Technology uncertainty and urban resilience

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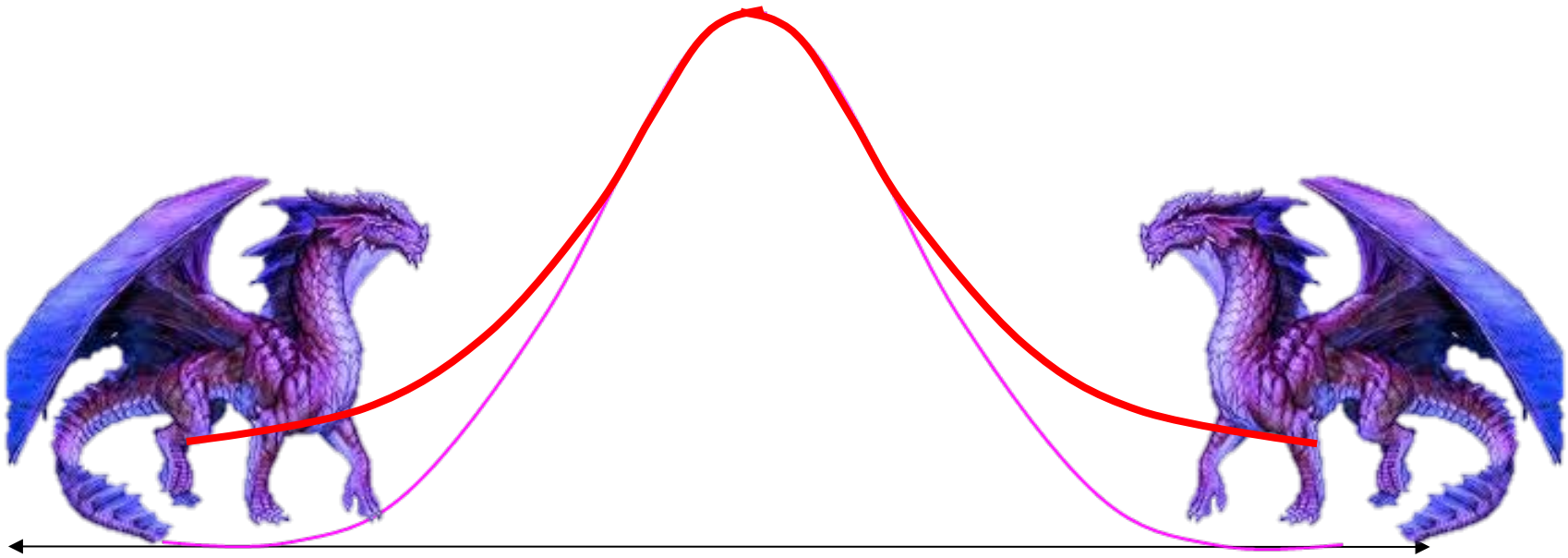
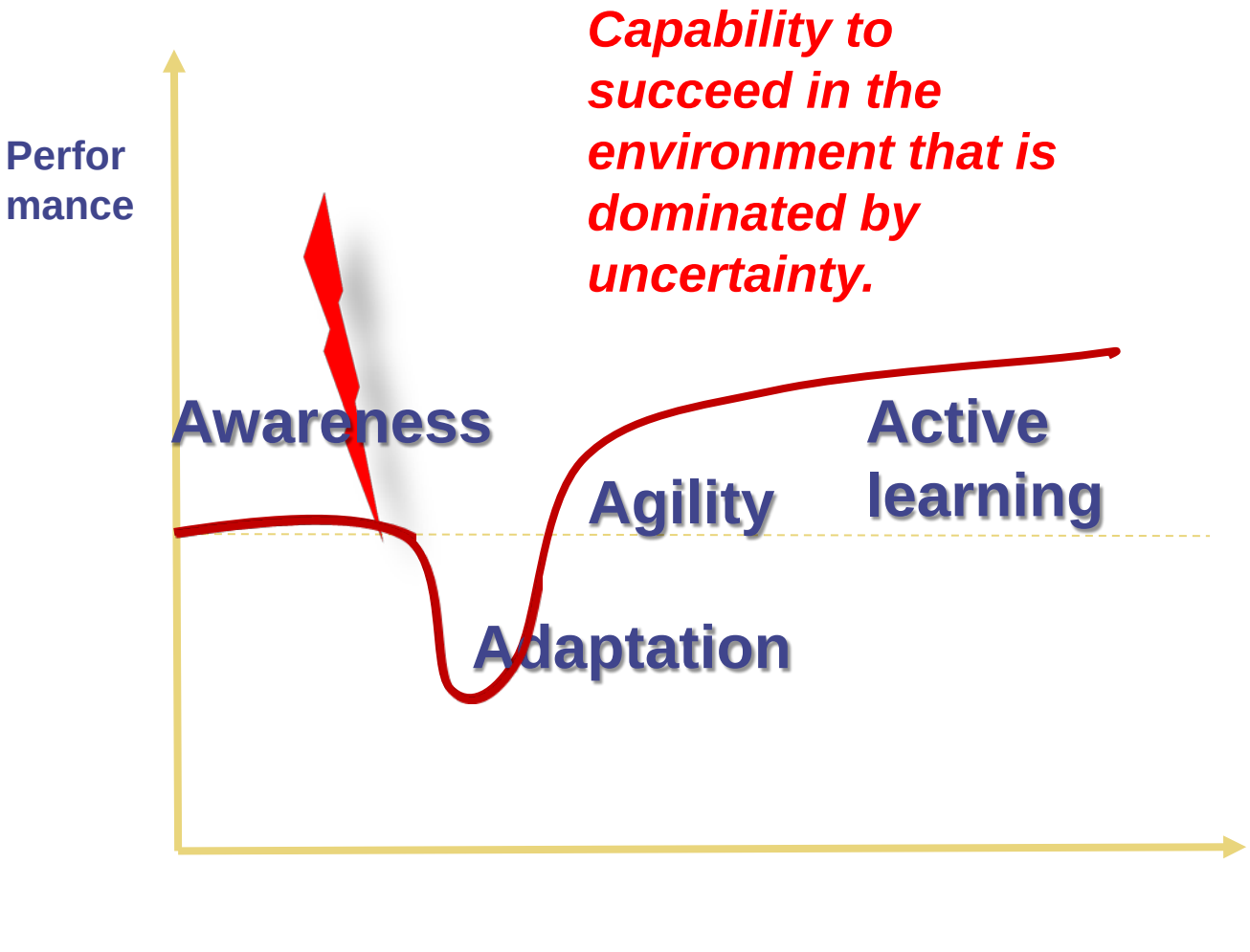
ABOUT RESILIENCE

