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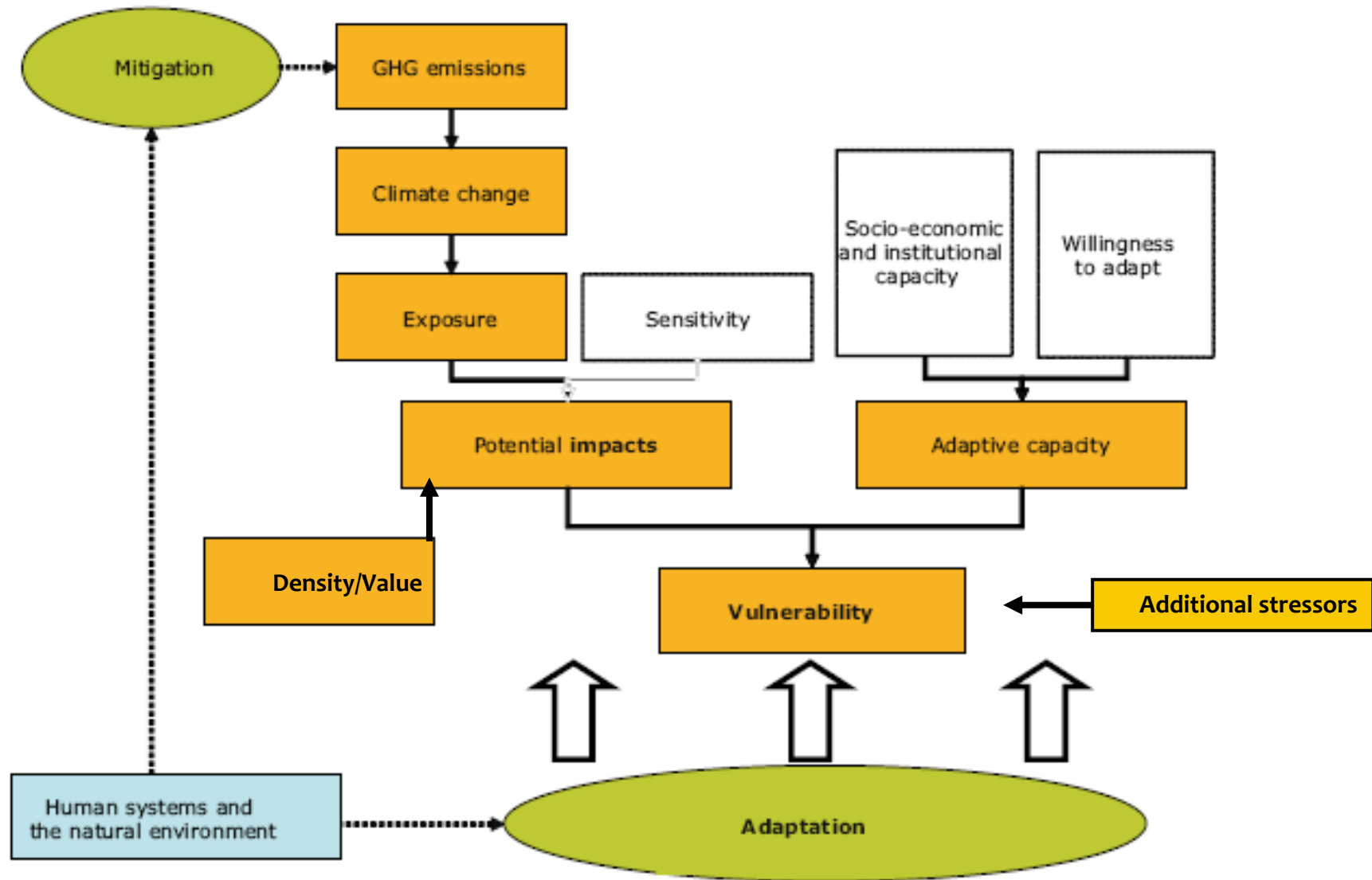
Adaptation Strategies to Minimize Climate Risks in Companies

Valentino Piana
Istanbul, 26th February 2010

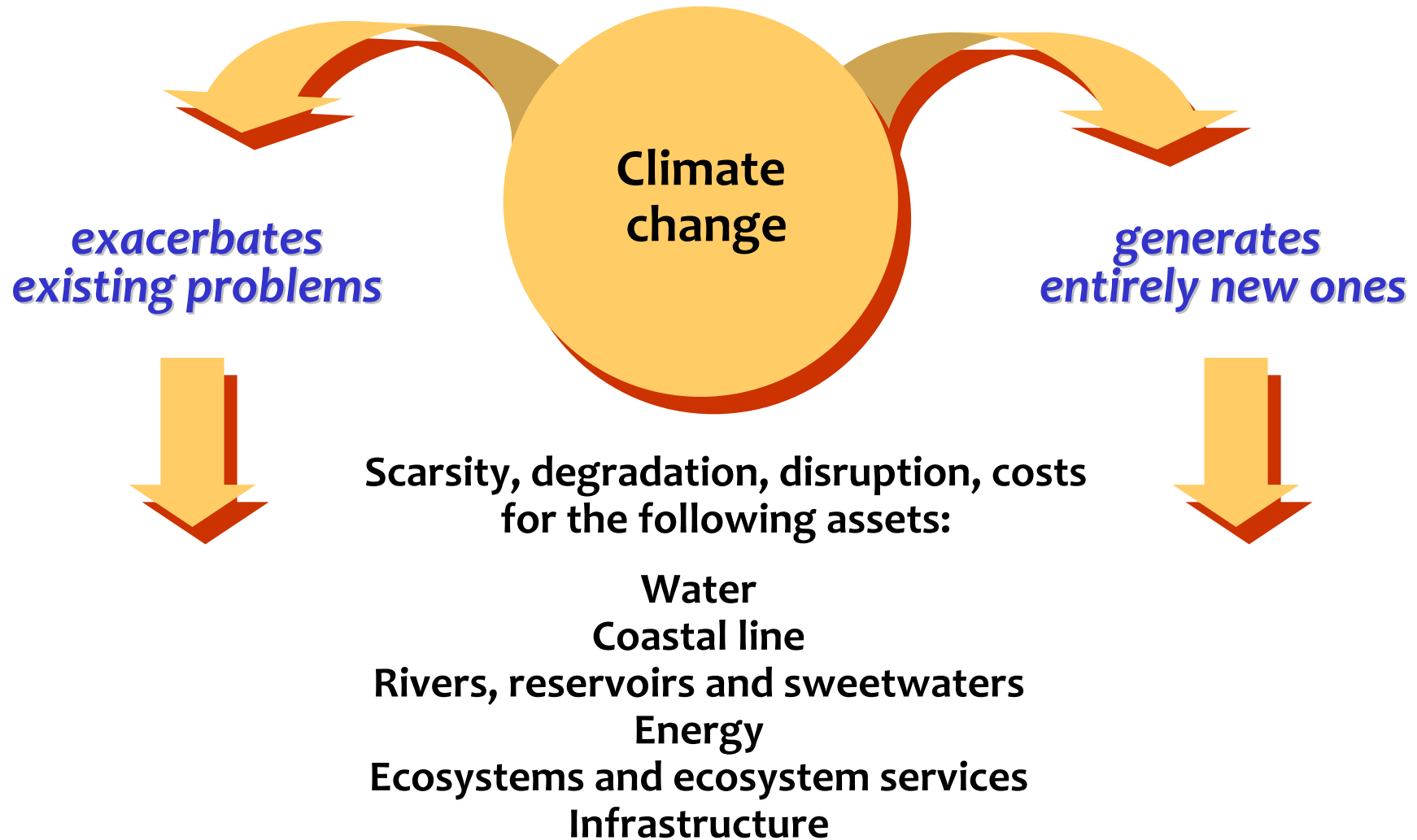
Contents

- 1. A simple scheme of climate change**
- 2. The pervasive impact of climate change on physical assets, ecosystems, infrastructure, people and business**
- 3. Long-run certainty and short-run risk: the costs of inaction**
- 4. Other stressors on the assets put at risk by climate change**
- 5. Adaptation strategies for businesses**
 - 5.1. Exclusive or inclusive adaptation?**
 - 5.2. Sector-specific challenges and options**
 - 5.3. Local adaptation plans: the role of business**
 - 5.4. Global business and the international diffusion of climate-related innovations**
 - 5.5. Financial and business models for adaptation**
- 6. Turkey's National Adaptation Strategy**
- 7. Conclusions**

