Spatial Risk Assessment for ASF Spread After First outbreak(2019) in Lao PDR

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Introduction

The first outbreak of African Swine Fever occurred in Lao PDR in June 2019, In Toumlan district, Saravane province in the South of Laos. Then the outbreak spread quickly to all 18 provinces of Lao, totally outbreak occurred in 141 villages, 52 districts. In 2020 the outbreak occurred in 10 villages of Xienghon district, Xayabuly province(North)

Objectives

- The project will aim to identify the risk factors for ASF spread.

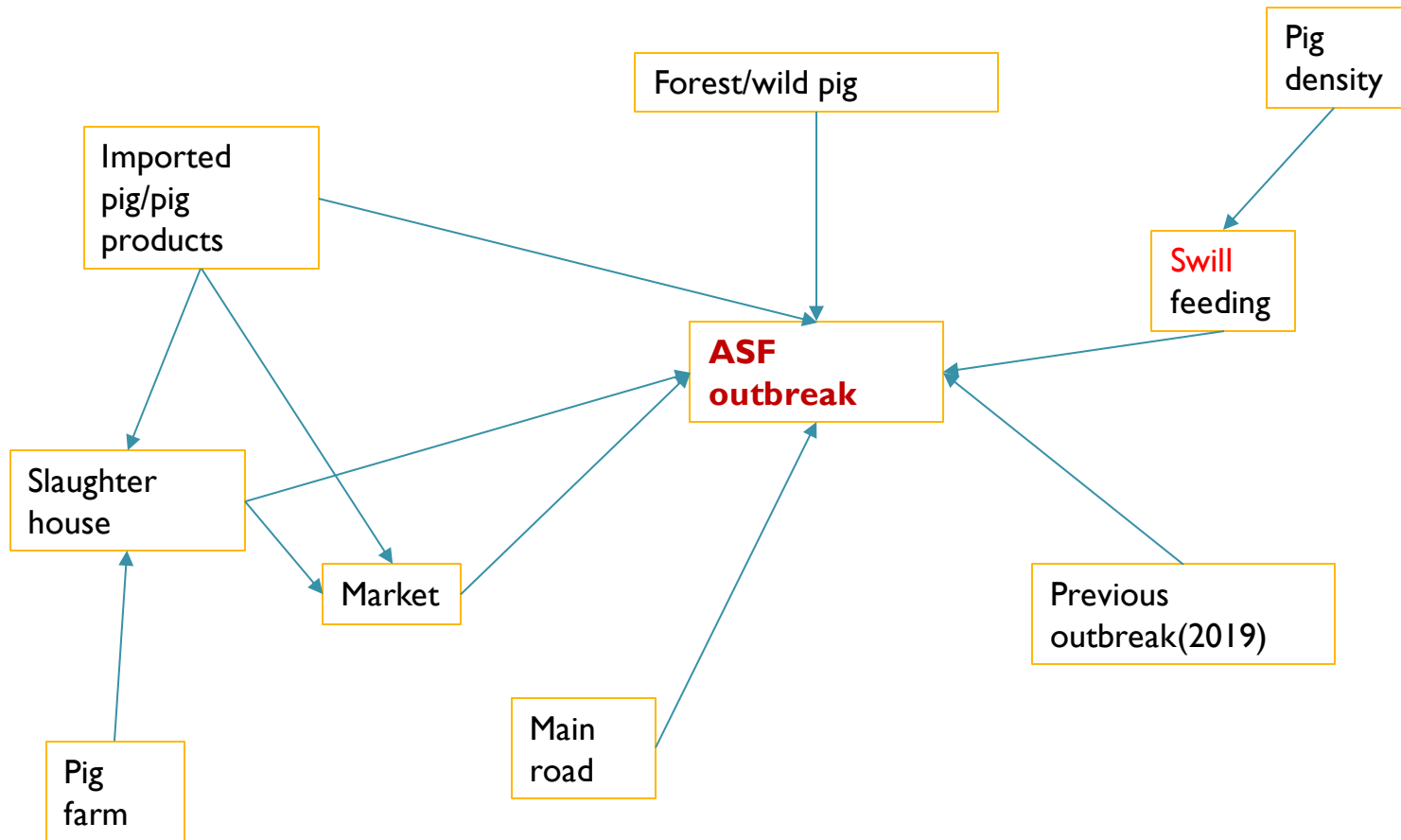- Create the Risk map for ASF Spreading After First outbreak(2019)

Purpose

- Learning to prepare good file, Use MCDA to weigh the important of each risks

- Learning to process the files in QGIS

- Learn how to compare the results risk map with real outbreaks occurred.

