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Research article

Effect of changes in business environments on traded medicinal plants products in Tanzania: An explorative study

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ABSTRACT

In Tanzania, a complex rural to urban supply network for the medicinal plants' products trade has developed over time driven by changes in business environments at the macro level notably in the policy and regulatory frameworks and the micro level resulting from traders' reactions and responses to those changes and pandemics. These changes in business environments and responses of traders have shaped the current trade practices. However, the response of traders to changes in business environments and the evolutionary paths over time are not well documented. Therefore, this paper aimed to synchronize changes in business environment over time and empirically determine how the trade has evolved concerning the responses of the medicinal plants' traders in Tanzania. The study applied economic evolution theory to describe the interactions of changes in business environments and responses of traders to demarcate the evolutionary stages. Primary data were collected from traders, regulators, and researchers through ten focus group discussions and sixteen in-depth interviews from five regions of Tanzania. The results indicated that the traders of medicinal plant products responded by improving product appearance and modernizing both practices and business premises. The study findings have identified four evolutionary stages of trade in medicinal plant products in Tanzania: The first stage was the colonial era (1882–1961), the second is the government supremacy era (1961–1984), the third is the emergence of the private sector era (1985–2004), and the fourth is the market and regulation integration era (started in 2005). Moreover, because of the partial implementation of the regulatory framework, the fifth stage of trade evolution is also expected. This stage is expected to be demarcated when the regulatory framework and market forces work together. Therefore, the study recommends that proper enforcement measures be put in place to ensure desired results whenever there are changes in business environments in traditional medicines practice. This is due to the expectation of the fifth stage whereby one of its characteristics is stiff competition among traders and which will require robust business models to survive in business.

1. Introduction

Medicinal plants products (MPPs) have been used to treat various diseases from time immemorial and in diverse cultures around the world (He et al. 2018; Jamshidi-Kia et al., 2018). MPPs are final commodities usually derived from a mixture of numerous different medicinal plants (Otieno et al. 2015; McMillen, 2012). The MPPs are the core business components of the traditional and alternative medicine industry in the health sector of most developing countries (Khasim et al. 2020). The MPPs constitute about 95% of traditional and alternative medicine systems such as African Traditional Medicines, Chinese Traditional Medicines, and Ayurveda (Gakuya et al., 2020; Kayombo et al. 2013). The World Health Organization (WHO, 2019) recognizes MPPs for their

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distinctive application in the management of lifestyle-related chronic diseases.

Distribution and access to MPPs form a trade with a global value approximated to USD 33 billion in 2014 and increased by 2.4 and 9.2 per cent annually in volume and value respectively (Vasisht et al., 2016). In Africa, the MPPs trade has been a buoyant local trade in various parts of the continent. The value of MPPs trade ranged from USD 25 900 in Marsabit county, in Kenya, to USD 300 000 in Johannesburg, South Africa (Cuni-Sanchez et al., 2017; Williams et al. 2007). In Tanzania, at the Kariakoo Market in Dar es Salaam, the value of non-wood medicinal plants in 2017 was approximately USD 200 000 (Posthouwer et al., 2018). Currently, there are about 400 medicinal plants traded in different markets in Tanzania (Veldman et al. 2020; Hilonga et al. 2018). The current MPPs trade practices in Tanzania include modern packaging of MPPs, established shops of MPPs as well as MPPs-based clinics (Mpelangwa et al. 2021). The current MPPs trade practices are the outcome of the MPPs traders' response to changes in business environments (Langwick, 2010, 2021).

The current rural to urban supply networks and value chains of MPPs trade in Tanzania have gradually developed due to changes in business environments and initiatives of MPPs traders over a period (Langwick, 2021; Mpelangwa et al. 2021; Hilonga et al. 2018). The business environments refer to the macro-level external working landscape of the firm such as policy, regulatory framework, and technological advancements (Cherunilam, 2003). Some of the changes in the business environments of MPPs trade included shifting of traditional medicine from the Ministry of Culture to the Ministry of Health in 1989, accommodation of traditional medicines in Health Policy in 1999, and the established Traditional and Alternative Medicine Act of 2002. This Act created the Traditional and Alternative Health Practices Council (TAHPC) in 2005 (Stangeland et al. 2008; Kayombo et al., 2007). Therefore, the current practices of the MPP trade have been the outcome of changes in business environments made by the government and the response of the MPP traders (Langwick, 2021).

However, the response of MPPs traders to the business environments changes and the evolutionary paths of trade and the existing status are not well documented. The literature on development of MPPs trade and traditional medicine in Tanzanian (Table 1) focused on the macro-level initiatives and little on micro-level initiatives. The macro-level initiatives referred to changes in business environments, which were taken by the government before and after independence including changes in policy and regulatory frameworks (Langwick, 2010, 2021; Stangeland et al. 2008; Kayombo et al., 2007). The micro-level initiatives are those taken by individual MPPs traders to respond to the market demand offered by changes in business environments. As the consequence, there is scant information to stretch the evolution stages of MPPs trade in Tanzania before and after independence as argued by Langwick (2010).

This paper aims to synchronize the changes in business environment incidences over time and to empirically determine the respective responses of the MPPs traders in Tanzania. Specifically, this study answers two research questions: (i) what are the responses of MPPs traders to changes in business environments over time? (ii) What are the evolutionary stages of MPPs trade in Tanzania to current practices? The study opted for the business evolution theory to analyse critical incidences of interactions of changes in business environments and MPPs traders' responses, and consequently determine those evolutionary stages over a period of time.

The study findings are envisaged to provide crucial information for the development of MPPs trade as it explains the response of traders to changes in business environments. The development of MPPs trade contributes to realizing one of the key World Health Organisation (WHO) strategic initiatives of creating conducive environments for distribution and access to quality MPPs (WHO, 2019; WHO, 2013). In addition, the information on the evolutionary stages of MPPs trade in Tanzania reinforces the understanding of policy impacts over time and is vital to traders because it can be used to design robust business models for enhancing trade exchanges and for predicting future business development stages.

