World Intellectual Property Day 2017
April 26
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technology
tourism
landscape

technik tourismus landschaft

Rural Innovation

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Gyeongsang National University, Jinju
Lab. Prof. Dr. Pil Joo Kim
April 26th, 2017, 16:00

PART 1: WHAT IS INNOVATION?

Innovation

- Innovation:
  - production or adoption, assimilation, and exploitation of a value-added novelty in economic and social spheres;
  - renewal and enlargement of products, services, and markets;
  - development of new methods of production; and establishment of new management systems. It is both a process and an outcome.

Source: OECD cited in Edison et al. 2013

Invention

- A precondition of innovation is the invention
  - made by inventors
- Inventions mainly relate to intellectual property rights
  - All private business affairs
  - Provision of private incentives and a stimulus of economic growth in market economies
- Inventions can also relate to a shift in private and societal attitude
  - to perceive things differently than before
  - to react to a changed economic or social context

Intellectual Property [IP] (1)

- Refers to :
  - **Patents**
    - A patent is a form of right granted by the government to an inventor
    - An invention is here a solution to a specific technological problem, which may be a product or a process and has to fulifill three main requirements: new, not obvious and industrially applicable
  - **Copyright**
    - Copyright may apply to a wide range of creative, intellectual, or artistic forms, or works. Copyright does not cover ideas and information themselves, only the form or manner in which they are expressed.

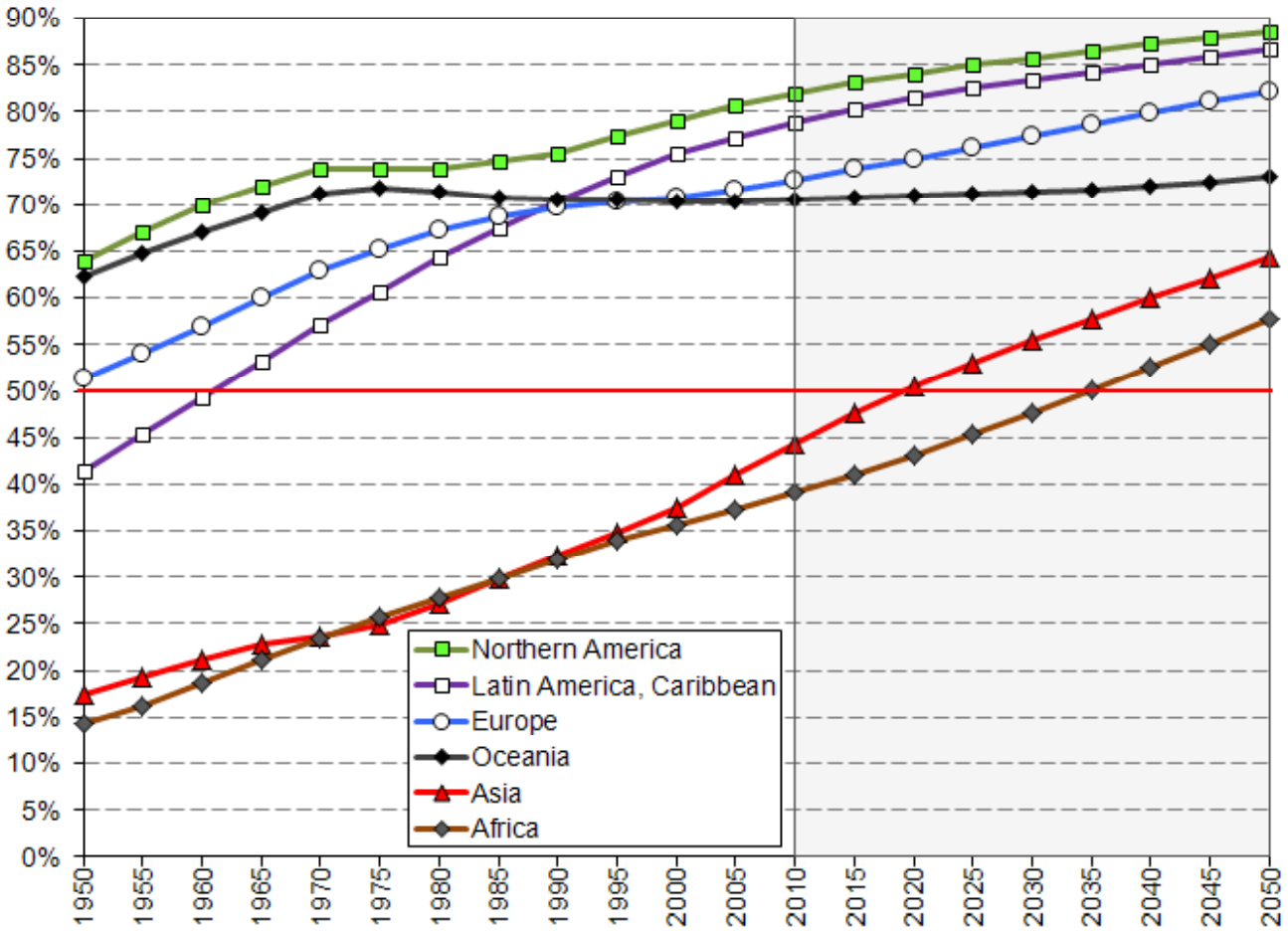
Intellectual Property [IP] (2)

- Refers to :
  - **Industrial design rights**
    - An industrial design consists of the creation of a shape, configuration or composition of pattern or color.
  - **Plant varieties**
    - Plant breeders' rights to commercially use a new variety of a plant. The variety must amongst others be novel and distinct
  - **Trademarks**
    - A trademark is a recognizable sign, design or expression which distinguishes products or services of a particular trader from the similar products or services of other traders

