

Author(s): Joyojeet Pal, 2011

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ICTs and Development in Community Informatics

Joyojeet Pal

Community Informatics Seminar, Oct 8, 2010

Why the topic within CI?



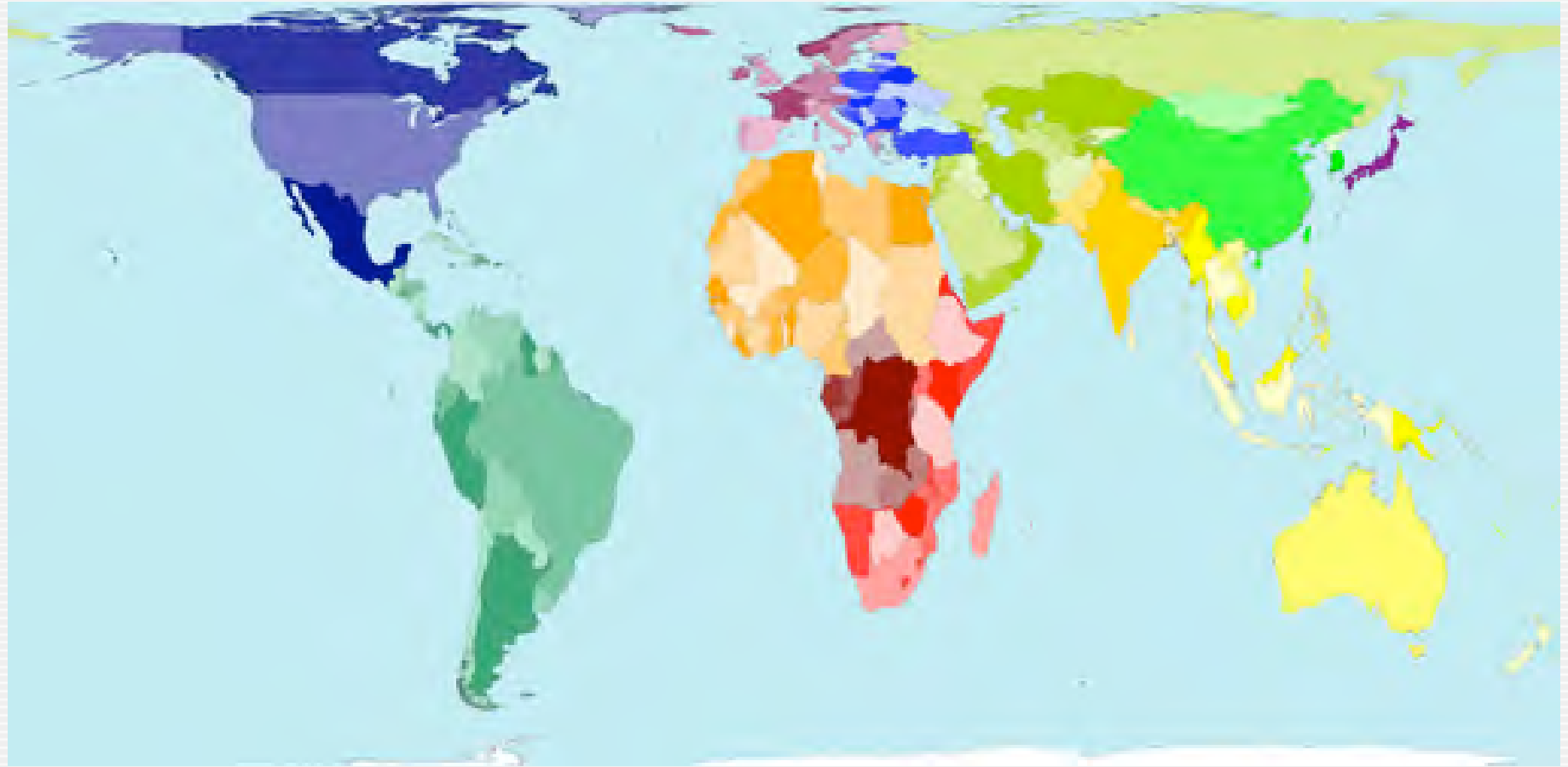
- The idea that information leads to development hotly contested:
 - What constitutes a community?
 - ✦ Jensen case
 - ✦ Vijaywada case
 - ✦ Open universities
 - What constitutes development?
 - ✦ Who chooses IT as the frame of reference?
 - ✦ How does aspiration play in?
- Natural extension of ‘digital divide’

A brief game...



