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**Path Formation and Reformation:
Studying the Variegated Consequences of Path Creation for Regional
Development**

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Human Geography and Planning

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Abstract

The emergence of new regional paths is a key topic in economic geography. While new paths are largely associated with positive regional economic outcomes, little is known about how the formation of a new industry affects other parts of the regional economy. By linking recent conceptual advancements on early path formation and inter-path relationships, this article develops a framework for studying how path creation, as a result of diverse resource formation processes, causes the reformation processes of existing industries. The value of the framework is illustrated in a case study on the tourism path formation process in the Zambezi region (Namibia) and its impacts on the agricultural sector. The findings reveal how the path formation has caused new forms of intra-regional inequalities as well as novel opportunities for the existing agricultural sector depending on the inter-path relationship. Beyond these case-study-specific findings, the results emphasize the importance of a broader perspective that goes beyond a single new path and includes non-participating regional actors in the analysis. Only in this way can we understand how new path creation translates into regional economic development.

Keywords: path creation, regional development, inter-path relationship, new industries, Namibia

Introduction

Policy makers harbor great hope for the emergence of new industrial paths, in particular in peripheral regions and regions characterized by declining industries, to create new economic opportunities and compensate for losses (e.g. Fornahl et al. 2012; Dawley 2014). Therefore, it is not surprising that the question of how new paths evolve in regions has been declared “as one of the most intriguing and challenging issues in the field of economic geography” (Neffke, Henning, and Boschma 2011, 241). Evolutionary Economic Geography (EEG) studies, in particular, have pioneered the discussion by showing that the emergence of new paths is more likely and successful in regions that host related industries (e.g. Boschma, Minondo, and Navarro 2013; Breul, Broekel, and Brachert 2015; Mewes and Broekel 2020). Recently, a number of important advancements have been made that broaden our understanding of how new paths emerge in regions. These studies have incorporated building blocks like agency

(Grillitsch and Sotarauta 2019), non-firm actors (Dawley et al. 2015), and extra-regional resources (Isaksen and Trippel 2017) into the discussion.

Despite the progress made in understanding how new paths emerge in regions, a major motivation for studying this phenomenon – i.e. the impact of a new path on the regional economy – has largely remained restricted to insights into economic impacts immediately inherent in the newly created path. However, a successful new industry cannot be equated with successful economic development for the entire region (Christopherson and Clark 2007). Beyond direct effects, new paths may generate opportunities for existing paths and form synergetic relationships; likewise, new paths may be the source of inequality in regions through competitive relationships with existing economic activities in the region (Hassink, Isaksen, and Trippel 2019; MacKinnon et al. 2019). Understanding these interdependencies is critical to grasp what kind of regional development is generated by new path creation. To derive more nuanced insights into the role of new path creation for regional economic development, a broader approach is required that goes beyond the analysis of a single new path. This article develops a framework that links the path formation framework by Binz et al. (2016) with ideas from the inter-path relationship framework by Frangenheim et al. (2020), allowing to study to what extent the formation process of a new path causes reformation processes of existing regional paths. The article, thereby, aims to contribute to the burgeoning research strand on new path creation by bringing the debate a step closer to the major point of concern – regional economic development.

We demonstrate the use of the framework to understand how new path creation may affect existing economic activities and how this relates to the overall goal of promoting regional economic development in an illustrative case study of the Zambezi region in northeastern Namibia. The Zambezi region, as we will show, is a suitable example to study the effects of new path creation on existing economic structures. Historically, the region relied on agriculture as the main livelihood activity. Since the 1990s, different resource formation processes have contributed to the creation of a tourism path. We analyze this formation process of the tourism path and its influence on the existing agricultural path. The findings highlight that new path development cannot be interpreted as a ‘growth path’ for the entire region. The formation of the tourism path has generated variegated outcomes within the region with benefits and losses unevenly distributed among firms and people.

The formation of new industrial paths and regional economic development

Where and how new industrial paths emerge has been the main line of inquiry within EEG. Here, the development of new paths is understood as a regional branching process that emerges out of preexisting economic structures and organizational routines (Boschma and Wenting 2007; Boschma and Frenken 2011; Neffke, Henning, and Boschma 2011). However, claims for more comprehensive conceptualizations of new path development have often been expressed (for an overview, see Hassink, Isaksen, and Trippel 2019). These include, inter alia, a multi-actor approach that goes beyond the mainly firm-driven understanding of new path development in EEG (Dawley et al. 2015). Recent work, therefore, suggests distinguishing between firm- and system-level agency. While the former refers to actors that establish new firms or to existing companies introducing new activities, the influence of system-level agency

transcends the organizational borders of individual firms and transforms regional innovation systems (Hassink, Isaksen, and Trippel 2019). Moreover, scholars have suggested broadening the narrow focus of EEG beyond locally available assets (Trippel, Grillitsch, and Isaksen 2018; Alonso and Martín 2019).

Binz et al. propose an analytical framework that incorporates these claims and explicitly includes firm and non-firm actors, resources other than knowledge and the crucial role of extra-regional assets to provide “more nuanced answers to the fundamental questions when (under what conditions) and how (through what kind of mechanisms) new industrial paths are created in regions” (2016, 174). The authors conceptualize new path development as an alignment process in which heterogeneous actor networks mobilize key resources in so-called formation processes aiming to introduce a new path. Key resources include knowledge, markets, financial investment, and legitimacy. Like in EEG, the framework sees *knowledge* as a central component of new path development. *Financial investment* is another critical resource for new path development. New economic activities are often characterized by high insecurity and, therefore, face difficulty in mobilizing financial inputs. Furthermore, markets for new paths are not automatically given, but have to be created in a *market formation* process. Lastly, new paths tend to face high skepticism or lacking acceptance. *Legitimation* can be achieved through the adaptation of the path to the existing institutional structure or vice versa.

But why is an understanding of how new paths emerge so important and attracts so much scholarly attention? A central reason is that the ability of regions to create new paths is perceived as crucial for long-term economic success. Various quantitative studies have shown that the ability to diversify into new economic activities matters significantly for the economic performance of countries and regions (for a literature review, see Content and Frenken 2016). Case studies on the formation of individual industrial paths have also provided valuable insights into regional economic outcomes (e.g. number of employees, firm entry, investments etc.) immediately inherent in this newly created path (e.g. Fornahl et al. 2012; Isaksen and Trippel 2017). In sum, new path creation is by and large positively associated with regional economic development concerns, which is also reflected in the occasionally interchangeably used term ‘new growth path’ (e.g. Trippel, Grillitsch, and Isaksen 2018; Hassink, Isaksen, and Trippel 2019).

