Spatial risk assessment on FMD incursion and spread in Cambodia, 2020-2021

Country: Cambodia

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Outlines

➢ Background

➢ Objectives

➢ Methods

➢ Results

➢ Discussions

➢ Conclusions

➢ Limitation

Background

- An endemic disease in Cambodia (Boyd 2010).
- Three serotypes were identified including O, A and Asia1.

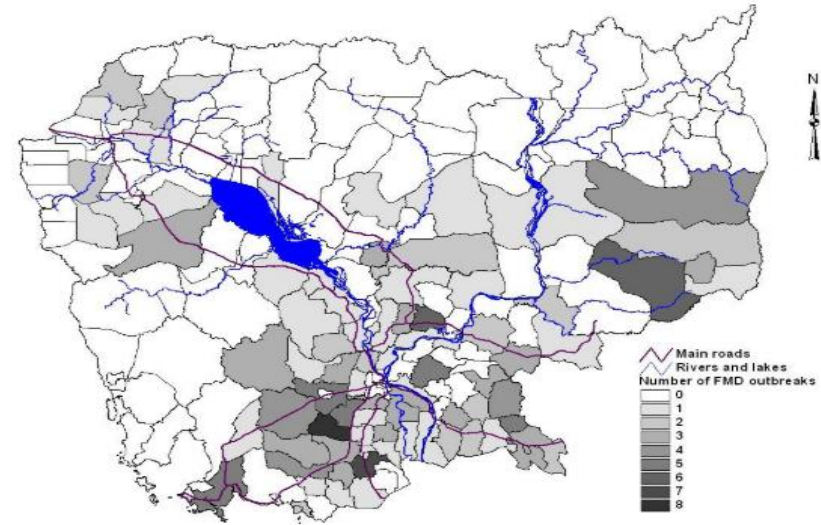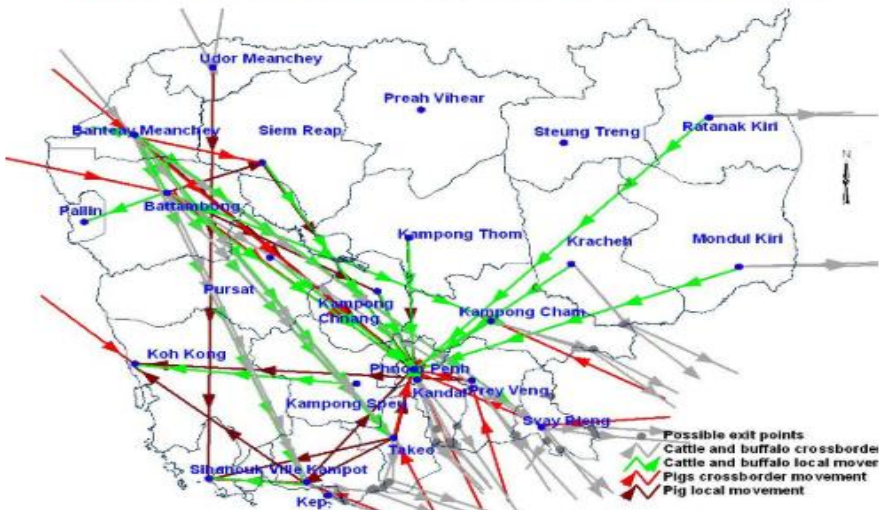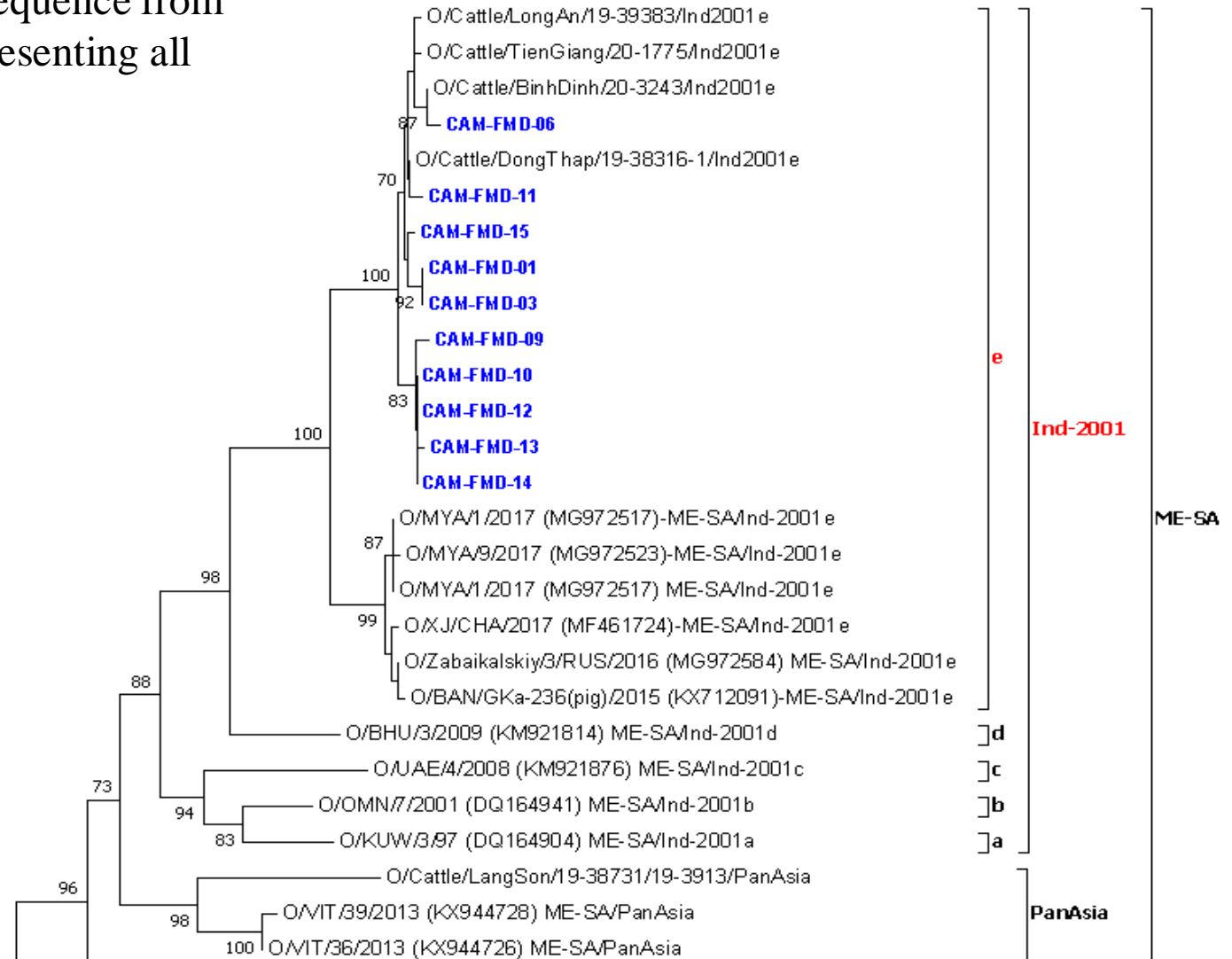Figure 1: Recorded FMD Outbreaks: 2005-09

