

Policy paper on
**commons for
development of more
efficient innovation
ecosystems**

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Policy paper on commons for development of more efficient innovation ecosystems

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Authors: Lina Svensberg, Jakob Lindvall, Per Danielsson, Compare Foundation/DigitalWell Arena and Anders G Nilsson, Ideon Science Park.

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Executive summary

The emergence and development of societies and markets are based on the access to and application of various commons, which streamline evolutionary development, including in the development of innovation ecosystems. However, the current Swedish innovation support system generally lacks models to finance the development, further development, and management of commons in a way that results in long-term value creation.

Problem formulation och analysis

The development of various innovation-supporting assets, such as tools, methods, and models, is financed through various development projects. However, today, there are insufficient incentives created to build long-term sustainable operations that can spread the use of these resources and manage and develop them in economically sustainable ways. This is particularly problematic in light of the need for transformative innovation and systemic change, which underpin the emergence of third-generation innovation policy, where coordination and learning are key dimensions. We see several aspects that hinder the development towards more effective innovation ecosystems:

1. *The project financing logic that dominates in the Swedish innovation support system is not suited for leading to long-term value-creating operations, and thereby not to sustainable commons either.*
2. *The understanding of commons as a management form is low in the Swedish innovation support system, among both financiers and implementers.*

Proposed actions

1. *Development and implementation of financing structures for commons in innovation ecosystems.*

This involves clearly distinguishing between traditional project financing and long-term investment logic, and adapting these structures to meet the unique needs of commons.

2. *Strategic Learning about commons in innovation ecosystems.*

To optimize innovation ecosystems, it is crucial to enhance understanding of the relationship between the design and outcomes of commons. Each commons is unique and requires experimental design of rules to achieve desired outcomes. As experimentation increases, so does the need to facilitate strategic learning within the ecosystem.

3. Exploration and development of technical platforms for managing commons in innovation ecosystems.

With technological advances in AI, such as knowledge graphs and large language models, new opportunities arise to further develop and manage commons. This requires platforms that can handle diversity in usage and IT environments across organizational boundaries.

4. Exploration and development of monitoring and evaluation methods for commons in innovation ecosystems.

It is important to identify which factors determine whether and when commons create value. Key aspects to consider include how many resources—time, commitment, and funding—the asset attracts, the scope and nature of its use (use-as-value), and the effects of its use, such as behavioral changes or shifts within the ecosystem.

Background

The emergence and development of societies and markets rely on access to and application of various system-wide assets, known as commons, which streamline evolutionary development, including within innovation ecosystems. However, the current Swedish innovation support system generally lacks models to finance the development, further development, and management of commons in a way that results in long-term value creation.

In the fall of 2023, Vinnova granted a preliminary study on the subject, citing that it is a challenge that Vinnova and the actors in the support system have struggled with for a long time. It is also noted that the issue has become more prominent recently, as transformative innovation has emerged as a hot policy topic, crucial for the development of solutions for innovation in general, and for the green and digital transformation of society in particular. This policy report is a result of that preliminary study. The preliminary study also resulted in:

- [Manual for financing commons for innovation ecosystems](#) (Available in Swedish and English).
- [Legal memorandum - commons in innovation ecosystems and state aid](#) (in Swedish).
- [Models for describing, organising and analysing commons](#) (in Swedish)
- [Final report of the preliminary study](#) (in Swedish, with English summary).

Definition of key concepts in this report

Innovation system vs. innovation ecosystem

Neither term has a clear and universally accepted definition; instead, there are various closely related "definitions" of each concept. A common feature of both is that they involve the structures, interactions, and relationships necessary for a system to successfully develop and exploit innovations.

The primary difference is that an innovation system emphasizes the institutional aspect – the network of public and private subsystems and actors that need to interact to successfully develop the conditions for and the development of innovations. This includes, for example, the interplay between industry, academia, politics, consumers, and institutional frameworks.

An innovation ecosystem does not center on institutions but starts from a given set of organizations/"organisms," such as life-science startups, and describes the living conditions and environment for these "organisms." Thus, an innovation ecosystem involves describing the environment and living conditions for a set of organizations to effectively develop and exploit innovations.

Since the focus of the report is on ecosystems, we further develop the concept: Like other types of ecosystems, innovation ecosystems are "nested" systems, where systems are included in, and relate to, other systems, and the delimitation of the system in each analysis depends on what one wants to analyze.

