food production as is climate change
- North America and Africa lose 16 to 30 tons of soil per hectare each year,



The UK advantage



- UK ability to grow grass and grain will increase
- Soil challenges not as significant as major competition
- Water challenge not as significant and major competition
- Output and productivity can increase relative to major competitors
- We are very near our main consumer market





Opportunities



Opportunity 1: Data



- The gathering and sharing of data
 - The use of data to manage
 - The use of data to compare
 - The use of data to justify
- The introduction and use of robotics
- The use of external advice and auto



What Can Data Do for Agriculture?



- Understand the current position
- Compare to other businesses or sectors
- Identify areas for improvement
- Enable Artificial Intelligence
- Enable Robotization

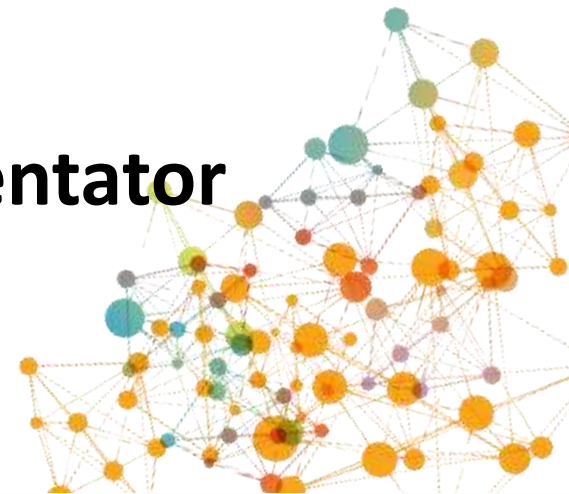


Sir Terry Leahy: “The introduction of the Tesco Clubcard was the single most significant factor in the success of the company”



“Enterprises that deploy analytics to obtain deep insights boost the odds for success, but ones that stumble may find their organization reeling or even failing”

Sam Greengard, Business Commentator



Opportunity 2: Learning



- Ireland: Trained farmers have 12% higher profitability than untrained
- Continuous Professional Development is key to a successful future
- Ability to visualise/understand what effect changes could have on your business
- Ability to see, understand and implement best practice and technology



