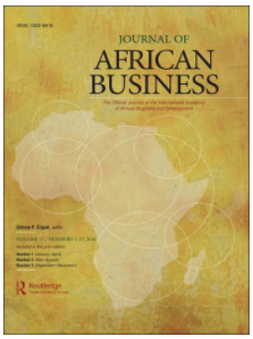

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From Myth to Reality: Making Sense of Innovation Hubs in Africa

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ABSTRACT

The global proliferation of organizations like incubators, accelerators, and co-working spaces is particularly striking on the African continent. Over the last 10+ years, a large number of such organizations have been established in African countries, which are mainly referred to as (innovation) hubs. However, along with the strong growth in the number of innovation hubs, a vast increase in the diversity of these organizations can also be observed, resulting in a general fuzziness of the hub concept. In this critical review, we describe the origin and the evolution of the concept. We contribute to the literature by providing conceptual clarity and disentangling the fuzziness of the innovation hub concept. We introduce a new definition of innovation hubs and develop four key differentiation criteria. Based on that, we provide avenues for advancing research on innovation hubs. Our review also entails practical implications, as entrepreneurs in African countries are wondering which type of hub they should choose for developing their business ideas and growing their entrepreneurial ventures.

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Introduction

Innovation hubs, tech hubs, incubators, accelerators, co-working spaces, fabrication labs, hackerspaces, makerspaces: The last decade has seen an enormous proliferation of innovation hubs and the likes in Africa. According to a report, the total number of active innovation hubs in Africa reached 1031 in 2021 (Sarangé & Chuku, 2021). Proponents argue that organizations such as hubs or co-working spaces, incubators, and accelerators have become a vital part of global entrepreneurial and innovation ecosystems (Crișan et al., 2021; Deyanova et al., 2022; Hausberg & Korreck, 2020) in developed (Franco et al., 2020; Lukeš et al., 2019; Rubin et al., 2015) and emerging countries (Chan et al., 2020; Dutt et al., 2015; Surana et al., 2020). In Africa, in particular, the term "hub" has become commonplace to describe these organizations. Such hubs are nowadays regarded as being of great importance in the wider innovation ecosystem of African countries and as having vast potential to stimulate business innovation and promote entrepreneurship (Atiase et al.,

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2020). There is, however, still a lack of reliable evidence that hubs do actually have the assumed positive effects in practice. In any case, the rapid proliferation of hubs over the past decades alone does not necessarily imply that they are effective. This is even more accurate, as previous research indicates that while the number of active hubs in Africa increased strongly, many hubs have also failed and ceased operations. Hubs obviously face challenges in terms of viability and sustainable business models (De Beer et al., 2017; Kolade et al., 2021). The sobering on-the-ground realities of individual hubs may well contrast with the high expectations and hype associated with hubs in general (Friederici, 2018). Not surprisingly, therefore, researchers have called for more research on measuring the success and impact of African hubs (Jiménez & Zheng, 2018; Littlewood & Kiyumbu, 2018). However, the discussion of the impact of innovation hubs in Africa is complicated by the fact that the concept of innovation hubs is not clearly defined and very different organizations refer to themselves as hubs or are classified as such by others. Against this background, this paper aims to provide conceptual clarity and reduce the vagueness of the innovation hub concept. We will distinguish innovation hubs from other related concepts and reveal the diversity of different types of innovation hubs along four key criteria: their basic organizational form, the services they offer, their target groups, and their financing and business models. The four differentiation criteria were developed based on the study of previous academic literature (e.g., Atiase et al., 2020; Littlewood & Kiyumbu, 2018; Züfle, 2023) and institutional reports (e.g., De la Chaux, 2021; International Trade Centre [ITC], 2020; Kelly & Firestone, 2016; Sarangé & Chuku, 2021).

The remainder of the paper is structured as follows: First, we outline previous attempts to map Africa's innovation hub landscape. Second, we describe the origin, proliferation, and increasing fuzziness of the buzzword (innovation) hub, which goes back to the foundation of Nairobi's iconic iHub. Third, we propose a new definition of innovation hubs and four key criteria to differentiate various types of innovation hubs. We conclude by showing avenues for future research and implications for various stakeholders.