However, so far the consideration of regional economic outcomes has been restricted to the given new path itself or takes place aggregated at a regional level. While new paths tend to produce economic benefits, less is known about their effects on the rest of the region (e.g. existing industries, actors, people). In their seminal work, Christopherson and Clark (2007) warn against automatically interpreting regions as successful when hosting a competitive industry and underline the importance of considering the intra-regional allocation of resources in order to grasp developmental outcomes for a region. In a similar vein, Coe and Hess call attention to the variegated effects the embedding of global production networks – i.e. path importation – may have on different parts of a region: “although the articulation of regions in global production networks can produce significant economic gains on an aggregate level, in many cases it also causes intra-regional disarticulations, for instance, through uneven resource allocation and the breakup of existing cultural, social and economic networks and systems.” (2011, 134).

These discussions indicate that new paths can be the source of new forms of intra-regional inequalities as well as an impetus for regional economic development. One cannot derive conclusions about regional economic impacts stemming from new path creation when only focusing on an individual new path.

Path formation and reformation processes of existing economic structures

In Binz et al.'s seminal work, "path creation is conceptualized as a sociotechnical alignment process where heterogeneous actor networks mobilize" (2016, 174) key resources. Appropriate for its purpose of explaining early path creation, this understanding only includes actors relevant for the path creation process itself. Naturally, other actors exist in the region that do not participate in the path formation process or are excluded from it and its related benefits (see Werner (2016) for a similar discussion in global production network research). To be capable of grasping the variegated developmental effects of new path creation on regions, it requires the inclusion of these non-participating parts of the regional economy into the analysis and to connect them to the path formation process. This section elaborates an analytical framework to analyze the impact of new regional path development on other parts of the regional economy by conceptually linking the path formation process with what we define as the reformation processes of existing regional paths (Figure 1). For this purpose, our approach considers changes in the intra-regional allocation of resources caused by the path formation process as outlined in the following section.

Our point of departure is the formation process of the new path. Resource formation processes as outlined in the section above are seen as the condition for a new path to successfully emerge (Binz, Truffer, and Coenen 2016). Through these processes, key resources are mobilized creating markets and different types of regional assets that are required by firm and non-firm actors to develop the new path. While being at the center of path formation, the resource formation processes can also be understood as 'asset modification processes' in which new regional assets are created, non-regional assets are imported, existing regional assets are re-used or destroyed (Tripl et al. 2020). This understanding highlights that the mobilization of resources for the new path possibly also affects the regional production environment of other existing paths. It thereby offers a helpful perspective to explicitly link path formation to other parts of the regional economy by considering changes in the regional availability and allocation of resources which may cause reformation processes of existing regional paths.

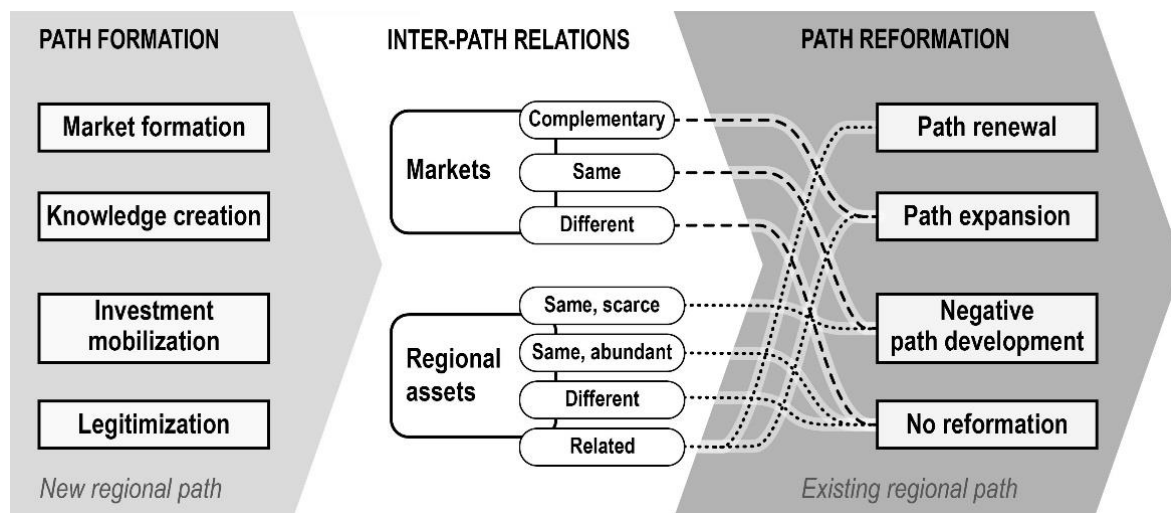


Figure 1: Analytical framework to study the effects of new path creation on existing regional paths

We define reformation processes as changes of existing regional paths initiated by the formation of a new path in the region. Different directions of reformation processes are possible as we derive below. The effect of the newly emerging path on existing regional paths is mediated through the assets and markets that were created by the resource formation processes, depending on how these relate to existing regional paths. We draw on recent conceptualizations of inter-path relations by Frangenheim et al. (2020) to elaborate the causal connections between new path formation and different types of reformation processes. The key idea of their framework is to characterize the nature of the relationship of two or multiple emerging paths by considering whether they rely on the same assets or markets (see also Sandén and Hillman 2011 for relationships among technologies). In addition, what matters to understand the relationship between different paths from the asset-perspective is whether the required assets are abundant or scarce.

Based on these inter-path relationships, four types of reformation processes of existing regional paths are plausible that have partly been mentioned in typologies of existing work: negative path development, path expansion, path renewal and no reformation. In the following, we define the different types, explicitly depict through which inter-path relationships they are caused, and discuss their consequences on regional development.

Negative path development: Following Blažek et al. (2019), we define this reformation type as the decline of an existing regional path, such as in terms of output or employment. While various exogenous and endogenous factors can cause the decline of an industry in a given region (e.g. Martin 2014), in this article the term explicitly refers to a negative path development caused by the formation of a new regional path. If a new path accesses the same scarce assets which are required in an existing path, both are in a competitive relationship with one another. In such a context, the formation of the new path can cause a reallocating effect on the availability of regional assets (e.g. crowding-out effects of skilled workers arising from foreign investments (Becker et al. 2020)). Moreover, negative path development can occur when the new path targets the same market as the existing path (Frangenheim, Tripl, and Chlebna 2020), potentially replacing the established path. Regarding questions of regional development, this type of reformation process highlights that while creating economic gains for some, the formation of a new path may also cause losses in other parts of the regional

economy. MacKinnon et al. term this phenomenon the ‘dark side of path creation’ and note that “new paths may generate new forms of inequality [...] through, for instance, [...] uneven resource allocation, and the exclusion and displacement of some groups” (2019, 121). Negative path development is especially troublesome and increases intra-regional inequality when the new path is not capable of compensating for the losses in the existing path.

