

Changing consumer behavior for pangolin products

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Introduction

Addressing the illegal trade in wildlife products requires a multi-faceted approach (Burgess, 2016; Challender et al., 2015). Regulatory measures, harvest and trade controls and appropriate enforcement thereof, in source countries, along trafficking routes and in major end-use markets, are essential (see Chapters 17 and 18). Interventions that enable community engagement should also ensure benefits arise from wildlife protection and/or legal, sustainable trade (see Chapter 23: Cooney et al., 2017). However, these measures can be, and are, undermined by illegal markets that are impossible to contain whilst demand persists (Nijman, 2010; Veríssimo et al., 2012).

Complementary efforts to effectively address demand for wildlife products are therefore increasingly recognized as critical in tackling illegal wildlife trade (TRAFFIC, 2016; Veríssimo and Wan, 2019). Economic theory, and some situational crime prevention models, assert that reducing demand for wildlife products among end consumers (Gore, 2011), and thereby average market price, reduces incentives for market actors, including international criminal networks, to engage in poaching and illicit trade. This should lead to less poaching, and all other things being equal, allow overexploited wild

populations to recover (Challender and MacMillan, 2014).

Within this context “demand reduction” has been recognized as a specific mechanism through which to address illegal trade in wildlife. The term and associated approaches have been recognized since the 1970s (e.g., Arthur and Wilson, 1979), but have gained substantial traction since around 2012, with examples of demand reduction actions agreed by governments in the 2014 and 2018¹ London Declarations and associated statements.

Another notable example of demand reduction commitment to action was the UN General Assembly Resolution (69/314) on “Tackling Illicit Trafficking in Wildlife.” It also features in key regional agreements such as those via the Forum on China-Africa Cooperation (FOCAC) and Asia-Pacific Economic Cooperation (APEC). These agreements and declarations were reinforced through adoption of measures to address demand at the 17th meeting of the Conference of the Parties (CoP) to CITES, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES CoP17). Resolution Conf. 17.4² requires parties to take action to reduce demand for illegally sourced wildlife products through evidence-based behavior change strategies. Demand reduction

¹ London Conference on the Illegal Wildlife Trade (October 2018) Declaration.

² Resolution Conf. 17.4, Demand reduction strategies to combat illegal trade in CITES-listed species.

action was also prescribed for pangolins specifically, in CITES Res. Conf. 17.10³ and in conservation strategies developed for the species.

In this chapter, the focus is on the behavior change component of demand reduction actions, which is recognized as complementary to measures imposing societal control (e.g., regulations/legislation, enforcement, and retailers removing products from sale; Burgess, 2016). The chapter first provides some background and context regarding consumer demand for pangolins, before discussing challenges and considerations relating to pangolin demand reduction efforts. It then summarizes insights in relation to consumer demand in Asia, and discusses opportunities to use these insights to reduce demand for pangolin products through behavior change.

Background and context regarding consumer demand for pangolins

Consumer demand for pangolins has been recorded throughout most, if not all, of their range countries in Asia (Chapter 14) and Africa (Chapter 15; Ingram et al., 2018). Pangolins can represent an important source of protein and their parts are used for a variety of medicinal, ornamental and ritualistic purposes (Chapters 12, 14–16). Such demand is hard to characterize given the multiple motivations for use, various consumer groups and the variety of derivatives that are used and consumed. This complexity is compounded by variations evident across major markets, due to, for example, disruptive marketing by suppliers and fads and trends in consumer markets.

That said, much of the contemporary illegal international trade is driven by demand in Asian countries, especially China, but also

Vietnam, and Myanmar (Chapter 16; Heinrich et al., 2017; Nijman et al., 2016). Demand for pangolin products has also been shown to exist in non-range countries, such as the United States, some European countries, and Japan (Heinrich et al., 2016, 2017). Most demand reduction research and interventions that aim to address the consumption of illegally traded wildlife, including pangolin products, have focused on Asia, particularly China and Vietnam (Veríssimo and Wan, 2019). This is due to the size of these markets for illegal wildlife products in general, combined with phenomenal rates of economic growth in recent decades (Nijman, 2010). More is understood about the nature of demand in these countries as a result and, for this reason, the rest of this chapter focuses primarily on these locations. However, it should be noted that further research into demand for pangolin products in other countries is needed to understand the impact of these markets on wild populations.