This paper is organized as follows: After this introduction, section two presents a literature review while the theoretical and conceptual framework is presented in section three. The fourth section explains the study methods and the fifth section presents the results. The sixth section presents a discussion and the seventh section presents the conclusion and recommendations.

2. Literature review

The literature review synchronise the changes in business environments at the macro level, solicited answers to the proposed research questions and established evidence of the evolution of MPP trade. The literature review focused on studies done in Tanzania. The keywords used for the literature search were traditional medicine (substituted with herbal medicine, medicinal plants, and ethnobotany) with the market (trade, commercialization, industry, supply chain, value chain) followed by evolution (changes, growth, evolution, practices, regulations). The databases searched were Science Direct (Elsevier), Web of Science, ABI/INFORM Collection, and Scopus. A check-up of citations and reference lists was done to find relevant articles and discarded others from databases. The literature search and review were carried out from June to December 2021. As illustrated in Table 1, there were few studies related to the evolution of the MPPs trade in Tanzania. This small number of published articles suggested a narrative literature review instead of a systematic review (Snyder, 2020).

The literature reveals that traditional medicine was the only health system before German colonialism in Tanganyika in 1882 (Alexander, 2012). The introduction of modern medicine to various parts of Tanganyika by colonialists created pluralisms in the health service systems (Vähäkangas, 2015). However, the expansion of modern medicines went in parallel with the detriment of traditional medicines because of their complexity and mystery in the diagnosis and treatment of diseases (Mbwambo et al. 2007). The situation became worse with the introduction of the Witchcraft Ordinance by the British Colonialists in 1929 which failed to distinguish witchcraft from traditional medicine (Mbwambo et al. 2007). The Ordinance resulted in dormant traditional medicines that operated underground (Veldman et al. 2020; Peter et al. 2014).

Moreover, the literature indicates that governmental initiatives were taken after Tanganyika's independence in 1961 to revive traditional medicine and in particular the uses of MPPs. The initial initiative was the issuing of a new Medical Practitioners and Dentists Ordinance of 1968 which recognized traditional medicine (Mbwambo et al. 2007). Another initiative was the establishment of the Department of Traditional Medicine in 1976 at the then Muhimbili Medical School, which was later upgraded to the Institute of Traditional Medicine (ITM) in 1991 (Stangeland et al. 2008). The literature indicates further that the development of traditional medicines after independence was motivated by the self-reliance policy which was influenced by Tanzania-China Friendship (Langwick, 2010). According to scholars (Langwick, 2010; Stangeland et al. 2008; Mbwambo et al., 2007), the development stages of MPPs trade, and traditional medicine can be categorized to be before and after Tanzania's independence.

The literature attributed the expansion of trade on MPPs to Human Immunodeficiency Virus/Acquired Immunity Deficiency Syndrome (HIV/AIDS) pandemic discovered in Tanzania in 1984 (Stangeland et al. 2008; Mbwambo et al. 2007). The MPPs were the most relevant, available, and affordable treatments for secondary infections in HIV/AIDS patients before the Antiretrovirals (ARVs) were introduced in 2004 (Kayombo et al., 2007; Mhame et al. 2005). About 600 000 people were estimated to be living with HIV/AIDS by 1999 (URT, 2001). All these infected people were considered potential users of MPPs because there was no significant help at hospitals for people infected with HIV/AIDS by that time. The HIV/AIDS revealed the potential of MPPs and the growth

Table 1. Summary of literature reviewed on changes of business environments of trade in medicinal plants products in Tanzania.

Title	Author (s)	Year	Topic	Findings
Regulation of Traditional Medicine in the WHO African Region	Kasilo et al.,	2005	Regulation of traditional medicine practices and products, and highlights the challenges posed by attempts to regulate the sector.	More than half of the countries in the African Region have developed national policies on traditional medicine and regulation is one of the components of such policies. Eighteen countries have developed national codes of ethics to ensure the safety, efficacy, and quality of traditional medicines. Less than half of the countries are yet to implement these policies and therefore, only a few countries have developed regulations for traditional medicine. Twenty-one countries have developed legal frameworks that provide for accreditation, registration of traditional health practitioners (THPs) and the establishment of a THP Council for regulation of traditional medicine practice and products
The traditional health practitioner and the scientist: bridging the gap in contemporary health research in Tanzania	Mbwambo et al.,	2007	Global, regional, and national perspectives of Traditional Medicine development and its inclusion in contemporary health research in Tanzania.	A legal framework has been put in place through the Traditional and Alternative Medicine Policy and Act of 2000, and 2002, respectively, and several research infrastructures in traditional medicine have been established. Practitioners are increasingly organizing themselves into associations and the ongoing collaborative research projects so far have significantly narrowed down the gaps between traditional and modern medicines
Recognition and Development of Traditional Medicine in Tanzania	Stangeland et al.,	2008	Tracing developments in Traditional Medicine (TM) and legislation concerning conservation and use of biodiversity in Africa, with Tanzania as a case study.	TM is the most common form of health care, and the HIV pandemic has highlighted the need to work across health sectors. New legislation has facilitated this need. In Tanzania, TM is experiencing a renaissance in being formally recognized, integrated into mainstream health care, the formal establishment of practitioners, and gaining the interests of different sectors. The development of TM can also provide income possibilities. It is, however, yet to be seen if the recent regulations can be made fully operational and implemented.
From Non-Aligned Medicines to Market-Based Herbals: China's Relationship to the Shifting Politics of Traditional Medicine in Tanzania	Langwick, Stacey	2010	Elaborate on the continuities and discontinuities central to the emerging field of market-based traditional medicines.	The institutionalization of traditional medicine in Tanzania reveals how strategies for socialist liberation are morphing into strategies for neo-liberalization. In the 1960s and 1970s, traditional medicine promised the raw material for the scientific development of an indigenous pharmaceutical industry. At the turn of the millennium, however, traditional medicine has re-emerged in Tanzania as a new path into the fast-growing global herbals market. Tanzania's relationship with China has been central to these dynamics.
Ethnobotanical Knowledge Transmission and Evolution: The Case of Medicinal Markets in Tanga, Tanzania	McMillen, Heather	2010	Explores the range and distribution of local ecological knowledge (LEK) of popular medicinal plants using a case study in the medicinal markets of Tanga, Tanzania.	The results diverge from the assumption that markets erode knowledge of medicinal plants. The worldwide trends of growing medicinal plant commerce and shifting from subsistence to market economies influence changes in plant knowledge, management, and use among many different contemporary local populations, not just the ones described here.
Climatic Change and Female Reproductive Health: The Case of Traditional Medicine in Tanzania.	Alexander, Nancy	2012	Climatic effect on medicinal plant uses in Makonde Community, Tanzania	With the legacy of traditional medicine in Tanzania following points were realized: Traditional medicines are important to many socio-economic groups regardless of their economic status and geographical location. Traditional medicine services are used in rural and urban areas because they fill a void of modern services in demand, they are cheap, accessible and they give recognized responses to illness. In addition, traditional medicines treat illness in its social, cultural, and familiar context and seek the root cause of the disease beyond the disease itself.
Prospects and Challenges of Medicinal Plants Conservation and Traditional Medicine in Tanzania	Kayombo et al.,	2013	Assessment of prospects and challenges of medicinal plants conservation and traditional medicine in Tanzania	Traditional medicine and medicinal plants were faced with challenges notably; threats due to increasing depletion of the natural resource as an impact of population increase, urbanization, modernization of agriculture and climatic change. The other major challenges to traditional medicine and MPs were constraints and include lack of data on

