SPATIAL RISK ASSESSMENT FOR FMD RISK FACTORS OF MONGOLIA

TEAM MONGOLIA

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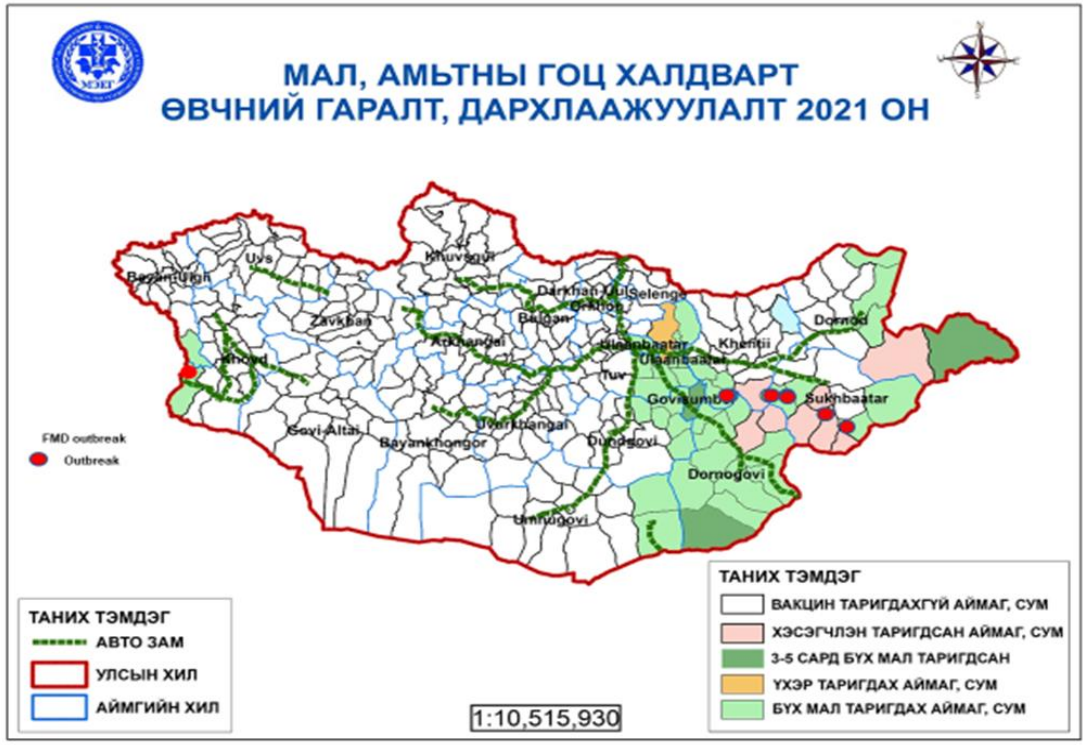
Background and Rational

FMD is one of priority diseases in Mongolia

- Outbreaks (Reoccurrence) of FMD have been reported in this years.
- Due to the high cost of FMD control and surveillance, the risk needs to be assessed and responded to in high-risk areas in the short term.
- In order to increase the economic turnover of Mongolia, we aim to support the export of raw materials and products of animal origin, including meat.

