

# Chapter 7

## The curious case of needs and innovation

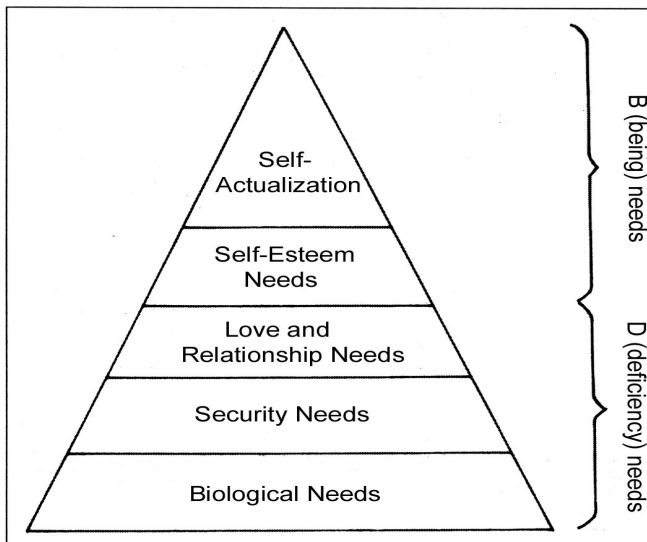
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## Abstract

This chapter investigates two precious ingredients of sustainable development: needs and innovation. Fulfilling needs is the touchstone of sustainability, while innovation is believed to be driven by needs. A closer inspection of technological change, however, shows that needs are not the starting point of innovation but the end result. That is, when technologies change, needs change too, and the chapter discusses how this confuses thinking about sustainability and innovation. A curious conversion occurs when innovators are successful: while innovators are expected to put great efforts into creating markets and needs, people do not explain the success of innovation by the efforts of innovators, but by the need itself. Needs are thus tautological here. The implication is that the question should not be to distinguish between “real” and “artificial” needs; the question should be which needs we can afford.

## 7.1 Introduction: the study of needs

The concepts of needs and sustainability have an intimate relationship. Needs figure prominently in the famous Brundtland (1987) definition of sustainable development: a “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”(UN WCED, p.45). Meeting needs is thus the touchstone in deciding whether a development is sustainable or not. Innovation is a well-appreciated route used to contribute to sustainable development and, at the same time, address needs. In this chapter, I investigate how needs and innovations are intertwined, I discuss how the touchstone of needs changes over time, and I conclude that needs and innovation are problematic and curious ingredients of sustainable development.



**Figure 7.1** The famous hierarchy of needs, according Maslow 1943

The best-known classification of needs is the one proposed by Maslow (1943), who placed the need for self-actualisation at the top (see Figure 7.1). “What a man can be, he must be. This need we may call self-actualization [...] It refers to the desire for self-fulfilment, namely for one to become actualized in what one is potentially. This tendency might be phrased as the desire to become more and more what one is, to become everything that one is capable of becoming” (Maslow 1943, p. 383). The hierarchy seems plausible to some degree, but can be contested with many cases, say, a mountain climber who prioritises her need for self-actualisation over the need for safety. Needs have also been studied in other disciplines, in many different ways (see Table 7.1).

**Table 7.1** Needs in research

| discipline                        | discussion  |
|-----------------------------------|---|
| psychology and biology:           | layers of needs, Maslow, latent needs, needs and imitation, conspicuous consumption |
| anthropology:                     | needs in the fabric of social life  |
| cultural studies:                 | relativistic accounts of needs  |
| political philosophy and history: | distribution of needs, philosophy of needs, human rights and capabilities           |
| economics:                        | “preferences” as a starting point, as intentional black box                         |
| innovation studies:               | demand articulation, user–producer interaction                                      |

The literature provides examples of long discussions about the distinctions between “basic needs” and “non-basic needs”, and on the distinction between needs and wants. (Rivers, 2008; Soper 2006), which are illustrated by Mahatma Gandhi’s famous warning that the world provides enough for everyone’s needs, but not for everyone’s wants. Another recurrent theme is the idea that what is conceived of as needs depends on the historical period and the locality (Townsend, 1979). This relativism is contested by Doyal and Gough (1991) in their influential *Theory of Human Needs*, in which they seek to establish principles to define universal needs. The basis from which they start is the idea of participation in social life. Two notions follow from this: physical health and autonomy, both starting points for a minimum of participation in social life. The emphasis on objectivity of needs leads away not only from (cultural) relativism but also from the idea that needs are individual expressions.

