

Importance of bushmeat hunting and trade in Papua

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Abstract

In Papua Province (East Indonesia) the great majority of the indigenous people depend on plants and animals extracted from natural forests. Bushmeat hunting is critically important in satisfying people's need for meat as a source of protein as well as cash income for households and communities. Bushmeat is considered as a "premium" good, because it has a high value per unit of weight compared to most other forest products. This hunting of animal for food and income has been recorded as unsustainable in many tropical areas. In Papua, however, there have been very few studies on bushmeat hunting and on the link between hunting and trade as part of the livelihoods of local people. This paper presents the results of studies on bushmeat hunting across 11 ethnic groups in Papua for the last 10 years. Bushmeat is the most important non-timber forest products that contribute significantly to protein intake and nutritional needs (100%) and to income via sale (55%) of households. In the highland, hunting off take is 5.8 ton/6 months (N = 5 hunters), while along the coast it is 19 ton/ 7 months (N = 33 hunters). Although main hunted animals vary from one place to another, wild pigs and deer, two exotic invasive species are the most commonly hunted and traded species for 90% of the ethnic group studied. This has interesting implications for biodiversity. We documented a wide variety of hunting techniques: people use bows and arrows, spears, machetes, nylon snare traps, dogs and shotguns. The shotgun is quickly becoming the main hunting technique in more than half of the sampled groups but hunters typically use more than one technique depending on the targeted prey. In places that have been opened up by roads, the main purpose of hunting shifted from subsistence to commercial hunting and the estimated value of tradeable meat looks promising. The middlemen travel regularly to purchase meat from the villages and bushmeat sold in urban markets fetch higher price. In our last survey along the coast, five different types of actors were involved and their roles are reasonably well defined from the extraction to trading processes in the bushmeat trading circuit.

Keywords: Bushmeat hunting, trade, subsistence, livelihood, Papua

Introduction, scope and main objectives

Wildlife hunting is important in satisfying people's need for meat as a source of dietary protein as well as economic value to communities. Furthermore, it may also offer other forms of income generation. Wildlife products are valuable commodities, and wild meat is considered as premium value, because it has a high value per unit weight compared with other forest products (Williamson, 2002).

Many people in West Papua rely on the benefits obtained from the extraction of plants and animals in the tropical forests. Currently, limited access to domesticated meat and the easy availability of wild meat from the forest are major reasons for those who live in remote areas participating in hunting. Gathering and hunting activities conducted for the purpose of obtaining food and collecting

ceremonial materials also play important roles in their traditional cultural life. For instance, hunting of some bird species is performed for both meat supplies and for acquiring their colorful plumes for traditional costume decoration.

Studies on the impact of hunting have been widely published, and it was found that hunting to obtain food and to gain extra income in tropical rain forests created a potential massive loss of wildlife throughout the tropics, and some forest areas vulnerable species have been extirpated (Robinson and Bennett 2000; Bennett *et al.* 2002; Bennett 2002).

Our knowledge of hunting in Papua is unfortunately behind similar research in the Neotropics and Afrotropics, even our neighboring Papua New Guinea. There have been few studies on wildlife hunting in West Papua; most observations have been anthropological in nature, designed to identify hunting systems and hunting justification by localised communities with little attempt to generalise the results across broader geographic or conceptual areas. However, despite the importance of this process in biodiversity conservation and the biodiversity value of the forests of New Guinea, there has been limited research on wild animal exploitation for various purposes. The significance of hunting and its importance in the household livelihoods of the people is poorly documented (Petocz 1994; Pattiselanno and Koibur 2008; Pangau-Adam *et al.* 2012; Pattiselanno and Arobaya 2013).

This study focuses on bushmeat hunting and trade among in Papua. We documented the importance of hunting and bushmeat trade by different ethnic groups in Papua and West Papua provinces.

Methodology/approach

Survey was conducted opportunistically during a fieldwork of the first author to 11 sites within Papua and West Papua provinces from 2004 to 2014. The study sites were Yongsu, Jayapura; Dasigo, Mamberamo; Biak, North Biak; Botawa, Waropen; Napan, Nabire; Kebar, Tambrau; Meyakh, Manokwari; Babo, Bintuni; Mpur, Amberbaken; Karon, Abun and Maybrat, Sorong Selatan.

In each village, we worked in close collaboration with the leaders to ensure villagers understood the rationale and aims of the study and to seek their consent to identify 10 active hunters to partake in the interviews. Semi-structured interviews using protocols and questionnaires developed by the Wildlife Conservation Society (Rao *et al.* 2005) were conducted. Interviews were conducted individually by visiting hunters at their home.