Ove Granstrand and Marcus Holgersson propose the following definition of an innovation ecosystem: "An innovation ecosystem is the evolving set of actors, activities, and artifacts, and the institutions and relations, including complementary and substitute relations, that are important for the innovative performance of an actor or a population of actors"¹. Competition among the actors is also highlighted as an important aspect. Each ecosystem is built to some extent on commons over which they then compete, meaning – each ecosystem needs to have a balance between commons and competition.

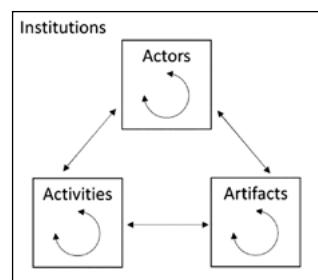


Fig. 1. Illustration of the innovation ecosystem definition.

¹ Innovation ecosystem: A conceptual review and a new definition by Ove Granstrand and Marcus Holgersson.

Institutions

In this context, the term 'institutions' refers to "the rules of the game," or common rules of play. Depending on the common rules in an innovation ecosystem, the conditions can vary significantly. For example, consider these two different models:



Commons and community

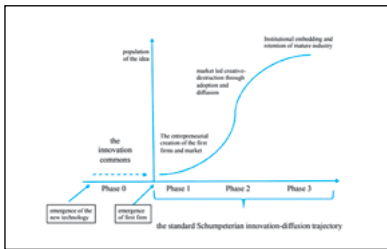
Commons is a general term for shared assets that are governed by a group of people, a community. Originally, commons referred to physical assets. When we discuss commons in relation to digital assets, there are many aspects of collective action related to development, further development, and/or management, which the theory around commons can help us understand and describe. Depending on the definition, the term for digital assets may include assets where various dimensions of collective action related to development, further development, and governance play a central role in the outcome. Therefore, in this report, we use the term commons in a broad sense.

Tragedy of the commons and Ostrom's Eight Principles

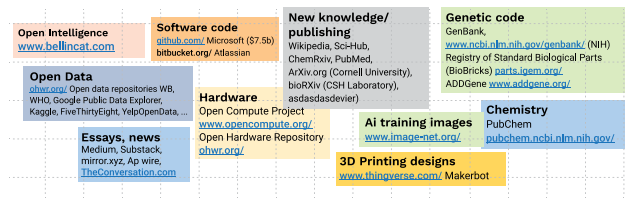
Elinor Ostrom's research challenged the conventional view of common resources – that they inevitably lead to overexploitation and depletion, known as the tragedy of the commons. By studying thousands of common assets, she identified 8 principles that long-term sustainable assets share, regardless of the type of asset or geographic location. These principles suggest that effective and sustainable management of common resources requires locally adapted, collectively agreed-upon rules, and mechanisms for monitoring, sanctioning, and conflict resolution.

Innovation commons

A specific form of commons that is interesting from an innovation policy perspective is the innovation commons, a term introduced by the New Zealand researcher Jason Potts, to describe an environment he considers to be a breeding ground for innovation².



According to Potts, innovation commons are a common-pool resource where distributed information is gathered and made accessible, thereby facilitating entrepreneurial discovery. *"The key resource in an innovation commons is not the technology itself, but the distributed, partial, and heterogeneous information that surrounds it."* Examples of communities that create innovation commons include hacker spaces³, and the classic example, the Homebrew Computer Club at Stanford. The following image is taken from a presentation by Potts, where he describes various forms of innovation commons⁴:



Examples of organizing ecosystems around the collective development of common resources, and models for balancing commons and competition, can be drawn from communities involved in open source software development.

² Innovation Commons, The Origin of Economic Growth, Jason Potts.
³ From hackers to start-ups: Innovation commons and Local Entrepreneurial Activity <https://www.sciencedirect.com/science/article/pii/S0048733322001962>.
⁴ How innovation commons contribute to discovering and developing new technologies, Darcy W.E Allen, James Potts.

Problem formulation

The Swedish innovation support system is fragmented and largely consists of underfinanced activities, presenting a challenge in developing long-term sustainable business models. The project financing logic that prevails today is not suited to result in long-term value creation, whether through actors, operations, or commons.

The development of various innovation-supporting assets, such as tools, methods, and models, is financed through different development projects. However, currently, there are insufficient incentives to build operations that are sustainable in the long term, which can disseminate the use of resources and manage and further develop them in economically sustainable ways. This leads to resources, whose development is financed with public project funds, rarely continuing to create value over time. The desired effect of the financing is not achieved, and actors in the system, both financiers and funding recipients, express frustration that they are "constantly reinventing the wheel" instead of building on the experiences and lessons accumulated in the system.

