



Counting the cost: The potential impact of African Swine Fever on smallholders in Timor-Leste

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ABSTRACT

In September 2019, Timor-Leste, where pigs are kept by more than 70 percent of households, became the eleventh Asian country to report African Swine Fever (ASF). Drawing on our recent, as-yet unpublished research we show that while national pork consumption is low, pigs hold tremendous monetary value for smallholders within the economy of ceremonies. Given the sums of money paid for live pigs, the value of the national pig herd is around USD160 million – more than USD1000 per pig keeping household. Accordingly, pigs serve to buffer families against shocks and pressures, especially for health and education expenses. While not a zoonosis, the potential for ASF to lead to significant, negative impacts for smallholder farmers in Timor-Leste - some of the world's most vulnerable people - cannot be underestimated. We argue that Timor-Leste faces significant challenges in responding to ASF and there is a strong case for international support.

1. Introduction

When mass pig mortalities were detected in Timor-Leste during September 2019, laboratory testing confirmed the presence of African Swine Fever (ASF). The response from the Ministry of Agriculture and Fisheries (MAF) was swift, notifying the World Organisation for Animal Health (OIE) on the 27th of September, within 24 h of confirmation. At the time of writing, the OIE listed a cluster of 100 outbreaks within Dili municipality consisting of 405 cases with a case fatality rate of 100% [1], though a government news source reported 2145 cases in Dili, Ermera, Lautein and Manatutu municipalities [2]. (See Fig. 1.)

The apparent, rapid spread of ASF is consistent with the epidemiological picture in the region. First reported in China in August 2018 and now in eleven Asian countries [3], ASF is a severe viral disease with no vaccine, spread by live or dead pigs, raw and cooked pork, vectors and fomites [4]. ASF is putting 50% of the global pig herd at risk in China alone [5] and while not a zoonosis, the impact of ASF on the lives and livelihoods of pig-keepers and pork value chains in and beyond affected Asian countries cannot be underestimated.

In September 2019, as MAF launched its initial investigation, our team was conducting our third round of field work for 2019, gathering data to evaluate opportunities for smallholder livestock-keepers in the country. In light of the emergence of ASF and call for response, here we describe the potential, devastating impact of ASF on smallholder pig-keepers in Timor-Leste. To provide this analysis in a timely manner, we

use existing literature and our recent, as-yet unpublished findings from observational, participatory and other qualitative research in four municipalities.

2. Timor-Leste is characterised by smallholder farming and more than 70% of households keep pigs

Across China and most of South East Asia, medium to large scale pig raising enterprises account for at least 20% of the total pig population [6], with a general trend towards commercialisation of the sector that has been accelerated by the effects of ASF across much of the region. Timor-Leste is significantly different than all other affected Asian countries in that almost the entire national pig herd is kept by smallholders; the average number of pigs kept per household is fewer than three [7]¹.

Another relatively unique feature of the pig sector in Timor-Leste is that pigs are kept by large numbers of households in both urban and rural settings. The pig keeping sector consists of around 142,000 (72%) households in the country [7]. In most rural communities, at least 75% of households raise pigs.

In Timor-Leste, more than in many other countries, these factors mean that the burden of ASF mortality will fall heavily on smallholder livestock keepers in both urban and rural environments.

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¹ Authors calculation, based on the agricultural information included in the most recent national population and housing census data, from 2015. The first dedicated national agricultural census was ongoing at the time of article submission.



Fig. 1. Community members in Covalima, Timor-Leste load their pig, worth about USD 600 and roofing materials onto a truck, both to be used in their clan's Uma Lulik (Sacred House) ceremony. Photo credit: T. Cooper.

3. Pigs are expensive and the value of the national pig herd is around USD 160 million

For families, replacing a pig comes at significant cost. Based on our field data as well as information gathered by Cargill [8], live animals cost around USD 150 per piglet, USD 600 per fattening pig (assuming an average weight of 60 kg) and USD 500 per sow.

