Prescription for change

How we can be more effective at reducing demand for wildlife-containing Traditional Chinese Medicine

Insights and recommendations from literature reviews and expert interviews

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Contents

Executive summary

Background and context

Traditional Chinese Medicine (TCM) is a longstanding cultural and medicinal practice that originated in China, with a history spanning thousands of years. It is not only a medical system but also a holistic philosophy reflecting Chinese values, beliefs, and traditions. The use of wildlife products such as tiger bone, rhino horn, and pangolin scales has long been considered integral to certain treatments. However, with growing global conservation efforts, there is an urgent need to address the unsustainable and illegal use of these endangered species while maintaining respect for the cultural significance of TCM.

Various national and international regulations, including the UN Convention on International Trade in Endangered Species (CITES), aim to control the trade of illegal wildlife products used in TCM. Despite these laws, enforcement is often inconsistent, and banned products still make their way into the market, where they continue to be produced, prescribed, and consumed.

This alludes to the social, cultural and behavioural forces underpinning continued demand for illegal wildlife-containing TCM. This ongoing demand for wildlife products in TCM is shaped by multiple stakeholders, including consumers, practitioners, law enforcement agencies, traders, and conservationists. Reducing this demand requires acknowledging cultural sensitivities, and one of the main challenges is the absence of widely accepted, suitable alternatives to illegal wildlife-containing TCM. Several demand reduction campaigns across China and Southeast Asia are targeting this issue, addressing different pain points for varied audiences.

This study was commissioned to BIT (the Behavioural Insights Team) by the "Partnership against Wildlife Crime in Africa and Asia", a global project implemented by GIZ on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) and the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV). The Partnership operates along the entire illegal trade chain in ivory, rhinoceros horn and pangolin from the countries of origin in Africa to the consumers. We have assessed a breadth of these demand reduction campaigns, and used the insights to provide recommendations for improving the use of behavioural science in campaign

development, elevating rigour in research and evaluation activities, and enhancing overall demand reduction strategies to bring about long-term behaviour change.

Methodology

We employed a two-part strategy comprising: 1) A literature review (n=93) of existing demand reduction campaigns for TCM, illegal wildlife trade and public health (related to wildlife consumption). To delve deeper into the practices, efforts and challenges of the industry, we also conducted 2) Interviews with key international and domestic experts (n=11) from mainland China to obtain detailed qualitative insights into current demand reduction efforts and key lessons learned.

Insights from demand reduction campaigns

Through our literature review and expert interviews, we gathered insights about demand reduction efforts for endangered wildlife products across three categories: campaign characteristics, behavioural insights used, and empirical strength of the campaigns.

Campaign characteristics

- Local and international **non-governmental organisations (NGOs) were the most prevalent organisations delivering demand reduction efforts**, with a few campaigns being delivered by academic institutes, the government, and TCM institutes, or in some cases, a combination of these organisations. Enforcement agencies rarely led any campaigns (although multiple campaigns were targeted at them), despite being considered valuable influencers for demand reduction: "Emphasising law is important. People in China are very sensitive to rules. Utilise community respect for law and rule to enforce behavioural changes." [Academic expert]

- In terms of the **focus of the campaigns**, most of the campaigns (62%) we reviewed were from **China** – a primary market for TCM, followed by Vietnam (27%). Further, a large portion (48%) of the campaigns were focussed on **illegal wildlife trade** generally. Some of these had a parallel focus on TCM, while some others were solely focused on TCM. A considerable portion of these campaigns were mostly **species-agnostic**, with many focussing on a combination of endangered wildlife species. Other common species included pangolins, bears, rhinos and tigers.

- A large portion of the campaigns were **general, public awareness campaigns** as 42% were **targeted at the general population** with a broad outreach strategy. While this does not imply that they cannot use behaviour science effectively, specific consumption behaviours are rooted in population and product-specific demands, which are often best addressed by segmenting the **target audience** and designing campaigns addressed at these specific groups. Some of the specific consumer subgroups covered (in 17%) of the campaigns we reviewed included tourists, women, civil society, or spiritual groups like Buddhists. Educational campaigns, often involving primary school and university students were the focus of many campaigns too – underscoring a prevailing theory of change: If people are aware of the dangers, risks and cruelties associated with wildlife used in TCM early-on in their lives, they will not purchase wildlife-containing TCM products in the future. While increasing awareness is a means to build knowledge, which could contribute to changing attitudes and intent, thereby informing behaviour change, the prevalence of strong cultural traditions and social norms related to using IWT-containing TCM can cause a gap between knowledge and action/behaviour change.

- Demand reduction also goes beyond the consumer level – **groups influencing the supply of endangered wildlife-containing TCM** were also targeted, although by a small portion of the campaigns. These included TCM doctors, manufacturers and enforcement authorities. These campaigns aimed at training these groups, educating/increasing their identification capabilities, and encouraging them to make public commitments to not prescribe/promote illegal/endangered wildlife through pledges.

- Campaign characteristics that influence successful implementation also include the **mode of delivery and types of messengers used**.

    - Most campaigns (73%) **we studied were delivered offline**, through events, workshops, visual displays (e.g. exhibitions, fairs, posters) etc. These offline methods are deemed effective by experts as they are considered to have stronger impact on recipients, however **in the current context of the digital age, online channels are critical as they can both, promote and discourage demand for IWT-containing medicines/products**. 40% of the campaigns we reviewed used online modes, primarily through social media content and advertising.

- We also found that **around half of the campaigns reviewed did not specify the use of messengers** to disseminate campaign messages. Among those that did, **celebrities were the most common**. While celebrities may engage the audiences and even influence them to an extent, there are risks with using them as messengers including short-term engagement and possibility of negative publicity: *"Celebrities can attract attention, but the public's fragility and sensitivity to rumours in China make them a risky choice."* [Academic expert]. As mentioned above, other key players like TCM doctors, law-enforcement officers and community leaders who were rarely used as messengers could be effective means to highlight laws and regulations and enforce behaviour change.

Behavioural insights used

We noted that the explicit, strategic use of behavioural science and related tools/methods was largely lacking in a majority of the campaigns.

- We used the **COM-B model** to understand the targeted barriers and enablers to demand reduction within the campaigns. We found that most **campaigns sought to strengthen the positive enablers/drivers of demand reduction** to influence behaviour, specifically the awareness of wildlife exploitation or endangerment. Campaigns had a dominant emphasis on awareness-raising, implying a naive model of behaviour change through which **knowledge/awareness is presumed to be the primary driver of behaviour**, though there was little evidence showing use of behavioural research, models or insights to arrive at this strategy

- Relatedly, through our assessment of campaigns using the Intervention Ladder, we find that **most (80%) interventions did not go beyond simply 'providing information' as a means to influence behaviour change**. This highlights the need to explore and trial more coercive and direct strategies such as restricting choices, guiding choices through incentives/disincentives or changing the choice environment in which consumption practices are happening. We recognise that this requires access to different 'levers of influence' that many conservation NGOs do not themselves have.

- From the lens of the EAST (Easy, Attractive, Social, Timely) framework to assess the use of behavioural insights design and delivery of campaigns, we again

found that awareness-raising was the primary focus, though the use of social influence techniques to influence demand was also widely prevalent (70% of the campaigns). This was done by making peer influence, social norms and community based changes salient. These campaigns employed other techniques of the framework simultaneously, in most cases, making the messaging and content attractive (through graphics, visuals, stories), possibly assuming that attractive and social campaigns would engage the audiences, thereby leading to behaviour change. However this is rudimentary as interaction alone does not translate to behaviour change.

Empirical strength of campaigns

The complex nature of the demand for these products, and the inherent challenges of influencing human behaviour, demands rigorous evaluation of campaigns to really learn what works. However our literature review indicated that **only 12% of the campaigns formally evaluated the campaign impact on demand reduction**. Moreover, these campaigns that did test for impact mostly lacked empirical rigour:

- A vast majority of these campaigns did not measure and report outcomes that indicated *actual* demand reduction, i.e. observable behaviour change. Instead, they reported outcomes lower down the hierarchy of rigour. In approximate order of greater to lesser validity, these outcome measures included *self-reported* behaviour change (we acknowledge, is often the only option when measuring illegal behaviours with no reliable administrative data); reduced *intent*, and other outcomes that are even more loosely linked to actual demand reduction, i.e. campaign *views* and *reach*.

- Moreover, none of the campaigns could claim causality between their intervention and actual demand reduction. Due to a variety of barriers like a lack of resources and low expertise to conduct thorough evaluations, less rigorous evaluation designs are commonly employed including pre-post polls and simple surveys. When strong evaluative methods like randomised controlled trials were used (by 2% of the campaigns), they measured changes in attitudes and perceptions, rather than behaviour. Again, we acknowledge the real constraints of running robust evaluations on illicit and hard-to-observe behaviours, with interventions that are hard to randomise within a population. But we maintain that poor sectoral expertise and lack of funding or demand from funders to run proper behaviour change impact evaluations are also a major factor here.

Recommendations

Current campaigns often fail to fully capture the diverse motivations behind wildlife consumption and to rigorously measure their impact. To enhance demand reduction efforts in the TCM context, we recommend incorporating key behaviourally-informed elements:

1. **Use robust behavioural science evidence, theories, principles and methodologies** when designing campaigns: A deeper understanding of behavioural drivers influencing demand is needed, extending beyond awareness alone. This will allow interventions to be more precisely tailored to achieve specific, targeted outcomes.

    a. **One way of doing this is by developing interventions backed by a well-developed theory of change.** A Theory of Change (TOC) maps how an intervention achieves its goals, linking activities to outcomes and identifying assumptions or obstacles. Integrating behavioural theory into the TOC strengthens its impact by addressing drivers of behaviour. Evaluations can then validate these behavioural changes, such as shifts in trust or health beliefs, alongside observable outcomes. It's also essential to recognise which behaviour drivers the intervention won't affect to maintain realistic expectations.

    b. We recommend using **established methodologies to guide research and intervention activities. BIT's** TESTS **framework is one such methodology that has been used across hundreds of behaviour science interventions across fields.** This methodology emphasises:

        i. A more **targeted perspective on audiences and behaviours**, allowing the motivations and context of specific segments to be reflected in intervention design. In the TCM context, audience segmentation or identifying target audiences is crucial. An expert we interviewed supported this view: "*A good campaign should only target people who are really interested in consuming the product.*" [Academic expert]. Research shows two key groups for effective demand reduction: 1) Patients using TCM for specific ailments, whose demand is more direct, and 2) Authority figures, such as law enforcement agents and TCM practitioners, who play a significant role in

influencing consumer choices regarding illegal wildlife-containing TCM products.

ii. **The undertaking of robust primary and secondary research to better explore drivers and barriers of those behaviours.** The use of behavioural models such as COM-B highlight a far wide range of influencing factors than typically employed within current campaigns: not just awareness, but wide-ranging capability, opportunity and motivational factors rooted in conscious and nonconscious decision processes, and contextual factors rooted in the social, physical, economic, and digital choice environment,

iii. The development of **evidence-based solutions** (communications and other behaviour change interventions), including through the use of Theories of Change to unpack the behavioural mechanisms through which impact can be realised, and

iv. **Rigorous evaluation** of those solutions, using outcome measures which more reliably reflect actual behaviour, within a research design which more robustly demonstrates causal impact. Specifically, this might include large-sample online randomised experiments to pilot and test communications (whereby we can measure psychological outcomes such as retention, comprehension, know-how, intent, trust, self-efficacy, health beliefs, etc. to validate the Theory of Change), as well as field trials to observe real-world behavioural impacts. These should aspire to the use of Randomised Controlled Trials (RCTs), or quasi-experimental alternatives such as difference-in-difference or regression discontinuity designs.

2. **Seek access to varied levers of change**: Current demand reduction efforts primarily focus on raising awareness about the harms of wildlife-containing TCM, but this often fails to lead to behaviour change due to a knowledge-action gap. Factors such as TCM's cultural significance, limited alternatives, and legal loopholes contribute to this disconnect. This highlights the need for strategies beyond awareness campaigns, incorporating more coercive approaches and engaging multiple stakeholders to address these deeper issues and effectively reduce demand for illegal wildlife products. While we acknowledge that these techniques may be challenging and

beyond the current scope of organisations leading demand reduction efforts, it is worth trying. Experts we interviewed provided various recommendations for demand reduction strategies beyond awareness, including restricting information and choice. While these are meritorious, stemming from expertise and experience, we recommend testing and evaluating the success of these and other techniques first in order to build confidence in what works.

a. **Enhance existing communication campaigns to serve a range of purposes beyond information-dissemination.** While communication campaigns are not the only means of triggering behaviour change, they are often the most viable solutions given the resource and capacity constraints that NGOs face. A behavioural lens can be applied to communications to increase their impact. At the individual level, communications can serve a range of functions, including providing procedural knowledge, combating misinformation and shaping and influencing social norms around demand reduction. Communications can reach beyond the individual to also influence the choice environment, by providing tailored and clear alternatives or seeking to influence the both, consumers and supply-side stakeholders like policy-makers and law enforcement authorities during key moments of change.

b. **Foster multi-stakeholder collaboration to access novel campaign delivery channels and methods is a way to actualise these varied levers of change.** Conservation NGOs face a challenge here: they are the dominant driving force of demand reduction, and yet they often lack the levers of influence to significantly change behaviour. Their powers often reside in communications and public engagement, and yet this tends to steer efforts towards 'information provision' (and more limited still, information which emphasises concern for wildlife). This overlooks a wide range of other voices and influencing stakeholders (including legal/enforcement bodies, research/educational institutes and consultants) who might be better placed to leverage other targeted touchpoints with consumers, impose (dis)incentives, or a wider variety of nudges. These campaign delivery partners may also have access to different data sources enabling more rigorous evaluation. A critical first step to multistakeholder collaboration is identifying the key stakeholders and their roles and influences on demand reduction – also known as

stakeholder analysis. Before engaging multiple stakeholders, it is important to assess which stakeholders are at the core of influence and interest in demand reduction, those who are directly involved in efforts and those who have a more indirect influence on demand reduction. The reviewed campaigns show that networking events like conferences and symposiums help connect decision-makers and influencers for demand reduction. However, to improve these efforts, there is a need for stronger, long-term partnerships, knowledge-sharing, and regular collaboration through projects, campaigns, and expert consultations. Funders are a key stakeholder, as they provide essential resources and shape the direction of demand reduction efforts. They should thus support long-term, evidence-based strategies that allow for innovation and learning from failure, rather than focusing on superficial impact metrics.

3. **Embrace a commitment to rigorous measurement and evaluation**: Current TCM demand reduction efforts lack a strong evidence base, making it difficult to design future campaigns empirically. Researchers need to collect accurate data on wildlife trade, though this is challenging – especially in regions with clandestine activities and inconsistent data collection. However, creating a repository of best practices and what works in demand reduction for TCM is not impossible. This requires transparent publication of methods, peer-reviewed research, and partnerships with independent evaluators to verify impact.

    a. **Randomised controlled trials (RCTs)** are one way of rigorously measuring impact. Although RCTs are considered the gold standard, they are not always practical or feasible. Quasi-experimental methods like difference-in-difference or regression discontinuity are viable alternatives, and expert guidance is recommended for their application – possible through multi-stakeholder collaboration.

4. **Ensure cultural sensitivity and adaptive management** across all of these efforts: It is important that the **planning, design and implementation of demand reduction efforts is grounded in the cultural context of TCM** and adapts over time, factoring in lessons learnt and future considerations.

    a. This would mean understanding different barriers and motivations of target audiences to select the most suitable yet culturally sensitive messengers and message framing. Experts also suggested educating the

public about the true purpose of TCM, which is to preserve life instead of diminishing it. An NGO expert we interviewed expressed the same, highlighting the need to account for the changing needs of the public, towards wanting more solutions instead of criticisms: "*Given the sensitivity of TCM, using positive messaging is essential. Previous approaches are no longer suitable. Criticism is challenging as it can be misinterpreted and amplified. Adapting to new strategies that emphasise collaboration and positive communication will be more effective. Emphasising the benefits and advancements within the field can help foster a more constructive dialogue and wider acceptance.*" [NGO expert]

b. Finally, we recommend **approaching long-term and sustained behaviour change by reflecting on and implementing continuous learnings** to current demand reduction efforts – a process known as adaptive management. This, in turn, requires a systematic and far more ambitious approach to trialling and evaluating campaigns to build a credible body of evidence of what works, where, when and why, to enable the sector to course-correct its efforts over the long term. **This also involves adopting a culture of knowledge sharing and collaboration between experts, practitioners and researchers**: "*Many organisations conduct demand reduction or public awareness campaigns in various ways. Unfortunately, we often learn about these efforts only when they publish results, such as hosting workshops or getting companies to sign pledges. This lack of information during the working process stage means that efforts are often not synchronised.*" [TCM academic expert]

As the context and scope of demand reduction using behavioural and empirical approaches is still limited, this leaves plenty of room for innovation, improvement and experimentation. Our recommendations aim to orient practitioners, policy-makers, and conservations to this wide scope of application, to enhance the quality and impact of demand reduction campaigns for endangered wildlife used in TCM. We also urge stakeholders to use (and advocate for the use of) behaviour science tools and methods to the broader TCM context, going beyond the consumer demand level and applying these insights to supply-level influencers too.

1. Aims and objectives

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH, Germany's leading development agency) has commissioned **BIT** (the Behavioural Insights Team, a social research agency) to assess the state of evidence on initiatives to reduce demand for wildlife products in and around China. Specifically, the project objectives are to:

i) **Understand existing campaign efforts in reducing demand for the trade or consumption of endangered wild animal products in mainland China and neighbouring countries;**

ii) **Gather lessons learnt from experiences in practice; and**

iii) **Highlight practical recommendations for conservation practitioners to more effectively design, implement/strategise and evaluate the impact of TCM wildlife campaigns in mainland China.**

STUDY DISCLAIMERS

This study follows in strict accordance with guidelines by the Collaborative Institutional Training Initiative (CITI), for conducting ethical quantitative and qualitative human subjects research (HSR).

2. Methodology

To achieve our project goals, we undertook a two-pronged approach consisting of the following research activities:

1. **A literature review of the existing evidence** (n=93) on design, implementation strategies and impact evaluation from existing campaigns aimed at reducing demand for endangered wildlife products used in TCM.

2. **Interviews with key international and domestic experts** (n=11) from mainland China, to gather in-depth qualitative insights on current demand reduction or research efforts and lessons learnt.

2.1. Literature review

Search strategy and scope

We conducted a literature review with Boolean search phrases to gather evidence on design, implementation strategies and impact evaluation from existing campaigns that aim to reduce demand for endangered wildlife products used in TCM. Specifically, we focussed on including campaigns with different product and campaign contexts, and sorted for relevance using 'relevance hits' between the years 2004-2024. Further details can be found in Appendix 1 (Table 1 and 2). We searched for information about campaigns from **multiple sources**:

(1) **Targeted searches/updates** of up to top 500 results per search phrase (or a minimum of 100 results) from higher-yield search engines (Google, Baidu Web and Scholar) and select mixed literature databases (Proquest, Web of Science, CNKI).

   a. For Source 1, we used Boolean search phrases based on our search scope to optimise the yield of relevant results, and also conducted direct searches on select NGO organisation websites and specific TCM campaigns that were identified from previous work and knowledge, and deemed likely for inclusion.

