

The Business of Biotech Thinking Globally

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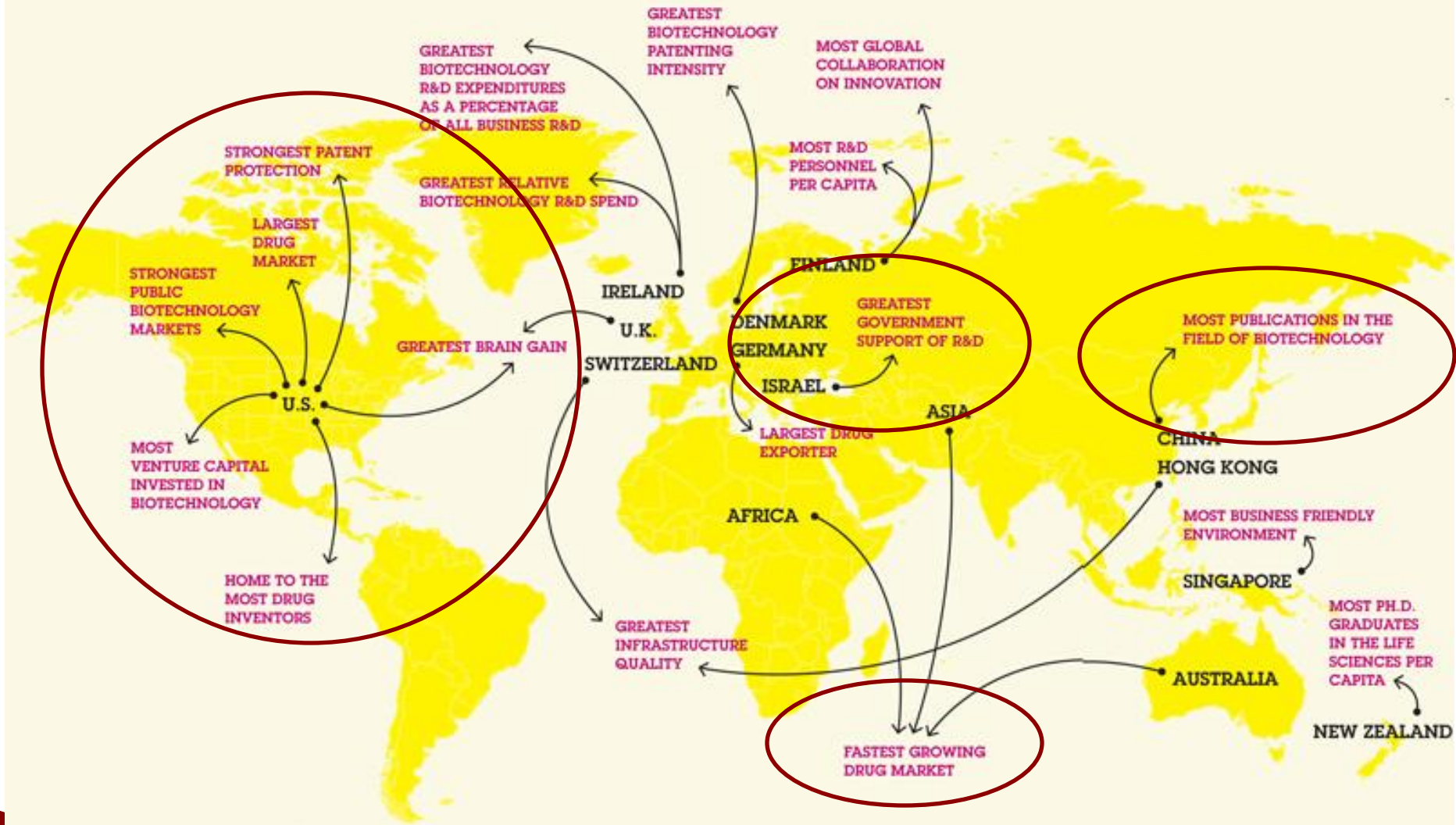


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Biotechnology - A Global View



Scientific American World View Special Report

Overview

- ▶ China
- ▶ Brazil
- ▶ India
- ▶ Africa

- ▶ Growing middle class
- ▶ Healthcare becoming a priority
- ▶ “Leap Frog Effect”
- ▶ Lessons learned from developed nations
- ▶ Opportunities for future innovation
- ▶ Large Markets



CHINA – IMITATION TO INNOVATION

China



Bigger...
Better...
Cheaper...
Faster...