Methodology

ASF Causal Pathway Diagram

Forest/wild pig

Pig density

Imported pig/pig products

Swill feeding

ASF outbreak

Slaughter house

Market

Previous outbreak(2019)

Main road

Pig farm

- We draft questionnaire form with Both Lao and English languages
- Interviewed 11 senior Vet officers(3 DLF, 8 from Provincial Vet)

MCDA

Dr Art_Laos_Final_ASF_RiskFactors_cal_Excercise_ART.xlsx - Excel

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Step 1: Copy raw values from Results worksheet filtered for each question into yellow cells below, over-writing any previous values															
2	Step 2: Manually enter the calculated median result in the orange cell for each question into the upper left blue cells to the right of the corresponding question number															
3																
4	Question	Median result		Raw values		This "Raw values" column will depend on how many expert you interviewed. If you interview 15 experts, then you need to find m										
5	1	4		2												
6	2	4		-8												
7	3	4		2		Serial No.	Name	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
8	4	4		6		1	Dr Phouvo	8	8	4	6	6	8	6	-4	8	2
9	5	-4		4		2	Mr Laphin	-2	-4	2	-6	-2	4	-4	2	-2	-8
10	6	4		0		3	Mr Sengxa	4	4	4	4	-6	4	2	-6	2	2
11	7	0		-4		4	Mr Vilidde	8	4	-4	6	2	8	4	-4	4	6
12	8	0		8		5	Mr Virakor	2	-8	-4	-4	-8	4	4	-8	-4	4
13	9	4		8		6	Mr Suban	8	0	4	-8	4	2	8	0	0	0
14	10	2		2		7	Mrs Malay	0	4	4	4	-4	-4	-4	4	4	-4
15				-4		8	Mr bounla	-2	8	4	6	-4	2	0	0	6	8
16			Question median	2		9	Mr Bounpa	8	0	4	6	-4	4	0	0	4	8
17						10	Mr Phoney	0	-4	4	4	-4	4	0	6	8	2
18						11	Mr Thongo	4	6	4	4	-4	-4	-4	6	6	-4

Questions | Questionaire_tran to Lao | ComparisonValues | Results | **ResultsSummary** | FinalResultsMatrix | Sheet1

		Risk factor 2						
		Major and minor roads	Pig population density	Live animal markets	forest/wild pig	previous outbreak		
	Major and minor roads	0	-4	-4	-4	0		
Risk	Pig population density	4	0	-4	4	0		
factor 1	Live animal markets	4	4	0	-4	-4		
	forest/wild pig	4	-4	4	0	0		
	previous outbreak	0	0	4	0	0		

Transformed scores, geometric means & weights

Transformed score for each risk factor comparison

		Risk factor 2					Geometric row mean	Weight for spatial risk layer
		Major and minor roads	Pig population density	Live animal markets	forest/wild pig	previous outbreak		
	Major and minor roads	1.00	0.30	0.30	0.30	1.00	0.21	**0.03**
Risk	Pig population density	3.33	1.00	0.30	3.33	1.00	1.69	**0.27**
factor 1	Live animal markets	3.33	3.33	1.00	0.30	0.30	1.00	**0.16**
	forest/wild pig	3.33	0.30	3.33	1.00	1.00	1.69	**0.27**
	previous outbreak	1.00	1.00	3.33	1.00	1.00	1.69	**0.27**
							6.27	1.00