(2) **Archived resources** from the team (including consented reference to analysed data from past reviews);

(3) **Supplementary documents/reports not available in the public domain** (consented for sharing/use in this study by project partners/report authors).

Data extraction and analysis

For this review, we primarily focussed on cataloguing campaigns with awareness, education or behaviour change strategies aimed at the public/consumer or the industry/practitioner level. Although we did not focus on policy advocacy or enforcement campaigns, we have included special mentions for those that promote stakeholder awareness and education with direct relevance to the management and regulation of endangered TCM products.

Campaigns included in the review were categorised at the intervention activity level, and separated by those with distinctly different audience strategies. Eligible types of campaigns, which were either aimed at or relevant to reducing demand from consumption or trade of wildlife used in TCM, were defined as mentioned in Table 1 below:

Table 1. Types of campaigns included in the literature review and their relevance to research aims

Level of relevance	Campaign category
High	(1) TCM campaigns - Targeted messages: Intervention activities aimed at reducing consumption or trade for one of the target endangered wildlife products, with direct relevance and context to reducing demand for TCM. - Broad messages: Intervention activities aimed at reducing consumption or trade of endangered wildlife used in TCM (no species specified), with relevant strategies targeted to TCM stakeholders, their behaviours and the environment.
Medium	(2) Health campaigns - Intervention activities with public health messages linked to wildlife protection (e.g. zoonotic disease transmission from wildlife products that may include TCM products)

Medium-low	(3) Species campaigns on the illegal wildlife trade - Intervention activities with messages that mention at least one of the target endangered wildlife products, with some descriptive information or indication about its usage in TCM.

We structured the outputs from our search according to the categories mentioned in Table 2 below. A detailed literature review framework can be found in Appendix 1 (Table 2).

Table 2. Categories included in the literature review framework

Categories	**Details**
General Information	• Type of publication • Research type • Abstract/Executive summary • Study/Campaign objectives
Research and Methodology	• Research methodology • Reported evaluation method • Methodological limitations (reported) • Reported Internal validity • Reported External validity • Strength of evaluation
Theoretical Frameworks	• Behavioural theory basis • Theory of change for intervention • Behavioural insights used
Target and Audience	• Targeted wildlife species • Targeted audience
Intervention Details	• Description of intervention • Intervention type • Targeted enablers for demand reduction • Targeted barriers for demand reduction • Mediums/Channels of intervention delivery
Evaluation and Outcomes	• Impact evaluation completed? • Level of outcomes • Main findings • Described impact • Evidence of adaptive management
Cultural and Future Considerations	• Cultural sensitivity of the process • Scope for further research and gaps (reported)

2.2. Expert interviews

We conducted 11 online, semi-structured interviews with key international and domestic experts from mainland China, to gather insights on current and recent research and campaign efforts on TCM demand reduction. Our focus was on lessons learnt both with respect to the campaigns (e.g. what works) and delivery (e.g. what challenges researchers and practitioners face) as well as to understand what methods and commons practices are used across the sector (e.g. what kinds of evaluation strategies are typically applied). Experts hailed from the fields of academia, conservation and public health NGOs and TCM practitioners, many of which had overlapping expertise or research backgrounds across groups. Detailed sample characteristics can be found in Appendix 2.

Analysis

All interview data were analysed thematically to find common themes/categories and elaborate on key findings relevant to our research objectives. Insights were categorised across the following themes:

- TCM background and baseline research
- Current campaign strategies
- Challenges/barriers to demand reduction, campaign delivery, and research
- Lessons learnt and recommendations

Interview insights are reported using quotes throughout the report to supplement the literature review findings.

Research ethics and data security

All data or insights acquired and included in this study (whether via literature review or expert interviews) were done so in strict adherence to CITI guidelines for ethical conduction of research, particularly on social science research with human subjects.

3. An introduction to traditional medicine in China

3.1. Origins and current practices

The Traditional Chinese Medicine (TCM) practice dates back to around 5,000 years ago (est. 2300 BC). Early pioneering practitioners (e.g. Shennong, a significant historical figure in ancient China) conducted manual taste tests of wild plants and herbs and experimented firsthand to document effects on the body from consuming natural materials in various combinations. Over time, principal components of the TCM practice were developed as practitioners (a) acquired extensive knowledge and cumulative experience about the healing properties of various wild plant, animal, and mineral ingredients; (b) gained a deeper understanding of how the human body functions to maintain a balanced state of internal health (or 'equilibrium'); (c) how they react to various forms of treatment (under variable physical and environmental conditions); and (d) ways to adapt treatment approaches, or refine remedies in the pursuit to restore imbalances of energy ("Chi") from ill health conditions of the patient.[1]

Divergent streams of practice

Over time, the practice and application of TCM grew exponentially in popularity, and diversified both domestically within China, and internationally across neighbouring countries in South and East Asia. Today, the practice of TCM operates on various levels in China. There is a formalised, professional industry standard for accreditation and practise for TCM doctors with educational institutes and recognised publishers of the theory and knowledge of TCM. The less-formalised, daily usage of TCM is multifaceted, and has regional or community variants in traditional medicine practices. For the Chinese community, TCM has multiple applications – it is used in the production of medical products and tonics (akin to health supplements); different applied treatment approaches/procedures (e.g. acupuncture), and diet and nutrition.[2]

Over the years and through multiple proponents who keep the practice alive and evolving, TCM remains deeply integrated within Chinese society, and infused within lifestyle choices. The use of specific TCM products, mostly containing "exotic" wildlife

and herbs also symbolises cultural heritage, tradition and manifests in social interactions, for example through gifting.[3]

Presently, we find a wide range of individuals who practise or engage in TCM in China. These include doctors with formal institutional training in the medical field, some of whom practise integrated medicine with both Western medicine and TCM expertise. Community leaders and healers offer potentially more informal, yet experiential, training of applied folk and indigenous medicines. Practitioners and consumers may also inherit specific regional, institutional, social or psychographic, and inter-generational knowledge. This may impact their preferences and perceptions about effective TCM remedies, reputable or trusted processed products, and recommended procedures.

This diversity of consumption practices is reflected in the online and offline marketplaces, where consumers access TCM. Consumers can directly enquire about, access or purchase TCM materials or processed products (whether manufactured commercially or produced independently) from various suppliers/sellers. In the offline marketplace, these include licensed pharmacists with formal institutional training, commercial TCM traders/retailers, or even industrial producers (including from captive-breeding farms). It is worth noting that the managers or frontline staff of these operations may often only carry experiential or informal knowledge about TCM ailments and treatment effects, which may lead to misguided advice and TCM sales. The online marketplace includes popular and common e-commerce retailers[4] like Alibaba and Taobao, as well as online stores of established TCM shops. Finally, some forms of TCM may also be passed down across generations and exchanged between families and known networks.

The concept and approach to treatment via regulating health

Western medicine practices often follow a primarily reactive approach, applying fast-acting remedies to targeted/contracted areas of the body for the immediate treatment of symptoms or causes. In contrast, many TCM practices are rooted in the concept that the body functions as an interconnected and self-regulating system, and thus pursues holistic methods of treatment to regulate ill conditions in connecting areas of the body and manage or restore health.[5] As the method or manner of treatment is highly adaptive and customizable to accommodate for individual patient needs and conditions, TCM can be considered to follow a more preventive approach for long-term healthcare and maintenance. However it also

allows symptomatic treatment of acute illnesses, albeit relatively more slow-acting, to tackle the perceived root causes of ill or "imbalanced" conditions of health.

Tools of the trade and the challenge of finding alternatives

Both Western medicine and TCM practices may apply or prescribe medication for internal or external use. They may also perform procedures for treatment. However, TCM medication is based on compound remedies that often include natural plant, animal, and mineral ingredients. These compounds are designed to amplify specific healing properties aimed at treating, regulating, or improving imbalanced or ill health conditions.[6] Depending on the medical practitioners' expertise, personal experiences and preferences of the consumer, and medical supply/inventory, some doctors may prescribe "decoction medicines"[7] with customised ingredient formulas to patients (whether by type or dosage), to enhance treatment suitability and effects to a patient's body condition. The pharmaceutical/commercial industry also manufactures (a) off-the-counter (OTC) government-patented medicines, with standardised ingredient formulas that are relatively more commonplace and well-suited to the wider population, or (b) produce products based on novel formulas by historically-renowned medical practitioners or reputable brands (e.g. Tongrentang). Off-the-shelf products containing endangered wildlife, and thus restricted for sale or production (e.g. tiger bone wine), are still available for purchase by consumers in the marketplace, albeit being unlicensed, or banned from being issued with new licenses.

The transition from wildlife products to alternatives is thus required, but it also presents economic and practical challenges. This process is seen as inherently complex and time-consuming for both consumers and practitioners, as it would require a gradual process of trialling new alternatives and it would also require shifting norms away from the use of endangered wildlife products. This process could lead to significant resistance rooted in the cultural and holistic nature of TCM practices. Without the availability of viable and culturally acceptable alternatives, experts in our interviews warned that there is a risk that demand reduction efforts could be proven counterproductive as they could inadvertently reinforce the perceived benefits of wildlife products.

> *"Finding alternatives in TCM is complex, like a puzzle. Substitutes often do not fit neatly into traditional prescriptions. Unlike a one-to-one replacement, the TCM philosophy involves holistic approaches where*

cures do not rely on specific ingredients alone."
[TCM expert and academic]

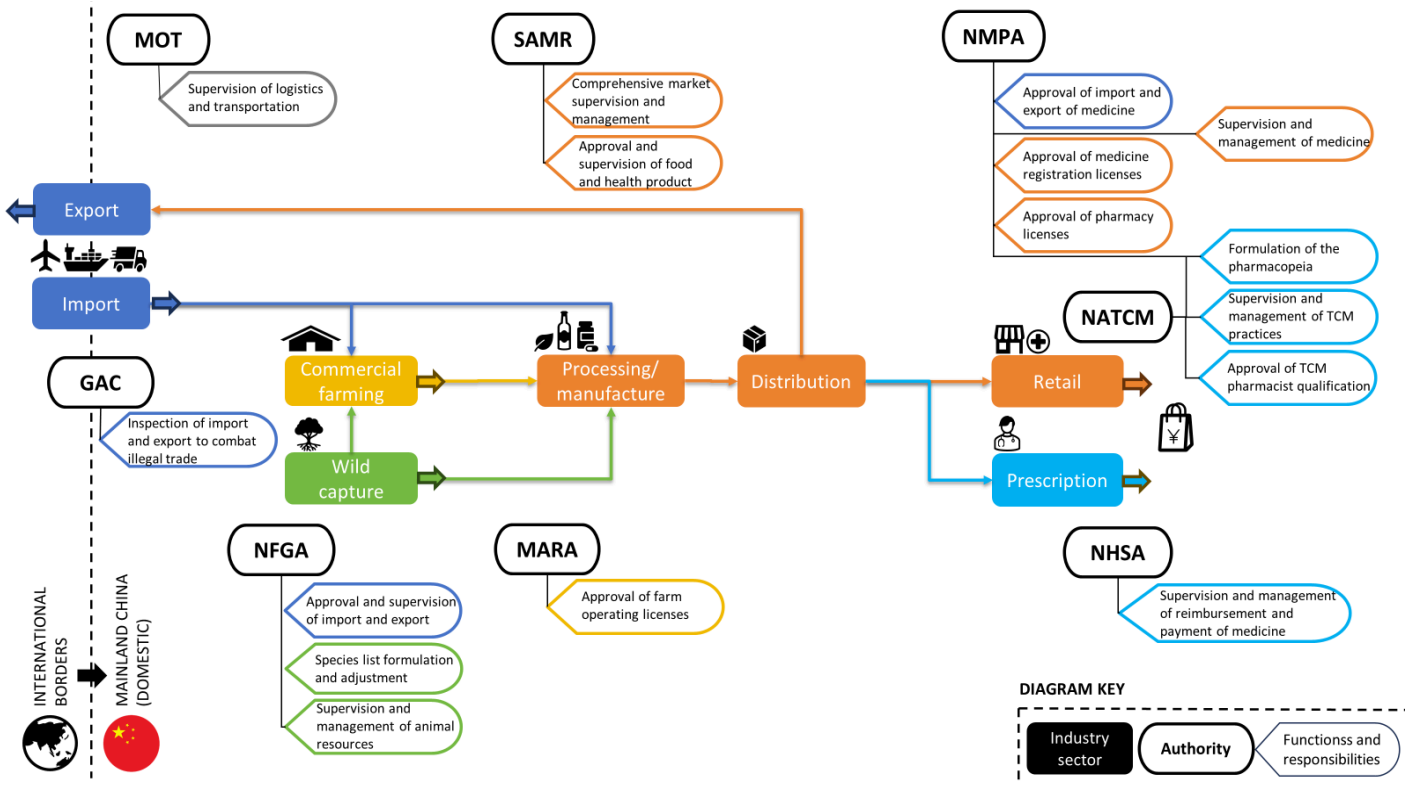
Despite these barriers, efforts to find and publish alternatives to wildlife-containing TCM have been active, such as the TAWAP (TCM Alternatives to Wild Animal Preparations) list created by a consortium of TCM academics and researchers globally.[8] The list provides a range of plant-based alternatives to the range of wildlife ingredients used in TCM as well as alternatives to patented wildlife-containing medicines. The list also enables easy understanding of the plant-based alternatives by providing symptom-specific information, for instance, the types of plants that can be used to substitute pangolin scales used to disperse blood stasis.

3.2. The domestic market and policy landscape

Multiple laws regulate the use of illegal wildlife in TCM and the trade of raw materials is overseen by different authorities

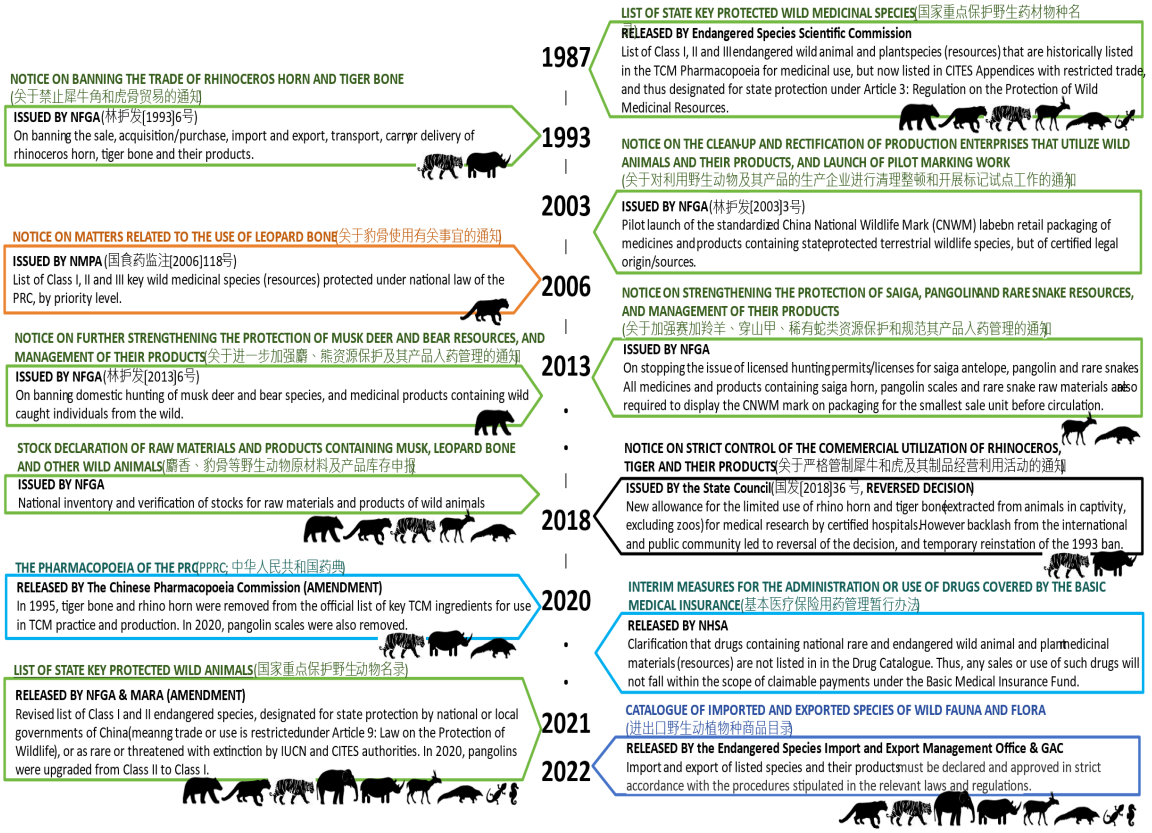
The extraction, production, import/export, and consumption of TCM raw materials, medicinal products and tonics are managed by different authorities per stage of the supply chain in mainland China (see Figure 1[9]). Within this space, a range of government policies cover the management or restriction of trade, production, and transport of medicinal products containing endangered wild animals. These policies have been continuously amended over the years to reflect decisions by international regulatory authorities (e.g. CITES on trade, IUCN on wild population statuses of species; see Figure 2). The figure below reveals a complex and multi-tiered supply chain for TCM in China, characterised by an integrated regulatory ecosystem and cross-sector interaction among various governmental bodies.

Figure 1: Map of the supply chain relevant to TCM material extraction, production, trade and retail/prescription, including relevant government authorities or regulatory bodies and their key roles



***MOT** - *Ministry of Transport*
***SAMR** - *State Administration for Market Regulation*
***NMPA** - *National Medical Products Administration*
***NATCM** - *National Administration of Traditional Chinese Medicine*
***NHSA** - *National Healthcare Security Administration*
***GAC** - *General Administration of Customs*
***NFGA** - *National Forestry and Grassland Administration*
***MARA** - *Ministry of Agriculture and Rural Affairs*

Figure 2: Key policies and decisions relevant to illegal wildlife trade in China



At present, all sale, purchase, and use of nationally protected species threatened with extinction (classified under Article 3: Wildlife Protection Law of the People's Republic of China, and by the National Forestry and Grassland Administration, NFGA), i.e. Class I and II wild animal species is banned, with the exception of special purposes including approved scientific research, captive breeding, exhibition, conservation of cultural heritage or others (see Appendix 4 for Class levels and forms of use). As such, certain Class II protected species such as Asiatic bears are state-approved for the extraction of bear bile from licensed captive-bred farms for medicinal purposes. This includes commercial production of patent medicines registered under the National Medicinal Products Association (NMPA), and statewide sale of licensed bear bile products that bear the NMPA registration number, as well as the China National Wildlife Mark issued by NFGA. These indicate

legal sourcing of classified nationally protected terrestrial wild animal species as an ingredient for this product.[10]

Wildlife trade regulations have also been integrated with broader health policies such as the exclusion of some species from the Basic Medical Insurance (BMI). Separate lists have been outlined that pertain to the banning or selective use of wild animals and plant species as material resources for the approved production of TCM medication. These lists also apply to their use by accredited doctors. The exclusion of these species is reflected in the industry through their removal from the official TCM pharmacopoeia, which accredited doctors use as a guide for TCM materials and their effects. However, there are still gaps between what is "allowed" and what is implemented, as removing species from the pharmacopeia does not necessarily mean that those species would not be used for medicine – for instance with pangolin scales. Though the regulations prohibit medical insurance from covering drugs for endangered animals, some drugs containing endangered animal ingredients still remain on the drug list of medical insurance. For instance, there is a national stockpile of pangolin scales, that can be accessed by accredited pharmaceutical companies for medicinal use.