FMD outbreak currents situation in 2021

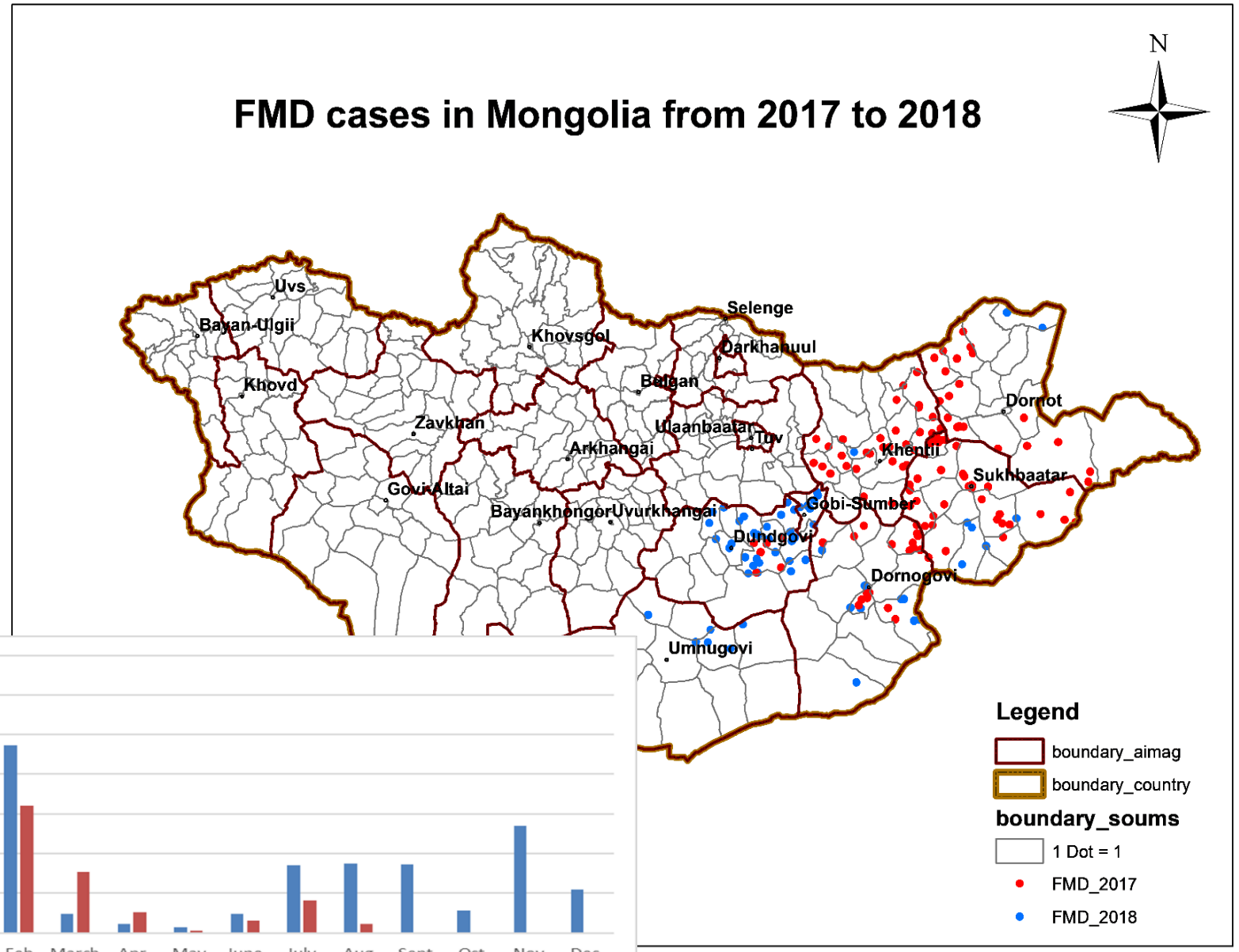


№	Province	Soum name	Started on	Cases /Cattle/	Sheep and goats	Status
1	Khovd	Bulgan	2021.06.30	85		on-going
2	Sukhbaatar	Ongon	2021.05.13	16		Resolved
3	Sukhbaatar	Galshar	2021.05.31		141	Resolved
4	Sukhbaatar	Tuvshinshiree	2021.06.08		8	Resolved
5	Dornogovi	Ikhkhet	2021.06.17		721	Resolved
6	Khentii	Darkhan	2021.06.18	38		Resolved
Total				**139**	**870**	

Control measures

- Emergency and routine Vaccination
- Surveillance outside containment and or the protection zone
- Movement control
- Quarantine