Africa's innovation hub landscape

Over the past years, repeated efforts have been made to identify and map the entirety of innovation hubs in Africa. Although the results of the different studies are not completely comparable due to different delineations of hubs and different survey methods, they clearly show that the number of innovation hubs operating across Africa has increased rapidly over the last 10+ years.

The World Bank documented 102 separate innovation hubs across Africa in 2013, 117 in September 2015, and 173 in June 2016 (Firestone & Kelly, 2016; Friederici, 2019; Kelly & Firestone, 2016). According to community insiders, there have already been 314 innovation hubs across Africa in 2016 and 442 hubs in early 2018 (Bayen & Giuliani, 2018). The research company Briter Bridges and the network organization AfriLabs identified 643 hubs across Africa as of October 2019 and 1031 hubs as of October 2021 (AfriLabs and Briter Bridges, 2019; Sarangé & Chuku, 2021) (see Figure 1).

However, parallel to the sharp increase in the number of active innovation hubs, it has also been noted that numerous hubs ceased operations during the same period. Of the 102 hubs initially documented by the World Bank in 2013, more than a quarter (27) had already been shut down by October 2016 (Kelly & Firestone, 2016). Similarly, AfriLabs

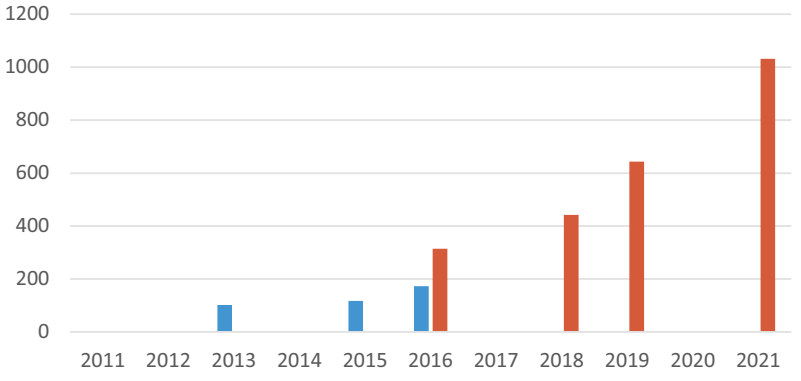

Figure 1. Number of innovation hubs in Africa. Sources: Blue columns are based on World Bank mappings (Firestone & Kelly, 2016; Friederici, 2019; Kelly & Firestone, 2016). Red columns are based on mappings of community insiders (AfriLabs and Briter Bridges, 2019; Bayen & Giuliani, 2018; Sarangé & Chuku, 2021). Own compilation.

and Briter Bridges (2019, n.p.) identified "over 110 hubs that have shut operations in the last few years due to bankruptcy, pivoting, or the expiration of their mandate," compared to 643 hubs active in October 2019.

According to Sarangé and Chuku (2021), the 1031 hubs identified as of October 2021 operate in 53 different African countries and over 200 cities across the continent. The greatest number of innovation hubs per country can be found in Nigeria with a total of 164 hubs, followed by South Africa with 96 hubs, and Kenya with 90 hubs (Sarangé & Chuku, 2021). Overall, there are at least 17 countries in Africa (13 in Sub-Saharan Africa) with at least 20 innovation hubs operating in October 2021. Of the countries with at least 20 innovation hubs, Togo and Ghana have the highest number of innovation hubs relative to their populations. In Togo and Ghana, there are about 2.3 and 1.9 innovation hubs per one million inhabitants respectively, compared to, e.g., less than 0.8 hubs per one million inhabitants in Nigeria, the country with the highest absolute number of hubs. Most innovation hubs are located in the countries' main business centers. There are, e.g., at least 54 hubs in Lagos, 51 in Nairobi, 42 in Tunis, 39 each in Cape Town and Cairo, and 26 in Accra (Sarangé & Chuku, 2021).