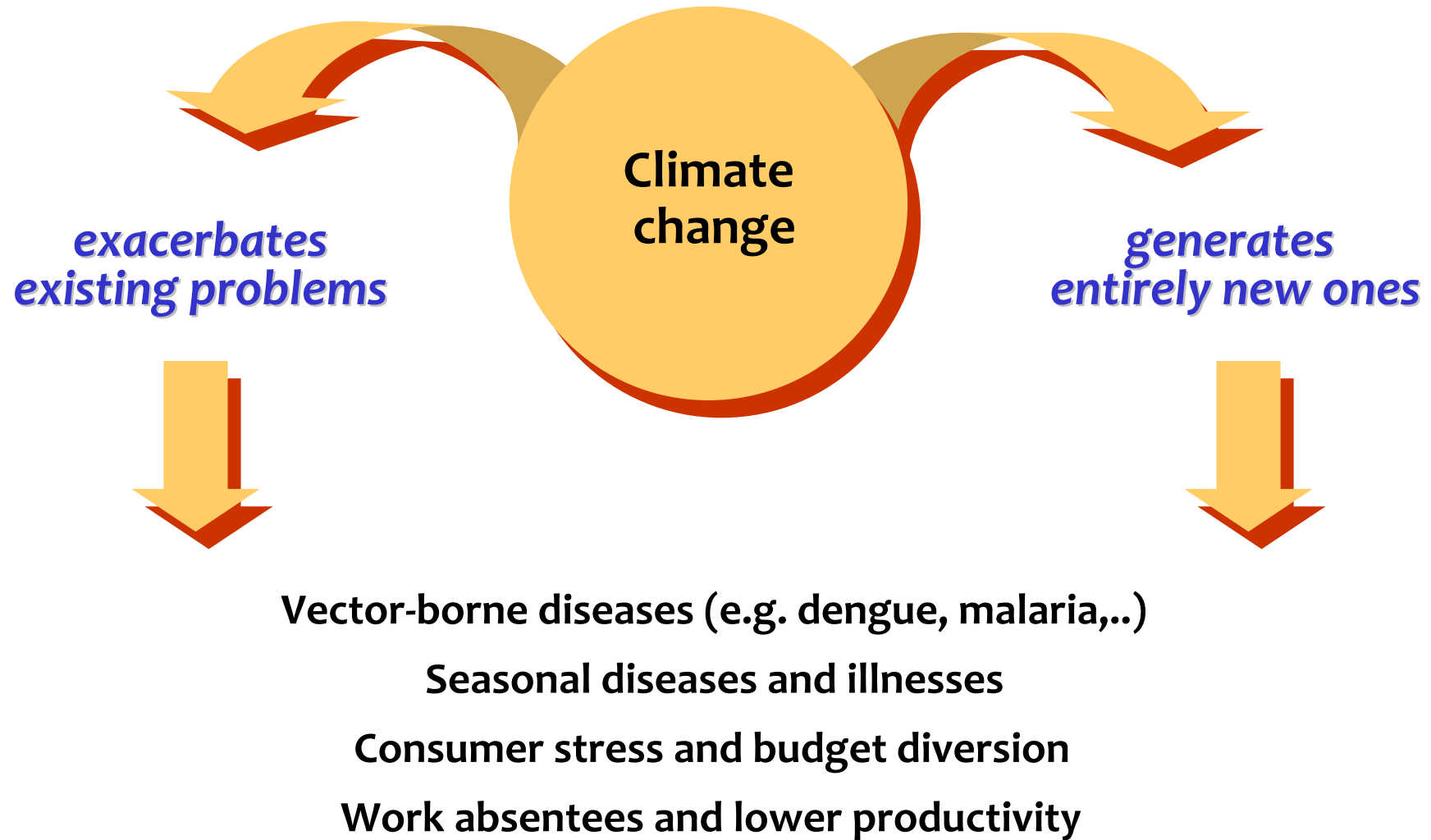
1. A simple scheme of climate change



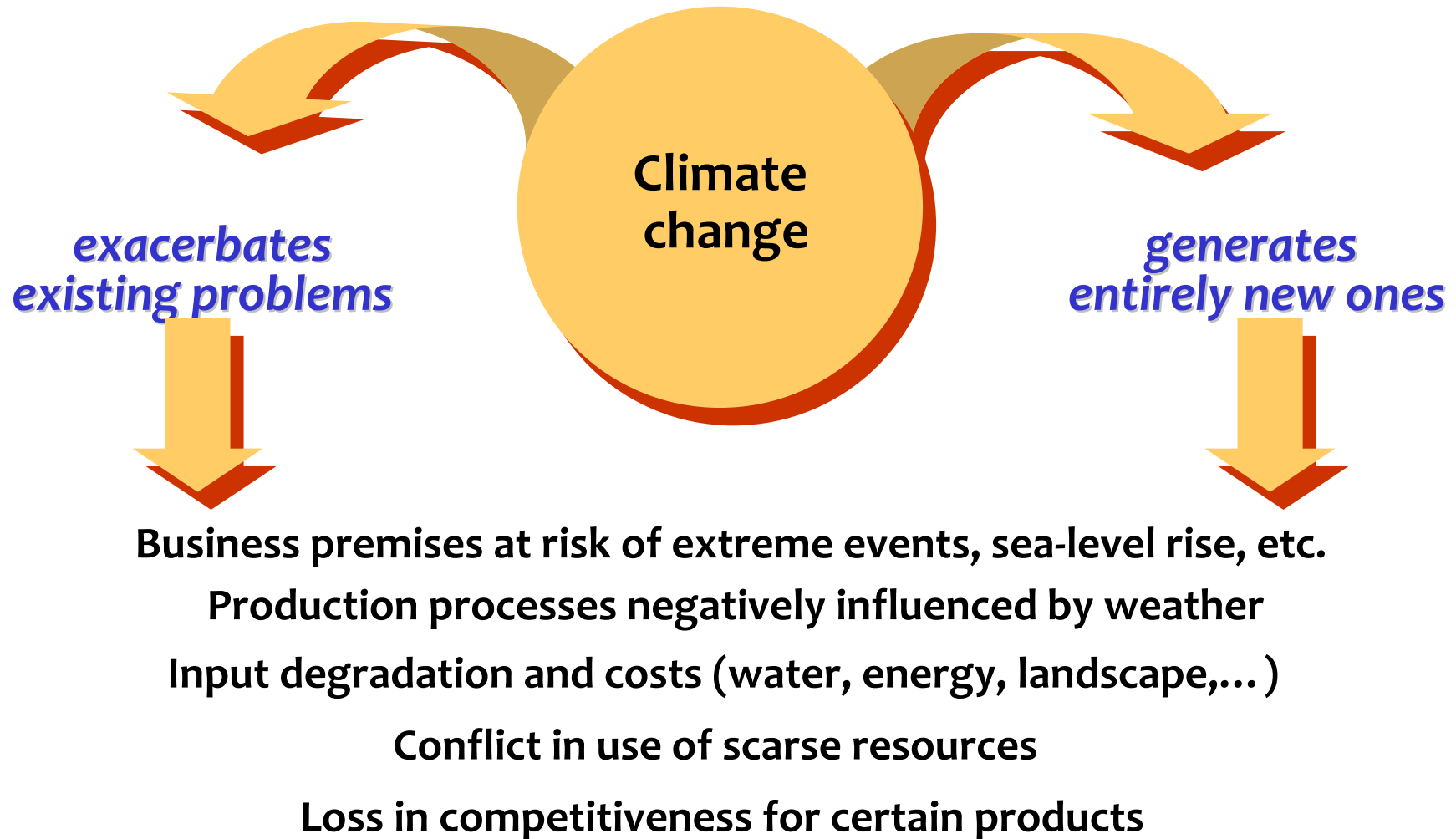
2. The pervasive impact of climate change on physical assets, ecosystems, infrastructure, people, and business