SPATIAL RISK ASSESSMENT ON FMD OUTBREAK IN MONGOLIA -2018

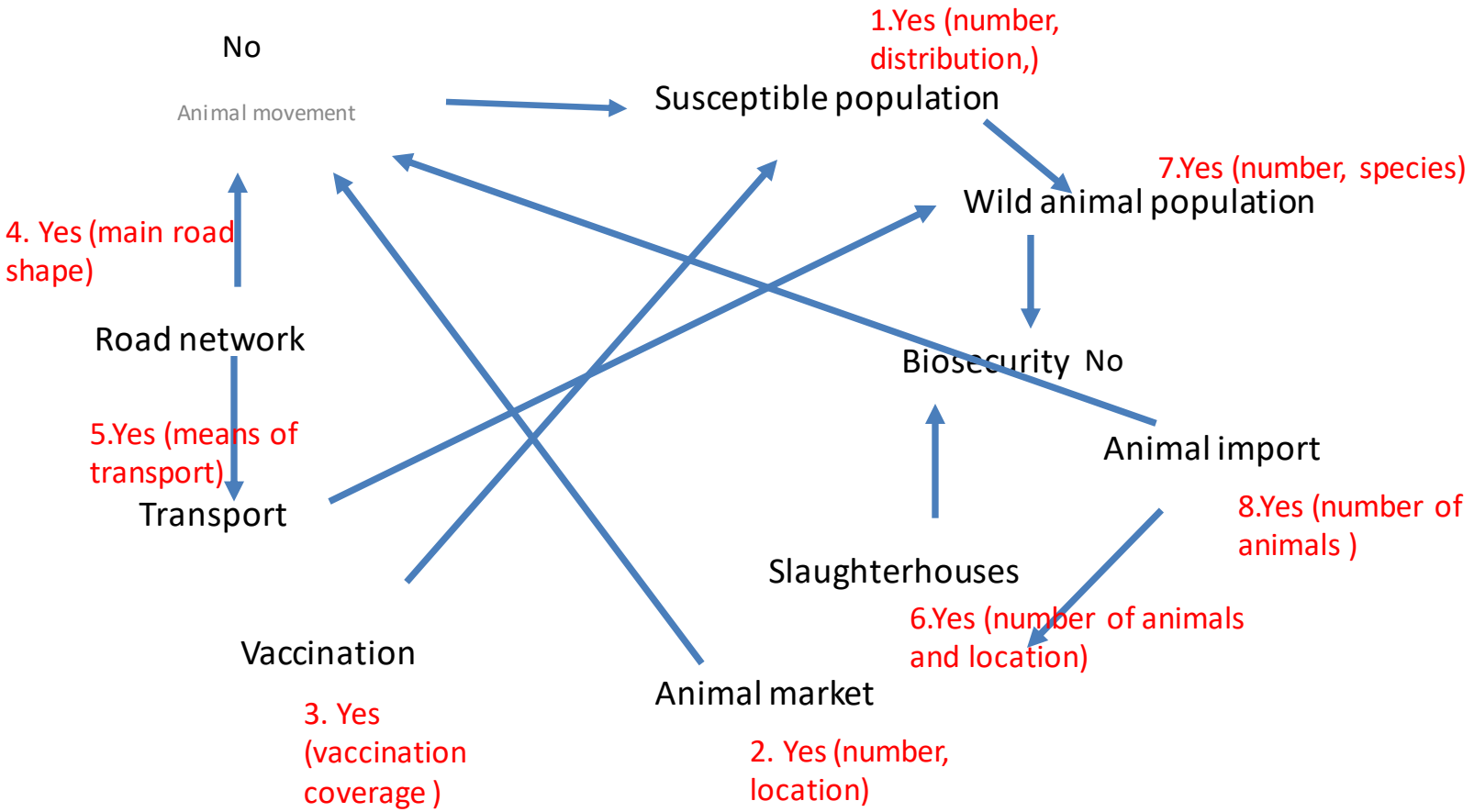


Methodology

CAUSAL PATH DIAGRAM

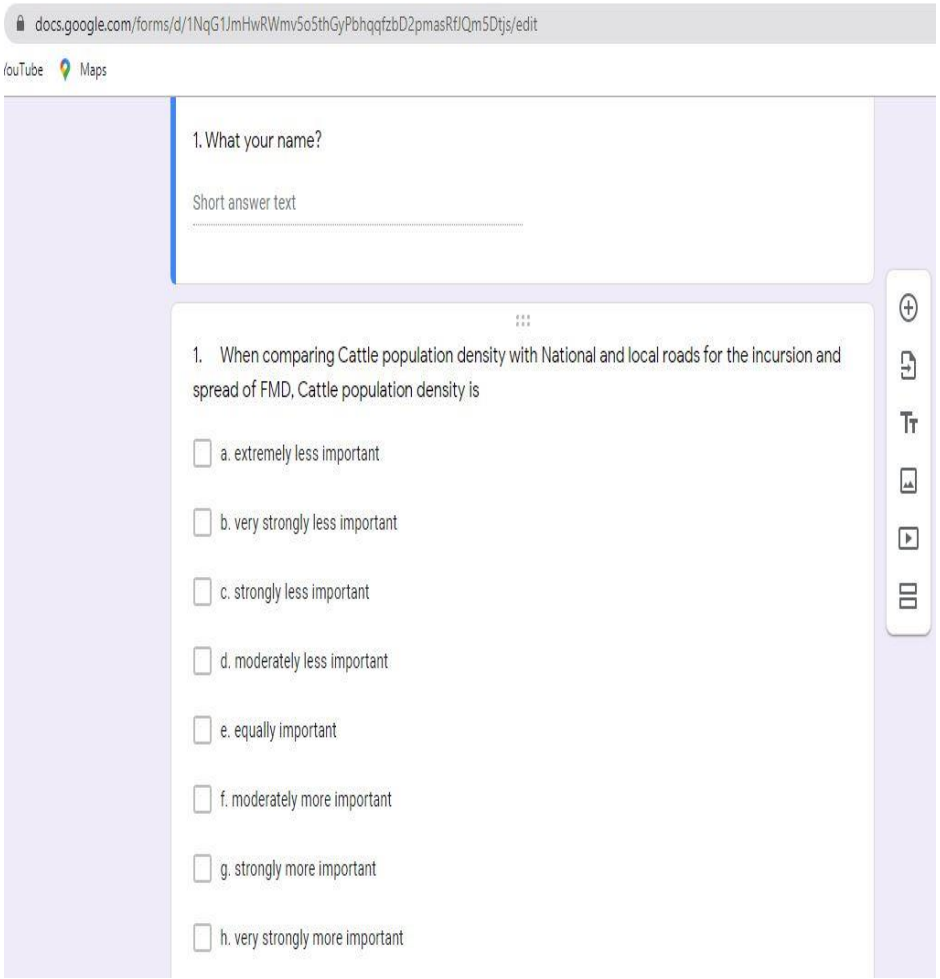
Risk factors (FMD)

Spatial data availability-8 risk factors



Questionnaire developed and circulated among experts

Collected 10 responses from FMD experts by google form questionnaire regarding to the importance of chosen risk factors



1. Bolortuya.P, OIE
2. Batchuluun.D, SCVL
3. Chris Bartels, FAO
4. Gerelmaa.U, FAO
5. Amarsanaa.L, FAO
6. Battsetseg.G, FAO
7. Batkhyag.S, MOFA
8. Bodisakhan.Kh, GAVS
9. Erdeneochir.Ts, MULS
10. Chimedtseren.B, MULS