Although bans for priority species such as tiger bone and rhino horn have been strictly enforced in the domestic market, regulatory loopholes remain and illegal consumption continues

Despite existing laws that prohibit the use of certain wildlife products in TCM, enforcement is often weak, and the complexity of overlapping jurisdictions hampers effective regulation. This results in both, the trade of illegal products and the continued use of endangered wildlife products as consumers and suppliers can easily find loopholes in the system, as expressed by a TCM doctor and academic in our interviews:

> *"Domestic law prohibits the use of some wildlife in TCM but people don't follow the law due to lack of enforcement and law education."*
> – [TCM doctor and academic]

Common Class I species derivatives that continue to be purchased due to these regulatory loopholes include: previously "formal" products which are now out-of-stock commercially (e.g. pre-ban tiger bone wine); informal self-produced products with illegal wildlife raw material and in a few cases, pre-existing material stock (e.g. tiger bone obtained from years before); or products that are

commercially-manufactured internationally (e.g. North Korean tiger bone wine). While the accessing channels to purchase these illegal products is challenging for pursuant consumers, it is not impossible. Consumers can find these in a variety of marketplaces, including offline markets, online e-commerce platforms, discussion forums and social media platforms, or independent private networks.

As Class II species such bear bile are approved for production, regulatory issues regarding products with missing or inaccurate certification labels are infused in the market, along with rarer raw material finds (e.g. whole horn, dried gallbladder) that may be available at market hotspots (e.g. provinces with prominent trade/farming industries) or via private networks and channels.

Additionally, our interviews suggested that the TCM industry itself is highly diverse, with a wide range of practitioners operating in various contexts. This diversity, particularly between high-end commercial practitioners and those in rural areas who face less scrutiny, complicates efforts to enforce standardised regulations.

To safeguard against the harmful effects of irresponsible wildlife trade, the UN Convention on International Trade in Endangered Species (CITES) provides a widely-accepted regulatory framework. Established in 1975, CITES has been embraced by 183 countries, reflecting a global commitment to conservation. The convention offers protection to over 38,700 species, including approximately 5,950 animal species and 32,800 plant species, helping to prevent their over-exploitation. CITES operates through a system of permits and certificates to regulate international trade in animals and plants – however, the definition of "illegal" in the context of wildlife trade can be complex and adaptable. This variability leads to different laws being created and enforced by individual countries. While CITES operates on a global scale to regulate wildlife trade, the legality of activities is not universally consistent. As a result, a product may be legally traded within certain countries but prohibited across international borders.[11]

3.3. Demand reduction: A behavioural problem

TCM is a deep-rooted cultural tradition within Chinese society, and demand reduction campaigns need to acknowledge and address this

The demand for illegal wildlife products in Traditional Chinese Medicine (TCM) is a multifaceted, **behavioural phenomena deeply rooted in generations-old cultural and social practices**, making demand reduction efforts particularly challenging.

Traditional beliefs in the curative properties of wildlife products like rhino horn, tiger bone, and pangolin scales are not simply health-related decisions but are also intertwined with cultural identity, social status, and deeply held values about the relevance of TCM. As a result, changing these behaviours requires more than just legal enforcement; it necessitates a comprehensive understanding of the underlying psychological, social and politico-legal drivers to consumption, and shaping demand reduction efforts in a culturally conscious manner. Our interviews also suggested that any messaging aimed at reducing demand for wildlife products must be carefully crafted to avoid backlash. Experts suggested that using positive messaging is essential in this context, as criticism of TCM can be easily misinterpreted and become counterproductive. An academic expert we interviewed warned against broad-rush criticisms of TCM practitioners' positions as practitioners:

> *"TCM practitioners' positions need to be respected rather than being pressured to change simply because a species is endangered or its trade is illegal."*
> – [Academic expert]

Demand-side consumption is a behaviour that happens within a context – and so requires an understanding of the complex interplay of all stakeholders in the industry

The TCM industry involves multiple stakeholders – consumers, TCM practitioners, suppliers and manufacturers, and even policymakers.

Experts also noted that there is a **general lack of preparedness** among stakeholders, including both practitioners and consumers, for a **transition away from wildlife products**. Alternatives to these generations-old medicines and formulations are not well-received by all members of the community, as expressed by an academic TCM expert we interviewed:

> *"Efforts [for demand reduction] are hampered by ignorance of different cultures, ideologies, and scientific systems. The TCM community operates within a different framework, making it difficult for them to engage with campaign organisers. While the logic of wildlife conservation makes sense to conservationists, it doesn't necessarily resonate within other communities."*
> – [TCM Expert]

Consumers often purchase these products based on long-standing cultural practices and the belief that these substances are more effective than alternatives. Experts noted that **consumers often lack specific knowledge about the ingredients in TCM** products and are influenced by cultural beliefs, advertisements, and misinformation. This contributes to the ongoing demand for wildlife products within TCM.

> *"Consumers are misled by commercials and believe using respective ingredients can improve the health of different parts of the body (bone will help bone)."*
> – [Academic expert]

Traditional medicine practitioners play a crucial role as they are often trusted and respected sources for health/medical advice, whom patients primarily rely on, and can either reinforce or challenge the use of endangered species. However, **practitioners themselves are divided on the use of wildlife products** – a TCM doctor and academic we interviewed expressed that younger generations are more open to alternatives:

> *"Most practitioners agree with not using wildlife, especially younger generations, but some more senior doctors believe they work well."*
> [NGO expert]

The expert also expressed their concern with this emphasised role of TCM practitioners:

> *"Consumers do not actively create demand. Practitioners provide them with specific products and services."* [NGO expert]

The quote above also indicates that strategies for **reduced consumption of illegal wildlife must look beyond the consumer**. Supply-level factors involving the influence of practitioners, manufacturers, and even law-enforcement and policy officers are critical to reducing IWT. Multiple experts echoed this perspective in our interviews, stating that efforts to reduce the supply of illegal wildlife is an effective approach, potentially perceived as more effective by some practitioners, which can also tackle demands from those who seek specific IWT products:

> *"For consumers who actively search for a specific product at risk of breaking the law, a demand reduction campaign would not work.*

Reducing supply is a better approach."
[NGO expert]

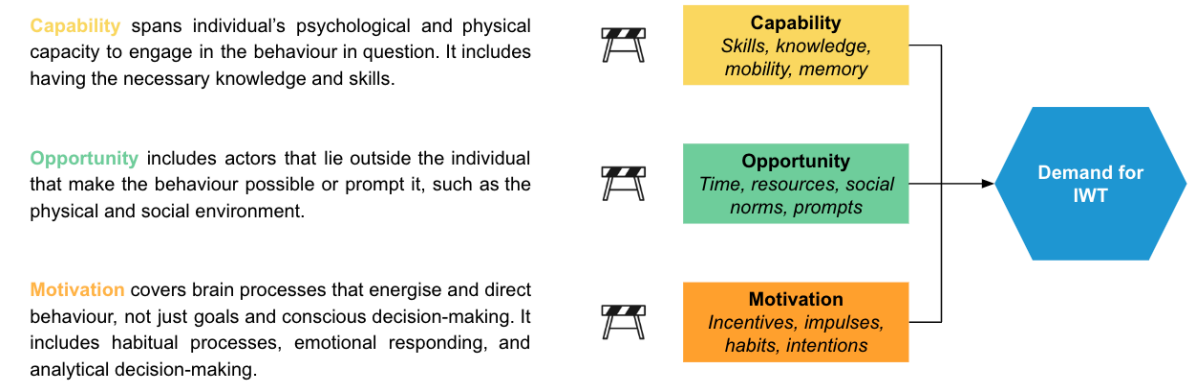
Suppliers, including those involved in illegal trade, can exploit these cultural beliefs for profit, often using sophisticated methods to conceal their activities. **Policymakers and conservation** organisations therefore need to navigate these varied socio-cultural sensitivities while implementing laws and creating demand reduction campaigns that resonate with the public.

Relevant behavioural frameworks can be used to understand human behaviour and develop a wider range of campaign and intervention strategies - but to date this has not happened often.

Demand reduction campaigns can be described as "outreach interventions aimed at encouraging individuals to voluntarily modify their current or potential behaviour as consumers of wildlife products or their derivatives."[12]

Established behavioural frameworks can be used to understand human behaviour, and typically articulate the drivers of behaviour which, in their absence, can also be seen as barriers. The **COM-B model** is one such framework, which posits that behaviour requires sufficient Capability, Opportunity and Motivation (a detailed explanation of the factors can be found in Figure 3). Behaviour change may require addressing all, or some of these categories. The COM-B model is a diagnostic tool that can be used at multiple stages of research – for instance, we use it in later sections to categorise insights from demand reduction campaigns (Section 4.2), but also recommend using the model as a framework to subsequently analyse the barriers and enablers that can be targetted for solution development (Section 5.1). This framework is suitable both for analysing behaviours we wish to *encourage* (e.g. how can we increase consumers' capability, opportunity or motivation to seek substitute products not containing endangered wildlife) or behaviours we wish to *discourage* (e.g. how might we reduce consumers' capability, opportunity or motivation to consume illegal wildlife products).

Figure 3. The COM-B Model



The field of wildlife conservation is beginning to adopt modern behavioural science methodologies,[13] in particular to characterise the motivations and attitudes which drive the consumption of wildlife products.[14] However, this practice is still nascent compared to some fields such as consumer finance, international development, and public health, and there are only a few instances in which the conservation sector takes the next step: using these insights to develop truly evidence-based, innovative and impactful behaviour change interventions.

One consequence of this is a very narrow understanding of behaviour and its drivers, reflected in our assessment of the literature later in this report. Specifically, many conservationists have tended to develop campaigns that rely on educational, advertising, and marketing initiatives,[15] which raise awareness or seek to elicit pro-wildlife attitudes. This approach rests on the assumption that consumers will intentionally change their behaviour upon realising the impacts of their actions on species. This approach rarely seems to be rooted in a formal or sophisticated behavioural analysis, but based instead on an intuitive yet naive mental model of human behaviour: one which assumes people's actions on wildlife will be driven primarily by their knowledge and attitudes about said wildlife. While this approach can, in theory, lead to an impact, it does overlook many other (often stronger) drivers of behaviour. These include contextual factors (e.g. relating to ease of access, recommendations from practitioners, and incentives), other motivations (e.g. health concerns or beliefs about enforcement), and unconscious drivers of our behaviour (such as habit, and the role of social norms).[16] Interventions leveraging these drivers may still use communications but with different messaging, but may alternatively require different 'levers' of influence, for example the creation of

incentives, or the use of nudges which alter the 'choice environment' (physical, digital, social) within which consumption decisions are being made. As such, we recognise that the limited approach within most conservation campaigns is not just down to a narrow understanding of human behaviour, but also a kind of 'permission bias' - doing what is possible with the range of levers typically within reach of most conservation NGOs.

Theories of Change can help practitioners develop evidence-based interventions with valid mechanisms of impact

Using **Theories of Change (TOCs)** to design interventions is an effective way to ensure campaigns are underpinned by valid behaviour change mechanisms. TOCs outline the sequential steps and mechanisms through which interventions are expected to achieve their desired outcomes. They are used to develop behavioural science interventions that account for the nuanced (and often indirect) relationship between attitudes, values and behaviours, the wider range of influencing factors (norms, incentives, defaults, choice architecture), and the importance of particular actors within complex systems[17]. Note that we do not refer here to simple Logic Models which highlight a campaign's inputs, activities, outcomes etc. Rather, we emphasise the importance of understanding causal mechanisms between an intervention and the intended behavioural change, and basing these on sound behavioural theory and evidence, rather than intuition alone. For example, 'raised awareness will lead to changed behaviour' is a commonly employed but generally inadequate assumption. Such claims would require significant supporting arguments, given the great volume of research revealing the gap between knowledge, attitudes and behaviour. As such, in order to approach this exercise with greater rigour (which typically requires less wishful thinking, more empiricism, and greater scepticism about a campaign's ability to significantly impact behaviour) it is often useful to integrate evidenced behavioural theory into TOCs. Established behavioural models, such as COM-B shown above, can offer a good starting point around which to structure a 'behavioural' TOC.

It is also important to consider not only why and through what mechanisms your intervention can lead to changed behaviour (a one-sided and confirmatory exercise), but also to consider why it may *not*. For example, it may well be true to point out that increasing consumer knowledge of pangolins' endangerment is a plausible mechanism that could, in theory, change behaviour. But it is equally valid to point out that generations of tradition, social norms, gifting practices, and strong health-related beliefs

and motivations still exist and continue to drive consumption. Moreover, the latter drivers are strong, whereas concern for wildlife may be relatively weak. If these pathways to continued consumption still exist, how can we use our TOC to identify and articulate other touchpoints and intervention elements to address them?

Theories of Change can therefore help to identify the (previously hidden) assumptions about human behaviour, as well as narrow, confirmatory and often wishful thinking about an intervention's pathway to impact. For example, literature indicates that even when interventions do change attitudes or intentions, we should not assume significant changes in behaviour.[18] We therefore need a better understanding of all the factors driving and enabling behaviours, both conscious and unconscious, individual, social, economic and contextual. This includes attitudes, beliefs, habits, financial incentives, social norms, interactions with doctors, the legal context, the 'choice environment' which determines the availability and ease of access, and other factors.[19]

Guidance for much of this already exists

CITES' provides guidance on demand reduction strategies[20] emphasising the importance of well-targeted, behaviour change-focused demand reduction strategies over general awareness campaigns to effectively address the demand for illegally sourced wildlife products. While acknowledging the value of both approaches, CITES considers behaviour change as more crucial for reducing illegal wildlife trade. They provide 10 benchmarks for behaviour change in demand reduction (see Figure 4 below), and encourage organisations to progressively work towards meeting these criteria through their demand reduction efforts, with the understanding that even partial adherence can lead to meaningful change. Other guidance from the wider behavioural science community is also plentiful, for example BIT's own 'Behaviour Change for Nature', and established frameworks for project delivery (TESTS) and intervention design (EAST).

Figure 4. CITES benchmarks for behaviour change in demand reduction

No.	Benchmarks for Behaviour Change in Demand Reduction	Starting to deliver behaviour change	'Fair' behaviour change approach	'Good' behaviour change approach	'Strong' behaviour change approach	'Excellent' behaviour change approach
		0-4 benchmarks	5 benchmarks	6-7 benchmarks	8-9 benchmarks	10 benchmarks
1	**Insight led and evidence-based**, including pre-testing approaches and experimental design where feasible					✓
2	**Targeted**: • To buyer desires /motivations • To a high-priority audience • To change a specific behaviour • To benefit a specific species • To the right time in the behavioural journey					✓
3	**Informed by up-to-date and culturally appropriate behavioural theories**, frameworks, and models of change, that relate to a specific country / audience / taxa					✓
4	**Aims to change what people do**, not just what they know or feel – goes beyond awareness raising, to change attitude and actions					✓
5	**Led from 'within' the communities being targeted** to ensure a bottom-up approach that is culturally appropriate and sensitive					✓
6	Embeds messaging in existing popular messaging (e.g. being a good citizen)/ uses a **creative approach**					✓
7	**Engages multiple-stakeholders**, and *persuasive* - not just 'popular' – messengers and mechanisms of change					✓
8	Considers the **benefits of, and barriers to, adoption of desired behaviour** and designs the initiative accordingly					✓
9	**Repeats & reminds** the target audience of the behavioural goal; recognises and rewards progress; refines the message over time					✓
10	**Robust evaluation of impact**, and process to share success factors, lessons learned and adaptive management treatments	✓	✓	✓	✓	✓

4. Insights from demand reduction efforts for endangered wildlife products (2004-2024)

The findings from the literature review and interviews highlight a multilayered approach to addressing illegal wildlife trade (IWT) in the context of Traditional Chinese Medicine (TCM). Insights from existing demand reduction campaigns and efforts are summarised in this section, according to the following categories:

1. **Campaign characteristics:** Relevance, regions and species, target audience, modes of delivery, messengers used
2. **Behavioural insights used:** COM-B model and the EAST framework
3. **Empirical strength of campaigns:** Impact evaluation conducted, types of interventions, levels of impact and findings, adaptive management

4.1. Campaign characteristics

Most of the campaigns were delivered by NGOs, with a few delivered by academic institutes, the government, and others

Our data highlighted that non-governmental organisations (NGOs) were the primary leaders in demand reduction efforts, as 72% of the campaigns were run by these organisations (see Table 2 below). This dominant representation indicates that NGOs are pivotal in driving initiatives to reduce demand, likely due to their flexibility, outreach capabilities, and focus on specific social issues.

Academia-run campaigns were somewhat common as well, accounting for 13% of the organisations. Government entities are similarly engaged, making up 12% of the organisations that ran demand reduction efforts. TCM organisations constituted 8% of the leading organisations, a low number considering their relevance in demand reduction. Their involvement is particularly relevant in contexts where traditional practices influence demand for certain products or behaviours, making their role essential in culturally sensitive campaigns.

Campaigns run by enforcement agencies and e-commerce platforms each represented 1% of the total. This highlights the need to bring in regulatory

enforcement and the influence of digital platforms in curbing demand, particularly in the digital age where online markets can rapidly facilitate the sale of endangered species. Strong regulation, combined with the power of digital platforms to monitor, restrict, and raise awareness, can reduce illicit trade and consumption.

Table 2. Types of campaigns according to the organisations delivering them

Campaign type	N	%
NGO campaigns	67	72%
Academia campaigns	12	13%
Government campaigns	11	12%
TCM organisations' campaigns	8	8%
Enforcement campaigns	1	1%
E-commerce campaigns	1	1%

A large portion of the campaigns addressed the illegal wildlife trade (IWT) generally, but these often overlapped with TCM-specific campaigns as well

Overall we found slightly fewer TCM campaigns than IWT species campaigns (Table 3), the latter having a focus on illegal wildlife trade but no specification of TCM relevance or particular products.

The **TCM campaigns (45%)** implemented in China (mainland, Hong Kong), Vietnam, and to Chinese diasporas overseas (e.g. USA) included a mix of public campaigns, consumer campaigns, and practitioner awareness/education campaigns.

IWT campaigns (52%) with TCM product references were primarily: 1) public media/education campaigns aimed at providing information to the general public or consumer groups, and 2) policy/enforcement campaigns to government agencies and e-commerce/transport delivery platforms that may include the target product as a topical focus (e.g. training workshop for customs/online detection of transport or sales of products, e.g. pangolin scales/medicinal products).

Finally, **health-related campaigns (3%)** addressed links between wildlife product consumption and zoonotic disease transmission (risks), and were seen to coincide

with worldwide pandemics such as SARS and COVID-19, to raise awareness and educate about health and safety risks linked with the consumption of wildlife products including those used in TCM (e.g. raw materials, tonics).