The evolution and increasing fuzziness of the term "hub"

The first widely recognized organization within Africa that used the moniker "hub" in its name was iHub, which was founded in Nairobi in 2010 (Friederici, 2019). The founders used the term "hub" to describe a novel organizational form that was supposed to differ from existing forms, such as co-working spaces and incubators, while combining known elements in a way that was supposed to be a "uniquely suitable answer" (ibid., p.200) to the particular challenges that young African innovators face. In the initial launch announcement of iHub, Erik Hersman, the principal founder of iHub, thus referred to iHub as "part open community workspace (co-working), part investor and VC [venture capital] hub and part incubator" (Hersman, 2010, as cited in Friederici, 2019, p. 200). By

facilitating connections among like-minded, committed, and "independent yet interdependent" individuals in Nairobi, iHub was expected to lead "to the formation of a community, which enabled a collective entrepreneurial process that generated innovations" (Friederici, 2019, p. 202). In the view of the iHub founders, there should, however, be no sharp division between a hub-internal and a hub-external community. Instead, the internal community of iHub (mainly Kenyan innovators focusing on locally adapted technological innovations) was to blend in with the broader Kenyan tech community. The idea was that "[t]hrough iHub, the technology community, industry, academia, investors and venture capitalists [could] meet, share ideas and collaborate [and] transform their ideas into actions" (Moraa, 2012, p. 9). By facilitating connections within a broader technology ecosystem, blending connections made within the hub and those existing in its environment, iHub would "'catalyse' the development of technology startups and ultimately make a significant contribution to economic development" (Friederici, 2019, p. 202).

The vision developed by iHub founders and managers turned out to be highly appealing to a wide array of actors seeking technology-driven economic development in Africa. As early as 2010 (the founding year of iHub) and 2011, numerous organizations following similar visions were founded, and in 2011, several of these organizations founded the network association "AfriLabs" to build a community around rapidly emerging innovation hubs (AfriLabs, 2023).[1] Though several of the newly founded organizations and their association AfriLabs chose the term "lab" rather than "hub" in their names, "hub" became the agreed-upon terminology to refer to this class of organizations. As the "hub" terminology became popular and was widely adopted across Africa, it quickly lost some of the specific meaning the iHub founders had attached to it (Friederici, 2019). Organizations distinctively different from iHub were referred to as hubs and were routinely included in counts and lists of hubs in Africa, including by the hubs' network organization AfriLabs itself. "hub" has thus become an umbrella term that is used everywhere in Africa today but "has come to mean drastically different things for different people" (Friederici, 2019, p. 212).

This is also reflected in very different definitions of hubs proposed by researchers in the literature. While some researchers see (innovation) hubs' primary goal as supporting community building and fostering collaboration within the tech community, others emphasize that they support specific start-ups and promote their survival and performance (AfriLabs and Briter Bridges, 2019; Comins & Kraemer-Mbula, 2016; David-West et al., 2018; De Beer et al., 2017). According to Jiménez and Zheng (2018, p. 95), a hub "is a space where technologists, computer scientists, hackers, web developers, and programmers congregate to network, share programs, and design to bring their ideas to fruition." For other researchers, however, hubs are more than just shared workspaces. For these authors, hubs may also be accelerators and incubators, which entail more structured programmes and stronger engagement of the hub management with the entrepreneurs (Littlewood & Kiyumbu, 2018). In line with this, Sarangé and Chuku (2021, p. 1) define hubs quite broadly as "support structures that offer services including incubation and acceleration programmes, co-working spaces and support structures to enable entrepreneurs to thrive" (Sarangé & Chuku, 2021, p. 1). And the study of AfriLabs and Briter Bridges (2019) defines a hub even more broadly as "a centre, structure or network

comprising of all actors supporting entrepreneurial ventures or innovation" (AfriLabs and Briter Bridges, 2019, n.p.).