- Serotype O was responsible for almost FMD outbreaks in Cambodia (Tum et al. 2015).

Figure 2: Recorded Livestock Movements

3

Background

FMDV Phylogenetic Tree showing the relationship of the partial nucleotide sequences of FMDV sequence from Cambodia with reference sequences representing all prototypes in 2020.

Objectives

- To describe FMD spatial risk assessment in Cambodia.

Materials & Methods

➤ 17 respondents (FAO 1, NAHPRI 1 and POAHP 15)

➤ Data collected and enter to MCDA sheets excel

➤ Calculation weight individual question

	E14		f_x	
	A	**B**	**C**	**D**
1	Step 1: Copy raw values from Results worksheet filtered for each questio			
2	Step 2: Manually enter the calculated median result in the orange cell for			
3				
4	Question	Median result		Raw values
5	1	8		2
6	2	8		-4
7	3	2		2
8	4	-4		6
9	5	-4		4
10	6	2		4
11				2
12				2
13				-6
14				2
15				-2

	A	B	C	D	E	F	G	H
1	**Median scores for risk factor comparisons**							
2				Risk factor 2				
3			Major and minor roads	Cattle population density	Pig population density	Water Way density		
4		Major and minor roads	0	-8	-8	4		
5	Risk	Cattle population density	8	0	-2	4		
6	factor 1	Pig population density	8	2	0	-2		
7		Water Way density	-4	-4	2	0		
8								
9	**Transformed scores, geometric means & weights**							
10				Transformed score for each risk factor comparison				
11				Risk factor 2				
12			Major and minor roads	Cattle population density	Pig population density	Water Way density	Geometric row mean	Weight for spatial risk layer
13		Major and minor roads	1.00	0.09	0.09	3.33	0.21	**0.03**
14	Risk	Cattle population density	11.11	1.00	0.55	3.33	3.70	**0.51**
15	factor 1	Pig population density	11.11	1.83	1.00	0.55	2.85	**0.39**
16		Water Way density	0.30	0.30	1.83	1.00	0.46	**0.06**
17								**1.00**
18								

Methods

➢Download Cambodia shape files, water way and major main road from the website (https://www.diva-gis.org/gdata) and https://gadm.org/download

➢Download animal density from the website

▪https://livestock.geo-wiki.org/download/

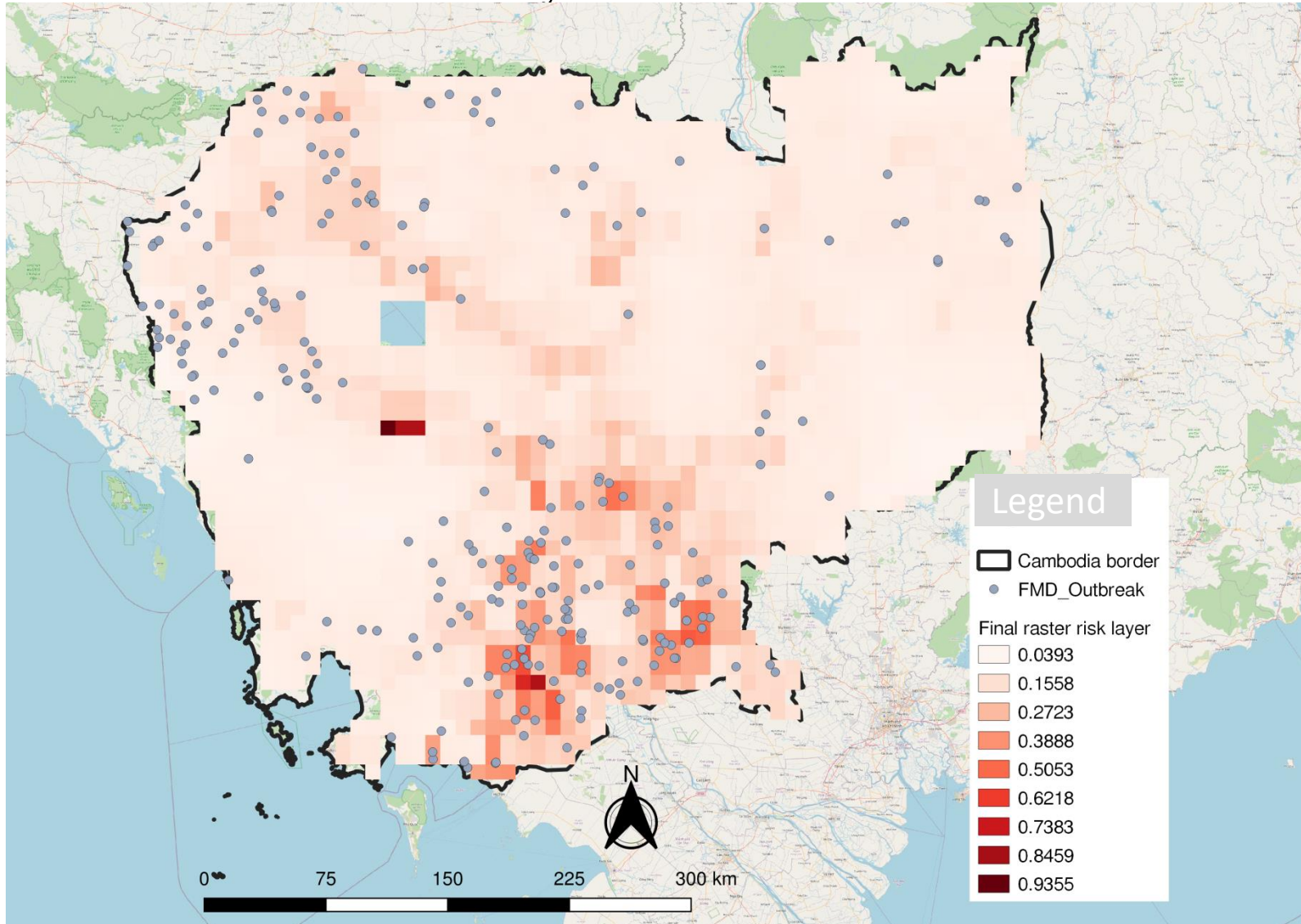➢Generate maps in (QGIS 3.16.9) follow the instructions

