International Trade of Peccaries pelts and benefit sharing

Dr. Marina Rosales Benites de Franco

Abstract

International trade of tanned leather of *Pecari tajacu* Linnaeus, 1758 “Collared Peccary” and *Tayassu peccary* Link, 1795 “White-lipped Peccary,” has had a low social sustainability indicator 0.3519 and a medium level economic sustainability indicator 0.5248. Furthermore, this influence for social and economic sustainability which has led inequitable benefit sharing in trade chain. Therefore, the fifty million dollars generated in the marketing chain (1986 - 2011) had no influence on the welfare of the affected regions and the participation of economic benefits, which is not significant for native communities or local people. Corresponding to the total generated 7% to hunters in economic benefits, 12% to the local gatherer, 15% to the city gatherer, 62% to the industrial and exporters and 4% to the National Wildlife Authority. This inequitable of benefits distribution does not encourage the conservation and sustainable use of *P. tajacu* and *T. pecari* populations in Peru.

Keywords: International trade, conservation, peccaries, profit sharing, skins, hides, tanned leather.

1.0 Introduction

International trade in tanned leather of *Pecari tajacu* Linnaeus, 1758 “Collared Peccary” and *Tayassu peccary* Link, 1795 “White-lipped Peccary,” is an economic activity derived from the activity of hunting by indigenous communities and the local people. This activity is characterized as the result of a subproduct of the main activity which is bushmeat hunting to feed of communities and for sale to the local and regional markets. International trade in tanned leather for the period 1986 - 2011 studied by Rosales (2016) is the baseline for conducting the assessment of benefit sharing in the marketing chain of these hides and skins for this period. The scope of the study are the regions or departments¹, where trade in hides and skins of collared peccary and white-lipped peccary come with official permits, corresponding to Loreto, Pasco, Madre de Dios, San Martin and Ucayali, which is referred to in this study as regions affected.

It is required to know whether international trade in the tanned skins of populations of *P. tajacu* and *T. pecari* influences the social and economic welfare of the affected regions. Knowing well that the sale of skins at local and regional level has been considered as a secondary activity, the main trade is meat. Therefore, the questions are: How did international trade influence in the socio-economic welfare of the affected regions? And how were the benefits sharing in this trade?

In the aforementioned context, the results of the influence of international trade in skins tanned of peccaries in the social and economic aspects of the affected regions, the marketing chain and its relation to the sharing of benefits and its characterization.

2.0 Objectives/Purpose of the study

Determine the influence of international trade in skins tanned *P. tajacu* and *T. pecari* on the socioeconomic wellbeing of the affected regions.

Know benefits sharing derive from this international trade in skins tanned of *P. tajacu* and *T. pecari* and its characterization in the marketing chain

3.0 Methodology

This research was conducted with primary and secondary information. The primary information collected on field were from the visits to markets iquitos, Puerto Maldonado, Pucallpa and Tarapoto; and, conducting informal surveys to local people, collectors, traders at the markets (Tingo Maria, iquitos, Pucalpá, Tarapoto and Puerto Maldonado) and formal surveys to scientific researchers and forest and wildlife authorities. Secondary information was derived from publications on international trade in peccaries (Rosales, 2016); statistics social and economic variables (INEI, 2007; INEI² ³ ⁴ ⁵); information from scientific studies on these species as biology, ecology and local trade (Fang, 2003; Fang et al., 2010); information on the surface of natural tropical forests (INEI, 2014) and deforestation (MINAN, 2009) of the affected regions, and licenses or export permits peccaries with data on Free On Board (FOB) from CITES Management Authority, the Forest and Wildlife Authority of Agriculture and Irrigation Ministry.

The study area corresponds to the departments or regions of Loreto, Ucayali, San Martin, Pasco and Puerto Maldonado, referred herein as affected regions (Annex 1). Determining the influence of international trade of tanned skins *P. tajacu* and *T. pecari* on the social and economic welfare was made through the determination of social and economic sustainability. These indicators were based in ranges and
levels on the study of Rosales (2014). Social sustainability (SS) based on the inverse of the population in poverty (PP), illiteracy rate (TA) and the infant mortality rate (TMI) based on social statistics of INEI for 2011 on average of the affected regions.

\[
SS = PP \times TA \times TMI \quad \text{in English} \quad SS = PP \times RA \times IMR
\]

The influence of international trade on social sustainability was determined according to the following ranges and levels.

