

Wildlife and economic policies affecting the bushmeat trade: a framework for analysis

D.J. Crookes* & E.J. Milner-Gulland†

Division of Biology, Imperial College London, Silwood Campus, Ascot, Berkshire, SL5 7PY, U.K.

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Hunting wildlife for food is a long-established component of livelihoods throughout the world. However, there is increasing concern that wildlife is disappearing due to overhunting, with associated impacts on both livelihoods and biodiversity. Tropical forest systems are particularly vulnerable, due to a unique combination of ecosystem, socioeconomic, technological and institutional constraints. Many approaches to reducing hunting pressure have been suggested, all of which impact on users to some extent. However, there has been little rigorous analysis of how these impacts are distributed. Here we discuss the key determinants of impact distribution, including who is targeted, who implements the policies, ability and willingness to comply with enforcement measures, and ecosystem characteristics. We then present a case study where the framework is applied, and conclude with an approach for planning policy interventions.

Key words: bushmeat, hunting, policy, wildlife.

INTRODUCTION

A growing body of literature concludes that bushmeat hunting¹ in many parts of the world is no longer sustainable (Wilkie *et al.* 1998; Robinson & Bodmer 1999; Wilkie & Carpenter 1999; Robinson & Bennett 2000; Milner-Gulland *et al.* 2003). A number of studies have undertaken broad reviews of the factors underlying declines in many bushmeat species (see for example Robinson & Bodmer 1999; Bennett & Robinson 2000; Brown, Bowen-Jones & Robinson 2002). Tropical forest ecosystems are particularly vulnerable given their low productivity, rapid habitat conversion (Oates 1999; Caspary 2001), human population growth, rising urban and declining rural incomes (Caspary 2001), improved access to hunting technology, loss of cultural values (Rose 2001) and weakness of governance, in some areas at least. The broad range of factors influencing the bushmeat trade² and its importance in rural and urban livelihoods

highlight the importance of a multi-disciplinary approach to finding solutions (Bakarr *et al.* 2001; Bennett 2002).

In this paper we develop a framework for analysing the effects of policy tools on hunter and market behaviour. Policy is defined in the broad sense, to include interventions at a national, regional and local (community) level. A decision tree approach is adopted for measuring the impact of policies. There are a number of other tools which may be utilized including conservation monitoring and evaluation approaches (Salafsky & Margoluis 2003; Stem *et al.* 2005), integrated environmental assessment³ (World Bank 1991; Crookes & de Wit 2002), Strategic environmental assessment (Therivel & Partidario 1996; Rossouw *et al.* 2000) and multicriteria analysis (*e.g.* Munasinghe 1993; Munasinghe *et al.* 1996).

CRITERIA FOR EVALUATING POLICY IMPACTS

An overall evaluation of the effects of particular policies on bushmeat hunting behaviour is complex, since it presupposes an evaluation framework and criteria. Furthermore, a detailed evaluation of policy effects requires context-specific information

¹The hunting of wild-caught game, either for consumption or sale. Bushmeat ranges from invertebrates, through rodents, to carnivores such as mongoose and civet cats, ungulates and larger species such as elephant, chimpanzees, monkeys and gorilla.

²Trade in bushmeat may occur in various contexts: at a community level, it involves hunting for subsistence and sale to markets. At the market level, trade flows occur between various actors, including traders, butchers, restaurateurs or chop bar owners, and final consumers (Mendelson *et al.* 2003). In some countries, bushmeat is exported, for example to European markets.

³Integrated assessment involves taking into account environmental, economic and social aspects and could involve the utilization of techniques such as the valuation of environmental resources, SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis and participatory appraisal.

*To whom correspondence should be addressed.

E-mail: d.crookes@hotmail.com

E-mail: e.j.milner-gulland@imperial.ac.uk

that is difficult to obtain and use at this level of analysis. Cognisance should also be taken of the greater socio-political context, since other policy decisions may also affect bushmeat (for example, timber logging or agriculture). A broad range of criteria may be used to assess policy impacts of measures for improving the sustainability of the bushmeat trade. We focus on four key criteria: (1) impacts on the supply chain (including what part of the distribution chain is targeted), (2) conservation effectiveness, (3) enforcement costs and (4) success of the policy in terms of overall compliance.

In assessing the impacts of a policy on the supply chain, two questions may be asked. Firstly, what is the nature of the policy? In other words, who are the target groups (*e.g.* hunters) affected by a particular intervention, who implements these policies (*e.g.* wildlife authorities) and at what level they are applied (*e.g.* market, community)? Secondly, what is the subsequent effect on the flow of bushmeat along the supply chain, and more specifically, the incomes of those involved in the bushmeat trade?