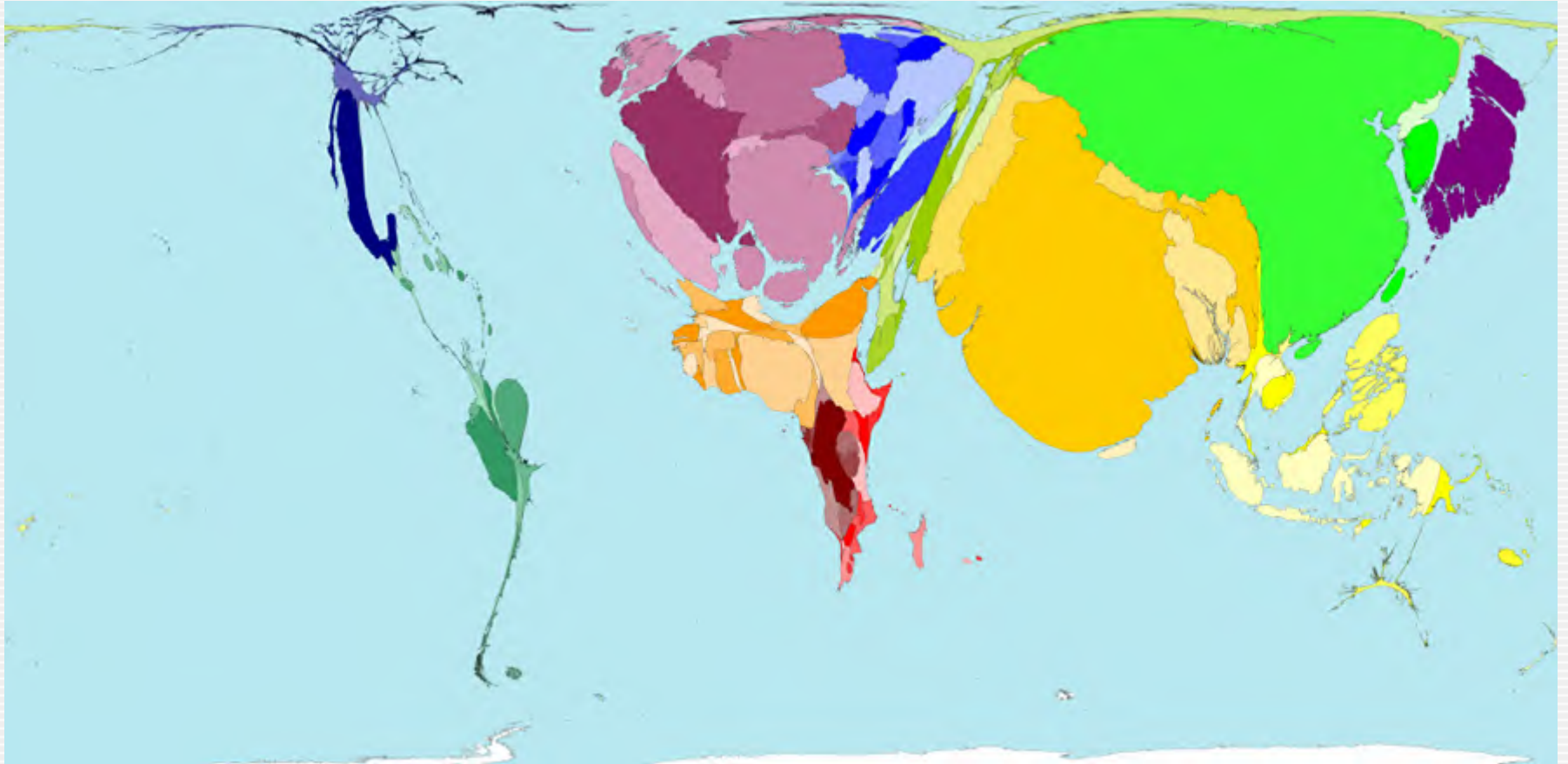
On visual information and “development”

A Map of the World



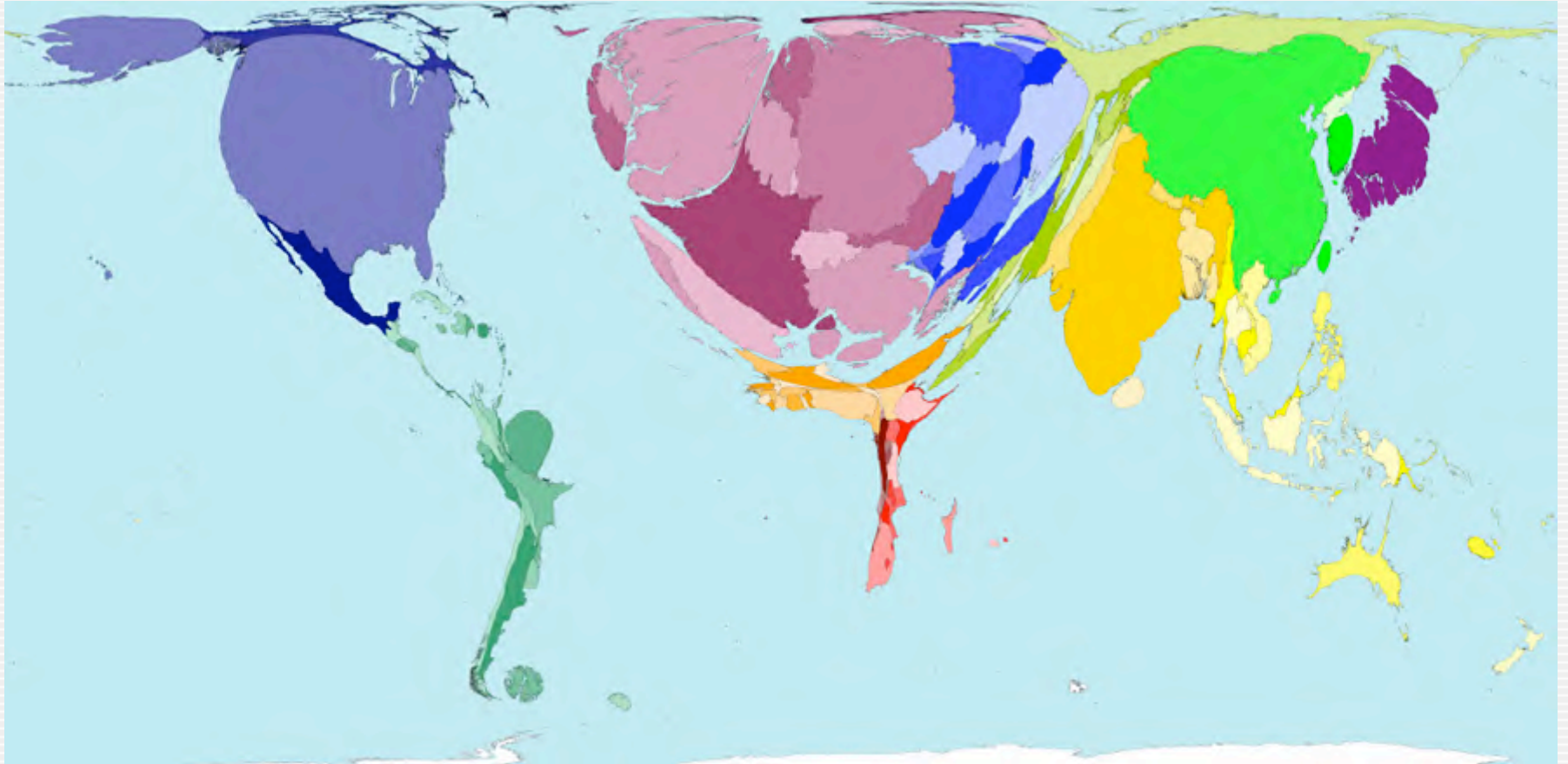
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Global Wealth Distribution: circa 1500