Results and Validation

Identified and selected risk factors

Factor Code	Factor Abbrev	Factor Description
A	WSS	Water sharing springs
B	RDS	National and local roads
C	CTL	Cattle population density
D	SRP	Small ruminants population density

Weighed risk factors

		RISK FACTOR 2					
		National and local roads	Cattle population density	Small ruminants population density	Water sharing springs	Geometric row mean	Weight for spatial risk layer
RISK FACTOR 1	National and local roads	1.00	0.55	0.74	1.35	0.77	**0.18**
	Cattle population density	1.83	1.00	1.00	1.35	1.48	**0.35**
	Small ruminants population density	1.35	1.00	1.00	1.35	1.30	**0.31**
	Water sharing springs	0.74	0.74	0.74	1.00	0.68	**0.16**
							1.00

Data sources for the Risk layers

Mongolian shapefile downloaded from *Geofabrik system.*

- Risk factor water sharing springs /Heat map/ *Figure 1*.
- Country boundary, national and local roads /Proximity/ *Figure 2*.

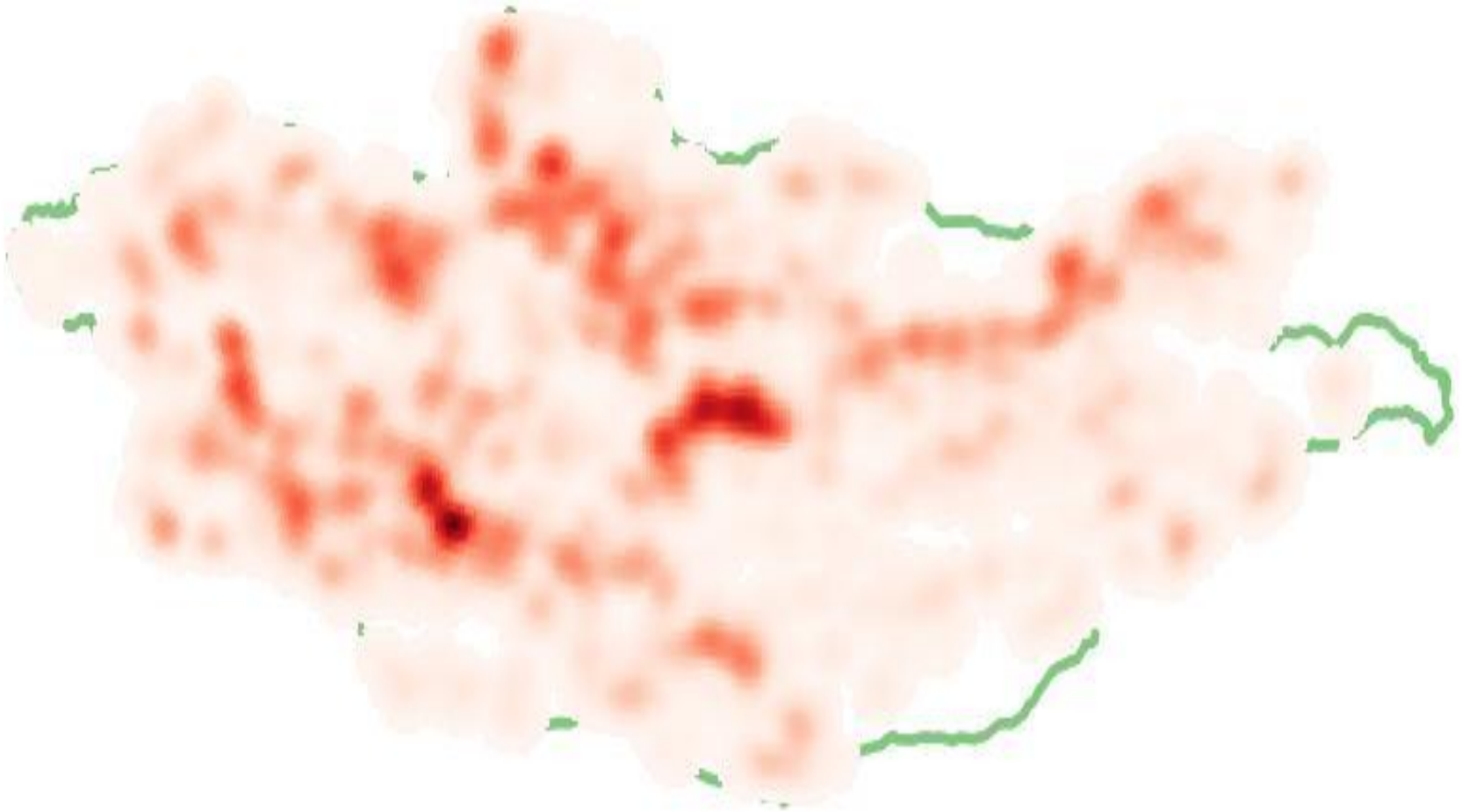
Livestock data collected from *FAO livestock system*

- Cattle and small ruminants population density /Raster/ *Figure 3*.