Challenges and considerations regarding demand reduction efforts

Before detailed consideration of the research evidence, it is worth recognizing that addressing the consumer demand driving illegal wildlife trade is challenging. Demand reduction campaigns often call into question long-held beliefs or a culturally-ingrained behavior on the basis of their impact on wildlife populations. Some of the challenges of these campaigns are, therefore, ethical in nature. Demand reduction campaigns focus on voluntary behavior change and as such do not aim to limit the freedom of choice of their target audience.

Disciplines such as social marketing should be used to benefit both the target audience and

³ Resolution Conf. 17.10, Conservation of and trade in pangolins.

society at large. In strict terms, this means that they should not be designed to benefit biodiversity at the expense of the target audience. Still, these efforts do often have as a premise not only that the target audience is not behaving in its own best interest, but that conservationists know better how the target audience ought to behave instead. This has led to behavior change efforts being criticized for being paternalistic and even manipulative (Andreasen, 2002). In the context of biodiversity conservation the situation can be further complicated when those promoting the importance of wildlife are based in countries far from species' range states or areas where target audiences reside, and thus accusations of neo-colonialism arise due to complex historical power imbalances.

It is thus important to recognize that while many demand reduction campaigns take their social license from laws and regulation enacted by a national government, there are numerous contexts where the assumption that those delivering demand reduction interventions work primarily for the benefit of the people they serve, does not hold. This means that to ensure a degree of legitimacy, conservationists engaging in demand reduction efforts should build broader partnerships with civil society in the countries they work and ensure there is ample evidence to support addressing the priorities they are focusing on. Moreover, the ethics of influencing behavior should also bear in mind the potential unintended consequences that interventions may have (Cho and Salmon, 2007). While in some conservation contexts, a failed intervention represents a simple loss of time and resources, in the case of the behavioral sciences, unintended consequences can mean that hastily implemented interventions can worsen the threats they were meant to mitigate (Pfeiffer, 2004).

Historically, efforts have lacked an in-depth and culturally sensitive understanding of both demand and the most appropriate interventions

with which to change consumer behavior (Greenfield and Veríssimo, 2019; Olmedo et al., 2017). Many of those delivering communications to persuade different types of purchasing preferences and consumer choice, have tended to focus on achieving breadth, rather than depth (Burgess et al., 2018). In terms of evaluation, impact measurement has often been described in terms of message "reach" rather than "resonance" (Burgess et al., 2018; Veríssimo and Wan, 2019), and on celebrities engaged as messengers, irrespective of their anticipated influence or measurable impact on key buyer, user and intender groups (e.g., Duthie et al., 2017).

Further, the links between information provision, awareness and actual behavior change are in most cases often tenuous at best (Burgess, 2016; Veríssimo et al., 2012). Behaviors are not just influenced by knowledge, but are shaped by a variety of forces, such as social context, political and cultural forces, as well as the degree to which the source of information is trusted (Burgess et al., 2018). Changes in knowledge may eventually lead to changes in attitudes and practice, but even where attitudes are supportive of, for example, biodiversity conservation and animal welfare concerns, this still may not result in changes in behavior (e.g., Lane and Potter, 2007).

Case study evidence and relevant context in this regard, is available from rhino (*Rhinocerotidae*) horn demand reduction efforts in Vietnam. Much international attention and donor support has been focused on combatting this illegal market. Interventions have thus enjoyed the strongest opportunities to demonstrate not just message outreach, but also best practice in behavior change approaches.

Olmedo et al. (2017) developed a framework against which to evaluate the design of behavior change interventions aimed at reducing consumption of rhino horn in Vietnam. This included clearly defined, measurable objectives,

explicit theories of change, supported by research, with built-in monitoring and evaluation, thus enabling evaluation of outcomes, learning, and adaptive management. Findings, however, included that very few interventions featured all requisite steps (Olmedo et al., 2017). Instead they tended to focus on communications, raising awareness of legal constraints and highlighting the cruelty and threat to rhinos, including of extinction. With some audiences seeking to acquire such products specifically because they are illegal or rare (e.g., Burgess, 2016; Kennaugh, 2016), such messaging risks being counterproductive at best. This illustrates the imperative of understanding in-depth what is driving demand before designing approaches to reduce it. Within this context the following section aims to summarize what is understood about demand for pangolin products in two major markets for products trafficked internationally.

Summary of insight into consumer demand in Asia

Asia has been the focus of the majority of systematic research into demand for pangolin products. This effort has focused mostly on the larger urban areas of China and Vietnam, associated to some extent with the role these urban populations play in the broader demand for wildlife (Nijman, 2010; Zhang and Yin, 2014). Thus, through a primary lens on these geographies, subsequent information is split into knowledge around consumption of each product type. Key gaps and limitations are discussed first.

