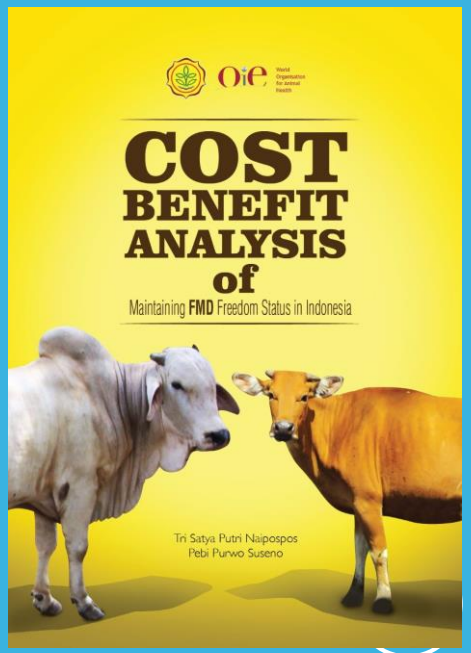
COST BENEFIT ANALYSIS OF MAINTAINING FMD FREEDOM IN INDONESIA

DR FADJAR SUMPINGTJATUR RASA, PHD

DIRECTOR OF ANIMAL HEALTH

SEACFMD EPI NETWORK MEETING – YOGYAKARTA, 2018



Resolution No. 22 (85th General Session of World Assembly, May 2017)

Albania	France	New Zealand
Australia	Germany	Nicaragua
Austria	Greece	Norway
Belarus	Guatemala	Panama
Belgium	Guyana	Philippines
Belize	Haiti	Poland
Bosnia and Herzegovina	Honduras	Portugal
Brunei	Hungary	Romania
Bulgaria	Iceland	San Marino
Canada	Indonesia	Serbia **(1)**
Chile	Ireland	Singapore
Costa Rica	Italy	Slovakia
Croatia	Japan	Slovenia
Cuba	Latvia	Spain
Cyprus	Lesotho	Swaziland
Czech Rep.	Lithuania	Sweden
Denmark	Luxembourg	Switzerland
Dominican Republic	Madagascar	The Netherlands
El Salvador	Malta	Ukraine
Estonia	Mexico	United Kingdom
Finland	Montenegro	United States of America
Former Yug. Rep. of Macedonia	New Caledonia	Vanuatu

(1) *Excluding Kosovo administered by the United Nations*

FMD free where vaccination is not practised

Member Countries recognised as **FMD free where vaccination is not practised**, according to the provisions of Chapter 8.8. of the *Terrestrial Code, Edition 2016*:

INDONESIA IS A COUNTRY FREE FROM FMD SINCE 1986, OFFICIALLY RECOGNIZED BY OIE IN 1990

CATTLE PRODUCTION IN INDONESIA

Table 1: Cattle industry in Indonesia (2016)

	2014	2015	2016
Total beef cattle population (head)	14,726,875	15,419,718	16,092,561
Total beef production (tons)	497,670	506,661	524,109
Live cattle import (head)	729,400	604,120	618,323
Value of cattle import (US$)	682,097,525	545,576,172	601,463,233
Beef import (kg)	76,887,337	50,309,023	116,761,381
Value of beef import (US$)	358,101,409	237,157,839	493,726,376
Beef export (kg)	2,069	6,750	14,841
Value of beef export (US$)	4,253	12,700	23,103