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Logistic disruptions

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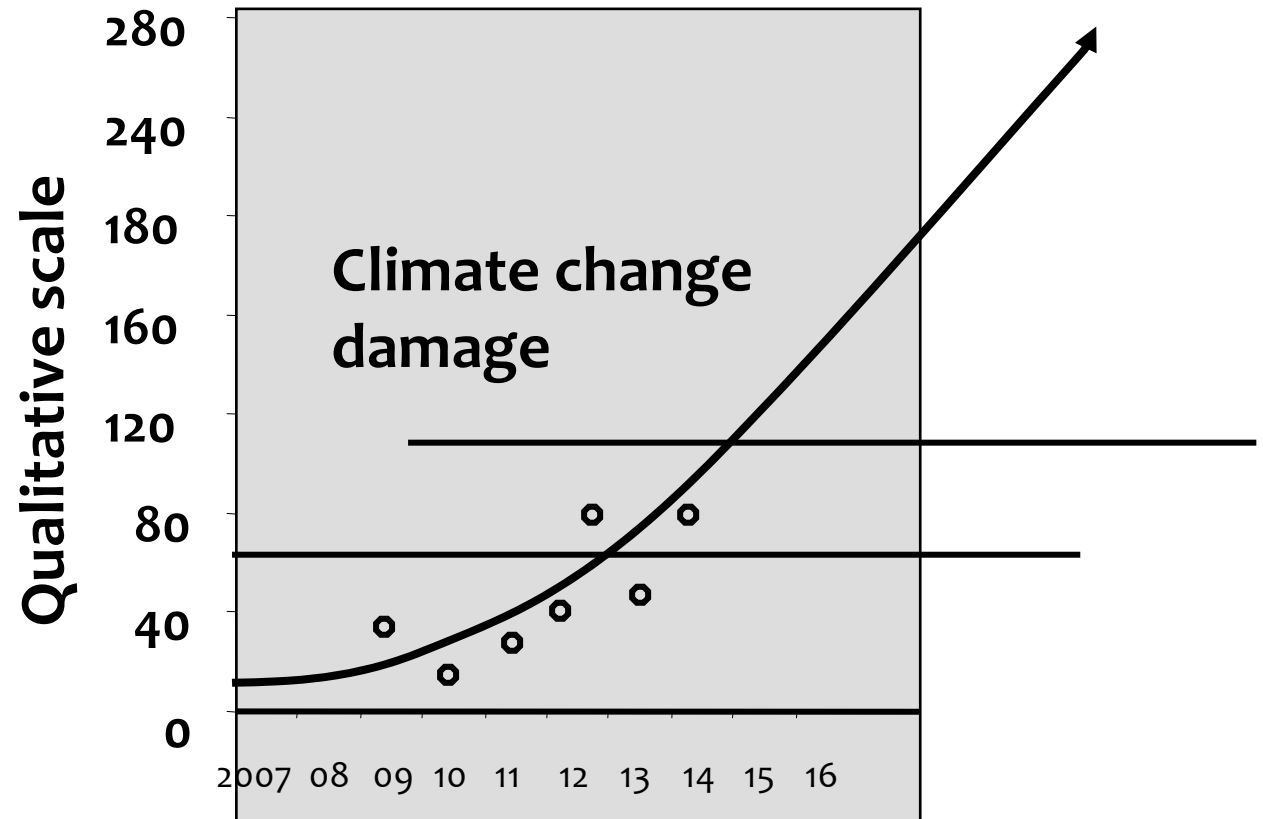
Cutting-edge research & implementation consulting

3. Long-run certainty and short-run risk: the costs of inaction (1)

The science of climate is the same as the physics that keep your plane flying and your mobile phone calling the world.

The rise of temperature in a greenhouse is a confirmed result of an experiment you can replicate. By adding CO₂ it becomes even warmer.

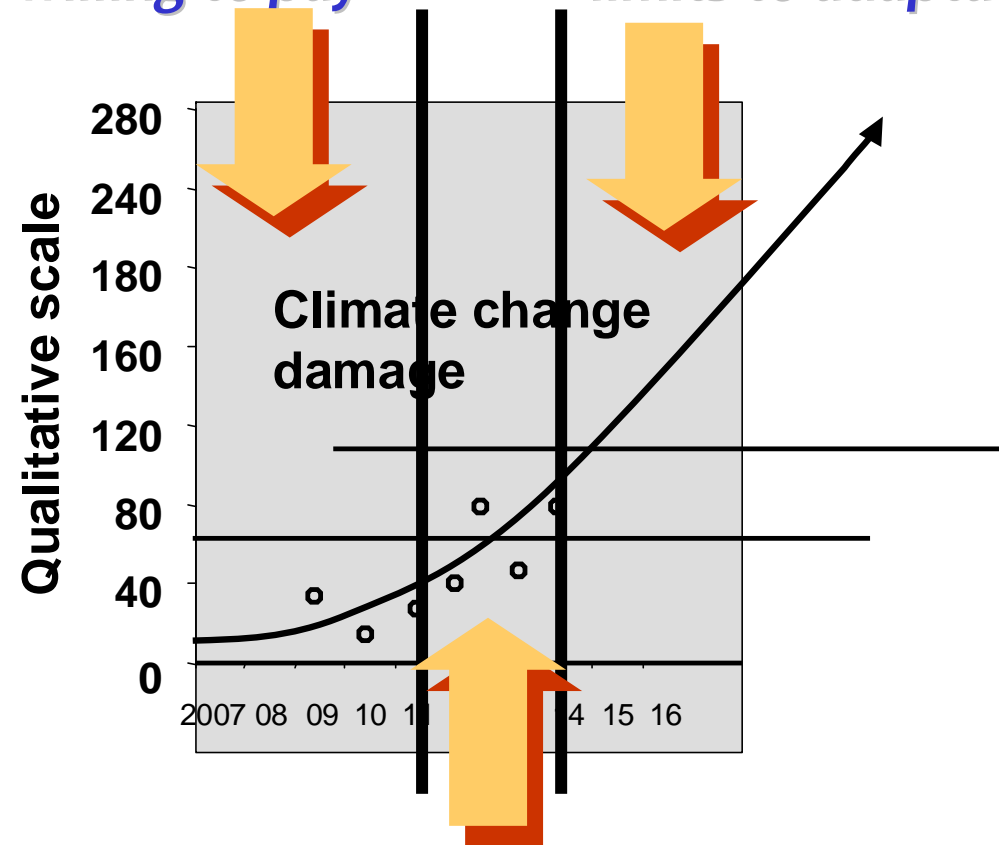
Extreme weather events will increase in frequency and impact, albeit will remain unpredictable in exact timing.