An associated note on nomenclature. The primary lens applied here is on demand reduction actions aiming to change behavior. Consumers are thus considered all those who buy, gift, or use products, or intend to do so. Market research is that identifying price and other details around the availability and sale of products in the marketplace; consumer research is

that revealing insights into the socio-economic and psycho-demographics of consumer knowledge, attitudes, values and behaviors.

Gaps and limitations

One key limitation to understanding the nature of demand for pangolin products is the lack of access to an adequate quantity or quality of consumer research. The authors are aware of nine surveys specifically focused on the consumption of pangolin products. Many remain either internal to the institutions that conducted them or have only been summarized as part of broader reports or press releases, which frequently omit information needed to interpret results. As a result, this chapter reports on the full results of two of those surveys. A related limitation is the dearth of information on the demographic and psychographic profile of consumers of pangolin products, beyond the multi-species studies carried out by Shairp et al. (2016) in Vietnam and USAID in both China (2018a) and Vietnam (2018b).

The scope of several surveys carried out in China and Vietnam had the potential for overlap. This raises the question of whether organizations communicated prior to, or during, the survey design process or research phase. Lack of collaboration can hinder the possibility of surveying consumer populations systematically across countries of interest. It also limits the opportunities for coordinated efforts at the implementation stage.

Lastly, due to differences in methodology, comparison across the results of these surveys is not possible. Many used methods unlikely to yield a representative sample and sample sizes implying large confidence intervals. This makes the resulting estimates harder to interpret meaningfully. Agreeing on common standards for conducting consumer research across various stakeholders would ensure findings

can be used in a complimentary manner, and could provide deeper insights on consumption patterns and motivations. It would also ensure interventions resulting from these findings are based on best practice as recommended by CITES (e.g., in Resolution Conf. 17.4).

Within this frame, the following insights represent the state of knowledge regarding demand for pangolin products in China and Vietnam. Further research is required to ensure that any diversification of illegal trade is identified before it proliferates, and that demand reduction action can be undertaken.

China

A survey of higher income households in Beijing, Shanghai, Guangzhou, Hangzhou, Nanning and Kunming, found that 10% of a total of 3000 respondents report having consumed pangolin products in the past (WildAid, 2016). A different survey of 1800 respondents in six cities (five of which overlapped with the previous study) found that 7% had purchased pangolin products in the last year (USAID, 2018a). According to this second survey, cities with the highest prevalence of consumption were Beijing and Shanghai, and retail stores and Traditional Chinese Medicine (TCM) pharmacies across all cities, were the locations where most consumers reported purchasing pangolin products (USAID, 2018a).

Pangolin meat

Research which surveyed 1037 randomly selected adult residents in Hong Kong Special Administrative Region (hereafter “Hong Kong SAR”), estimated that only 0.1% had consumed pangolin meat in the past year; however, the majority of these individuals had consumed this product in mainland China (Humane Society International, Hong Kong University, 2015). Another survey conducted in 2016, where 1892 residents of ten large,

medium and small Chinese cities were interviewed, found that 9% of respondents reported eating pangolin meat in the previous year (Horizon China, 2016). WildAid (2016) found around a quarter of respondents had consumed pangolin meat and had done so mostly because it was regarded as an “expensive status symbol” and “exotic wild animal.” A previous study of 969 people in six cities found that 0.6% of respondents reported having eaten pangolin in the last year (Wasser and Bei Jiao, 2010).

Pangolin scales

Results of a survey showed that 78% of self-declared consumers have purchased scales in the last year; these are used to cure illnesses and contribute to overall well-being (USAID, 2018a; Fig. 22.1). Meanwhile, Wasser and Bei Jiao (2010) found that 1.4% of 969 respondents reported consuming pangolin as a tonic or as medicine but did not specify which product. A different survey indicates that 14% of urban Chinese residents have used pangolin products for medicinal purposes in the previous year (Horizon China, 2016).

WildAid’s research in China suggests that scales can be one of many ingredients in



FIGURE 22.1 Seized pangolin scales. Photo credit: Linh Bao Nguyen.

prescription medicines; medicines containing pangolin scales are one of the most consumed pangolin products, with about two thirds of self-reported consumers having consumed them. These medicines are believed to treat an array of illnesses including rheumatism, skin diseases, swelling and pus, asthma, promoting lactation and treating cancer, among others (see Chapter 14; [Nash et al., 2016](#); [WildAid, 2016](#)). Similarly, [Yu and Hong \(2016\)](#) describe scales as a common ingredient in medicines to treat symptoms associated with breast cancer and lymphoma. Pangolin scales are listed in the official Pharmacopeia in China where they are prescribed to promote lactation, improve circulation and treat skin diseases ([Chinese Pharmacopeia Commission, 2015](#)).

