

International Conference on Science and Technology for Sustainability

The Sustainability Path in Asia

A Global Agenda

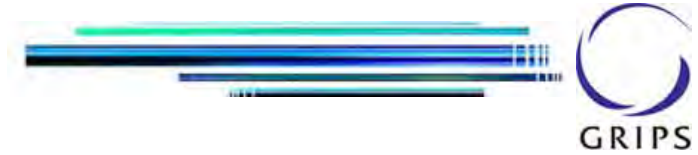


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Key messages



(1) The transdisciplinary approach

- ◆ The significance of understanding the ‘unintended consequences’ of human behaviour

(2) The historical development path in Monsoon Asia

- ◆ The significance of appreciating the social capacity to hold a very large proportion of world population

(3) The environmental foundations of Monsoon Asia

- ◆ The significance of understanding Monsoon Asia’s future for global environmental sustainability

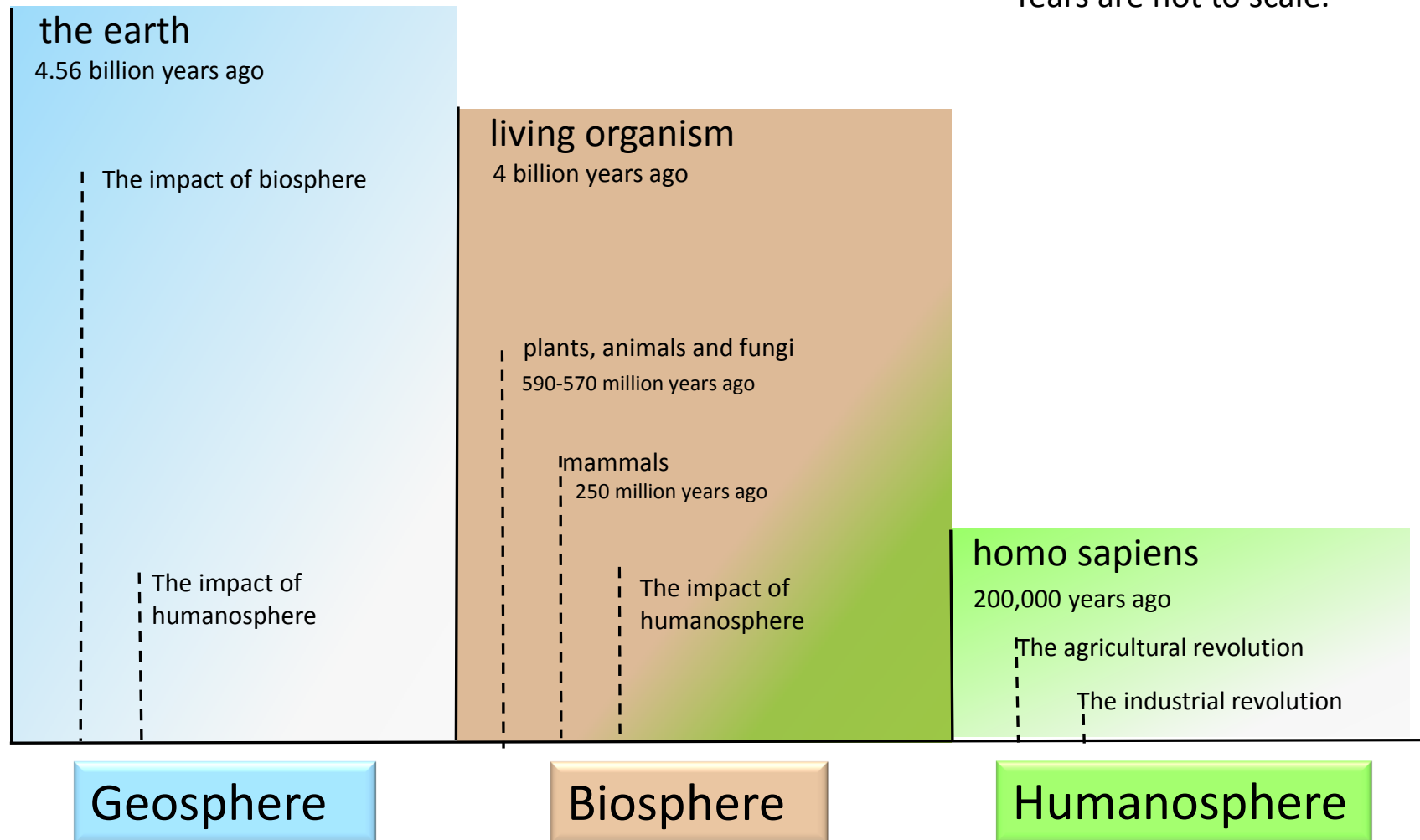
(1) Transdisciplinary approach

Sustainability of three spheres

- ◆ Geosphere, biosphere and humanosphere appeared in this order. The humanosphere depends for its existence on geosphere and biosphere, not vice versa.
- ◆ Geosphere and biosphere have their own logics. They are only partially affected by human activities (e.g. global warming).
- ◆ Yet global environmental sustainability can only be achieved by making all three spheres sustainable, regardless of the extent of human control.

The historical evolution of three spheres

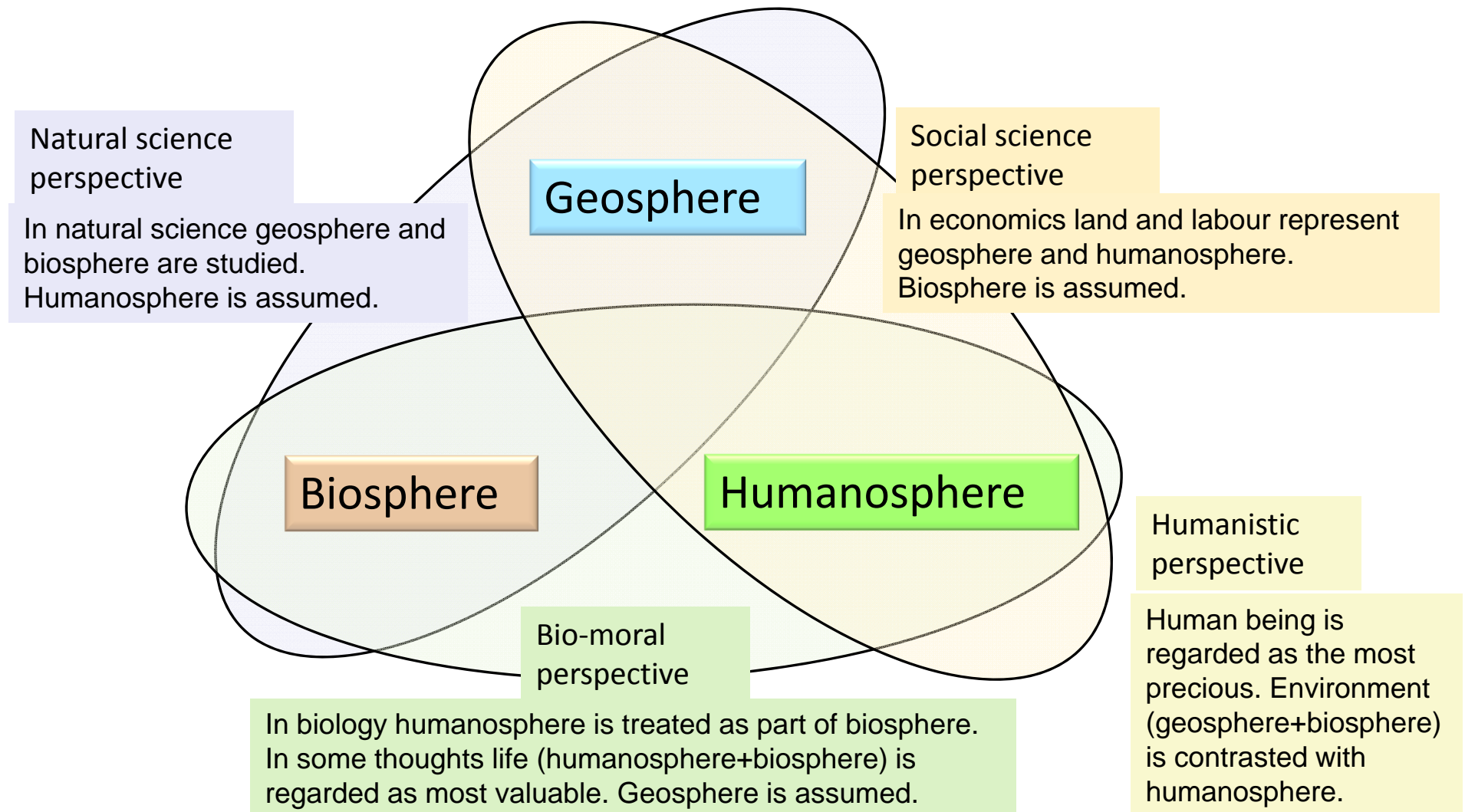
Years are not to scale.