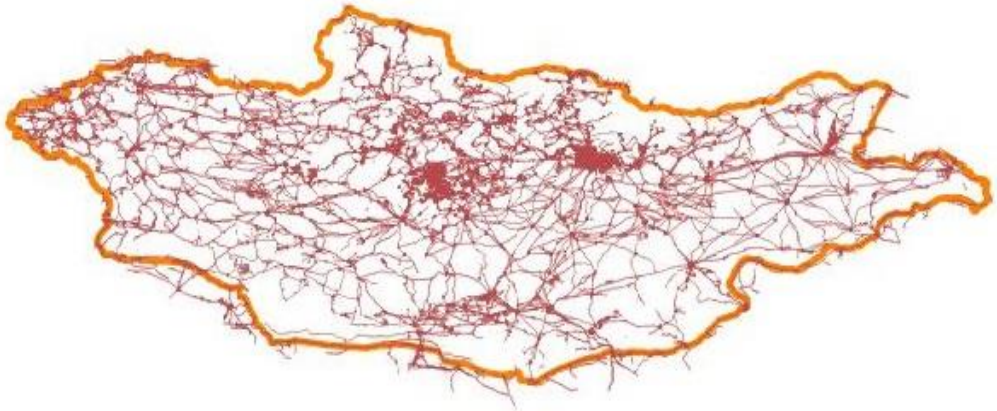
Then…

FMD outbreak locations GPS in Mongolia, 2018

Risk factor water sharing springs /Heat map/



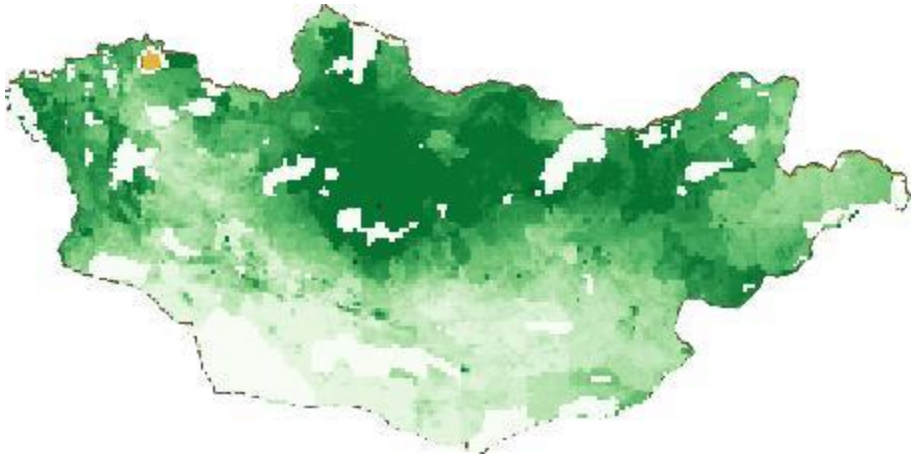
Risk factor national and local roads /Proximity/