Although the sale and trade of some products derived from pangolin species has been prohibited by China's National Forestry and Grasslands Administration (NFGA), there is a legal trade in scales for medicinal use. This allows scales from government stockpiles to be used in the manufacture of around 70 patented traditional Chinese medicines by about 200 pharmaceutical companies and, once certified, sold by about 700 hospitals in China ([China Biodiversity Conservation and Green Development Foundation, 2016](#)). However, evidence indicates that unlicensed hospitals still prescribe and use pangolin scales, which are also readily available in unregistered pharmacies ([Xu, 2009](#); [Xu et al., 2016](#)). Further research is needed to determine whether the existing legal trade creates social acceptability around the consumption of pangolin products, further encouraging demand.

WildAid's survey found 70% of respondents reported they believe that pangolin scales have medicinal properties ([WildAid, 2016](#)). In contrast, only 39% of Hong Kong SAR residents surveyed believed scales had medicinal benefits and only 0.2% had used scales for medicinal purposes ([Humane Society International, Hong Kong University, 2015](#)).

Interestingly, 57% of respondents from research conducted by [USAID \(2018a\)](#) in mainland China suggested that synthetic products similar to those from pangolins could substitute for scales used for medicinal purposes, while 17% said that nothing could perform the same function.

Although it is not possible to compare research findings across studies due to different methodologies employed, overall all studies found a higher prevalence of consumption of pangolin products for medicinal purposes, when compared to other use types and motivations. This finding has however to be interpreted in the light that medicinal use most commonly entails the use of a much smaller part of the animal than other uses.

Consumers

The only information regarding the beliefs, attitudes, values and other socio- and psychodemographics of pangolin consumers in China is the study conducted by [GlobeScan for USAID \(2018a\)](#). This research found that 61% of self-declared pangolin consumers (n = 126) were men. The majority of consumers, both men and women, were in the 31–40 year old range and in a middle-income category. Among 67% of those who purchased pangolin products in the last 12 months, there was a high social acceptability for buying or owning such products.

Pangolin wine

Pangolin wine (i.e., body parts steeped in rice liquor) has been reported to be consumed by a "large proportion of consumers" in China ([WildAid, 2016](#)), but there is little information on the prevalence of consumption among populations surveyed, or the profile of the consumers or the motivations driving their consumption.



FIGURE 22.2 Pangolin scale carved into a hair comb.
Photo credit: Xiao Yu/TRAFFIC.

Ornamental use

There is some evidence that pangolin scales are available online as engraved pieces (for example, as hairgrips; Fig. 22.2), and also used for ornamental purposes in China (Soewu and Sodeinde, 2015) but there is very limited information and further consumer research will be key to understanding it.

Vietnam

In Vietnam, consumer research conducted in 2015 found that 4% of all respondents (815 high income individuals from Hanoi, Ho Chi Minh City [HCMC] and Da Nang) reported purchasing pangolin products. Within this 4%, wine and meat were the most consumed products, with about half having used each of these (WildAid, 2016). In a survey of wildlife consumption in general, Do et al. (2011) found that less than 10% of adult respondents in HCMC (total sample size: 4062) and just over 10% of children surveyed (total sample size: 3562) reported consuming pangolin products. In contrast, a consumer survey of randomly selected adult residents of HCMC suggested that only 0.3% had consumed products

derived from pangolins (Education for Nature Vietnam, 2016).

A 2018 survey was conducted with 1400 participants via mobile phone in five cities in Vietnam: Hanoi, Hai Phong, Da Nang, Can Tho and HCMC. This research included only respondents who were over 18 years old and earning a minimum of VND 10,000,000 monthly before tax. Results show 10% of respondents across the five cities report purchasing pangolin products at some point in their life; 6% having done so in the last year and 5% in the last six months. Most purchases are made physically in-country from private individuals (USAID, 2018b). The difference in results is substantial but may be due to the differing methodologies employed in each study. However, it is not possible to evaluate this hypothesis due to the lack of detail about the studies undertaken.