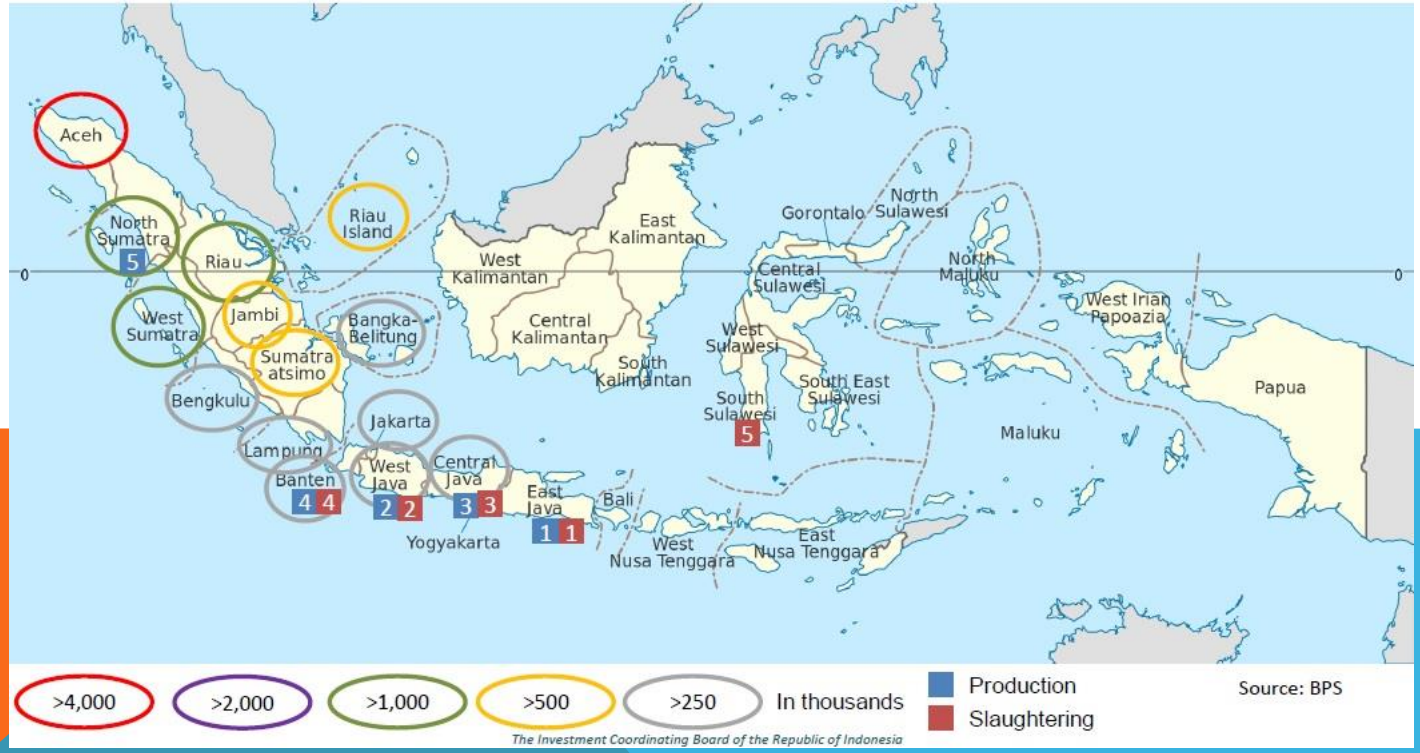
- Cattle are the second most important livestock sector after poultry
- Indonesia is a net importer country of livestock and livestock products
- Still heavily reliant on imports of live cattle and beef

The largest livestock labor force is in East Java province – 42% of the total employment in livestock sector (Livestock and Animal Health Statistics, 2016)

Sumatra is home to most of the cattle population

Java has the greatest concentration of the slaughter houses and production sites – 22% in East Java, 11% in West Java

Figure 2: Indonesia's cattle industry concentration



GOVERNMENT PROGRAM TO INCREASE CATTLE PRODUCTIVITY

The GoI is currently aiming for self-sufficiency in beef to:

- maintain domestic price stability
- make beef more affordable to consumers
- support the livelihoods of local farmers

Target for beef self-sufficiency is to be achieved by 2025, but still need to import around 10% of the country's total demand

SIWAB (Sapi Indukan Wajib Bunting) – an artificial insemination program to increase breeding productivity (launched in early 2017)

provide 2 to 3 million frozen semen straws a year for cattle breeding within a six year period

another three years to make self-sufficient in the downstream sector

WHY MAINTAINING INDONESIA'S FMD FREEDOM IS CRITICALLY IMPORTANT?