(1-2) The prevailing perspectives

- ◆ The prevailing disciplinary boundaries mean that we tend to consider part of the sustainability issues, assuming that other fields/ issues can be dealt with separately.
- ◆ In practice this is creating a serious ‘unrecognized spot’ for the study of environmental sustainability.
- ◆ For example, the desertification in Central Asia in the 1980s can be studied in the context of the collapse of the Soviet Union or global warming. If social scientist studies the former, and natural scientist studies the latter, who is studying the emergence of a ‘special risk’ created by a ‘coincidence’ of two separate crises?

Prevailing perspectives of three spheres



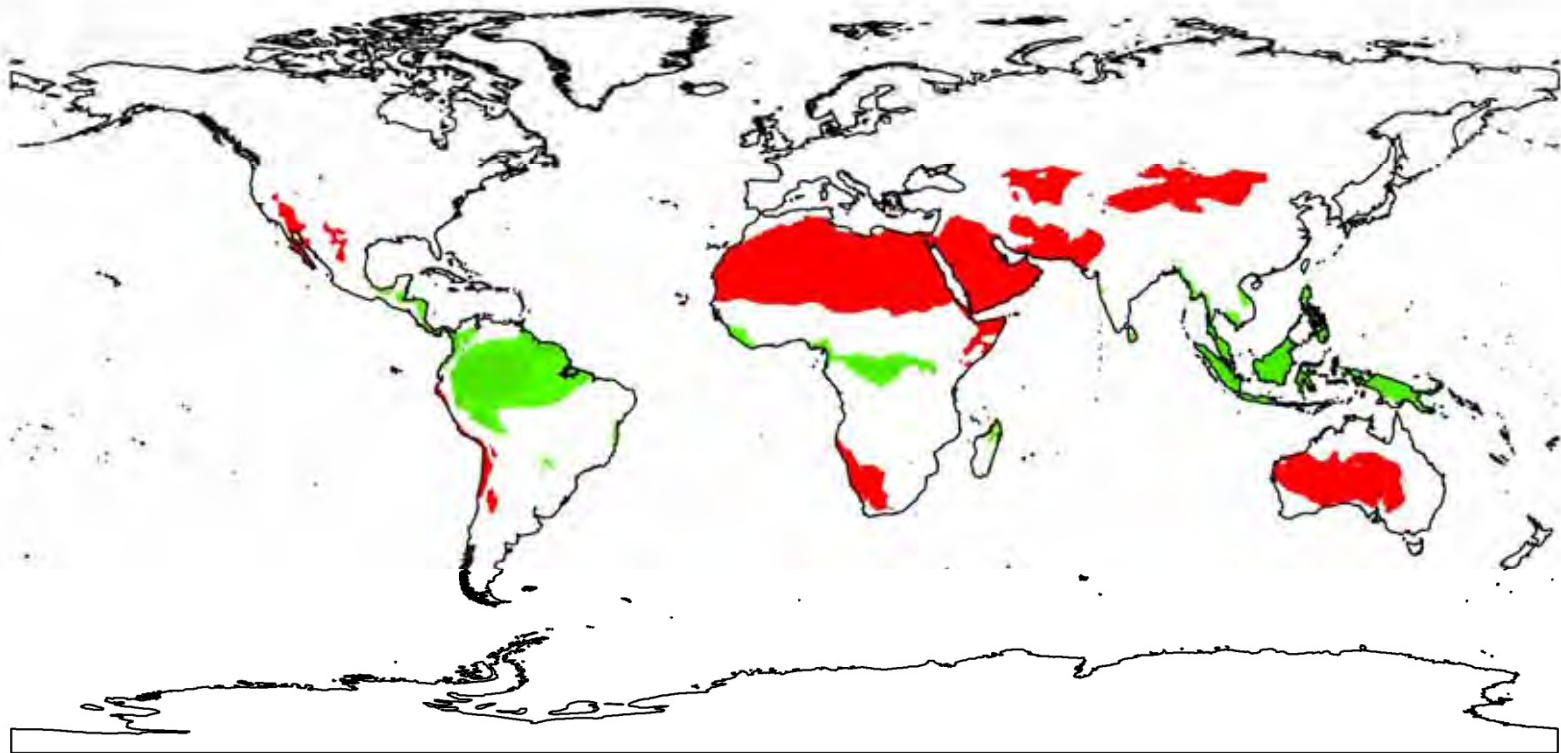
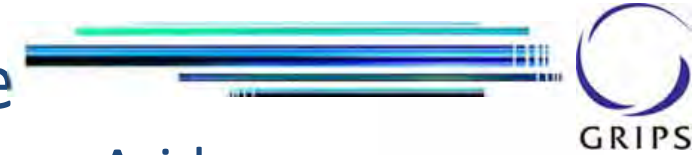
(1-3) The Eurocentric bias

- ◆ Most of the current scientific knowledge has historical roots in early modern Europe, especially the period from the scientific revolution to the industrial revolution.
- ◆ The institutional basis of modern capitalism has been created around the ideas of private property rights (including intellectual property rights).
- ◆ Both technology and institutions evolved around North Western European environment, an environmental periphery with a small percentage of world population.
- ◆ We have had an enormous task of making them compatible with global environmental diversity.