THE NATURE OF POLICY INTERVENTIONS

Two broad types of policy are distinguished. The most common types of policy are those whose primary aim is to target bushmeat supply, either directly or indirectly through the market. Examples include protected areas management policies, and supply side restrictions such as gear, species and seasonal restrictions on hunting. A second category of policy is that which mitigates the effects of a reduction in bushmeat supply. Examples include providing alternative sources of protein and promoting alternative income sources. The reasons for classifying these as mitigating measures are: (1) The effects of these policies on wild-caught species is uncertain (for example, increased income might increase the demand for bushmeat; Damania *et al.* 2005); and (2) the long-term viability of such policies, particularly in West Africa, is uncertain (*e.g.* feasibility may be low in the short term when bushmeat prices are low and as a result production costs exceed income, but may increase as bushmeat becomes increasingly scarce).

Based on the overall market structure of the bushmeat trade in many West African countries, it is possible to identify at least four groups of people who are likely to be affected by policy interventions in the bushmeat sector: hunters, intermediaries (including restaurateurs, traders and butchers),

subsistence consumers (mainly in rural areas) and commercial consumers (mainly in peri-urban or urban areas). Table 1 indicates which of these groups are targeted by various policy interventions. It is evident that most of the supply side and protected area management policies are targeting one group (hunters), whilst market restrictions, taxation and education could be applied to various groups. It is also evident from the table that policies aimed at targeting specific groups should also develop mitigation measures that reduce adverse impacts on those directly affected (*e.g.* through promoting alternative livelihood activities).

Different bodies or stakeholders may also implement a particular policy. For example, policies focussed on hunters could be community based or implemented in a top down manner by authorities. Furthermore, whilst supply side policies are more likely to be implemented by wildlife authorities, monetary and fiscal authorities will probably undertake market-based interventions, whilst community based interventions may be facilitated by non-governmental organizations.

Often, these agents are active at different levels of intervention with different priorities. For example, wildlife authorities may be active at a community level, whilst fiscal and monetary authorities will be active on a market level. Husbandry promotion may occur on a peri-urban or community level. Where different authorities are involved in different levels of interventions, this is likely to increase the complexity of managing policy impacts and emphasizes the importance of forging partnerships between institutions.

IMPACTS ON THE SUPPLY CHAIN

A framework for evaluating the impacts of policy interventions on the supply chain is given in Fig. 1. Regardless of the target of a particular policy, different components of the supply chain will be impacted in different ways. For example, a policy impact aimed at hunters (*e.g.* species or gear restrictions) may impact hunters in that behaviour may change. However, this does not necessarily imply that bushmeat supply is reduced. Hunters may increase effort to compensate for restrictions, so that overall supply is unchanged.

In terms of the outcomes predicted by this framework, these are either: (1) minimal impact, (2) impacts on hunters only, (3) impacts on hunters and intermediaries, (4) impacts that are dependent on the target of the policy (*i.e.* it is not possible to generalize on the outcome of the policy interven-

Table 1. Nature of bushmeat policies: target groups, implementing agents and levels of intervention.

	Hunters	Traders and other intermediaries	Subsistence consumers	Commercial consumers
Policy	Spatial management policies ¹ Supply side measures ² Market bans (where hunters supply market)	Direct taxes on trade Market bans (where traders collect from hunters)	Change preferences (e.g. education)	Taxes on market prices Change preferences (e.g. marketing)
Implementing body	Communities/Authorities	Authorities	NGOs, Other Authorities	Authorities
Mitigation measures (in response to decreases in supply)	Promote alternative income sources (e.g. agriculture) Education (to develop alternative livelihood skills)	Promote alternative income sources (meat and/or other) Education (alternative market behaviour, skills development)	Game species rearing Non-game species rearing also food imports	Game species rearing (not applicable where market bans in force) Food imports More investment in e.g. fishing
Level of intervention	Various ³	Market based	Community based	Community or peri-urban based

¹Examples of spatial management policies include the establishment and enforcement of protected areas, and management through the use of buffer zones, sources and sinks and the establishment of core areas of supply.

²Examples of supply side measures include equipment (gear) restrictions, restrictions on the species that may be hunted, quotas on the numbers of individuals that may be hunted, seasonal hunting policies, and quotas on the number of hunters allowed to operate in a particular area (for example through privatization of the resource).

³For example, protected area policies are implemented on an ecosystem-level, and the market bans are market level. Many policies (such as supply side measures) may be more effective if implemented on a community level (see Fig. 2).

tion) and (5) the whole supply chain is affected. Key criteria are the extent to which bushmeat supply is actually affected, whether hunter behaviour is influenced, and whether consumption is changed. Furthermore, the responses of intermediaries are also important factors. For example, whether existing suppliers promote alternative products, or whether new markets and supply networks are established.