FMD is the most of important exotic livestock disease internationally and would be a major obstacle for the Indonesian cattle industry to achieve its self-sufficiency target (16 million cattle, SIWAB target in 2017 is 3 million pregnant cows)

The risk of FMD virus entering Indonesia via deboned meat may be justified on social and economic criteria, Indonesia should be vigilant in protecting its live cattle and managing beef import policies

Table 22: Volume and value of frozen boneless buffalo meat import from India

	2016	2017	Total
Volume (tons)	812	65,808	66,620
Value (US$)	2,363,974	229,823,747	232,187,721

Source: APEDA, 2017

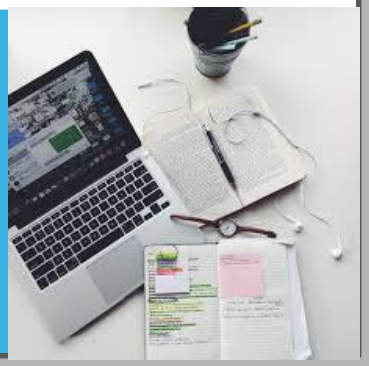
THE STUDY

Objective:

- to estimate the economic and financial benefits to Indonesia from maintaining its FMD free status
- to support advocacy with the decision makers of the GOI and relevant stakeholders in the livestock industry

Outputs:

- a Cost Benefit Analysis for an FMD incursion in Indonesia using multiple scenarios
- potential losses from FMD at national level
- the estimation of costs of FMD preparedness activities



METHOD

Literature search

Literature search includes journal articles and research report using online browsing by using key word "*FMD*" or "*foot and mouth disease*" and "*economic impact*" or "*financial impact*" or "*cost-benefit*"

Estimating Economic Impacts of FMD and Preparedness Costs for Indonesia

PART I: **Estimating the economic impacts of FMD outbreak in Indonesia**

PART II: **Estimating potential losses from FMD at the national level**

PART III: Estimating FMD Preparedness Costs for Indonesia

THE COST BENEFIT ANALYSIS

The CBA results indicate that <u>the time of detection of an FMD outbreak</u> is critically important in making a rapid decision for cost effective control

- Outbreak control measures using a vaccination approach is an ambitious long-term objective (McLeod, 2010)
- The worst case scenario assumption produce a B/C ratio < 1, indicates that the benefits from three consecutive years vaccination covering a much greater area most likely would not be seen within a 5 year period

FMD IMPACTS ON INDONESIA'S FARMERS, TRADE AND NON-AGRICULTURAL SECTOR

Some commodities in small quantities exported to various countries, but the economic impact of trade restrictions of an FMD outbreak incursion in Indonesia is not too significant

Impacts on cattle production	• Farmer financial losses
Impacts on Trade	• Impact on sugarcane tops export • Impact on raw leather exports
Impacts on Industry	• Impact on meat and processed meat exports • Impact on domestic prices • Impact on tourism industry

BENEFITS OF AN FMD FREE STATUS

can be assessed from:

- the direct costs that can be saved such as financial benefits borne by the farmers when their livestock are not affected by FMD, and
- indirect costs such as costs due to trade restriction, and costs incurred due to the impact on the non-agricultural sector (Dillon, 2006)

Others state that generally in FMD-free countries, the economic costs that can be saved from active surveillance, increased biosecurity and awareness during peace time and eradication costs during an outbreak (Beyi, 2012)

FINANCIAL LOSSES AT NATIONAL LEVEL

Table 15: Estimation of FMD financial costs at national level

Variable	Number	Remarks
No. of infected cattle	201,951	The number assumed incurred in 8-weeks onset of the outbreak (see Chapter III – scenario 3)
Financial costs per head saved at the village level	Rp 4,463,250	The numbers obtained from the above calculation
TOTAL	Rp 901.357.800.750 (US$ 69.335.215)	

- **To extrapolate this number into the national level requires an assumption of the number of infected cattle during the outbreak**
- **The difference between total financial costs that can be saved between the unvaccinated and vaccinated village is Rp 4,463,250 per head – Rp 901.4 billion at national level**

INDIRECT IMPACTS ON INDUSTRY FROM INFECTIOUS ANIMAL DISEASES

Ripple effects **include impacts on livestock and livestock products price, and upstream and downstream activities along the cattle value chain**

Spillover effects **include impacts other than to the agricultural sector, such as on tourism and the sectors related to public services**

Effects on wider society **can include exposure to zoonotic risk, which is a threat to public health**