3. Long-run certainty and short-run risk: the costs of inaction (2)

The time window of opportunity to sell adaptation solutions will be short.

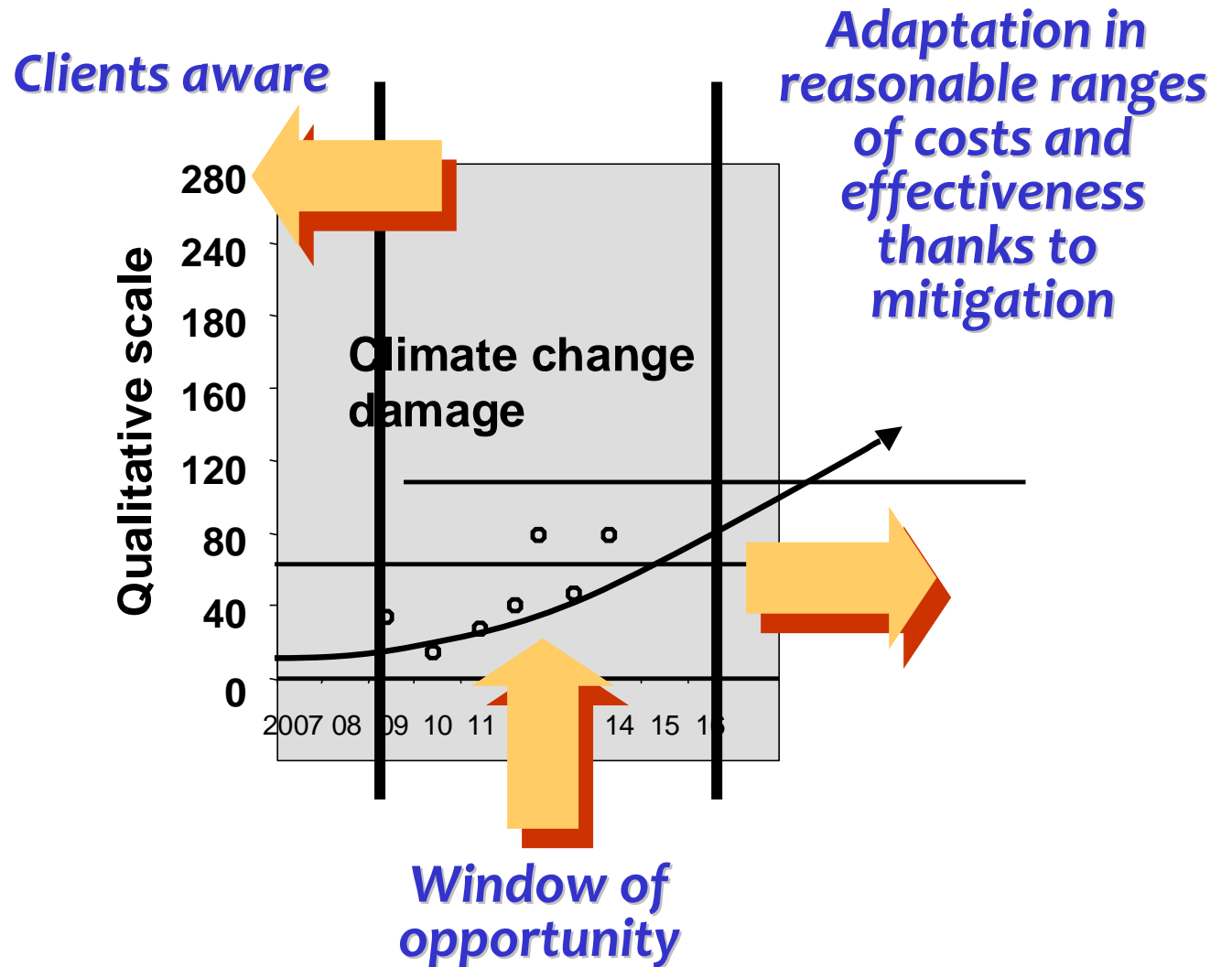
Clients not aware and not willing to pay *Too late - limits to adaptation*



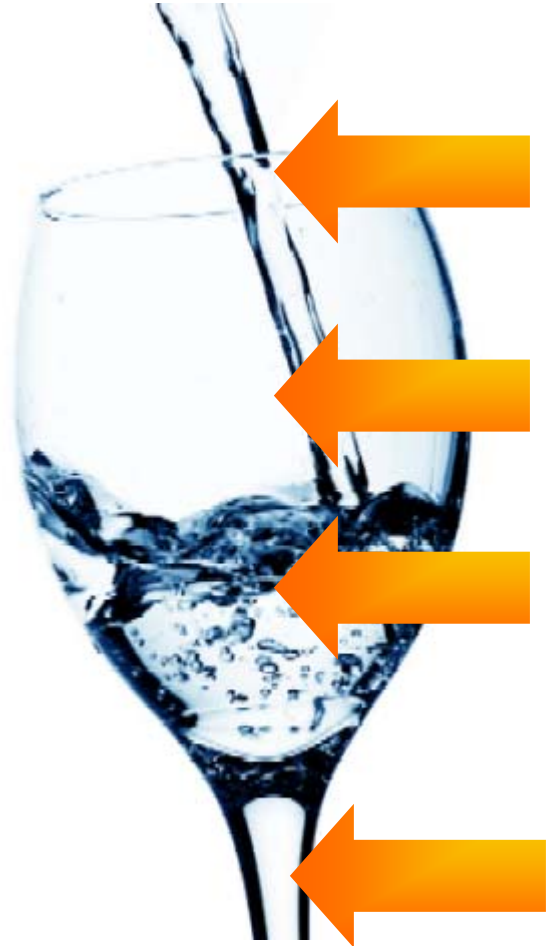
Window of opportunity

3. Long-run certainty and short-run risk: the costs of inaction (3)

To widen the window, it is necessary to raise awareness in advance and to push for strong mitigation actions



4. Other stressors on the assets put at risk by climate change



**Climate change
damage**

Inadequate pipelines

**Conflict for use
for agriculture,
energy, population**

...

**Adaptation
by protecting
key assets
cannot distinguish
the stressors
nor differentiate
between
anthropogenic climate
change
and climate in general.**

5. Adaptation strategies for businesses

1

Vision, new processes, new products

2

Push to market, push to policymakers

3

Restructuring the supply chain / value chain

4

Upgrade skill and core competences

5.1. Exclusive or inclusive adaptation?

Adaptation strategy based on separation and exclusiveness

- Isolation, closing borders, protection of key assets
- Only the rich and highly profitable human activities protected
- Negative externalities on the rest of population and natural ecosystems
- Conflict

Adaptation strategy based on solidarity and risk sharing

- Co-planning
- Solidarity network
- Insurance schemes
- Conditional emergency plan and fast broad mobilization
- Reciprocal guarantees
- Nobody left behind
- National and international cohesion

5.2. Sector-specific challenges and options

- ✧ **Agriculture**
- ✧ **Fishery**
- ✧ **Forestry**
- ✧ **Energy generation and distribution**
- ✧ **Building**
- ✧ **HVACR- Heating, Ventilation, Air Conditioning and Refrigeration**
- ✧ **City management**
- ✧ **Tourism**
- ✧ **Industry/manufacturing**
 - ✧ **Food processing**
 - ✧ **Water provision**
- ✧ **Telecommunications**
 - ✧ **Public sector**
 - ✧ **Healthcare**
 - ✧ **Insurance**
 - ✧ **Retail**
- ✧ **Transport infrastructure**
 - ✧ **Logistics/distribution**