APPLYING THE FRAMEWORK: THE CASE OF GHANA

Ghana is part of the Guinea Forest Ecosystem, a unique biogeographical area which comprises one of the world's biodiversity hotspots (Myers *et al.* 2000). At least 17 species that are hunted for bushmeat, many of which are endemic to the region, are on the IUCN Red list of threatened species (Eves & Bakarr 2001), and one primate, Miss Waldron's colobus (*Piliocolobus badius waldronae*), was once believed to be extinct

although new evidence suggests that a small number may be living in the southeastern corner of the Ivory Coast.

Wildlife in Ghana is principally managed through a system of protected areas, a closed season and through restrictions on species that may be hunted. Furthermore, hunters are required to be in possession of a game license and a game and trophy export permit for removal of game from the country. Other restrictions on hunting include prohibitions on the use of gin traps and hunting in groups. An impact matrix provides some indication of the effect of existing policies (Table 2).

The closed season spans from 1 August to 1 December (Crookes *et al.* 2005), in which no species may be traded on the market with the exception of grasscutters (*Thryonomys swinderianus*). However, market data indicate that, for some markets at least, trade in restricted species has continued in the closed season (Ntiemoa-Baidu 1998). An elaborate supply chain

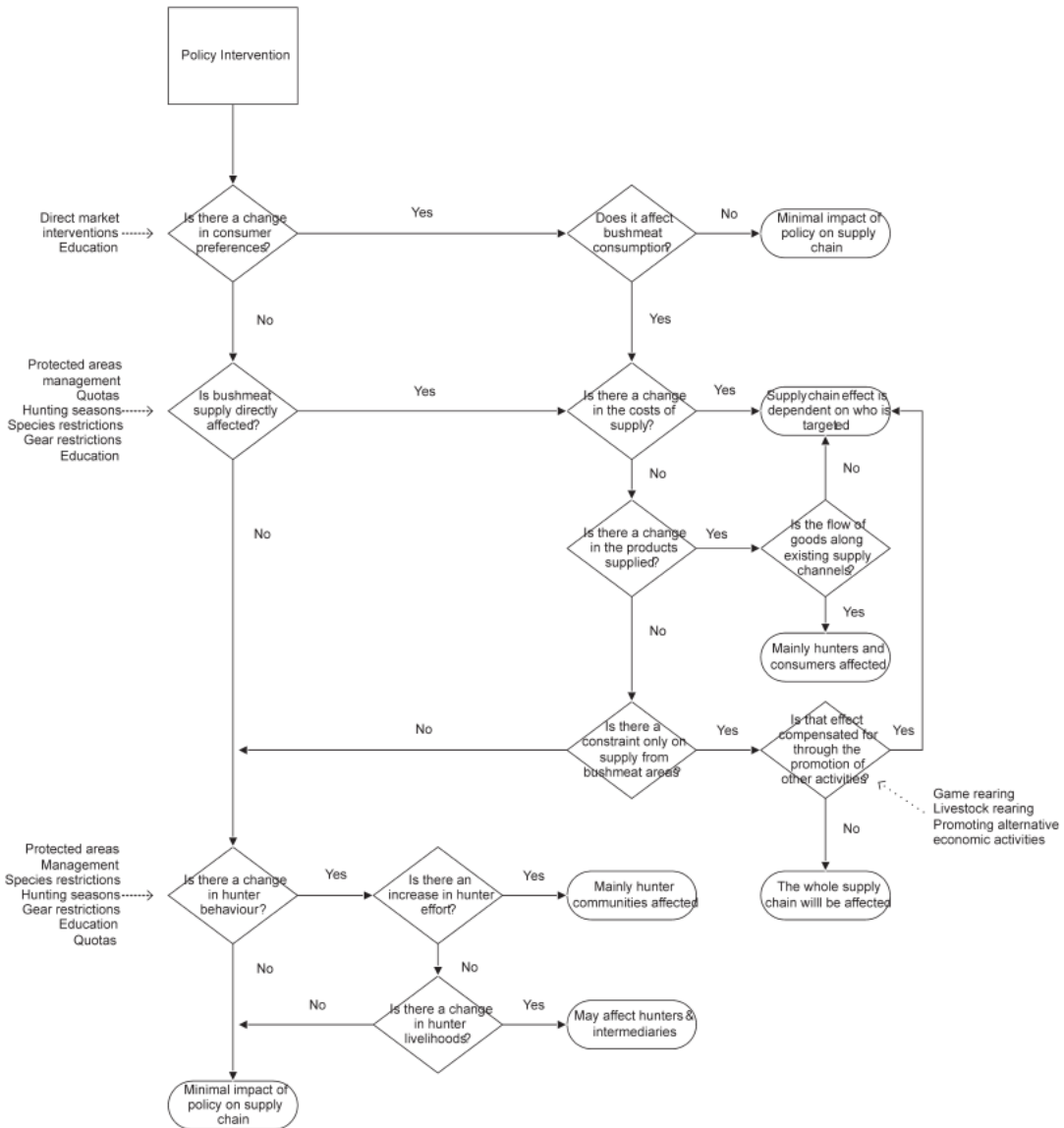


Fig. 1. Framework for evaluating the impact of policy interventions on the supply chain.

exists, where hunters sell to the ‘market queens’ – wholesalers who determine the bushmeat prices. Usually the meat is then transferred to ‘chop bar’ owners via the butchers, who then prepare the bushmeat for sale to consumers. Profits from the sale of bushmeat in the Atwemonom market in Kumasi in 1993 ranged from 40% for bushbuck (*Tragelaphus scriptus*) to 129% for grasscutter (Ntiamao-Baidu 1997). The bushmeat trade is highly lucrative, and was estimated to be worth US\$350 million in 1998 (Ntiamao-Baidu 1998).

The situation in Ghana is not atypical of conditions in other countries throughout the region, and highlights the need for innovative approaches to managing wildlife in these areas.

TRADEOFFS BETWEEN CONSERVATION, COSTS AND COMPLIANCE

In this evaluation a generalized trade-off diagram is developed (Fig. 2), where it is argued that: (1) in the absence of mitigation measures, the higher the conservation effectiveness, the greater the impact on the rural livelihoods of those dependent on the

Table 2. Policy impact matrix for bushmeat in Ghana. Impacts under the PIM are assessed as high (H), medium (M) or low (L), positive (+) or negative (-). Blank cells indicate areas where we currently expect negligible impact.

Policy	Bushmeat supply	Cost of supply	Hunter behaviour	Extent of supply chain affected
Closed season	(-L)		(-L)	(-L) Entire
License fees		(-L)		
Species restrictions	(-L)	(-L)	(-L)	(-L) Hunters
Fines for contravention		(-L)		