Table 3. Campaign categories

Campaign type	N	%
IWT	48	52%
TCM	42	45%
Public health	3	3%

Most campaigns focused on China, followed by Vietnam

The majority of the campaigns (62%) were concentrated in China, the primary market for TCM and a significant player and contributor in the global wildlife trade.[21] Vietnam, another key market, was the focus of 27% of the campaigns, reflecting its important role in the trade of wildlife products. We also identified efforts with a global reach (6.5%), as well as targeted campaigns in regions such as the USA, Singapore, Hong Kong SAR, Russia, and Taiwan Province, indicating a broader international strategy (see details in Appendix 3).

Many campaigns were not species specific

The campaigns identified primarily focused on a broad **range of wildlife species**, with 40% of the efforts directed at all wildlife species collectively. Specific products such as pangolin scales, bear bile, rhino horn, and tiger bone received attention, reflecting their prominence in TCM and the urgency of their conservation needs. Lesser but notable focus was also given to saiga horn, leopard bone, big cats, seahorse, plants, and elephant skin (Table 4).

Table 4. Target species in the campaigns included in the literature review

Type	N	%
All wildlife species	37	40%
Pangolin scale	13	14%
Bear bile	12	13%
Rhino horn	11	12%
Tiger bone	9	8%
Saiga horn	6	6.50%
Leopard bone	3	3.20%
Big cats	2	2.10%
Illegal wildlife species	1	1%
Seahorse	1	1%
Plants	1	1%
Elephant skin	1	1%

Relatively few campaigns are targeted and tailored to specific audiences - most are general public awareness campaigns

Though this is not an absolute defining characteristic of 'behaviour change campaigns', one common approach that differentiates them from general public awareness campaigns lies in the focus on identifying a specific, high-priority **target audience**, engaging in a specific behaviour in a specific context. This is not to suggest that broad awareness campaigns cannot use behavioural science (e.g. leveraging social norms or stronger messengers within messaging). However, specific consumption behaviours tend to be rooted in population- and product-specific attitudes and beliefs, and influenced by context-specific choice architecture and social environments. This means effective interventions necessarily become more tailored to these particular drivers and barriers of a particular behaviour within a particular context. In contrast, general awareness campaigns typically rely on mass media to disseminate information—such as legal guidelines or the risks of species extinction—to the broader public.[22]

Our literature review indicated that a significant portion of campaigns (43%) were indeed aimed at the **general public** (Table 5), reflecting a broad outreach strategy instead of targeted behaviour change. Identifying the right audience to target for

demand reduction initiatives requires a level of insight to establish audience segmentation - a process through which a high-priority target audience is identified. Amongst the campaigns we studied, target audiences were segmented depending on the levels of influence desired. Subgroups such as commuters and tourists were targeted through broader campaigns in public places, and specific socio-cultural groups such as Buddhists, runners, or women's communities were targeted through specific campaigns within relevant contexts. For instance, the '*Be Their Bodhisattva*'[23] campaign was rolled out Vietnam[24] (see Figure 5) to educate Buddhists on the devastating impact of the illegal wildlife trade and the importance of elephants, rhinos and pangolins.

Figure 5. Anti-wildlife trafficking statues at a Buddhist pagoda in Ho Chi Minh, Vietnam, as part of the '*Be Their Bodhisattva*' campaign

Various **TCM stakeholders** form an important subgroup to target for demand and supply reduction efforts, however these groups were the focus of only 20% of the campaigns reviewed. Experts in the interviews emphasised that TCM doctors are key in this context, as the patients rely on them for prescriptions and tend to place trust in their knowledge:

> *"TCM doctor is the decision maker. When patients visit TCM doctors, they typically do not request specific ingredients because they do not know what they need. Instead, they rely on the doctor's expertise to diagnose*

their condition and prescribe the appropriate treatment. Doctors also take price into consideration and generally avoid prescribing more expensive options due to concerns about affordability for the majority of their patients." – [Academic expert]

TCM manufacturers, procurers, distributors; **enforcement authorities**; and **medical authorities** are key groups to influence and regulate the supply of illegal wildlife products for TCM – however very few of the campaigns we studied involved these groups. Recent research and our interviews suggest that TCM practitioners are becoming increasingly open to suggesting alternatives to wildlife-containing medicines. Furthermore, 12% of the campaigns targeted industry and business sectors, including e-commerce and couriers.

Student-focussed educational and awareness campaigns were also common – although only 12% of the campaigns were solely for school or university students, a majority of the campaigns included educational elements for the public. The overarching theory of change for such campaigns was: If students are aware of the dangers, risks and cruelties associated with wildlife used in TCM early-on in their lives, they will not purchase wildlife-containing TCM products in the future. The Rhino Horn Demand Reduction campaign in Vietnam[25] is one such example of a primary school intervention, wherein a widely-received book and television animation for school children was prepared, titled "I'm a Little Rhino" to sensitise children so that they don't consume rhino horn and related products in the future.

A prominent theme that emerged from the interviews too, was the emphasis on targeted campaigns designed to influence specific behaviours within well-defined groups, such as TCM practitioners, consumers, or industry stakeholders. Interviewees consistently highlighted that campaigns aimed at broad, general audiences might not be as effective as those tailored to specific demographic, psychographic, or sociographic profiles. An NGO expert emphasised the value of campaigns that target and re-shape one's socio-cultural identity:

"If they are no longer driven by these [demographic, psychographic, or sociographic] factors they will not consume wildlife products. One example is of the "face" series video on Tiktok - A middle-aged male buys tiger bone wine to gain face, but ends up losing face."

Table 5. Target populations in campaigns

Population type	N	%
General public	40	43%
Specific subgroups	16	17%
Buddhists, runners	4	
Tourists	2	
Women (new mothers, middle-aged women, women's associatoins)	4	
Civil society	2	
People with illnesses	3	
Those who perform abnormal online searches	1	
TCM Stakeholders	19	20%
TCM practitioners/doctors	11	
Experts, businesses, scholars	8	
Industry and businesses	11	12%
Industry (tourism, e-commerce, couriers, gaming)	7	
Consumers (pharmacy, e-commerce, gaming)	4	
Students (school/university)	11	12%
Enforcement officials (customs, police)	8	9%
Medical community	2	2%
Clinical doctors	1	
Pharma companies	1	

Most campaigns were delivered offline, including through mainstream media channels, exhibitions and workshops

In terms of **delivery methods**, offline strategies dominate, accounting for 73% of the campaigns (Table 6). These offline efforts include events such as workshops, conferences, and exhibitions, as well as visual displays and printed materials. An NGO policy expert we interviewed commented on the merit of offline events and meetings to convey the need for demand reduction among enforcement officials:

> *"In person meetings are really important. People would tell you things face to face that they would never tell you over the phone or in an email."*
> – [Policy expert]

These methods are complemented by marketing strategies like package label ads, aimed at raising awareness and influencing consumer behaviour at the point of purchase. Online campaigns, although less prevalent, are still widespread, comprising 40% of the campaigns reviewed. They leverage social media, online platforms, and educational content to reach audiences, especially through digital advertisements and dedicated informational and networking websites.

Notably absent were TV ads. Only state-sponsored campaigns (which are themselves rare) were likely to be on television, with one example, of the Rhino Horn Demand Reduction campaign in Vietnam[26] being an official campaign by the Vietnam CITES Management Authority, run on Vietnamese state TV.

Table 6. Prevalent modes of campaign delivery

Mode of delivery	N
Offline	**68 (73%)**
Events and workshops (conferences, tours, symposiums, talks)	
Visual displays and exhibitions (exhibitions, sculptures, stickers, advertisements, posters)	
Competitions and contests	
Printed material and publications (books, animations, handbooks)	
Marketing and advertisements (package label ads)	
Online	**37 (40%)**
Social media and online platform content (Social media, Documentary/film, Weibo post, Posters/articles - WeChat, Webpage, Support platform, Toolkit PSA)	
Educational and informational content (Workshop, live public discussion session, Training/Curriculum, Blog, Guide, Handbook)	
Marketing and advertising (Advertisements (Facebook, Google, Outbrain; Pop-up messages)	
Websites and webpages	

Celebrities were the most common messengers employed, though a greater number of campaigns had no particular messenger at all. The use of doctors, law enforcement and other key influencers was rare.

The role of messengers or **key opinion leaders (KOLs)** is also critical in demand reduction campaigns, as messages from well-known and well-respected individuals can be perceived as more credible and trustworthy, and thus, are more likely to be engaged with.[27] Within our literature review, we found that a significant number of campaigns (46%) do not specify particular messengers, implying a general outreach approach (as Table 7 shows). Among those campaigns that did use messengers, celebrities were the most common, leveraged in 26% of the campaigns. There is mixed evidence about the positive influence of celebrities[28] as even though they may increase initial or short-term engagement with campaigns, they may not necessarily facilitate recall and behaviour change. This was a view mirrored by multiple experts during the interviews too, who cautioned against using celebrities as the primary messengers as they run the risk of negative perceptions by the public:

"Celebrities can attract attention, but the public's fragility and sensitivity to rumours in China make them a risky choice. Thus how we choose our messengers are crucial. Figures such as policemen (or respected people of authority) may be more trustworthy."
– [Academic expert]

Campaigns that employed TCM practitioners, business leaders, doctors, and law enforcement officers as messengers were not common – even though each of these stakeholders play an important role in shaping the integrity and impact of campaigns.

Table 7. Key messengers used

Messenger type	**N**	%
N/A	46	50%
Celebrities	26	26%
TCM doctors/practitioners	4	4%
Business/industry	3	3%
Doctors	3	3%
Law enforcement officers	3	3%
School children/students	3	3%
Conservation leaders/experts	2	2%
Intellectuals/scholars	2	2%
Government officials	2	2%
Women's groups	2	2%
Charities	1	1%
TV channels	1	1%
Pharmacies	1	1%
School leaders	1	1%

4.2. Behavioural insights used

Awareness-raising was by far the most common approach to influencing behaviour, and more specifically, awareness of wildlife exploitation or endangerment.

We used the **COM-B Model** (as detailed in section 2.4) to categorise the barriers and enablers to demand reductions that were apparent in the campaigns reviewed. Here it is important to note that most campaigns did not specify the explicit study and use of these influences on behaviours – they were inferred through our own analysis. In the absence of evidence to the contrary, either from our literature review or from the expert interviews, our understanding is that most campaigns were designed not with a formal or sophisticated model of behaviour change in mind, but rather through a merely intuitive focus on factors such as knowledge, awareness, and attitudes towards wildlife. Table 8 below highlights the key barriers and enablers to demand reduction we identified in our literature review.

Table 8. COM-B factors identified across campaigns

Barriers to demand reduction		
Influence	**N**	**%**
Capability	**19**	**20.50%**
Lack of awareness about exploitative practices and market information	8	
Lack of awareness about alternatives to TCM	6	
Low understanding of the negative impacts of TCM	2	
Low awareness and knowledge about laws, risks	2	
Misinformation	1	
Lack of knowledge and skills among local organisations	1	
Opportunity	**8**	**9%**
Lack of adequate legal information	2	
Positive social norms for TCM products	1	
Increasing wildlife trafficking practices	1	
Insufficient funding and resources for organisations	1	
Low community engagement	1	
Lack of incentives to use and research alternatives	1	
Lack of government collaborations	1	

Motivation	**2**	**2%**
Concern about reputation/social image	2	
Enablers to demand reduction		
Capability	**69**	**74%**
Increasing public awareness about TCM practices, risks, legal consequences, methods and alternatives	63	
Training and capability building	3	
Improved legal knowledge and identification capability	2	
Correcting false information	1	
Opportunity	**33**	**35.50%**
Expanding the reach of information	12	
Social influence (modelling and social norms) against IWT consumption	8	
Reducing consumer access to illegal wildlife-containing TCM products	4	
Reminders through advertisements	3	
Creating enabling forums (online platforms, social forums)	2	
Increasing consumer access to information and data about IWT consumption	2	
Information about alternatives to TCM products	1	
Offering financial support to NGOs through targeted grants/facilitating access to resources	1	
Motivation	**29**	**31%**
Reducing intent to consume IWT products	13	
Emotional engagement with the process of IWT for TCM (sympathy for animals)	6	
Commitments (public pledges)	4	
Fear of persecution	3	
Reinforcement through rewards	3	

A COM-B analysis of the targeted influences on demand reduction behaviours through our literature review revealed two key insights:

First, a **great majority of the campaigns focussed on the positive drivers (enablers) of demand reduction, such as increased awareness of wildlife endangerment.** It was rare that a campaign considered the three other sides of this 4-sided issue:

1. Enablers of demand-reduction behaviour (which we want to amplify)
2. Enablers of wildlife consumption behaviour (which we want to diminish)
3. Barriers to demand-reduction behaviour (which we want to overcome)
4. Barriers to wildlife consumption behaviour (which we want to amplify)

There is significant overlap between these four framings of the problem, and in many cases the distinction might be largely semantic. Nonetheless, **each has the potential to identify a unique approach to a campaign**. For example, (1) amplifying a positive enabler of demand reduction (e.g. increasing concern for wildlife) is a different perspective to (2) diminishing a current driver of wildlife consumption (e.g. de-normalising gifting of TCM), or (3) overcoming a barrier to demand reduction (e.g. addressing low trust in legal substitutes).

Overall, a third of the campaigns focussed on building the capability of the audience by increasing awareness about exploitative TCM practices and the risks involved. While this is not necessarily a negative trait, a balanced approach that addresses barriers and enablers holds merit.[29]

Second, the **predominant strategy across campaigns was increasing capability for** demand reduction through public awareness about TCM practices, risks, and alternatives. This underscores the importance placed on education and correcting misinformation in driving demand reduction. The Saiga Trade Market Monitoring, Outreach Campaign in Guangzhou, China[30] for example, developed a special exhibition at an art fair to deliver a strong message to visitors that illegal wildlife trade has driven many wildlife species towards extinction. The campaign also designed the brochure for the 16th Asian Games to include key information on CITES and avoiding Saiga-related products.

Other capability-focused enablers included training and capacity building and improving legal knowledge and identification capability, which aimed to equip individuals and organisations with the necessary skills and understanding to make

informed decisions while purchasing TCM. A related example is WCS China's training workshop for Shenzhen customs that aimed to educate officers about CITES and the identification of commonly traded animals (specifically, Saigas), to eventually improve market monitoring.[31]

We emphasise that this **dominating focus on capability-factors (particularly awareness) is simplistic on two counts**. Firstly, in assuming that knowledge or awareness are the dominant drivers of behaviour, generally. Secondly, in assuming that it is knowledge of wildlife endangerment and exploitation, specifically, that will best motivate consumers, as opposed to knowledge of illegality and criminal consequences, or knowledge of health benefits of alternative medicines, for instance.

Fewer campaigns focused on **opportunity-related** factors. A third of the campaigns were geared towards enhancing the opportunities for demand reduction given that low awareness and lack of adequate legal information were identified barriers. A number of campaigns worked to expand the audience's reach and access to information, and facilitate social influence by encouraging modelling of desired behaviours and highlighting and shaping social norms. Efforts that reduced consumer access to wildlife products were less common. For instance, the video game company, Huya, joined the Coalition to End Wildlife Trafficking Online (or, the "Coalition") (Figure 6) to crackdown on the spread of harmful online content about wildlife by using image and voice-recognition to flag and remove harmful content from the platform in real-time.[32]

Figure 6. A poster demonstrating *Huya*'s collaboration with the Coalition

Source: Press release

Finally, **motivational barriers** were rarely identified – a couple of campaigns targeted concerns related to social image and reputation, since consuming wildlife products can be considered a mark of social status among some elite populations.[33] Campaigns that leveraged the motivational drivers to demand reduction directly targeted consumer intent through tools like sympathy education and emotional engagement and sensitisation towards wildlife. An NGO expert we interviewed supported the idea of sympathy education especially amongst young people and children, to leverage their inherent sensitivity for animals early-on:

> *"While immediate results may not be apparent, working with young people and children is crucial. Many of them inherently have sympathy for animals, including bears."*
> – [NGO expert]

Public pledges were also used in some instances as commitment devices, and many of these were targeted at businesses and TCM communities. For instance, the internet medical treatment platform, Chunyu Doctor, was the first to sign the Wildlife-Friendly commitment with World Animal Protection Association, and pledged

to refuse recommending TCM containing endangered wildlife ingredients to customers, encourage customers to not purchase medicines with these products and also support humane alternatives.[34] While public pledges are known to be effective behaviour change tools, their effectiveness in the field of demand reduction for illegal wildlife is lesser-researched.[35] Our literature scan confirmed this prevailing lack of evaluation as campaigns promoting public commitments were not evaluated to assess if pledges translated to actual behaviour change.

While awareness-raising was the primary focus, many campaigns also used 'social' influence, including social norms and well-known messengers.

We used the **EAST** (Easy, Attractive, Social, Timely) **framework**[36] to assess the use and extent of behavioural insights for campaign design and delivery (summarised in Figure 7). Insights from the literature review are summarised in Table 9 below.

Figure 7. The EAST Framework

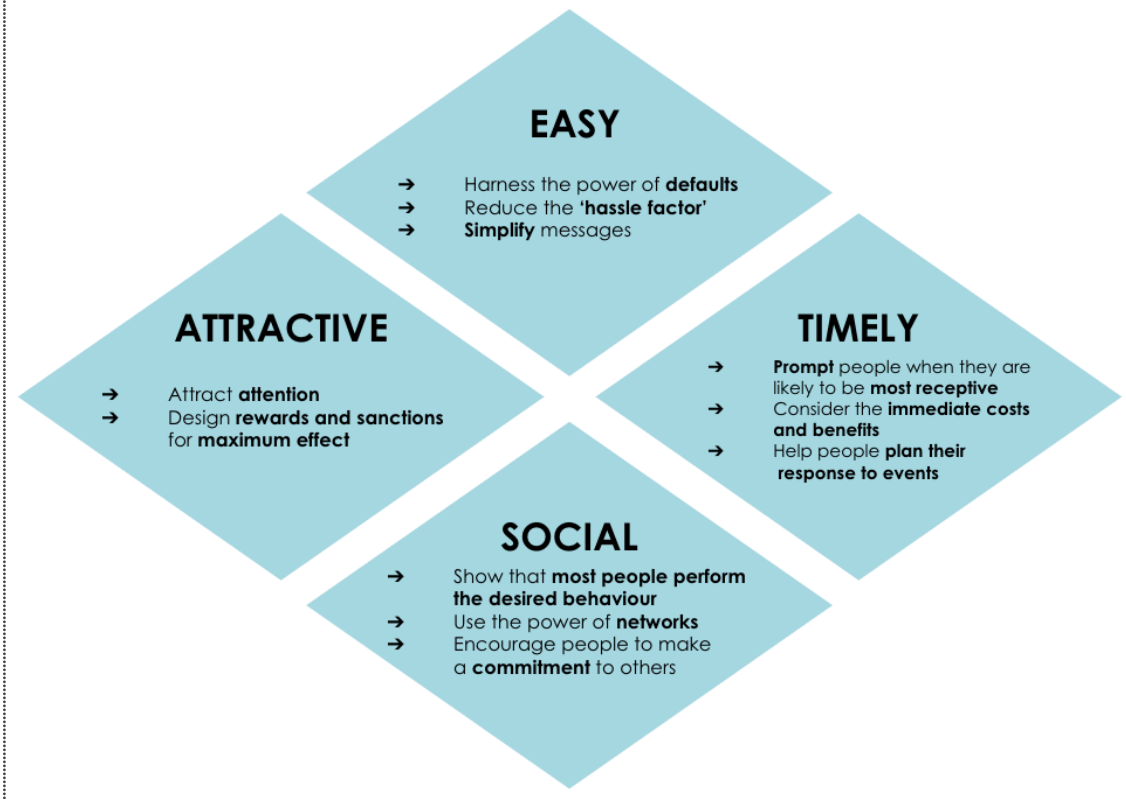


Table 9. The use of the EAST framework in identified campaigns

EAST Framework Categories							
Social (N=64; 69%)		**Attractive (N=44; 47%)**		**Timely (N=33; 35%)**		**Easy (N=12; 13%)**	
Type	**N**	**Type**	**N**	**Type**	**N**	**Type**	**N**
Social network	49	Graphics (posters, images, stickers, sculptures)	13	Response planning support	11	Reduce hassle factor	9
Modelling (messengers)	6	Videos/animations	11	Relevant events	13	Simplify message	3
Commitment (pledges)	4	PSA story	11	Eary school years	6		
Social norms	4	Exhibition	5	Pandemic-related	3		
Charity	1	E-design	2				
		Incentives	2				

The **Social** element was the most widely leveraged one across campaigns with 69% of the campaigns focusing on leveraging social networks, messengers, and social norms to drive behaviour change. This approach capitalised on peer influence and community-based changes. For instance, a study to test strategic advertising of online news[37] framed the use of saiga horn products as socially unacceptable among middle-aged Chinese Singaporean women, leveraging social norms and peer influence to provide models for what most others do in order to influence the target population. The use of celebrities is another prominent way by which campaigns made their messages more social.