<table>
<thead>
<tr>
<th>Ranges</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.9 - 0.7</td>
<td>High</td>
</tr>
<tr>
<td>Less than 0.7 - 0.6</td>
<td>Media</td>
</tr>
<tr>
<td>Less than 0.6</td>
<td>Low</td>
</tr>
</tbody>
</table>

Economic sustainability (\(S_\epsilon\)) was determined as a function of the inverse of the Gini coefficient (IG) for 2011 (INEI, 2013) and the economically inactive population (EIP) based on the data of employment statistics INEI for 2011.

\[
S_\epsilon = IG \times PEI \quad \text{in English} \quad \epsilon S = GI \times EIP
\]

The influence of international trade on economic sustainability was determined according to the following ranges and levels.

<table>
<thead>
<tr>
<th>Ranges</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2 - 0.3</td>
<td>High</td>
</tr>
<tr>
<td>Less than 0.3 - 0.5</td>
<td>Media</td>
</tr>
<tr>
<td>Less than 0.5</td>
<td>Low</td>
</tr>
</tbody>
</table>

4.0 Result/Findings

International trade of peccaries tanned skins on social sustainability

International trade of tanned skins is not a hunting target specimens of \(P. tajacu\) "Collared Peccary" and \(T. pecari\) "White-lipped Peccary" in the Peruvian Amazon. The skins are marketed as a secondary activity of native communities or local people. Individuals of these species are hunted for their meat as bushmeat of family or community consumption, and for sale to the markets cities, for restaurants selling regional food and households at cities as a source of protein. The skins are sold by native or local communities who have learned skins treatment.

The circuit of marketing of fur from subsistence hunting mainly includes hunters, a set of intermediaries that are local, regional and national collectors or stockers to sell to industrialists, exporters and importers, both in fur or tanned leather and finished products. (Llelish, 2001; Fang et al., 2010 y Rosales, 2016).

The origin of skins corresponds to the departments or regions of Loreto, San Martin, Ucayali and Pasco, averaging 42%, 10%, 47% and 1% respectively. Peru exported in the period 1986 - 2011, 1'201,524 of Collared Peccary and 405,938 White-lipped Peccary. In addition, exports of products made with these tanned leather as clothing, leather goods and shoes.

The higher percentages were exported to Germany and Italy, finished products and clothing to France, Germany and the United States in the case of products made from leather products of Collared Peccary and, products made leathers of White-lipped Peccary to Germany and the United States (Rosales, 2016).

The peccaries skins come from Loreto, San Martin, Ucayali, Pasco and Madre de Dios, the first three department reported the largest amounts of trade.

Their social indicators are detailed in Fig. 1. Loreto and San Martin were the departments with the largest population; however, the population density per square kilometer were higher in San Martin 14 inhabitants / km2 and Pasco 11 inhabitants / km2, which is correlated with the highest rates of deforestation at San Martin 41% and Pasco 21% on their forest surface in 2000, corresponded to 69% and 57% of its departmental territory, calculated based on data published by INEI (2007). Fig. 2.

The employed population with incomes below the extreme poverty line was on average higher in Loreto (34.23%) and Pasco (33.87%) (Fig. 3), consequently the mean percentage of the population living in poverty was higher for Pasco 62.36% followed by 62% Loreto, 49.72% Ucayali, 47.53% San Martin and 25.31% Madre de Dios (Fig. 4).

The incidence of poverty is higher in Pasco (63%) and Loreto (55%), the infant mortality rate of children under one year⁶ in Loreto (28) and Ucayali (25) and the illiteracy rate⁷ of the rural population is greater in Ucayali (14.3%) and San Martin (13.3%). Fig. 5.