We also collected information on hunting techniques, preferred game species, motivation and hunting off takes. Photographs were used to aid in proper identification of hunted species. To reduce potential mistakes, biases and failing memories we sought to corroborate the information collected and also interviewed elders, tribe leaders, village chiefs and religious leaders. Information on the importance of bushmeat hunting was gathered through interviews and selected hunters from Kebar (n=5) and Amberbaken and Abun (n=33) those who involved in the detailed off-take study. Kebar was located at the highland while Abun and Amberbaken were located along the coastal site of The Bird's Head Peninsula. Results of the study were presented in percentage (number of ethnic groups among the studied groups).

Results

Hunting was conducted for a variety of purposes including for family consumption, trade, festive and crop protection. Of the eleven ethnic groups, all (100%) stated that they hunted for consumption purpose, 72% or 8 groups hunted for festive, 45% or 6 tribes hunted for trade and 36% or 4 groups hunted for get rid of pest.

Different hunting preys were acknowledged in the last hunting excursions in the previous three weeks prior to the interviews. Two species that most commonly hunted and traded by 90% of the ethnic groups were two exotic invasive species - wild pigs and deer.

A variety of hunting techniques were documented in the study sites. Hunters used bows and arrows, spears and machetes (active techniques), nylon snare traps (passive technique), hunted with dogs or using guns. Each hunter typically used more than one technique depending on the target prey. The shotgun is quickly becoming the main hunting technique in more than half of the sampled groups.

Hunting off takes from the highland was sampled from Kebar, in collaboration with five hunters. Total hunting off takes from five hunters during 6 month observations in Kebar was 5.8 ton. Along the coastal landscape, the total off take during seven month observations from 33 hunters was 19 ton.

Trading was mostly conducted by hunters along the road sides. Although we did not record all market transactions, live animals which were still in good condition were sold in life. This view is gained from the hunters' motivation for hunting being mostly for achieving a cash income. Our finding on the highland indicates a total of 3,480 kg of dressed weight of deer and wild pig were harvested. Along the coastal, we records a total of 11,475 kg of dressed weight of deer, wild pig, cuscus, tree kangaroo and dusky padamelon were harvested.

A tradeable meat at the local price per kilogram being Indonesian Rupiah (IDR) 10,000 and 5,000 for venison and bacon respectively at the highland in 2001. Along the coastal, the tradeable meat was priced IDR 25,000 for venison and IDR 15,000 for bacon in 2014. The hunted catch was valued at IDR 27,150,000 at the highland and IDR 320,625,000 on the coastal.

The actual production of bushmeat for the consumers in the nearest towns has four primary steps. First was the extraction from the hunting tenures (primary forests, secondary forests, along the riversides and the crop land). Dressing sometimes was done at the hunting sites, but more often it was done in the villages. Further, meat was transported to the villages and the processing step could also run in the villages. Once arrived at the villages, meat could be sold directly to the middlemen in the villages, or sometimes the middlemen from towns that operated along the coast. The meat was later transported to the town to the traders or directly to the restaurants. So far only fresh carcasses or sometimes live animals were formally traded.

The roles of different people particularly along the coast are reasonably well defined with respect to bushmeat extraction (hunters only), dressing (hunters and middlemen) and trading (middlemen, market traders). Transportation to the market was the responsibility of the middlemen supporting the trading circuits in the bushmeat commodity chain.

Discussion

Hunting practices

The contribution of wild meat from hunting to household meals was significant in Papua and it was similar to other parts of the world such as Asia, Africa and Latin America that has been widely published. Bushmeat consumption varies between communities. Some people consume it because it is acknowledged as a high class meal, but in Papua, bushmeat is consumed because of the cultural background, it is also affordable, familiar and the most accessible animal protein in the remote areas compared to domestic meat. Limited or no access to alternative sources are other factors influencing bushmeat consumption, and consequently in some cases people still rely on wild meat and cannot readily make the switch to other sources. In Papua, the geographical barrier is the reason why native Papuan relies on bushmeat consumption (Pattiselanno 2006).

Half of the ethnic groups hunted for gaining cash income from bushmeat trading acknowledged the reliance of the local communities on hunting because it was an important alternative source of family revenue. The introduction of a cash market economy, combined with rapid urban and infrastructure development such as road connections have brought a significant change in hunting purposes and practices in this region.