Path renewal: Grillitsch and Asheim (2018, 1641) define path renewal as “a major change of the existing industry due to the introduction of new technologies, change of business models, or organizational innovations.” Path renewal in this article explicitly refers to changes in an existing path based on the introduction of new assets such as knowledge or technologies by the formation process of a new path. A conducive inter-path relationship for this reformation type to occur is the reliance of the new and the existing paths on different, but related assets. For instance, the creation or transplantation of new knowledge for new path formation also contributes to the expansion of the regional asset base, thereby increasing the scope for knowledge re-combinations in the region. Following the relatedness argument (Frenken, van Oort, and Verburg 2007), it is more likely that this newly available knowledge may be applied by existing paths that are related to the new path. Moreover, existing regional industries may also benefit from investment mobilization that is utilized to create assets for the new path if these are related to these industries’ own asset requirements. Research on the development of production linkages uses the term ‘horizontal linkages’ to describe a situation where capabilities that are developed by one path also meet the needs of other existing regional paths (Morris, Kaplinsky, and Kaplan 2012). Path renewal implies that the developmental impact of a new path exceeds the new path itself and spills over to other parts of the regional economy. It contributes to the rejuvenation of existing regional economic structures. This is particularly crucial for declining mature paths which are losing competitiveness (Coenen, Moodysson, and Martin 2015).

Path expansion: Path expansion is defined as the growth of an existing regional path in terms of economic output, revenue, and/or employment caused by multiplier effects resulting from the formation of a new regional path. This reformation type can be initiated if a new path creates a market that is complementary to the market of an existing regional industry. Through backward or forward linkages or the production of complementary products, the existing path may benefit from the formation of the new path. For instance, the market formation of solar photovoltaic through feed-in-tariffs caused growth effects for the existing semiconductor path, due to complementary markets (Choi and Anadón 2014). Furthermore, the creation of related assets cannot only cause the renewal of an existing path, but also contribute to path expansion due to an improved production environment. An example is the development of a port to enable an export-oriented mining path, which is then also used by actors from other paths thereby increasing their economic output (Morris, Kaplinsky, and Kaplan 2012). When this reformation type occurs, the growth of the new path prompts the expansion of the existing path, leading to increased regional economic development that also unfolds beyond the new path.

No reformation: Lastly, new path formation does not necessarily lead to any reformation of existing paths. This is the case when the new and the existing regional paths are unlinked and are, therefore, in a neutral relationship. Following Frangenheim et al. (2020), this inter-path relationship exists when two or multiple paths target different markets or rely on different (abundant or scarce) assets or the same, but abundant assets.

The various reformation types highlight that while some parts of the regional economy may benefit from the new path, others are hit by losses. In reality, one may not be able to observe the one reformation process or the other individually, but one can possibly detect various resource formation processes in parallel. These processes need to be analyzed jointly in order to assess the complete impacts of path creation on regional development.

Case study and method

The analytical framework developed above is applied to analyze the impacts of the formation of the tourism path on the existing agricultural path in the Zambezi region. Located in north-eastern Namibia, the Zambezi region is home to roughly 100,000 inhabitants (2016), 70 % of whom live in rural areas (Namibia Statistics Agency 2017). The Zambezi case is suitable to illustrate the value of the analytical framework for two reasons.

First, its economy is mainly based on two sectors: agriculture and tourism (Hulke, Kairu, and Revilla Diez 2020). Although economic activities such as timber export, fishing, and logistics exist on a limited scale, the region is traditionally characterized by small-scale crop farming and cattle herding for subsistence use (Mendelsohn 2006). Farmers typically grow dry crops such as maize, mahangu, or sorghum for their own consumption and occasional surplus selling. The farming system has shown few dynamics over the past decades and is characterized by smallholders with a low-input, low-output structure (Mendelsohn 2006). This is despite recent government efforts to intensify and formalize agricultural production and promote Zambezi as Namibia's 'bread basket' (Republic of Namibia 2017). Medium and large-scale irrigation schemes, so-called Green Schemes, ought to realize this vision by including small-scale farmers as out-growers. However, so far only one Green Scheme has been established in the Zambezi region which employed six permanent farmers in 2019 (Hulke, Kairu, and Revilla Diez 2020).

Since the late 1980s, the emergence of a tourism path has led to economic diversification in the region. Large mammals, such as elephants, hippopotamuses and cape buffaloes, attract an increasing number of tourists who come for photo-safari tourism and/or hunting tourism. Although distribution channels differ, both types of tourism rely on similar assets and institutions (Kalvelage, Revilla Diez, and Bollig 2020b), which is why we consider it as one path. Both hunting and photo-safari tourism build on the designation of nature conservation areas and the more transcendent or more direct consumption of wildlife. Furthermore, both products are tailored for wealthy international clients. The two types of tourism can also not be clearly separated, as hunting tourists are often accommodated in the same lodges or engage in photo-safari activities after a successful hunt. In short, the region is largely characterized by the existent agricultural sector and the emerging tourism path. It therefore provides a contextual field that facilitates the empirical investigation of the reformation processes of the existing regional economy caused by new path creation.

A second reason for the case selection is the relatively recent emergence of the tourism path which allows the reconstruction of its path formation process and its consequences on agricultural activities.

However, quantitative data on the two economic sectors at a regional level are scarce and, if available, only depict small excerpts of the existing economic activities. This is particularly

true for the agricultural sector, where informal work greatly contributes to people's livelihoods, 87.6 % of all households depending on informal work are engaged in the agricultural sector (Namibia Statistics Agency 2015). These limitations make a qualitative research design more appropriate.

To grasp the resource formation processes of the tourism path as well as its consequences on agricultural activities, qualitative data was gathered during eight months of fieldwork in 2018 and 2019 in Zambezi and Namibia's capital Windhoek. During this period, focus-group discussions (FDGs), go-along interviews and semi-structured interviews with stakeholders from various actor groups were conducted, covering both the tourism and agricultural sectors (Table A1, annex). In the case of tourism, all 47 accommodation establishments (LOD-T) were contacted aiming for a complete survey, 21 of which agreed to be interviewed. Moreover, seven professional hunters (PH-T) and seven tour operators (TO-T) were interviewed. Sampling included businesses that currently are or previously were active in Zambezi. A semi-structured interview guideline was used to assess local linkages, distribution channels, relationships with other stakeholders in the sector, and to reconstruct the history of the companies. Interviews took roughly one hour and were conducted in English or occasionally in German, since German speakers are active in Namibian tourism and the interviewer is fluent in German. To this interview were added with conservancy management boards (17, CONS-T/CONS-A), business associations (9, ORG-T), and government agencies (4, GOV-T) to explore system-level agency and contextualize findings.