This is particularly problematic in light of the need for transformative innovation and systemic change, which underpin the emergence of third-generation innovation policy, where coordination and learning are key dimensions. Vinnova emphasizes the importance of mechanisms that drive the interaction between innovative solutions of a technical and methodological nature on the one hand, and the infrastructure, regulations, and demand required for innovations—individually or in clusters—to make a difference on the other.

Analysis on the current situation

We observe two main aspects that hinder the development towards more effective innovation ecosystems:

5. *The Project Financing Logic that dominates in the Swedish innovation support system is not suited for leading to long-term value-creating operations, nor to long-term sustainable commons.*
6. *Understanding of commons as a governance form is low in the Swedish innovation support system.*

We can trace the issue to the project financing logic extensively used for financing the Swedish innovation support system. Two main financing logics are identified - project financing logic and investment logic.

Project financing logic

This model follows a research or consultancy logic, where an expert undertakes a specific task – often a research or development project. The expert then delivers a tangible result, such as an article, report, or prototype. The primary purpose is to address a specific problem, challenge, or fill a knowledge gap, meaning the problem is central. In this model, the focus is on the solution and the quality of the expertise. Once the project concludes and the result is made available, the expert's commitment to utilizing the project result also ends, and the responsibility for utilizing the result typically falls on the commissioning party. The assessment within this model focuses on the project's and its participants' ability to solve the problem. Assessors must consider the project's relevance, feasibility, budget credibility, and the team's potential to achieve the solution.

Investment logic

In contrast to the project financing model, the investment model focuses on creating or developing an operation. The operation and its potential value creation are central. The responsibility for utilization lies with the recipient of the financing. The focus here is on the applicant's capacity, with the help of financing, to create long-term value, whether economic or social. Key considerations include the potential to meet demand, the ability to realize the intended value, the competitive situation, development and validation of a business model, and the capacity to attract necessary resources for long-term value creation. This implies an entrepreneurial approach and capability. Financing is often awarded in stages, with smaller investments in the early, most uncertain stages, and the size of the investments increases as uncertainty decreases, in line with venture capital logic.

The choice of financing logic depends on the desired outcome. One must consider whether the purpose of the financing is to contribute to a long-term sustainable operation or rather to finance the solution of a problem or fill a knowledge gap, and whether the value is to be realized by someone other than the performer of the project.

What happens when we apply the research/consultancy model to operational development?

If we apply the research/consultancy model to business development, the best project gets the funding, not necessarily the operation with the greatest potential to create long-term value. It is often unclear how the project result will be utilized once the project ends. The research/consultancy model does not include requirements for the project implementer to develop a sustainable business or economic model, which reinforces the short-term nature of the project outcomes. Consequently, the project model fails to

develop and validate important characteristics that a sustainable business model would require: verifying that there is a demand for the value created by the operation, and that the recipient of the financing has the capability to meet that demand. From the financier's perspective, this model also means that system effects and portfolio strategies for system development are absent or weak. The result is a fragmentation of the innovation support system and undercapitalization of operations. There is a lack of incentives to develop long-term sustainable operations, and the assets developed are not further developed or used sufficiently.

What does an investment logic mean in relation to commons?

The development of commons involves the creation of assets that are to be shared by a community and utilized by its members to efficiently exploit an innovation opportunity. The value of the development work must be assessed based on at least:

- The size of the community that will benefit from the asset (comparable to a primary market for an innovation).
- The application potential of the asset, i.e., the significance and scope of the use cases for which the asset is critical.
- The willingness, capability, and long-term commitment of the organization tasked with developing, disseminating, further developing, and managing the asset (this assumes one organization does all activities, but there may be cases where organizations collaborate on this, and then the interaction and cooperation between these organizations must be evaluated).

For these reasons, a research/consultancy financing model is not suitable for the development of commons; instead, an investment model should be applied. Both the value-creating potential of the commons and the funding recipient's ability to attract resources and realize the value of a commons need to be assessed. The [manual for financing commons for innovation ecosystems](#) provides guidelines on how to assess a funding application for developing, further developing, or managing a commons.

Understanding of commons

The understanding of commons as a governance form is low within the Swedish innovation support system, both among financiers and implementers. There is a lack of a common language and reference frameworks for describing and analyzing various aspects of commons, and their potential to accelerate and enhance value creation within a community.