CHINA

Case Study: BGI

Some Interesting Facts.....

- VC investment in biotech 2010 – \$1 Billion
 - 319% more than 2009
- 250 Genomics companies in China
 - 70% founded in last 3–5 years
 - 80% founded by Chinese returnees
- 22,660 Medical Device Companies
 - \$15B of which \$13.8B is exported!
- Traditional Chinese Medicine (TCM)
 - 95% of hospitals
 - \$28 Billion 2010



The screenshot shows the CHINADAILY website interface. At the top, there is a banner for the 'TOUCH CHINA' app, powered by China Daily. Below the banner, the date is Sunday, Jul 10, 2011, and the Chinese characters '中國日報' are displayed. The navigation menu includes Home, China, Business, Metro Beijing, Regional, World, Opinion, Sports, Life, and Entertainment. A secondary menu lists Government, Think Tank, E-paper, Mobile News, Language Tips, Newsphoto, Culture, and Ca. The main content area is titled 'Society' and features a news article: 'China genomics institute outpaces the world' (Xinhua) updated on 2011-06-14 17:19. The article text states: 'SHENZHEN - Many people were surprised when BGI (formerly Beijing Genomics Institute), a Chinese genomics institute, sequenced a strain of E. coli bacterium responsible for the outbreak in Germany that killed at least 18 people earlier this month.' To the right of the article, there are links for Comments(2), Print, Mail, and Large Medium Small. A small 'Global TAX F' logo is visible in the bottom right corner of the screenshot.

- 5000 people employed worldwide
3000 Scientists under 25yrs old
- Sequenced the E.Coli genome in 3 days
- 2010 – 500Tb of Genomics Data
10X more than the NCBI in 20 yrs

CHINA: Challenges and Opportunities

The Challenges...

- IP Protection
- Lack of education in **Applied** Biotechnology
- Reaching the domestic market
- Establishing International credibility
- Attracting Chinese nationals back to China
- Regulatory barriers

The Opportunities

- Lower cost of entry 30–50% less than US
- Workforce powerhouse
- From imitation to innovation
- Large population = large patient pool
 - clinical trials
 - rare disease research
 - large healthcare market
- International collaborations / partnerships

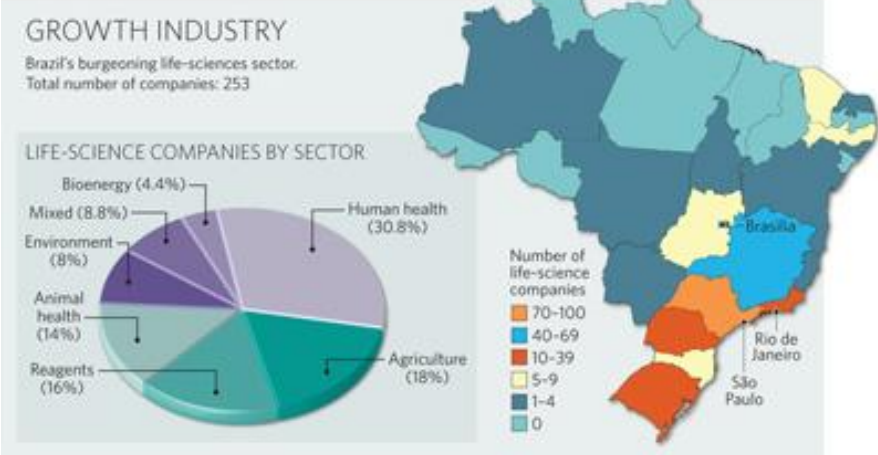
Key Priorities...