Fat tails – dragons of uncertainty



What do we mean with resilience?



- Awareness– Organization is aware of potential shocks and their impact
- Adaptation – Organization is fast to change the operations in order to improve the fit with the markets
- Agility – Speed of seizing new opportunities
- Active Learning – Use a shock as a trigger for improvement

Principle

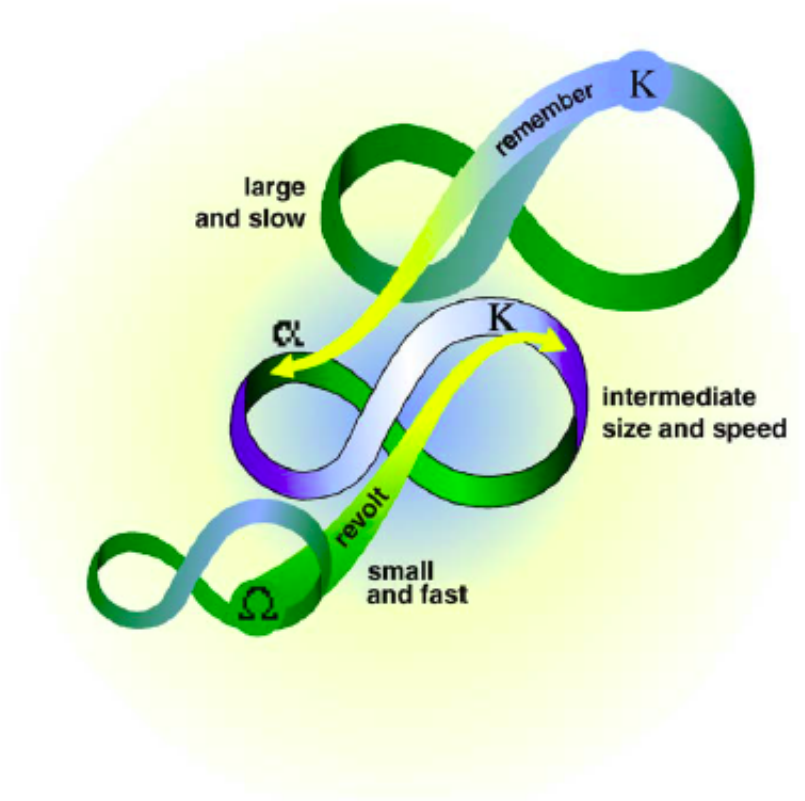


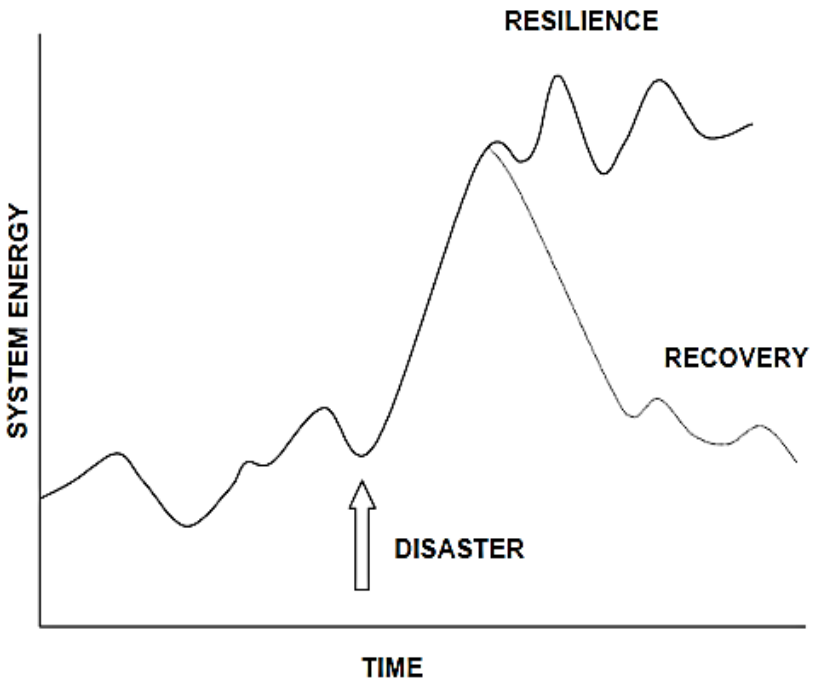
Fig. 1. Panarchy, a heuristic model of nested adaptive renewal cycles emphasizing cross scale interplay (see text for explanation) (modified from Gunderson and Holling, 2002).

Resilience is degree of:

1) **disturbance the system is able to absorb and still maintain its purpose and operations**
2) **system is capable of self-organization**
3) **system can build and increase the capacity of learning and adaptation**

Folke (2006 p. 259-260)

Resilience emerges from energy



Dalziel and McManus 2005

Theory behind our proposition for definition

- Ecosystems theory
  - Holling C.S. (1993) Resilience and stability of ecological systems How adaptation builds complexity
  - Holling C.S. (2001) Understanding the complexity of economic, ecological and social systems. Ecosystems 4, 390-405
  - Gunderson, L.H., Holling C.S. (2002) (Eds.) Panarchy. Understanding transformation in Human and natural systems, Island Press, Washington D.C.
  - Folke C. (2006) The emergence of a perspective for social-ecological systems analyses Global Environmental Change 16 pp. 253-267)
  - Resilience Alliance www.resalliance.org
- Complex Adaptive Systems theory
  - Anderson, P (1999) Complexity Theory and Organization Science, *Organization Science, VOL 10, No.3, May-June 1999 pp 216-232*
  - Berger P.R. & Luckmann T (1966) *The social construction of reality*, *Doubleday, New York*
  - Holland J. (1995) Hidden Order: How adaptation builds complexity, Addison-Wesley, Reading MA
  - Luhman N. (1995) *Social Systems*, Stanford, Stanford University Press
- Innovation theory
  - Reinmoeller and van Baardwijk (2005) http://sloanreview.mit.edu/article/the-link-between-diversity-and-resilience/
  - Cho, Mathiassen, Robey (2007) Dialectics of Resilience Journal of Information Technology
  - Liisa Välikangas, A. Georges L. Romme, (2012) "Building resilience capabilities at “Big Brown Box, Inc.”", Strategy & Leadership, Vol. 40 Iss: 4, pp.43 – 45

