

PRODUCTION AND CONSERVATION OF INDIGENOUS DOMESTIC ANIMALS IN THE PHILIPPINES

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Abstract

Biodiversity in the agricultural ecosystem could aid in longer survival and the preservation of plant and animal equilibrium. Utilization of existing resources to meet the fundamental requirements of humans could be sustainable. The multiplication of native animals in the village community provides a source of income and maintains the species' biodiversity. Intervention with appropriate technology to existing natural resources could protect, encourage diversification, and facilitate the trade of products across species, thereby preserving the ecological balance. Indigenous animals should be thoroughly observed and documented for future dietary references and improved surveillance of new diseases.

Keyword: environment, food, livelihood, climate change

Introduction

The Philippines is home to an abundance of wild animals, which are used by locals as a source of food and income. It provided a high-quality supply of protein for their family's diet. The primary system of production is classified into three categories: intensive for commercial production, extensive for homestead production, and semi-intensive (BAI, 2013). The majority of animal holdings are found in backyard operations where family and friends are involved. These animals are raised in a very conventional manner with little housing, little food, and poor breeding management.

The advantage of producing this native species is that it can adapt to a variety of harsh conditions, is disease-resistant, and has a potential market in the future due to people's rising knowledge of food safety (Monleon, 2005; Santiago, 2012). The preferred method for reliably preserving the genetic stock of the current breed of backyard animals, with the exception of commercial production (FAO, 2007), is in situ and ex situ conservation. The purpose of this review is to evaluate the position of indigenous domestic animals in relation to the systems and practices that can sustain the local population's way of life.

Poultry

Numerous native chicken strains are produced in the nation employing cheap housing, low-input food, and high productivity (Lambio and Gray, 1993). This chicken is renowned for its distinctive flavor (Lambio and Gray, 1993). Farmers typically use an open ranged management system (Lopez, 2007). Additionally, in the Visayas region, "darag" chicken dispersal utilizing minimal input technology was carried out (Cocjin et al. 2006), creating a "open nucleus" system for local chicken (Cocjin et. al., 2000). The rise in popularity of "inasal" (roasted chicken in Visayan dialect) and the introduction of a chicken manufacturing system utilizing coconuts (Magpantay et. al., 2005). Additionally, the description of indigenous chicken production on a

coconut-based production system (Magpantay et al., 2005) and other crops like rice-duck farming system led to an increase in farm yield (Parks et. al., 2015). In Western Visayas, Cabarles et al. (2007) examined the physical traits of native chicken and identified black-plumed duck hens as productive layers (Datuin and Magpantay, 2013). The country's reported genetic biodiversity of these animals can be found in FAO (2007). Furthermore, it is crucial to apply molecular biotechnology to assess genetic deterioration. The use of DMSO and DMA in the semen processing of native chicken may boost productivity, and artificial insemination is another viable technique to incorporate into the production system (Baguio, 2005). Evolutionary analyses of domestic ducks were also done (Bondoc and Santiago, 2012). The community has supported the commercialization of locally raised chickens and ducks for the production of meat and eggs. Additionally, organized organizations were established to support and advance indigenous animal-based businesses (PNAD, 2016). The collection of phenotypic data, its characterization and analysis, the choice and improvement of feeds, the promotion of native animal production and management, the commercialization of native animal products, the use of value-adding technologies, and the value chain analysis of native animal products were all completed as part of this study. To address the nutrient needs of these animals, it is important to fully investigate the proposed feed formula using grains and feedstuff that are readily available locally.

Native swine hogs typically raised for pig roasting in the provinces of Quezon, Bondoc Peninsula, and Marinduque (Acorda et al., 2011). (Monleon, 2005). It was discovered that native pigs are healthy, productive, and have a market. For this reason, the Local Government Unit (LGU) embraced the production technique and used local pig for distribution projects to rural farmers. According to Monleon (2005), the province of Marinduque is engaged in conservation initiatives where raisers are driven by industrial need, reducing the risk of extinction (Monleon, 2008). By using effective local resources to treat sick native pigs, disease-related mortality was reduced (Lastica, 1999). However, research is scarce and early on, basic knowledge was disregarded (Peñalba, 1993). Backyard production is practiced in the province of Zambales, and feeding of cashew apples integrated under mango orchards (Corpus and Farin, 2000) and low-cost feed ration were both researched (Sorsano, 2010). The melanocortin-4 receptor (MC4R) gene, which is thought to have a role in growth development, was discovered by Octura (2014) in native pigs.

Communities have successfully developed a local pig production system for breeding and fattening. The beneficiaries received five heads of piglets and two heads of gilts, which will create revenue after three to four months while they wait for the gilts to bear piglets (PNAD, 2016).