(*continued on next page*)

Table 1 (*continued*)

Title	Author (s)	Year	Topic	Findings
				seriously threatened and endangered medicinal plant species, inadequate and conflicting guidelines on management and utilization of natural resources, especially medicinal plants. Traditional health practitioners, TRM and medicinal plants should be essential components in PHC to meet the health millennium goals by 2025.
Babu was Loliondo—Healing the Tensions between Tanzanian Worlds	Vähäkangas, Mika	2015	Analyses the reasons for instant and huge success as well as the demise of Rev. Mwasapila's healing ministry connected with the use of medicinal plants.	The theoretical explanations of medical pluralism practices in Tanzania. Introduction of modern medicine leads to considering the cultural categories in the lives of Tanzanian Christians as portrayed through the reception of Churches once established by Western missions often lack the embodiment of the spiritual and thereby also represent the Western dichotomy between the body and the soul. Among several other African Christian healers, Babu was able to bridge the gap between the bodily and the spiritual.
Vernacular Dominance in Folk Taxonomy: A Case Study of Ethnospecies in Medicinal Plant Trade in Tanzania	Otieno et al.,	2015	To elucidate the relations between the most common vernacular names and the ethnicity of the individual traders among the medicinal plant markets in Dar es Salaam and Tanga regions in Tanzania	In Tanzania, a thriving trade in traditional medicine exists in both rural and urban areas. Most of the Tanzanian medicinal plant material originates from the wild where the supply chains have emerged to serve the urban consumers. Existence of the markets for medicinal plants in various parts of Tanzania
The quantitative market survey of non-woody plants sold at Kariakoo Market in Dar es Salaam, Tanzania	Posthouwer et al.,	2018	To assess the sustainability of traded herbal medicine at Kariakoo Market in Dar es Salaam, the major hub for medicinal plant trade in Tanzania by a market survey of non-powdered, non-woody medicinal plants	The growth of the trade in MPP at Kariakoo Market in Dar es Salaam. Kariakoo Market is the main medicinal plant market in this city, with the largest number of stalls and vendors. Besides Kariakoo Market, Dar es Salaam accommodates several herbalist shops, individual stalls, and ambulant sellers of herbal medicine throughout the city. Additionally, there are several shops exclusively selling dried herbal medicine imported from the Middle East or a combination of Tanzanian and Arab medicinal products.
Trade of Wild-Harvested Medicinal Plant Species in Local Markets of Tanzania and its Implications for Conservation	Hilonga et al.,	2019	To assess the trade of wild-harvested medicinal plant species in local markets of Tanzania and its implications for conservation	Identified emerging supply chains in the trade in MPP in Tanzania. Existence of urban and rural markets selling different MPPs in Tanzania
Properties of (Dis)Possession: Therapeutic Plants, Intellectual Property, and Questions of Justice in Tanzania	Langwick, Stacey	2021	To trace the practices of knowing and unknowing that forged traditional medicine in Tanzania and their role in constituting the terms, objects, and institutions through which struggles for justice have been imagined.	The dynamism of traditional medicine as a modern category of knowledge and practice lay in its ability to solve (first colonial and then postcolonial) problems of knowledge and politics simultaneously. Twenty-first-century Tanzanian scientists, healers, herbal producers, policymakers, and patients grapple with these colonial legacies. Yet, traditional medicine has never fully captured the wide range of practices that strive to catalyse growth, fullness, maturation, extension, strength, and fertility. Healing remains unruly, and the friction this creates holds open the possibility of generating alternative forms of the therapeutic value of plants and rendering visible the ongoing forms of (dis) possession that shape notions of justice in late liberalism.

of its trade. Non-Government Organizations (NGOs) were the initial promoters of the use of MPPs for HIV/AIDS patients (Mhame et al. 2005). However, flourished trade in MPPs demanded regulation for public health security (Kayombo et al., 2007). According to literature (Stangeland et al. 2008; Kayombo et al., 2007; Mbwambo et al. 2007), the regulatory framework was initiated in 2000 and reached a climax in 2005 with the establishment of TAHPC.

The current practices of MPPs consumption have grown from community gifts to commodity trade in both rural and urban areas with the development of complex networks of supply chains (Hilonga et al. 2018; McMillen, 2012). According to literature (i.e., Mpelangwa et al. 2021; Veldman et al. 2020) the trade in MPPs has shifted from personal contacts between healers and patients to different supply and value chains The value chain nodes were harvesters, vendors, and formulators with distribution centres such as shops and herbal clinics (Hilonga et al. 2018; Posthouwer et al., 2018; Otieno et al. 2015). The growth in trade in MPPs went in parallel with the increased use of MPPs for non-communicable and chronic diseases such as diabetes (Mwanri et al. 2017; Stanifer et al. 2015).