At 93% and 90% respectively, the vast majority of respondents were aware that selling pangolin products and purchasing them is illegal (WildAid, 2016). The consumption prevalence, despite known illegality, suggests law enforcement is currently not an effective deterrent in Vietnam. With the adoption of a new Penal Code, as of January 1, 2018 some conservationists expect that laws relating to possession of illegal wildlife products will feature more prominently in the public consciousness and be enforced more thoroughly. USAID's research (2018b) found that despite 52% of respondents who have purchased pangolin products in the last year having heard about the revision in the Penal Code, and 86% of the same group agreeing with these revisions, 60% of these buyers are likely to purchase pangolin products again in the future.

Pangolin meat

Do et al. (2011) found that pangolin meat was the most consumed pangolin product in HCMC (less than 10% of all respondents); similarly, Venkataraman (2007) found that just



FIGURE 22.3 Pangolin meat being cooked. *Photo credit: Linh Bao Nguyen.*

over 10% of 2000 respondents surveyed in Hanoi, consumed pangolin meat (Fig. 22.3). These findings echo other results that found 10% of respondents had consumed pangolin meat, although most of them had done so more than five years ago (WildAid, 2016). Research conducted in 2018 found that 12% of those who have purchased pangolin products across five cities have purchased pangolin meat (USAID, 2018b).

The most common motivations for consumption of pangolin meat in Vietnam are related to the rareness of pangolins, the perceived medicinal properties of the meat and the prestige that comes with purchasing a very expensive item (WildAid, 2016). These findings align with Shairp et al.'s (2016) research which determined that the high price and rarity of pangolin meat, particularly of wild-sourced pangolins, are attractive attributes for those who wish to display their social status in urban centers in Vietnam. Individuals identified as pangolin meat consumers included wealthy business elites and government officials. These findings support those of Do et al. (2011) relating to the general consumption of wildlife in Vietnam, although there is the need for more up to date research.

Pangolin scales

Research conducted by WildAid (2016), found that pangolin scales were consumed by 41% of self-declared pangolin consumers. Although prescription medicines containing pangolin scales are used in Vietnam, unlike China only a quarter of pangolin consumers claimed they purchase them. These results support findings from Do et al.'s research (2011) in which pangolin products used as medicine and pangolin wine were some of the products most consumed. Similarly, results from USAID's research show that scales and powdered scales are the products being purchased the most. Out of those who admitted having purchased pangolin products, 37% have purchased scales and 31% have purchased powder (USAID, 2018b). Scales are believed to treat several ailments including cancer, chronic varicella, malaria, chills, rheumatism, menstruation stagnation, breast feeding problems, styptic and scrofula (Vo, 1998).

In contrast with China and Hong Kong SAR, WildAid's research determined that only 8% of respondents in Vietnam believe pangolin scales have medicinal benefits. However, 64% of all respondents are aware of the "curative" properties of this product but are unsure whether the claims are true (WildAid, 2016). Additionally, research has found that pangolin products are believed to increase the efficacy of other medicinal ingredients (USAID, 2018b).

Pangolin wine

WildAid (2016) reported pangolin wine was consumed, but no research has been conducted on this product specifically. Research conducted by USAID (2018b) found that only 1% of those who have purchased pangolin products reported purchasing pangolin wine (Fig. 22.4).

Ornamental use

USAID's research (2018b) found that out of the total number of respondents who have



FIGURE 22.4 Pangolin wine in Vietnam. *Photo credit: Save Vietnam's Wildlife.*

purchased pangolin products, 6% have purchased sculptures/statues.

Consumers

Research conducted under USAID's Saving Species project is the only research thus far that shows insights on who pangolin buyers are. This research found that 64% of those who have purchased pangolin products in the last year are men with a higher income and who are on average 35.8 years old. The top three purchase occasions of pangolin products are: to promote wellness, treat an illness and to gift the product to someone else (USAID, 2018b).

Opportunities to reduce demand through behavior change

Types of behavior to change

Available consumer research reveals demand for pangolin products in China and

Vietnam is driven by, amongst other motivations, perceptions and beliefs that scales can treat illness or promote wellness; and that meat can demonstrate status (whilst also providing nutrition). These two "clusters" of motivations, i.e., medicinal and emotional, are also apparent for other types of illegally traded wildlife - including rhino horn, tiger (*Panthera tigris*) products and elephant (Elephantidae) ivory (e.g., Burgess, 2016; Burgess et al., 2018).

Within this broad classification, the occurrence and frequency of product purchase and use (i.e., "ingestion"), becomes important in determining the relevant behavioral science theories, models and frameworks to apply for demand reduction. Additional considerations relate to the covert or overt nature of the practice, and the social proof required to validate them. Consideration also needs to be given as to whether the primary target for behavior change initiatives should be the person ingesting the product, or rather those procuring or prescribing it.