In the case of agriculture, we conducted 14 FDGs and 14 go-along interviews with farmers in four conservancies (Sikunga, Bamunu, Dzoti, Mayuni) and two settlements on ordinary communal land as a reference (Masokotwani, Sibbinda). The chosen conservancies cover various population sizes, age structures, income sources, and geographical locations in the region. The FDGs, which took two hours on average, were conducted in the local languages and subsequently translated into English by two Namibian research assistants who are familiar with the objective of the study. Local gatekeepers, i.e. members of the respective settlements, assisted in the sampling of FGD participants with the aim of balancing gender and age and covering various crop types and farm sizes. The total number of participants was 155 (F=73, M=82), the group size ranged from 5 to 20, with a mean of 9. The FDGs aimed to trigger discussions on overarching structures and trends in agricultural production and marketing, the conservancy impact, and tourism development in the respective sites. In this way, common knowledge on overarching trends concerning agricultural livelihoods, conservation and their interrelationships with tourism could be extracted from the data. Successful or innovative farmers that ventured into horticulture were chosen for additional go-along interviews (FARMER) in order to gather details on the livelihood strategies of individual farmers. As the stakeholder landscape in the agricultural sector is relatively small, we included most relevant actors in the study (total of 44), ranging from national and regional government bodies (GOV-A) to non-governmental-organizations (NGO-A), lobby groups or associations (LOBBY-A), and private companies (COMP-A). Interviews, varying between 30 minutes to two hours in length, were conducted mostly in English and occasionally in German and transcribed afterwards.

The qualitative data from the FDGs and individual interviews were analyzed in a systematic content analysis (Mayring 2000). Coding followed the categories developed in the conceptual

framework (see Figure 1). This approach allows the systematic extraction of common narratives and recurring information provided by a large number of interviewees. Thereby, our analysis aimed to reveal similarities that reoccur across the cases as well as differences that might occur only in a few cases but are of importance to understand the entire dynamics (e.g. to highlight missing synergies between paths). In the empirical sections, we quote expressive statements from the interview material to illustrate general findings as described in Mayring (2000). The original data is supplemented with a systematic literature review on existing scholarly sources, reports, and policy documents.

The formation of the tourism path in the Zambezi region

The emergence of the tourism path in Zambezi is relatively recent, although the endogenous development potential of wildlife in Zambezi has been recognized since the early stages of colonial rule. In 1983, an advisory commission to the national government identified nature conservation and tourism among the most significant areas of economic potential (Lenggenhager 2018). First attempts to establish a national park date back to 1937 (Lenggenhager 2018), but only came into effect a few weeks before Namibia gained independence from South Africa in 1990. Prior to independence, tourism development in the area was hampered by the military activities of the South African Defence Force, which used the region as a base for operations during the Angolan war.

Infant stages of tourism development can be traced back to the 1980s, when the centre of military conflicts shifted westwards, away from Zambezi. Since the 1970s, more and more trophy hunters had come to Central Namibia, as an increasing number of cattle farms specialized in game breeding for tourist purposes (Lindsey et al. 2013). These farmers advocated for a change of legislation which resulted in the Nature Conservation Ordinance (No. 4 of 1975) that transferred the right to benefit from and utilize wildlife to farm owners. Interestingly, the farmers' agency met the government's objective of protecting wildlife on private land. This policy proved to be successful as wildlife numbers increased steadily and trophy hunting was expanded to communal land in northern Namibia. In 1988, two newly created concessions in Zambezi enabled game-breeding farmers from Central Namibia to expand their business activities (I-PH-1), and a small number of trophy-hunting tourists made their way to Zambezi. However, trophy hunting did not yield much and, in 1994, an estimated of 163,000 USD was earned from trophy hunting (Barnes 1995). Between 1980 and 1990, only four tourism establishments had emerged in the region (Suich, Busch, and Barbancho 2005).

The tourism path took off in parallel with the introduction of the Nature conservation Amendment Act No. 5 from 1996, which served as a *market formation* process. The new legal framework was driven by the post-apartheid government that aimed at empowering the previously disadvantaged population in rural areas. By granting communities on public land similar rights to wildlife as those that had been enjoyed by the owners of large private farms since the 1970s, the mobilization of nature – mainly wildlife – as an asset for the tourism industry was enabled. The act entitled communities to form village-based conservation entities (Silva and Mosimane 2014). These conservancies were obliged to implement conservation measures to protect free-roaming wildlife and, in return, were awarded use-rights over wildlife. The conservation narrative led to the revaluation of wildlife as agreements could be made with

hunting outfitters who sold quotas to trophy hunters. Since then, there has been a strong incentive for communities to engage in hunting as the revenues paid to the conservancy are exempt from tax (I-gov-t-1) and provide a new income opportunity besides agriculture. Local residents, however, are largely excluded from hunting as most quotas are sold to professional hunters and fetch high prices (Lubilo and Hebinck 2019). All in all, trophy hunting was legalized as a result of system-level agency and, thereby, created new market opportunities for legal hunting activities in the area. As a consequence of the commodification of wildlife, trophy-hunting activities increased in parallel with the establishment of new conservancies.

Salambala was the first conservancy to be gazetted in Zambezi in 1998, 14 more conservancies were formed in the following years (Figure 2). The formation of conservancies was accompanied by NGOs like the Namibian organization IRDNC (Integrated Rural Development and Nature Conservation) and WWF (World Wide Fund For Nature) and supervised by the Ministry of Environment, Forestry and Tourism. Until today, these organizations play a major role in the management of conservancies by providing support in legal advisory, auditing, the negotiation of contracts with private enterprises, and conducting game counts. Conservancies contributed to an increase in large mammal populations and provided space for the expansion of trophy hunting in the area. In 2017, the total turnover from trophy hunting in Zambezi was 5 m USD (Kalvelage, Revilla Diez, and Bollig 2020b). 54 % of the region is currently protected to varying degrees, including national parks, a state forest, and conservancies (Kalvelage, Revilla Diez, and Bollig 2020a).

The development of this new path has not been uncontested because it interfered with the pre-existing use of natural resources and land by the local population (as is outlined in more detail in the next section). Thus, the alignment of institutions was necessary to create acceptance for the new path to develop. This *legitimation* process is apparent in the institutional structure of the conservancies. For instance, zone management has been introduced to set aside plots for tourism development, exclusive hunting areas, and core wildlife areas of no disturbance (CONS-T-2). The designation of areas to particular land uses is a formal requirement for the establishment of a conservancy, and the planning involves the community, conservancy committee, traditional authorities, and the staff of conservation NGOs. Similar to hunting outfitters, lodges enter a benefit-sharing agreement with conservancies and pay annual fees to the conservancy. This income is shared with conservancy members to reward the implementation of conservation measures and compensate for coexistence with wildlife in the area (GOV-T2). All these activities were intended to increase the legitimacy of the tourism path and have facilitated its steady growth. During the 1990s, following independence, a rapid increase in tourism can be observed. In 1994, a study identified four up-market lodges, three fishing lodges, and one campsite in the region (Barnes 1995). In 2005, 24 establishments catered for an estimated 31,000 guests (Suich, Busch, and Barbancho 2005). From 2005 to 2018, the total number of tourism establishments had doubled to 47 (Kalvelage, Revilla Diez, and Bollig 2020b), and so had the number of arrivals to the region (60,000 in 2017, Kalvelage, Revilla Diez, and Bollig 2020a).