While most definitions consider hubs as separate, individual organizations or entities, there are also broader definitions of the term in the literature. The term is sometimes also defined as a cluster of several distinct entities, including individual hubs, venture capital firms, start-ups, etc., that are located physically close to one another in a small geographical region, such as a neighborhood, municipality or urban region, and frequently interact with one another (De Beer et al., 2017, p. 250). Occasionally, even an entire country or larger regions are referred to as a hub, such as in a recent web article titled "Kenya Is Becoming a Global Hub of FinTech Innovation" (Chitavi et al., 2021). De Beer et al. (2017) refer to these as "cluster hubs"and "country hubs," respectively, and contrast them with hubs as separate organizations or entities, which they refer to as "company hubs".

Defining innovation hubs and categorizing them based on four key differentiation criteria

Conceptual clarity is a necessary stepping stone for future research on the effects of innovation hubs in Africa (Züfle, 2023). So far, research questions are all too often formulated based on different understandings of what hubs actually are and how they differ from each other. In this section, we therefore first propose a new definition of innovation hubs that is both broad enough to include the various types of innovation hubs observed in practice in Africa and narrow enough to distinguish these hubs from related but different forms of co-location-based development tools or institutions, or from competing, broader meanings of the term "hub" encountered in the literature. Based on this definition, we then suggest categorizing different innovation hubs along four differentiation criteria.

According to our definition,

> innovation hubs are organisations that provide and manage facilities where (mostly) early-stage companies and entrepreneurs closely co-locate, typically in the same building or room, and that offer them, to a varying extent, support services, such as networking, training, mentoring, and financing services, to promote their entrepreneurial ventures or innovations.

This definition is broad enough to cover different basic forms of innovation hubs, such as co-working spaces, incubators, or accelerators. They all (closely) co-locate start-ups or founders, typically at a single site, but differ in the way they select participants and structure their interactions, as well as in the range and intensity of support services they offer to them (Madaleno et al., 2022).

At the same time, the focus on early-stage firms and entrepreneurs highlighted in the definition distinguishes innovation hubs from providers of serviced or managed offices that rent individual fully equipped office space (mainly) to established businesses (Madaleno et al., 2022). The very close co-location of start-ups or entrepreneurs within a single building or room distinguishes innovation hubs from industrial parks or industrial estates that also provide (urban) space for the co-location of businesses but refer to larger, less dense spaces (ibid.). Also, the definition of hubs as separate, individual

organizations excludes other meanings of the term hub in the literature, such as the "cluster hubs" or "country hubs" referred to by De Beer et al. (2017).

Despite these delineations, the proposed definition of innovation hubs still encompasses a wide range of different forms of hubs, which may vary considerably in their impact. To advance future research on the impact of innovation hubs in Africa, we suggest categorizing innovation hubs along four differentiation criteria: their basic organizational form, the services they offer, their target groups, and their financing and business models.

The first differentiation criterion refers to the (basic) *organisational form* of the innovation hub. A World Bank report introduced four main categories: hubs led by civil society institutions, by governments, or by academic institutions, and hybrid hubs (Kelly & Firestone, 2016). Hubs linked to civil society are most common in that report, comprising 79 out of 117 documented hubs (ibid.). They can be further differentiated as being for-profit ventures led by private sector companies or not-for-profit organizations that may be tied, e.g., to a foundation or NGOs (Kelly & Firestone, 2016; Littlewood & Kiyumbu, 2018). Alternatively, innovation hubs may be supported and supervised exclusively by an academic or government institution or even be part of such an institution. Hybrid models occur, for instance, when hubs are established with the support of international organizations such as the World Bank. These hubs are often self-governed by an administrative board or consortium encompassing numerous stakeholders, including private sector firms, academic organizations, or NGOs (Kelly & Firestone, 2016).