It is also important to note that the strategies and approaches suggested largely span the "social mobilization" and "behavioral change communications" realms of Social and Behavioral Change Communications (SBCC: per Clark et al., 2017). Social marketing (Kotler and Zaltman, 1971) is considered a cross cutting approach that can be applied to either realm.

Although there are a diverse range of reasons for scale consumption, the examples in this section will focus on medicinal and "emotional" use.

Medicinal motivations

In relation to the "medicinal" cluster, while exceptions are evident, a generalization is that products used to promote wellbeing or treat chronic conditions need replenishing over time and thus, their purchase and use has the

potential to be more routine or habitual. This is distinct in behavioral terms, from occasional or “one-off” practices.

“Habitual” behaviors tend to be more “sticky”, less malleable and more challenging to change. They may also be subject to more heuristics and biases (e.g., [Caputo, 2013](#)), illustrate “System 1” thinking ([Kahneman, 2012](#)) and an associated diminished sense of agency and process of cognition. In simple terms, the behavior has the potential to be more of a repeated pattern than active choice, as compared to more deliberative types of decision-making. This creates challenges for empathy-based demand reduction campaigns, which are also subject to compassion fatigue (e.g., [Kinnick et al., 1996](#)) and concepts such as the Social Cognitive Theory of Morality ([Bandura, 1991](#)). The latter considers the influences on what is a moral thought or action, and thus on an individual’s self-regulation or control in relation to, e.g., purchase choice and practice.

An additional complicating factor is that the behaviors and actors for “purchase” and “use” are distinct and may require very different strategies for engagement and influence ([Cialdini, 1984](#)). By way of illustration, in Vietnam, the grandmother of new-born babies may both supply and recommend the new mother consume pangolin scales to promote lactation ([Thomas-Walters, 2017](#)). Elders typically are beyond reproach, and so the treatment is consumed. A corollary from China, is that the healthcare professional prescribing traditional medicine treatments may be above questioning by the patient receiving the prescription. Much the same as in “Western” medicine systems, it would be highly irregular to challenge the judgment, knowledge or decision of the professional recommending the treatment. This reinforces that careful consideration is required around the target of the demand reduction intervention and the manner through which change can be most effectively influenced.

“Emotional” motivations

In relation to the “emotional” cluster (whereby consumption choices largely fulfil a need for hedonistic pleasures or social gain), while exceptions are once again evident, a generalization is that eating meat to demonstrate status is, by contrast to habitual use, a more occasional or one-off practice. Inherently the experience of ingestion should be an infrequent, elusive or exclusive one, if it is to adequately exemplify the “rarity” attribute sought after.

Consumption of meat would thus, for this type of motivation, typically be conspicuous or overt, i.e., the behavior requires observation and may also be subject to social proof ([Aronson et al., 2005](#)) to ensure peer acknowledgment and status “validation.” This suggests that whether the context for eating pangolin meat is a corporate, political or social one, the person ingesting the dish may not always be the same as the person who ordered it. The target for demand reduction campaigns therefore also, in this motivational cluster, requires careful consideration.

In general, with both medicinal and emotional motivations, more in-depth research is required, around the frequency and occasion of use. Clear insight should be acquired in relation to the underlying knowledge, values, attitudes and beliefs that pangolin product consumers have. This would be in addition to understanding their definitions of quality; how they identify the best product to acquire, whether they research it extensively first or rather go to trusted sources; their reaction to price; motivators and inhibitors to purchase, intention and use; any catalyst or “gateway” behaviors governing pangolin product consumption more broadly; the channels of influence generally and triggers for ingestion. All aspects are important in determining the best theoretical foundation to employ, through initiatives aiming to change behavior and reduce demand (see [Fig. 22.5](#)).



FIGURE 22.5 A pangolin carved into a fruit pip by master carvers in China, illustrating a behaviorally informed approach to persuade an alternative consumption choice by ornamental collectors in China. The artist Liu Baodong, is a Master Carver, and keen to show how sustainable materials can fulfil the need for an exclusive product while protecting pangolins. *Photo credit: Liu Baodong.*

Existing experience

At least five non-governmental organizations (NGOs) and one inter-governmental organization (IGO) are either designing, developing or starting to deliver, “demand reduction” initiatives intended to reach potential pangolin product consumers in China and Vietnam. The majority seem to follow a mass media distribution or “spray and pray” approach; their aim is maximum coverage rather than that targeted to specific channels of influence. Only one initiative is understood to have any substantial behavioral change theoretical foundation (Olmedo et al., 2017; Veríssimo and Wan, 2019), and none are at a sufficient level of implementation for success

factors and lessons learned to be deduced i.e., there is no evaluation of impact yet on either buyer, user or intender groups. The strategic approaches summarized in the sections that follow therefore, are based largely on theories applied, and experience gained, in other fields, or taxa consumed for similar motivations in the same markets.