Diversity in tropical climate

Tropical rainforest · Tropical monsoon · Arid

(adapted from Kottek et al., 2006)



 Tropical rainforest  Tropical monsoon  Arid

(2) Monsoon Asia as environmental anomaly

- ◆ Monsoon Asia is endowed with a unique history of technological and institutional transfer between the tropics and the temperate zones, because the eruption of the Himalayas created perhaps the biggest exception for the latitudinal divide of the earth.
- ◆ There have been rich interactions between South and Southeast Asia, located in tropics or semi-tropics, and East Asia, located in the temperate zone, because they were made easier by the common environmental characteristics of monsoon Asia.

The great Himalayan watershed

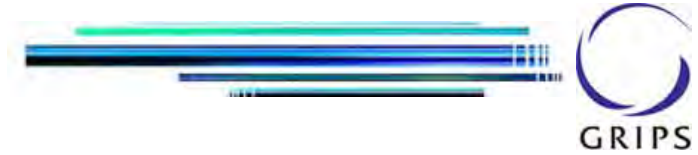


(出所) Pomeranz 2009, 6 を編集。

Economic development in monsoon Asia

- ◆ Harry Oshima stressed the common seasonal rainfall patterns induced by monsoon winds, the centrality of the large delta with a rich soil at the mouth of the river originating from the Himalayas for the growth of each region, and the development of rice farming leading to the unparalleled capacity to hold a large population (*Economic Growth in Monsoon Asia*, 1987).
- ◆ However, the peasant family economy has often been portrayed as a society incapable of transforming itself into the modern, industrial one without an impact from outside (namely Western impact).