Nearly half of the campaigns employed the **'Attractive'** component, making their messages more appealing through the use of graphics, videos, animations, and engaging storytelling. These strategies ensured that the messages captured attention and resonated with the audience.

Figure 8 below is a screenshot from a video made for the Guardians of the Wild campaign[38] to conserve pangolin species, which leveraged both, the social element through the use of multiple celebrity ambassadors, as well as the attractive element through an appealing story and engaging graphics/animations.

Figure 8. A screenshot from a celebrity-endorsed video for the Guardians of the Wild Campaign

Description: *The short film "Guardians of the Wild" revolves around the characteristics of 4 Asian pangolin species: the Sunda pangolin, the Philippine pangolin, the Chinese pangolin, and the Indian pangolin. The images of the 4 species are personified in the images of 4 superheroes, protecting the villagers from the invasion of millions of legions of ants and termites. To widely spread the message, the campaign is supported and represented by goodwill ambassadors: Top 5 Miss Universe 2018 H'Hen Nie, Actor Duy Khanh, Dancer Quang Dang, and MC-Journalist Trac Thuy Mieu. In addition, the film is voiced over by Actor Ngoc Trai.*

Timeliness was also an important factor, with 35% of the campaigns delivering messages at optimal times, such as during relevant events or by providing response planning support, increasing the likelihood that the messages would be effective. Multiple campaigns focussed on primary school children leveraged early learning years to drive future behaviour change. Events like the World Environment Day or World Tiger Day were also used by stakeholders to kickstart collaborations and announce commencements of conservation efforts, such as the "Love Big Cats" campaign[39] aimed at users who use the express delivery company services of Cainiao Network (Figure 9).

Figure 9. Campaign material from the collaboration between Cainiao Network, International Fund for Animal Welfare (IFAW) and the China Wildlife Conservation Association (CWCA)

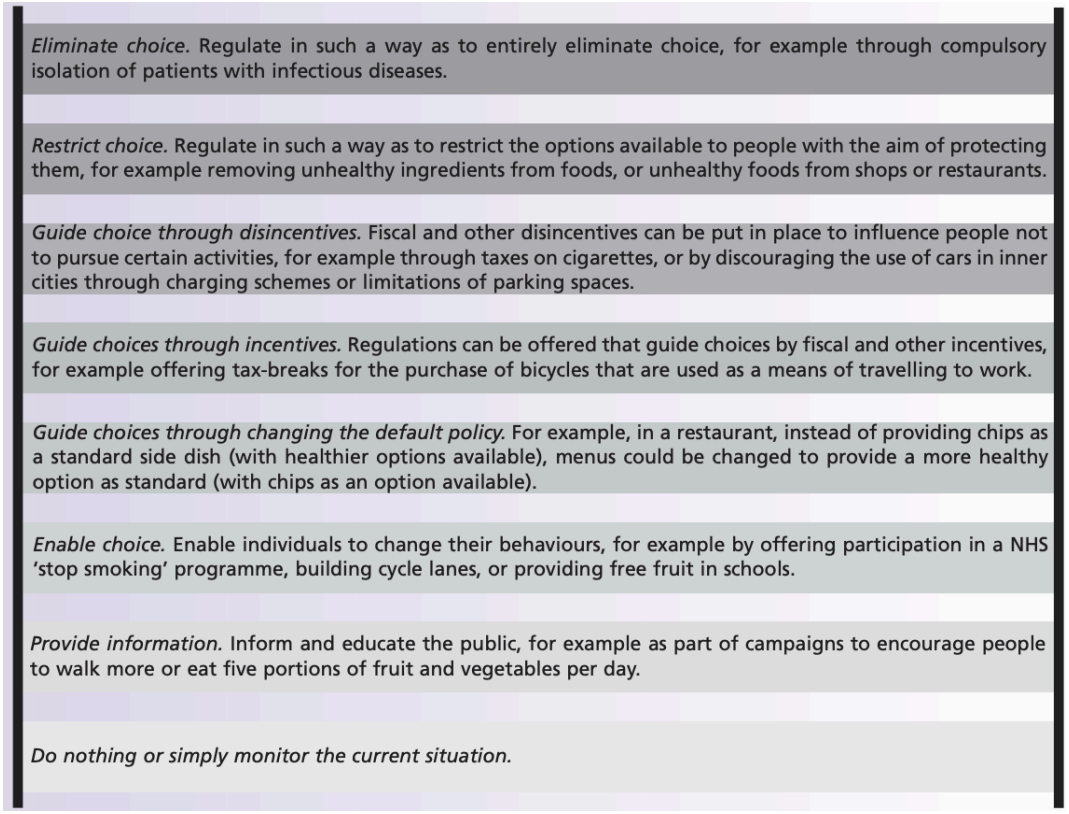
Description: *"On the occasion of Global Tiger Day, users who use the express delivery company services of Cainiao Network will have the opportunity to find big cat marks on the waybills and learn more about protecting big cats. The "Cainiao Personalized Waybill", Cainiao APP and Cainiao Mini Program will become a window to convey the concept of harmonious coexistence between humans and animals. 100 million express parcels carry "100 million protections", which is the promise of logistics companies and also an invitation - please join us in protecting big cats and our common home."*

However, the **'Easy'** element was the least utilised, with only 13% of the campaigns focusing on simplifying behaviour change by reducing hassle and clarifying messages. Campaigns aimed at enforcement officers often leveraged this element, for instance, through the development of an identification sheet for wildlife goods traded in southeast Asia by the ASEAN-Wildlife Enforcement Network (WEN) to help customs and enforcement officers.[40] This suggests there is potential to enhance the effectiveness of these campaigns by placing greater emphasis on making actions easier to adopt, reducing the hassle of engaging in demand reduction and ensuring timely identification and delivery.

A great majority of interventions relied simply on information provision. Very few used 'stronger' interventions such as enabling choices, incentives or disincentives.

We used the Intervention Ladder (Figure 10)[41] to categorise the depth of behaviour change efforts across campaigns. Used primarily for public health interventions, this model can be applied to conservation interventions too as it includes progressive steps from individual freedom and responsibility towards state intervention as one moves up the ladder.[42] While it is not necessarily a hierarchy of impactfulness, it is generally evidenced that intervention categories towards the top of the latter (which are by definition more restrictive or 'stronger') will usually have greater impact as they are more coercive in nature.

Figure 10. The Intervention Ladder



The literature review showed a **strong reliance on information dissemination as the primary method of intervention**. As Table 10 shows, a substantial 86% of the campaigns we reviewed focused on providing information to their target audiences. This approach typically involves raising awareness about the issues related to IWT and the associated risks to endangered species. While the provision of information is a critical first step in behaviour change, its effectiveness can be limited if not supported by more robust interventions that actively influence decision-making processes.

Table 10. Campaigns falling under different stages of the intervention ladder

Intervention type	N	%
Provide information	80	86%
Enable choice	8	9%
Guide choices through incentives	6	7%
Do nothing or simply monitor the current situation.	3	3%
Guide choices through changing the default policy	1	1%
Restrict choice	1	1%
Eliminate choice	-	-
Guide choice through disincentives	-	-

Beyond information provision, **only a handful of campaigns employed more coercive strategies to guide behaviour.** About 9% of the campaigns sought to enable choice by creating environments that facilitated demand reduction. Some ways by which campaigns sought to enable choice included providing legal messaging to consumers, establishing reporting and communication channels for IWT stakeholders and organising conferences and encouraging interaction between multiple TCM experts and stakeholders. A fitting example is of the iThink campaign[43] that formed a civil society network in China with like-minded organisations through an online global forum, and supported their campaigns and strengthened everyone's campaign messages through the iTHINK platform.

Furthermore, incentives can be powerful motivators for behaviour change, offering tangible rewards for making choices that align with conservation goals. However, campaigns were not fully leveraging the potential of this approach as incentives were not widely used (approximately 7%). Those used were social in nature (e.g. through pledges and commitments) instead of more tangible incentives like tax breaks or discounts on alternatives.

Interestingly, only 1% of the campaigns attempted to restrict choice, and none reported eliminating choice or using disincentives to guide behaviour. This suggests two trends: first, a general preference for approaches that focus on informing and influencing rather than restricting or punishing behaviour; and second, since the demand reduction sector is dominated by NGOs' efforts (as established above), this could mean a lack of adequate resources at their

disposal leading to efforts that are limited in scope. An NGO expert we interviewed expressed their experience with the latter trend:

> *"Our strategy in public awareness has faced challenges due to limited resources and a small organisational structure."* – [NGO expert]

The data highlights that while the campaigns have largely been strong in disseminating information and, to some extent, in enabling choices, they fall short in systematic and planned influence. The heavy reliance on information provision could limit the campaigns' effectiveness, particularly in the absence of strategies that engage more directly with the decision-making processes of the target audiences. While some of these campaigns could have high internal validity, they also have low external validity and may lack feasibility in practice, as the findings may not be applicable to other cases. The relatively low adoption of stronger behaviour change tools, such as incentives and default policy changes, further suggests an opportunity for more robust interventions.

4.3. Empirical strength of campaigns

Very few campaigns had any kind of impact evaluation, and those that did were low in rigour

Human behaviour is complex and often difficult to change, particularly when there are strong incumbent driving forces of culture, habits, social norms, and a large network of commercial incentives and professional practitioners perpetuating those behaviours. As such, we should never simply assume our campaigns are effective. Failing to evaluate campaigns with rigour means the sector cannot continually learn and adapt its approach, and important opportunities for impact will be overlooked.

As Table 11 shows, we found that **only 12% of the campaigns had a clear impact evaluation**, meaning that the vast majority (88%) either lacked an evaluation component altogether, or had an unclear evaluation status. Among the campaigns that did have an evaluative component, we suggest considering the empirical strength of campaigns based on two indicators – the **validity of outcome measures** (are they measuring observable behaviour change, or a close proxy of it?), and the **extent of causal inferences that can**

be drawn (e.g. with how much confidence can it be said that the campaign message led to demand reduction?).

Table 11. Types of reported findings and impact across campaigns

Reported findings/impact	N	%
N/A	**52**	**56%**
Interaction	**28**	**30%**
Self-reported reduced intent	10	
Participation in events, campaigns	9	
Engagement (offline, social media, support)	6	
Increased awareness	2	
Self-reported reduced social acceptability	1	
Reach	**20**	**22%**
Spread	14	
Views	2	
Impact	1	
Training	1	
Visitors	1	
Media coverage	1	
Behaviour change	**6**	**7%**
Observed or validated behaviour change	0	
Self-reported demand reduction	3	
Reduced C, O, M to consume	1	
Community engagement and collaboration	1	
Atittude changes	1	

Most campaigns did not measure and report outcomes that indicated actual demand reduction, i.e. observable behaviour change

Among the campaigns that were evaluated, a **hierarchy of outcome measures emerged**. None of the campaigns measured observable and validated behaviour change – the strongest indicator of campaign success in demand reduction. Self-reported behaviour change was reported by three campaigns, in some cases relating to the ultimate behaviour of concern (e.g. rejection of

tiger parts[44]) and in other cases proxy behaviours (e.g. increased community engagement[45]). Here, we acknowledge that it is challenging to capture observable data for behaviours that are often illicit and lack reliable administrative data. While self-reported behaviour change is not as strong an indicator as observed behaviour change due to the risk of reporting biases (e.g. self-report bias or social acceptability bias), it is a stronger indicator that immediate or proxy measures like interaction, (self-reported) intent or the reach of a campaign.

As in Table 11, most of the evaluated campaigns we found measured either the intent for demand reduction, or, even less reliable, the reach/interaction of the campaign. While some campaigns found that the target audience reported a reduced intent to purchase illegal wildlife products, or self-reported a decrease in how desirable they consider these IWT-containing products[46], these intentions may not translate to actual behaviour change in the future. Similarly, participation in events and competitions – a metric often reported by campaigns to indicate success – is a positive start to demand-reduction, however attendance alone can not indicate actual engagement and behaviour change. The spread of campaigns was also reported by many campaigns to show "impact" – this was through measures like social media engagement (clicks, likes, comments). For example, the Wild for Life campaign is considered the UN Environment's most successful digital campaign, reaching over 1 billion people, generating 4.5 million social media reactions, engaging 35 celebrity voices, inspiring 15,000 pledges to take action and the winner of numerous awards.[47] While these numbers show success in spreading awareness, they do not indicate any level of behaviour change that the campaign may have caused.

None of the campaigns could establish causality between the intervention and actual demand reduction

Relatedly, another indicator of empirical strength is the extent of causal inferences that can be drawn between the intervention and demand reduction. Even if we are able to robustly measure observed behaviour, we cannot be confident that our campaign caused a change in that behaviour unless the research design allows for causal inference. None of the campaigns we reviewed were able to make this claim. Only three we reviewed demand reduction efforts used randomised controlled trials (RCTs) to establish causality;

as we discuss later in the report, RCTs are considered the gold standard for evaluation, but are also not as common as they require considerable resources and expertise. The campaigns that did employ an RCT design, however, also measured either indirect influences on demand reduction (e.g. prosociality among children, which could lead to low demand for IWT in the future[48]) or changes in attitude and perceptions of individual capability, opportunity and motivation to consume illegal wildlife products – instead of behaviour change or actual demand reduction.

Pre and post-campaign polls and surveys were the most common tools used, which indicated self-reported behaviour change, reduced intent to consume wildlife products or the spread/reach of the campaign. The "*Rhino Horn Isn't Medicine*" campaign in Vietnam[49] for instance, self-reported decreases in people's purchases of rhino horn and their perceptions about its medical effectiveness post campaign delivery. While these are important indicators of campaign success and positive findings for informing future work, they are prone to external influences as they do not confirm causality between the campaign and reported changes in behaviours/attitudes. There are many confounding variables that may explain an increase or decrease in demand over the course of the campaign, and so when using a simple pre-post study design, it is generally necessary to buttress findings with strong evidence of the mechanisms of impact in an effort to connect any observed changes in demand to the actual activities and influence of the campaign rather than other factors.

A wide range of other quasi-experimental impact evaluation methods, such as difference-in-difference, randomised encouragement designs, or regression discontinuity designs, are all widely employed in other sectors and generally considered robust when done well. They each in their own way aim to approximate the benefits of a true randomised controlled trial but within constraints that don't allow randomisation. They would be well suited to testing conservation campaigns in a variety of scenarios, but have not been used at all in campaigns we reviewed.

5. Recommendations

Our literature review demonstrated that many of the existing demand reduction campaigns were aimed at increasing general public awareness, reflected by the use of mass communication channels, information provision strategies, and KPIs focussed on outreach and engagement rather than observable behaviour change. Despite the growing interest in the application of behaviour science to conservation and demand reduction, the full range of insights and techniques the field has to offer are still relatively unexplored. However, the sector is also increasingly receptive, as expressed by a policy expert in our interviews:

> *"There's a lot of support for behaviour change initiatives now. For example in China, with the support of TRAFFIC, we've been able to set up an expert group composed entirely of Chinese nationals. This ensures that each country can drive these initiatives themselves and that they are culturally relevant, embedded within their own perspectives and based on what they believe will work. This approach is being implemented, and there's strong recognition that it holds great promise and is a positive way forward."*
> – [Policy expert]

However, **current campaigns and approaches often fall short in addressing the specific yet varied motivations and contextual drivers of wildlife consumption, and in rigorously measuring impact.** Successful behaviour change efforts in other sectors have shown the value of four key ingredients, which are in various ways mostly lacking from the wildlife conservation sector generally, and from TCM demand-reduction efforts specifically. We recommend including the following key ingredients to behaviourally-inform demand reduction campaigns in the TCM context:

1. **Use robust behavioural science evidence, theories, principles and methodologies** when designing campaigns – including understanding and targeting behavioural factors beyond awareness and understanding

2. **Seek access to varied 'levers of change'** - this often means working in partnership with other industry stakeholders so that interventions can use

touchpoints other than broad-brush, consumer-facing media campaigns, strengthening existing communications campaigns to serve purposes beyond information dissemination, and trialing non-informational interventions (e.g. changes to incentives or to the choice architecture).

3. **Embrace a commitment to rigorous measurement and evaluation** to start to build an evidence base of what works, when, where, with whom and why – which is currently lacking; and

4. **Ensure cultural sensitivity and adaptive management** across all of these efforts

Table 12 below summarises our recommendations for behaviourally-informing demand reduction efforts. We expand on each of these points in the section below.

We stop short of recommending specific demand reduction strategies in the TCM context, simply because the evidence does not exist. As this review demonstrates, many potential behaviour change strategies simply haven't been tried in this sector yet, and those that have are rarely evaluated rigorously. This is why our recommendations primarily focus on improving the *approach*, based on the fundamental insights of current behavioural science, and on best practice methods, tools and principles used in sectors where the discipline is more mature and more rigorous.

Table 12. Summary of recommendations to behaviourally inform demand reduction efforts

Recommendations		**Key takeaways**
Use robust behavioural science evidence, theories, principles and methodologies when designing campaigns	Develop interventions backed by evidence and a well-developed theory of change (TOC)	➔ Build a comprehensive understanding of the behavioural influences on demand reduction (beyond awareness) ◆ Adopt a culture of incorporating behavioural insights into intervention design and delivery ◆ Consult behavioural scientists to provide expertise on design, process and delivery ➔ Develop a detailed theory of

		change to guide intervention design and delivery.
	Use established methodological frameworks to guide research and intervention activities	➔ BIT's TESTS methodology can be used to systematise the process of research, design and delivery. We outline specific considerations for the TCM context across the 5 stages of TESTS.
Seek access to varied levers of change	Enhance existing communication campaigns to serve a range of purposes beyond information dissemination	➔ Encourage individual action by providing procedural knowledge to consume alternatives, combating misinformation, and influencing and creating desirable social norms. ➔ Create an enabling choice environment by clearly signposting alternative behaviours and leveraging key moments of change for demand reduction. ➔ Adapt existing frameworks like BIT's EAST framework for sustainability communications to guide campaign design.
	Access levers of change beyond awareness	➔ Explore behavioural techniques beyond increasing awareness, such as incentives, nudges, and altering the choice architecture ➔ Cross-sector collaboration with fields like public health can introduce proven techniques from behavioural science.
	Engage multiple stakeholders throughout the campaign process	➔ Conduct a stakeholder analysis to identify the core, involved and influencing stakeholders that are involved in, and have an interest in demand reduction. ➔ Using this analysis, build connections between TCM practitioners and relevant external stakeholders (researchers, consultants, law enforcement, and businesses) to expand data access, understand audiences, and apply diverse behavioural interventions.