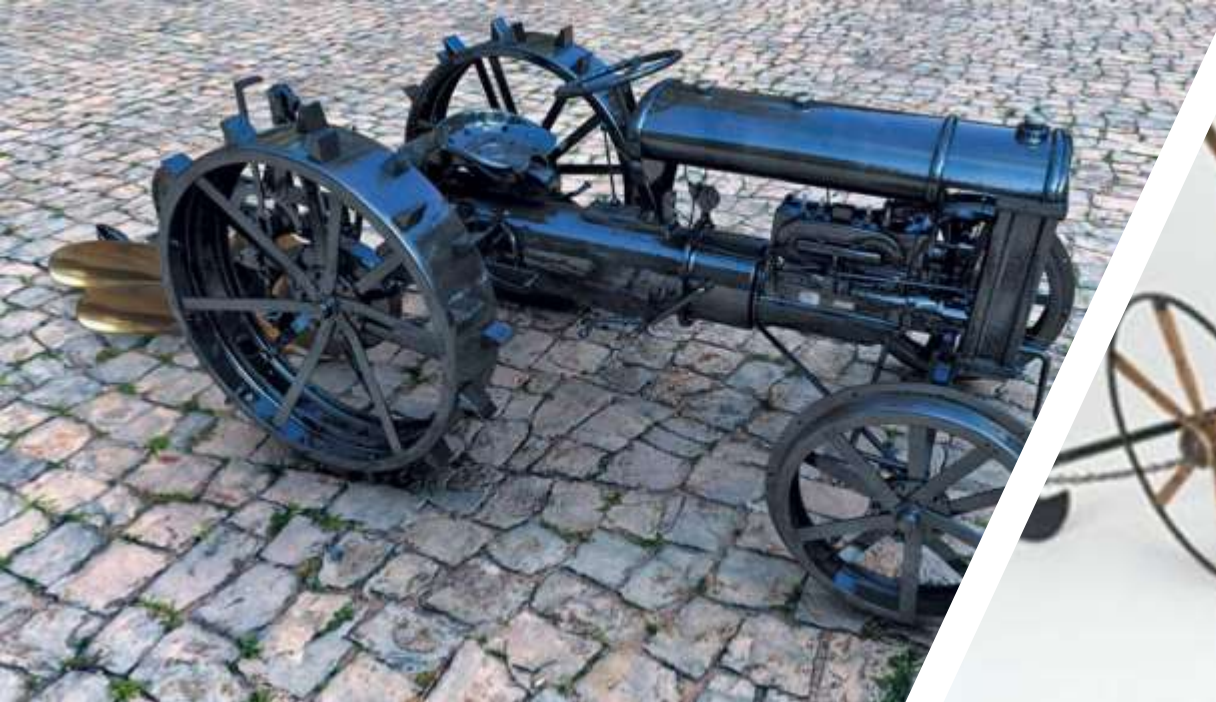
Opportunity 3: Transformation



Fourth Technological Revolution

- Robotics
- Artificial intelligence
- Nanotechnology
- Quantum computing
- Biotechnology
- The Internet of Things (IoT)
- Decentralized consensus
- 3D printing
- Autonomous vehicles







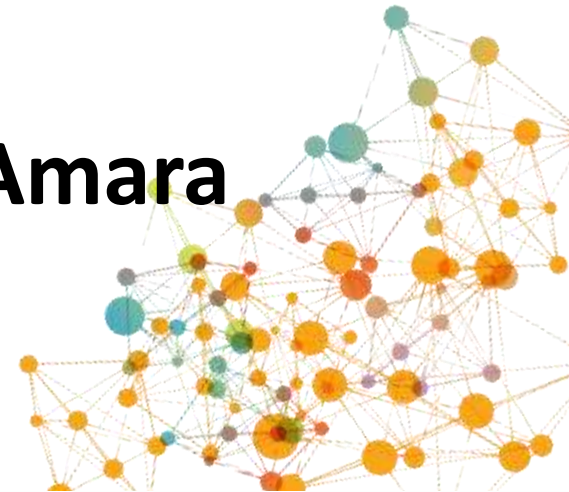
amazon

ebay



“We tend to overestimate the initial effect of technology and underestimate the long-term effect”

Roy Amara



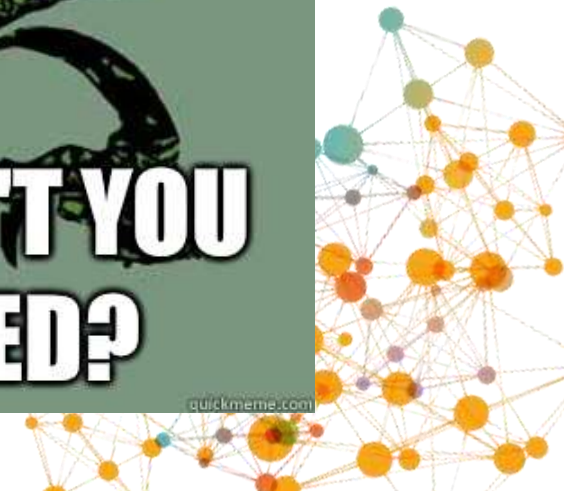
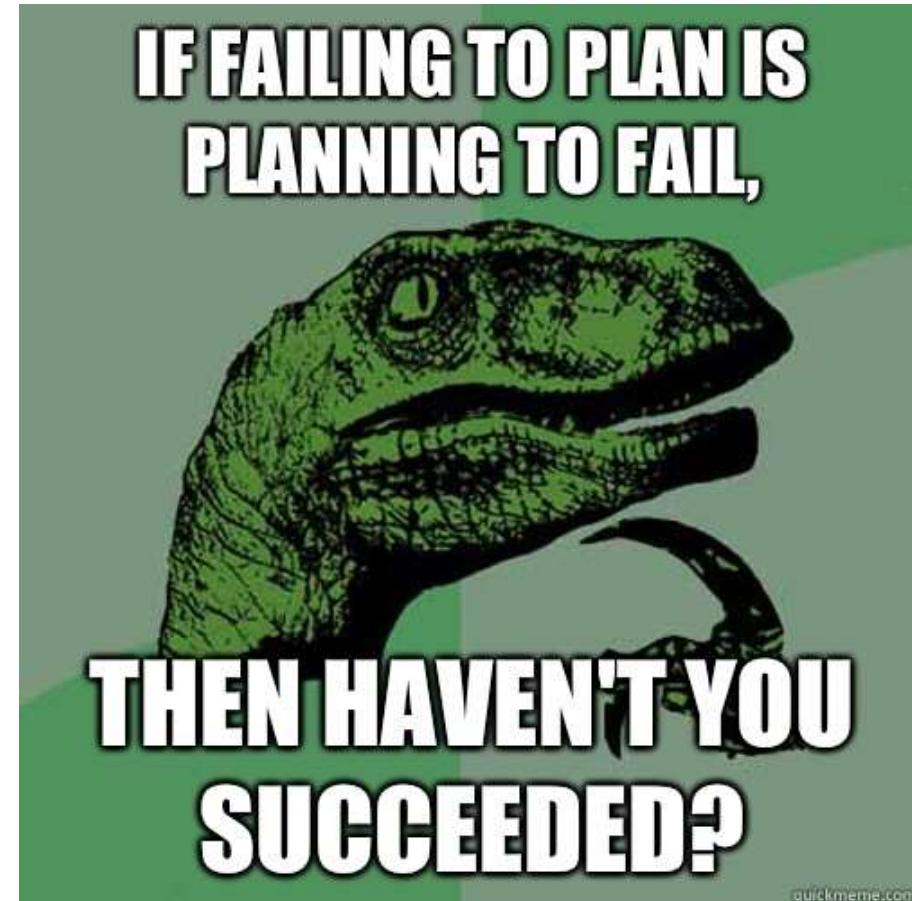