Own analysis based on Ntiemoa-Baidu (1997, 1998) and Damania *et al.* (2005).

bushmeat Trade⁴; And (2) the lower the likely compliance rates are, the greater the enforcement costs would need to be to ensure greater conservation effectiveness. Following from these two observations, it is concluded that, in general⁵, there will be a negative relationship between conservation effectiveness and compliance. In other words, the higher the impact on livelihoods are likely to be, the lower the incentive to comply with legislation and the higher the enforcement costs would need to be to ensure compliance. Fig. 2 illustrates the categorization of policy interventions (in the absence of mitigation) in terms of these trade-offs.

It is argued that strict protected areas management interventions (command and control methods) are most likely to promote conservation; however these come at a high livelihood and enforcement cost, since voluntary compliance is expected to be low. In general, supply restrictions are likely to provide a lower level of conservation effectiveness (although these will vary depending on the type of supply restriction that is introduced). These policies may be preferable in that livelihood effects are likely to be somewhat reduced. For both protected areas management and supply restrictions, a shift in involvement towards more community-based approaches is likely to improve compliance, and may also improve conservation effectiveness (in the case of supply restrictions). However, this does not necessarily result in cheaper law enforcement compared with enforcement by national agencies⁶. For community-based approaches to be cheaper assumes that (a) communities have the authority to regulate their own members and have the social capital to do so,

and (b) communities have the military and judicial capacity to enforce regulations on outsiders.

CONSIDERATIONS FOR PLANNING POLICY INTERVENTIONS

The preceding discussion highlights the importance of several stages in developing appropriate policies for managing the bushmeat trade. First, policy-makers usually require specific information on the (potentially) affected area in order to assign priorities for intervention. For example, there is a need to understand the vulnerability of the species in the hunted area, the sustainability of existing harvesting practices, and the sensitivity of affected communities (urban and rural) to changes in supply. This type of information will tell policy-makers where the balance lies between promoting sustainable livelihoods and conserving vulnerable species.

Based on this information it is possible to develop criteria for evaluating an intervention. For example, a policy target may be to ensure that sustainable populations of all critical species are maintained, while minimizing the net welfare losses or maximizing the net welfare gains of society. In this critical stage, the decision-makers need to trade-off economic, social and environmental factors and assign priorities.