Three scenarios and urban resilience

Methodological experiment

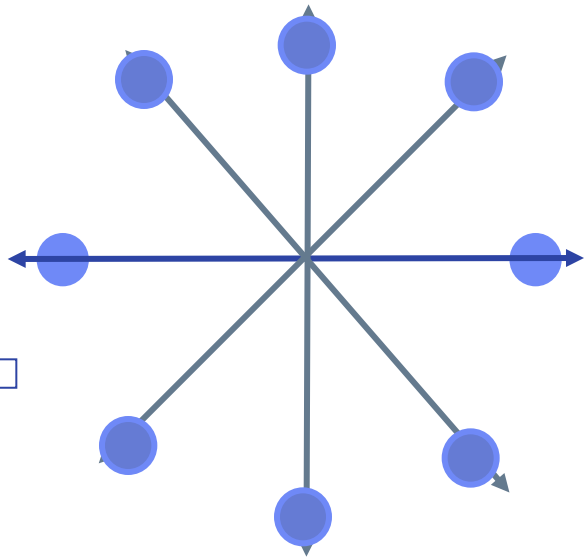
Portfolio Process

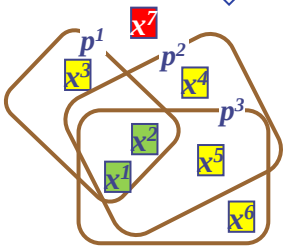
1. Shock environments
   Descriptions of shocks environments

2. Success strategies for every shock environment
   List of activities, capabilities or development items that produce success in the shock environment

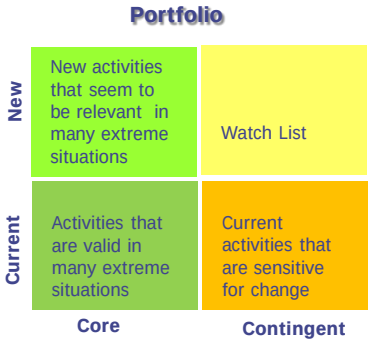
3. Assessment of activities' benefits
   Web enquiry