5.2. Sector-specific challenges and options



✧ Agriculture and livestock

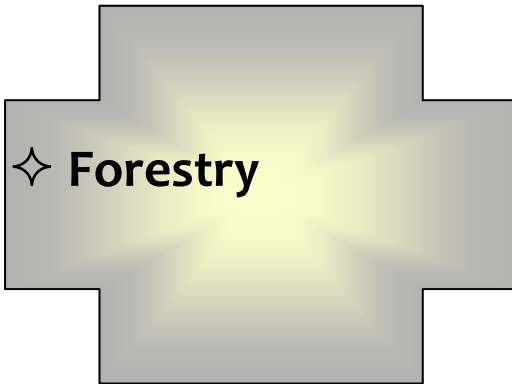
- Soil degradation, erosion, landslides
- Pests, crop predators and diseases
- Water stress and local droughts
- GMOs and water-resistant crops
- Food vs. non-food productions
- Organic agriculture
- Community rehabilitation of degraded land



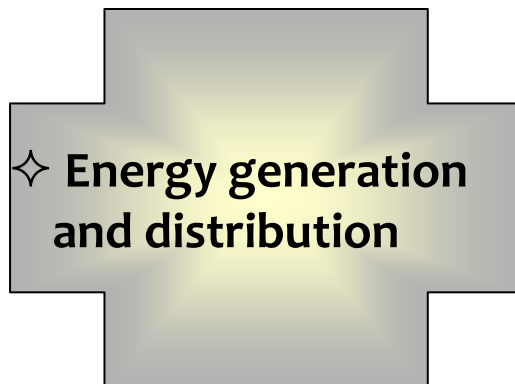
✧ Fishery

- Overall reduction in fish catch
- Unsustainable fishery
- Risk of extinction of local species
- Changes in temperature and acidification
- Reef corals extinction
- Ecosystem irreversible damage
- Aquaculture
- Local sustainable fishing

5.2. Sector-specific challenges and options

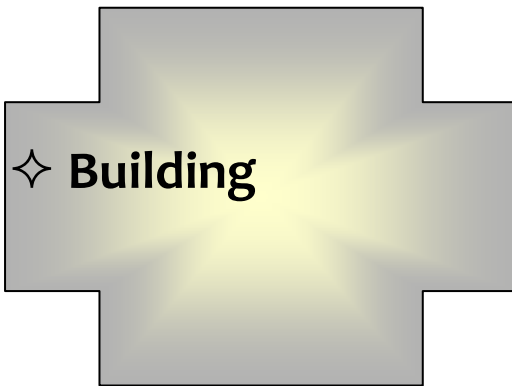


- Shift in species over latitudes and mountain heights
- Acid rains destroying forests
- Original forest vs. plantation
- Sustainable forest management
- Indigenous knowledge-led forestry
- Non-wood income generation activities

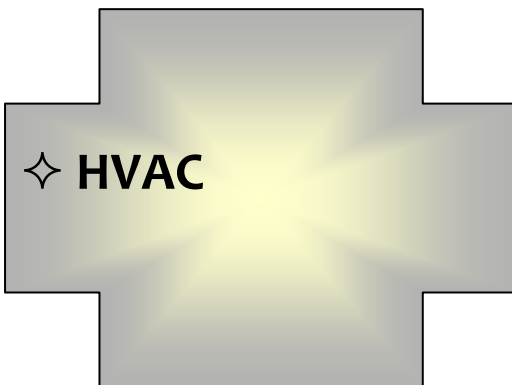


- Shifts in energy demand
- Changes in temperatures and operational conditions
- Increased competition with other sectors for water
- Threats to coastal plants
- Paradigm shift towards renewables
- Business models for mini-grids (e.g. solar+low-energy water desalinization, etc.)

5.2. Sector-specific challenges and options



- Shelter function under stress
- Difficulties in maintaining proper micro-climatic conditions and comfort levels
- Energy-intensity under regulatory, economical and societal pressure
- Integration buildings-surroundings-nature
- Top-quality buildings as eco-buildings
- Locally appropriate materials
- Reduced water consumption
- Separation grey, black and white waters
- Local recycling

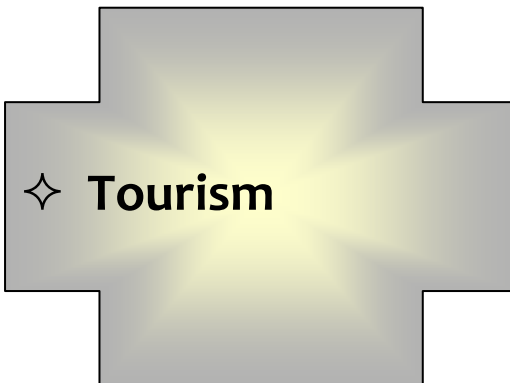


- Low energy solutions
- Heat pumps
- Mono- or multi-renewable local sources
- Natural or forced ventilation

5.2. Sector-specific challenges and options

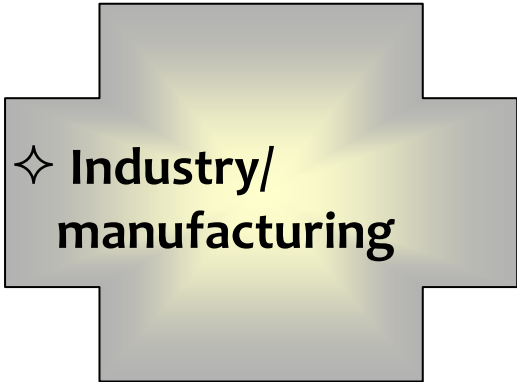


- Compound effect of atmospheric pollution from industry and cars, temperature and humidity on comfort, asthma, and other stressors
- Green urban areas
- Urban unconventional greening (e.g. vertical or roof greening)
- Waste management
- Biogas
- Locally viable alternative mobility systems



- Entire localities under threat (sea-level, lack of snow, etc.) and losing attractiveness
- Extreme negative events
- Reduced resilience
- Artificial snow and other artificial ways to recreate the tourist experience
- Sustainable tourism

5.2. Sector-specific challenges and options



✧ **Industry/
manufacturing**

- **Temporary or definitive lack or degradation of inputs**
- **Higher costs for water and energy**
- **Disruption in operations**
- **Risk to production facilities located near the sea and in flood-prone areas**
- **Reduced consumer willingness to purchase**



✧ **Food
processing**

- **Difficulties with inputs**
- **Weather-dependent productions**
- **Difficulties in exports and imports**
- **Sanitary provisions**
- **Health of employees**

5.2. Sector-specific challenges and options



✧ Water provision

- Reduced average rainfall
- Shifting and unpredictable rainfall patterns
- Different locations for heavy rains
- Empty dams
- Further stresses on river-related ecosystems
- Acidification of rains
- Low-energy treatment of water
- Prices and availability of water
- Conflicts for water
- Rain harvesting and treatments



✧ Telecommunications

- Disruptions in infrastructures
- Early warning systems
- Awareness raising systems
- Smart grid

5.2. Sector-specific challenges and options



✧ Insurance

- Higher insurance payouts resulting from damage to infrastructure by extreme weather events
- Greater uncertainty of risk assessments
- Re-insurance at higher rates
- Financial stress



✧ Retail

- Disruption in supply chains and transport infrastructure
- Changing consumption patterns
- Locations at risks

5.2. Sector-specific challenges and options



✧ **Public sector**

- **Higher expectations in the population for protection**
- **New regulations**
- **Planning skills**
- **Implicit insurance**
- **Financial stress**
- **Difficulties in mediation of conflicts**