7

Results

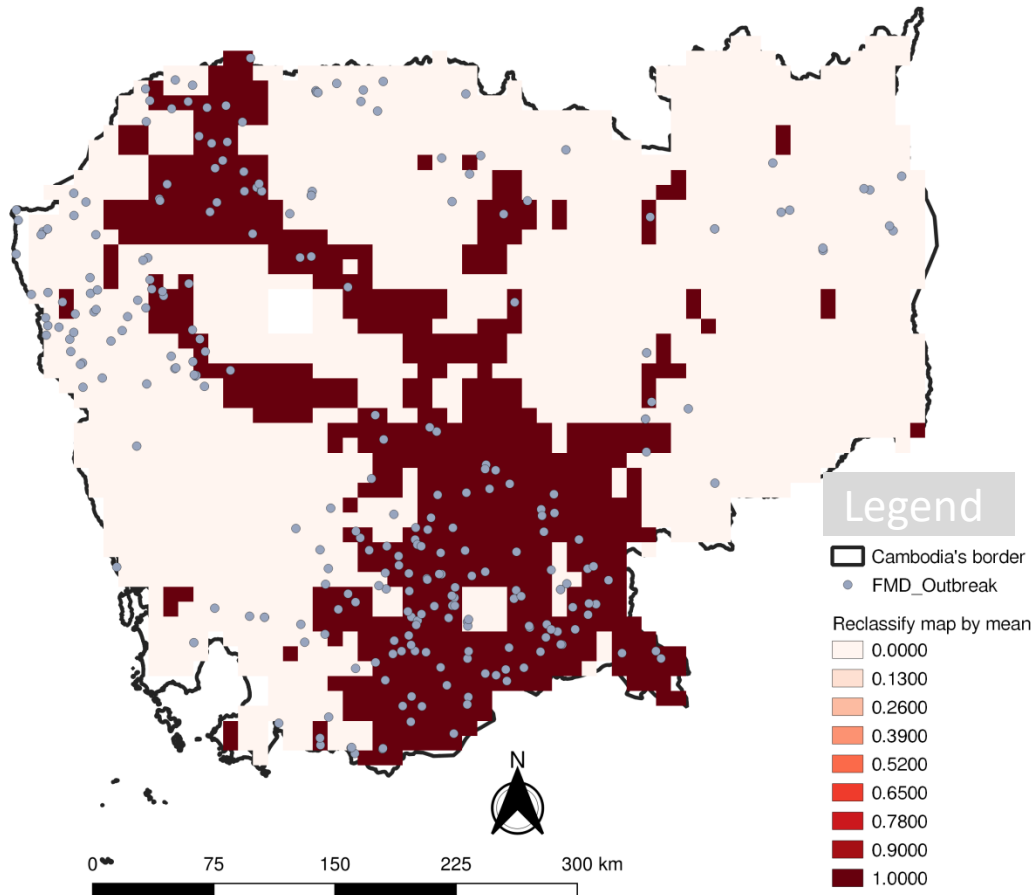- Heat map of FMD outbreak