- Genomics
- Regenerative Medicine
- Agbio
- Drug discovery and development
- Biologics



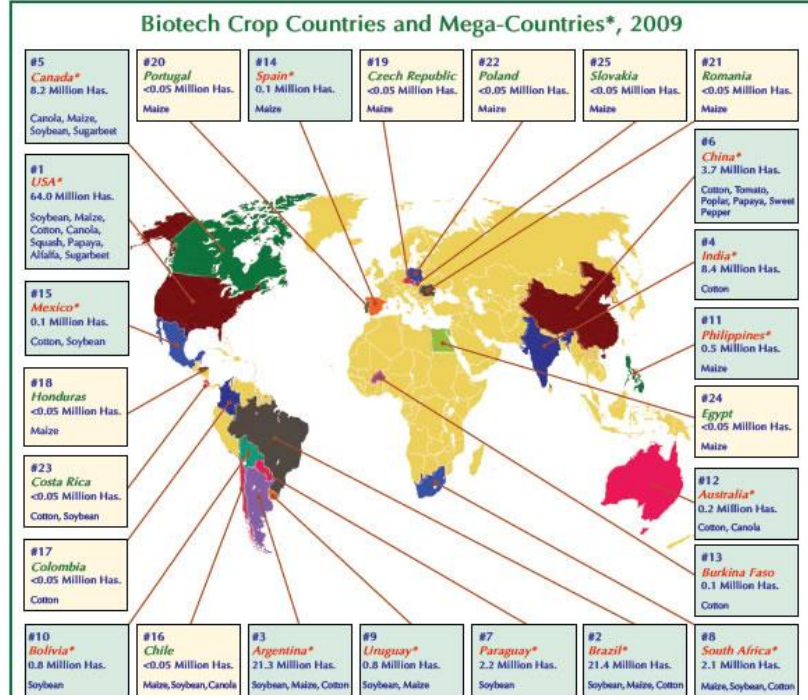
BRAZIL – A LEADER IN AG-BIO

BRAZIL



Some Interesting Facts.....

- Will be the biggest food producer in the next decade
 - Coffee, Oranges and Sugar Cane
 - Largest exporter of Beef and Poultry
- Produced 24 Billion litres of ethanol from half its sugar cane crop
 - 12.5million vehicles
 - 1.2 million jobs
 - 43% of all Brazil's energy renewable sources, 3X higher than world average



- Top 5 Countries growing biotech crops**
- USA
 - BRAZIL
 - ARGENTINA
 - INDIA
 - CANADA

Brazil: Critical Success Factors

Geographic Advantages

- 400M hectares of arable land
- Largest reserve of renewable fresh water
- Favorable climate
- Cheap Labor

Community Drivers

- Significant investment in innovation from EMBRAPA
- Investment in Graduate education
- Openly accepting of transgenic technologies
- Farmers hungry for latest innovation

Ability to Attract Foreign Investments



BONSUCRO
RAÍZEN, A 1ª EMPRESA DO MUNDO
A RECEBER O CERTIFICADO BONSUCRO.
WWW.BONSUCRO.COM

Shell, Brazil's Cosan form \$12 billion ethanol unit

(AFP) – Feb 14, 2011

SAO PAULO, Brazil — Anglo-Dutch energy giant Shell and Brazilian sugar-production group Cosan said Monday they were forming one of the biggest joint ethanol fuel ventures in the world, with an estimated market value of \$12 billion.

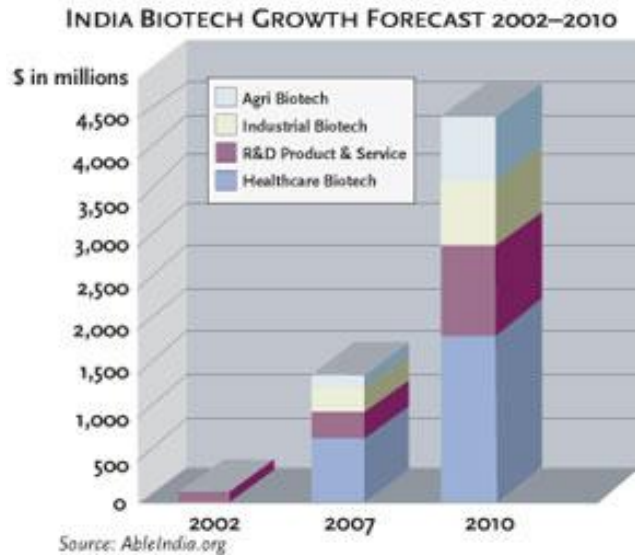
The new entity, to be called Raízen, will employ around 40,000 people and produce over 2.2 billion liters (580 million gallons) of ethanol per year to Brazilian and international markets, the two companies said in a statement.