⁶The Republic of Peru is territorial organized in 26 regions or departments in the legal system. They are the largest subnational entities in the country, they are autonomous government in political and administrative matters defined (Rosales, 2016).
⁷https://www.inei.gob.pe/estadisticas/indice-tematico/sociales/
⁸https://www.inei.gob.pe/estadisticas/indice-tematico/ocupacion-y-vivienda/
⁹https://www.inei.gob.pe/media/cifras_de_pobreza/pobreza_informetecnico2013_1.pdf
**Fig. 1:** Population and density per capita from suppliers departments of skins peccaries.

![Graph showing population and density per capita for different departments.](image)

**Source:** Made by myself. Based on data INEI (2007). Censos Nacionales 2007. IX de Población y VI de Vivienda.

**Fig. 2:** Density per inhabitant and the percentage of deforestation of tropical forests from departments suppliers of peccaries skins.

![Graph showing density per inhabitant and deforestation percentage.](image)

**Source:** Made by myself. Based on INEI (2007), MINAM (2009) y INEI (2014)
**Fig. 3:** Employed population with incomes below the extreme poverty line (%) by department or region.

**Source:** Made by myself. Based on ENAHO (2001 - 2010)
http://proyectos.inei.gob.pe/web/biblioinepub/bancopub/Est/Lib1012/obj01.htm

**Fig. 4:** Annual Percentage of population living in poverty by department or region.

**Source:** Made by myself. Based on ENAHO (2001 - 2010)
http://proyectos.inei.gob.pe/web/biblioinepub/bancopub/Est/Lib1012/obj01.htm
The international trade of skins tanned *P. tajacu* and *T. pecary* presented a low social sustainability index 0.3519, according to the data of social indicator for 2011\(^8\) (Annex 2), the average values for the regions affected, this business was not significant for local people at departments studied. In this regard, international trade of this tanned skins derived from subsistence hunting has not had influence on the participation of benefits which they were depending on social variables for the affected regions. The fifty million dollars generated in the marketing chain (1986 - 2011) did not have influence on the welfare of the affected regions and, benefit sharing was not significant for native communities or local people.

International trade of peccaries tanned skins on economic sustainability – benefit sharing.

The marketing of tanned peccaries leather is given through middlemen who go to the native communities to buy bush meat and skins of peccaries. The gatherers are people who go to communities by boat (boat operators). The native and local communities usually exchanged furs for food and clothing. The gatherers cited are called minor collectors who sell dry skin to the city collectors, and they sell them to the industrial companies who are exporters of tanned leather or exporters of leather products.

The average selling prices in “soles” (Peruvian money) of skins and leather are detailed in Figure 6, on the basis of data published by Fang (2003), data from CITES Management Authority, the Forest and Wildlife Authority, Ministry of Agriculture and Irrigation, and the surveys. The ranges of values from hunters are S/.2.00 - S/.20.00 for *P. tajacu* skins and S/.2.00 - S/.15.00 for *T. pecari*, depending on the quality condition of skins. Sales values of intermediaries or middlemen are among S/.10.00 - S/.17.00 soles for *P. tajacu* and S/.5.00 - S/.7.00 for *T. pecari*. FOB prices reported by industrial exporters for the period 2001 - 2011, US $ 13.00 – US $ 63\(^9\) and US $ 11.00 - US $ 51.00 for *P. tajacu* and *T. pecari*, respectively. Nowadays, these FOB values could be USD $ 173 and US $ 142 for *P. tajacu* and *T. Pecari*\(^10\)\(^11\) . The gatherers collect per month between 40-100 skins and city gatherers between 1,000 - 1,500 skins per month, in the festive seasons these values increase. It is important to say that this data are referential to evaluate benefit sharing in this trading chain. It does not have purpose observe gains of exporters. This study recognize vital importance of exporters and their investment to improve economic growth and their contribution to energize local market.