✧ **Healthcare**

- **Shift in spatial and temporal distribution of diseases**
- **Heat wave deaths in cities and other areas**
- **Change in distribution of vectors of infections**
- **Wider range of stress-related illnesses**
- **Carrying capacity of hospitals in case of extreme weather events**

5.2. Sector-specific challenges and options



✧ Insurance

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✧ Retail

- Disruption in supply chains and transport infrastructure
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5.2. Sector-specific challenges and options



✧ **Transport infrastructure**

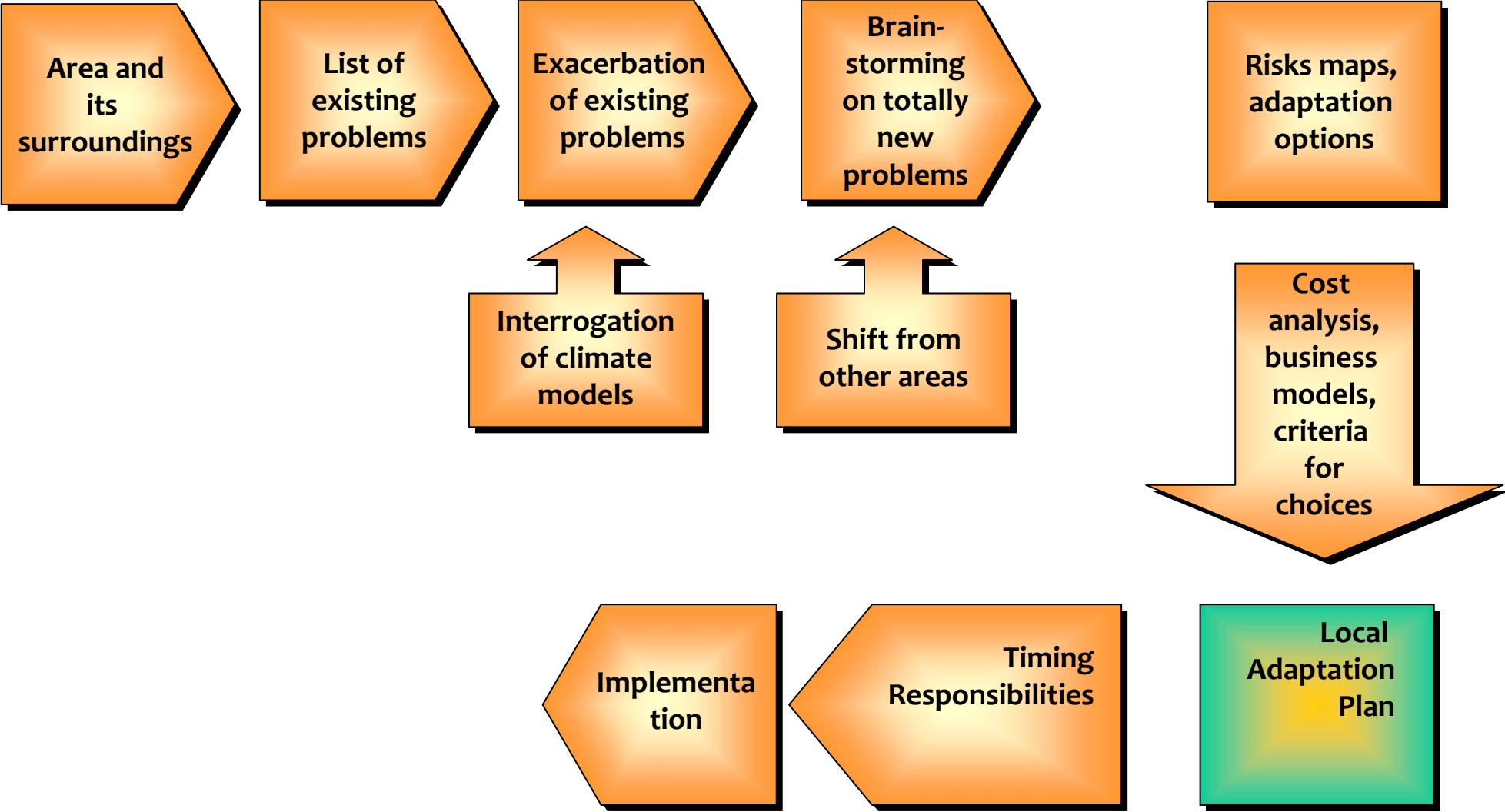
- **Roads and railways localised near the sea or in flood-prone areas**
- **Temporary or definitive damage and disruption**
- **Isolation of villages and other locations**
- **Bridges under threat of stronger winds and waves**



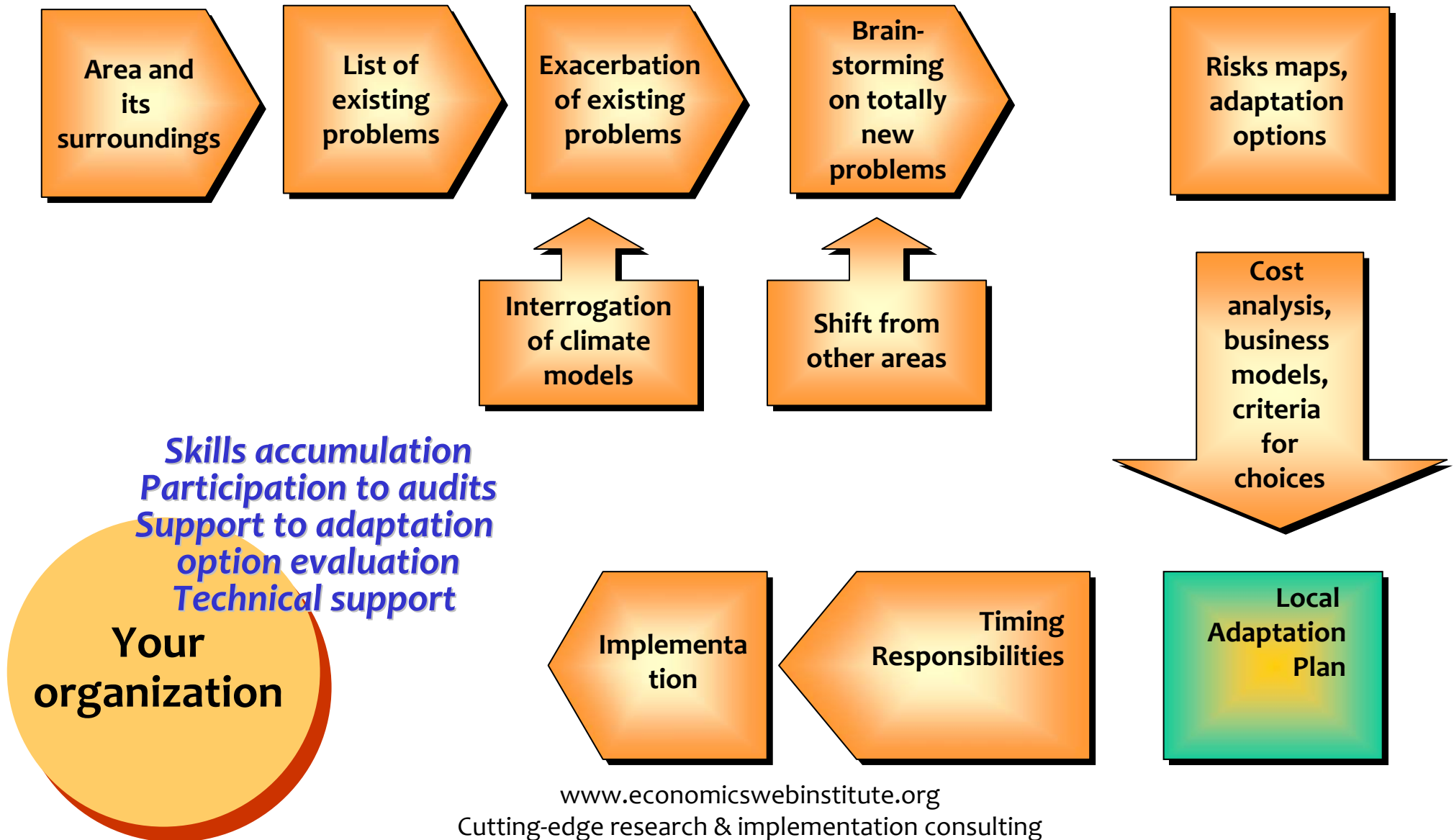
✧ **Logistics/
distribution**

- **Disruption of ground and marine transportation systems as a result of severe weather patterns**
- **Inundation of transport routes**