		➔ Encourage longer-term and more regular collaborations amongst key stakeholders through projects, expert consultations etc. in addition to networking events. ➔ Funders should support long-term research, embracing failure and learning, rather than focusing solely on superficial metrics like campaign reach.
Embrace a commitment to rigorous measurement and evaluation	Develop and conduct robust evaluations through RCTs (or best alternatives)	➔ Create a repository of successful demand reduction efforts by reviewing a range of campaign characteristics, including: 1) key and vulnerable target audiences, 2) successful delivery channels (online or offline), 3) effective messengers in the Chinese TCM context and 4) levels and types of interventions that facilitate behaviour change. ➔ Seek to rigorously measure impact through RCTs. ◆ In cases where RCTs are not feasible, consider alternative methods like quasi-experimental designs, ideally with expert guidance.
Ensure cultural sensitivity and adaptive management across all efforts	Consider the cultural context while designing and implementing demand reduction campaigns	➔ Consider cultural and regional barriers and enablers while deciding the type and content of messaging, who the messenger is, and the framing of messages. ➔ Involve local experts and stakeholders in decision-making and implementation processes.
	Ensure adaptive management for long-term and sustained impact	➔ Seek to achieve a clear and transparent publication of methods, results and publish peer-reviewed research, which can be used and developed further by others.

5.1. Use robust behavioural science evidence, theories, principles and methodologies when designing campaigns

Effective demand reduction interventions should be grounded in evidence and follow a clear, evidence-based framework or theory. The first step towards this is to conduct comprehensive research to establish the evidence behind the target behaviours and demand reduction methods. This involves gathering both primary and secondary data to understand the key barriers and drivers that influence the demand for illegal wildlife used in TCM. We elaborate on this in the following sections.

Currently, most campaigns target 'lack of awareness' as a driver of demand reduction. However, the demand for wildlife-containing TCM is a complex, behavioural problem involving the interplay of multiple social, cultural, political and economic influences on individual behaviours. There is a need for **a more comprehensive understanding of these behavioural influences on demand reduction beyond awareness**, to tailor interventions to more targeted outcomes. Building a comprehensive understanding of such influences can be enabled by consulting experts like behavioural scientists who can provide this expertise, and also by actively seeking to incorporate behavioural insights into demand reduction efforts. In this section we highlight different models and frameworks that enable the use of behavioural insights in intervention design and delivery.

The **COM-B model is one such key framework** (elaborated on previously in the report) that can be used to build an evidence base for solutions. It can be applied to understand the varied barriers and drivers relevant to different target audiences and stakeholders (e.g. different types of consumers, medical practitioners, NGO stakeholders, law enforcement authorities, industry leaders, etc.) to inform interventions, and to study how the different capability, opportunity and motivation factors interact with each other to shape demand for TCM.

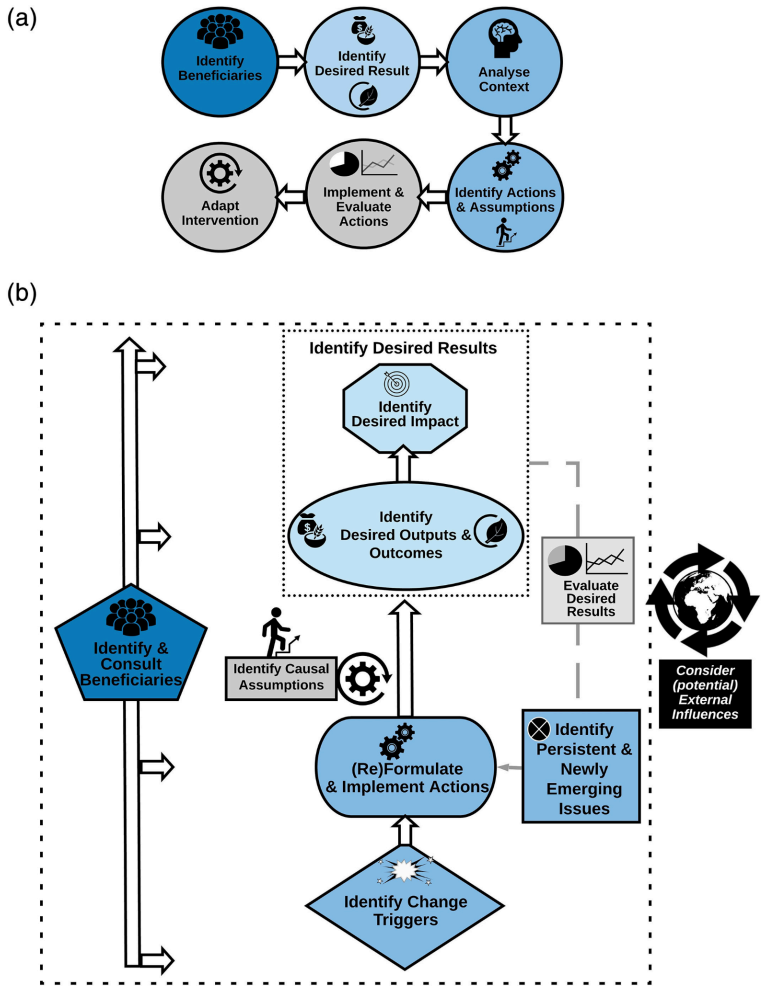
Develop interventions backed by evidence and a well-developed theory of change

Once the evidence is established, the next step is to use these findings to develop a **Theory of Change (TOC)**. A TOC serves as a roadmap, clarifying how the intervention will lead to the desired outcomes. It establishes the logical

connections between activities, outputs, and the final impact, ensuring that each stage of the intervention is designed to contribute to the overall goal. A well-developed TOC also highlights any assumptions or potential obstacles, offering a more strategic approach to intervention planning.

Figure 11 below demonstrates how TOCs can be developed for conservation. We would further emphasise the importance of integrating **behavioural theory** into this TOC, ensuring the intervention's pathway to impact is valid in the way it is expected to leverage drivers of behaviour or overcome barriers. These behavioural mechanisms can then be validated during evaluation or piloting of the communications or intervention. For example if the intervention is designed to influence levels of trust, or health beliefs about legal alternatives, these attitudinal changes can be measured (alongside observable behaviour change, whenever possible). It is also valuable to consider which drivers of consumption behaviour will not be impacted by an intervention, to maintain a realistic perspective on the potential for impact. Table 13 provides a step-by-step case study example of the different stages of creating a TOC for developing an intervention to descrease practitioner prescription of pangolin scale containing medicines (PSCM).

Figure 11. A guide to developing Theories of Change for conservation



Source: Rice et al. (2020)

Table 13. A case example of how a TOC was created to develop an intervention to decrease practitioners' prescription of pangolin scale containing medicine.

TOC stage	Example
Identify beneficiaries	**Identify**: - Practitioners reduce frequency of prescription of pangolin scale containing medicines (PSCM) within hospitals and clinics. **Consult**: - Conducting primary research through interviews to gauge the range of COM-B barriers and enablers to prescribing PSCM
Identify desired results	**Desired impact:** - Reduced demand for PSCM **Desired outputs and outcomes:** - Reduce likelihood of practitioners prescribing PSCM. - Shift practitioners from prescribing PSCM to promoting appropriate alternatives to patients. - Reduce likelihood of practitioners prescribing PSCM when requested by a patient.
Analyse context	**Capability factors:** - Incorrectly believe that the scales contained in the medicines come from captive-bred pangolins. **Opportunity factors:** - Practitioners usually only prescribe pangolin scale decoction-ready medicines when explicitly requested by the patient **Motivational factors:** - Practitioners don't have a strong incentive to necessarily use PSCM.
Identify actions and assumptions	**Actions:** - Providing practitioners with a behaviourally-informed message that their peers prefer prescribing medicines do not contain ingredients from endangered animals. **Assumptions:** - Practitioners will prescribe less PSCM if they know their peers don't want to use it, and if they know the fact that pangolins in the medicines come from the wild.
Implement and evaluate actions	- **Pilot programme** to test the acceptability and initial effectiveness of intervention methods - **Conduct RCT:** Divide participating practitioners randomly into three groups on an online consultation platform: Group T1 receives poster with business-as-usual message, Group T2 receives poster with behavioural informed message, and Group C with no information. - **Measure Outcomes:** Compare likelihood of prescribing the target

	PSCM among the three groups to assess whether intervention message reduce the likelihood of PSCM - **Evaluate**: Collect questionnaire data to evaluate the effectiveness of the intervention.
Adapt intervention	- **Reformulate and implement actions based on feedback and levels of outcomes.** For example, if practitioners from different departments and types (TCM or modern) prescribe the target PSCM differently, the way in which the intervention messages are delivered should then take this difference into account.

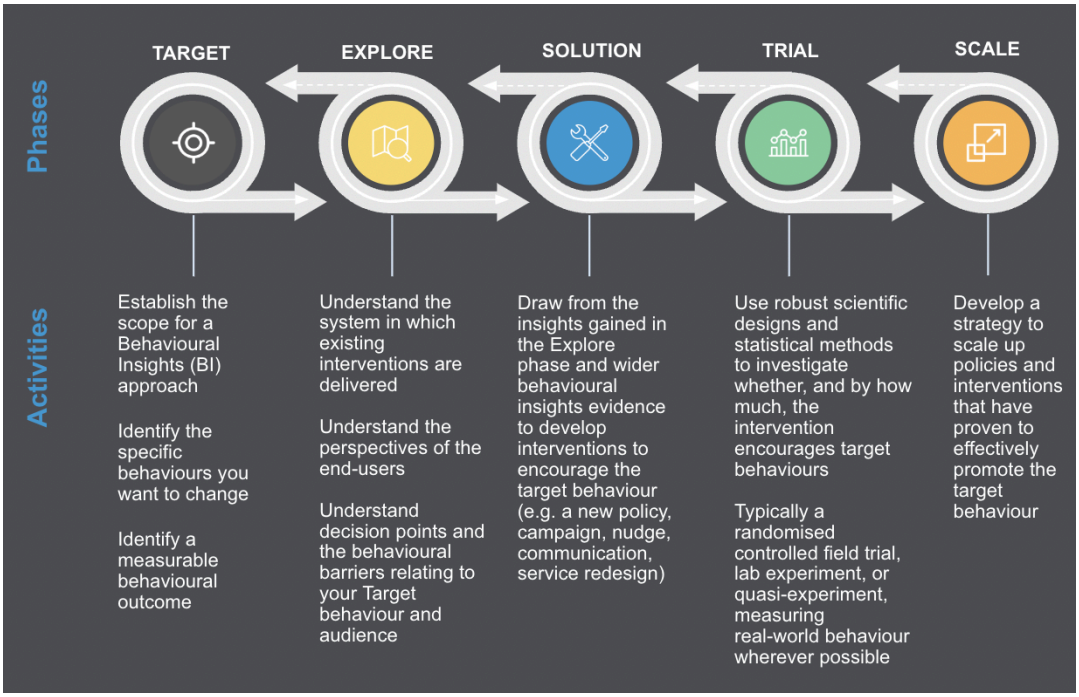
Note: This is a case example to further highlight the process of developing a TOC and we advise readers to not directly apply it as a template or reference for developing interventions to decrease the prescription of PSCM.

Drawing on this TOC, interventions can then be designed using evidence and behavioural frameworks such as the EAST framework (Easy, Attractive, Social, and Timely), to ensure that interventions are not only well-founded but also consider the psychological, social, and cultural factors that shape behaviour. For example, making alternative products easier and more attractive to access, promoting the social desirability of herbal alternatives, and delivering messages at the right moments of change[50] can all significantly enhance the effectiveness of a campaign.

Use established methodological frameworks to guide research and intervention activities

Referring to established frameworks to guide the thinking, planning, design and implementation of campaigns can enable practitioners to undertake a logical, step-by-step approach to demand reduction which factors-in multiple actors, influences on behaviour, courses of action and means of evaluation. Different frameworks exist, including Rare's Behaviour-Centred Design (BCD) methodology[51] and **BIT's TESTS framework**[52] (Target, Explore, Solution, Trial and Scale; Figure 12).

Figure 12. The TESTS Framework



Policy makers and NGOs/organisations may use the TESTS framework as a systematic way of identifying the target behaviour, audience, and solution (campaign or intervention). TESTS enables teams to identify a specific behavioural outcome, and also allows teams to evaluate campaigns' effectiveness based on outcomes that are direct measures of the desired behaviour, or close proxies. The TESTS methodology involves five phases (detailed in Figure 12 above):

- **Target**: Choose a **specific behaviour in a particular target audience to change**, where behaviour change can be measured.
    - **In the TCM context**, this would include considerations about which types of audiences to target, for which type of endangered/illegal wildlife product and the specific behaviours linked to these audiences (e.g. purchase of IWT animals for medicinal purposes online by those suffering specific ailments/illnesses).
    - Our research indicates that targeting two types of consumers beyond the general public can be effective for demand reduction: 1) Patients who seek TCM for specific illnesses and

purposes as their demand are more direct and targetted, and; 2) Authority figures like law enforcement agents and TCM practitioners who directly influence consumer demand and purchase of IWT-containing TCM.

- **Explore**: Understand the **context** in which your target behaviours take place, and **identify the barriers** to behaviour. Interventions in campaigns should address the barriers identified in this phase, or leverage on opportunities and drivers that have the potential to encourage desired behaviours.
    - **In the TCM context**, this would involve: Primary research, such as interviews or surveys with consumers, practitioners, suppliers, and authority figures as well as observational work to understand the choice environments (social, digital, physical markets etc) within which consumption takes place. This can direct insights into the motivations behind the use of these products. This self-reported data is not the only source of insight, and so activities such as observation or behavioural 'audits' can also be valuable, in which behavioural researchers put themselves through a purchase journey, and analyse the presence of problematic norms, incentives, defaults, choice structures, influencing messengers and more. Meanwhile, secondary research through literature reviews, meta-analyses and case studies, can uncover broader trends and lessons learned from past interventions to inform new ones - in this case, as this review reveals, there is very little high-quality evidence to draw upon, so we would encourage practitioners to take inspiration from fields where behaviour change is a more mature discipline e.g. public health.
- **Solution**: Design **interventions informed by the Explore phase and the wider behavioural science evidence** to influence target behaviours and prioritise which to test. Practitioners can generate a list of solutions by referring to gaps and opportunities identified in the Explore and behavioural science literature, and rank them based on their impact and feasibility.
    - In the TCM context, solutions need to go beyond awareness and broad consumer-facing advertisements. While we recognise the

real difficulties in developing non-informational interventions (e.g. incentives or changes to the choice architecture), it is worth trying. Consider using interventions further up the 'intervention ladder', for example, (1) **guiding choice by changing defaults** (e.g. prescribing plant-based TCM unless patients specifically request wildlife-containing TCM), *disincentivising demand* by imposing additional taxes to make wildlife-containing medicines more expensive and less attractive, or *restricting choice* by limiting the sale and availability of wildlife-containing medicines to only a few platforms/shops that are not as easily accessible to all. These may all require action by partners (governments, trade bodies, TCM practitioners) - see 5.2 below.

- **Trial: Evaluate the effectiveness** of interventions by measuring the change in the stated behavioural outcomes through an RCT or quasi-experimental design. Ideally, the evaluation should consider differences in the behaviour of groups with similar characteristics where the intervention has or has not been delivered to, and if this is not possible, differences from an existing baseline measurement.
- **Scale: Determine successful and unsuccessful aspects** of the intervention, and decide whether and what to scale in future campaigns. This includes communicating the results and lessons learnt from the project widely to other stakeholders so that as many people benefit from them.

5.2. Seek access to varied levers of change

Our research indicates that most current demand reduction efforts are aimed at increasing awareness about the harms and risks associated with consuming wildlife-containing TCM. While awareness is one possible starting-point to action, it often does not translate into significant behaviour change due to a gap between knowledge and action, and many other factors driving consumption which remain unchanged. Several reasons can explain this gap in the context of TCM, including the deep-rooted cultural significance of the practice, low availability of suitable alternatives as well as legal loopholes that allow IWT to continue for TCM. We believe this focus on awareness-raising is a result of two issues in the demand-reduction sector: first, behaviour change campaigns may often be based on an intuitive but naive model of behaviour

(e.g. knowledge/attitudes drive behaviours), rather than a sophisticated understanding of the myriad drivers of consumption. Second, NGOs often only have the power and means to deliver informational interventions, precluding a wide range of other possibilities (incentives, defaults, etc). Despite these real challenges, there is a great need for approaches that go beyond awareness, and where possible, beyond information provision/messaging. Gaining access to a wider range of touchpoints will often require partnerships with other stakeholders.

Enhance existing communication campaigns to serve a range of purposes beyond information-dissemination

We recognise that communication campaigns that hinge on awareness-based information dissemination to the general public are common within the sector, and in many cases, the only viable options for NGOs or similar other bodies. By applying a behavioural lens to communications campaigns, existing efforts can be enhanced to move beyond simple awareness-raising and knowledge-building, to serve a range of purposes.