The values of tanned pelts exported for the period 1986 - 2011 showed lower economic benefits for hunters, *P. tajacu* US $ 3’115,062 and *T. pecari* US $300.695; local gatherers *P. tajacu* US $ 5’340,107 and *T. pecari* US $ 902,084; for city gatherers *P. tajacu* 6’230,124 and *T. pecari* US $ 1’052,432; and for industrial exporters *P. tajacu* US $ 24’475,489 and *T. pecari* US $ 6’615,286.

State revenues to the right to use of tanned leather was 1’557,531 by Collared Peccary and US $ 526.216 by White-lipped Peccary. The highest values are presented for industrial exporters, eight times higher for *P. tajacu* and Twenty times for *T. pecari* from values hunters received by the native communities or local people. It is also important to state that the values received by the Forestry and Wildlife Authority were sixteen times lower for Collared Pecary and thirteen times lower for White - lipped Peccary in relation to FOB values registered. Fig. 7.

\[\text{Source: Made by myself. Based on INEI (2007).}\]

\* Rural population

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**Fig. 5:** Percentage of poverty incidence, mortality and illiteracy rate by department.

- **Incidence of poverty (%)**
- **Infant mortality rate**
- **Illiteracy rate**

- **Mde de Dios:** 15.6
- **Pasco:** 23.2
- **San Martin:** 22.3
- **Ucayali:** 12.5
- **Loreto:** 5.4

**Source:** Made by myself. Based on INEI (2007).

\(^8\) Per 1,000 live births
\(^7\) Percentage of the total population over 15 years old
\(^9\) 1 US $ = S/.2.7 nuevos soles el año del estudio 2011
\(^10\) https://www.datosperu.org/comercio-exterior-de-kero-productos-peruanos-de-exportacion-sa-20100108113-en-la-partida-41.php

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Under tanned leather exports during the period 1986 - 2011 (Rosales, 2016), the average annual benefit for hunters was US $ 124,603 by selling Collared Peccary pelts, US $ 12,028 White-lipped Peccary; local gatherers US $ 213,604 for Collared Peccary pelts and US $ 36,084 per White-lipped Peccary; the cities gatherers US $ 249,205 for Collared Peccary pelts and US $ 42,099 per White-lipped Peccary; and industrial exporters US $ 979,020 for tanned leather of Collared Peccary and US $ 264,619 for tanned leather of White-lipped Peccary.

The exporter must pay for right of use for marketing S/. 3.50 soles, considering this value for the period of exports mentioned, it is that the State, through the Forestry and Wildlife Authority received annual average US $ 62,301 and US $ 21,049 from tanned leathers of *P. tajacu* and *T. pecari*, correspondingly.

*P. tajacu* tanned skins exports were higher, whose exports account for 75% of total exported, and consequently, *T. pecari* exports represented 25%, according to records from
1986 - 2011 (Rosales, 2016), whereas exports are recorded from 1987, year that these species were included in Appendix II of CITES.¹²

The FOB values recorded by the CITES Management Authority - Peru (1995 - 2011) have higher values for P. tajacu leathers, it reflected in the marketing chain. Total FOB values for P. tajacu constitute 77% of the total and 23% T. pecari, their FOB values keep a correlation of 0.8242 with similar annual trends and decrease for the period studied. The highest values were given for the years 1996 and 2006 exports of tanned hides. The annual average FOB value is US $ 1'033,682 P. tajacu and US $ 312.120 T. pecari.

Fig. 8. Evolution Annual FOB values of peccaries leathers exported from 1995 - 2011.

The Gross Domestic Product (GDP), considering the annual data reported by INEI for the period 2001-2011 (Annex 3) and an annual average, Loreto generated 34% GDP of the five total departaments, San Martin 22%, followed by Madre de Dios 19%, Ucayali 18% and Pasco 7% (INEI, 2011). In this regard, Loreto produced US $ 1'120,466 million, Madre de Dios US $ 627,540 million, Pasco US $ 217,692 million, San Martin US $ 701,990 million and Ucayali US $ 598,504 million. These departments generated US $ 3'266,163 million annually. Exports of peccaries leathers generated US $ 1'345,802 annual average FOB. This value represented 4.12 X 10 -5 total GDP of the five departments; and, in relation to the economic benefit to the entire chain marketing US $ 2004,614, has represented a 6.14 X 10-7 total GDP.