It is also important to note that while a range of approaches to reduce demand are discussed, this should not erode emphasis on the importance of effective legal deterrents that are appropriately enforced. Whether the target behavior is associated with product purchase or use, or in the medicinal or emotional cluster, effective societal controls, enforcement thereof and the removal of products from sale, will always be critical in complementing messaging to shape motivation, to ensure enduring behavior change. This is important in itself, but also because the perception of prosecution can be an important influence on individual intention and action (Schneider, 2008; USAID, 2018b).

Multiplicity of models

While behavioral science is replete with theories, frameworks, principles, concepts and models of change that could have application to this issue, a limited number are introduced here. This is both for clarity and the purpose of illustration, but also because those selected are considered amongst the most notable, for their potential application in relation to pangolin demand reduction initiatives. The narrative focuses on the mixed methods typically required around messaging, messengers and mechanisms for communication activities and distribution. It is difficult to disaggregate the models that can guide campaign structure and design, from the concepts underpinning the models. This is not discussed further here therefore, but additional resources include

Darnton (2008), Michie and Johnston (2012), and Change Wildlife Consumers (2019).

Specific behavior change theories relevant to reducing “medicinal” demand

In relation to more routine or habitual behaviors, such as those that might surround medicinal motivations, Lewin’s “Unfreeze-Change-Refreeze” Model, later coined “Change Theory” (Lewin, 1947), is of particular relevance.

The central premise of this cornerstone in behavioral theory, is that by raising the level of cognition an undesirable behavior can be “frozen”, and new more socially responsible/ environmentally desirable behavior identified and recommended to replace it. The new behavior is then “refrozen.” Subsequent research has suggested that the overarching nature of “keystone habits” (Duhigg, 2012) should also be considered. These may have an important influence on the context within which the target behavior is conducted. Disrupting any subconscious practices around it should also be a priority. An additional consideration is that interventions delivered during a “Key Life Change” (e.g., changing jobs, moving home, getting married, or –of relevance to pangolin scale users– having a baby) may be especially impactful, as automatic patterns of behavior are naturally disrupted through such fundamental changes in routine and day to day decision-making (Duhigg, 2012).

From this composite set of insights, a recommendation for demand reduction professionals aiming to target, for example, the use of pangolin scales to promote lactation, could thus be to engage those developing e.g., “Take Home” bags from hospitals or maternity clinics, or others providing advice through medical referral services to new mums, as “messengers” in initiatives aiming to reduce demand for the medicinal use of pangolin

scales. Such professionals may prove especially powerful in unfreezing, changing, and refreezing desired behaviors.

Alternative products providing an equivalent function for the mother, would need to be identified alongside this to increase the probability of success. Research is required in order for suitable alternatives to be identified (see also Broad and Burgess, 2016). Stories from those who have successfully challenged conventional wisdom handed down through generations regarding how best to stimulate milk production, should also be sought at the “change” stage, to reinforce what is possible and increase the “agency” the target audience perceives regarding their ability to make a more environmentally desirable choice.

Of further note regarding communicating about alternative products, is that those typically issuing messaging around pangolin scale purchase and use, need to be those with the most credibility to comment on suitable medical treatments. Conservation NGOs or government departments with a natural resource or wildlife protection mandate, are not healthcare professionals, and thus may offer either no or low credibility and an equivalent ability to influence.

Engaging messengers who can identify and prescribe alternative treatments to promote wellness/reduce illness, is therefore key. Ministries of Health, Traditional Medicine Colleges, training institutions, research bodies and universities, alongside proponents of a sustainable industry with a respected reputation, such as the World Federation of Chinese Medicine Societies (WFCMS), may be crucial and should be engaged.

Regular reinforcement, recognition and reward of the new “desirable” behavior are also important. Messaging that promotes a positive rather than aims to negate a negative, would also be implicit, and in line with evidence about the approaches to messaging that achieve greatest affect (e.g., Keller and Lehmann, 2008; Schaffner et al., 2015).