5.3. Local adaptation plans: the process



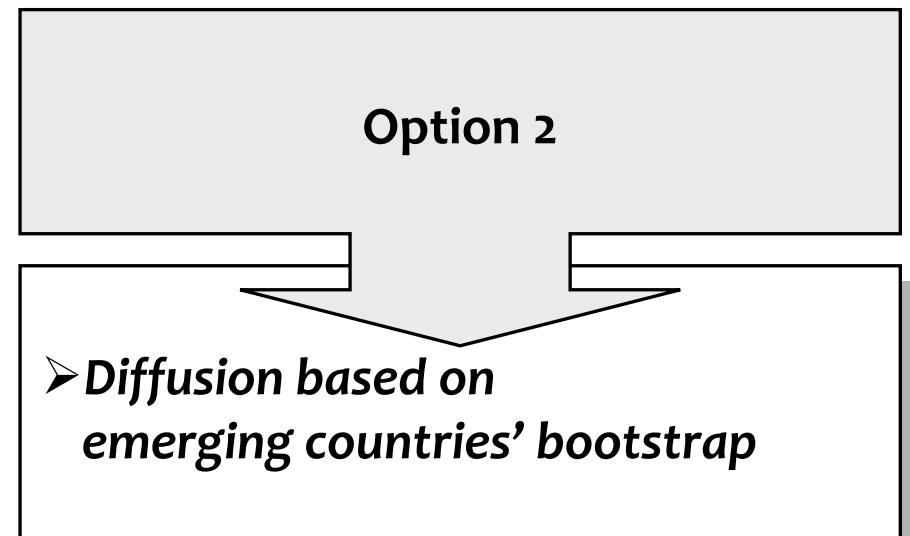
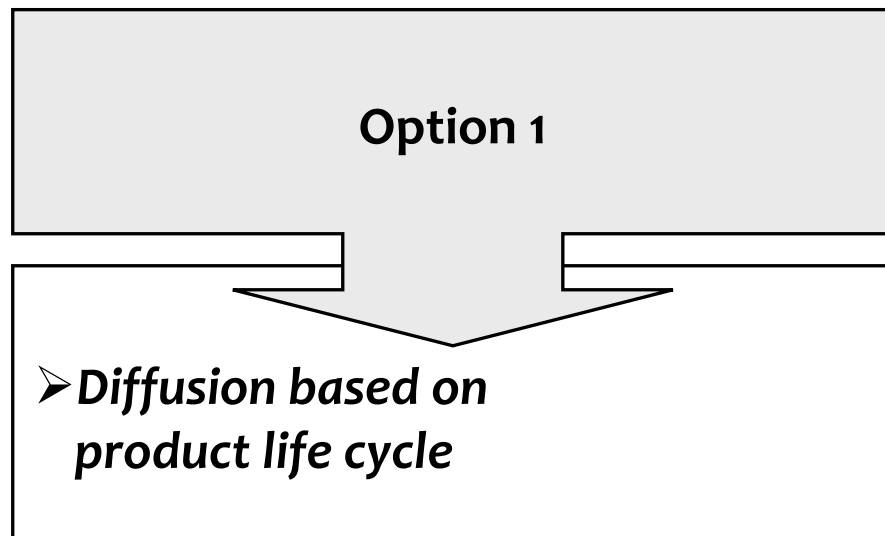
5.3. Local adaptation plans: the role of business



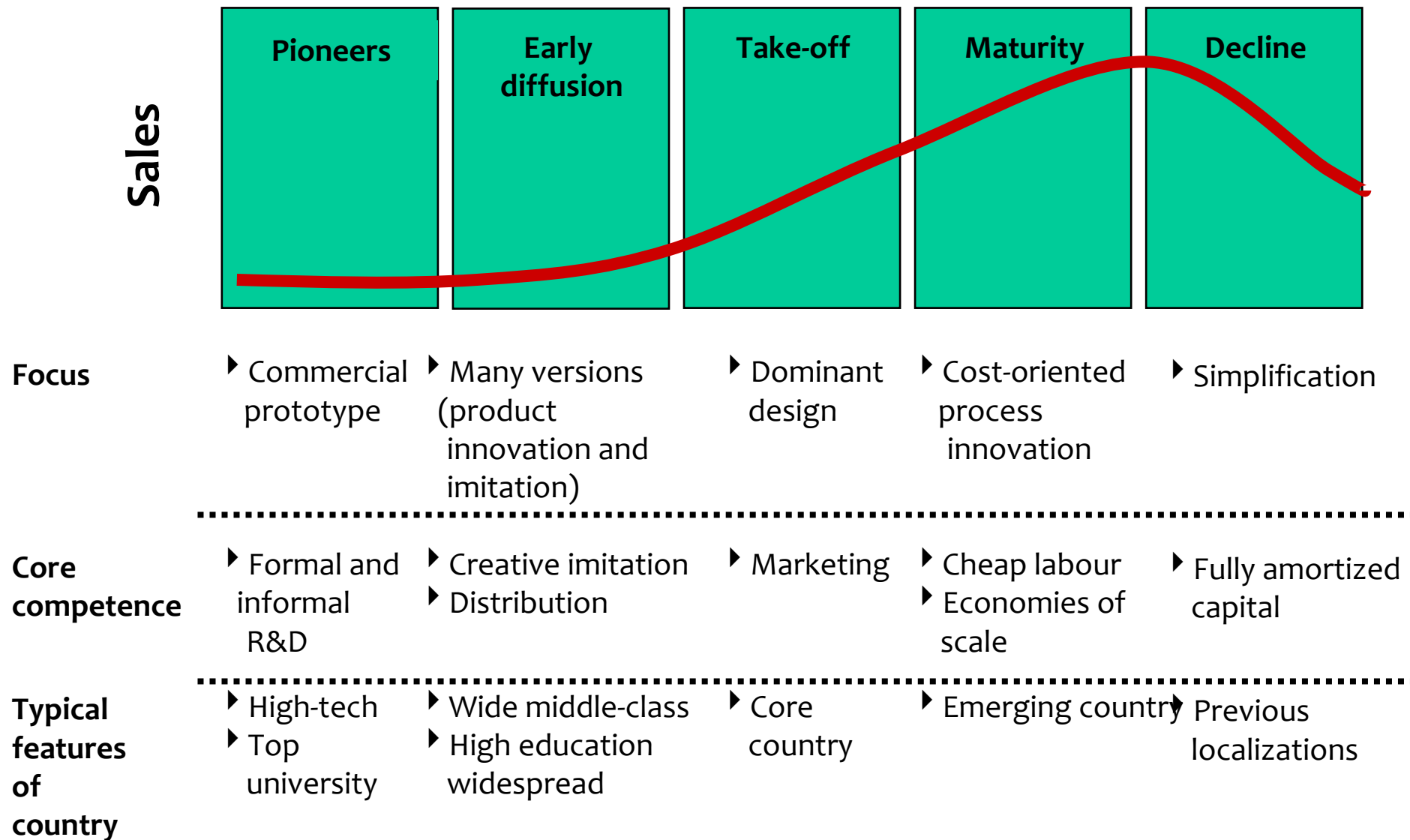
5.4. Global business and the international diffusion of climate-related innovations

Globalization, the UNFCCC process, including the Bali Action Plan, the Copenhagen Accord (art. 11) all indicate that the international dimension of technology development and deployment has a crucial role for both mitigation and adaptation.