in Cambodia, 2020-2021
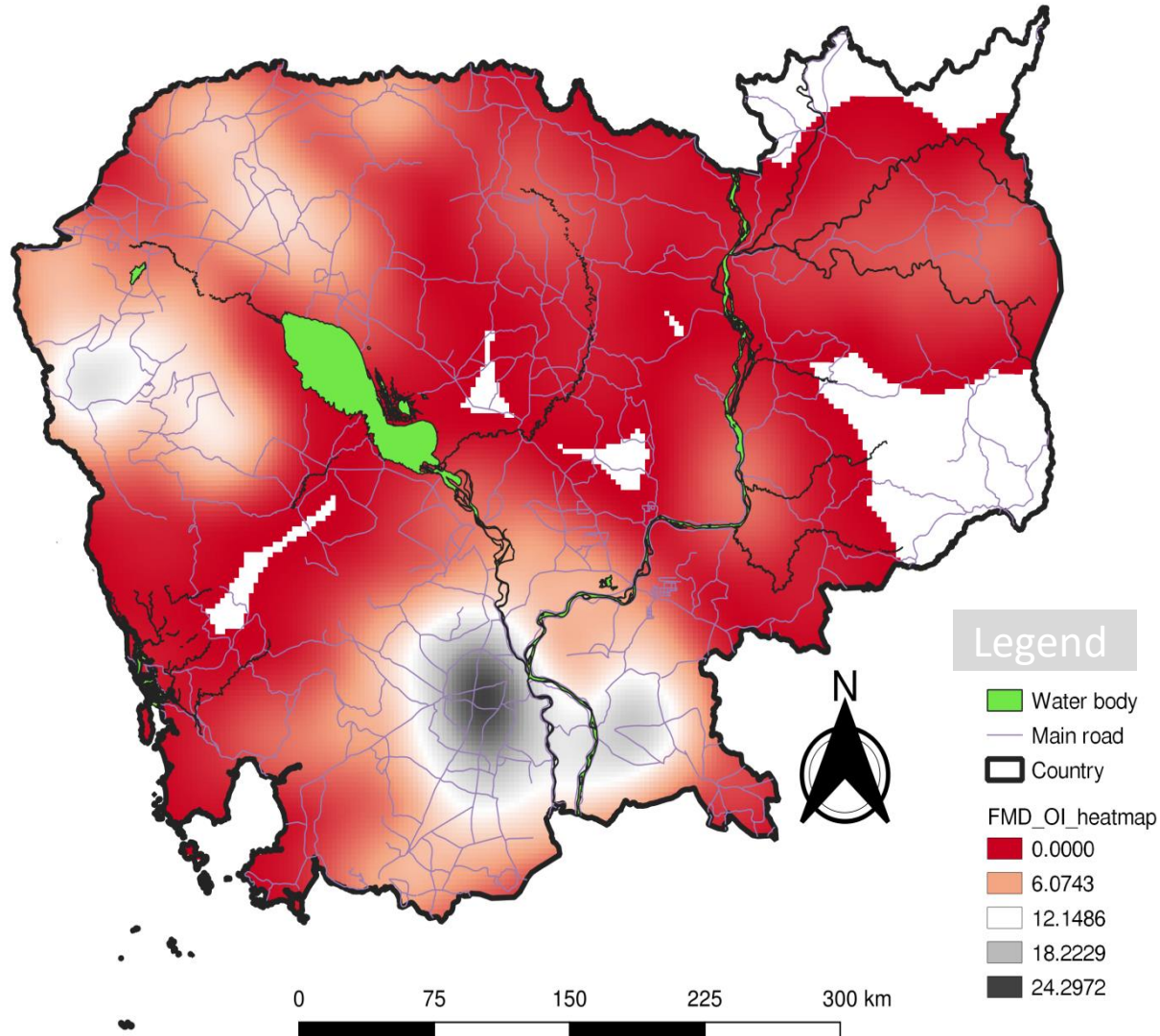
Results