Third, policies should be identified that minimize the trade-offs between the various factors, based on the vulnerability of affected populations. Potentially conflicting factors include the likely conservation effectiveness, costs of enforcement, and expected compliance in the absence of enforcement. Policies should be evaluated in terms of their potential impact on consumers, producers, and on biological populations. For example, where the need for conservation is low, market interventions may be sufficient in the first instance. However, if conservation priorities increase, it may become necessary to impose increased levels of hunter

⁴This would not be the case where hunters are selective and vulnerable species are seen as locally significant and not a target.

⁵The general principles discussed in this paper are always subject to exceptions in practice. Indeed, these exceptions are what conservation managers strive towards.

⁶We are grateful to an anonymous reviewer for highlighting this point.

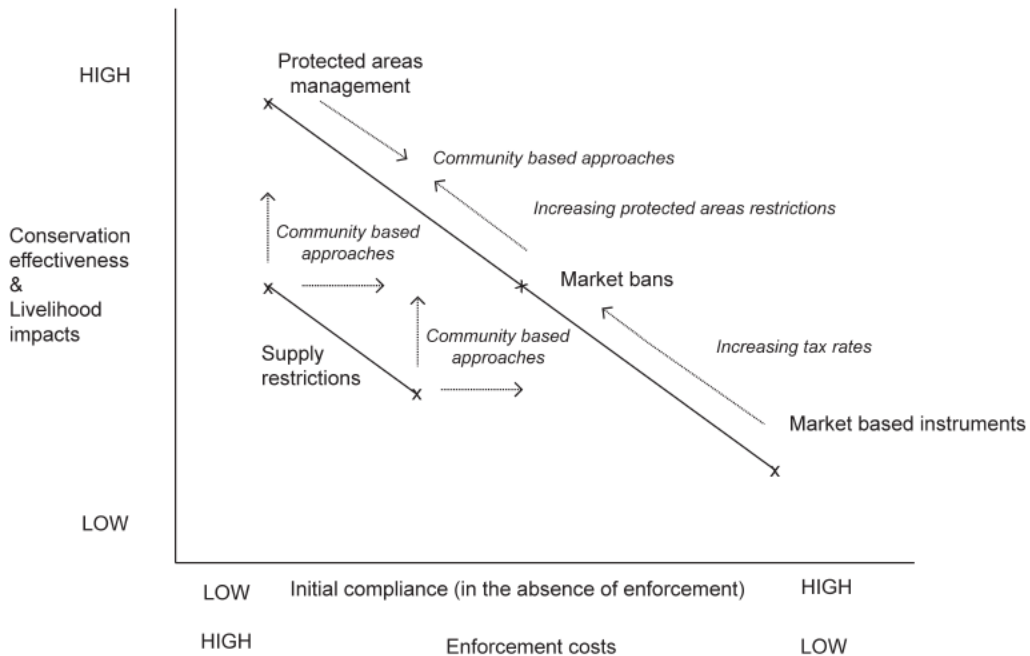


Fig. 2. Trade-offs between costs, compliance, conservation and livelihoods.

restrictions. Similarly, the more vulnerable hunters and consumers are to changes in bushmeat supply, the greater the need for mitigation measures, or more pro-active enforcement measures. The sensitivity of target groups (for example the extent to which preferences may be influenced) is also important for determining the effectiveness of policies.

The timing of the implementation of these policy measures is critical. In many instances, it is necessary to ensure that specific social safety nets are in place before a policy measure is implemented. For example, it may be necessary to provide viable economic alternatives to bushmeat through the stimulation of game ranching and other income generating activities. Awareness-raising is also important, not only as a measure to reduce demand but also to facilitate increased understanding of the reasons for a particular policy intervention. This will reduce antagonism and may also promote compliance once a policy is introduced. A gradual, phased approach is therefore recommended in all instances.

Finally, monitoring, adaptive management (*i.e.* revising management based on the outcomes of monitoring) and communicating the results of the intervention to broader society (to act as evidence for planning future interventions) is required.

CONCLUSION

Management of the bushmeat trade is a very complex issue, requiring interventions that are context specific and culturally relevant. Given the wide range of policy options available and in use, it is evident that no single approach is likely to be applicable in all contexts. In addition, no single approach is likely to be sufficient to ensure that the needs of all the various stakeholders are taken into account of in the best possible way.

We have highlighted the importance of policy impacts, not only in relation to the underlying biological population, but also on hunters, consumers and intermediaries involved in the processing of and trade in bushmeat. The range of policies, potentially affected groups, levels of interventions and potential implementing bodies highlight the need for a holistic evaluation of policy interventions for all those involved in the bushmeat trade.

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