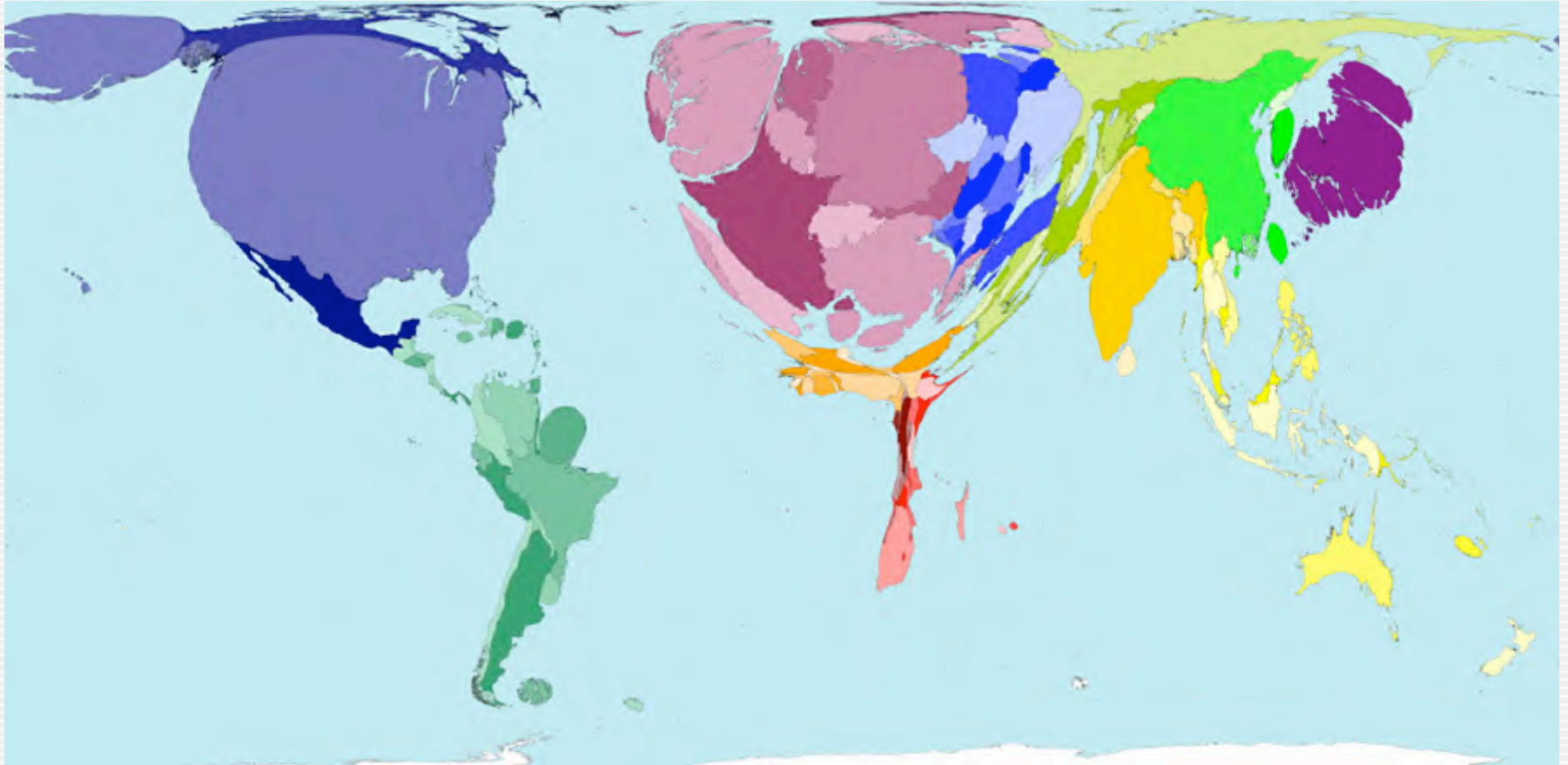
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Global Wealth Distribution: circa 1900