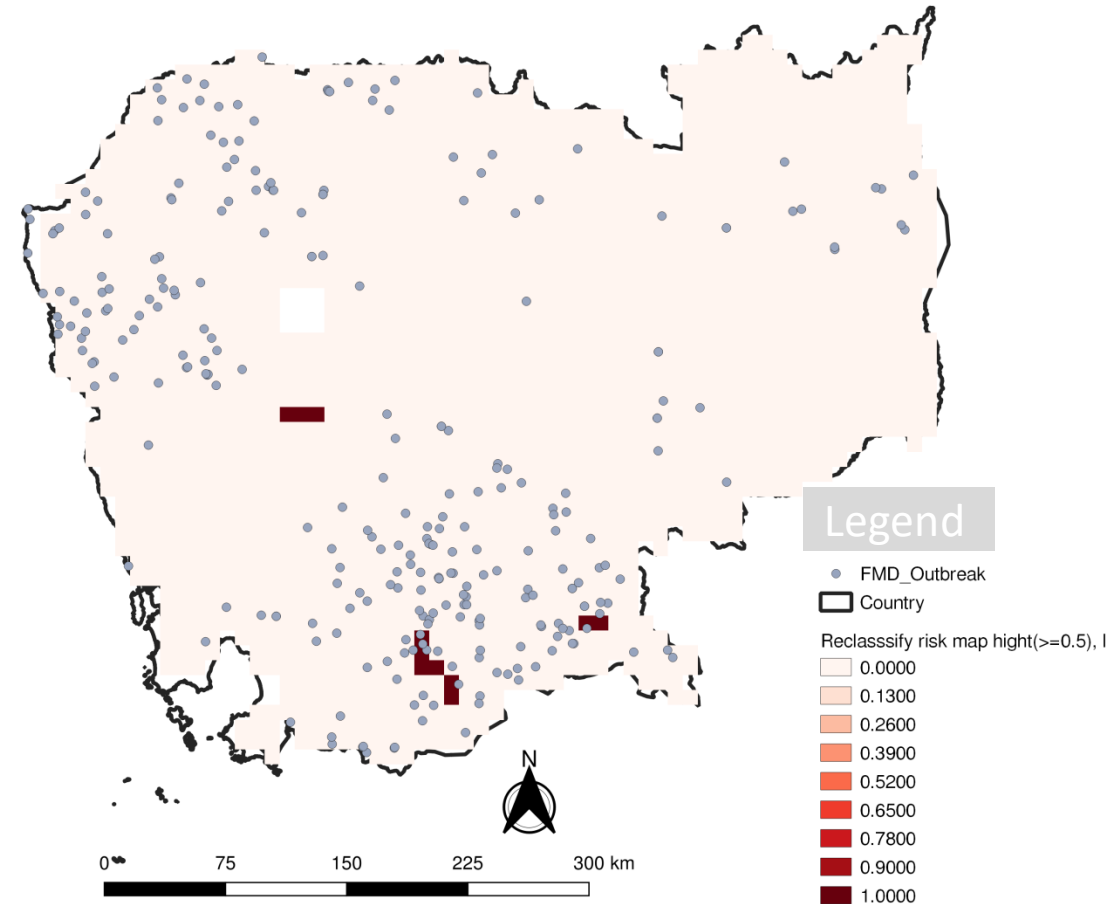- Final Cambodia FMD risk raster layer

9

Results

- Reclassify map by mean

- Reclassify map by 0.5

Discussion

➢ FMD more outbreak in north-west border with Thailand and South border with Vietnam,

  ▪ Live cattle import from Thailand to Vietnam cross Cambodia

➢ FMD more case in an area of province who had large densities (cattle and pig)

  ▪ Cambodia has limited FMD vaccine coverage to animal

➢ FMD most report closest to main road than water ways

  ▪ Generally, cattle transportation by traders via main road

Limitation

❖ Other risk factors don't have data record may associated with FMD outbreak

- Animal movement
- Slaughterhouse location
- Animal quarantine location
- Entry and Exit of animal trader from neighboring country

Conclusion and potential next step

❖ To reduce FMD risk incursion and spread

- Increase FMD vaccine coverage
- Announcement any knowledge and information about FMD disease to stakeholders to control and prevent
- Check animal health certificate and restrict animal movement
- Work together between government and private sector to combat with FMD
- Increase cattle production the country and reduce import form other.

Thank you for your attention!