The reviewed literature provides evidence that the MPP trade has been evolving; however, there is little information about traders' reactions. The indicated preliminary set of evolutionary phases: before and after independence, need to be confirmed, revised, and/or detailed empirically. The reviewed literature indicated the changes in business environments which affected the MPP trade over time as synchronized in the legitimation column in Table 2. The literature indicated the evolutionary paths influenced by the government's initiatives and HIV/AIDS pandemic. Although the literature indicates the increased use of MPPs on non-communicable and chronic diseases, there is a gap in the time when it evolved and how it impacted the MPPs trade.

3. Theoretical and conceptual framework

3.1. Theoretical framework

Evolution theory in economics focuses on the transformation of economic activities such as production, exchange, consumption, distribution, and accumulation over time and the consequences this transformation has on the current conditions of particular economic activities (Witt, 2016). The theory explains how business evolves because of its response to changes in environments based on its internal capacity (Witt, 1996; Nelson and Winter, 1982). The theory considers that no stage of business development came into existence spontaneously, but grew or evolved out of the stage before it (Keizer, 2015).

Economic evolution has been theorized from biological concepts of how the living organisms survive in the changing environment at their inherent characteristics over time (Witt, 1996). Evolutionary theory has its roots in Darwin's theory which focuses on genetic mutation and the survival of the fittest, and the Lamarckian model which focuses on evolution through the use and usefulness of a capability. The theory of evolution in economics was refined by Freeman and Hannan (1989) who built an organizational ecology based on Darwin's explanation and by Nelson and Winter (1982) who focused on economic change based on the Lamarckian explanation.

This paper is based on Freeman and Hannan (1989) who see environmental changes as affecting the legitimacy of the organizations and so is their access to resources which can affect the capabilities of the organizations to survive and compete. According to Freeman and Hannan (1989), legitimacy implies suppliers, customers, and other economic actors determine the acceptability to exchange resources with the organization. The legitimation enhances the survival of firms through increased product consumption and is attained when products are socially taken for granted.

The surviving organizations compete themselves for market opportunities which trigger the next stage of development with the demand for new environments for surviving organizations. Freeman and Hannan (1989) consider competition as the market force that shapes the behaviour of firms towards efficient operations, diversification, and survival. Continuation of such kind of a relationship of legitimation and competition forms a basis for organizational ecology and evolution stages. For this matter, the stages are determined by the incidences which cause the environmental changes and competition between organizations.

An important part of the Freeman and Hannan (1989) framework is the interplay between legitimation and competition and how this interplay shapes the evolution of an industry. The interplay is explained through Density Dependency Model (DDM). The model explains that legitimation and competition have an inverse relationship with each other in how they influence changes in trade hence the growth or death of firms. The legitimation causes the changes while the competition controls it. The effect intensity on trade caused by the interaction of legitimation and competition depends on the growth stage and the population density of firms in a given industry.

3.2. Conceptual framework

This study was guided by the conceptual framework in Figure 1. The framework indicates legitimation, the market/demand, and their interaction as core constructs with the boxes showing their components.

In line with Freeman and Hannan (1989), the framework considers the evolution of MPPs trade as influenced by changes in business environments which aimed to legitimatize MPPs consumption. In this study, a distinction is made between legitimation through promotion and legitimation through regulation. In the former case, the government encourages the development, production, and sale of MPPs. In the latter, the government increases legitimation by assuring that MPPs are tested and thus safe to use. The legitimation roles can be played by other actors such as NGOs and civil societies. The changes in business environments at the macro level are conceptualized on the legitimation side.

The micro-level initiatives of MPPs traders were conceptualized as market forces and demand-side which shaped their reaction to changes in business environments in line with Freeman and Hannan's (1989) theory. Market/demand includes terms of the response of MPPs traders, pandemic, and technological advancement. Two sets of mediating and influential factors are included in the framework. The first includes institutional factors such as economic policy (for example structural

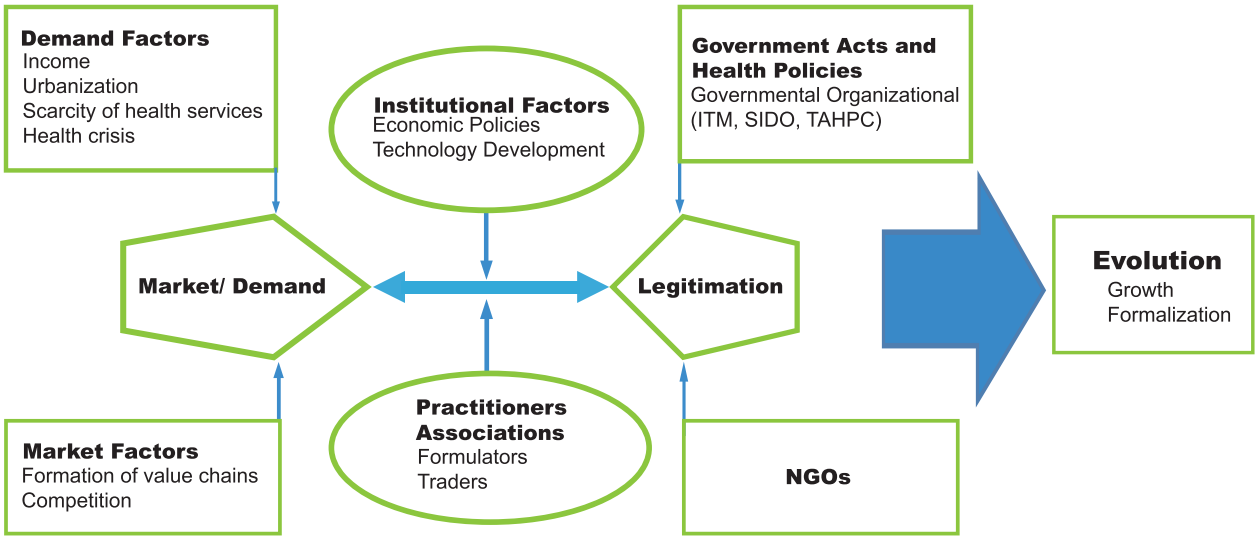

Figure 1. Conceptual framework of evolutionary development of trade in products of medicinal plants in Tanzania.

programs) and technological development (for example mobile phones). The second includes associations for practitioners of traditional medicines. These influential factors shape the outcomes of legitimati on-market/demand interaction.