A second differentiation criterion for hubs refers to the *services* they offer to early entrepreneurs and start-ups. According to Sarangé and Chuku (2021), a majority of 53% of the 1031 African hubs identified in their study are mainly offering co-working and community services, while only a minority of about 45% of hubs are (also) running more intensive start-up support or (cohort-based) acceleration programs, offering mentoring, acceleration, or funding services. However, in some countries with more sophisticated tech ecosystems, such as Kenya, Ghana, or South Africa, a majority of hubs are running such support programs (Sarangé & Chuku, 2021). Based on such differences, hubs may be categorized by the range and the intensity of services they offer to entrepreneurs and start-up firms. They may mainly offer *co-working spaces* (with some shared inputs such as safe energy supply or internet access) to like-minded entrepreneurs with only minimal additional support. Alternatively, they may, in addition, offer rather "light-handed support" such as running networking events and providing ad-hoc training and mentoring ("incubator model"), or they may provide (usually for a limited period) intensive support for competitively selected start-ups. Such support may include skills training, intensive mentoring, and networking, including with investors and possibly even hubs investing themselves in aspiring start-ups ("accelerator model") (Madaleno et al., 2022). In addition to hubs that follow any one of these specific models, there are also hubs following a hybrid model approach offering different services or programs, such as co-working spaces, incubation services, or acceleration programs, to different groups of founders or start-ups.

As a third differentiation criterion, we introduce the *target group* of the innovation hub. Relevant dimensions concerning the targeted entrepreneurs and start-ups are, in particular, (i) the start-up stage, (ii) the sector of activity of the start-up, and (iii) specific

demographic characteristics of the targeted founders. While hubs can, in principle, provide support to start-ups at all stages, hubs often focus their programs on specific start-up stages. Many hubs focus on very early-stage entrepreneurs who are still at the idea and exploration stage and have yet to generate any revenues, while others have set minimum criteria with respect to product development or sales to target early-stage start-ups or focus on the start-up growth stage (De la Chaux, 2021; Sarangé & Chuku, 2021). While traditionally most hubs had no specific sector preference, there has recently been an increase in (sector) specialization of hubs (Sarangé & Chuku, 2021). According to a non-representative survey among more than 100 hubs across Africa, today, only a (small) minority of hubs (12% in the sample) still take a sector-agnostic approach. The large majority focuses on entrepreneurs or start-ups from specific sectors or industries. Based on the survey sample, the sectors/industries most frequently targeted by specialized hubs are agriculture (12%), fintech (10%), and healthcare (8%), followed by hardware, internet of things, media, and cleantech (ibid.).[2] In addition, hubs may target entrepreneurs from specific demographic groups, such as female entrepreneurs (Friederici, 2018). In a (non-representative) sample of 92 hubs from 34 African countries surveyed in 2019, 25 hubs focused on supporting women founders, though not necessarily exclusively (AfriLabs and Briter Bridges, 2019). Other hubs focused on kids or youth, or marginalized groups such as refugees or persons with disabilities (ibid.).

The fourth and final differentiation criterion refers to the *financing and business models* of innovation hubs. A survey based on interviews with 39 hubs in 21 African countries that was conducted in 2019 provides information on the funding sources and "business models" of African innovation hubs (International, 2020). The results show that, on average, the surveyed hubs generate only a minor share of their funding from services they directly provide to local entrepreneurs and start-ups, such as co-working or incubation fees. A much larger share of revenues comes from external sources of finance. On average, across the non-representative sample of 39 hubs, about 50% of revenues come either from funded programs of development organizations, governments, or other nonprofit actors (25%), or from fees for consulting services (24%) provided to clients such as governments, enterprises, or foundations.[3] An additional 13% of revenues come from grants provided by such organizations. By contrast, only about 20% of surveyed hubs' revenues come from co-working fees (11%) or incubation fees (9%) and less than 5% from investment success fees or the (later) sale of equity shares in the supported start-ups. Another 13% of hub revenues come from event (management) or training fees (International Trade Centre, 2020). These are, of course, only average values. The financing structures of individual hubs vary quite substantially from each other. Based on these funding differences, several different business models of innovation hubs can be distinguished (International Trade Centre, 2020). One group of hubs (the largest group among the 39 hubs surveyed in International Trade Centre, 2020) has adopted the "consultant model," generating most of its revenue from providing consulting services to and designing and managing programs for NGOs, private companies, or governments, which allows these hubs to support entrepreneurs at little or no cost. The latter also applies to hubs that have adopted the "grantee model," which receive the bulk of their funding from grants or fully funded programs. By contrast, hubs that have adopted the "networker model" offer entrepreneurs mainly co-working services and access to networks and fund their activities primarily from co-working fees, training and event fees,

and possibly project management fees. The "agent model" is chosen mainly by acceleration-oriented hubs, which help investment-ready start-ups connect with investors. These hubs generate revenues mainly from exits, investment success fees, and fund management fees.