Ytrehus (2001) made a distinction between (i) the positivist tradition, assuming the possibility to objectively measure needs, (ii) the market-oriented tradition, equalling needs with expressed preferences of economic agents, (iii) the cultural tradition, stressing the relativity of needs, and finally (iv) the universal standards tradition, which embeds needs in a broader understanding of social and cultural participation.

## 7.2 Tautological needs

Needs are thus contested but powerful concepts in the way we understand society and the challenges of sustainability. Instead of aiming for a final verdict on what needs really are and how we should account for them, I want to take a different approach to the matter. My starting point is that needs change and that the change is intimately related to innovation. According to popular belief, need is the mother of invention. The idea is that given the scarce resources and the unsatisfied needs, human ingenuity comes with appropriate and welcome solutions. Yet, historical studies of technical and societal change also show that needs are changeable: what is needed now is not the same as what was needed a century ago. So, while needs may be the mothers of innovation, needs have mothers as well, and one of them is innovation itself. When new offerings

are planned, tested, and used, new needs will develop as well. This holds for technological systems, as Frédéric Graber (2007) has described in his case study of water supply in eighteenth- and nineteenth-century Paris. It also holds for individual purchases. Twenty years ago, for instance, I did not need a mobile phone. Today, I need a mobile phone – because people expect me to have one. And many manufacturers are more than happy to satisfy my need. Two hundred years ago, there was no need for cars because in the absence of this option, people had a very limited travel range. Today, it is not easy to live without a car and many manufacturers are happy to satisfy this need.

An innovation is thus accompanied by a new need. It is a well-understood lesson in business studies: without a new need, a new product or service will not survive. Peter Drucker (1954), one of the most influential authors on business, puts it like this: “There is one valid definition of business purpose: to create a customer” (p. 37). Business studies investigate how firms can be more or less successful in creating customers, that is, in creating the situation in which people purchase their goods or services. Clearly, this is not an easy task, requiring vision and stamina. Interestingly, when the task is successfully performed, the explanation makes a U-turn: it is no longer explained in terms of a firm being successful, but in terms of a mysterious other factor that somehow has entered the scene. This factor, identified as “need”, or, to make it even more mysterious, “latent need”, is now held responsible. It was not the firm, but the “latent need” that achieved the remarkable outcome of people purchasing goods and services! And how can we know that it was this “latent need” which achieved this? Well, the argument is that the “latent need” can be proven by the mere fact that people purchase the new goods and services. This is a circular argument, comparable to explaining thunder from a “thunder factor” and proving that such a factor exists by pointing to thunder itself. Logicians would call this a tautology.

Tautological needs are embedded in dominant ideas about the relation between humans and the goods they purchase. According to the German philosopher of technology Arnold Gehlen (1904-1976), humans differ from animals by their state of vulnerability and their needy condition. Since humans lack fur to warm their bodies, strength to defend themselves against predators, and speed to catch prey, the species *Homo sapiens* had to rely on technology: clothing, housing, weapons. Technology, then, is the extension of the body, an instrument, because humans have bodies with disabilities: they are “Mängelwesen”. Clothing is the extension of the skin, the artificial fur, shovels are the extension of the arms, and knives the extension of teeth and claws. This instrumentalist vision of technology, although philosophically contested, is by now a well-established and common-sense notion. It fuels the self-image of engineers and provides justification for firms who come up with ever new products. When new technologies are sold and used, the argument is that firms just cater for the needs of humankind. And new technologies are then seen as yet another step towards the fulfilment of the needy condition of humans. The fact that they are used and recognised simply reinforces the initial assumption that they were needed in the first place.