Investment mobilization in the early stage was primarily driven by individual firms and, thus, characterized by firm-level agency. For instance, there are a number of former South African militaries who built lodges to cater for tourists, as this example illustrates:

*“Well, *lodge has been around for a long time; actually, it was the first lodge after independence that existed. Because before independence *lodge was a recreational camp used by the South African army. [...] then after independence it was continued as a lodge by one of the officers.”* (LOD-T-1, translated from German)

During the war, the entanglement between nature conservationists and military had been high, as military reconnaissance and nature conservation both aimed to expand their knowledge on the environment (Lenggenhager 2018). **Knowledge creation** on environmental features was crucial for successful military operations (Lenggenhager 2018). Therefore, the South African military hired local residents as trackers to access indigenous knowledge of the environment (Taylor 2009). Knowledge of the environment, however, was not only used for military purposes, but also for hunting. Members of the South African Defence Force hunted excessively, both for sport and to trade ivory (Lenggenhager 2018). When conditions became more peaceful, this knowledge about the environment could now be used to offer tourist products.

The first lodges and campsites that had emerged were designed to accommodate fishing tourists and trophy hunters because the poor condition of roads and phone signal prevented the development of an upmarket safari tourism sector (TO-T-1). It required **investment mobilization** from extra-regional sources to exploit these new market opportunities that were created by the commodification of nature. Infrastructural and material assets had to be constructed. For instance, the construction of a tar road that connects Zambezi with the national tourism hub Windhoek generally improved the accessibility of the region and allowed for the arrival of guided bus tours (Kalvelage, Revilla Diez, and Bollig 2020b). Furthermore, investments were required for hunting operations, the maintenance of roads to keep hunting grounds accessible, and for installing accommodation facilities. Investment capital in both segments, photo-safari and hunting tourism, has mainly been mobilized from outside the region. Hunting concessions in the Zambezi region are exclusively operated by white Namibians or increasingly South African professional hunters. Most of the time, these professional hunters gained experience in the field as owners of a private game farm in Central Namibia and hold concessions to offer a more exclusive hunting experience in the open range (Kalvelage, Revilla Diez, and Bollig 2020b). The growth in the number of lodges has also been largely spurred by the great involvement of extra-regional actors in the tourism path. In 2005, only 21 % of the lodges were owned by black Namibians (Suich, Busch, and Barbancho 2005). Although this figure is not a reliable indicator for local ownership, the low share of black ownership hints toward the dominance of extra-regional actors in the tourism industry in the Zambezi region. While the first investments were primarily owner-operated, lately the region has attracted investments from larger corporates from France, South Africa, and Central Namibia (Kalvelage, Revilla Diez, and Bollig 2020b) which run luxury lodges mainly for the market in the global North. Aiming for the up-market segment, tourism market knowledge is crucial, as an example of a community-run campsite illustrates:

“There was a community camp (...) that didn't run well at all until people said: Okay, let's show you how it's done. And I think they went from something like N\$3,000 minus every month, then something like N\$61,000 plus for the next 6 months, just because it was marketed or managed a little bit right. So it's not that the will is not there, (...) but simply the know-how

and these international connections and that is unfortunately fast-moving in tourism and it is networked.” (LOD-T-1, translated from German).

In addition, anchoring international knowledge in Zambezi through the training of professional service staff has been critical to the success of the tourist path. Large companies organize training in-house to reach international standards:

“For our kitchen, very often and for service, we have professionals that come from training companies that will come up and re-train staff, service staff. And the kitchen quite regularly receives visits from professional trained chefs who come in and change things on the menu and show them how to make new things and stuff like that” (LOD-T-2).

Thus, the influx of financial investments was accompanied by a transfer of industry-related knowledge from international target markets which was recombined with region-specific knowledge about nature.

Overall, although the endogenous development factor ‘wildlife’ was identified early on, the mere presence of game did not automatically induce a tourism path. As depicted above, several resource formation processes were required, such as the legalization of trophy hunting, the recombination of local knowledge about nature with a tourism-related skillset, the establishment of the conservancy institution to gain legitimacy, and the influx of extra-regional investments to turn the endogenous economic potential into a tourist path. These processes were driven by both, firm- and system-level agency. On the one hand, pioneering entrepreneurs commenced offering trophy hunts and built first accommodation establishments in the Zambezi region. On the other hand, concerted action was required from conservation NGOs and public bodies to create a legal framework that allowed for the emergence and expansion of the tourism sector.

Conservancies, as local institutions, enforce transfer payments and local employment, which leads to some degree of local value capture. Overall, roughly 20 % of the tourism turnover remains within the region (Kalvelage, Revilla Diez, and Bollig 2020b). Nevertheless, the economic effect of tourism is limited: less than 3 % of the local labor force work for a tourism business, predominantly in low-wage jobs such as receptionists, cleaning staff, and gardeners. In total, tourism-related revenues account for 5.5 % of the total household income in the rural areas (Kalvelage, Revilla Diez, and Bollig 2020a). In addition, local linkages are limited, as most of the inputs required for the operation of lodges and camps are imported from outside the region (Kalvelage, Revilla Diez, and Bollig 2020b). Despite the limited extent, the new path has generated immediate economic effects. But what does the formation of the tourism path mean for the rest of Zambezi’s economy? This requires an analysis beyond this single path, which we elaborate in the following section.

Reformation processes: the impact of the tourism path formation on the existing agricultural path

The afore-mentioned resource formation processes of the tourism path have created, imported, and reallocated key resources within the Zambezi region that also modify the regional production environment for the existing agricultural path. Table 1 summarizes the formation processes in the tourism sector and resulting reformation processes in the agriculture path, which we elaborate below.

The institutionalization of conservancies commodified wildlife and, thereby, enabled a *market formation process* for the tourism sector. This new market is not in a competitive relationship with the existing agricultural path. On the contrary, the two paths partially form a complementary market relationship as the growing number of lodges, campsites, and restaurants has created new opportunities for farmers to sell fresh produce. Since large parts of the rural population can cover their demand for fresh food from their own production, the local market in the Zambezi region is limited. Therefore, the sale of fresh food to lodges and campsites was mentioned as an attractive opportunity by various farmers (FARMER-11; FARMER-1; GOV-A-1; NGO-A-8; COMP-A-6; FGD3-Dzoti; FGD2-Mayuni). Selling directly to businesses in the area reduces transport costs and the need for cold storage to keep products fresh. For instance, a company that operates three lodges in Zambezi sources roughly 20 % of its fresh food from local farmers in Zambezi (COMP-A-1). This is especially relevant for farmers within conservancies and thus in proximity to lodges. However, the scope of this new sales channel is limited due to the relatively few lodges in the area. A quote from a farmer illustrates the benefits of supplying directly to lodges: “Sometimes they tell me ‘grow for us some onions, we need spring onions, we need salads, so I grow the things according to their demand. (...) You can put a higher price because the vegetables are still in the garden, they are fresh” (FARMER-1). Yet, the share of vegetables this farmer can sell to lodges is below 30% of his production, as there are only two lodges nearby. Through these backward linkages, the tourism path has prompted the growth of agricultural output for some farmers and, thereby, contributing to path expansion, albeit on a limited scale.