The East Asian path (1): the industrious revolution



- ◆ The more recent research elaborated the long-term path of economic development in each region for the past few centuries. In the lower Yangzi delta, the core region of East Asia, the peasant family economy, centring on rice cultivation but combined with commercial crops and proto-industry, developed labour-intensive technology and labour-absorbing institutions by the 17th century. Other areas, including Japan, pushed these efforts further, as population grew and land became scarcer.
- ◆ Such an East Asian pattern of development was characterized as the “industrious revolution” path.

The East/Southeast Asian path (2): labour-intensive industrialization

- ◆ The industrious revolution path provided the basis for labour-intensive industrialization, beginning in Japan after the late nineteenth century and diffused in other parts of East Asia in the first half of the twentieth century.
- ◆ In this phase, cheap labour of a good quality was fully exploited, while the use of capital was minimized, in adapting Western technology and institutions.
- ◆ After World War II, the labour-intensive path diffused beyond East Asia, slowly but steadily, making a decisive contribution to the global diffusion of industrialization.

(3) Environmental foundations of Monsoon Asia

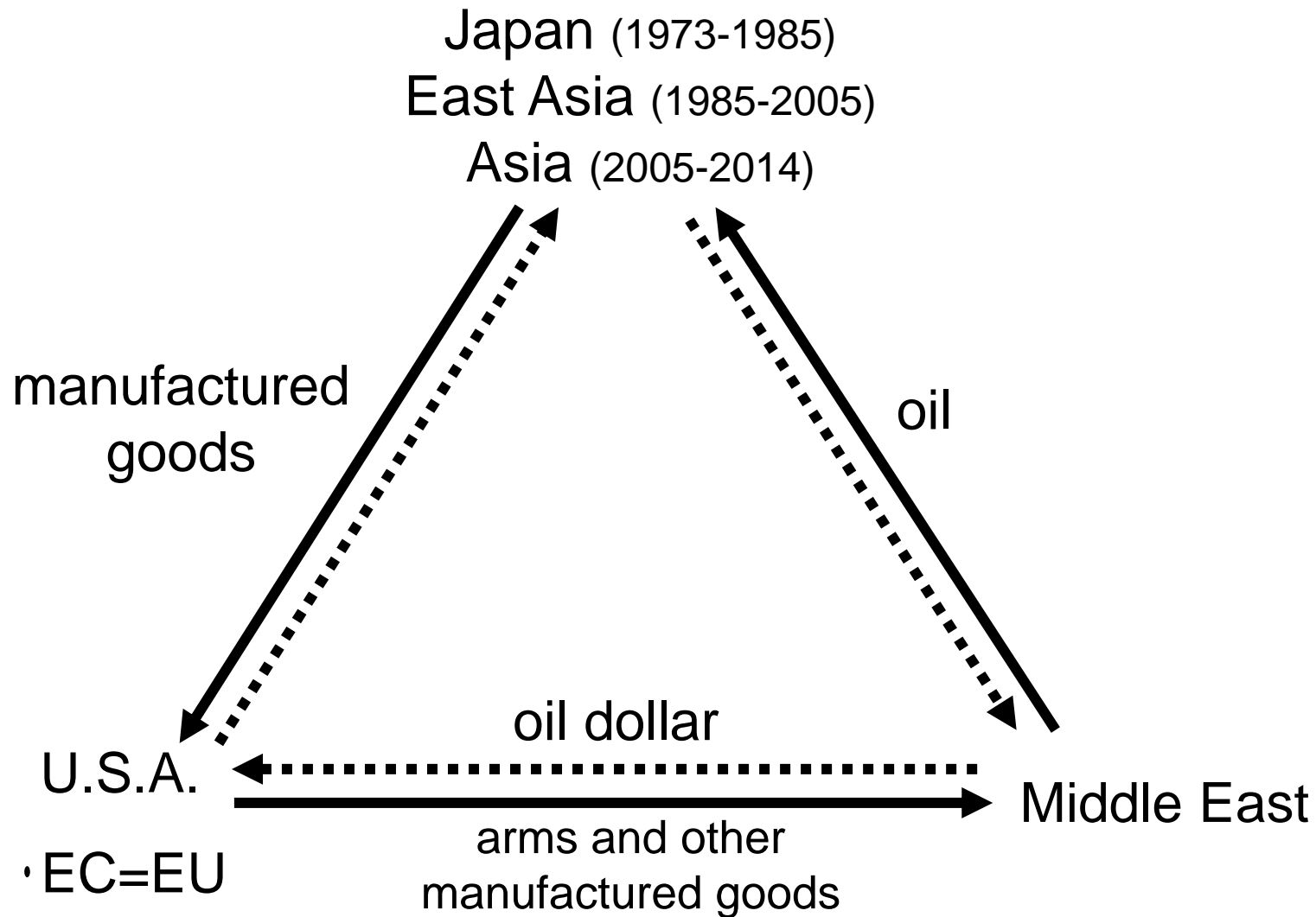
- ◆ As most developing countries in and around Monsoon Asia lacked capital and modern technology, but had access to local resources, they also had a tendency for adopting relatively less resource- and energy-intensive production methods, through the diffusion of reliable knowledge (in addition to scientific one).
- ◆ The development of local resource use in Monsoon Asia is a fertile source of imagination for the study of human relationships with nature, especially those of densely populated regions' livelihood strategies with their environs (such as forests, rivers and coasts).