Critical Incidence Technique (CIT) was sought to identify incidences that are strong enough to announce and cause a shift to a new evolutionary stage. A critical incident is defined as an activity that is sufficiently complete to permit inferences and predictions to be made about the changes (Butterfield et al. 2005). The incidences to cause the evolution should be persistent and significant to change legitimation and/or competition of the MPPs trade (Viergever, 2019).

4. Research method

4.1. Study design

The study used qualitative primary data from MPPs traders and secondary data synthesized from the literature reviewed. The study was designed to identify the critical incidences which caused changes in MPPs trade from traders, regulators, and researchers in the traditional medicine sector.

4.2. Sample and sampling procedures

The study was done in five regions of Arusha, Dar es Salaam, Manyara, Morogoro, and Njombe in Tanzania. Two regions (Njombe and Manyara) were selected to represent rural settings and the other two (Morogoro and Arusha) represented urban settings. Dar es Salaam region was selected as the market hub and in each region, two districts were selected for the study.

The study units were traditional medicine practitioners who owned MPPs shops and clinics, referred to as MPPs traders. Sampling procedures were based on the following arrangement: The list of registered MPPs traders was obtained from district coordinators of traditional medicine. The list of MPPs traders was categorized based on experience in terms of the number of years of working, location within districts, and sex with help of district coordinators and leaders of practitioners' associations. Ten members for focus group discussions (FGD) were selected from the most experienced and the least experienced traders, various locations of districts, and a mixture of men and women. The framework considered triangulation of the content discussed in the FGD as well as clarification of some debated issues to be done through in-depth interviews with other qualified but not selected MPPs traders within the districts. The selection of the MPPs traders for in-depth interviews was purposive and solely done by the authors. The researchers and regulators of traditional medicines who participated in in-depth interviews were identified by their respective organizations.

4.3. Data collection

Primary data were collected through ten FGD, one in each selected district. In total, 99 MPPs traders participated; ten for each district, except nine for Ifakara District, Morogoro Region. Among them, female participants were 46.5% and males were 53.5%. The youngest participant was 32 years old, while the eldest was 76. The most experienced MPPs trader practised for 38 years while the least experienced practised for seven years. Most (69%) of the participants had primary education, and only 26% had secondary education, while 5% had a college education.

In addition, 16 in-depth interviews were conducted; ten from selected MPPs traders one in each district, three researchers from ITM, the TAHPC chairperson, and two officers from the Directorate of Traditional Medicines in the Ministry of Health, Community Development, Gender, Elderly, and Children (MHCDGEC). The FGD and in-depth interviews were guided by prepared and reviewed guidelines. On average, FGD used 90 min while in-depth interviews were 70 min. All participants provided their consent to participate and sound record before the interviews. Data were collected from April to June 2019 once in each region, except for Dar es Salaam where the second FGD was carried out in April 2022 to capture the effect of the COVID-19 pandemic on the MPP trade. In the second round of FGD, three participants who participated in the first round missed and were replaced by new participants. The sample was heterogeneous which included practitioners, regulators, and researchers of MPPs.

4.4. Data analysis

Data were analysed using content analysis followed by the analytical hierarchy, as described by Spencer et al. (2003) with the assistance of NVivo 12 computer software. The codes excerpted the incidences from the data which reflected the actions of MPPs traders over time. The codes summarized data to four nodes which reflected the nature of the response of MPPs traders in terms of product, practices, practitioners, and places (Table 2). The responses of MPPs traders in each node were arranged chronologically to the corresponding changes in business environments to form an interaction matrix based on the identified critical incidences (Table 3). The interaction matrix had two columns of market/demand (from primary data based on MPPs trade response) and legitimation (from the literature review based on changes in business environments). The interaction matrix was categorized, based on periods, formed themes of eras, as meta-events. The meta-events were given numbers which were identified as evolutionary stages. To ensure that the emerging themes of meta-events came from the data, they were cross-checked with scribed and voice records continually.

The analysis of the evolution pattern reflected the roles of the business environment and institutions to trade in medicinal plant products. Based on Bojnec and Fertő (2018), the evolution patterns were described as the reflection of structural changes in the whole trade sphere. The evolution patterns are considered to emerge over the period and should alter the cause of the trade in either the short or long run (Bojnec and Fertő, 2018). The structural changes were from both changes in business environments and responses of traders in medicinal plant products.

In this study, the trade evolutionary stages were identified based on de-coordination, re-coordination, and new order as per identified critical incidences. The de-coordination stage corresponds to the creation of the point of disturbance which could be a potential source of change (Zharova and Chechel, 2020). The re-coordination stage retains the order at various levels while new order stage is created after changes in approaches, methods, and tools previously used.

5. Results

The responses of MPP traders were reflected in four themes products, practices, practitioners, and places (Table 2). The themes summarized the response in the change of all dimensions of MPP trade. The responses of MPP traders to change products' appearance were more noticeable to both FGD and in-depth interview respondents. The changes in places of MPP trade were noticeable by researchers and officers of MHCGEC more during an in-depth interviews than during FGDs.

The response of MPP traders reflected their intention to capture the market opportunities. The MPP traders focused not only on improving the appearance of the product but also on modernising both practices and business premises. The changes in practitioners were influenced by new entrants such as youths and modern medicine professionals. The shift from villages to town places was the outcome of the registration process to various government agencies such as tax authorities and local governments, as reported from in-depth interviews.