Table 1: Path formation and reformation processes in Zambezi

Formation processes of the tourism path	Inter-path relationships	Reformation of the agriculture path
<p>Market formation:</p> <ul style="list-style-type: none"> - Commodification of wildlife (Nature conservation Amendment Act No. 5 (1996)) 	Complementary markets (synergetic)	<p>Path expansion:</p> <ul style="list-style-type: none"> - Lodges, campsites and restaurants as new markets
<p>Investment mobilization:</p> <ul style="list-style-type: none"> - Foreign investments in tourism 	Related assets (synergetic)	<p>Path expansion:</p> <ul style="list-style-type: none"> - Spillovers to set up local procurement structures for fruits and vegetables
<p>Legitimation:</p> <ul style="list-style-type: none"> - Zoning - Benefit distribution 	Same, scarce assets (competitive)	<p>Negative path development:</p> <ul style="list-style-type: none"> - Displacement of farms near rivers - Necessity-driven irrigation schemes for horticulture - Mismatch of HWC offsets turns some agricultural activities unprofitable
<p>Knowledge creation:</p> <ul style="list-style-type: none"> - Recombination of industry-related knowledge from international target markets with region-specific knowledge on nature 	Related assets (synergetic)	<p>Path renewal:</p> <ul style="list-style-type: none"> - Introduction of newly demanded crops and quality standards, e.g. organic products

Furthermore, we found a case in which path expansion has been supported through *investment mobilization* by tourism businesses. The lodge operator “started a program in [*village] where

we said we will pay for the infrastructure for the vegetable garden but we need you guys to manage it and we will buy the vegetables from you again.” (COMP-A-1). This example shows that extra-regional financial investments directed toward the development of the tourism path partly spilled over to the local agricultural sector aiming to set up reliable local procurement structures for fruits and vegetables.

Legitimation processes (zoning of land uses and offsets for human wildlife conflicts) did not only allow the tourism path to develop, but also had severe effects on the use and allocation of critical regional assets for agriculture. In many cases, the zoning process in conservancies has allocated favorable agricultural land along rivers to tourist use (see Figure 2). In this context, the relationship between the two paths is characterized by a demand for the same scarce asset, i.e. areas proximate to rivers. Since the zoning exhibits a reallocating effect on the availability of fertile land and water, it withdraws this scarce natural asset from its previous agricultural use, as exemplified by this quote *“Areas for farming in conservancies are becoming scarce because of zoning”* (FGD2-Sikunga).

According to the zoning maps of 11 conservancies¹, 78 % of the area along rivers, i.e. agriculturally favorable areas as they enable access to water and provide fertile soils, is allocated to tourism/hunting or wildlife use, compared to 22 % for settlements, cropping and livestock use. Excluding the Salambala conservancy from the analysis, which designated significantly more areas for settlement and cropping, tourism/hunting and wildlife zones even account for 97 % of the areas along the rivers. According to these numbers, in most conservancies agricultural activities have largely been displaced from areas along rivers, thus impeding agricultural practices. A central reason for this one-sided reallocation of critical natural assets is that the zoning process was dominated by the conservancy management, local elites, the government, and international NGOs that often favored the interest of tourism businesses and wildlife rather than the local population’s needs (Hulke, Kairu, and Revilla Diez 2020; Lenggenhager 2018). Although residents participate in the planning process of a new conservancy, these outcomes indicate that their needs are not considered in the actual implementation of a conservancy in the long run.

Based on a livelihood baseline survey (Mosimane et al. 2014), 26.5 % of the surveyed households in Zambezi region state that conservation constraints hinder them from the self-determined use of water, and 77 % could not access their land as before. The reallocation of scarce assets to the benefit of the tourism path, thus, impedes existing agricultural activities and caused a negative path development of the existing agricultural path. As a consequence of the zoning, fields partly had to be relocated to dry, touristically unattractive areas, as farmers described in two case study sites (FGD1-Dzoti; FGD2-Mayuni). This hampers specifically the development of irrigated horticulture. One group of farmers concludes: *“Gardens are very important. The only problem there is the land to build these gardens on. Around here most of the fertile land is next to the river and we cannot farm there anymore because it has become a core area for wildlife in this conservancy.”* (FGD2-Mayuni). As a result of the relocation

¹ Conservancies in eastern Zambezi that are located in a regular flood plain are excluded from this analysis. The analysis was carried out with ArcMap 10.5.1 by clipping the zoning with a 1 km buffer around rivers. This distance can be assumed to enable the agricultural use of water and fertile soils along the river banks.

processes, irrigation to cope with the dry environment becomes challenging: *“The water has to be sourced underground or pumped kilometers from the river. And for our members also access to loans from Agribank [for installing a pumping system] is a problem [...] that is why we end up not having those big horticulture farms, only small farms, just for people”* (FGD1-Mayuni).

In addition, human wildlife conflicts have been increasing since the establishment of conservancies in the late 1990s in the region because of the recovering populations of wildlife (e.g. Matinca, 2018; FGD1-Mayuni; FGD4-Bamunu). Human wildlife conflict offsets have been introduced as a crucial instrument to compensate farmers for losses of crops or cattle caused by wildlife (GOV-A-5; NGO-A-3), thereby contributing to the legitimacy of the tourism path among the local population. Although the offsets have been raised from 15 USD per destroyed hectare to 60 USD, there was broad consensus in the FGDs that these payments do not compensate for the actual losses. Thus, the conservancy institution is blamed for hampering agricultural production (e.g. FGD1-Bamunu; FGD2-Bamunu; FGD1-Dzoti; FGD2-Dzoti; FGD1-Mayuni; FGD2-Mayuni; FGD1-Sikunga): *“I can plan to plough more, but the wild animals we have in the conservancy are damaging our crops and we hardly get anything in the end. Our livelihoods keep going down”* (FGD1-Mayuni). *“The conservancy is paying little as compared to the income I was going to get if I had harvested my crops”* (FGD2-Bamunu). As the quotes exemplify, the mismatch of human wildlife conflicts offsets results in the withdrawal of farmers’ livelihoods and turns some agricultural activities unprofitable. In the livelihood baseline survey from 2014, 70 % of the surveyed maize farmers stated suffering losses from wildlife crop raiding, with an average of 22 % of yield losses (Mosimane et al. 2014). A recent study on a conservancy in Zambezi found that only 30 % of the value of crops lost in wildlife raids is compensated through offset payments by the conservancy (Drake et al. 2021).