Rural vs. Urban

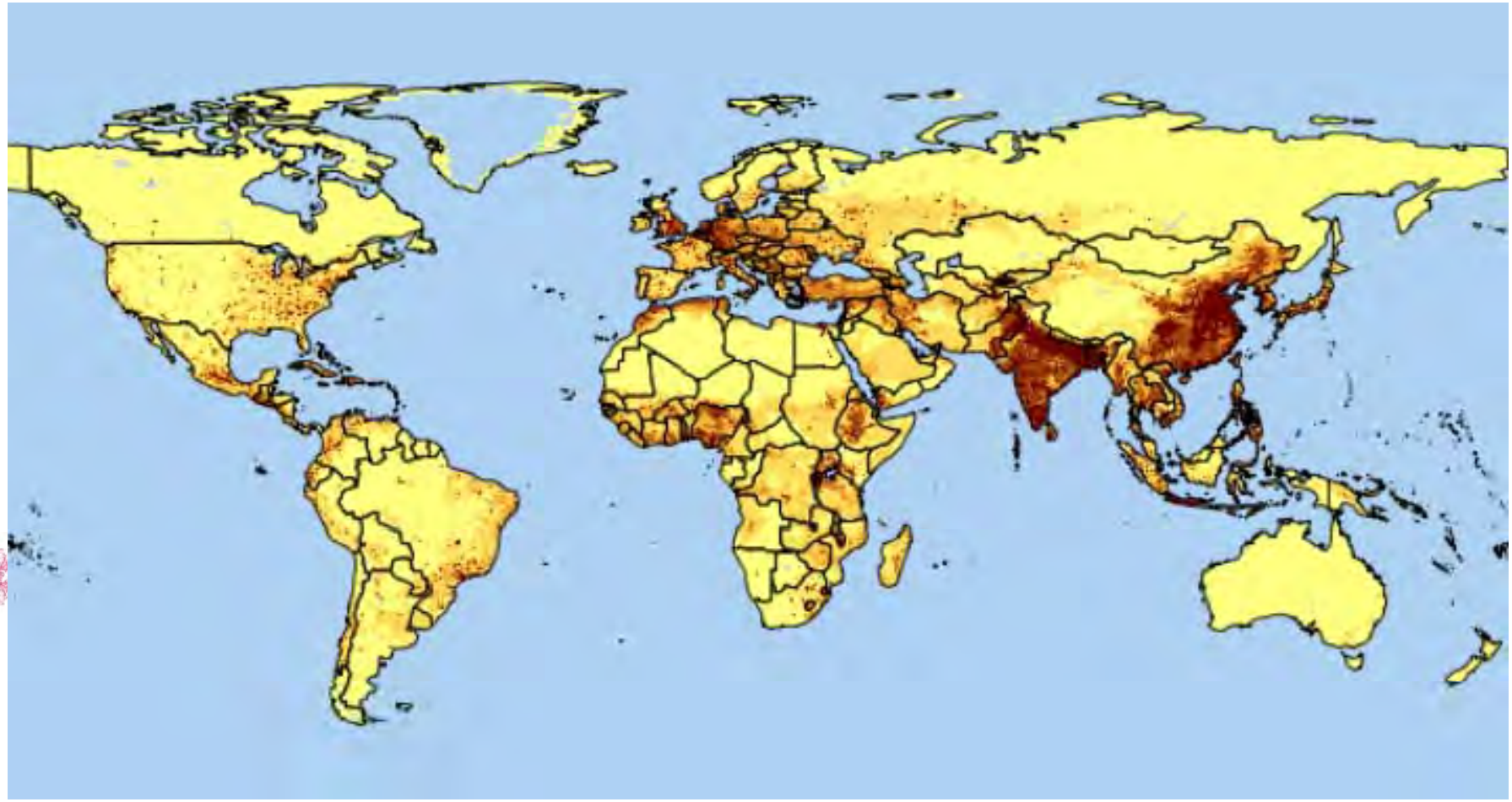
- The globe, continents, countries or regions are divided into rural and urban
- Rural, resulting from a time when man and the size of population was almost exclusively dependent on local resources and their carrying capacity
- Urban, a previously priviledged minority, is now universal, currently 50% of world population with anticipated increase to 80% in 2050.

Urbanization of the World



Source: United Nations, Department of Economic and Social Affairs, Population Division: World Urbanization Prospects, the 2011 Revision. New York, 2012