Table 2. Response of MPP traders to business changes in business environments based on products, practices, practitioners and places.

Theme of response	Response of MPP traders
Products	Started packing MPP in the modern containers and labelled them
	Produced various forms of MPP such as jelly, tablets, soaps, and syrups
	Registered the MPP to TAHPC
	Developed brands of MPP such as Ngetwa which were distributed throughout the country
	Developed the specific products for specific diseases compared to broad-spectrum MPP in the previous, with specified dosage
	Sent the products to certifying agencies like GCLA and control mechanisms such as Barcodes
	Started to include scientific information to traded MPP to increase their legitimacy
	The MPPs from renowned researchers were the most recognized during COVID-19
Practices	Changed from the preparation at demand to readily available MPP
	The focus changed from domestic alone to both domestic and export of MPP
	Establishment of the cultivation of the medicinal plants
	Started to advertise MPP in the media i.e., radio, television, newspapers, and social media.
	Use of mobile phones in the conducting the trade in MPP such as mobile money transfer
	The attraction of investors to trade in MPP, but not engaged in daily practices.
	Started to use the modern diagnoses of diseases before the consumption of MPP
	Focused more on selling the service on the use of local steaming (*nyungu*) than on MPP
Practitioners	Youths started to dominate the trade in MPP compared to the elders who dominated before.
	Other professionals started to join the MPP trade such as medical doctors and pharmacists.
	Practitioners started to register with TAHPC for legitimacy and encounter fake practitioners.
	Collaboration among practitioners and the established referral systems within traditional medicine increased the knowledge share on MPP.
	Formation of the practitioners' associations.
	Practitioners started to be recognized based on concentration in one of the value chain nodes such as harvesters, wholesalers, formulators, and healers.
Places	Started to register the places for the selling and practices of medicinal plant products
	The place shifted from hidden places to the centres of towns and cities.
	Started to establish herbal medicine clinics and herbal medicines shops to sell MPP, in addition to traditional uses places, known as *kilinge*

Table 3. Critical incidents, meta events, periods and evolutionary stages of MPP trade in Tanzania.

Critical Incidents		Meta event	Periods	Evolution Stage
Market/Demand	cLegitimation			
	1929: Introduction of witchcraft Ordinance by the British	Colonial Era Detrimental of traditional health systems	1882–1961	1.
1980: Trade in individual medicinal plants (not mixture/readymade) started at Kariakoo Market – Dar es Salaam	1963: Colonial Laws on Traditional Medicine relaxed 1968: Recognition of traditional medicine through new Medical Practitioners and Dentists Ordinance of 1968 1976: Establishment of Traditional Medicine Department at Muhimbili Medical School 1980: Establishment of the National Institute for Medical Research (NIMR)	Government Supremacy Era Initiatives to revive traditional medicine systems for self-reliance	1961–1984	2.
1985: Increased demand for MPPs due to HIV/AIDS crisis as there were few services from modern medicines 1987: Started value addition activities such as milling of individual medicinal plants for urban consumers 1990: The shift of the traditional healers from rural to urban areas with most customers 1992: Established supply chains of medicinal plants to facilitate the traditional healers who shifted to urban areas 1999: Emergence of readymade (formulated) MPP. 2000: Introduction of container packaging with modern printed labels Visible frauds MPP, specifically in urban markets.	1989: Traditional Medicines moved from Ministry of Culture to Ministry of Health 1990: Incorporation of traditional medicine into National Health Policy 1991: Transformation of Department of Traditional Medicine to Institute of Traditional Medicine 1995: Introduction of registered organizations of practitioners (Registered by Ministry of Home Affairs) 1998: Reported challenges of unregulated trade and unregistered practitioners. 2000: Traditional and Alternative Medicine Policy formulated Involvement of NGOs in the promotion of MPP to PLWHA 2002: Establish a Traditional and Alternative Medicine Act	The era of Emergence of a Private Sector	1985–2004	3.
2005: Using modern diagnosis tools by sending patients to private health laboratories. This action increased specificity in using MPP.	2005: Implementation of Traditional and Alternative Medicine Act Working in public since has been registered by the	The era of regulation and market integration	2005 –	4

(*continued on next page*)

Table 3 (*continued*)

Critical Incidents		Meta event	Periods	Evolution Stage
Market/Demand	cLegitimation			
2009: Perceived increase of customers from identified non-communicable diseases to MPP 2012: Public visibility of trade MPP because of registration from Traditional and Alternative Health Practices Council. This action was associated with an increased number of service centres and shops Advertisements in public media for already formulated MPP 2015: Special formulators of MPP and other products such as oils, jelly, rubbing Packaging of MPP in modern packs such as tubes, sealed bottles, and containers Regulated advertisements of MPP in mainstream media 2020: Provision of services on local steaming (*nyungu*) suppressed sale of MPPs 2020: MPPs formulations with the potential to fight COVID-19 penetrated Pharmacies and Supermarkets shelves	government 2005: Decrease use of the *Ramli* (traditional way of diseases diagnosis using spirits) due to fierce government actions motivated by the killing of people with albinism 2009: Availability of mobile phones which make communication easy and money transfer 2010: Establishment of Traditional and Alternative Health Practices Council which facilitated the registration of both practitioners and MPP 2013: Recognition of traditional medicine by the government attracted people other than practitioners to join the industry in investments in processing medicinal plants 2015: Involvement of other government organs in control of MPP such as TMDA, TBS, and GCLA 2020: Government institutes revealed the preparation of COVID-19 remedies 2020: Governments authorities relaxed some of the bureaucracy for the distribution of formulations with the potential to fight COVID-19			

The responses of MPPs traders were chronologically arranged and represented in Table 3 with their respective changes in business environments.