Although the majority of the ruminant cattle population in the nation are thought to be indigenous, the introduction of exotic breeds led to "indiscriminate crossbreeding" (Parker, 1987). Today, it can be challenging to tell native cattle apart from upgraded livestock. Cattle conservation is currently being carried out by the Bureau of Animal Industry with the assistance of authorized private farms nationwide (BAI, 2014). Additionally, the country's identified national gene pool for native animals was formed (Agriculture, 2018). Additionally,

biotechnology was used to examine native cattle for features with economic value for the nation's future dairy cattle development (PGC, 2017)

Using buck semen with 5% egg yolk extender, Beltran et al. (2013) conducted an experiment to improve birthrate by 70.50%. Development of a rural industry based on goats was emphasized as a popular small ruminant breed in the country to increase productivity (Orden et. al., 2006). Additionally, the rice-goat production method makes effective use of farm resources (Baconawa et. al., 1987). The establishment of the "Philippine Goat Breed Registry" allowed for the monitoring of goat breeds in the nation. Additionally, the development of technology to disclose animal species' richness through the effective application of nucleotide barcoding (Bondoc and Cerbito, 2013).

Currently, the Philippine carabao is a keystone of conservation in the nation. Numerous Filipinos' lives have been impacted by this specie's production, study, and extension activity (PCC, 2014). There is a facility backed by legislation that requires Philippine Carabao Center to grow Philippine Carabao in order to increase milk and meat production as well as power supply for the local populace.

Horse

Particularly for those under the care of regular farmers, the status of the horse species in the nation is not paid much attention. The Philippine Statistics Authority (PSA) report confirms this, stating that horses were not included in the nation's monitoring and inventory chores. There is no comprehensive report on the population, production, distribution, and official use of this species to the country's contribution to agriculture, industry, and tourism (PSA, 2013). However, their ability to pull "kalesa" (carts) in the historic district of Manila, transport agricultural products from farmers in highland areas of the country to markets, and carry people and goods over difficult terrain has demonstrated their value. As a result, this species exists to meet human needs and should be managed similarly to other domesticated animals in the nation. Philippine culture includes horses, which are recreated as decor in vintage jeepneys used for public transportation. On the other hand, Ching et al. (2014) stated that a new illness spread by fruit bats in southern Philippines can have a serious negative impact on both horses and people. The Bureau of Animal Industry (BAI) faces a challenge in enforcing adequate surveillance of this species against potential disease threats that could harm humans as a result of problems with newly emerging diseases brought on by the effects of climate change.

Conservation in place

Various regions of the country have in-situ native animal conservation programs. These include the domesticated cattle, goats, chickens, ducks, pigs, and carabao (PNAD, 2016).

Cryobanking off-site

The job of keeping animal reproductive gametes and tissue samples across the nation has been given to the Philippine Carabao Center (Sarabia and Cruz, 2008). Additionally, the center provides services across the nation and continuously improves its facilities and technical expertise for cryopreservation. It also has existing in situ regions for conservation (PCC, 2014).

Conclusion

In the Philippines, native animal conservation has long been practiced. Different government agencies, stakeholders, academics, researchers, and advocates for private partners on a local and global scale have started and taken part in this initiative. Inter-agency coordination between the parties concerned on a regular basis has been successful in defining swift action on specific tasks. It is still difficult to document how native animals behave in the nation's many climatological patterns, although there is information accessible on their habitat, particularly for chicken and swine. The family has received additional income from the local chicken in the Visayas region as well as the native pig-based livelihood in the province of Marinduque. However, given the rising demand for the goods, problems with a reliable commercial supply of pig and chicken need to be rectified. As a multipurpose animal, horses must be recognized for their role in agriculture. Emerging illnesses pose a threat that could breach the animal-human boundary. Gametes from cattle and buffalo can now be stored in cryobanks.