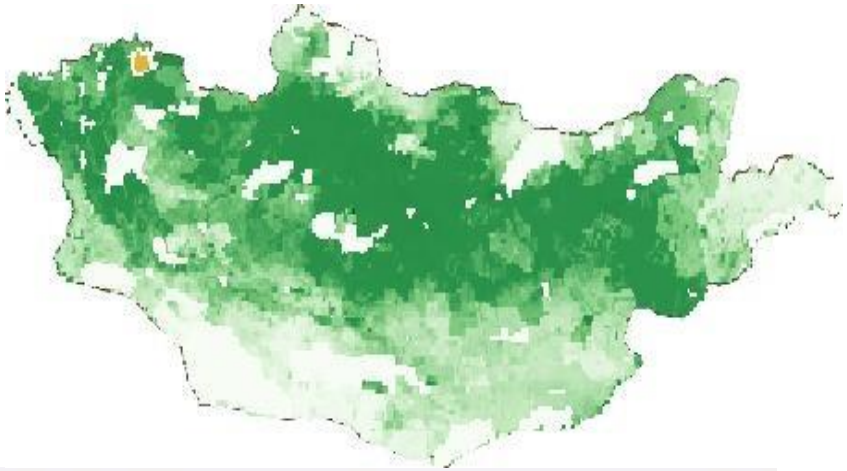


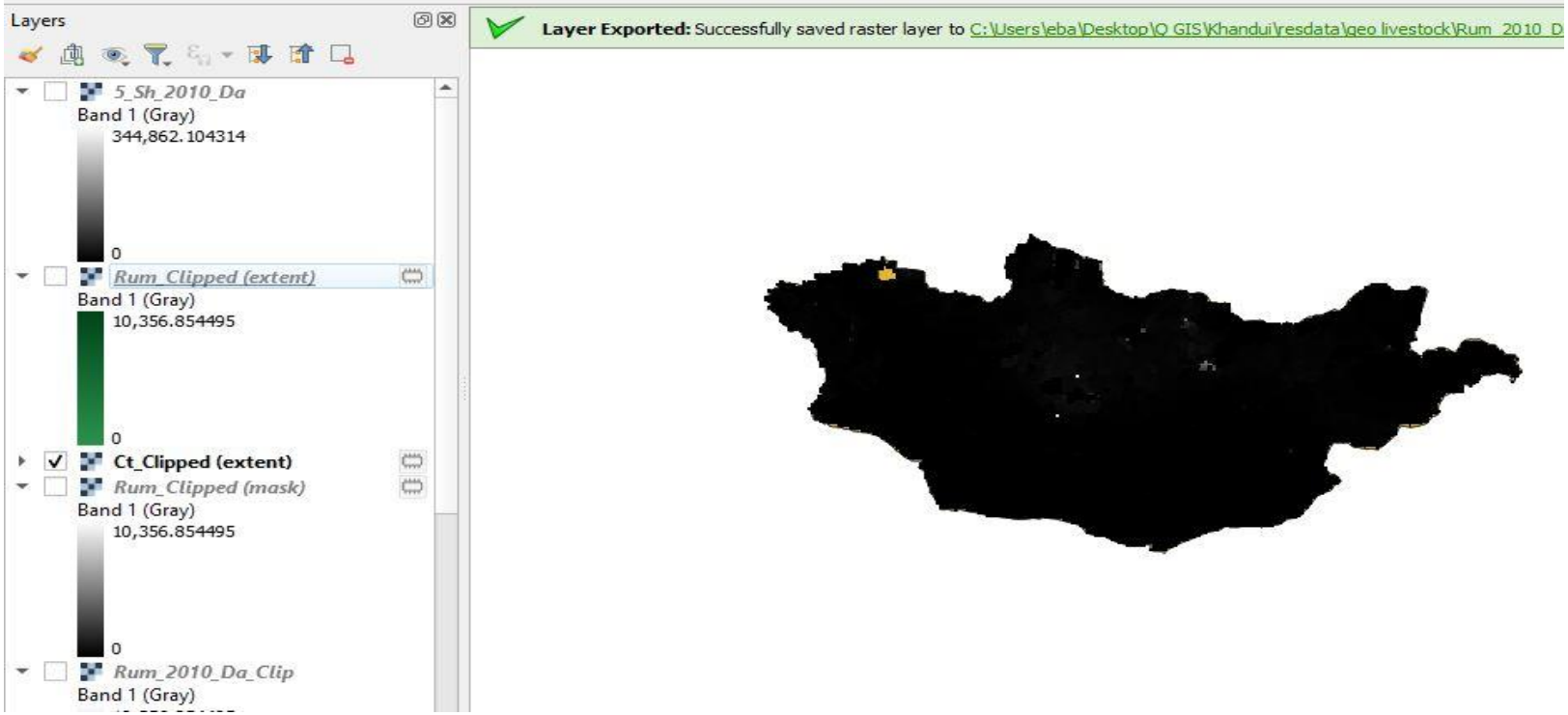
A. Primary and secondary roads

B. Primary and Secondary