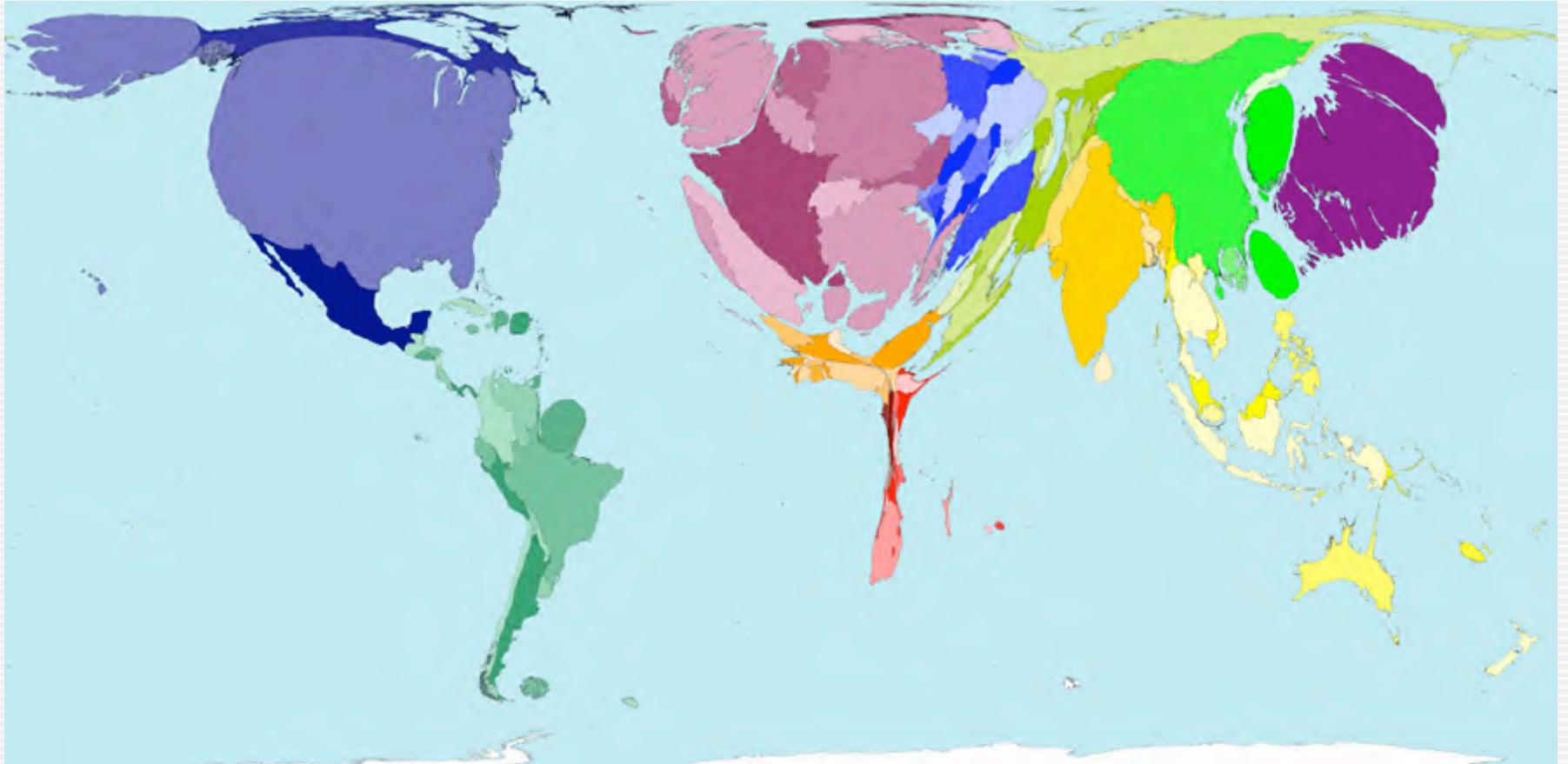
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Global Wealth Distribution: circa 1960



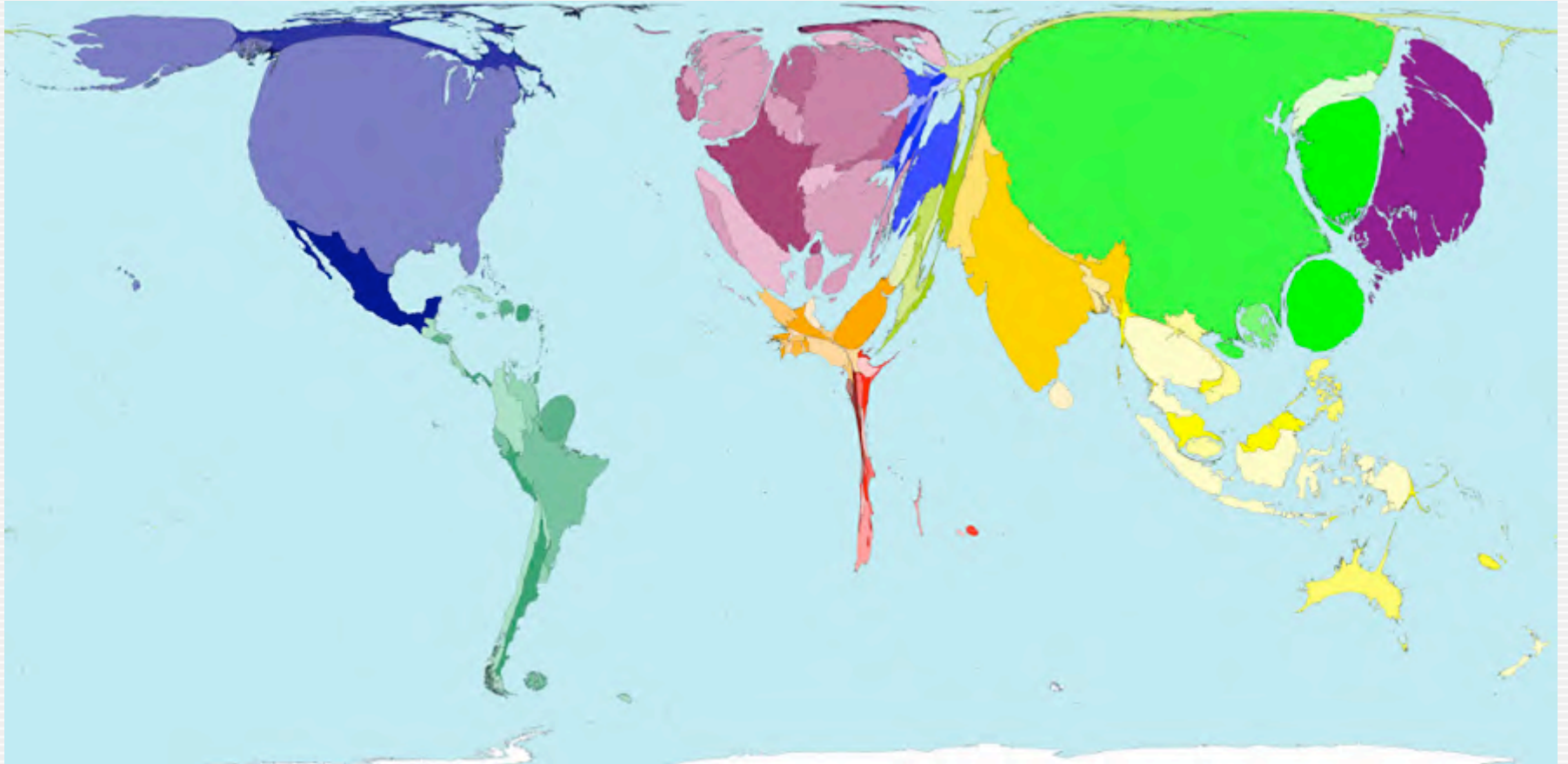
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Global Wealth Distribution: circa 1990