4. Potential portfolio that will produce success what-so-ever happens





RPM method for quantitative analysis

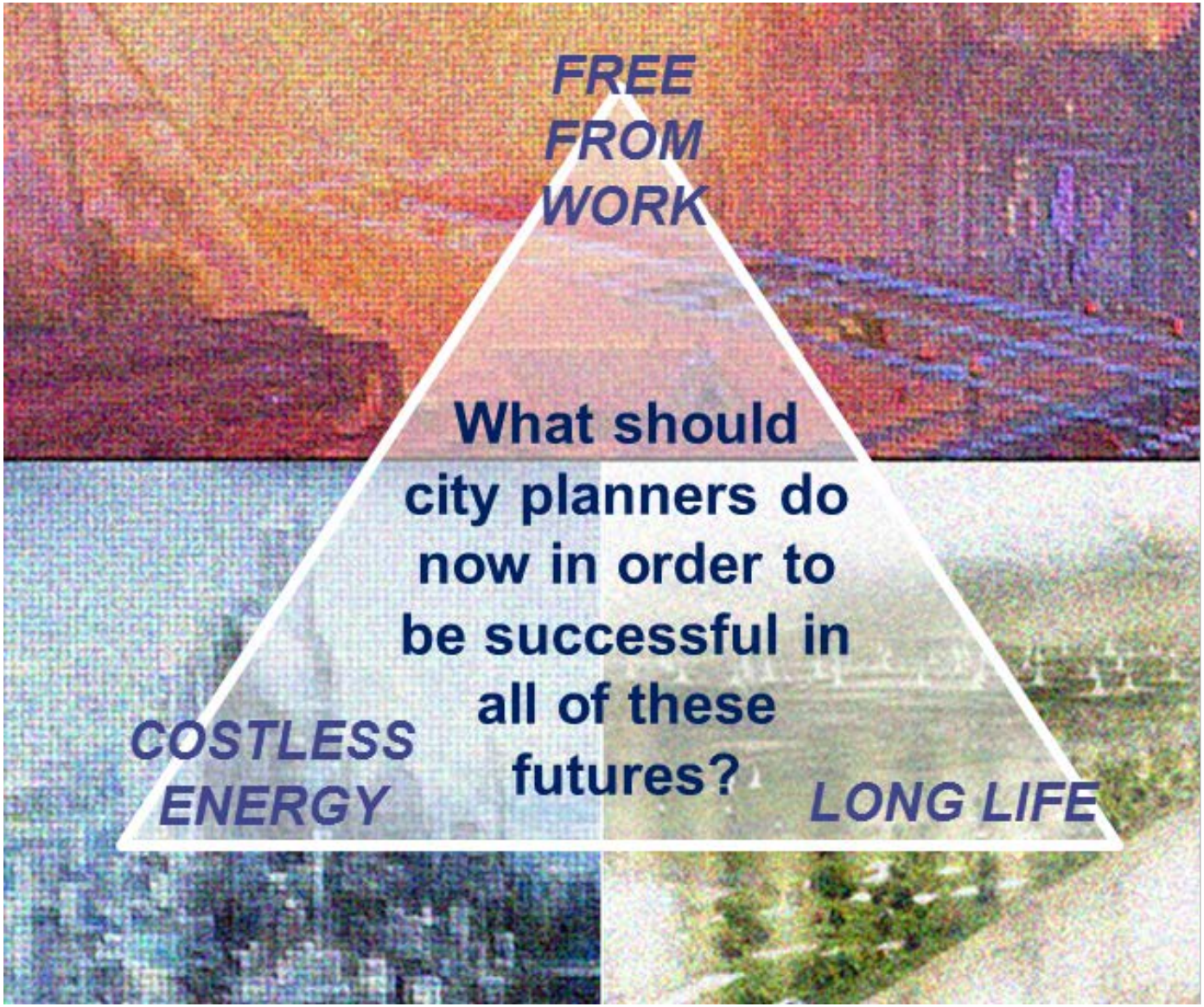


Pragmatic List of Actions

Portfolio

New	New activities that seem to be relevant in many extreme situations	Watch List
Current	Activities that are valid in many extreme situations	Current activities that are sensitive for change
	Core	**Contingent**

List of potential actions derived from uncertainty > leading criteria: resilience and fit with current development activities


FREE
FROM
WORK
What should
city planners do
now in order to
be successful in
all of these
futures?
COSTLESS
ENERGY
LONG LIFE

TASK 1

- You are the Mayor of Tokyo
- Generate examples of policies within 2014 would make your extreme situation given to you