raízen



INDIA – THE VACCINE CAPITAL OF THE WORLD

INDIA: The Market Advantage



- 40% market growth between 2009–2010
- 200 Biotechs
 - 75% founded in the last 5 years
- \$5 Billion Market by 2011, \$16 Billion by 2015

The Indian Advantage

- Drug Development 70–80% cheaper than the US
- Large skilled, English speaking workforce
- Large patient pool for complex disease – cancer, CVD, Diabetes
- Genetically diverse population
- Abiding by (WTO) IP protections since January 2005
- Over 60 US FDA approved manufacturing facilities

India: Key Accomplishments

Vaccine Development

- Supplies 60% of the worlds vaccines procured by UNICEF
- Low cost, high quality, local trials

Biotech Crops

- 4th largest in terms of Acreage
- 2nd largest producer of Cotton in the world due to Biotech crops

Bioinformatics

- Apply its success in IT industry to Biotechnology
- Poised to play major role



**AFRICA – A GOLDEN OPPORTUNITY TO
CHANGE THE LIVES OF A 1 BILLION PEOPLE?**

AFRICA: Big Challenges

iReport

10 million at risk from East Africa drought

By Mark Tutton, for CNN
July 9, 2011 - Updated 10:58 GMT (18:58 HKT)



STORY HIGHLIGHTS

- East Africa drought puts up to 10 million people at risk
- Dadaab refugee camp in Kenya is housing 380,000 people

East Africa is in the midst of its worst drought in more than 60 years, with as many as 10 million people at risk.

The drought has led to crop failures and food shortages in parts of Ethiopia, Kenya, Djibouti and Somalia, and now a refugee crisis looms

78.0% in 2011

Would this be the headline if the crops were drought resistant?

Healthcare

Prevalence of HIV, total (% of population ages 15-49)

Arab World	0% 2007
East Asia & Pacific	0% 2009
Euro area	0% 2009
European Union	0% 2009
Europe & Central Asia	1% 2009
Latin America & Caribbean	0% 2009
Least developed countries: UN classification	2% 2009
Middle East & North Africa	0% 2009
OECD members	0% 2009
South Asia	0% 2009
Sub-Saharan Africa	5% 2009
World	1% 2009

Poverty

Poverty headcount ratio at \$1.25 a day (PPP) (% of population)

East Asia & Pacific	16.8% 2005
Europe & Central Asia	3.7% 2005
Latin America & Caribbean	8.2% 2005
Middle East & North Africa	3.6% 2005
South Asia	40.3% 2005
Sub-Saharan Africa	50.9% 2005

AFRICA: Where there is challenge...

....There is opportunity

Biotech can help

- ▶ Disease
 - Cheap Healthcare products?
 - Clinical trials
 - Unique diseases?
- ▶ Food
 - Drought and pest resistant crops
 - Increased nutritional value
 - Livestock
- ▶ Poverty – Create Industries
 - Biofuels
 - Healthcare
 - Textiles

Kenya set to give green light to GM crops

Bt cotton first in line for open release.



Cotton that uses genes from *Bacillus thuringiensis* to fight pests is likely to be the first crop approved under Kenya's new rules for genetically modified organisms.

Kenya is the 4th country to adopt Biotech Crops after

- Egypt
- South Africa
- Bur

The Africa Advantage

- Market demands
- Fastest growing middle class
- Natural resources
- Governments pledging investment

AFRICA – If you have any doubts...

BUILDING BRIDGES WITH AFRICA

The Forum on China-Africa Cooperation (FOCAC) made plans in 2009 to roll out a wide range of collaborative projects by 2012. The map shows some of those now under way.