Urban Areas cover perhaps 1.5 to 3% of land resources

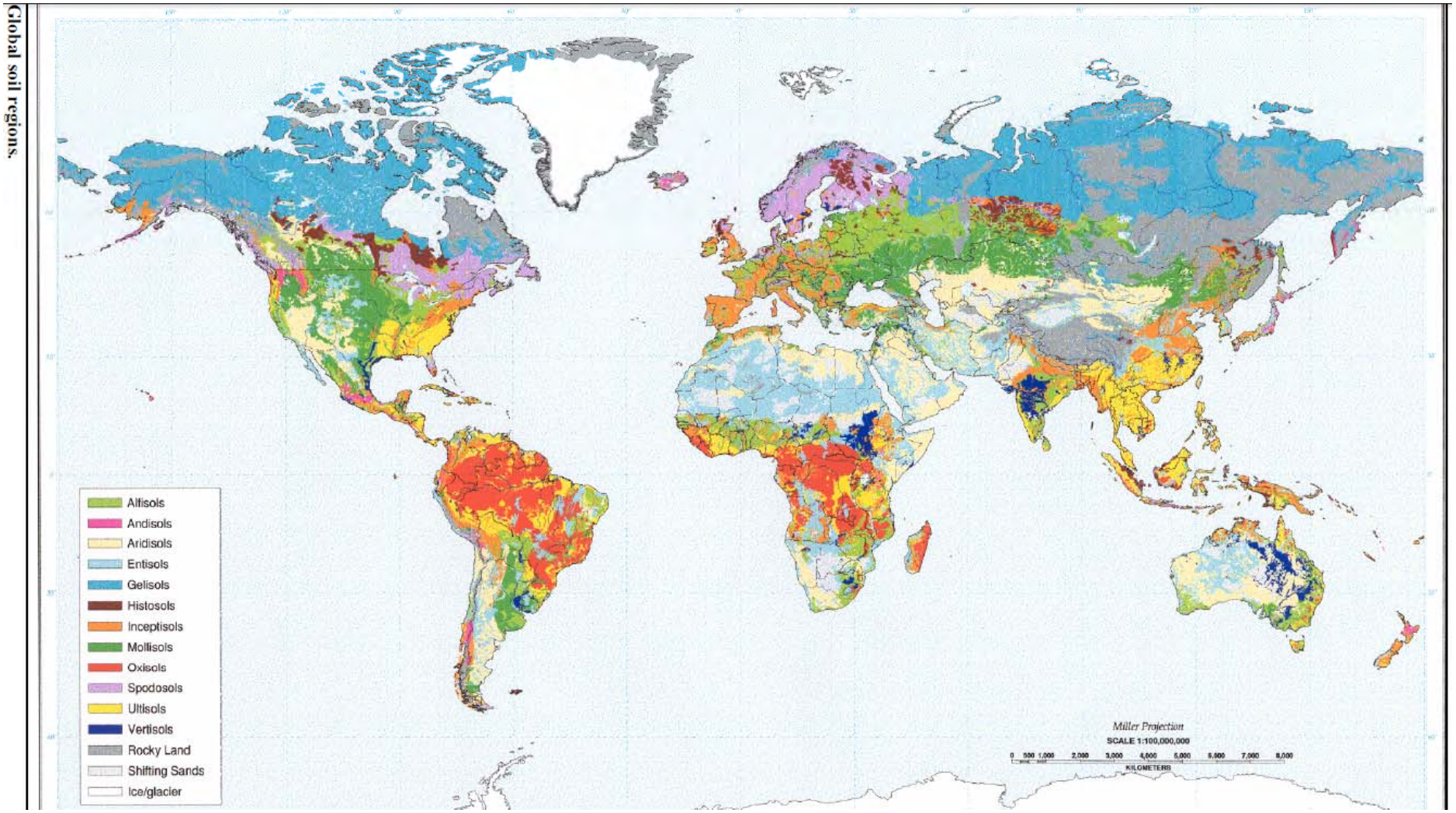


Source: http://sedac.ciesin.columbia.edu/gpw/

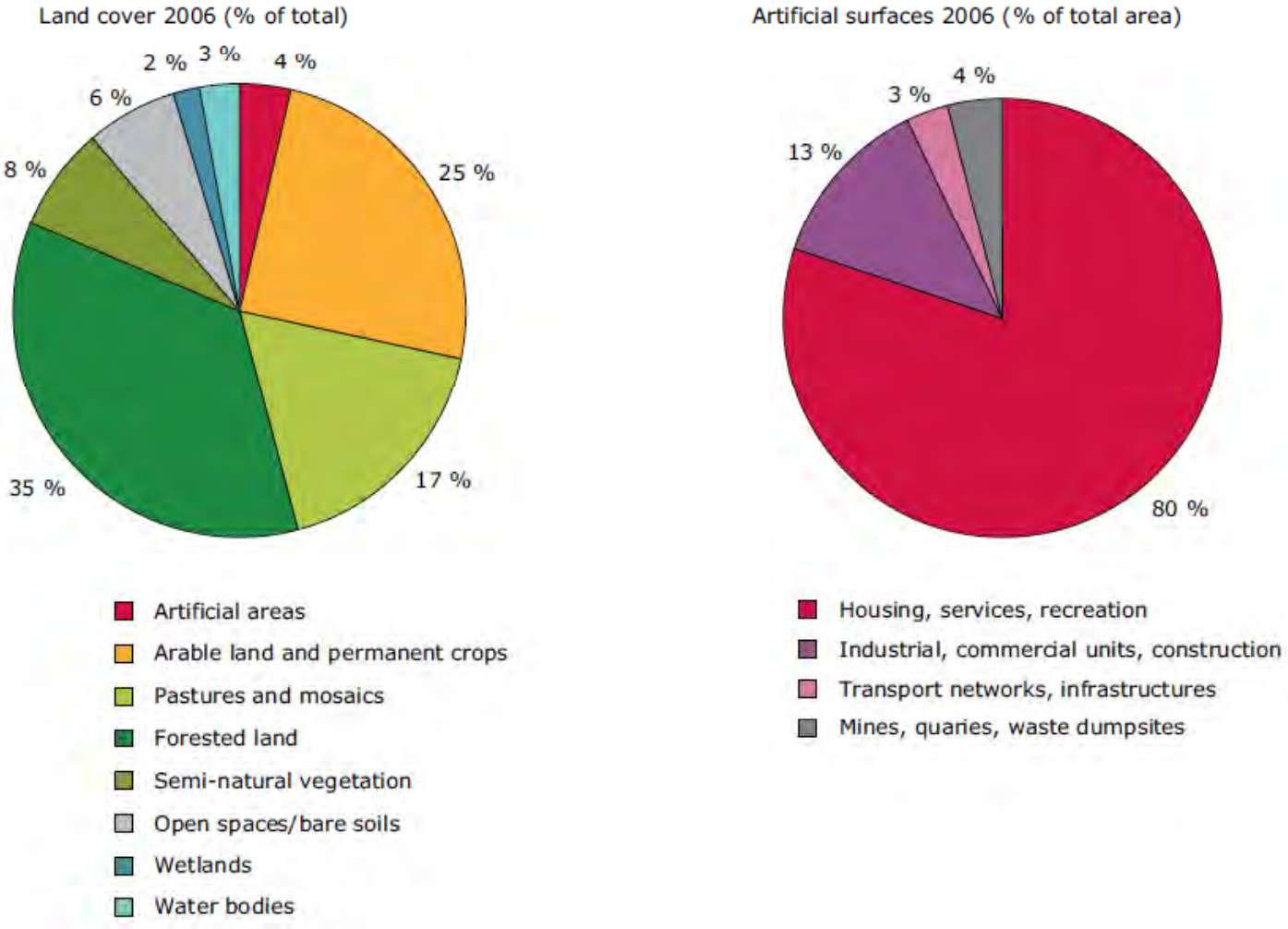
Global land surface (150 million km²)

- Estimates of global soils
  - compiled from various sources
    - Forest ecosystem (34 million km² forest ecosystems)
      - Threat of deforestation
        - » Estimate of annual 100.000 km² loss
        - » http://www.globalchange.umich.edu/globalchange2/current/lectures/deforest/deforest.html
    - Dryland (70 million km², arid, semiarid, dryhumid)
      - Threat of desertification
        - » http://www.fao.org/docrep/007/y5738e/y5738e06.htm
    - Arctic land and glaciers (20 million km² cryosphere)
      - No pedogenesis
        - » http://en.wikipedia.org/wiki/Cryosphere
    - Agricultural used land 16,5 million km²
      - » USDA estimate 2001
      - » http://www.iiasa.ac.at/Research/LUC/External-World-soil-database/HWSD_Documentation.pdf
    - Urban land areas 2,2 million km²
      - » Annual increase 1970 to 2000 was 58.000km²
      - » Most likely number in 2030 4 million km²
      - » Seto et. al. 2011, http://www.plosone.org/article/info:doi/10.1371/journal.pone.0023777