  Use 15 minutes
- Select three examples you will

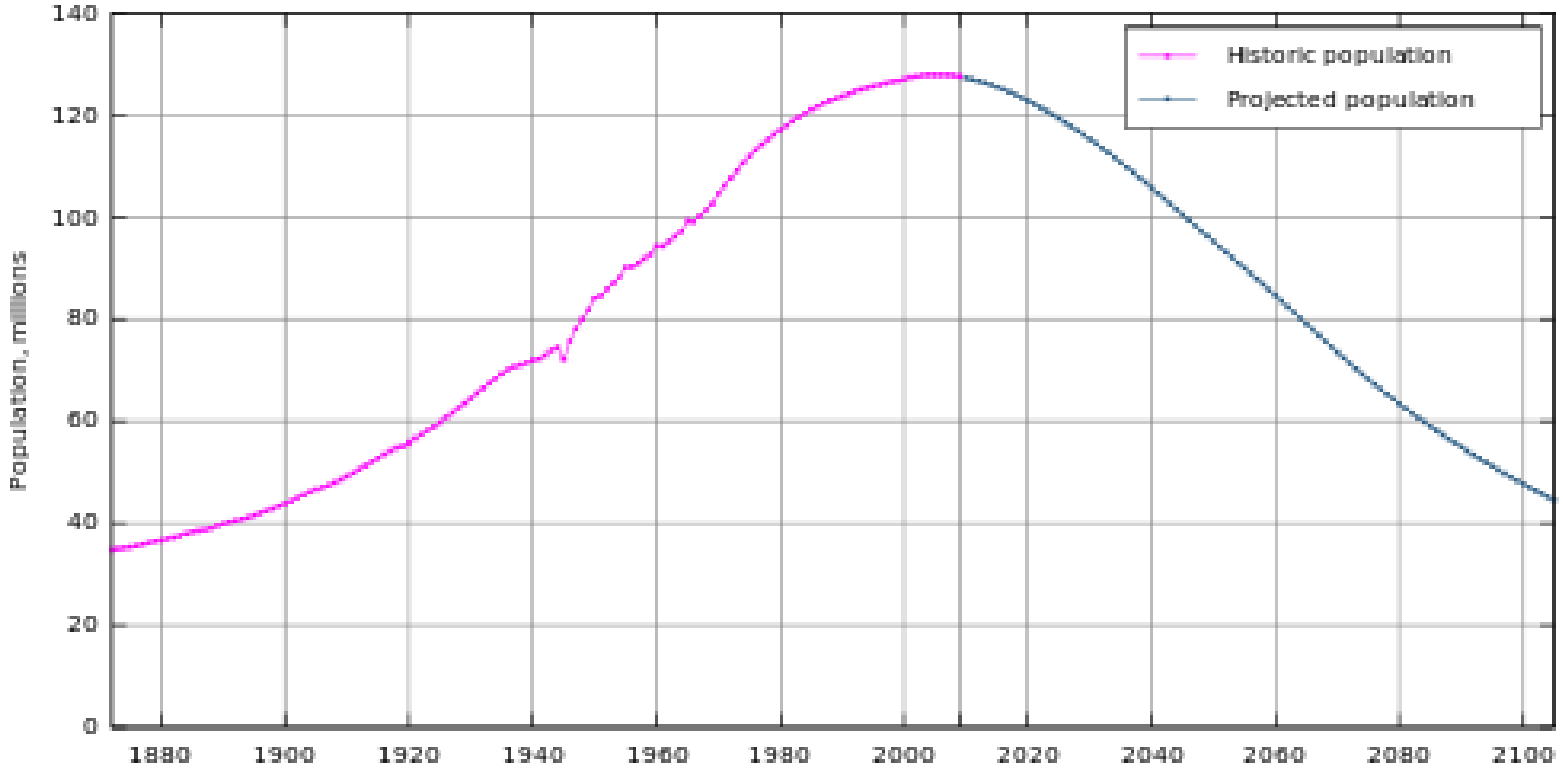
Price of energy drops by 90%

New energy technologies are implemented.
People are able to produce their own energy with only 10% of the 2014 production cost. Energy replaces other raw materials; artificial food, thin insulation of buildings, mobility increases dramatically.