Farmers are, therefore, constrained in their agricultural activities. Zoning limits access to fertile soils and water and especially fields that are located far away from settlements and need protection from animal damage become uneconomic.

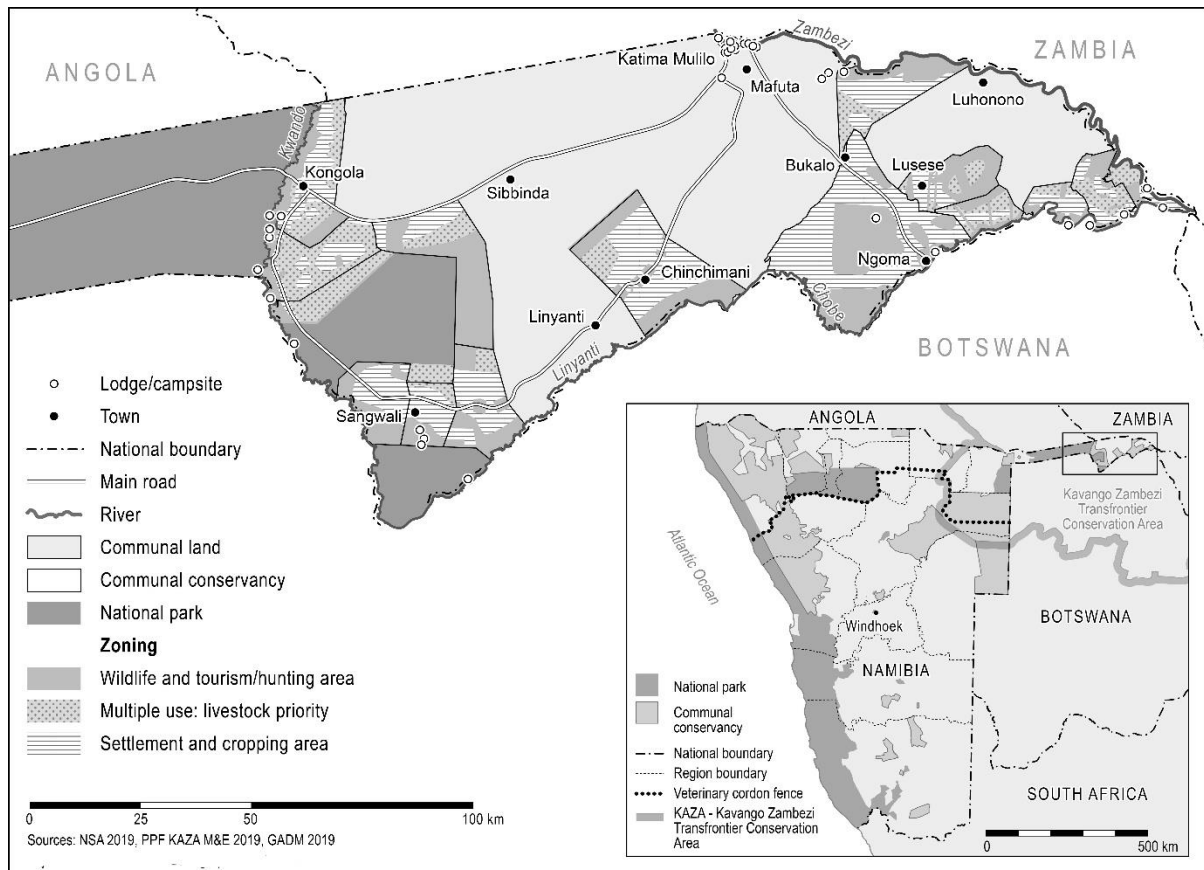


Figure 2. Map of the Zambezi region, location of lodges & campsites and zoning in conservancies. Own figure, data from Namibia Statistics Agency (2019), Peace Parks Foundation (2019)

The recombination of tourism-specific market *knowledge* with region-specific knowledge about nature has been a crucial resource formation process for successfully creating tourist products in Zambezi. The transplantation of this new tourism-specific market knowledge in Zambezi can be characterized as a different, but to a certain degree related, asset to the requirements of the existing agricultural path. It, therefore, provides opportunities for knowledge recombinations and path renewal in the agricultural sector regarding the types of crops and quality standards.

One farmer explains that vegetables commonly grown in the region are usually not in demand by tourism businesses, and knowledge on what to grow and how to access seeds is often a barrier for farmers to diversify accordingly (FARMER-6). Tourism businesses demand vegetables that meet the western appetite, such as lettuces, eggplants, or strawberries (COMP-A-1; GOV-A-6). The introduction of this knowledge, when communicated to local farmers, has occasionally driven on-farm diversification and facilitated their access to new markets for horticulture (FARMER-1; FARMER-2; FARMER-4; FARMER-6; FARMER-11). A regional horticulture association is active in transferring this market knowledge to Zambezi farmers: “So now what happens is that we communicate to the farmers and more of them are starting to produce according to the demand. Now they start to plant herbs and lettuces for the lodges. So the whole perception shifted from there is no market over to there is a market and we need to produce” (LOBBY-A-5). However, only a few lodges exist in the region that cooperate with local producers.

In addition to newly introduced crops, new quality standards, such as organic production, are set by tourism businesses that help farmers to access formal supply channels with supermarkets that demand similar quality standards (COMP-A-1; NGO-A-8; LOBBY-A-7). Thus, the use of this newly imported knowledge has, at least to a small extent, contributed to a path renewal of the existing agricultural activities toward the emergence of a regional horticulture value chain. However, this knowledge is still difficult to access for the majority of actors from the existing agricultural path, as one group of farmers complains: *“We need to get knowledge of other sectors, especially to find out what the international market might demand”* (FGD4-Bamunu). The analysis shows that the reformation process induced by market-specific knowledge is primarily driven by private actors (a few lodges, regional supermarket branches and an association for horticulture farmers). There was no indication of support from government bodies.

To sum up, these findings reveal that resource formation processes have not only enabled the creation of the tourism path in Zambezi, but also caused variegated effects in the existing agricultural path. On the one hand, the formation of the tourism path has created new related assets and complementary markets. These could be partially exploited by some actors from the agriculture sector, thereby contributing to path expansion and renewal. The occurrence of both reformation processes has contributed to increase the heterogeneity within the agricultural path. New economic opportunities have started to provide some farmers with additional income and knowledge, albeit on a limited scale so far. Thus, both reformation processes reveal ways in which the formation of the tourism path has also spilled over to other parts of the regional economy. They, thereby, contribute to increasing regional economic development that exceeds the new path itself. However, as revealed above, these benefits only reach some actors from the agricultural path.