Global Soil Types (Source: USDA 2001)



Average land-use and cover types in Europe: results for 36 countries in Corine



European Environment Agency (2010): THE EUROPEAN ENVIRONMENT: STATE AND OUTLOOK 2010: **LAND USE**

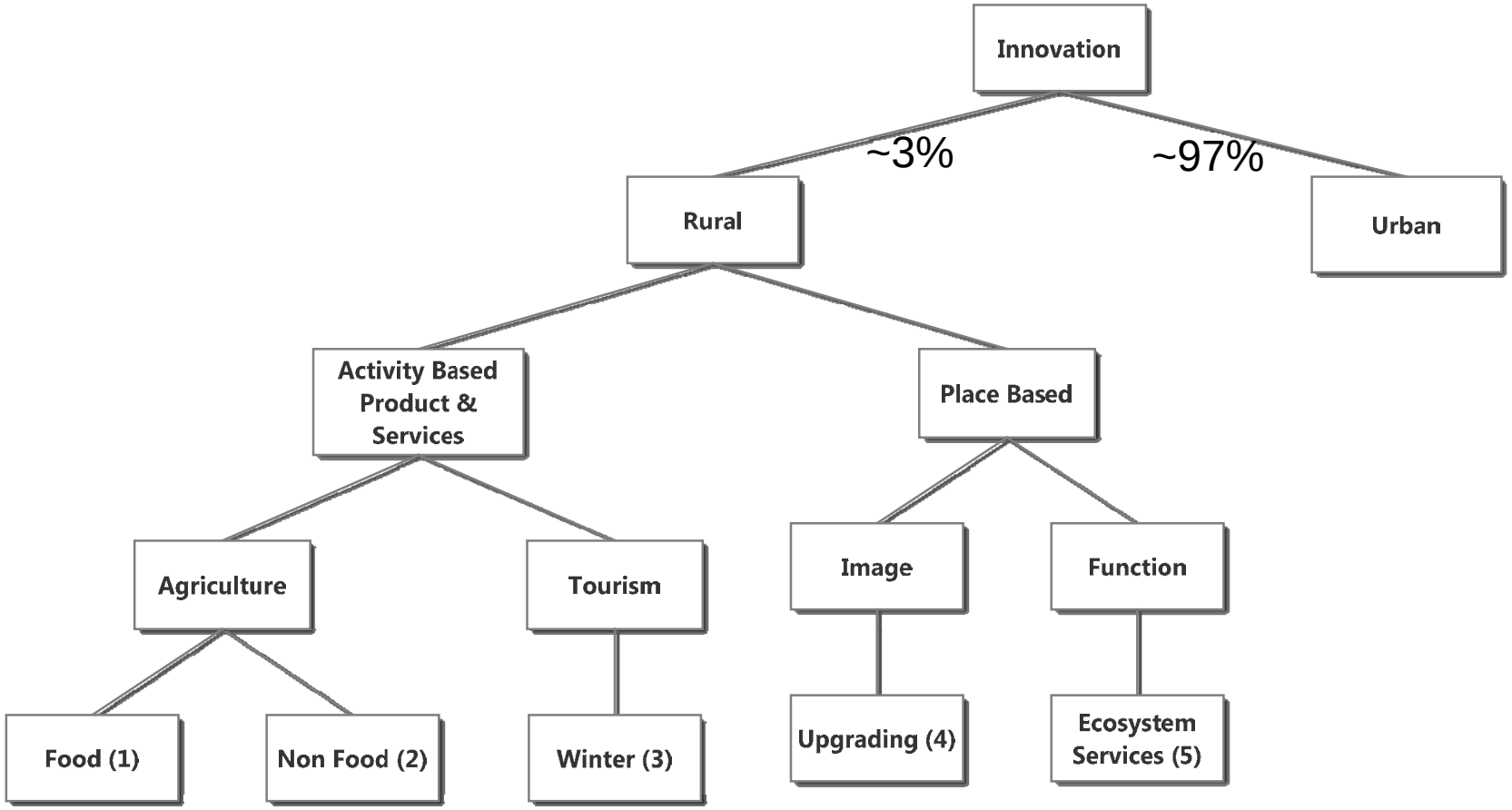
Rural Innovation Related to Human Activity: Trends in Austria and EU (i)

- Innovation related to food production
  - from agricultural machinery to smart farming
- Innovation related to non food production
  - from energy farming to resource renewal and purification
- Innovation related to services (=tourism)
  - from low cost to high tech

Rural Innovation Related to Rural Places: Trends in Austria and EU (ii)