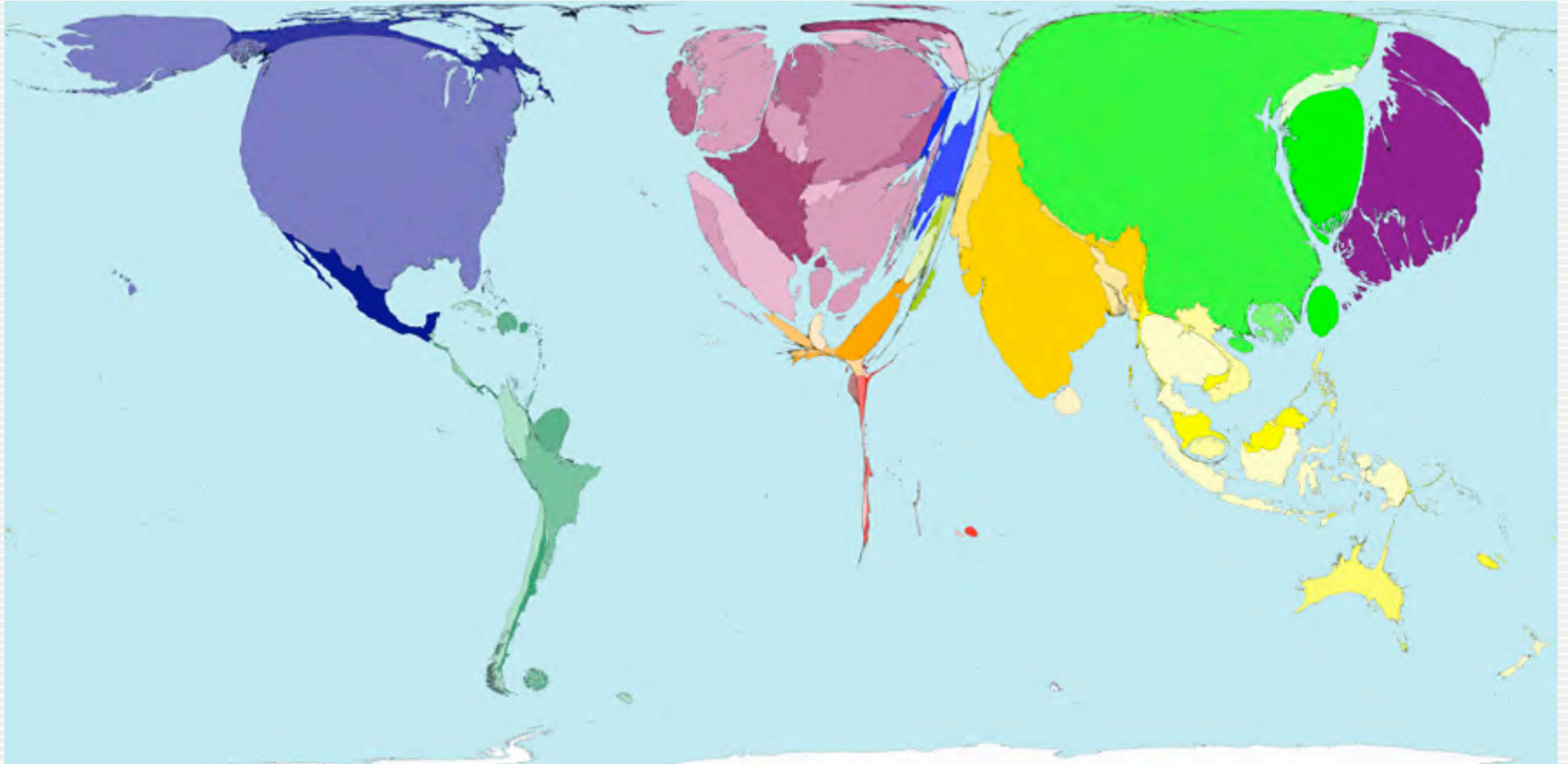
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Global Wealth Distribution: circa 2015