Results from hunting support all communities with different amounts of income. This has also been experienced by local communities in the Philippines, Ghana and India (Shively 1997; Mendelson *et al.* 2003; Hilaluddin *et al.* 2005). It was clear that there was an extreme increase in hunting to meet fast-growing markets for wild meat in nearby urban centres.

Larger numbers of wild pig and deer brought home in the last hunting trips, not only indicated the abundance of this species in the study sites, but also supported the practice of hunting which was mainly for consumption as well as trade. The range of species taken is determined by the hunter's assessment of its profitability. Deer and wild pig are targeted because they provide a large amount of meat for both consumption and sale purposes.

In reference to reasons for hunting, in most cases, bushmeat markets mainly sell ungulates such as deer and wild pig. These species are the most important source of income where trade has been documented (Fa and Brown 2009; Robinson and Bennett 2000; Milner-Gulland and Clayton 2002).

Different hunting techniques yield different amounts of target animals. Hence, there is a trend for certain animals to succumb to specific tactics, and the most appropriate method can be used for particular species-specific behaviours. The use of traps (passive technique) clearly connected the techniques used to kill prey such as deer and pig. Trapping requires little or no money to build traps and snares because they can be built from forest materials and nylon, or ropes that can be reused.

The use of active techniques (bows and arrows, spears and machetes) was also predominant, and these methods were widely practiced in tropical Asia (Corlett 2007). The use of active and passive hunting techniques indicated the reliance of hunters on traditional hunting techniques. The higher percentage of hunters hunting with dogs was strongly related to the beliefs by the local communities that dogs have a strong instinct to locate and kill prey, and they can also protect hunters and their families from evil spirits. Despite relying on traditional hunting techniques, half of the ethnic groups using guns to kill animals and this suggests the notion that the cultures of hunters are currently changing, as they all have access to this modern hunting technique.

Hunting returns

Despite the importance of hunting for consumption, our data expresses that in both sites, hunting for sale is also essential for local livelihoods. The hunting returns may only contribute to local economy, but it is important to household income in the study sites. Our finding was in contrast to studies from the African and American continents as it was found that bushmeat trade in west and central Africa was not a small economic activity.

Sometimes, venison was transported to the nearest district where the meat was sold to non-Papuan natives, mostly Muslim at the transmigrant settlements. In this study, the harvest rates of particular species were also more likely to be influenced by market demand and consumer preference for particular bushmeat and the market value was promising. Similar to other studies around the world, it was clear that trading was conducted in the rural sites in these study villages and meat was transported into the market in town.

Bushmeat trading circuits

The bushmeat trading circuit along the coast was different compared to the African situations. The difference is shown through the participants involved in trading and the flow of meat passed from the forests to consumers in towns and the commercial relationships among participants.

In this study we only found part-time hunters with different backgrounds or occupations, but most of them were farmer hunters. In most cases, hunters had a connection with dealers who are responsible for selling the meat to the market traders or restaurant owners.

In this study dealers who operated their own vehicles usually purchased meat in large volumes and they were tied to particular hunters who supplied them with meat. Some of our interviewees expressed how they worked with particular dealers in special relationships and their views mirrored those hunters in North Sulawesi, who are tied to particular dealers, because dealers provided them with string for making snares (Clayton and Minlner-Gulland 2000). In reality, hunters could sell their meat to any dealers they wanted, but dealers who provided them with string for snares usually had to be prioritised in trading.

Market traders used to operate in the local markets where they had stalls to sell their goods and usually they were not specifically selling wild meat. Market stalls although not regularly available, could be found in the nearest town. Markets were opened the whole week, but wild meat stalls were all most reliant on the supply of meat from dealers.

Restaurant owners were among the wild meat retailers in this study. Most of the restaurants sold meatballs from venison. Restaurant owners were among the wild meat retailers in this study. Most of the restaurants sold meatballs from venison.

Conclusions/outlook

The fact that wild meat was mostly consumed across the study sites indicates the very critical requirement of an animal protein source in the diets among the ethnic groups. Economically, hunting was also important livelihood for local communities.

The development of the provinces tended to replace traditional hunting methods using bows and arrows, spears, machetes, traps and dogs with the modern hunting technique of using guns.

Hunting pressure on particular target species such as rusa deer and wild pig may divert hunting pressure from more threatened wildlife species, in particular the endemic New Guinea species of cuscus and tree-kangaroos that might have been harvested unsustainably.

Intensive study to assess the impact of hunting on the biodiversity value and long-term sustainability of wildlife populations should be conducted to provide baseline information on hunting and local livelihoods in Papua.

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