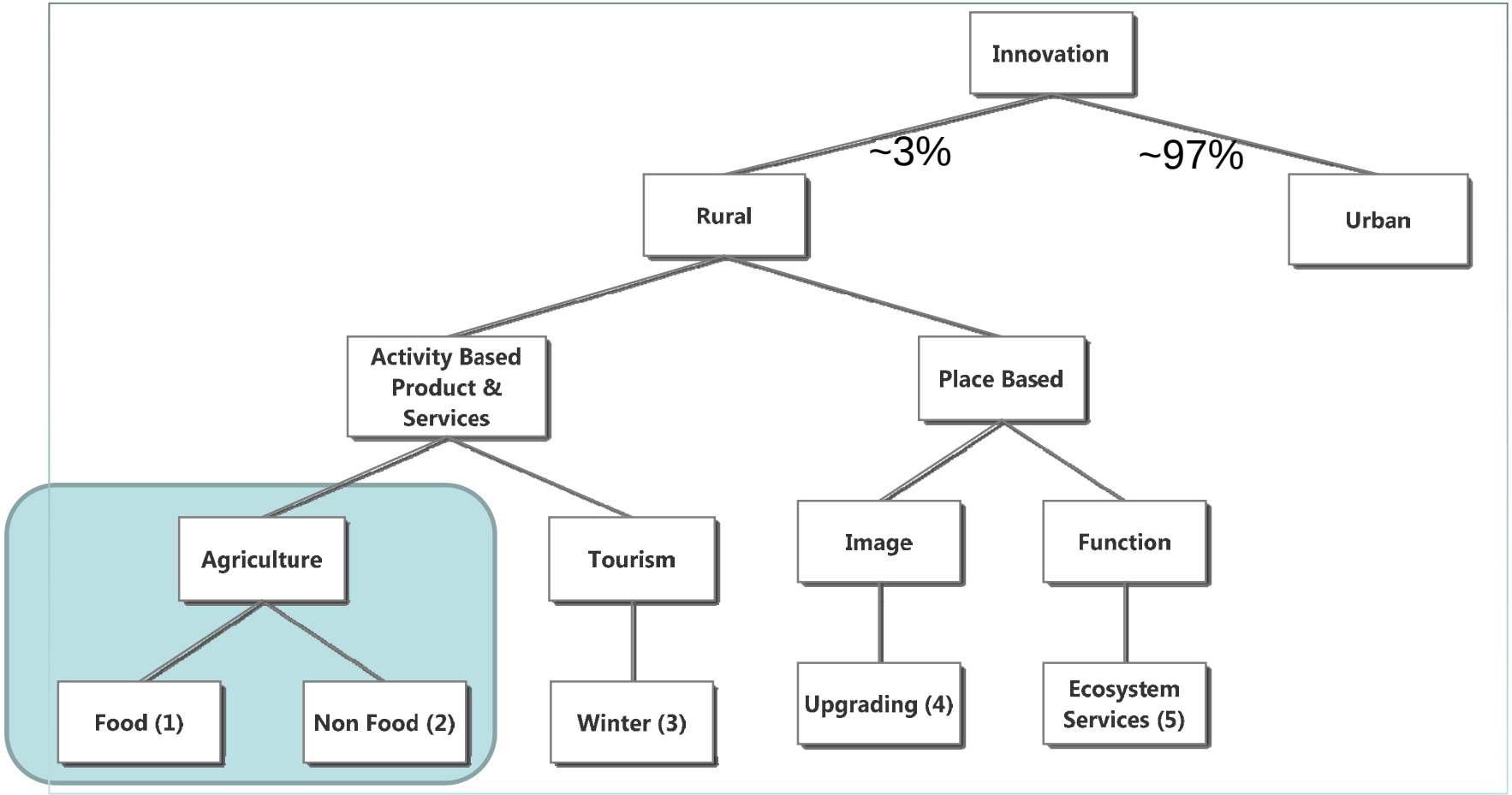
- Innovation related to the image of a place
  - from backward to authentic
  - from decline to village renewal
- Innovation related to higher value of available resources
  - from available at no cost to value ecosystem services