On the other hand, the reallocation of scarce natural assets in favor of the tourism path has caused a negative path development for agricultural activities reflecting the ‘dark side of path creation’ (MacKinnon et al. 2019) for regional development. This type of reformation process is particularly troublesome for Zambezi as 65 % of livelihoods depend on agriculture (Mosimane et al. 2014). Meanwhile, the new tourism path has only created employment for less than 3 % of the local workforce (Kalvelage, Revilla Diez, and Bollig 2020a).

Thus, from a distributional perspective on regional development, a balancing of these various reformation processes is unlikely as benefits and losses are unevenly distributed among the people. Therefore, policies are needed that focus on the synergies between the two paths and support farmers to adapt to the changing business environment. Similarly, empowering farmers’ agency is crucial in order to consider their needs in the process of designating new conservation area. For instance, a more participatory zoning process that is sensitive to the needs of local farmers could help to mitigate negative effects on the agricultural sector, while allowing the development of tourism. This would have to go hand in hand with strengthening communication and knowledge transfer among farmers and tourism businesses.

Conclusion

While new path creation is largely associated with the generation of positive regional economic outcomes, little is known about its effects on other parts of the regional economy. To close this gap, this study has established a link that has been missing so far between the question of how

new paths are created and how this formation process affects the existing regional economy. We applied the analytical framework developed in this article in a case study on the tourism path formation process in Zambezi. The framework not only revealed the various resource formation processes that were required so that a tourism path could evolve, but also allowed the disclosure of how these processes caused reformation processes of the existing agricultural path. The creation, importation, and reallocation of key resources for the tourism path modified the regional production environment for agricultural activities, thereby in parallel triggering different types of reformation processes depending on the inter-path relationships. The reallocation of agriculturally favorable land for the tourism path led to the negative path development of agricultural activities. Simultaneously, through the knowledge generation and market formation of the tourism path, new assets have been imported and complementary markets were created that provide new opportunities for the expansion and renewal of the agricultural path. These nuanced insights are crucial to understand how path creation relates to the overall goal of promoting regional economic development. Besides generating direct economic opportunities for a small share of the local population, the resource formation processes of the tourism path have also restricted established agricultural activities and, thus, hampered the major source of livelihood in Zambezi. This indicates that the mobilization of resources for new path creation does not necessarily reflect harmonious interests between regional actors, but can also be a source of intra-regional conflicts and inequalities (Coe and Hess 2011; MacKinnon et al. 2019).

Due to the single case study approach, the generalizability of the empirical findings is limited. These are most instructive for other industrial paths that also rely heavily on natural assets, such as extractive industries. However, the single case study served for illustrative purposes and is rather to be understood as largely analytically generalizable. In different sectoral settings, e.g. high-tech industries, resource formation processes create assets and markets that differ widely from the presented tourism case. Therefore, reformation processes are mediated through distinct assets, markets, and inter-path relationships which are, nevertheless, detectable along the logic of the developed analytical framework. In this example, the reformation processes would rather be triggered by spillovers of synthetic knowledge or the competition for scarce highly qualified labor than fertile land.

Beyond the case-study-specific findings, the insights illustrate the analytical value of the framework to study and explain the variegated outcomes path creation can produce in other parts of the regional economy. The novel lens acknowledges that a new path not only triggers one sole direction of development in a region, but is closely intertwined with other existing industries so that even the presence of a new ‘growth path’ cannot automatically be interpreted as successful regional economic development (Christopherson and Clark 2007). It includes non-participating regional actors, such as farmers in Zambezi, in the analysis and, thereby, helps to develop nuanced answers to the crucial question of “what kind of local and regional development and for whom” (Pike, Rodríguez-Pose, and Tomaney 2007, 1254) path creation can induce. A greater consideration of the distributional issue of new regional dynamics is not only relevant for research on path creation, but also an exigent topic for other literature strands on regional development, such as research on global production networks (Coe and Hess 2011; Coe and Yeung 2015). Our framework could help to overcome the predominant ‘inclusionary bias’ (Werner 2016) in global production network research and enable research “to consider

the extent to which the [effects] of strategic coupling spill over to the region more generally—that is, to those who are not directly plugged in” (Coe and Yeung 2015, 192).

Closely related to this issue, studying the variegated consequences of path creation raises awareness for the fundamental question which paths are the most ‘desirable’ for a certain region. While we know a lot about the feasibility of path creation, i.e. facilitating and constraining conditions, little research has focused on questions of desirability (for an exception see Hartmann, Bezerra, and Pinheiro 2019). Taking into account possible reformation processes as a consequence of path creation delivers important insights to reflect on decisions about which path to promote. This decision should not only be based on relatedness as an enabling environment and the complexity of the new path, but also consider the intra-regional allocation of resources and the possible consequences on the existing regional economy. Knowledge about inter-path relationships between new and existing paths could allow policy to play a proactive role in harmonizing them and to carefully consider the conditions under which the gains from new path creation can be optimized across the entire region. On the one hand, negative reformation processes resulting from competitive inter-path relationships are to be avoided by designing solutions to meet conflicts of use early on. For instance, actors from existing paths could be integrated into resource formation processes to avoid or reduce exclusionary mechanisms. On the other hand, it is important to note that the existence of potential synergies between new and existing paths does not automatically result in beneficial reformation processes. Strategic policy interventions, such as supporting networking among the actors of different paths or promoting regional value chains to foster complementary market relations, could activate these synergies.

Finally, more research is required to improve our understanding of the conditions under which path creation can contribute to regional economic development beyond the single path. Especially from a methodical perspective, this will be a challenging task. First, this broader view on inter-path relationships between new and existing paths in thicker and more diversified urban regions will be demanding due to larger regional portfolios. Future research could meet this complex task by building on well-researched paths and extend the research focus retrospectively. Second, quantitative approaches (e.g. intersectoral analyses) are needed to reveal the systematic interrelations between new and existing paths. Only through this broader perspective can we bring research on new path creation a step closer to the major point of concern – its translation into regional economic development.

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Annex

Table A1: Overview of qualitative data

Method	Sector/path	Number	Actor group	ID
Focus-group discussion	Agriculture	14	Crop farmers (individual and collective)	FGD#-site
Go-along interviews	Agriculture	14	Crop farmers (individual and collective)	FARMER-#
Semi-structured interview	Agriculture	3	Conservancy management	CONS-A-#
	Agriculture	9	Government	GOV-A-#
	Agriculture	12	Lobby	LOBBY-A-#
	Agriculture	8	NGO	NGO-A-#
	Agriculture	12	Private company	COMP-A-#
	Tourism	14	Conservancy management	CONS-T-#
	Tourism	21	Accommodation establishments	LOD-T-#
	Tourism	7	Tour operators	TO-T-#
	Tourism	7	Professional Hunters	PH-T-#
	Tourism	4	Government	GOV-T-#
	Tourism	9	Business associations and other tourism organizations	ORG-T-#
Total: 134				