At last census¹ the national pig herd was almost 420,000 with an average herd size per household of 2.86 head [7]. Assuming a distribution of pig types [9] within the herd typical of smallholder based production systems in Asia [8,10,11], we can assume 15% of the herd are sows, 45% are piglets and the remaining 40% are weaners and other fattening pigs. Based on these unit values, the value of the national herd is more than USD 160 million. This implies a per pig-keeping-household value of more than USD 1000, which represents an extremely important stock of savings given GDP per capita² is around USD 1200 and more than 70% of the population lives on less than USD 3.20 per day [12].

4. Pigs mean money in the economy of ceremonies

Predominantly used for sociocultural and ceremonial purposes, pigs are not only of symbolic value to smallholders in Timor-Leste, in fact nothing could be further from the truth. While pork consumption in Timor-Leste beyond cultural ceremonies is reported to be very low [13], a focus on consumption data is too simplistic; the impact of pig mortality on the livelihoods of smallholder livestock keepers in the country is exceedingly high. This is explained by the value and irreplaceability

² GDP per-capita figure, as stated by The World Bank, does not include offshore petroleum production

of live pigs for key ceremonies (See Fig. 1.) [14,15].

Our recent findings reveal that when households cannot provide their own live pigs for ceremonies they must purchase them, with money diverted from education, food and health. Consequently, while not a zoonosis, ASF presents a One Health challenge in Timor-Leste. Among other impacts, pig mortality strikes an indirect blow against household food and nutrition security. In a country with a rate of childhood stunting exceeding 50% [16,17], this is of grave concern.

5. Backyard pigs buffer families against shocks and pressures

Our findings also describe pigs as an important livestock bank, which can be sold in response to family emergencies or to cover unexpected or substantial expenses – especially expenses related to education of children. Pigs are significantly more valuable than chickens or goats but reproduce faster than cattle, so are often the first-choice livestock commodity for ameliorating financial stress.

Rebuilding the national pig herd once ASF has been brought under control will take significant time. As pig-keepers will likely retain gilts for restocking purposes, increases in the price of piglets and gilts in the short-medium term could compound and prolong the negative livelihood impacts of ASF on smallholders.

Much of the international conversation around ASF in Timor-Leste has concentrated on the proximity of, and potential for transmission to, the commercial pig herds in neighbouring Australia. This is certainly a legitimate concern, but we have highlighted here the very real possibility of ASF leading to significant, negative, livelihood, food and nutrition security impacts for some of the world's most vulnerable people.

6. Timor-Leste faces many challenges in responding to African Swine Fever

The challenges for Timor-Leste in responding to ASF are many. Firstly, ASF can be difficult to distinguish from Classical Swine Fever (CSF) [4], which is endemic to Timor-Leste [18]. While the pig mortalities triggering the outbreak investigation in September were much higher in number and rate than MAF has seen with CSF, the overlapping clinical signs may explain why only 41% of samples initially tested for ASF were positive [19]. Future steps will include genotyping the ASF virus and developing a local case definition, particularly highlighting any points of distinction between ASF and the particular genotype of CSF circulating in Timor-Leste.³ Secondly, Timor-Leste does not have the capacity to conduct definitive tests for ASF and so samples have to be sent to Australian laboratories [1]. Thirdly, ASF transmission will be driven by characteristics of the national pig herd. These include the relative density of pigs throughout the country [7], dominance of free-range systems and overwhelming reliance on household scrap-feeding [20]. Finally, crucially, according to the OIE Performance of Veterinary Services Gap Analysis [21], the entire veterinary service in Timor-Leste is severely under-resourced in all respects, financial, physical and human, both in number of staff and their technical capacity.

The above factors combined with the characteristics of the pathogen and the value of pigs to Timor-Leste describe the potential for devastation. There is a strong case for timely and well-targeted support to the Government of Timor-Leste from the international community, not only to protect home countries from the threat of ASF, but to avert a potential country-wide crisis for families in Timor-Leste.

Ethical approval

The ongoing research project referenced in this paper received ethical clearance from the University of Queensland Institutional Research Ethics Committee (approval number 2019001595). Informed

³ To date, the CSF virus circulating in Timor-Leste has not been genotyped.

consent was obtained from all human subjects.

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Declaration of Competing Interest

The as-yet unpublished research cited in this article is being conducted in partnership with the government of Timor-Leste and two authors are employees of the government. The authors have no other conflicts of interest to declare.

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