Rural Innovation



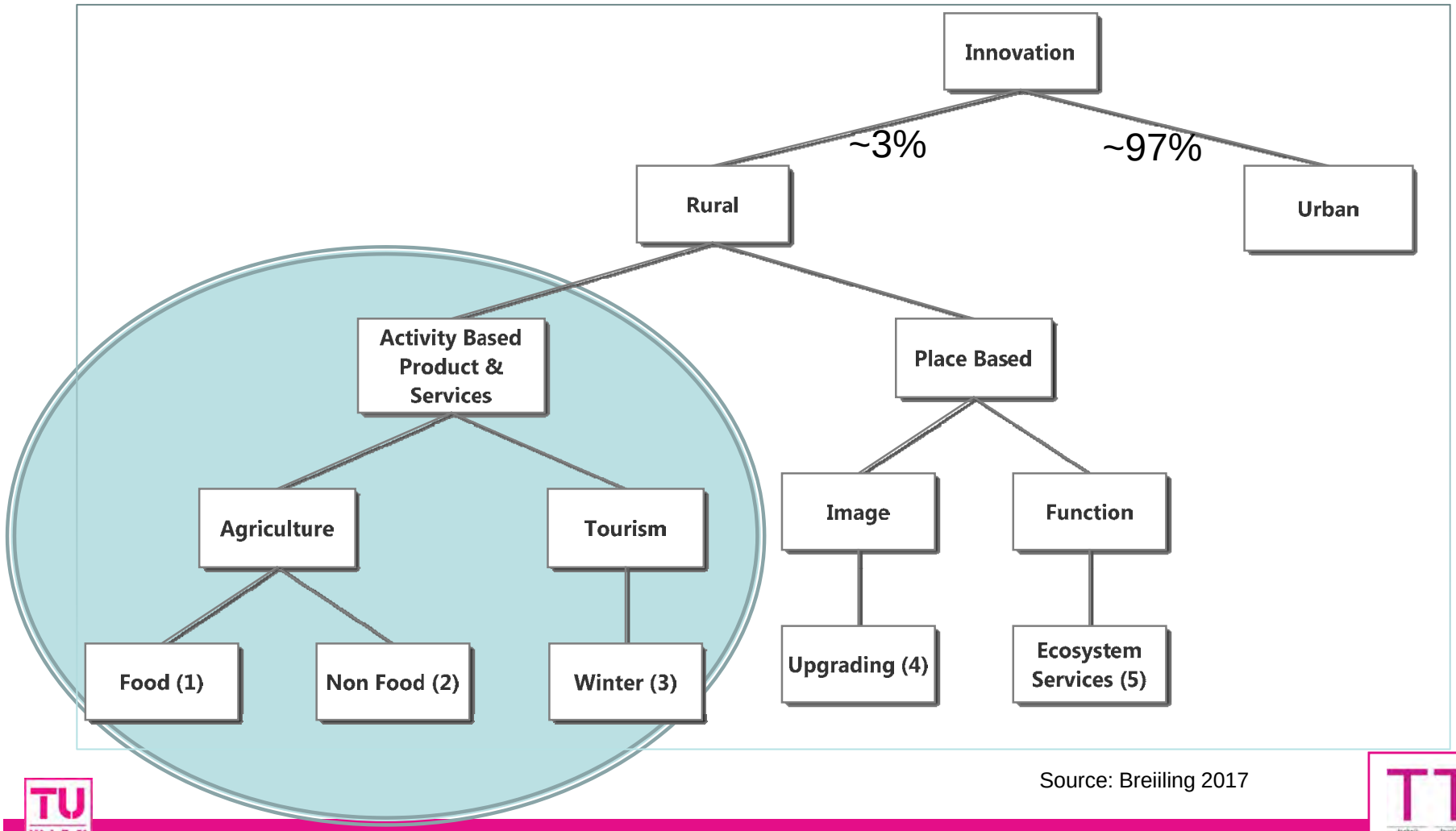
Source: Breiiling 2017

Rural Innovation: Agricultural Machinery, Type 1 and 2



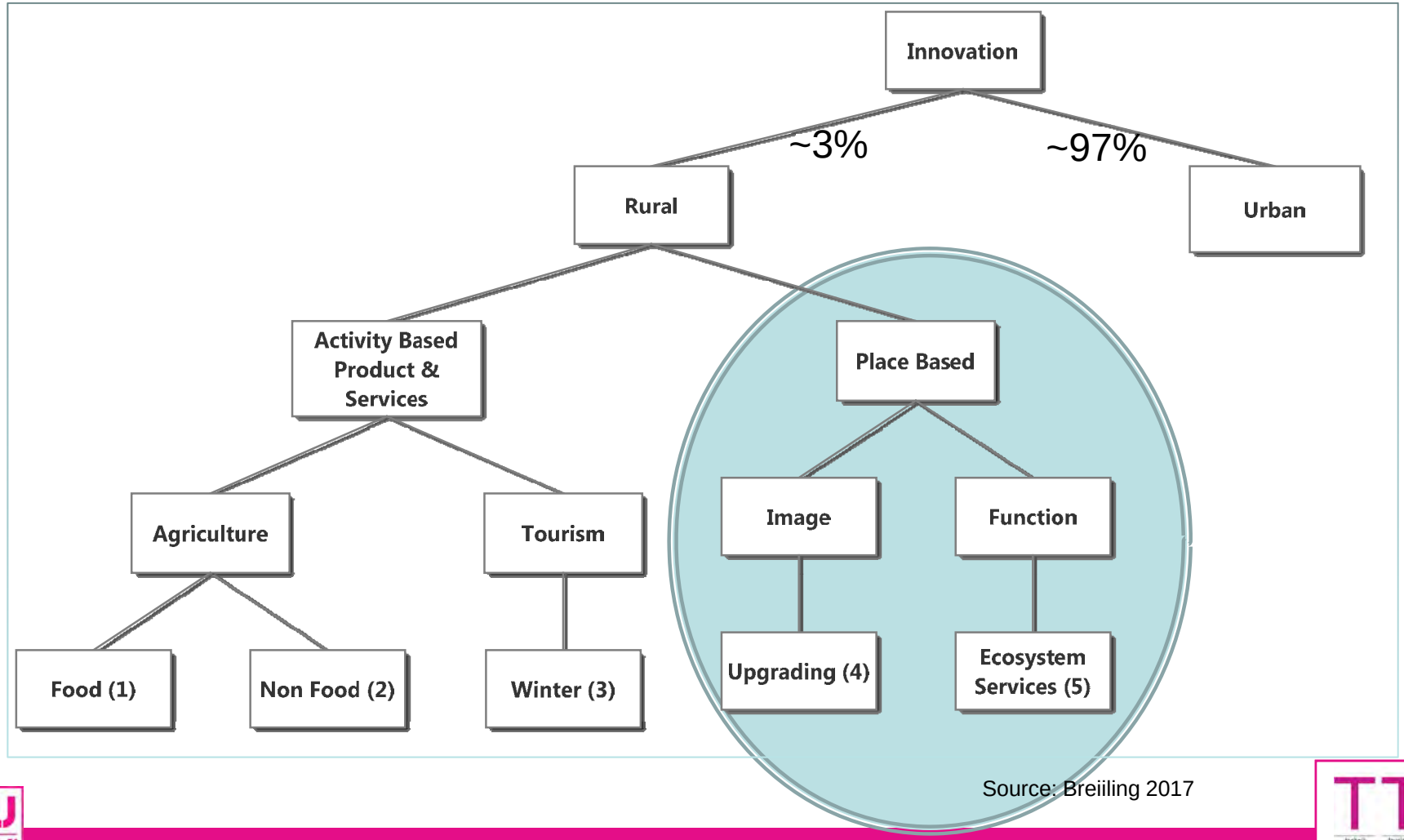
Source: Breiiling 2017

Rural Innovation: Based on Technology Type 1, 2 and 3



Source: Breiling 2017

Rural Innovation: Based on Reassessment, Type 4, 5



Source: Breiling 2017

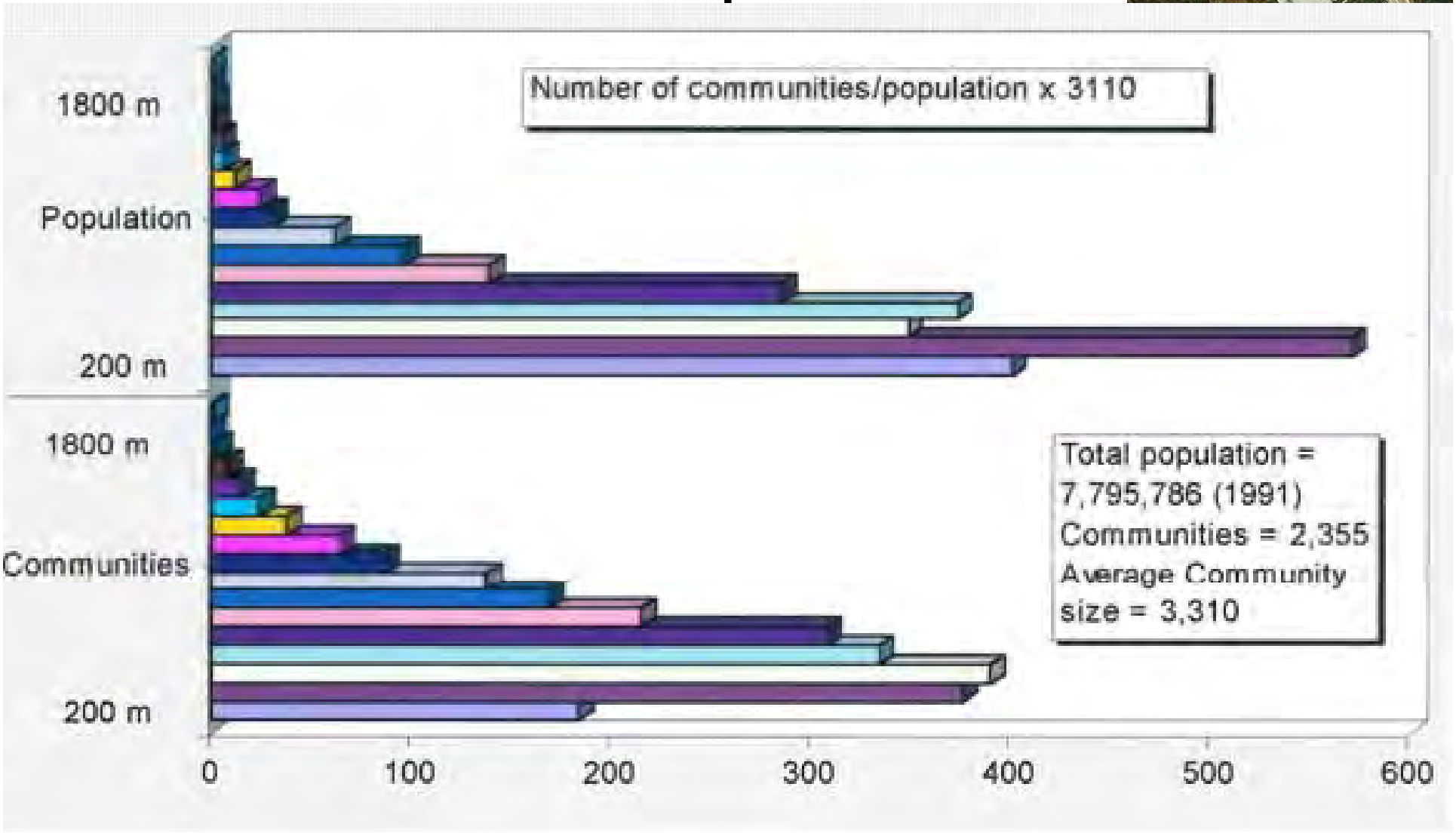
PART 2: EXAMPLES OF RURAL INNOVATION

Experience from Austrian Rural Innovation Type 4, 5

Austria

- Source of map: travel.yahoo.com

Particular Role of Altitude in Rural Landscape



The Austrian rural landscape

- Is the basis for agriculture and tourism

Innovation strategy for rural landscapes

- Unique qualities that can be found in all rural landscapes

Type 1 Rural Innovation: Food Production

- Shift from conventional to organic farming
  - Usually a five years period is required
  - Austria has highest percentage of organic farms within EU -> 21%
  - There are 11 organizations that certify agricultural organic production method
- Create local trademarks
  - http://www.genuss-region.at