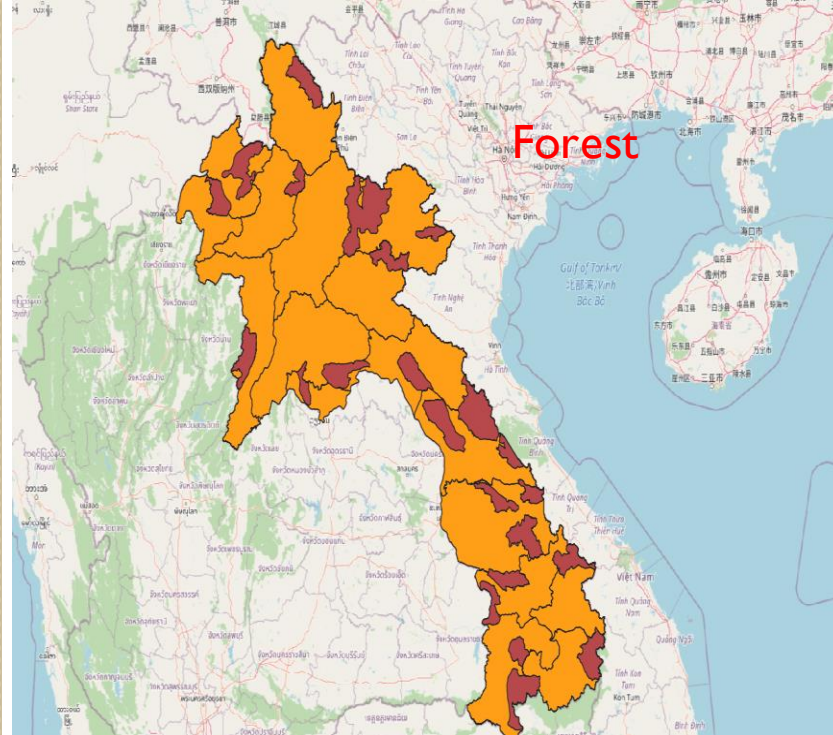Sheets: Questions | Questionaire_tran to Lao | ComparisonValues | Results | ResultsSummary | **FinalResultsMatrix** | Sheet1
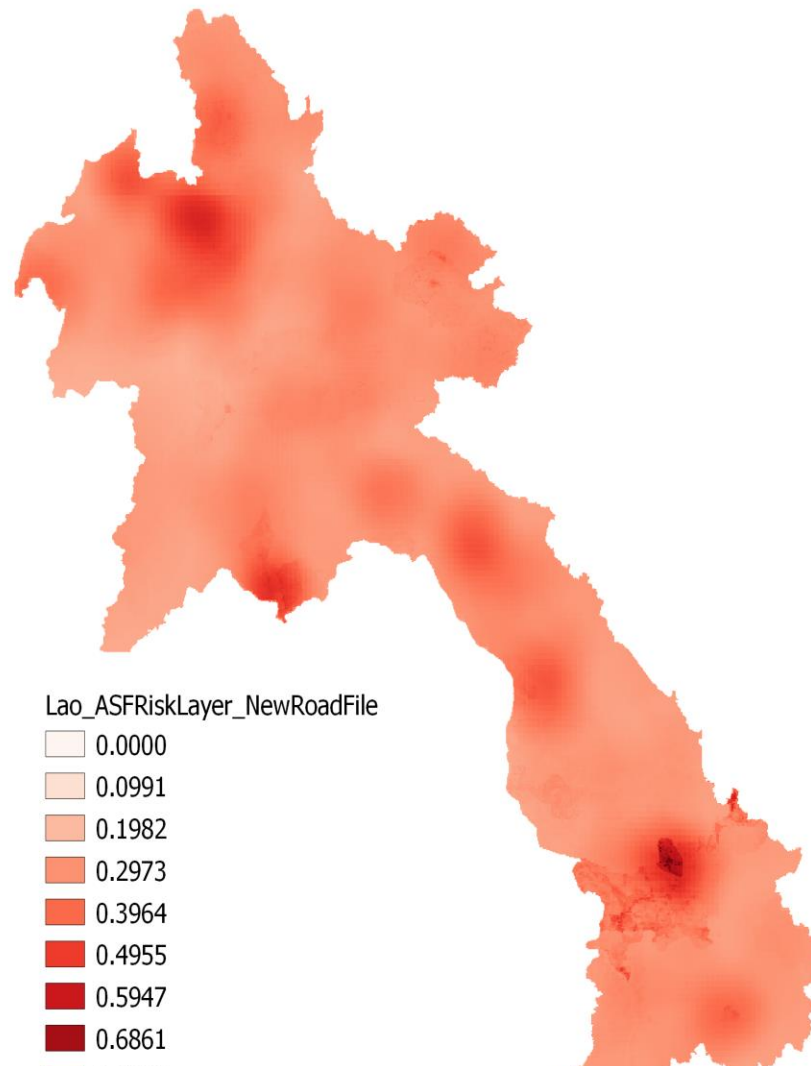
Files for spatial layers