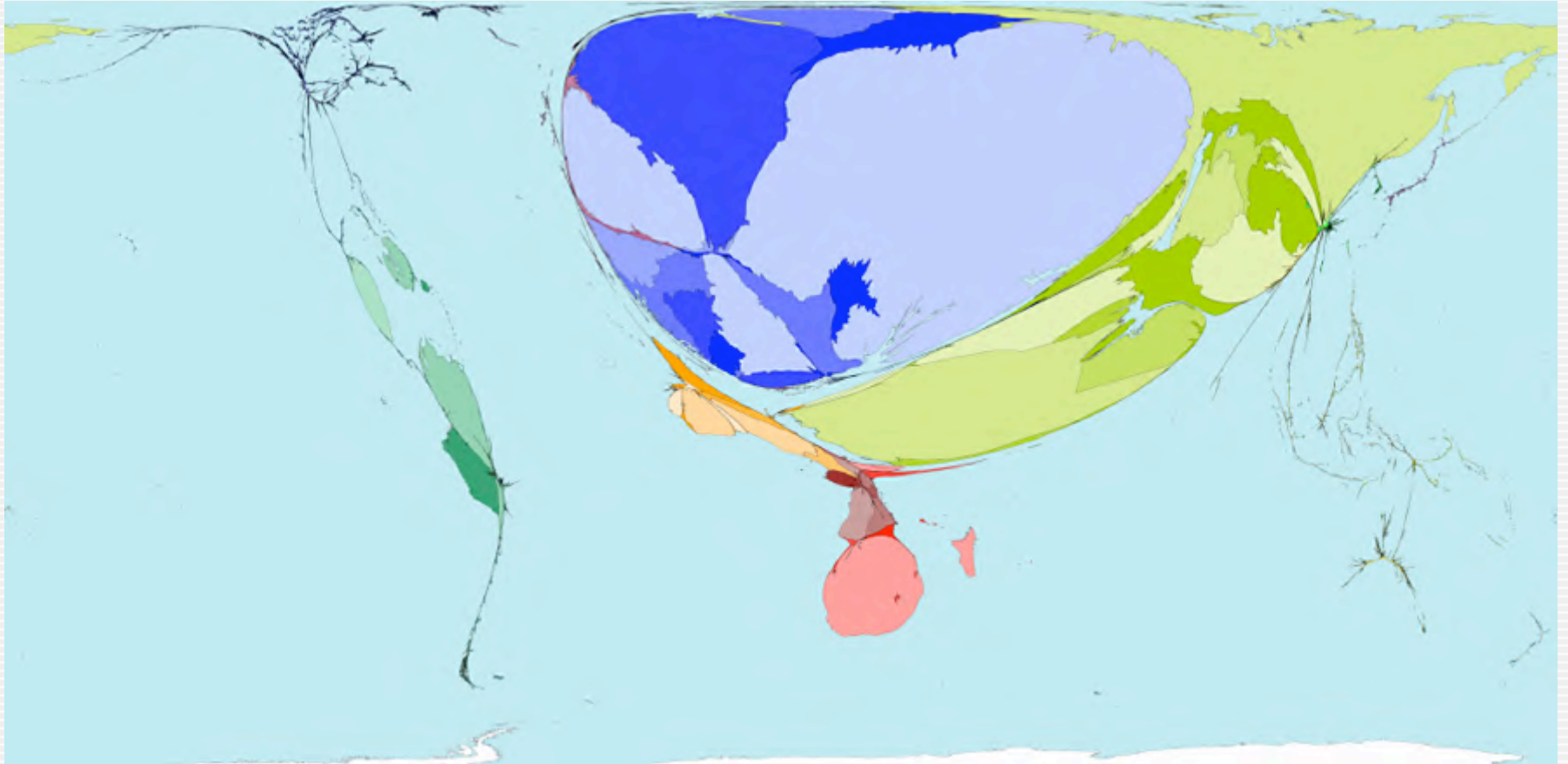
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Global Economic Growth since 1975



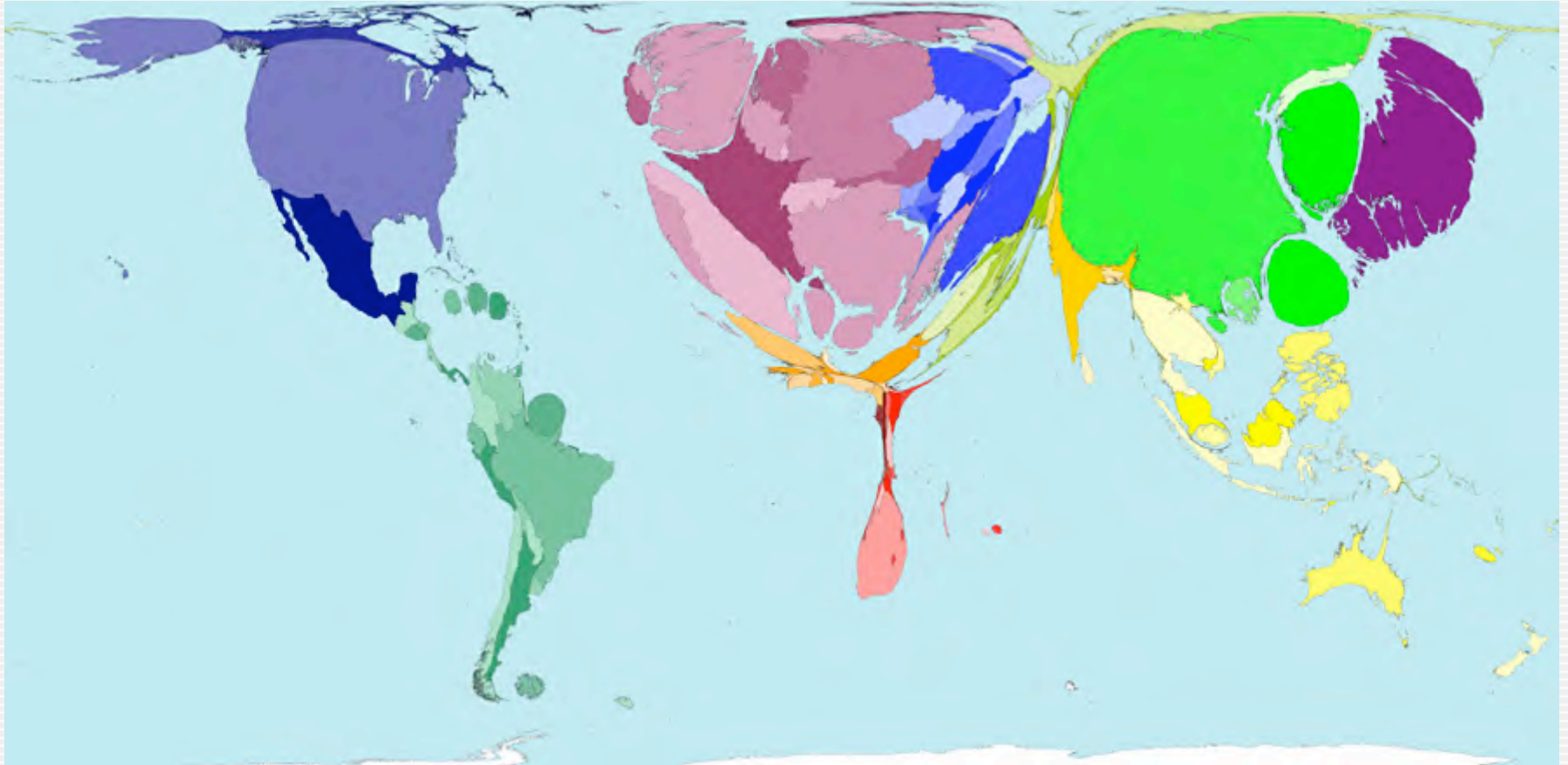
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Global Economic Decline since 1975