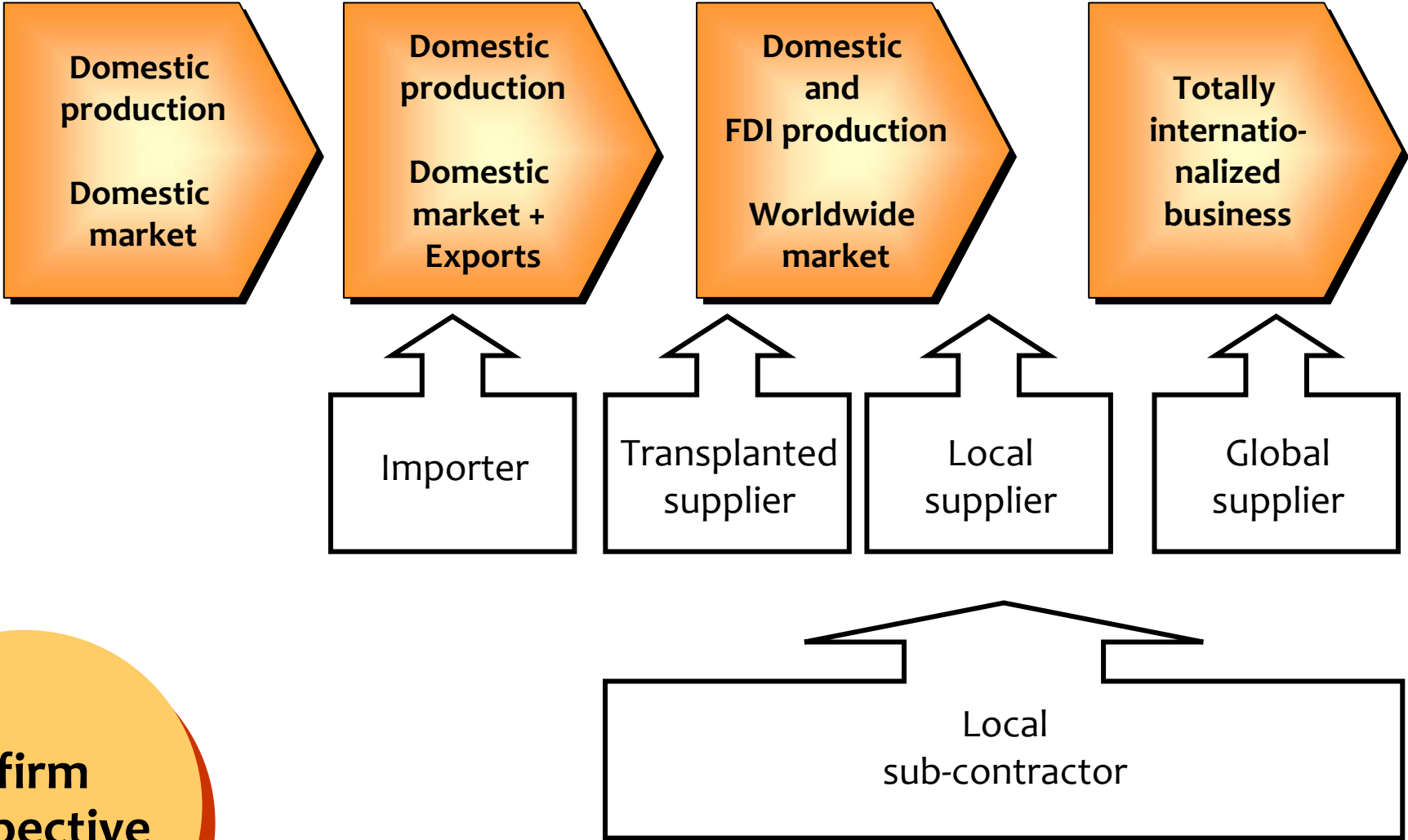
Innovation economics suggests two alternative pattern of international diffusion.



5.4. Global business and the international diffusion of climate-related innovations (Option 1)



5.4. Global business and the international diffusion of climate-related innovations (Option 1)



A firm perspective

5.4. Global business and the international diffusion of climate-related innovations (Option 2)

	Old industrialized country	Newly industrialized country
Invested capital	Large and amortized	Small, to be repaid
Future demand	Stable or declining	Strong growth potential
Mental framework	Defensive, pessimist	Challenger, optimist
Political system	Vested interests	Freedom at the frontier

5.4. Global business and the international diffusion of climate-related innovations (Option 2)



Cutting-edge research & implementation consulting

5.5. Financial and business models for adaptation

1

Clients aware and willing to pay

2

Public mandate

3

Public support and asset swaps

4

**Ad-hoc taxation on polluters
(domestically and internationally)**

5

**International funds - the experience of NAPAs
and the Adaptation Fund**

6. Turkey's National Adaptation Strategy

In December 2009, Turkey has drafted the National Climate Change Strategy, soon to be followed by more detailed Action Plans.

In terms of adaptation, a selection of lines of activities is the following:

Short run (2010)

- ▶ Agricultural Drough Action Plan
- ▶ Improving water quality
- ▶ Livestock and crop sector capacity to combat diseases and pests
- ▶ Public health

6. Turkey's National Adaptation Strategy

In terms of adaptation, a selection of lines of activities is the following:

Medium term (2010-2012)

- ▶ Watershed Master Plans development
- ▶ River Basin Management Plans
- ▶ New agricultural practices
- ▶ Vulnerable ecosystems, urban biotopes, bio-diversity
- ▶ Minimize impact, including through early warning systems, for floods, avalanches, landslides
- ▶ Financial assistance
- ▶ Risk management and risk maps

6. Turkey's National Adaptation Strategy

In terms of adaptation, a selection of lines of activities is the following:

Long term (2012-2020)

- ▶ Watershed Master Plans finalized
- ▶ River Basin Management Plans
- ▶ Studies on volume-based water pricing
- ▶ Food production and processing export and imports
- ▶ Multi-optional insurance systems
- ▶ Public access to risk maps
- ▶ Environmental impact assessment processes linked with legal regulation and plans
- ▶ Use of architecture and construction materials appropriate for local climate
- ▶ Rainwater accumulation, utilization, recycling
- ▶ Waste water efficiency for urban green areas

7. Conclusions

Climate change is devastating the future scenarios of development. Mitigation is an immediate priority and a good investment for survival.

Adaptation will have an exponential growth, quickly passing from marginality to relevance to dominance, until limits to adaptation are reached and the environment is so degraded that we would need a Planet B.

But...

7. Conclusions

Since



Business has a crucial role in bringing timely and adequate technical and economic expertise to adaptation and mitigation planning and implementation before it is too late.

References

Isoard, S., Grothmann, T., and Zebisch, M. (2008). Climate Change Impacts, Vulnerability and Adaptation: Theory and Concepts. Paper presented at the Workshop 'Climate Change Impacts and Adaptation in the European Alps: Focus Water', UBA Vienna

T.R. Ministry of Environment and Forestry - National Climate Change Strategy

World Business Council for Sustainable Development