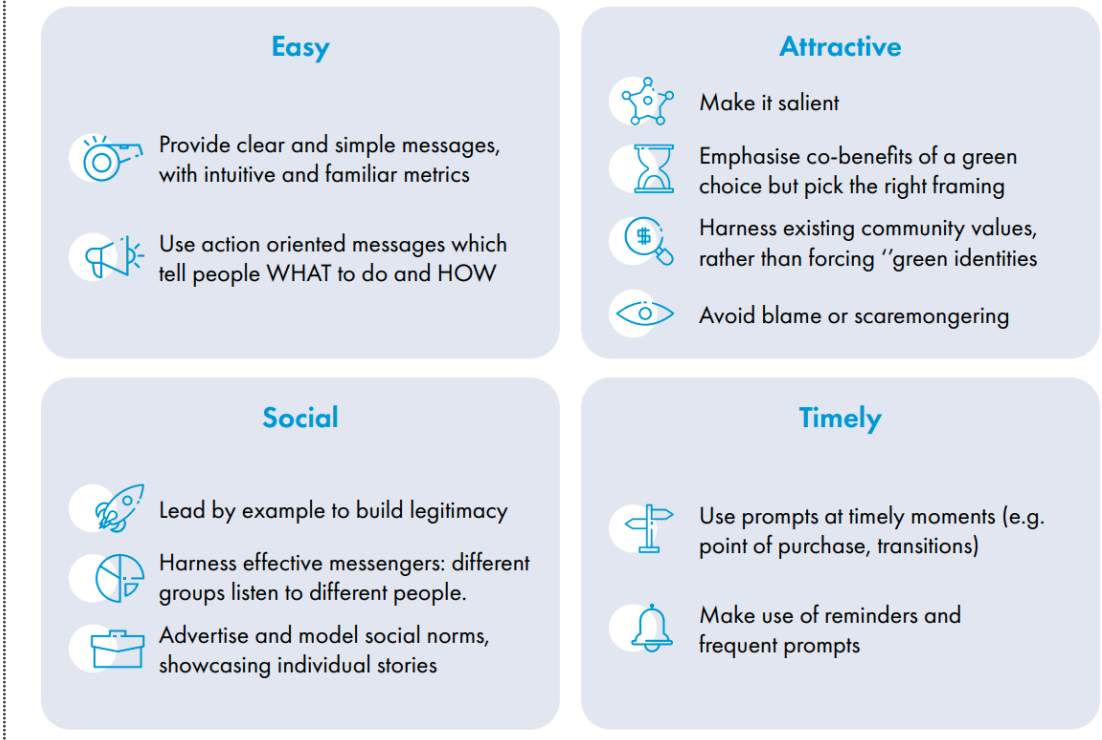
Currently, our review suggests that communication campaigns aim to encourage individual demand reduction by informing the public about the harms of using wildlife-containing TCM. These efforts can be enhanced, by including **procedural knowledge** within campaigns for the public to easily access the ways in which they can reduce consumption, and access viable alternatives. A related purpose is **combating misinformation** regarding existing alternatives (both, for consumers and practitioners). Communications can also be useful to **influence and create social norms**, both to reduce the consumption of wildlife-containing TCM, and to increase the social desirability of alternatives.

While successful demand reduction, as we have previously outlined, will also require changes on the supply and policy sides, communications can **highlight an enabling "choice environment" for demand reduction.** One of the ways to do this is by clearly **signposting alternatives** and the benefits of using them, using tailored advice for different types of consumers (e.g. differentiated by occupations, regions, ailments/requirements, and other demographic variables that emerge important). Another effective approach could be to **leverage key "moments of change"** where people are prompted to do the right thing at the right moment in time – this applies to consumers, as we observed in Section 4.2

through the use of the EAST framework's 'timely' element in campaigns, but also to policy-makers, practitioners and law-enforcement authorities. For example, the recent government announcement outlining the 14th Five-Year Plan for TCM[53] could be a fruitful opportunity to integrate elements of combating illegal wildlife use in TCM by encouraging plant-based or lab-grown substitutes, strengthening e-commerce regulation, and enabling greater stakeholder collaboration through the creation of relevant committees or groups tackling demand reduction.

Previous BIT research[54] provides an **adaptation of the EAST framework for sustainability communications**, which can be applied in the current context of demand reduction too. Figure 13 below outlines examples of how the framework can be used.

Figure 12. The TESTS Framework



Access levers of change beyond awareness

Given the relatively limited application of behavioural science in wildlife conservation, there is a significant opportunity for innovation with demand reduction approaches. Exploring and experimenting with behavioural tools

such as incentives, nudges, leveraging key moments of change, and altering/shaping the choice architecture can help identify successful strategies for reducing the demand for illegal wildlife products. For instance, pilot programmes could be launched to test the impact of default options that automatically favour wildlife-free products in pharmacies or online platforms. These experiments could provide valuable insights into how subtle changes in the decision-making environment can influence consumer behaviour. A TCM policy expert we interviewed provided insights on the need for engaging the sector through different channels, including prompting self-control among consumers and broader market regulation:

> *"From a scientist's perspective, it's essential to understand the legality of these products in trade. CITES management authorities will naturally look at the endangered status as reflected in national and international laws to determine what actions they can take. In the past, their efforts have often focused on raising awareness, informing people about these products, and ensuring they are not used. However, there may not have been a commensurate effort to engage the sector itself to stop ordering these products and to encourage self-regulation and market control."*
> – [TCM policy expert]

Experts we interviewed shared their insights on techniques to influence demand reduction beyond awareness, based on their experiences. A TCM doctor suggested stricter measures in terms of educating TCM doctors: *"To educate young students or practitioners against prescribing wildlife-containing products, wildlife should be removed from textbooks altogether, and an alternative education should be included in the curriculums practitioners need to renew their licenses."* An NGO expert also recommended restricting consumer choice by withholding information about the specific functions of wildlife ingredients: *"Don't let more people know the functions of certain wildlife ingredients in TCM."* While these recommendations hold merit as they are based on experience and cultural awareness, it is important to first **test and build reliable evidence** on which measures are effective, and among which types of target audiences. We elaborate on the need for rigorous testing in the next section.

Cross-sector collaboration and adequate funding are crucial for advancing these innovative approaches. By drawing on insights from fields such as public health or consumer finance—where behavioural science has been more

extensively applied—conservation efforts can benefit from proven strategies and new perspectives. Working with experts from these disciplines can introduce fresh ideas and techniques that have already demonstrated success in changing behaviour in other contexts, thereby enhancing the effectiveness of wildlife conservation campaigns.

Engage multiple stakeholders throughout the campaign process to find novel channels of delivery for interventions

The TCM market is complex and involves multiple levels of influence on demand reduction, both legally and socio-culturally. However, experts allude to the fact that the TCM practitioner community is still relatively isolated from other stakeholders like businesses, manufacturers, policy-makers and conservationists, and show strong support for multi-stakeholder engagement for demand reduction. It is thus important to build a bridge between TCM doctors and stakeholders outside the TCM community, to consolidate support and resources for the target audiences.

A critical first step to multistakeholder collaboration is identifying the key stakeholders and their roles and influences on demand reduction – also known as stakeholder analysis. One way of conducting this analysis is by first identifying the different stakeholders, according to levels of influence and involvement in demand reduction; these can be:

1. **Core stakeholders:** Individuals or groups who are **directly impacted** by or have a **direct interest** in demand reduction.
2. **Involved stakeholders:** Individuals or groups who are **actively engaged** in the process and whose **involvement is direct and at a behavioural level.**
3. Influencing stakeholders: Individuals or groups who have an **indirect impac**t on demand reduction, often at a **structural or policy level.**

By mapping out the roles, motivations, and resources of each stakeholder, organizations can build targeted strategies that leverage the strengths of each group. Within the context of demand reduction campaigns for endangered wildlife, stakeholder analysis would involve identifying key actors such as conservation NGOs, legal and enforcement bodies, educational institutions, and funding agencies. It would also include assessing their level of influence on consumer behavior and their ability to contribute to different aspects of the campaign, such as communication, incentives, and data sharing.

Our literature review showed that most campaigns are NGO-led, and thus often under-resourced. Experts in our interviews also highlighted similar **challenges with resources and capacity constraints** – smaller countries or organisations face significant challenges due to limited resources, which can hinder their ability to effectively implement and sustain conservation efforts. This was emphasised by an NGO policy expert we interviewed:

> *"Many countries, especially smaller ones in regions like the Mekong, face resource challenges. They often don't have large teams dedicated to CITES, let alone the funding to address these issues comprehensively."*
> – [Policy expert]

Resource constraints, and often, a naive understanding of behaviour change and demand reduction based on awareness alone, limit the capability of these campaigns/efforts to reach their desired impact. Smaller, independent organisations like NGOs would thus benefit from working alongside suitable **campaign delivery partners** who can support the range of efforts needed to render demand reduction campaigns successful. To that effect, partnerships with researchers, consultants, academics, law enforcement officials, trade bodies and businesses, can target behaviour change on a deeper level. Different types of organisation provide access to useful data, access to study and understand audience segments, and different intervention opportunities which may allow campaigns to leverage different behavioural mechanisms that conservation NGOs can typically access themselves. Existing campaigns we reviewed demonstrated examples of collaboration between different stakeholders through networking events like conferences and symposiums. These are means of bringing together a variety of decision-makers and influencers, however efforts need to be made to strengthen these networks through longer-term partnerships and knowledge-exchanges through collaborative projects, campaigns and regular expert consultations.

Funders also play a critical role as collaborators, and should push for a more systematic long-term body of research and innovation that accepts failure and real learning, rather than creating an incentive towards superficial metrics of impact (e.g. campaign reach). Funding bodies and individuals should also have a culture of allowing failure – behaviour is difficult to change especially

when it is so culturally embedded. In the TCM demand reduction context, therefore, funders should enable and encourage innovation and demonstrate a genuine commitment to empiricism even if initial efforts are unsuccessful and have low impact.

To give one example from a comparable challenge: when BIT worked to successfully reduce the excessive use of antibiotics within the UK, we did not target a campaign at consumers (patients) discouraging them from asking their doctors for antibiotics. We instead worked with Public Health England to fundamentally change the decision-making process of doctors, through the use of: i) social comparisons (telling high-prescribing doctors that they were prescribing more than others), ii) creating a 'delayed prescription' option (meaning many patients with minor ailments would have cured before needing to use the prescription), iii) leveraging a powerful messenger (the chief medical officer of England), and iv) providing doctors with self-care advice to be given to patients (to offset the pressure that doctors faced in giving *something* to patients rather than turning them away untreated). To draw the analogy between this and the prevalent approach in TCM conservation campaigns: None of these intervention elements depended on raising the awareness of antimicrobial resistance among patients, and none of this required the patient to actively 'change their behaviour' - instead we changed doctor's behaviour in order to create a different environment for patients (one in which antibiotics were less freely prescribed). But importantly, none of this would have been possible if we were running our own campaign directly at patients. Instead, it required partnering with other stakeholders who hold a more direct and relevant relationship with our target audience, and who had access to different levers of change.

Box 1 below demonstrates another successful multi-stakeholder collaboration for the *Partners Against Wildlife Crime* campaign.[55]

Box 1. Case study: Multi-stakeholder collaboration for the Partners Against Wildlife Crime initiative

Project Overview

The *Partners Against Wildlife Crime* project is an EU-funded initiative aimed at disrupting illegal supply chains for endangered species such as tigers, Asian elephants, Siamese rosewood, and freshwater turtles. The project operates across key trafficking regions in the Greater Mekong, Malaysia, and China, targeting both the source areas and consumer markets. Through coordinated actions along the supply chain, it aims to increase the effectiveness of government and civil society partnerships in combating wildlife crime.

Key Partners and Stakeholders

- Led by the **Wildlife Conservation Society (WCS)**, the project involves **12 international and national organisations**.
- Collaborates with **government agencies**, **local communities**, and **protected area authorities** across Malaysia, Thailand, Myanmar, Cambodia, and China.
- Engages with **law enforcement**, **judicial bodies**, and **civil society groups** to improve patrolling, intelligence-sharing, and enforcement efforts.
- Academic **researchers and consultants** for training and knowledge dissemination

Key Strategies and Actions

- Operates in **six high-priority protected areas** targeting tigers, elephants, and freshwater turtles.
- Implements **patrolling** and **wildlife crime hotlines** to detect illegal activities and gather intelligence.
- Focuses on **capacity building** for law enforcement, with training workshops and intelligence coordination.
- Facilitates **community-based patrolling** and conservation training to engage local communities in anti-trafficking efforts.

Reducing Consumer Demand

- In China, the project employs **behaviour change initiatives** targeting consumers of wildlife products such as tiger bone and elephant skin.
- Utilises a **behavioural science-based approach**, involving online campaigns and training through the **Behavioural Insights Team** (BIT) to reduce the demand for wildlife products.
- Collaboration with private sector platforms, such as **e-commerce and courier services**, to prevent the trafficking and sale of wildlife products online.

By involving multiple stakeholders early in the campaign development process, trust can be built and it can be ensured that the initiatives are culturally sensitive and practically aligned with the industry's needs. Experts in our interviews are aligned with this approach, and believe that co-creating solutions with these stakeholders not only fosters a sense of ownership but also enhances the likelihood of successful implementation. Experts recommended stakeholder engagement on multiple levels, but mostly including the government. To this effect, an NGO policy expert we interviewed suggested:

> *"Stakeholder engagement is needed between the government and TM industry. It's important that there's discussions between the Natural Resource Ministry and then the Health Ministry because the TM industry obviously has to work with that set of discussions as well. There have been actions, in both China and Vietnam in recent years to remove species that are illegally traded internationally from pharmacopoeia."*
> – [Policy expert]

Another NGO TCM expert further elaborated on this approach by highlighting the need to target transparency issues in the industry on multiple levels:

> *"In the transportation sector currently HS codes used in shipping are too vague, making it nearly impossible to determine what companies are transporting. Finance sector should advocate for the disclosure of information under ESG principles. There have been positive attitudes from the TCM community at conferences organised by the Coalition. We have started to build relationships with these prominent professors in China. But there are major challenges in dealing with the Government."*
> – [TCM Expert]

Furthermore, it is also important to encourage TCM practitioners to take on advocacy roles for the transition away from using endangered species. Highlighting and celebrating successful examples of practices that have already made this shift can serve as powerful motivators for others in the industry to follow suit. Within

5.3. Embrace a commitment to rigorous measurement and evaluation

Our research indicated that the demand reduction sector overall lacks an evidence base from which future campaign designs can learn. A key step for researchers and practitioners is to thus begin building a strong evidence base of what works, when, where, with whom and why. This is particularly critical given our starting assumption should always be that behaviour change is difficult, and most efforts will likely fail: particularly when the behaviour is so culturally ingrained, and the tools of influence are often relatively weak (information, awareness-raising). We cannot overstate the importance of kick-starting a more empirical and rigorous approach to evaluation to build up this knowledge base.

However we recognise the difficulties: obtaining accurate and comprehensive data on wildlife trade was seen as particularly challenging by some experts in our interviews, especially in regions where the trade is clandestine or where data collection is inconsistent. This lack of reliable data hampers the ability to conduct thorough research and build a strong evidence base, and to design effective interventions.

A former TCM doctor and policy expert we interviewed highlighted the difficulties faced in gathering necessary information:

> "*Most incidents are concentrated in Asia, and due to the nature of the trade their data is not always accessible*."
> – [Policy expert and former TCM doctor]

This challenge of limited data spans various barriers, including lack of research, lack of data and impact evaluation skills within the sector, lack of regulation and also low resource and motivation across organisations to contribute to a rich database, and approaches to solve for this will involve multiple stakeholders to be engaged – especially those who control and regulate data creating and sharing, such as legal/enforcement bodies, research/educational institutes and consultants working in the space. Funders again play a critical role, since they can demand more rigorous impact evaluations that track behavioural impact, not just 'reach' or programme delivery KPIs. They must also embrace and accept failure, and break the perception that future funding may be contingent on current success. Many innovative efforts will likely fail to

significantly impact behaviour, but it is better that we genuinely learn what doesn't work, than continue to fail to properly evaluate a campaign.

Currently, this may seem ambitious given the dearth of existing research. However once efforts begin in a concerted manner, we posit that it would not take long to create a repository that can be used by relevant stakeholders. A suitable example of such a repository is the UK government's *What Works Network*[56], which provides an evidence base for effective policy making by evaluating the impact of different interventions across sectors like education, health, and crime. It synthesises high-quality research to help decision-makers understand what policies work, for whom, and under what circumstances, ensuring public funds are used efficiently to achieve positive outcomes. The need for a repository of evidence is even more important for TCM demand reduction given how important local cultural influences are on demand. An expert we interviewed expressed this challenge, as often small-scale successes in demand reduct can not predict behaviour change on a larger scale:

> *"Achieving impactful results is complex and often not feasible with large-scale campaigns. Context is key. The experience of small-scale events is highly contextualised and cannot be replicated to large-scale events."* – [TCM academic expert]

Creating a repository of evidence on best-practices involves reviewing successful demand reduction efforts across a range of campaign characteristics, including (but not limited to):

1. Key and vulnerable target audiences,
2. Effective messengers in the Chinese TCM context
3. Effective delivery channels (online or offline), and
4. Levels and types of interventions that facilitate behaviour change.

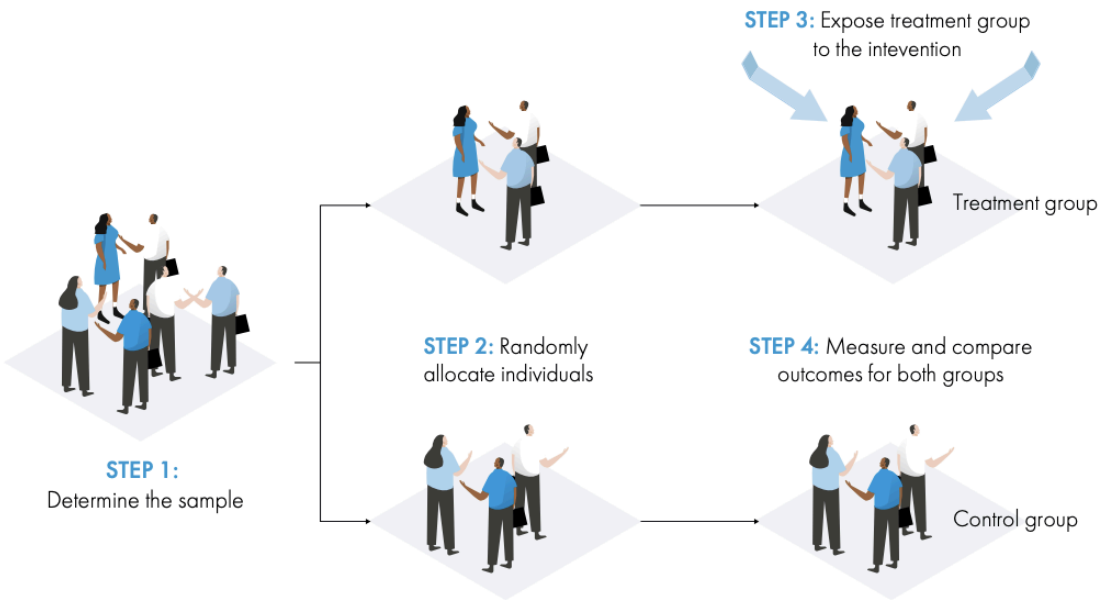
This would require clear and transparent publication of methods, peer-reviewed research and partnering with independent evaluators and consultants who can verify the scale of impact of demand reduction efforts.

Develop and conduct robust evaluations through randomised controlled trials (RCTs), or best alternatives, to confirm campaign effectiveness

A crucial aspect of any demand-reduction campaign is determining whether it effectively changes behaviour. Even if an idea appears promising, the only way to confirm its effectiveness is through a systematic evaluation process. Experts in our interviews however noted the difficulty in isolating the impact of specific campaigns due to external factors like the lack of controlled environments and limited resources within organisations. While this process requires time and effort, it ultimately conserves resources that might otherwise be wasted on an ineffective approach, and is the only way to ensure the sector learns from its mis-steps and maximises impact in the long term.

The use of **randomised controlled trials (RCTs)** is one way of rigorously measuring impact. It enables campaign implementers to establish if the intervention has had an effect on the target behaviour, and how large this effect is. RCTs are one of the most common experimental designs, and this is for a reason: using an RCT allows one to be confident that any difference between a treatment group and a control group is due to the intervention, and not some other difference between the groups. This allows the demonstration of causality, which is a much stronger claim to make than simple association. Practitioners should consider obtaining broad baseline measures about consumption prevalence, preferences or even consumer profiles on sociographic or psychographic levels, which are not confined to a specific product or condition, and using these to inform intervention aims and also to measure post-intervention impact. Chapter 4 of BIT's TESTS manual[57] provides detailed guidance on the steps to design and conduct an RCT – these steps are summarised in Figure 14 below.

