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Innovation system

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The concept of the **innovation system** stresses that the flow of technology and information among people, enterprises and institutions is key to an innovative process. It contains the interaction between the actors who are needed in order to turn an idea into a process, product or service on the market.

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Development and diffusion of the concept [\[edit\]](#)

Systems of Innovation are frameworks for understanding innovation which have become popular particularly among policy makers and innovation researchers first in Europe, but now anywhere in the world as in the 90's the World Bank and other UN affiliated institutions accepted. The concept of a 'system of innovation' was introduced by B.-Å. Lundvall in 1985 ^[1] "however, as he and his colleagues would be the first to agree (and as Lundvall himself points out), the idea actually goes back at least to the Friedrich List's conception of "The National System of Political Economy" (1841), which might just as well have been called "The National System of Innovation" (Freeman, 1995). Christopher Freeman coined the expression "National Innovation System" or in his 1988 study of the success of the Japanese economy.^{[2][3]} The concept, similarly used as "National System of Innovation" or "National Innovation System" was later applied to regions and sectors. According to innovation system theory, [innovation](#) and technology development are results of a complex set of relationships among actors in the system, which includes enterprises, universities and research institutes.

Innovation systems have been categorized into [national innovation systems](#), [regional innovation systems](#), [local innovation systems](#), [technological innovation systems](#) and sectoral innovation systems.

There is no consensus on the exact definition of an innovation system, and the concept is still emerging. Innovation is often the result of the interaction among an ecology of actors, and the term 'innovation ecosystem' is occasionally used to emphasize this. For some, the expression 'innovation ecosystem' is a subset or synonym of 'innovation system'. Others separate between the expressions, using the expression "innovation system" for labeling a planned innovation environment, and "innovation ecosystem" for an ecological innovation environment.^[4]

Recently, the debate also started to study the problems that affect green innovation since in addition to the issues typical of innovation generally (such as market failures related to limited appropriability of economic benefits of knowledge), green growth innovation is also hindered by market failures related to the environment (pollution externalities). It is possible (and not uncommon) for an innovation system to successfully support innovation in many technology areas, but not in ones related to green growth. For this reason, it is necessary to focus on addressing both kinds of failures in order to drive innovation towards a green growth trajectory.^[5]

Examples of Definitions of National Innovation Systems [\[edit\]](#)

A national system of innovation has been defined as follows:

- "... the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies." (Freeman, 1987)
- "... the elements and relationships which interact in the production, diffusion and use of new, and economically useful, knowledge ... and are either located within or rooted inside the borders of a nation state." (Lundvall, 1992)
- "... a set of institutions whose interactions determine the innovative performance ... of national firms." (Nelson, 1993)
- "... the national institutions, their incentive structures and their competencies, that determine the rate and direction of technological learning (or the volume and composition of change generating activities) in a country." (Patel and Pavitt, 1994)
- "... that set of distinct institutions which jointly and individually contribute to the development and diffusion of new technologies and which provides the framework within which governments form and implement policies to influence the innovation process. As such it is a system of interconnected institutions to create, store and transfer the knowledge, skills and artefacts which define new technologies." (Metcalfe, 1995)