The economic sustainability found for the affected regions presented an index 0.5248, on the basis of national data (INEI, 2011). The GDP value has generated medium influence on the economic welfare of the affected regions, mainly for exporters.

International trade in tanned leather P. tajacu and T. pecari populations during the period 1986 - 2011 generated US $ US $ 31’090,775 FOB value corresponding to total economic benefits generated US $ 50’115,026. From total value corresponded 7% for hunters in economic benefits, 12% for local gatherers, 15% for city gatherers, 62% for industrial and 4% for the Authority Wildlife, state institution (Fig. 9). Therefore, this analysis showed a disproportion in profits generated in the marketing chain. Disproportion of sharing benefits generated are related with conservation of these populations in their habitats.

¹²CITES: Convención sobre el Comercio Internacional de Especies Amenazadas de Fauna y Flora Silvestre

5.0 Discussion

The Convention on Biological Diversity establishes among its objectives "... the fair and equitable sharing of benefits arising from the utilization of genetic resources " (CBD, 1992)¹³, this international treaty explicitly states the participation of benefits derived from genetic resources use; however, it is implicitly the fair and equitable sharing of benefits arising from the use of biological components and ecosystems, as a condition "sine qua non" for the conservation and sustainable use of biological diversity. In this regard, the "biotrade" initiative of the United Nations Conference on Trade and Development (UNCTAD) has established principles and criteria for bio-trade¹⁴ through the value chain approaches, adaptive management and ecosystem approach. The evaluation of the application of these principles shows that the quota management model for export of hides peccary from subsistence hunting does not favor the fair and equitable sharing of benefits (UNCTAD, 2007) (Annex 4)

Trade in hides and skins of peccaries not meet the approach value chain, the actors in the production or commercial chain are not integrated in pursuit of sustainable use and conservation of populations of peccaries and their habitats, creating an inequity in the distribution of benefits. Managing this trade does not follow the adaptive management to ensure the conservation of populations and ecosystems peccaries, it refers primarily to the establishment of export quotas for hides from subsistence hunting. The ecosystem approach is absent in the management of these stocks, it is not participatory and have not been formally identified the communities areas from where skins peccaries come, the system does not establish mechanisms to promote conservation from the profits generated and determining the limits of the ecosystems where these populations live for the fur trade.

Social sustainability presented low index, which is not conducive to fair equitable sharing of benefits in the marketing chain, generating inequality and low environmental responsibility in the conservation of populations of peccaries and their habitats by the marketing chain components.

The average economic sustainability is mainly for industrials and exporters, disfavoring the commitment of communities and local people to enter the marketing chain and move to the stage of the value chain.

On the other hand, foreign exchange earnings is justified as an important component of economic growth, prioritizing authorizations from state agencies, trade in natural resources, as in this case tanned leathers peccaries; however, its share in GDP of the affected regions is not significant, 4.12 X 10 -5% of the total GDP of the five suppliers departments.

The costs of management and conservation of biological diversity should be internalized within the area of management and reflected in the distribution of benefits derived from use as established in the principles of the ecosystem approach, taking as a basis in "management and conservation of natural resources incurs costs. If these costs are not adequately covered then management will decline and the amount and value of natural resources may also decline. It is necessary to ensure that some of the benefits from use flow to the local authorities in managing natural resources so that essential management to sustain conserve resources" (Secretary CBD, 2004).

¹⁴Biocomercio es entendido como aquellas actividades de recolección, producción, transformación y comercialización de bienes y servicios derivados de la biodiversidad nativa (recursos genéticos, especies y ecosistemas) que involucran prácticas de conservación y uso sostenible, y son generadas con criterios de sostenibilidad ambiental, social y económica.
It is imperative that management of peccary populations should be under Biotrade principles, which is crucial to ensure the fair and equitable sharing of benefits for native communities or local people in areas where harvesting or hunting are done. Activity should focus on areas of communal management, so that it can establish the chain of custody and the value chain, so that it can ensure the process of fulfilling the objectives of the Convention on Biological Diversity (CBD) and the "Non-detriment findings" - CITES. This will be resulting primarily in the sustainable development of local populations. Moreover, taking into account the demand for rapid human population growth in the affected regions, with population growth rates for Loreto 485%, Madre de Dios 2113%, Pasco 206%, San Martín 66% and Ucayali 2575% 1940 to 2007 (Annex 5).