Useful Principles



1. Planning

- Where do you want to be?
- What do you want to do?
- What are your particular skills?
- What makes you or your business better?
- What do I need to do to get there?
- How will I know when I've arrived and need a new plan.....?



A Dream

written down with a date becomes a

Goal

A goal broken into steps becomes a

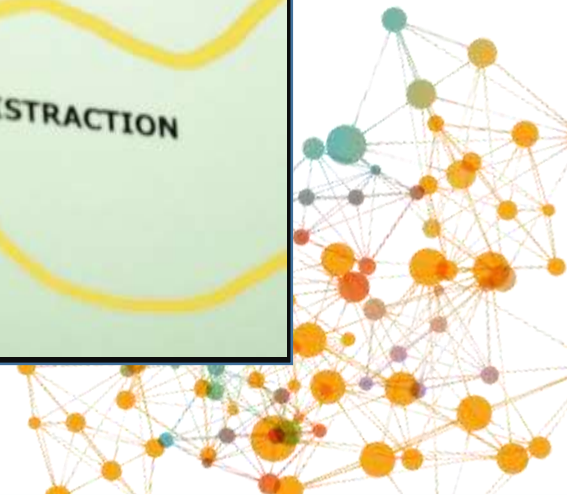
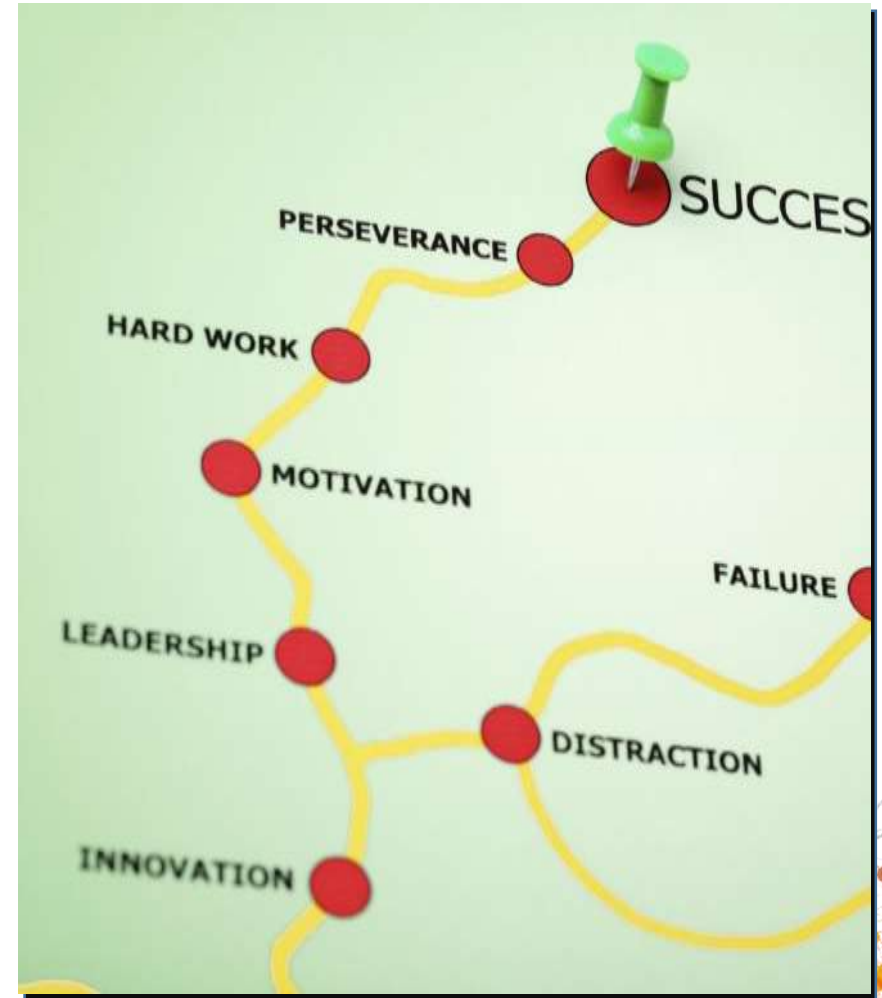
Plan