roads combine and raster calculation

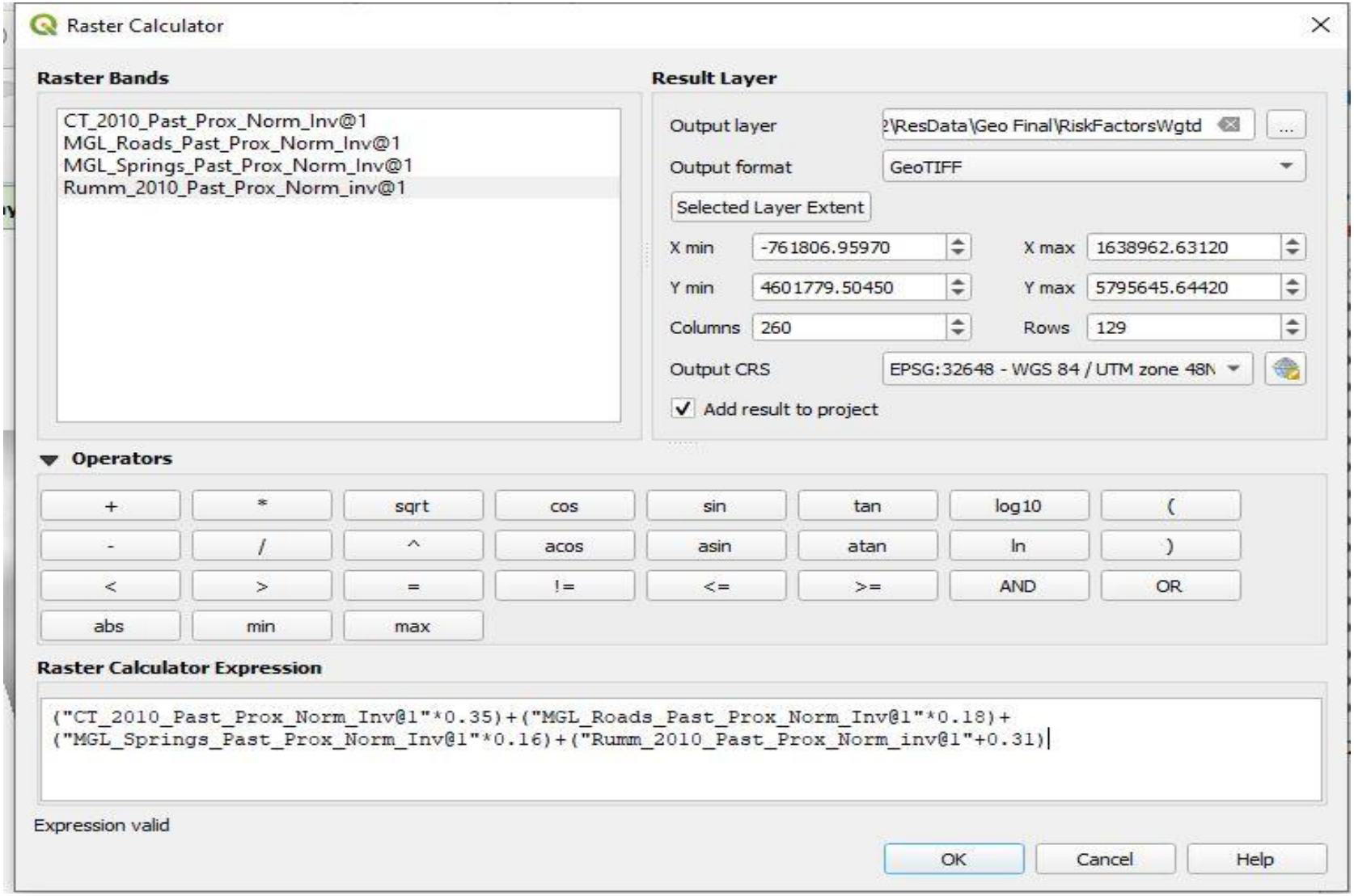
Cattle and small ruminants population density as a raster