Two remarks need to be made about the classification of hubs along the four categories in practice. First, although the four categories were introduced as largely independent of each other, in practice, there are empirically relevant complementarities or correlations between the attributes that hubs may be assigned to within the different categories. Not-for-profit, government-led hubs, for example, will tend to use different financing models than for-profit hubs operated by private companies. Also, hubs that offer accelerator programs tend to target high-potential start-ups that meet certain minimum criteria regarding product development or revenue, and generally, only hubs with accelerator programs may be able to fund their operations primarily through success fees or profits from equity investments in the start-ups (agent model). Second, assigning an individual hub to one of the specific types or models within each category will often not be unambiguous in practice. This is especially true for the second to fourth criteria. Individual hubs may often have a hybrid character, simultaneously pursuing elements from more than one model. For example, a hub may simultaneously offer different bundles of support services for different types of start-ups: co-working spaces with minimal additional support for very early-stage start-ups and, at the same time, acceleration services for a select group of promising growth-stage start-ups. And hubs may change their characteristics over time as they adjust to, e.g., varying financial constraints or changes in the regional entrepreneurial ecosystem. Nevertheless, classifying hubs according to the proposed criteria will help researchers and practitioners better understand how hubs differ from each other and which types of hubs work best and for whom.

Conclusion

The rapid proliferation of innovation hubs in Africa for more than ten years has been accompanied by a vast increase in the diversity of these organizations, but also of the fuzziness of the hub concept. As the effectiveness of innovation hubs in promoting entrepreneurship and innovation and their impact on local development are highly debated, more rigorous in-depth research on innovation hubs in Africa is much needed (De Beer et al., 2017; Friederici, 2018). A prerequisite for such research is conceptual clarity. We contribute to the literature by providing a new definition of innovation hubs in Africa as well as four differentiation criteria to categorize the different types of innovation hubs. The definition of innovation hubs provided helps to reduce the fuzziness of the concept and to distinguish innovation hubs from other related but different co-location-based business support infrastructures. The four differentiation criteria help to structure the wide variety of different types of innovation hubs observed in practice in Africa. Together, they make for an important first step toward a better understanding of the nature, diversity, and impact of innovation hubs in Africa.

Future research can build on the results of this paper. The criteria introduced enable a structured comparison of individual hubs and allow for the substantiation of case selections and the formulation of specific research questions. Future research may investigate whether innovation hubs are effective in promoting

entrepreneurship and innovation in Africa, in general, and what type of support (services offered) works best, and for which type of entrepreneurs or start-ups (target groups), more specifically. And it may investigate how the answers to these questions depend on the characteristics of the local entrepreneurial ecosystem. For policymakers, international development organizations, and NGOs, it would be essential to know whether and how the effectiveness of hubs is affected by the hub's ownership or governance structure (organizational form) or by the amount and form of public support the hub receives (financing and business model).

Our results have various implications for hub managers and entrepreneurs. The proposed differentiation criteria help hub managers determine their business model to strengthen their competitiveness and increase their prospects of survival. The distinction between the different forms of innovation hubs is also essential for African entrepreneurs when wondering which (type of) hub they should choose for developing their ideas and growing their businesses.

Notes

1. Today, AfriLabs (https://www.afrilabs.com/) comprises over 400 member hubs across 53 African countries and the diaspora.
2. It needs to be stressed, however, that these results are only illustrative. The survey sample is not representative of all innovation hubs in Africa, so the frequency of specific sectors/industries targeted by hubs in the sample may differ significantly from corresponding frequencies for other more representative sub-samples.
3. The various hubs offer a wide range of consulting services, including, e.g. providing data access or market research for public and private organizations, advising development organizations on designing effective programs to engage with start-ups for goals such as job creation, or women's empowerment, or providing software design or digital solution services (ITC, 2020).

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