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Cellular Subscribers 2002



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Can we explain development?



- Congo / Korea roughly comparable in 1960s
 - Congo higher GDP than Botswana, China, India, Indonesia
- Both countries had
 - High population growth, military regimes, cold war aid
- Explanations
 - Population diversity
 - Natural wealth
 - State formation and capacity
 - Political and economic “neighborhood”
 - Civil War driven by greed, than grievance
 - ...and
 - Technology

For instance... is Aid good?



Despite failures, aid shows poverty reduction

- Augments low savings & therefore adds capital stock
- Raises worker productivity
- Serves as a conduit for technology transfer

Jeff Sachs, Joseph Stiglitz, Dems

Cited Success Domains

- Agriculture: Green Rev
- Healthcare: Vaccination

Cited Success Nations

- Botswana
- Indonesia

Major Donors

- Scandinavia: Norway, Denmark, Sweden (%)
- US, Japan, Germany, UK (Net)
- US >> Egypt, Israel, Iraq, Afghanistan
- Japan >> China, Vietnam
- China >> Cambodia, Mongolia
- France >> Francophone Africa
- Libya >> Sudan, Mali

Bloats bureaucracies, weakens democracy

- Reduces savings (by lowering interest rates)
- Limited absorptive capacity of receiving nations
- Damages local industry (raises exchange rates, farm prices)

William Easterly, Milton Friedman, GOP

Cited Failure Domains

- Infrastructure

Cited Failure Nations

- DRC
- Papua New Guinea

Major Aid-Recipients

- Very small nations (Sao Tome, Central America)
- Strategically important low-income (B'desh, Vietnam)
- Large Developing nations (China, India)

Information Technology and Development in US acad



- **NSF research in 2004 starting point for engineers in ICTD**
 - Driven by anti-terror argument
 - SV funded and staffed initially
- **Initial technological research drivers**
 - Low-cost computing
 - Long-distance networking and communications
 - HCI
- **Action research approach**
 - Social scientists often working on engineers' agenda
 - Technical research frequently with the intent of productization

Origins



- **Initial push in late 1990s/early 2000s**
 - Driven by SV boom, later arguments such as anti-terror/poverty, neo-lib
 - Initial technological research drivers
 - ✦ Low-cost computing
 - ✦ Long-distance networking and communications
 - ✦ HCI
 - Action research approach
 - ✦ Social scientists often working on engineers' agenda
 - ✦ Technical research frequently with the intent of productization
- **Academic Departments**
 - NYU, MIT, Univ. of Colorado, Michigan, CMU, Several UK, India, Middle-East universities
- **Industrial Research**
 - Microsoft Research, HP, IBM, Intel each have small ICTD teams
- **Philanthropy / International Agencies**
 - Gates Foundation / IDRC, WorldBank, UN-GAID
- **Products**
 - Digital Green, Simputer, Grameen Foundation, OLPC

ICTD Engineering domain areas



- Healthcare
 - Low-cost diagnostics
 - Telemedicine
 - Healthcare informatics
- Agriculture
 - Supply chain efficiencies
 - Crafts
 - Crop quality information
 - Geophysical sensing
- Education
 - Low cost computing
 - Computer sharing
 - Distance education
- Governance
 - Information organization
 - ✦ Manpower costs
 - ✦ Healthcare informatics
- Design
 - Text-free interfaces
 - Assistive technology
- Financial services
 - Microfinance information

Sample CI Project: Agriculture



Digital Green Project: Rikin Gandhi

• Research Problem

- Poor agriculture extension
 - ✦ Only works with rich farmers
 - ✦ Too expensive, hard to replicate

• Proposed solution: Digital Green

- Mediation / Mediator
- Highly formatted video content
- Contextual content
 - ✦ Local presenter, not “well-dressed” urban scientist

• Outcomes

- 55% adoption of new practice over 8% in old system
- Gates Foundation funding




Sample CI project: Education



- **MultiMouse: Microsoft Research / UC Berkeley / UW**
 - Started with ethnographic research on computer use
 - Found high value association with computers
 - Patterns in seating, control, learning
 - After iteration, designed multiple mouse systems
- **Move from Research to Product**
 - Early designs mouse-racing oriented
 - Subsequent work on screen splitting
 - MultiPoint product group at MS
 - Currently in use in over 10 countries
 - Several research groups working on MM projects