6. Discussion

The MPPs trade in Tanzania has passed four evolutionary stages that have been the outcome of changes in the business environment which influence interactions of public policies, the response of MPPs traders, pandemics, and technological advancements. The MPPs evolved from being a free community toward traded commodities in the health sector. The four evolutionary stages of MPPs trade as discussed in this paper are more explorative than the two stages before and after independence (see Langwick, 2010; Stangeland et al., 2008; Mbwambo et al., 2007). These four stages are the colonial, government supremacy, emergence of the private sector and market and regulation integration eras.

6.1. The Colonial Era

The Colonial Era started in 1882 when Tanganyika was invaded by the Germans to 1961 when Tanganyika obtained her independence from the British. This era was characterized by strict rules on MPPs trade and traditional medicine practices. The Witchcraft Ordinance by the British colonialists, which was introduced in 1929, failed to distinguish MPPs from witchcraft, which spoiled severely the progress of the MPPs trade. The ordinances reduced the legitimacy of MPPs and treated herbalists and witchdoctors as the same as possessors of occult power. This era is considered as stage one of the evolution of MPPs trade in Tanzania.

6.2. The government supremacy era

The government Supremacy Era covers from 1961 when Tanganyika gained her independence to 1984, a year before economic structural adjustment policies. The era saw the rebirth of traditional medicine and the legitimate use of MPPs. Development initiatives during this era were dominated by the government as MPPs would reduce the importation of pharmaceuticals. The government took the lead by establishing different organs such as the Department of Traditional Medicines at Muhimbili Medical School in 1976 and the National Institute for Medical Research (NIMR) in 1980.

There was limited involvement of MPPs traders in this era. It was noted during the FGDs that there were only a few stalls in Dar es Salaam Markets by 1980 that sold raw medicinal plants. No one recalled the presence of MPPs shops in regions other than Dar es Salaam. In this era, the government considered re-coordinating the MPPs trade which was de-coordinated by the colonial era. Therefore, the government era is the second evolutionary stage of the MPPs trade.

6.3. The era of emergence of a private sector

The Era of Emergence of a Private Sector started in 1985 with the World Bank-inspired structural adjustments policies which focused on market and private sector-driven economy. This era persisted until 2004, a year before the implementation of the Traditional Medicine Act of 2002. During this era, private sectors flourished in different sectors including traditional medicines, and MPPs trade. Amid the implementation of structural adjustment policies and people taking advantage of the private sector, emerged the HIV/AIDS pandemic. The increased number of people infected by the HIV/AIDS pandemic accelerated the number of consumers hence the MPP trade.

Some of the initiatives taken by MPPs traders had to shift to urban areas for the expanded market, establish structured supply chains, pack, and label MPPs. It was revealed during FGD that it was this period when MPPs-based clinics and shops emerged in the urban areas. However, during FGD it was further revealed that fraud, by selling fake but well-packed MPPs, was at its peak towards the end of the 1990s.

The Era of the Emergence of a Private Sector was the result of the de-coordination of the Government Supremacy Era by structural adjustment policies and the invasion of HIV/AIDS pandemics. The re-coordination by MPPs traders as the private sector took place and established supply chains, MPPs shops, and clinics to advance MPPs trade. Therefore, the Era of the Emergence of a Private Sector is referred to as the evolutionary stage three.

During in-depth interviews with researchers, it was revealed that in this era, the potential of MPPs for health services was manifested. The ability shown by some MPPs to treat secondary HIV/AIDS infections and the appearance of fake practices stimulated the need to integrate traditional medicine into mainstream modern health services and regulate it. The initiatives include shifting the traditional medicine activities from the Ministry of Culture to the Ministry of Health, the inclusion of traditional medicine in the national health policy, and the establishment of Traditional and Alternative Medicine Act of 2002 which came into effect in 2005. The Traditional Medicine Act of 2002 aimed to regulate traditional and alternative medicine practice through the established TAHPC. The functions of TAHPC include monitoring, regulating, promoting, and supporting the development of traditional medicine.

6.4. The era of markets and regulations integration

The established regulatory framework through TAHPC de-coordinated the MPPs trade was practised in the Era of the Emergence of a Private Sector. The re-coordination of MPPs traders to abide by the regulations began in 2005 when TAHPC started to function. This era is referred to as Market and Regulation Integration which is considered as the fourth stage.

The MPPs traders responded by starting to produce MPPs that could abide by the regulatory framework. It was described during FGD in urban areas and market hubs, that it was this period where diseases specified by MPPs started to appear in the markets. Non-communicable diseases took the lead in the consumption of MPPs. The observation confirmed numerous shops selling MPPs in the form of tablets, oil, jellies, soaps, and rubbing medicines for specified diseases. It was narrated during FGD that Government Organizations such as Institute for Traditional Medicine (ITM) and Small Industries Development Organizations (SIDO) enabled MPPs traders to acquire processing and packaging skills of MPPs, respectively.

It was reported during FGD that the supply chains and trade activities in MPPs became structured and strengthened by various technologies available such as mobile phones, printing services, packaging materials, and media for publicity. The example was the mobile phone services, such as voices and money transfer, which simplified the rural-urban trade of raw medicinal plants.

It addition, the study revealed further that few MPPs traders were abiding by the requirements of TAHPC. The registration was based more on practitioners than on-premises and MPPs. The mentioned barrier was excessive costs associated with the registration of MPPs and premises because it involved other authorities such as the Tanzania Medicines and Medical Devices Authority (TMDA), Tanzania Bureau of Standards (TBS), and Government Chemistry Laboratory Authority (GCLA). The outcome was that most MPPs traders were registered by TAHPC but their premises and MPPs were not registered. It was revealed during the in-depth interview with the TAHPC chairperson that there were about 21,000 registered practitioners out of more than 70,000 who were expected to be registered. The registered premises were less than 1000 while registered MPPs were 40.

Changes in business environments, in terms of public policies and regulatory framework, played the de-coordination role along the four stages in the evolution of trade in MPPs. Although the changes in business environments aimed to legitimize the trade-in MPPs, they had mixed results. In the second and third stages, the legitimation aimed to promote MPPs. In the fourth stage, the legitimation was based on the regulation of MPPs trade to assure their quality. However, a low level of implementation of regulation legitimation led to mixed practices as indicated in stage four where registered and unregistered MPPs traders, premises, and MPPs perform under the same platforms. This practice left consumers with uncertainty about the legitimacy of MPPs in terms of quality, efficacy, and safety.

