

# Diversity in production environments

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## Abstract

At the heels of ‘bio-diversity’ and its worldwide acclaim, scientific diversity — or ‘sci-diversity’ — has great advantages for scientific life at large, but perhaps concerns for those who capitalise on science.

## 1 Introduction

Biological diversity, or ‘bio-diversity’ — i.e. the co-existing and potentially interacting *variety* of forms of Life (Purvis and Hector, 2000) — has been regulated by nature up until the first ‘production environments’ were set up with the advent of agriculture, which *directed change* to the interests of certain groups such as the producers, the consumers, and the ensuing food industry. Science has been regulating its own diversity, or ‘sci-diversity’ — i.e. the concurrent and potentially interacting (e.g. competing or collaborating) variety of scientific ‘species’ of science such as theories, methods, interests, and points of view (PoV) — up until the first ‘production environments’ were set up with scientific publishing (Perdicoulis, 2014). Hence, let us consider diversity in the history of agriculture as a production environment in nature, to gain insights about scientific publishing as a production environment in science.

## 2 The age of trade

Small-scale agricultural producers, a.k.a. farmers, *trade* (i.e. sell or barter) their agricultural goods, part of which is destined for family consumption. This model of ‘low intensity’ agriculture aims at good quality products and — in a simplistic or perhaps naïve approach — these are expected to become known for their intrinsic goodness (Figure 1).



FIGURE 1 The assumption that ‘popularity is proportional to goodness’

The simplistic assumption of Figure 1 is rather reasonable in the context of small-scale agriculture at the ‘age of trade’, where (a) popularity is confined to local dimensions and (b) there is no great interest to increase popularity by deception.

### 3 The age of commerce

Large-scale or commercial agriculture becomes more of a ‘serious business’, and is often associated with marketing — i.e. the business service responsible for the promotion of products, including market research and advertising. Thanks to statistical information about their products, commercial farmers (or their holding companies) can be assessed, ranked, and paid for their production, and make ‘informed’ decisions about their future production (Figure 2).

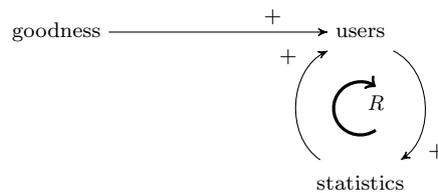


FIGURE 2 ‘Informed’ users produce reinforcing patterns (a.k.a. ‘vicious cycles’)

Statistics about popularity is eventually responsible for key reinforcing feedback loops (a.k.a. ‘vicious cycles’), strengthening strong patterns and eradicating weak patterns. The issue of *path dependence* (Sterman, 2000, pp.349–353) — or ‘how to start a loop in a particular direction’ — becomes particularly interesting in the context of commercial production.

### 4 The age of regulation

The management or *control* of a production environment becomes more demanding with the increase of its dimensions and diversity, striving to drive the system towards a particular end. In such circumstances, norms and standards are introduced for *regulation* — e.g. to define the procedures for the achievement of what is considered as ‘good’, ‘desirable’, ‘safe’, ‘valued’, ‘valid’, or ‘appropriate’ (Figure 3).

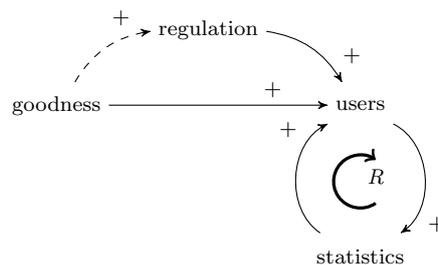


FIGURE 3 ‘Regulated’ users exhibit a ‘boost effect’ on the reinforcing patterns

As commercial production projects involve a certain (usually narrow) field of products, diversity becomes a distraction, a waste, or even a threat. In agriculture, for instance, weeds or fungi are generally considered as unwanted and removed with herbicides or fungicides, while ‘productive’ varieties of plants or animals are selected and bred. Hence, the *selection* of diversity becomes imperative for ‘tightly managed’ production projects, and this extra reinforcement is expected of regulation.

## 5 The age of maturity

Agricultural markets in very industrialised countries are beginning to re-appreciate organic farming, vegetable plots, and small-scale productions for their better-quality produce. Perhaps the associated figures such as prices or market share are not as important as the *trend* itself, which brings back and sustains the simple idea about goodness as illustrated in Figure 1. And perhaps even more important than the trend are the *reasoning* and *courage* of the producers and the consumers that are backing it.

## 6 Discussion

‘Sci-diversity’ involves complex dynamics, but everything looks simpler when approached from separate points of view (Figure 4). For a start, authors and publishers are *empowered* in an environment where diversity is a value, as they gain independence and courage through the freedom to publish. Ideas can circulate freely, and there is plurality of perspectives, opinions, interpretations, and experiences. Science is not — and does not need to be — a ‘dry’ and boring world.

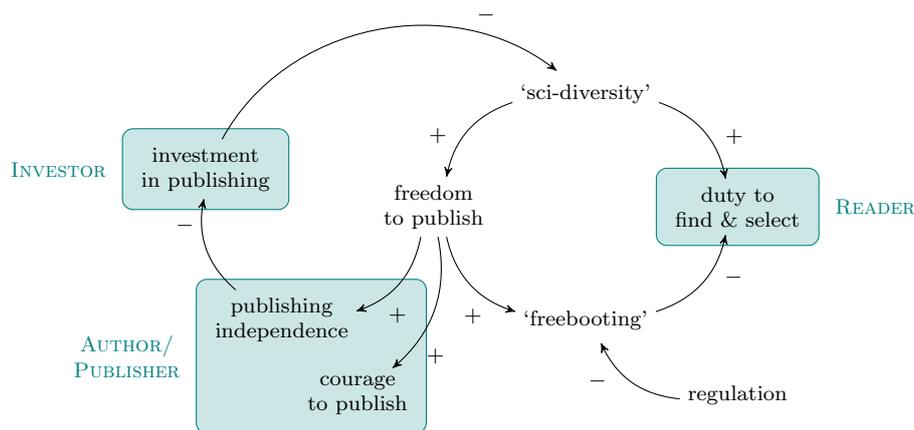


FIGURE 4 Dynamics of ‘sci-diversity’

‘Sci-diversity’ puts an extra onus to the reader: the duty to discover and select the *bona fide* publications. The task becomes particularly challenging due to the increased number of ‘freebooters’, or opportunists who are also free to publish anything — including mis-information — for any motive. This is exactly where *some regulation* could be beneficial, but good and responsible selection will always require *educated* readers (Perdicoulis, 2013).

From the perspective of the investors, ‘sci-diversity’ appears to be a threat — for instance, through independent publishing. There are many stakeholders in scientific publishing, including the publishers and ancillary services (Noorden, 2013; Perdicoulis, 2014). The major players are likely to defend their interests: i.e. not let the current publications circuit be weakened and their earnings jeopardised. Hence, commercial publishing becomes a threat to ‘sci-diversity’, and by extension to all its benefits to the authors and readers.

## 7 Challenges

‘Sci-diversity’ is generally advantageous for authors and readers, who are the main actors of science, but decision-making in ‘sci-diverse’ production models — which are essentially low-regulation environments — must be done by *educated* readers and protected by *exempt* regulatory authorities.

In similarity to the post-industrial maturity of agricultural production, it would be interesting to see authors relinquish the ‘publish or perish’ frenzy and seek quality in ‘organic’ and ‘local’ productions — i.e. low intensity, fit-for-purpose, pluralistic pursuit and sharing of knowledge.

## References

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