Literature Cited

- 1) Acorda, J.A., Lapitan, R. M. and Canaria, T.L. 2011. Native pigs of the Philippines: A potential genetic source for the development of a strain of mini pig. Proceedings of the 48th PSAS National and 29th PSAS Visayas Scientific Seminar and Annual Convention. The Philippine Society of Animal Science. L' Fisher Hotel, Bacolod City, Negros Occidental.
- 2) Agriculture Magazine, 2018. <https://www.agriculture.com.ph/2018/08/28/native-carabaos-are-forever/>
- 3) Babera, S. C. Unpublished. 2009. Production, Breeding and Management of native pigs in Zambales. Proceedings of WLAC-RMTU In-house review, San Marcelino, Zambales.
- 4) Baconawa, E. T., O. O. Parawan, G. A. Bautista, H. B. Ovalo and D. P. Catbagan. 1987. Pilot project on integrated livestock-fish-crop farming in the southern Philippines. Resources and Conservation. Vol 13, issue 2-4, 265-272.
- 5) Baguio, S. S. 2005. Semen characterization and preservation and artificial insemination in Philippine native chicken (*Gallus gallus domesticus* L.). <http://www.uplb.edu.ph>
- 6) Beltran, M. A. G., Atabay, E. P., Atabay E. C., Cruz, E. M., Aquino, F. P., Cruz, L. C. 2013. Optimized extenders for cryopreservation of buck semen for artificial insemination. Philippine Journal of Veterinary and Animal Science 39 (1): 1-10.
- 7) Bondoc, O. L. and R. C. Santiago. 2012. Identification of domesticated duck breeds, strains and hybrids (*Anatiformes: Anatidae*) in the Philippine using DNA barcodes. Philippine Journal of Veterinary Medicine, College of Veterinary Medicine, University of the Philippines, Laguna. Vol 49. No. 2.
- 8) Bondoc, O. L. and W. A. Cerbito. 2013. Genetic diversity and relationships of domestic goat and sheep breeds (*Artiodactyla: Bovidae: Caprinae*) in the Philippines based on DNA barcodes. Science Direct. Vol 50. No. 2.
- 9) Cabarles Jr., J. C., A.L. Lambio, S. A. Vega, S. S. Capitan and M. S. Mendior. 2007. Distinct morphological features of traditional chickens (*Gallus gallus domesticus* L.) in Western Visayas, Philippines. Animal Genetic Resources. FAO-UN. Vol 51, pp. 73-87.
- 10) Ching, P. K. G., V. C. Delos Reyes, M. N. Sualdito, E. Tayag, A. B. C. Vingno, F. F. Malbas, G. C. Bolo, J. J. Sejvar, D. Eagles, G. Playford, E. Dueger, Y. Kaku, S. Morikawa, M. Kuroda, G. A. Marsh, S. McCullogh and A. R. Foxwell. 2014. Outbreak of Henipavirus Infection, Philippines, 2014. Emerging Infectious Diseases. Vol. 21, No. 2. http://wwwnc.cdc.gov/eid/article/21/2/14-1433_article

- 11) Cocjin, B. B., Al. L. Lambio, V. T. Gonzales, S. U. Hipolito, E. D. Tomambo, M. C. Linga, G. F. A. Roxas, C. G. Casiple and R. L. Arenga. 2000. Proceedings of the Philippine Society of Animal Science 37th Annual Convention. The Philippine Society of Animal Science. Heritage Hotel, Roxas Blvd Cor. EDSA Pasay City, Metro Manila, Philippines.
- 12) Cocjin, B. B., R. L. Arenga, G. F. A. Roxas, C. G. Casiple. 2006. Improvement, utilization and conservation project for the Philippine native chicken (Darag type) in Western Visayas II. Dispersal of the technology to farmers (Progeny Testing). Proceedings of the 43rd scientific seminar and annual convention. The Philippine Society of Animal Science. Eco Village Training Center, Boracay Island, Malay, Aklan, Philippines.
- 13) Corpus, J. C., and A. C. Farin. Unpublished. 2000. Performance of Native pig fed with cashew apple. Proceedings of WLAC-RMTU In-house review, San Marcelino, Zambales.
- 14) Datuin, J. R. M. and V. A. Magpantay. 2013. Hen-day egg production and egg qualities of Philippine mallard duck (*Anas platyrhynchos domesticus* L.) with varying plumage colors. Philippine Journal of Veterinary and Animal Sciences, University of the Philippines Los Banos, College, Laguna 4031, Philippines.
- 15) FAO, 2007. Global plan of action in animal genetic resources and the Interlaken Declaration.
- 16) Lambio A. L., E. C. Gray. 1993. The indigenous chickens of the Philippines. Journal in Animal Production Technology. Institute of Animal Science, College of Agriculture, University of the Philippines Los Baños, College, Laguna.
- 17) Lastica, E. A. 1999. Proceedings of the 36th Annual Convention. The Philippine Society of Animal Science. Heritage Hotel, Corner Edsa and Roxas Blvd. Pasay City, Metro Manila, Philippines.
- 18) Lopez, C. S., 2007. Assessment of naturally-occurring feed resources available to free range “Darag” chickens in Region 6. Proceedings of 44th scientific seminar and Annual convention. The Philippine Society of Animal Science. CSB International Conference Center and Hotel Arellano Ave. Corner Estrada St., Malate, Manila.
- 19) Magpantay, V. P. A., E. P. Supangco, A. Y. Pacificador, C. C. Sevilla, A. L. Lambio. 2005. Development of bio-economic model of native chicken production system for coconut-based farming system. Proceedings of the 42nd scientific seminar and annual convention. The Philippine Society of Animal Science. The heritage hotel manila EDSA corner Roxas Blvd., Pasay City, Philippines.
- 20) Magpantay, V. P. A., E. P. Supangco, A. Y. Pacificador, C. C. Sevilla, A. L. Lambio. 2005. Characterization of native chicken production system in a coconut-based farming system in Dolores, Quezon. Proceedings of the 42nd scientific seminar and annual convention. The Philippine Society of Animal Science. The heritage hotel manila EDSA cor. Roxas Blvd., Pasay City, Philippines.
- 21) Monleon, A. M. 2005. In situ conservation efforts for the Philippine native pig (*Sus domesticus*) in Marinduque. Proceedings of the 42nd Scientific Seminar and Annual Convention. The Philippine Society of Animal Science. The Heritage Hotel Manila EDSA Corner Roxas Blvd., Pasay City Philippines.
- 22) Monleon, A. M. 2005. Local conservation efforts for the Philippine native pig (*Sus domesticus*) in Marinduque. Philippine Journal of Veterinary and Animal Science. 32 (1): 79-86.
- 23) Monleon, A. M. 2008. Population structure and rate of inbreeding of native pigs (*Sus domesticus*) in Marinduque, Philippines. Proceedings of the 45th Scientific Seminar and Annual Convention. The Philippine Society of Animal Science. Philippine Carabao Center National Headquarters and Gene Pool. Science City of Munoz, Nueva Ecija. Philippines.
- 24) Octura J. E., R. R. C. S. Yambao, R. C. Santiago, B. W. Cho, R. S. A. Vega. 2014. Polymorphism in the melanocortin-4 receptor (MC4R) gene and its effect on fatness and weight performance of native pigs: A preliminary Study. International Journal of Science. Volume 15, No. 1, pp. 464-474.