On the other hand, market/demand played the re-coordination role in stages three and four in the evolution of trade in MPPs. In the second stage, the re-coordination role was played by the government to address the damage caused by colonialism in traditional medicine practice. The re-coordination role was performed well with the private sector in stages three and four when compared to the public sector in stage two. The private sector was active by taking advantage of other changes in business environments such as technological advancement.

As a result of partial implementation of the legitimation and infant competition between traded MPPs, the fifth stage of MPP trade evolution is expected. This stage is expected to be full-fledged commercialization where legitimation and market forces will work together. The fifth stage will be characterized by stiff competition among firms where registered brands of MPPs will be competing in the market. Further, legitimation procedures like protection of the property rights of formulated MPPs as well as complete registration of the traded MPPs may fast-track this stage.

The partial implementation of the legitimation on the part of the business environments can be considered as the answer to further research proposed by Stangeland et al. (2008) on the operational of developed regulations. The results of this study have indicated the developed regulations were not fully operated and implemented. Further, this study indicated the addition role of traditional healers' associations to that explained by Mbwambo et al. (2007). The associations of traditional healers were used for trade promotions in addition to participation in the development of regulatory framework.

6.5. The impact of COVID-19 on trade in MPPs

The COVID-19 pandemic aroused the importance of MPPs in times of crisis. The COVID-19 reflected the trigger to consumption of MPPs caused by HIV/AIDS before the arrival of ARVs, however, with different impacts of traded MPPs. During the initial stages of COVID-19, the Tanzania Government insisted on the use of MPPs and local steaming (*nyungu*). Government institutes such as the National Institute for Medical Research (NIMR) responded by providing a list of ingredients, formula, methods of preparation of the proposed remedies, and recommended medicinal plants for *nyungu*. Muhimbili National Hospital set a modern room for carrying out *nyungu*. Therefore, the people were making their remedies and rarely depended on MPPs traders. The ingredients were ginger, garlic, and lemons, which are available at local markets throughout the country. Some practitioners of traditional medicines benefited from training in the best way of administering *nyungu*.

Nevertheless, a few formulations, from renowned researchers and government institutes such as Prof. Hamis Malebo's COVIDOL, Sokoine University of Agriculture (SUA)'s SYNADOL, and NIMR (NIMRCARF), were allowed to be stocked on shelves in pharmacies and supermarkets without bureaucracy. However, the products were rarely found in pharmacies and supermarkets after the slowdown of the COVID-19 spread. Therefore, although the COVID-19 pandemic promoted the MPPs, it had a short lived impact on MPPs trade, whereby the production of some of the products has been halted. COVID-19 had a small impact on traded MPP to cause practices of trade in MPP to change to another stage. The provided reasons were a quick discovery of vaccines and a brief period of the pandemic.

7. Conclusion and recommendations

Medicinal Plant Products have been used to treat various diseases from time immemorial in diverse cultures around the world. Its trade has emerged to be a complex rural-urban supply network in Tanzania which has developed over time driven by various changes in business environments which shaped the current practices. However, the response of MPPs traders to changes in business environments and the evolutionary paths over time to the existing status was hardly known. It was crucial to understanding the evolutionary stages up to current practices of MPP trade because they could reinforce the understanding not only of factors that caused changes but also the assessment of policy impacts over time.

Therefore, this paper sought to use the economic evolution theory and business environment concept from a business strategy point of view to answer two research questions about the status of MPPs trade in Tanzania: (i) what is the response of MPP traders to changes in business environments over time? (ii) What are the evolutionary stages of MPP trade in Tanzania to current practices? The study findings indicate that MPP traders responded by improving the products' appearance but also by modernizing both practices and premises. The changes in practitioners were influenced by new entrants such as the youths and modern medicine professionals. While the changes in business environments caused de-coordination, the MPPs traders in the private sector responded by re-coordination to explore market opportunities brought about by pandemics while taking advantage of other technological advancements. The study identified four evolutionary stages of trade in MPPs in Tanzania. These stages are the colonial era (1882–1961), the government supremacy era (1961–1984), the emergence of the private sector era (1985–2004), and the market and regulation integration era (started in 2005). As a result of partial implementation of the legitimation and infant competition between traded MPPs, the fifth stage of trade evolution

is expected. This stage is expected to be full-fledged commercialization where legitimation and market forces will work together.

The study recommends for the establishment of accompanied incentives and proper enforcement measures to ensure the desired results whenever there are changes in business environments in traditional medicines for the health and economic security. The activities of mediating factors in the interaction of legitimation and market demand such as ITM, SIDO, and practitioners' associations should be strengthened. Further, because the fifth stage is expected, awareness creation on the importance of intellectual property rights of MPPs and branding should be prioritized. In addition, potential and robust business models to be adopted in the fifth stage can be studied to ensure firms' survival and business sustainability during stiff competition. However, the consumers of MPPs were not included in the study. Therefore, the limitation of the study is the absence of consumers' views on the evolution of the trade-in MPPs which could balance the views of the responses provided by traders. The views and consumers' experience of traded MPP should be taken into consideration when characterizing the expected fifth stage, which is being considered at this stage, as an implication for further research.

Declarations

Author contribution statement

Eziacka Mathew Mpelangwa - Performed the experiments, analyzed and interpreted the data, wrote a paper.

Jeremia Ramos Makindara - Conceived and designed the experiments; tools, performed experiments, wrote a paper.

Olav Jull Sorensen - analyzed and interpreted data, wrote a paper.

Kenneth Michael Kitundu Bengesi - Conceived and designed the experiments, wrote the paper.

Faith Philemon Mabiki - conceived and designed the experiments, performed experiments, wrote the paper.

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The authors do not have permission to share data.

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The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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