Figure 14. The main steps of conducting an RCT



While RCTs are often called the gold standard for evaluation, they may not always be feasible or practical. There are a **number of alternative approaches**, quasi-experimental methods (e.g. difference-in-difference, matching, regression discontinuity design, randomised encouragement design) which may be employed, for which we recommend working with an expert to conduct. Where resources are limited and the campaign has one shot at success, pilot testing before deciding whether to invest and dedicating resources to running an RCT would be one approach to consider. This may take the form of a small-scale field trial, or running an online randomised experiment to test the impact of messaging on a wide range of outcomes including changed sentiment, comprehension and retention of information, self-reported intent, self-efficacy, knowledge of the correct course of behaviour, trust, and many other metrics which, typically, would aim to capture whatever psychological mechanisms the communications are seeking to exploit (and in doing so, validate the potential for the intervention to be effective in the way the campaigners are intending). While online experiments have major caveats (principally that they are not measuring real-world behaviour) they can be extremely powerful, particularly to compare and prioritise one among several campaign ideas.

5.4. Ensure cultural sensitivity and adaptive management across all efforts

Consider the cultural context while planning, designing and implementing demand reduction campaigns

TCM, for some, can be considered as sacred as religion and thus, there is a need to be cautious about the cultural sensitivity and awareness in the design, messaging and reporting of demand reduction campaigns.

A key consideration for cultural sensitivity is involving local experts and stakeholders in decision-making and implementation processes, as they are likely to be the closest to the cultural ground realities and expectations. An NGO expert we interviewed advocated for this:

> *"Foreign leadership sometimes struggles with cultural sensitivity, affecting the campaign's reception. If another organisation were to undertake similar efforts, they should prioritise local involvement from the start to avoid cultural conflicts. Hiring local experts and PR firms can help mitigate the impression of foreign interference."*
> – [NGO expert]

When developing campaigns, the consideration of who delivers messages as well as which messages are being delivered is critical. As established earlier in the report, while celebrities are common messengers used to influence the masses, experts suggest that this may not always be successful. Instead, law enforcement officers or community leaders could be more effective, as an academic expert notes:

> *"Emphasising law is important. People in China are very sensitive to rules. Utilise community respect for law and rule to enforce behavioural changes."*
> – [Academic expert]

Another important consideration of emphasising the law and regulations is to highlight key recent developments in policies related to TCM, to target audiences and also to other relevant stakeholders. It is also important to frame messages with a consideration of the characteristics and motivations of the target audience. An expert in our interviews highlighted that social norms are valuable levers to behaviour change in China:

"Collectivism is strong in China, whether it may be in public, or amongst industry or government stakeholders; I perceive it may be much stronger than many Western countries or communities. It can be leveraged to facilitate change when the time is right. Social norms can accelerate the transition process." – [Academic expert]

Another important cultural consideration is to avoid framing messages in a manner that could be interpreted as an attack on TCM or local Chinese cultures. Instead, the focus should be on highlighting the positive aspects of conservation and the alternative sustainable practices that can be embraced within the TCM tradition. Some experts we interviewed also expressed that there would be value in education the public about the true purpose of TCM, and correcting misconceptions that TCM is solely dependent on wildlife ingredients:

"According to a very famous TCM doctor in the Tang Dynasty (孙思邈), if you kill one life to save another life, then it is against the Chinese method."
– [TCM doctor]

"TCM emphasises the harmony between people and environment, people and nature, people and the wildlife. So if you really destroy the wildlife and environment, then you create huge challenges for this traditional medicine, which has been in practice for over 2000 years, to be endangered as well."
– [TCM academic]

Emphasising the role that modern TCM can play in global conservation efforts can help position practitioners and consumers as stewards of both health and the environment. This approach not only fosters a sense of pride but also aligns conservation goals with cultural values. Experts argue that understanding the cultural context and motivations behind wildlife product consumption is essential for creating effective messages. Campaigns like the 'Chi' campaign, which aligns with cultural values like "Chi" (inner energy), were mentioned in interviews as successful examples. Experts also highlighted the need for positive messaging which highlights the advancements within the field (e.g. availability of suitable alternatives), as campaigns that criticise the use of IWT-containing wildlife for TCM could be misinterpreted, running the risk of being counterproductive:

"Given the sensitivity of TCM, using positive messaging is essential. Previous approaches are no longer suitable. Criticism is challenging as it can be misinterpreted and amplified. Adapting to new strategies that emphasise collaboration and positive communication will be more effective. Emphasising the benefits and advancements within the field can help foster a more constructive dialogue and wider acceptance."
– [NGO expert]

Furthermore, campaign messages should be tailored to reflect the regional differences in TCM practices and consumer behaviour. What resonates in urban centres may not have the same impact in rural areas or among overseas Chinese communities. By customising messages to suit local contexts, campaigns can more effectively engage their target audiences and achieve better outcomes in promoting sustainable practices within TCM.

Ensure long-term and sustained behaviour change through adaptive management and applying continuous learnings to demand reduction campaigns

For demand reduction campaigns targeting illegal wildlife products in TCM to be effective, behaviour change must be not only immediate but also long-term and sustained. Achieving this requires a strategic approach that goes beyond one-off interventions, fostering an ongoing commitment to adaptive management.

Adaptive management is a critical component of ensuring sustained behaviour change. This approach involves continually assessing and adjusting strategies based on what works, what does not, and under which circumstances.[58] By openly communicating the successes and failures of past interventions, organisations can contribute to a collective knowledge base that benefits all stakeholders involved in conservation efforts.

This transparency allows other practitioners to replicate successful strategies while avoiding the pitfalls of less effective approaches. It also promotes a culture of innovation, where insights from one campaign can inform the design and implementation of new projects.

For behaviour change to be truly long-term and sustained, it is also essential to cultivate a culture of continuous learning within and across organisations. This

involves not only sharing outcomes and insights but also encouraging experimentation and the development of new interventions. Each project should be viewed as an opportunity to gather valuable data, which can then be used to refine future initiatives through prompt, transparent and accurate reporting. A TCM expert we interviewed supported this idea of cultivating a culture of sharing knowledge between practitioners for sustainable behaviour change:

> *"Enhance collaboration and information sharing. Many organisations conduct demand reduction or public awareness campaigns in various ways. Unfortunately, we often learn about these efforts only when they publish results, such as hosting workshops or getting companies to sign pledges. This lack of information during the working process stage means that efforts are often not synchronised."*
> – [TCM academic expert]

By embedding adaptive management into the fabric of demand reduction campaigns, conservation practitioners can ensure that their efforts remain relevant and effective in the face of evolving challenges. This long-term perspective is crucial for addressing the deep-rooted behaviours driving the use of illegal wildlife products in TCM, ultimately leading to more significant and enduring conservation outcomes.

Conclusion

Through our assessment of existing demand reduction campaigns for endangered wildlife used in TCM, we find that over the years, there have been several efforts already made which have considerably increased consumers' awareness of the drawbacks of using these products for TCM. However, work remains to be done when it comes to translating awareness and intent to actual, observable behaviour change. There are significant gaps and thus, opportunities for development and innovation in terms of making campaigns more empirically-sound, and equipped with behavioural insights.

We recognise the various, layered challenges that the TCM community operates within – the deeply ingrained traditional value of the practice, the regulatory uncertainties and a lack of concerted efforts by relevant stakeholders to change observable behaviours. However, conservation and demand reduction are rich areas for the application of evidence-based behavioural insights and theoretical frameworks, and our recommendations highlight these opportunities.

Influencing observable behaviour change should be the ultimate goal of demand reduction efforts, and appropriate evaluation methods should be undertaken to do so. This is however, not a simple task – it requires significant expertise, motivation/prioritisation by those in power, and resources. This is where multiple stakeholders can collaborate to leverage their strong-points for the ultimate goal of sustained behaviour change. The good news here is that the TCM community is showing a nascent yet growing openness to alternatives and for approaches like behaviour change to enable the transition away from IWT products.

To approach demand reduction from a well-rounded perspective, we also urge stakeholders to look beyond the demand-side factors, and apply a behaviour change lens to the whole system influencing demand for endangered wildlife-containing TCM. This includes groups managing the supply, advocacy and enforcement of TCM-related raw materials. Although we have not systematically reviewed the literature concerning supply-side factors of TCM and IWT, our previous work highlights that behaviour change is not synonymous with simply demand reduction or influencing the consumer – it has immense value in shaping the processes and tools within the wider industry and legislative process.

Appendix

Appendix 1. Literature review protocols

Table 1. Detailed list of search terms

Region		*English terms*	*Mandarin terms*
	1	China, Chinese	中国
	2	Asian, South*, east*	东南亚
Campaign	1	Campaign*, event*, advert*, educat*,	活动, 广告, 宣传, 传播, 教育, 培训,
	2	train*, ambassador	大使
		Compet*, exhibit*, talk*, workshop, charity, pledge	比赛, 展览, 讲座, 公益, 承诺
Evaluation	1	aware*, attitud*, behavio*,	认知, 态度, 行为
	2	alternative*	减少, 持续性, 改变, 影响, 效果
	3	reduc*, sustainab*, chang*, impact, effect*	评估, 调查, 报告, 访谈, 问卷
		evaluat*, research, study, report, interview*, survey*	
Wildlife	1	Wildlife, animal*, plant*	野生动物, 植物
	+	Endanger*	濒危
Species/products	1	Elephant, elephant skin	大象, 大象皮
	2	rhino*, rhino* horn	犀牛, 犀牛角
	3	Pangolin, pangolin scale	穿山甲, 鲮鲤甲, 甲片
	4	Saiga, saiga horn	高鼻羚羊, 赛加羚羊, 羚羊角
	5	Tiger, tiger bone	虎, 虎骨, 大猫
	6	Leopard, leopard bone, big cat	豹子, 豹子骨
	7	Asiatic bear, bear bile	黑熊, 熊胆
	8	Tokay gecko	蛤蚧, 大壁虎, 仙蟾
	9	Seahorse	海马
	1	skin*, horn*, bone, scale, bile, dried	皮, 角, 骨, 甲, 片, 壳, 胆, 干
	+	root*, *stem*	根, 草

Trade	1 2	Trade, demand, consum*, buy*, purchas*, sell* Medic*, heal*, treat*	贸易, 需求, 消费, 购, 买, 卖 药用, 保健, 治疗

Note: All terms are listed above as suggested inputs for Boolean searches.

Underlined: Priority terms for coverage of most relevant results

** asterisk = Boolean expression for text coverage*

, comma = Boolean expression for OR

Table 2. Scope of campaigns included in the literature review

Scope/context	Description
Product context	Endangered wild animal products used in TCM with their corresponding uses: **Mammals** - Bear bile: gallbladder, powder, medicinal products - Elephant skin: skin piece, powder, medicinal products - Leopard bone: medicinal products, tonics - Pangolin scale: scale pieces, powder, medicinal products, tonics - Rhino horn: horn, powder - Saiga horn: horn, medicinal products - Tiger bone: medicinal products, tonics **Fish** - Dried seahorse: whole, tonics **Reptiles** - Dried tokay gecko: whole, tonics
Campaign context	**Target region:** - China (primarily) - Neighboring countries in Southeast Asia **Target population:** - Chinese nationals residing in China, including mainland Hong Kong SAR, Macao SAR and Taiwan Province - Chinese nationals/communities residing overseas (diasporas)
Search relevance	**Sort by**: Relevant hits **Year of implementation:** 2004-2024

Table 3. Detailed literature review framework

Component	Description
Type of publication	• Peer-reviewed journal article • Working paper • Book • Government report • Other report • Grey literature • Other - specify
Research type	• Primary • Secondary
Research methodology	• Quantitative - experimental field trial • Quantitative - experimental lab study • Quantitative - QED • Quantitative - observational • Qualitative • Mixed-methods • Desk review • Other - specify
Abstract/executive summary	
Study/campaign objectives	
Behavioural theory basis	For example, Ajzen's theory of planned behaviour; Michie's behaviour change wheel
Behavioural insights used	As per the EAST framework
Targeted wildlife species	Specify whether consumption/trafficking is legal; Specify CITES/IUCN designation.
Targeted audience	Demographics, subgroups - clearly identify gender, if mentioned
Description of intervention	What the study/campaign intervention introduced to the audience in order to change their behaviour. Include details, if any, on length of campaign.
Theory of change for intervention	

Targeted enablers for demand reduction	As per the COM-B model (see summary in glossary)
Targeted barriers for demand reduction	As per the COM-B model (see summary in glossary)
Cultural sensitivity of the process	How culturally appropriate and sensitive was the intervention process? - Did it take a top-down or bottom-up approach? - Which stakeholders were involved in the process of intervention creation, design and implementation (e.g. community members, local authorities, consultants etc)?
Mediums/channels of intervention delivery	Can be *physical/in-person* through tangible material, posters, campaigns etc. or *digital* through social media, text-messaging, radio etc. Note channels/messengers.
Intervention type	As per the **'intervention ladder' (see glossary)**
Evidence of adaptive management	Did the campaign refine the message over time? If yes, how? E.g. continual monitoring and research
Level of outcomes	• Individual • Group / team • Organisational • Population • Multiple
Main findings	Reach, interaction, behaviour change
Impact evaluation completed?	Yes/No
Reported evaluation method	• RCT • Pre-post study • Quasi-experimental study • Difference-in-Difference study (DiD) • Qualitative evaluation (interviews, focus groups, observations) • Survey • Theoretical evaluation (logic models, framework analysis)
Reported Internal validity	

Reported External validity	
Strength of evaluation	● No concerns (3) ○ **Studies** and **campaigns** in this category exhibit high methodological rigor and reliability. The study/campaign has a clear, appropriate and robust design that directly addresses the research question or objectives. It comprises a randomised-controlled trial or multiple small scale trials; alternatively, it is well supported by meta-analyses, systematic reviews or RCTs. It has a broad reach through an adequate sample size. It demonstrates appropriate analysis and impact evaluation using appropriate, well-defined metrics. Results are reported in a transparent, detailed and complete manner. If the study/campaign is published in a peer-reviewed journal or endorsed by credible external organisations, it is a plus. ● Some concerns (2) ○ **Studies** and **campaigns** in this category show moderate methodological quality but have some issues that may impact reliability. Design can be non-randomised or observational, and campaign design may be reasonably structured with some weaknesses in planning/execution; alternatively, it may be supported by quasi-experimental studies, one-two RCTSs and/or qualitative studies. The sample size/reach is moderate but sufficient to provide some useful insights. Evaluation tools are adequate but not ideal, with some data collection limitations. Impact evaluation is performed but may lack some critical aspects. In terms of reporting results, there could be inconsistencies between data and conclusions, but overall reasonable. The peer-review process may be less rigorous. ● Major concerns (1) ○ **Studies** and **campaigns** in this category have significant methodological issues that

	substantially impact reliability. The study/campaign is poorly designed, through case reports or anecdotal evidence, and has limited evidence through lab experiments or a few qualitative/correlational studies. The sample size and reach is insufficient, with poor engagement of the target audience. Impact evaluation is poor or absent, with no consideration of confounders/biases. Reported conclusions may not be supported by the data/may be overstated, and there is no external review from credible forums/journals.
Described impact	Claims about study achievements, e.g. success in meeting objectives (statistical/metrics, qualitative findings, self-report)
Methodological limitations (reported)	
Scope for further research and gaps (reported)	

Appendix 2. Interview sample characteristics

Table 1. Interview sample characteristics

Expert group (N=11)	**Country of work (base)**	**Relevant area of expertise**
2 – Academics	2 – China (Mainland)	Social science research: • Illegal wildlife trade, TCM, sustainable living, urban ecology,human-nature relationship • conservation interventions
3 – Conservation policy experts, including:	1 – China (Mainland) 1 – UK *(worked in China)*	Policy and regulation:

• 3 NGOs • 1 Academic (concurrent)	1 – USA *(worked in China)*	• International wildlife trade (CITES) • China/Vietnam: National species protection, captive-breeding industry for mammals, commercial trade, public health, traditional medicine/pharmaceutical production
4 – NGO practitioners, including: • 1 Western medical doctor (former)	3 – China (Mainland, Hong Kong SAR) 1 – UK *(worked in China, Vietnam)*	Species conservation and demand reduction: • Illegal wildlife trade, TCM, policy and enforcement, social behaviour change communications
2 – TCM practitioners, including • 2 Academics • 1 TCM doctor (concurrent) • 1 TCM commissioner (concurrent)	2 – USA *(practised/worked in China)*	TCM practice: • Accupuncture, integrated medicine, clinical research, professional education, vocational accreditation • Conservation advocacy

Appendix 3. Campaign characteristics

Table 1. Regions covered in the literature review

Regions		
Region	**N**	**%**
China	58	62.00%
Vietnam	25	27%%
Worldwide	6	6.50%
USA	3	3.20%
Singapore	2	2.10%
Hong Kong SAR, China	2	2.10%
Asia/Southeast Asia	2	2.10%
Russia	1	1%
Taiwan Province, China	1	1%

Appendix 4. TCM policy landscape

Table 1. State protection level and product landscape for select endangered wild animal products used in TCM.

Wildlife product	**State protection level in China**	**Main product forms**	
		Raw ingredient	**Medical products**
MAMMALS Bear bile 熊胆	Class I (Sun bear only), Class II	- Whole gallbladder (dried), - Fresh bile	- Processed medication (e.g. powder, patented medicines, decoction medicines) (packaged/unpackaged) Health tonics (e.g. tea)
Elephant skin 大象皮	Class I (Asian elephant)	Cut piece (dried)	Processed medication

Leopard bone 豹子骨、牙	Class I	Whole segment/piece	Processed medication Health tonics (e.g. medicinal wine)
Pangolin scale 穿山甲片	Class I (all species)	Scale pieces (炮甲raw, roasted)	Processed medication Health tonics (e.g. medicinal wine)
Rhinoceros horn 犀角	Class I	Whole/piece	Processed medication
Saiga antelope horn 羚羊角 *(S. tatarica)*	Class II	Whole/piece	Processed medication Health tonics (e.g. medicinal wine)
Tiger bone 虎骨、牙	Class I	Whole segment/piece	Processed medication Health tonics (e.g. medicinal wine) Pre-ban auction items
FISH Seahorse海马 *(Hippocampus spp.)*	Class II	Whole animal (dried)	Processed medication Health tonics (e.g. herbal soup)
REPTILES Tokay gecko *(G. gecko)*	Class II	Whole animal (dried)	Processed medication Health tonics (e.g. herbal soup)

Table 11. Types of reported findings and impact across campaigns

Reported findings/impact	N	%
N/A	**52**	**56%**
Interaction	**28**	**30%**
Self-reported reduced intent	10	
Participation in events, campaigns	9	
Engagement (offline, social media, support)	6	
Increased awareness	2	
Self-reported reduced social acceptability	1	
Reach	**20**	**22%**
Spread	14	
Views	2	
Impact	1	
Training	1	
Visitors	1	
Media coverage	1	
Behaviour change	**6**	**7%**
Observed or validated behaviour change	0	
Self-reported demand reduction	3	
Reduced C, O, M to consume	1	
Community engagement and collaboration	1	
Atittude changes	1	

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