A plan backed by

Action

Makes your dreams

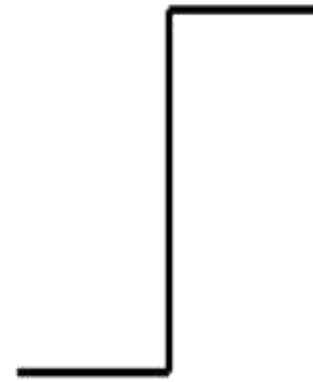
Reality



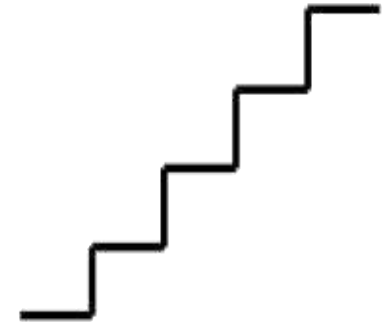
2. Incremental Change



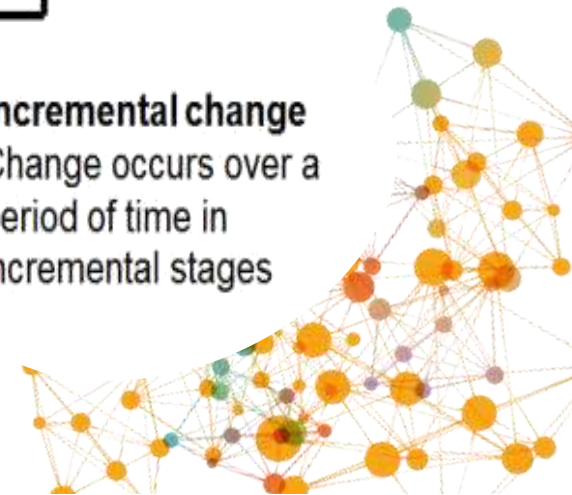
- Take a long term view
- Change only a small number of things at one time *
- Measure the effect of the changes
- Keep it going
- See where it takes you!