No need to work

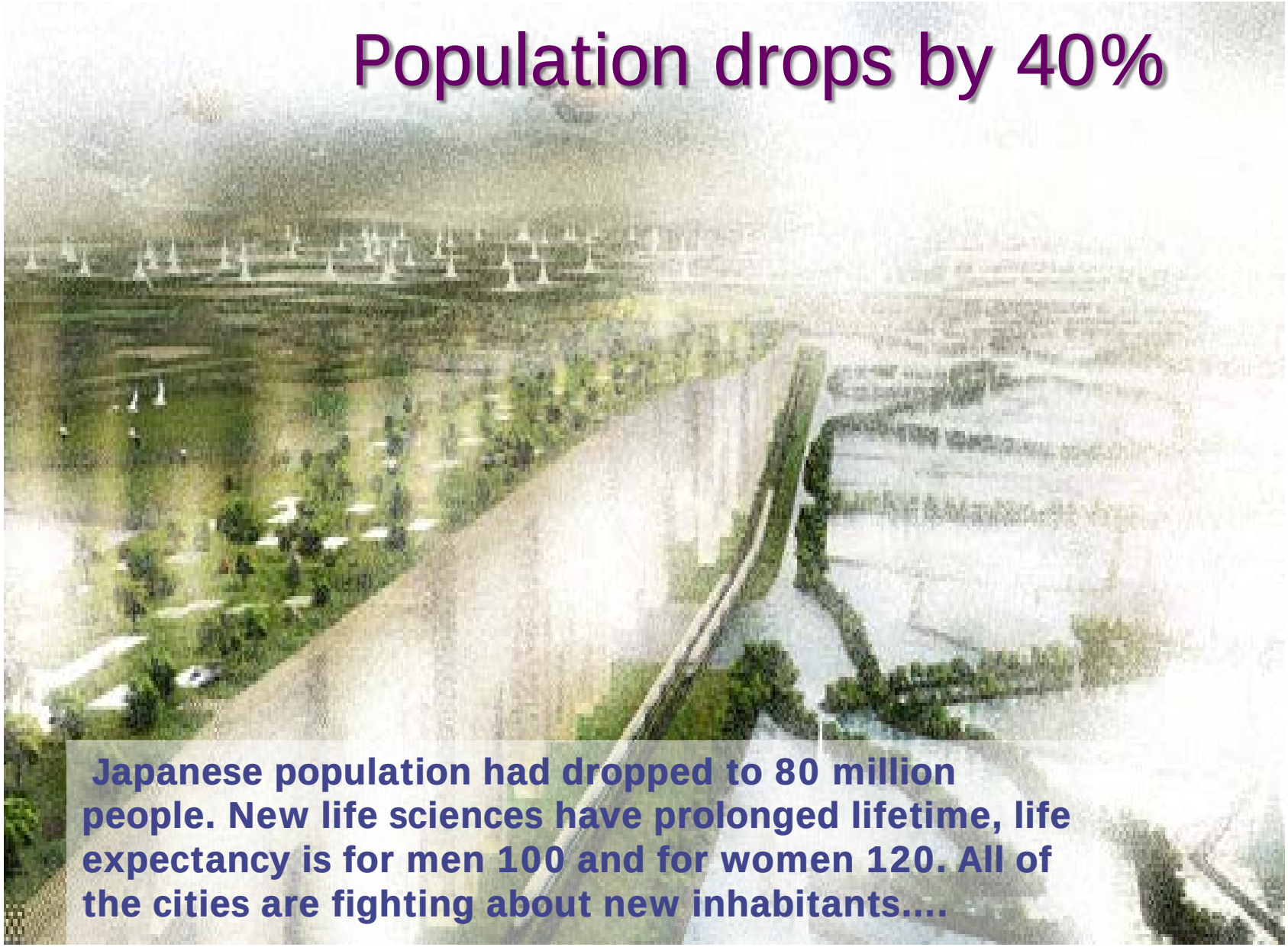
80 % of production is take care by automatized processes that use robotics. City people have all of their time to entertainment, consumption, social networking… State pays to citizens in order to support demand.

Japanese population



Source: OECD population projections

Population drops by 40%



Japanese population had dropped to 80 million people. New life sciences have prolonged lifetime, life expectancy is for men 100 and for women 120. All of the cities are fighting about new inhabitants....

Solutions

1. Robots rule
    1. More Disneylands x x
    2. Decide goals and communicate to people > what should I do xxx
    3. Subsidise travelling around the world x
    4. Establish self-organizing community clubs x
2. Free energy
    1. Build completely ecological city by using energy (Abu Dhabi) x
    2. Exercise center to burn the cheap food x
    3. Support dispersed energy systems -
3. Old peoples town
    1. More marriages – remarriages subsidized x
    2. New university hospital with PhD courses for old ladies

Task 2

- Assess the utility of all of these actions in your environment.
- Choose 5 most useful.