- Lao National Protection Forest(Polygon file)
- ASF Outbreak 2019(CSV file)
- Lao Market(Shp file)
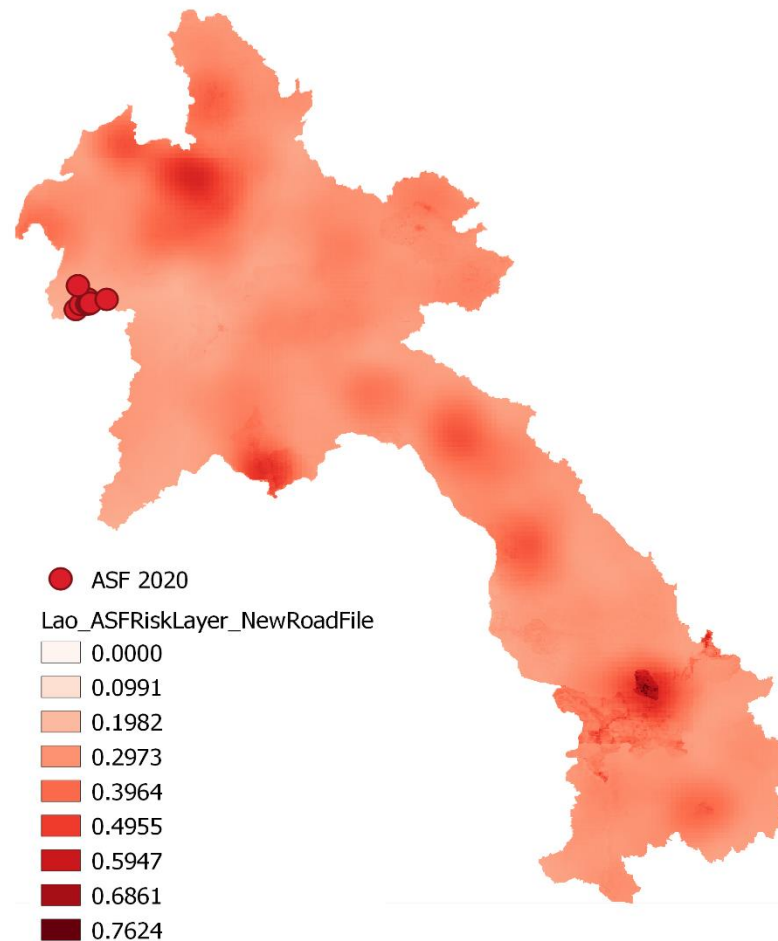- World Pig density2006 from FAO
- Lao primary-secondary road
- Lao_adm0

Forest

Market

ASF outbreak
2019

ASF Risk Layer Result Map

Lao_ASFRiskLayer_NewRoadFile

- 0.0000
- 0.0991
- 0.1982
- 0.2973
- 0.3964
- 0.4955
- 0.5947
- 0.6861

ASF Risk Layer Result Map with ASF outbreak 2020

ASF 2020

Lao_ASFRiskLayer_NewRoadFile
- 0.0000
- 0.0991
- 0.1982
- 0.2973
- 0.3964
- 0.4955
- 0.5947
- 0.6861
- 0.7624

Conclusion

- After ASF outbreak 2019 Lao PDR Has through country.

- The ASF outbreak 2020 seem to occurred in the low risk area of the map maybe cause from many reasons such as:

✓ In the high risk area farmers have not started pig re-raising yet

✓ under reporting from the farmers because of low compensation

Future plan

- Do Re-projection on ASF risk layers put one more risk factor "Slaughter house"
- Try to do with others important diseases

Thank you very much for your attention!