This analysis should lead to conclude that benefit sharing is direct related with social and economic sustainability. There could not be equitable benefit sharing where there are unfavorable social and economic surroundings. The natural resources values at the market, improves benefit sharing where the people have social and economic wellbeing. Furthermore, this conditions enhance environment poverty, give access education and health for all with quality, reduce social inequalities and improve work opportunities.

We must ask then if trade in meat for human consumption and its skin as a sub product of the first economic activity, is sustainable in the context of sustainable development under the current management model, taking into account the analysis of fair and equitable sharing of benefits.

References


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Appendix

Annex 1. Study area peccaries international trade and benefit sharing.
Annex 2: Social indicators per departments 2011

<table>
<thead>
<tr>
<th>Social indicators</th>
<th>Loreto</th>
<th>Pasco</th>
<th>Madre de Dios</th>
<th>Ucayali</th>
<th>San Martín</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population in poverty (1)* (%)</td>
<td>63</td>
<td>48</td>
<td>32</td>
<td>55</td>
<td>43</td>
</tr>
<tr>
<td>Infant mortality rate (2)</td>
<td>38</td>
<td>24</td>
<td>27</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Illiteracy rate (3) (%)</td>
<td>7.1</td>
<td>6.7</td>
<td>4.1</td>
<td>5.3</td>
<td>6.9</td>
</tr>
</tbody>
</table>

*Population at least one unsatisfied basic need

Source: Made by myself. Based on (1) INEI - Encuesta Nacional de Hogares (percentage of total population of each year) In line <https://www.inei.gob.pe/estadisticas/indice-tematico/sociales> ; (2) INEI - Encuesta demográfica y salud familiar (per 1000 live births) In line <https://www.inei.gob.pe/estadisticas/indice-tematico/sociales/> ; y, (3) INEI - Encuesta Nacional de Hogares (percentage of total population aged 15 and more years old) en línea <https://www.inei.gob.pe/estadisticas/indice-tematico/sociales/>

Annex 3. GDP 2001 - 2011 (miles de nuevos soles a precios constantes de 1994)

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<tbody>
<tr>
<td>Pasco</td>
<td>409,367</td>
<td>449,259</td>
<td>449,017</td>
<td>494,148</td>
<td>544,043</td>
<td>565,342</td>
<td>626,829</td>
<td>674,783</td>
<td>679,481</td>
<td>745,467</td>
<td>827,731</td>
</tr>
<tr>
<td>Madre de Dios</td>
<td>1,386,018</td>
<td>1,512,180</td>
<td>1,506,843</td>
<td>1,563,519</td>
<td>1,589,671</td>
<td>1,713,379</td>
<td>1,914,504</td>
<td>1,937,316</td>
<td>1,843,761</td>
<td>1,821,868</td>
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<tr>
<td>San Martín</td>
<td>1,368,041</td>
<td>1,415,563</td>
<td>1,464,116</td>
<td>1,586,538</td>
<td>1,728,977</td>
<td>1,619,008</td>
<td>1,983,231</td>
<td>2,178,177</td>
<td>2,262,117</td>
<td>2,445,230</td>
<td>2,598,101</td>
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<tr>
<td>Ucayali</td>
<td>1,221,856</td>
<td>1,281,902</td>
<td>1,328,456</td>
<td>1,439,891</td>
<td>1,539,686</td>
<td>1,640,186</td>
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<td>1,861,813</td>
<td>1,959,377</td>
<td>1,985,533</td>
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Annex 4. Assessment of compliance with the principles of BioTrade by the model of export quotas tanned peccary in Peru.