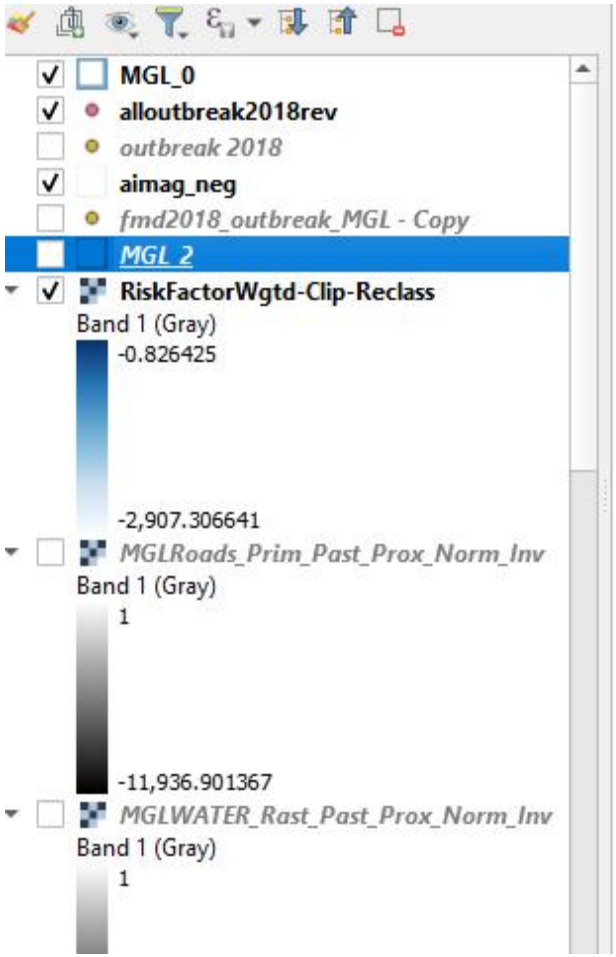


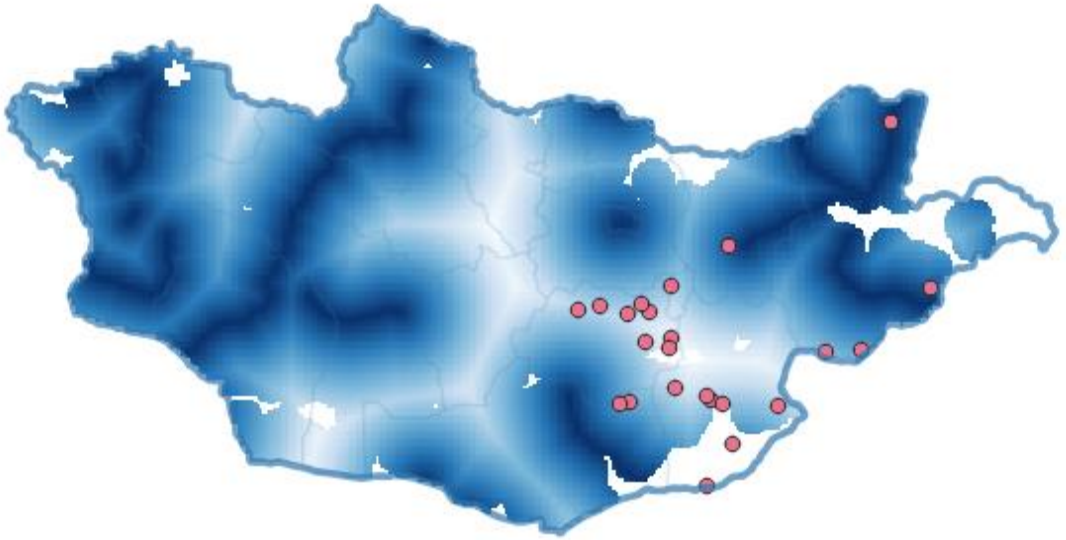
Combining weighted risk layers



Steps for risk combination

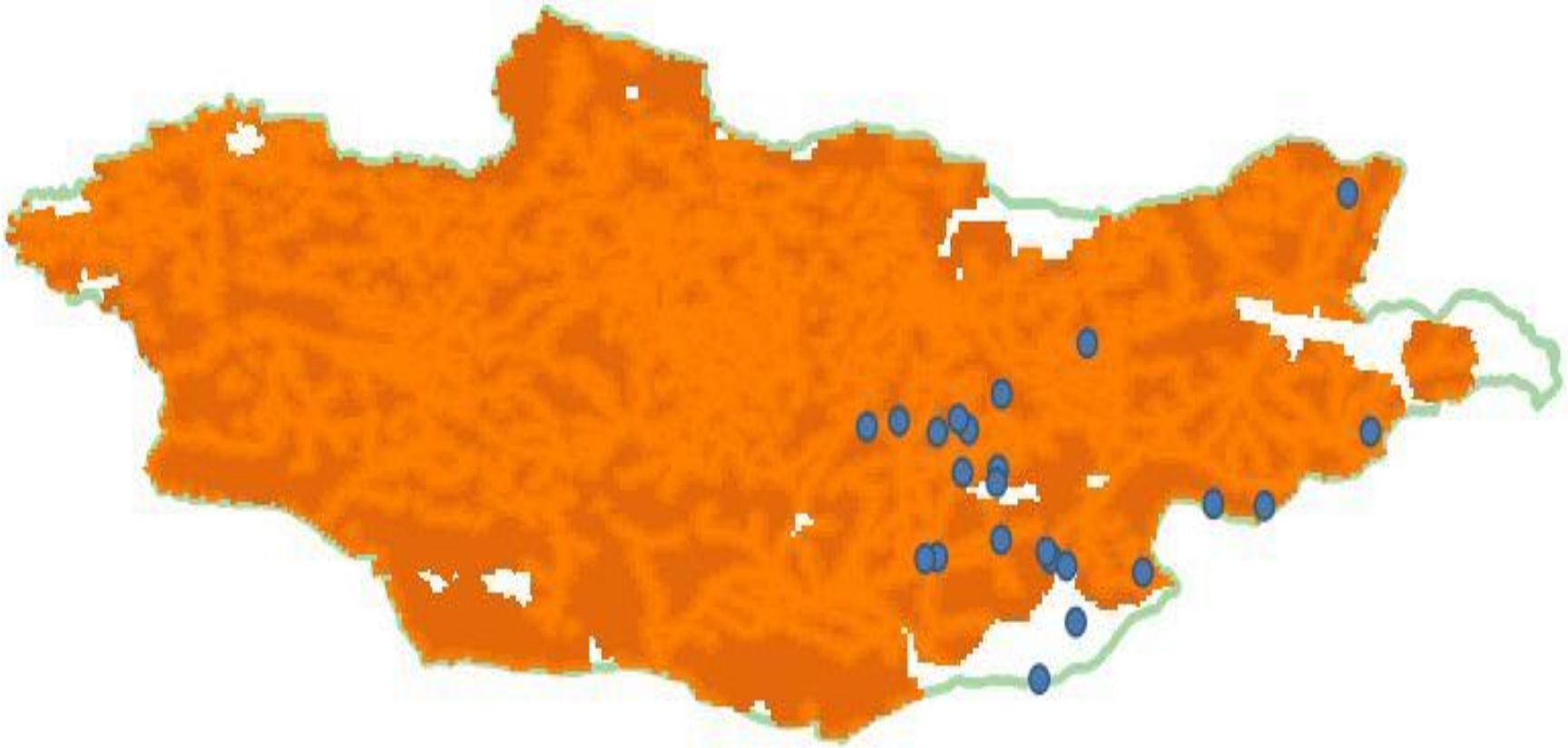
Add layers → Heatmap → Risk factors- raster file → Proximity → Raster calculation → Layers standard → Combining weighted risk factors → Raster analysis





Discussion

- Map shown the result of the Risk combination
- Eastern part of Mongolia matched with the FMD outbreak in 2018
- Some technical errors encountered during the analysis
- Further data validation is needed and replicate the analysis.



Thank you for your attention