- 25) Orden, E. A., E. M. Cruz, M. E. M. Orden, A. S. Galamgam and P. Q. S. Delos Reyes. 2006. Barangay goat breeder farms in selected areas in Nueva Ecija and Pangasinan. Proceedings of the 43rd Scientific Seminar and Annual Convention. The Philippine Society of Animal Science. EcoVillage Training Center, Boracay Island, Malay, Aklan, Philippines.
- 26) Parker B. A. 1987. Philippine cattle: A breed to conserve and develop. Animal production technology Journal. Institute of Animal Science. College of Agriculture, University of the Philippines at Los Baños, 8-14.
- 27) Parks, M. H., M. E. Christie and I. Bagares. 2015. Gender and conservation agriculture: Constraints and opportunities in the Philippines. Agriculture, Ecosystems and Environment. Vol. 214, 118-132. <http://link.springer.com/article/10.1007/s10708-014-9523-4>.
- 28) Peñalba, F. F. 1993. Philippine native pigs performance and potential. Animal Production Technology. A Journal of the Institute of Animal Science, College of Agriculture, University of the Philippines at Los Baños, 2-7.
- 29) Philippine Carabao Center. 2013. Annual Report. <https://www.pcc.gov.ph/research-for-development/>
- 30) Philippine Genome Center. 2017. <https://pgc.up.edu.ph/research-development/program-on-agriculture-livestock-fisheries-forestry/developing-a-sustainable-dairy-cattle-genetic-stock-in-the-philippines/>
- 31) Philippine Native Animal Development. 2016. https://bar.gov.ph/downloadables/digest/2016/BD_4thq%202016_final%20draft.pdf
- 32) Philippine Statistics Authority, 2013. Livestock and Poultry Statistics Report 2013-2017. https://psa.gov.ph/sites/default/files/LIVESTOCK%20AND%20POULTRY%20STATISTICS%20of%20the%20PHILIPPINES%20as%20of%2006%20Mar%202019_V4_0.pdf
- 33) Santiago, R. C., 2012. Role of Government stock farms in the development of Philippine native pigs, chicken and ducks. National Swine and Poultry Research and Development Center. Bureau of Animal Industry, Lagalag, Tiaong, Quezon, Philippines.
- 34) Sarabia, A. S. and L. C. Cruz. 2008. Cryobanking of animal genetic resources: the Philippine Experience. Philippine Carabao Center. Department of Agriculture. National Headquarters and Gene Pool.
- 35) Sorsano J. M. Unpublished. 2010. Performance of Native pigs feed with different low- cost ration at Botolan, Zambales. Proceedings of WLAC-RMTU In house Review, San Marcelino, Zambales.