Step change
Occurs rapidly



Incremental change
Change occurs over a period of time in incremental stages



* Unless business model is completely broken

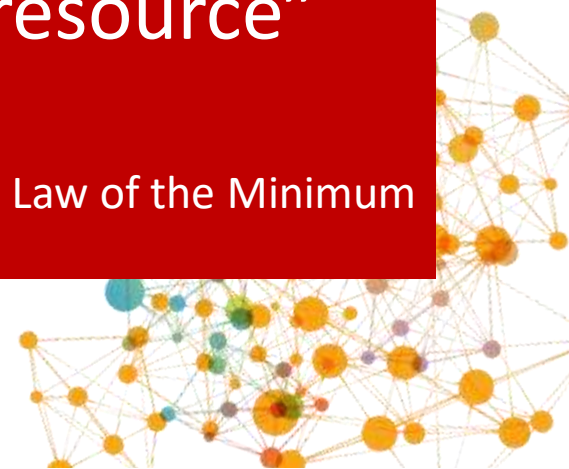
3. First Limiting Factor



- Identify the single biggest thing holding you or your business back
- Understand why it is a problem
- Understand the implications of the problem
- Calculate the cost to resolve the problem
- Carry out a cost benefit calculation
- Solve the problem or move on to a more cost effective solution

“Growth is controlled not by the total amount of resources available, but by the scarcest resource”

Liebig's Law of the Minimum



4. Know People Who Know



- No-one knows everything
- Someone else is always better than you
- Be generous
- Build friendships
- Do some things for nothing
- Help others
- Others will help you



5. Market Focus



- Business depends on the customer
- Key questions
 - What does the market need?
 - What does the market want?
 - What are the key price points?
 - What are the required attributes?
- Is your business predicting what customers will need and adjusting to it?



Market Demand & Meeting it



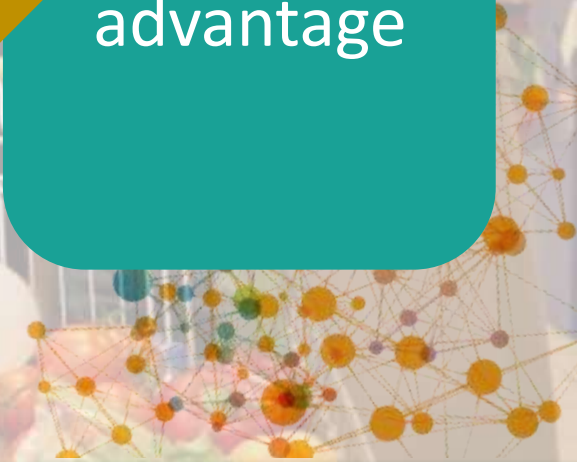
- Value
- Consistent
- Welfare
- Ethical
- Sustainable
- Eating quality
- Nutritional value
- Healthiness

Data collection and flow

Guaranteed and Proven
Highly Transparent
We must enable this

UK/Devolved systems

UK/devolved advantage





Successful business owners....



1. Implement Change



Change

verb (used with object), changed, chang-ing.

to make the form, nature, content, future course, etc., of (something) different from what it is or from what it would be if left alone:

to change one's name;

to change one's opinion;

to change the course of history.

to transform or convert (usually followed by *into*):

The witch changed the prince into a toad.

IT IS NOT THE STRONGEST
OF THE SPECIES THAT SURVIVES,
NOR THE MOST INTELLIGENT.
IT IS THE ONE THAT IS
MOST ADAPTABLE TO CHANGE.