Source : UN 1956, 18-20.

Asia as consumer of global resources

- ◆ Over the past twenty years, growth economies of Asia became the largest net importer of mineral resources and fossil fuels (e.g. imports of oil from the Middle East).
- ◆ Energy consumption increased not just in manufacturing and transport sectors (the shares of these sectors declined, partly as a result of the improvement in energy efficiency) but in the household sector, as air conditioners and refrigerators diffused among the ordinary people.
- ◆ Arrival of the ageing society in Asia would reinforce the relative importance of energy consumption at home, care institutions and hospitals.

The Oil Triangle, 1974-2014



Asia as leader of resource- and energy-saving technology

- ◆ At the same time, Japan developed resource- and energy-saving technology by responding to diversified needs. Other Asian countries also compete in the international markets of energy-saving and eco-friendly products.
- ◆ Today, Asia contributes significantly to the global trend towards energy efficiency and better resource use. There is a possibility of sharing these ideas across national and political differences.

Concluding remarks (1)

- ◆ Monsoon Asia has been feeding a very large proportion of world population over the long run. Its institutional design tended to accommodate the careful and efficient use of limited natural resources rather than the increase of productivity through labour-saving, resource-intensive methods.
- ◆ While fully appreciating the contributions of modern technology and institutions, developed in the West, to the enhancement of economic welfare on a global scale, we also need to take advantage of the norms and institutions, engrained in monsoon Asia, in order to secure global environmental sustainability.

Concluding remarks (2)

- ◆ Future Earth is going to work with both ISCU and ISSC, as it recognizes the importance of collaboration between scientists, and humanities and social scientists.
- ◆ Japan has a role to play, because (1) it has a strong scientific community, (2) it has the longest history of industrialization as a country belonging to the monsoon Asian development path, and (3) the society has a mature and sensible understanding of human-nature interface, not least because it has gone through bitter experiences of pollution and man-made disasters in recent times.



Thank you.