FOCAC goal
Achievements

100 clean-energy projects
More than 30 launched

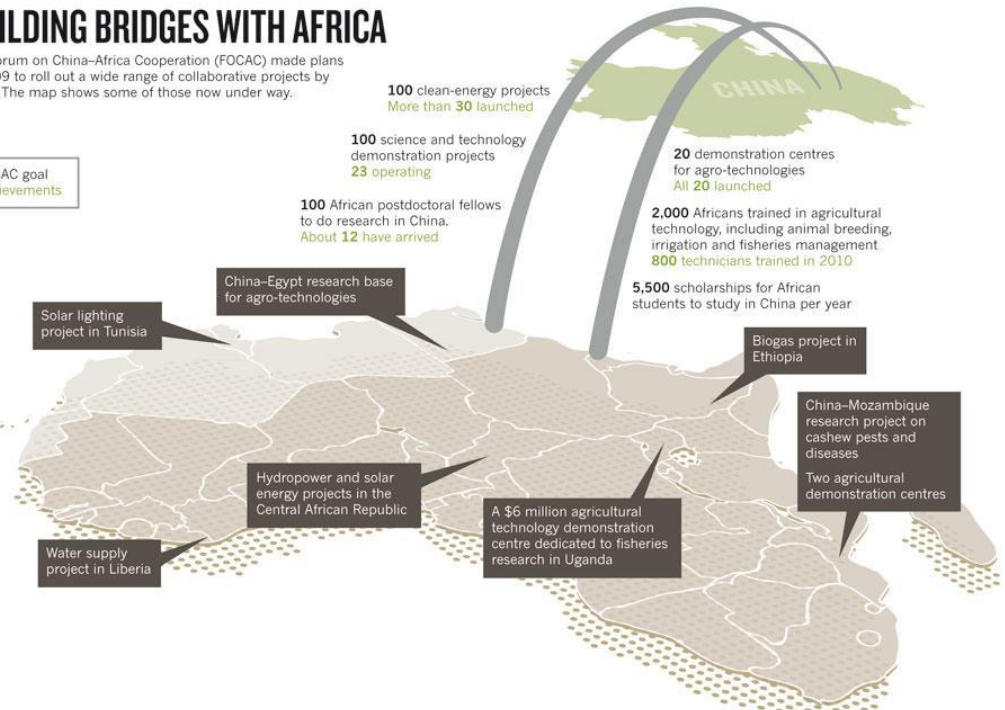
100 science and technology demonstration projects
23 operating

100 African postdoctoral fellows to do research in China.
About 12 have arrived

20 demonstration centres for agro-technologies
All 20 launched

2,000 Africans trained in agricultural technology, including animal breeding, irrigation and fisheries management.
800 technicians trained in 2010

5,500 scholarships for African students to study in China per year



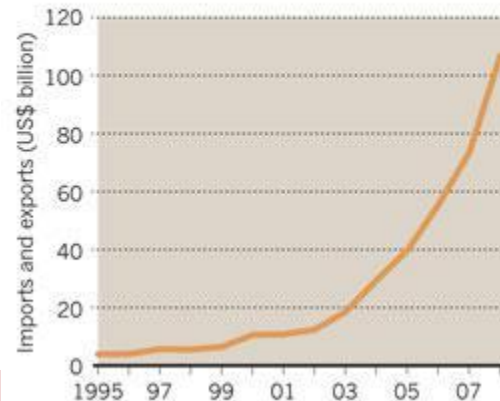
Building relations: China's financing of Africa's industries, such as construction and mining, is extending to research collaborations.

ENTER THE DRAGON

China is pumping money into African science. But what do both sides stand to gain – and lose?

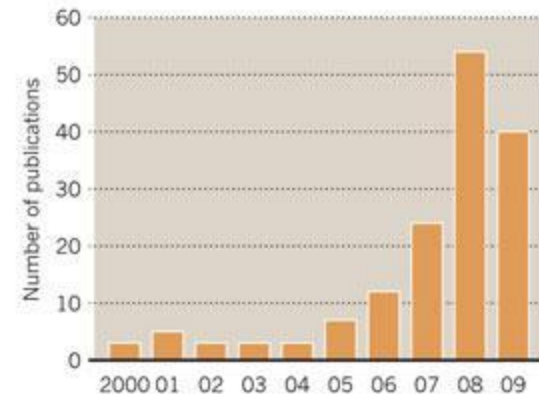
CHINA'S TRADE WITH AFRICA

China's imports and exports with Africa have accelerated, but dipped after the global financial crisis



NIGERIA-CHINA COLLABORATION

The number of scientific publications involving at least one Nigerian and one Chinese institution has risen.



Points to consider

- ▶ Does my product or service suit International markets?
- ▶ How have I protected my IP?
- ▶ What is the regulatory landscape I will have to consider?
- ▶ Are there cultural considerations that must be taken into account?
- ▶ How will I access the international market?

Key Messages

Resources, skills and opportunities can be found in unexpected places

Success or failure in a western market is not indicative of success or failure in an emerging market

Think Globally!

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