Although there are some de facto commons, such as shared spaces in science park environments, these assets are not designed or analyzed with that perspective in mind. This results in very few structured experiments within the innovation support system, which also leads to a lack of strategic learning in the area. The opportunities offered by commons models as an approach are generally not highlighted in projects and preliminary studies aimed at creating more effective innovation ecosystems.

There is a need to increase knowledge among financiers and project organizations. While it is possible to create commons using short-term project financing, and for the project organization to then attract the resources needed to convert the project results into long-term sustainable commons, this is much more challenging than if the financing explicitly targets commons development from the outset.

Proposed actions

There are two central aspects to achieving more effective innovation ecosystems. Firstly, **the development and implementation of financing structures that promote the development, further development, and management of commons**. This change involves a transition from traditional project financing to a more dynamic investment logic that is also applied to other types of assets and operations, not just commons. Secondly, a **deeper understanding of commons as a governance form and its relation to outcomes within innovation ecosystems**. Additionally, two areas have been identified that should be further **explored – technical platforms for managing commons, and monitoring and evaluation methods**.

1. Development and implementation of financing structures for commons

It is crucial to develop and implement financing structures that support the development, further development, and active management of commons. The first step is to clarify the difference between traditional project financing and an investment logic aimed at long-term sustainable shared resources. This logic should be applied to both commons and other assets and operations, regardless of ownership form.

Furthermore, financing processes that support these goals must be designed to meet the unique needs of commons, including collective action and dynamic requirements. This involves experimenting with new control models and adapting criteria and milestones for efficient resource use.

To accelerate development, financiers should now begin structured experiments with financing processes tailored for commons. A proposal for such a financing process is available in [manual for financing commons for innovation ecosystems](#). [Legal memorandum - commons in innovation ecosystems and state aid](#) contains a legal memorandum on how financing of commons should be viewed in relation to state aid rules.

2. Strategic learning about commons in innovation ecosystems

To make innovation ecosystems more efficient, it is crucial to enhance understanding of the relationship between the design and outcomes of commons. Therefore, we have compiled basic material in [models for describing, organising and analysing commons](#), about different models for describing, organizing, and analyzing commons.

Elinor Ostrom's insights warn against the risk of "blue-print thinking," where a specific design is replicated across commons with the expectation of similar results. Each commons is unique and requires experimental design of rules to achieve the desired outcomes. As experimentation increases, so does the need to facilitate strategic learning within the ecosystem. Conducting experiments without integrating learning is both inefficient and wasteful.

To further implement these insights, a commons and a community around this subject have been established during the preliminary study. This initiative promotes not only initial knowledge enhancement but also long-term strategic learning. All material produced during the preliminary study is licensed under Creative Commons (CC0) to ensure long-term availability and use. During the study, an open reference group was formed with 42 participants from 31 different organizations, including financiers, project organizations, and academic institutions. This contributes to the development and maintenance of a sustainable environment for commons.

3. Exploration and development of technical platforms for managing commons in innovation ecosystems

Key aspects of commons within innovation ecosystems include digital accessibility and relevance. It is important to emphasize that when we talk about a technical platform, we do not mean a place to collect and make project results available. Instead, we refer to a technical platform designed to enable the further development and active management of commons, which are handled by communities. Previous discussions have highlighted that simply making project results available is not sufficient; commons require active management and continuous development to remain sustainable over time.

Preliminary results from the study "Information Structures in Learning Networks" show that technological advances in applications of artificial intelligence, such as knowledge graphs, LLM (large language models), and RAG (retrieval augmented generation), offer significant opportunities to efficiently compile, structure, and further develop commons. However, many existing platforms, such as those within the Microsoft environment, are not sufficiently adapted for communities consisting of users from different organizations and IT environments. With increasing interest in commons, there is a predicted growing demand for platforms that promote the development, further development, and active management of commons across organizational and IT boundaries.

4. Exploration and development of monitoring and evaluation methods for commons in innovation ecosystems

When financing the development, further development, or management of commons according to an investment logic, what exactly are we investing in? How is the balance sheet for such an investment reported, especially when ownership is not tied to a specific organization but is collective? It is crucial to identify the factors that determine if and when commons create value. To understand the value that commons add to an ecosystem, what models for monitoring and reporting can be applied? Key aspects to consider include the amount of resources—time, commitment, and financing—that the asset attracts, the scope and nature of its use (use-as-value), and the effects of its use, such as behavioral changes or shifts within the ecosystem. An example of a model that could be tested is the layered accounting model used in the Swedish VINNVÄXT program.