  - Particular food products of distinct origin within Austria
    - http://www.genuss-region.at/genussregionen/niederoesterreich/index.html
    - Food products from nine provinces have a seperate homepage
      - http://www.genuss-region.at/genussregionen/niederoesterreich/wachauer-marille-g-u/index.html
      - Food specialities from particular subregion

Rural Innovation Austria: Food production Example Wachau Landscape

Conference Participants “Vulnerability of Agricultural Production Networks and Global Food Chains Due to Disasters” investigating projects in Wachau Landscape, June 22nd, 2016

„Wachauer Wein“ Wine from Wachau Landscape

Since 1990 „Wachauer Beef“ as Trademark

„Wachauer Marille“ Apricot from Wachau Landscape

- A successful project
  - Prices are considerably higher due to the certificate of origin concept
- In 2016 fall out of entire harvest due to late spring frost
  - Enormous damage

Shifting from Conventional to Organic Food Production

- Certified methods of organic food production greatly increase prices

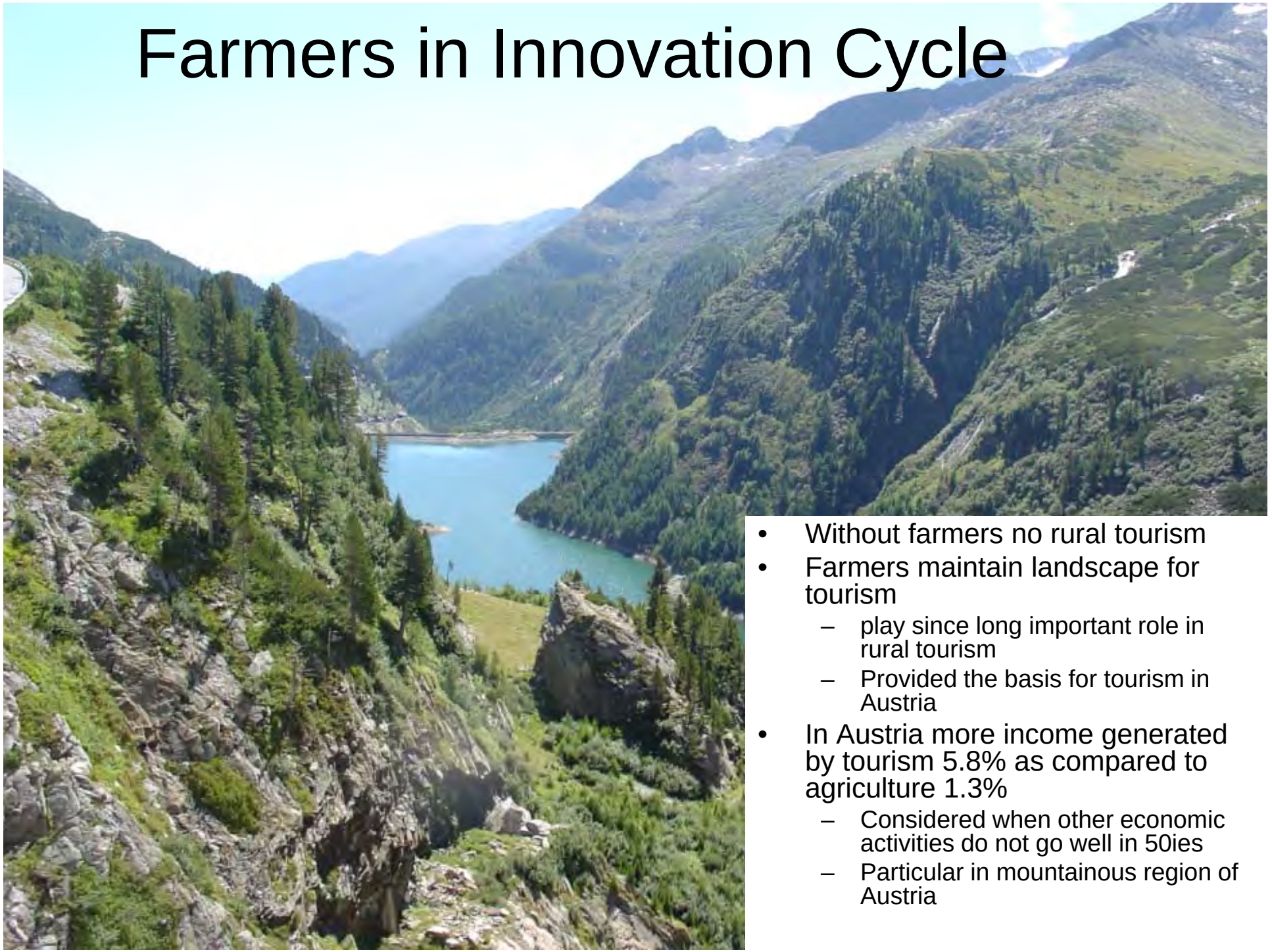
Type 2 Rural Innovation: Non Food Production