Specific behavior change theories relevant to reducing “emotional” demand

In relation to overt or conspicuous consumption practices, such as those involved in the status driven behavior of consuming pangolin meat, validation is required by a respected peer group, i.e., “social proof.” Social Network Theory (Lin, 1999), is thus of particular note for this type of demand. The central premise of this behavioral theory, is the insight it provides into pathways of influence in social networks. Attributes such as “Nodes” and “Ties” are the subject of much research in “social network analysis,” and evidence is therefore rife around dynamics such as node types offering the most connections into, and social proof for, selected target audiences, alongside the ties that may be strongest in ensuring the uptake of new behaviors. Dunbar’s Number (Dunbar, 1992) sheds light on the most influential circles surrounding the target individual – 15 close family members and friends are generally deemed to be the most impactful in changing an individual’s habits and decisions.

Several influential personality types are identified as relevant to behavior change in more populist texts such as Roger’s Diffusion of Innovations model (Rogers, 1983) and Gladwell’s *Maven’s Connectors and Salespeople* (Gladwell, 2000). In Roger’s model, “Innovators” (estimated to be 2.5% of any populace or group) are the first to adopt a new practice and thus generally most open to change. This then shifts to increasing momentum/shaping more substantial change via “connectors” engaging “early adopters”; and subsequently by “salespeople” convincing the “early majority.” Although this set of insights focuses on message distribution, due to the validation required through the overt set of behaviors in conspicuous consumption, it represents an essential mechanism to consider, in ensuring enduring and meaningful change.

Relevant models to both medicinal and emotional motivations

The “Stages of Change” model (Prochaska and Diclemente, 1983) originated from the application of behavior change in relation to public health practices, and is one of the few that recognizes the “journey” people proceed through when moving from a socially or environmentally “undesirable” to “desirable” behavior. Relapse, retention and refinement are important parts of the process; in simple terms, redirecting those consuming pangolin scales to treat illness/promote wellness, or consuming meat to display status, is anticipated to happen through a series of stages, and messaging and messengers need to be engaged differently at each stage.

The “Socio-Ecological Model” (SEM: Bronfenbrenner, 1979), originally the *Ecological Framework for Human Development*, is also relevant and overarching. Similar to Vlek’s “Needs-Opportunity-Abilities” model (Vlek et al., 1997), SEM essentially recognizes the various influences on deliberations around the pros and cons of adopting a new choice, amongst broader decision-making processes. The layers distinguish inherent (i.e., internal) factors from those more inter-personal, institutional, or at the community or society level. Influences on behavioral intention and action, and the barriers, facilitators, inhibiting or enabling factors involved, are thus implied as distinct for each layer. Each should therefore be considered in demand reduction initiative design, planning and execution.

Conclusion

This chapter has sought to summarize the imperatives, opportunities and potential mechanisms for using behavioral science to reduce demand for illegally traded pangolin products. A central premise for the chapter is

that a multifaceted approach is critical. That is, one that employs social science interventions such as behavior change, alongside others more legislative in nature.

While there have been a number of studies aiming to increase insight into what drives consumer demand for pangolins in Asia, so as to guide, shape and inform efforts to dissuade it, few such studies have been published in full in the public domain, and further, few have focused on psycho-graphic and socio-demographic elements driving purchase and use.

Thus, while it is clear pangolin scales are consumed in many markets for a perception of efficacy in treating illness and promoting wellness; and pangolin meat is consumed for an association with demonstrating status, substantial knowledge gaps unfortunately remain around various aspects that might help to shape and inform truly transformative efforts to change both these types, and other types, of consumer choice.

Examples of research priorities therefore, aside from those identified for the geographies aforementioned, include various elements necessary to conduct behavioral journey mapping and a stages of change analysis – such as purchase pathway triggers and drivers, inhibitors and facilitators, and catalyst and gateway behaviors (e.g., [Austin et al., 2011](#)).

Strategic prioritization of demand reduction efforts could also occur if comparative analyses were conducted around which use types and motivations were the most common amongst consumers, and perhaps the most “destructive” in terms of product. Scales are often identified in seizures but they feature in small amounts typically in traditional medicine treatments – so are pangolins poached mostly for meat with scales a profitable by-product? Or vice-versa? (see [Chapter 16](#)).

Such data and insight would arise from research designed to deliver a more fine-grained level of resolution than is available currently. Once such knowledge is secured,

the development of segmentation models identifying priority behaviors to target and the consumer clusters most willing and able to act, might occur. While these approaches to behavior change are quite commonplace in other fields of application (e.g., [Defra, 2008](#)), they have yet to be brought to bear for the benefit of the heavily trafficked yet enigmatic pangolins. This chapter has aimed to help inform action to address such issues.

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