– CHARLES DARWIN

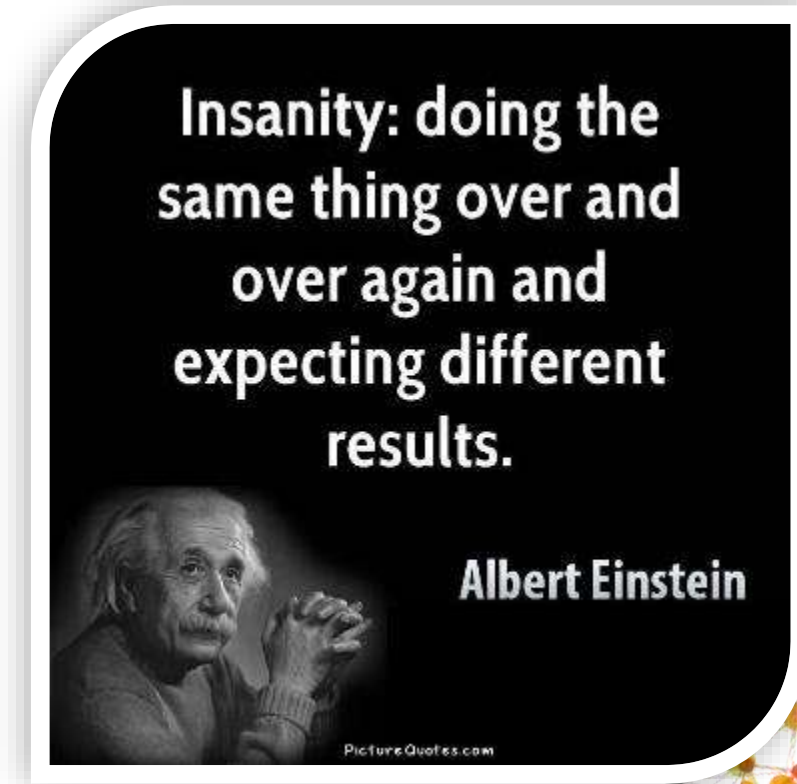
“Adjusting the Future Course”



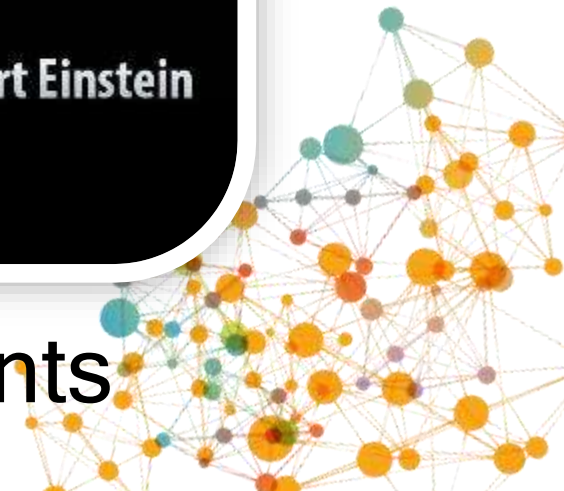
Why Don't We Change?



1. Some lack knowledge
2. Some lack confidence
3. Some lack vision
4. Some lack feedback
5. Some lack accountability
6. Some are lazy