- Energy forest
- Biofuels
- Biomass projects
- Wind mills
- Biomass electricity plant
- Waste disposal
- Water purification

Type 3 Rural Innovation: Service Provision -> Rural Tourism

- Farmers stay on their farms to provide services for urban or foreign population that comes as visitors
- Tourism is example for this shift
  - In Austria we distinguish between
    - Summertourism from May to October
    - Wintertourism from November to April
  - Tourism creates three times the value of agriculture

Farmers in Innovation Cycle



- Without farmers no rural tourism
- Farmers maintain landscape for tourism
  - play since long important role in rural tourism
  - Provided the basis for tourism in Austria
- In Austria more income generated by tourism 5.8% as compared to agriculture 1.3%
  - Considered when other economic activities do not go well in 50ies
  - Particular in mountainous region of Austria

Example Innovation by Farmtourism

- Farm tourism
  - offers one seventh of Austrian tourist beds (140,000)
  - Is small scaled and close to a “home stay”
    - Moderate prices, about € 30 for one overnight stay
    - Some € 30,000 turnover per farm and year due to tourism
  - www.farmholidays.com
    - “Trademark” of over 20% of all farms offering tourism
    - Divided into 8 provinces with regional characteristics
      - Common website and Online booking
      - Some 25% higher income than other farms offering farmholidays
    - Offer specialisation for members
      - Organic farming cuisine
      - Children farms
      - Riding farms
      - Wine farms
      - Disabled persons farms
      - Other programs

Rural tourism makes use of cultural heritage

- Most of the attractions are already in the landscape
- Here there are Roman excavations reassigned as tourist attraction

Story telling to outside visitors

- Local people explain connections of their village
- Understanding of wider details become possible

Type 4 Rural Innovation: Image Lifting of Place

- The entire place/village need to be regarded higher and to become more beautiful and economically more valuable
  - Village renewal
    - Elaborating measures to make infrastructure, houses, gardens, more beautiful or to emphasize the beauty of the place in a village settings
  - Bring actions to the village: More transactions between rural and urban
    - Volunteer work camps
    - Lively annual festivals „Kirchtag“
    - Artistic actions: Folk dance, Local skills demonstrations
  - Traditional heritage in the village
    - Farmhouses, churches
    - Fortresses
    - Historic gardens

Type 5 Rural Innovation: Ecosystem Services

- Management of marginally used lands needs to be higher economically evaluated as:
  - Climate protection
    - Carbon sink
  - Disaster protection
    - Floods, droughts, cyclones,
  - Filter protection of soils and vegetation
    - Purification of water
  - Keeping a high biodiversity
    - Often in dependence of agricultural management practice

Rural Innovation Type 5
Renaturation of creek in rural landscape

- In Austria special programs to improve environment of villages (Dorferneuerung)

Combined with flood protection

- River renaturation both in connection with aesthetics and flood protection

Appropriate signing to attract tourists (T4)

- Local products are sold
- The village museum is indicated

PART 3: Technical Innovation in Winter Tourism

An intermediate state of the development of the Dendrite Generator DG

Dendritic snow produced by a DG prototype

Project SNOW

- Builds on a series of previous projects
  - Projects related to the quality of snow and snow physiscs
    - PRIZE09 „Dendritic Snow Production“ Feb. 2010 to Jan. 2011
      - Funded by the Uni:INVENT program of Austria
    - EU INTAS Project 03-51-5296 „Influence on snow vertical structure on hydrothermal regime and snow related economical aspects in Northern Eurasia” May 2004 to April 2007
      - Funded by European Union
    - UNESCO Snow Classification System of 2009

Devoted Developers of the DG

The tourism industry depends on snow

Kitzbühel Hahnenkamm

Alpincenter Kaprun

Iglo Dorf Kaprun

In search for new snow production and snow conservation methods

- Sustainable snow production is not defined yet
  - Danger of misinterpretations
  - In general: produce the same amount of snow with less resources
- Various methods seem feasible
  - Conventional snow making based on snow making devices
  - Cooling the ground (TU Luleå) gives up to 20 days longer season e.g. in Jukkasjärvi Icehotel
  - Conserving the snow of last season (snow farming), e.g. Davos
- Various methods not feasible (at least in EU)
  - Cloud seeding (Russian partners)
  - Micro-organism induced increase of dew point

Snowfarming

Source: M.Phillips, WSL Davos, 2006

Cloudseeding

Quelle: A. Sinkevich, Voichev Laboratory

CONCLUSION

Innovation

Economic Growth Needs Continously Innovation

- If rural areas do not innovate they will vanish
- There is technical innovation and non technical innovation
  - Both are equally important for the future of rural areas
- The value chain increases greatly by innovation
  - Only if urban and rural innovation rates are in balance, further urbanization will stop

Situation Rural versus Urban

- Currently we have globally „peak rural“ and global income of rural areas will continously decline
- Rural innovation is a means to slow down, stop or even reverse this trend
- In another case agriculture may develop into an urban activity

Thank you for your attention!

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