Source: Agra CEAS Consulting, 2007

TABLE 21: ESTIMATION OF FMD ECONOMIC IMPACTS AT NATIONAL LEVEL

Impacts	Costs in Rp	Costs in US$
FMD financial impacts at national level	901.4 billion	69.3 million
FMD impacts on sugar cane tops export	622.9 million	47.9 million
FMD impacts on raw leather export	880.8 billion	67.7 million
FMD impacts on meat and processed meat export	43.6 billion	3.4 million
FMD impacts on domestic prices	942.5 million	72.5 million
FMD impacts on tourism industry	6.5 trillion	500.5 million
Total	9.9 trillion	761.3 million

The total annual losses at national leval is Rp 9.9 trillion (US$ 761.3 million)

This indicates that the indirect impact such as on tourism which is the spill-over effect incurs 66% or more than half of the total indirect impacts

If all industries and trade related to agricultural sector are accounted for, then the proportion is 25%

ESTIMATION OF ANNUAL COST REQUIRED FOR FMD PREPAREDNESS

Preparedness activities	Unit Cost (Rp)	Cost Estimation	Remarks
Sero-surveillance (8.000 samples/year)	Rp 400,000 per sample	Rp 3,200,000,000 (US$ 246,154)	Unit cost including diagnostic kit, equipment, quality assurance, and training
Simulation (100 person/year)	Rp 6,000,000 per pax	Rp 600,000,000 (US$ 46,154)	Unit cost including logistic, travel, accommodation and material
Outbreak investigation (conducted 3 times each year with sampling of approximately 100 samples)	Rp 1,200,000 per sample	Rp 360,000,000 (US$ 27,692)	Contingency cost required to conduct outbreak investigation including sending samples to laboratory
Vaccination (250,000 heads)	Rp 45,000 per dose	Rp 11,250,000,000 (US$ 865,385)	Contingency cost to purchase vaccines if outbreak occurs. Unit cost includes operational
Communication and public awareness improvement (1.000 village/year)	Rp 300,000 per village	Rp 300,000,000 (US$ 23,077)	

ESTIMATION OF ANNUAL COST REQUIRED FOR FMD PREPAREDNESS (CONT.)

Preparedness activities	Unit Cost (Rp)	Cost Estimation	Remarks
Quarantine and traffic control (40.000 heads/year)	Rp 25,000 per head	Rp 1,000,000,000 (US$ 76,923)	
Outbreak Command Center (25.000 heads)	Rp 15,000 per head	Rp 375,000,000 (US$ 28,846)	Emergency funds if outbreak occurs to establish Outbreak Command Center in outbreak area and the operational of URC team
Identification and livestock database (livestock traceability) (15.000 heads)	Rp 150,000 per head	Rp 2,250,000,000 (US$ 173,077)	Cost to build database and electronic devices required for livestock identification
Total cost		Rp 19,335,000,000 (US$ 1.5 million)	
Total comtingency cost		Rp 11,610,000,000 (US$ 893,077)	
Total required cost		Rp 7,725,000,000 (US$ 594,231)	

SUMMARY

The result of the CBA shows that if an FMD incursion occurs in Indonesia:

- every effort should be made to restrict the outbreak to a scenario 1 to have the maximum B/C Ratio of the cost of control measures against the economic impact
- Although scenario 2 is more likely to be occur in a country such as Indonesia, the result that the benefits are only slightly larger than the costs
- Scenario 3 should be avoided as much as possible since the costs outweigh the benefits and potential losses may be unrecovered, even over an extended period

The total estimated losses in a year for Indonesia are estimated to be Rp 9.9 trillion (US$ 761.3 million), which includes:

- the financial loss in cattle production
- impacts on trade
- impact on industry including declining domestic cattle price and beef sales as a consequence of the ripple effect, and decrease in tourism expenditures as the spill-over effect

SUMMARY (CONT.)

Indonesia needs to develop its FMD emergency preparedness to a more higher level to:

- prevent the risk of exposing Indonesia's cattle herd to FMD
- protect the livestock sector to achieve its beef self sufficiency target
- minimizing the risk from importation of deboned beef from countries or zones still infected with FMD

The annual FMD preparedness budget required to protect the Indonesian livestock assets and economy are Rp 7.7 billion (US$ 594,231) plus a contingency cost of Rp 11,6 billion (US$ 893,077) which include outbreak investigation and vaccination

The magnitude of the risks of an outbreak and the potential economic impact of FMD determine the level of investment needed to protect a country's territory from the FMD threat

THANK YOU
TERIMA KASIH