Effective change will address the first 5 points



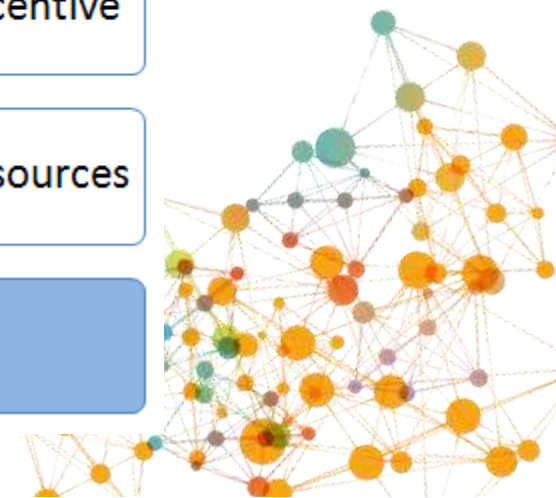
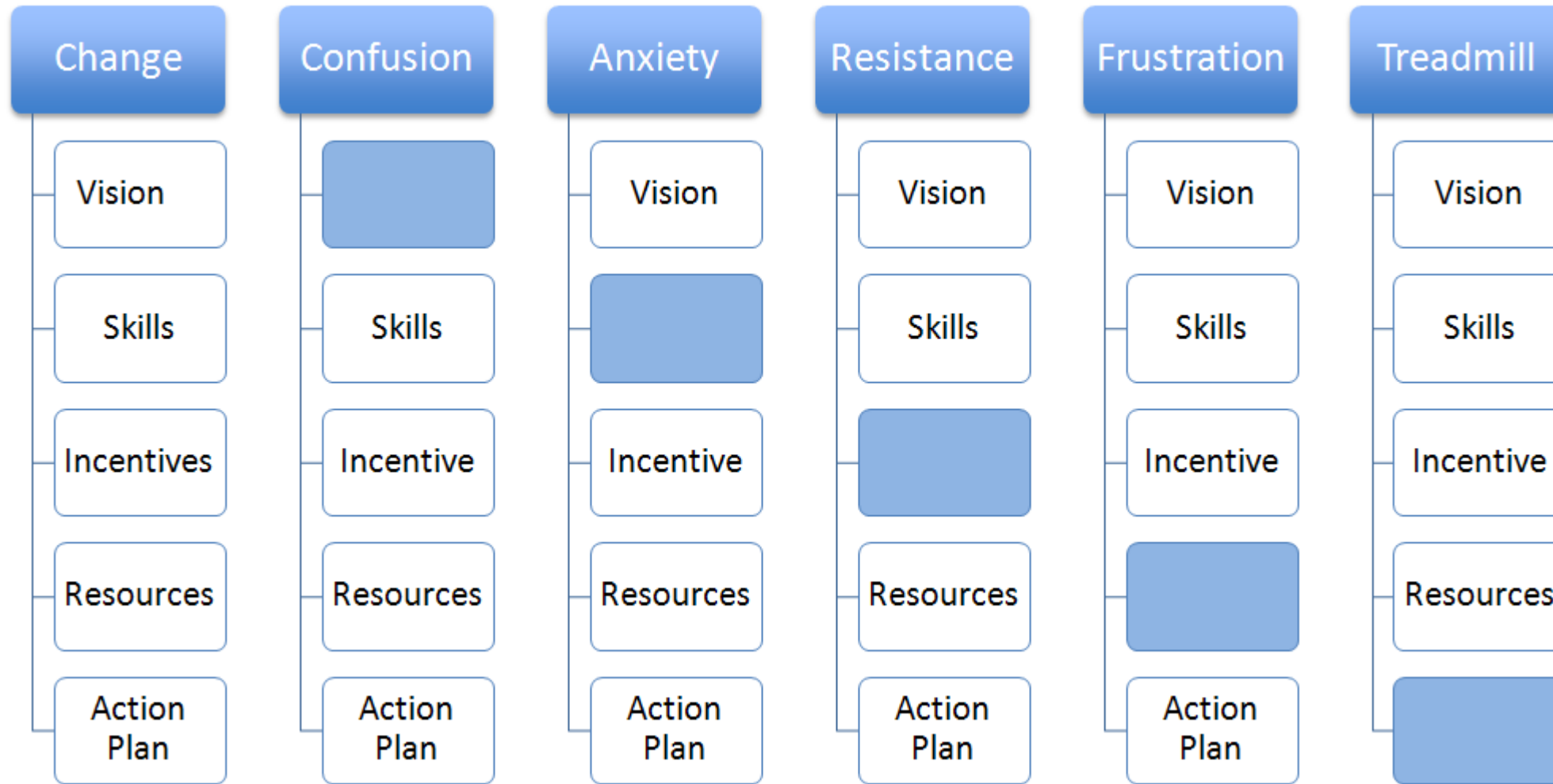
Change is a Process



- **Pre-contemplation:** Don't realise need to change
- **Contemplation:** Aware of problems, realises need for change
- **Preparation:** Accepts responsibility to change behaviour/practice and plans for change
- **Action:** Conscious choosing of new behaviour or techniques
- **Maintenance:** Keeping the good practice going
- **Termination:** The change is complete and established. Keep it going and move on to something else.