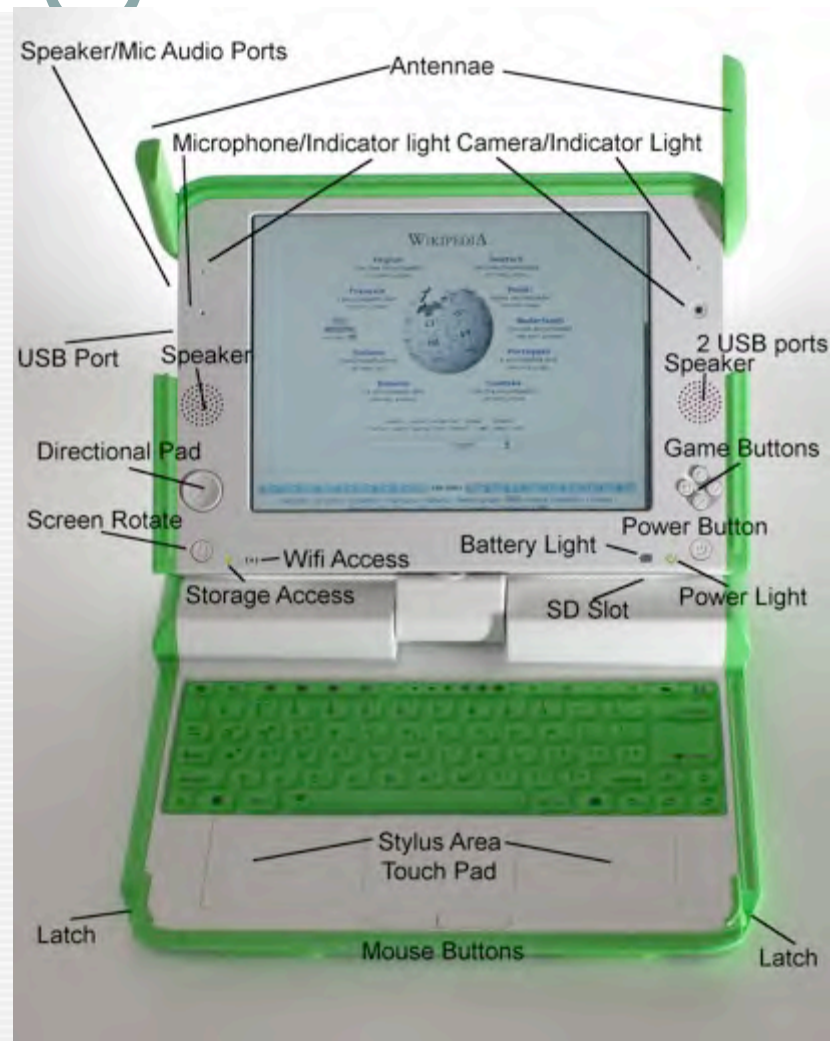
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Original Images: Pawar, U., Pal, J., & Toyama, K. (2006). Multiple mice for computers in education in developing countries. Retrieved from <http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=04085516>

Further Resources: <http://cdn2.windows7news.com/wp-content/uploads/2010/01/microsoft-multimouse-mouse-cursor.jpg> http://www.microsoft.com/presspass/images/features/2006/12-14kidswinmultipoint_sm.jpg

Sample UI Project: Education

- Originally the \$ 100 Laptop
 - Later OLPC
 - Finally XO (\$399 for 2)
- Technological Innovation
 - Screen (dual-mode display)
 - Casing (ports under wi-fi)
 - Software/interface
 - Power (cooling w/o vents)
- Market approach
 - 1 million orders plus
 - 1 bought, 1 donated
- Learning approach
 - Constructivism
 - Take laptops home, play with them
- Critiques
 - “little or no sustained and scaled effects on teaching, learning, and achievement” Bain and Weston



Looking ahead



- **UNCRPD March 2007**
 - Highest first day signatories in history
 - Currently 144 signatories, about 80 ratifications, 44 OP
- **What does it specify**
 - Defines rights: health, political participation, education, non-discrimination etc
 - Recommends steps for states: endorsements of technologies, support for community groups, peer facilitation, education etc.
- **The “cost” of the convention has not been clearly articulated**
 - The legislative measures relating to the convention are easier to fix
 - Several recommendations need both significant social and economic investment
 - Legal scholars concerned about the consequences of non-compliance
- **Huge opportunity for new Assistive Technology and Accessibility Research**

Technology agenda going ahead (vision)



- E.g: Devices & Networks
 - Low-cost screen readers
 - ✦ Improvements on NVDA or development
 - ✦ Development of web-based systems (WebAnywhere)
 - ✦ Language support for screen readers
 - ✦ Low-cost Braille displays
 - Cell-phones
 - ✦ Basic accessibility features
 - ✦ Navigation / low-cost A-GPS
 - ✦ Audio interfaces
- E.g: Technology Training
 - Community training centers
 - ✦ Braille training centers
 - ✦ Screen reader access in libraries
- Rigorous economic analysis of the cost of the convention in terms of AT

What does it cost to provide screen readers in...

Countries	Blind Population	Total Cost in US\$ Million	Cost / GDP (%)	Shared Model Cost in \$US Million
Australia	80531	0 - 96.6	0 - 0.01	0 - 0.96
Brazil	744526	0 - 893.4	0 - 0.06	0 - 8.93
Mongolia	11126	0 - 13.4	0 - 0.31	0 - 0.13
Niger	45943	0 - 55.1	0 - 1.29	0 - 0.55
United Kingdom	243741	0 - 292.5	0 - 0.01	0 - 2.92

ICTD: What worked and what did not



- Pricing
 - Fishing case
 - ✦ Are mobile phones good for fisherfolk?
 - Agriculture case
 - ✦ Are agricultural price kiosks good for farmers?
- Localization critical
 - Most listed success projects have major local element
 - Often the need is for engineering, not science



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Aspiration....

- Perception as ticket to modernity
- Move from rural to urban aspiration
- Indian IT as global competitor



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Cinema...



Christian Haugen, "Indian movie posters", Flickr,
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And guess this one...



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