### 7.3 Needs as end points of innovation

New technologies thus seem to be the next step in the ever continuing struggle of humans against nature. Yet, in socio-historical studies of technical change, another dynamic comes to the fore, emphasising the dramatic impact of new technologies. While innovations may bring new elements, they also disturb customary patterns and forms of life. The economist Joseph Schumpeter characterised the role of innovation in economic structures as “creative destruction”: building new opportunities while demolishing established industries. James Utterback’s *Mastering the Dynamics of Innovation* (1993) presents an overview of “waves” of innovation that have changed the face of an industry. Using examples such as televisions, typewriters, and flat glass, he demonstrates a particular pattern. In a first phase, various models abound and new firms compete on the basis of yet another model. Users are not sure what the new product is, how to use it, and what features would matter to them. In its first decade, for instance, the typewriter was seen as a strange intruder, occupying the no-man’s-land between printed text and personal letters. It is, as sociologists of technology would say, a monster, a hopeful monstrosity. Culturally and organisationally, such a newcomer is both disturbing and exciting. Criteria to judge its performance have not yet stabilised, so it is difficult to compare the various models. This is a period with a lot of product innovation and a lot of uncertainty about appropriate requirements – it is what Utterback labels the “fluid” phase. The period ends with the advent of a convergence in models and regularities of use and preference. Under such conditions a “dominant design” may evolve, which embodies the collective learning in terms of what the new product is and how to use it. At the other extreme, in a mature market, competition is no longer about models, but about cost and quality. In this “specific phase”, competition is dominated by economies of scale, and the number of competitors has fallen sharply.

The study of innovation also stresses that new products alone will not do the job. Celebrated innovators like Thomas Edison, Henri Ford, or Steve Jobs did not start working from signals of “need”, but from visions about a new system that could work, provided a mass market would buy the products and services. In his voluminous *Networks of Power*, the historian Thomas Hughes describes in detail the strategies Thomas Edison used to build new empires. “I have the right vision”, he said and sought ways to involve others in his plans: politicians, financiers, and consumers. George Eastman (1854-1932) had the vision to turn the delicate and difficult art of photography into a mass market. As one of the obstacles was the handling of glass plates and the employment of light-sensitive emulsions, he looked for alternatives and found celluloid, a sturdy, yet bendable new material. Celluloid made it possible to avoid plates and have a roll instead, inside a box that only the manufacturer needed to open. The customer could simply use the camera and when the box was full, return it to the manufacturer, who would develop the photos and return the box with a new roll. “You push the button, we do the rest”. He gave his products the brand name Kodak, and became the

world leader in photography for almost a century, until it was overtaken by the next wave of innovation: digital photography.

According to innovation studies, new products need new markets, and big firms indeed tend to spend as much on marketing as on R&D. The sociology of expectations takes us one step further, into another, contrasting account of technological change (Van Lente 2012, Borup e.a. 2006). It is on the basis of circulating and shared expectations that researchers, technologists, and firms decide what options to take and what routes to follow. The central idea here is that progress is a given, and that engineers and firms are keen to discern the “next step”. So, when a new option is seen as promising, its priority will rise and it will figure on the research or company agenda. And when this is the case, further development is mandatory. The promise will then be used as a guideline and even as a measuring stick to assess the strategy and progress of research and development. Hence, the promise has been transformed into a requirement. It is not a matter of pre-defined problems or articulated needs, but a matter of ongoing technical change driven by promises in which actors cannot afford to miss the next generation of technologies. And when technologies diffuse across society, they become normal ingredients of social life and, at the same time, become indispensable for people who want to function in society. In other words: needs are not the starting point of an innovation, but the end result.

#### 7.4 To conclude

In this chapter I have explored the curious case of needs and innovation. Needs are often presented as a starting point for innovation, and new products and systems are seen and justified as fulfilling pre-existing needs. The assumption is that human beings are full of (latent) needs and that technologies are increasingly successful in meeting these needs. On closer inspection, however, needs are the end point of innovation. When new products and systems are successfully taken up, their availability will gradually become taken for granted as a part of social life, to the extent that they are duly missed and “needed” when they happen not to be present. This condition of needs resulting from innovation is relevant to sustainable development in two ways. First, when new products and systems generate a need for them, they are not easily abandoned. Limiting internet use would have been easy twenty years ago, but is now a tedious and cruel task. Limiting car use seems a mission impossible now, while a hundred years ago it still was an option. A second consequence is that the ongoing process of innovation which characterises our modern societies implies the ongoing generation of new needs as well. The pertinent question for sustainability, then, is which new needs we can afford.

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