Change is Multi-Factorial



2. Drive Productivity



productivity

[prɒdʌk'tɪvɪti]

NOUN

- 1.the state or quality of being productive.
- 2."the long-term productivity of land"
- 3.the effectiveness of productive effort, especially in industry, as measured in terms of the rate of output per unit of input.
- 4."workers have boosted productivity by 30 per cent"



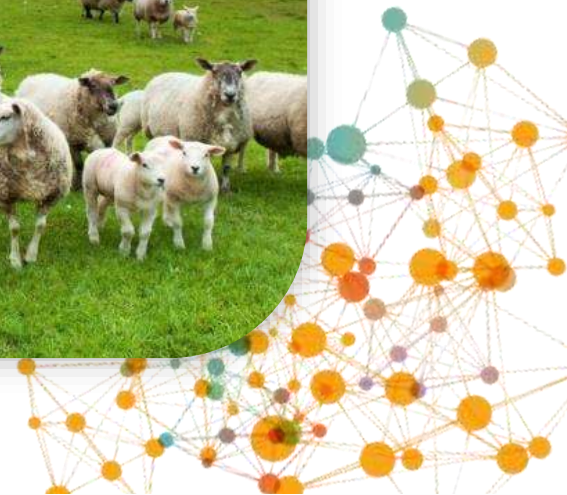
“Maximum output, minimum input”



Common factors in productivity



- Data gathering
- Data analysis
- Management according to data
- Good attention to detail
- Farm development plan
- Involvement of outside expertise
- Positive farmer attitude
- Lifelong learning



3. Build Business Resilience



resilience

/rɪˈzɪliəns/

noun

noun: **resilience**; noun: **resiliency**; plural noun: **resiliencies**

1.1.

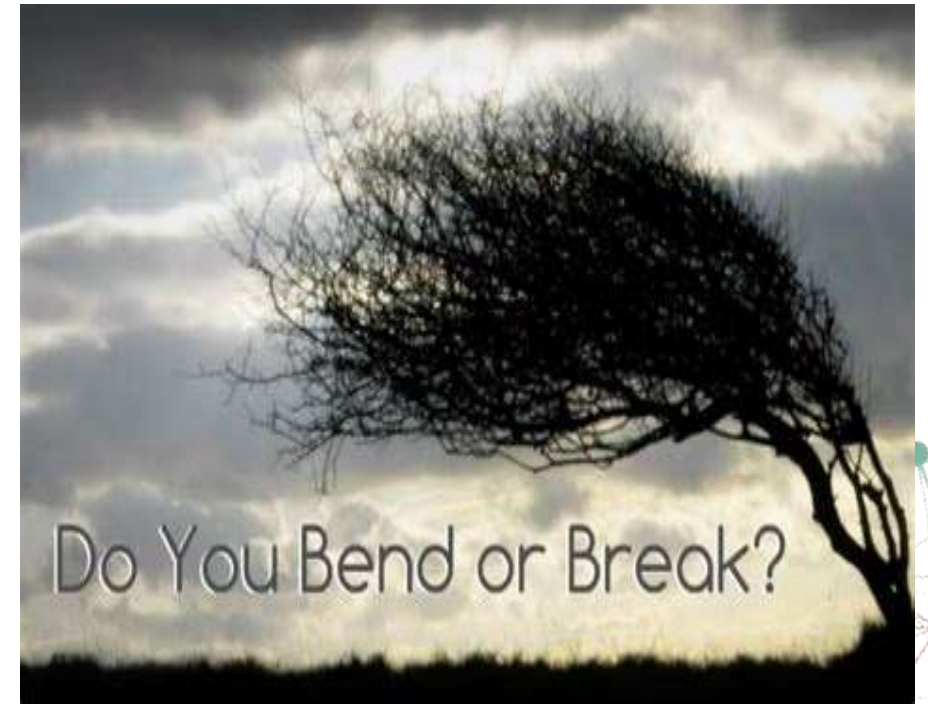
2.the capacity to recover quickly from difficulties; toughness.

3."the often remarkable resilience of so many British institutions"

4.2.

5.the ability of a substance or object to spring back into shape; elasticity.

6."nylon is excellent in wearability, abrasion resistance and resilience"



“Able to withstand challenge”





A bad attitude is
like a flat tire, you'll
never go anywhere
until you change
it.

Anonymous

14 Oct 2013 11:01 pm



Conclusions



An Exciting Future



- We are entering exciting times
- Unparalleled opportunities
- New challenges, big challenges
- Competitor challenges are bigger than yours!
- Robotization and Artificial Intelligence will effect big change in the UK
- The future is bright



“Those who cannot adjust to change will be swept aside by it. Those who recognize change and act accordingly will benefit”

Jim Rodgers, Financier





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