

# Spatial Risk Assessment for African Swine Fever in Raho1 region, Vietnam

## Vietnam Team

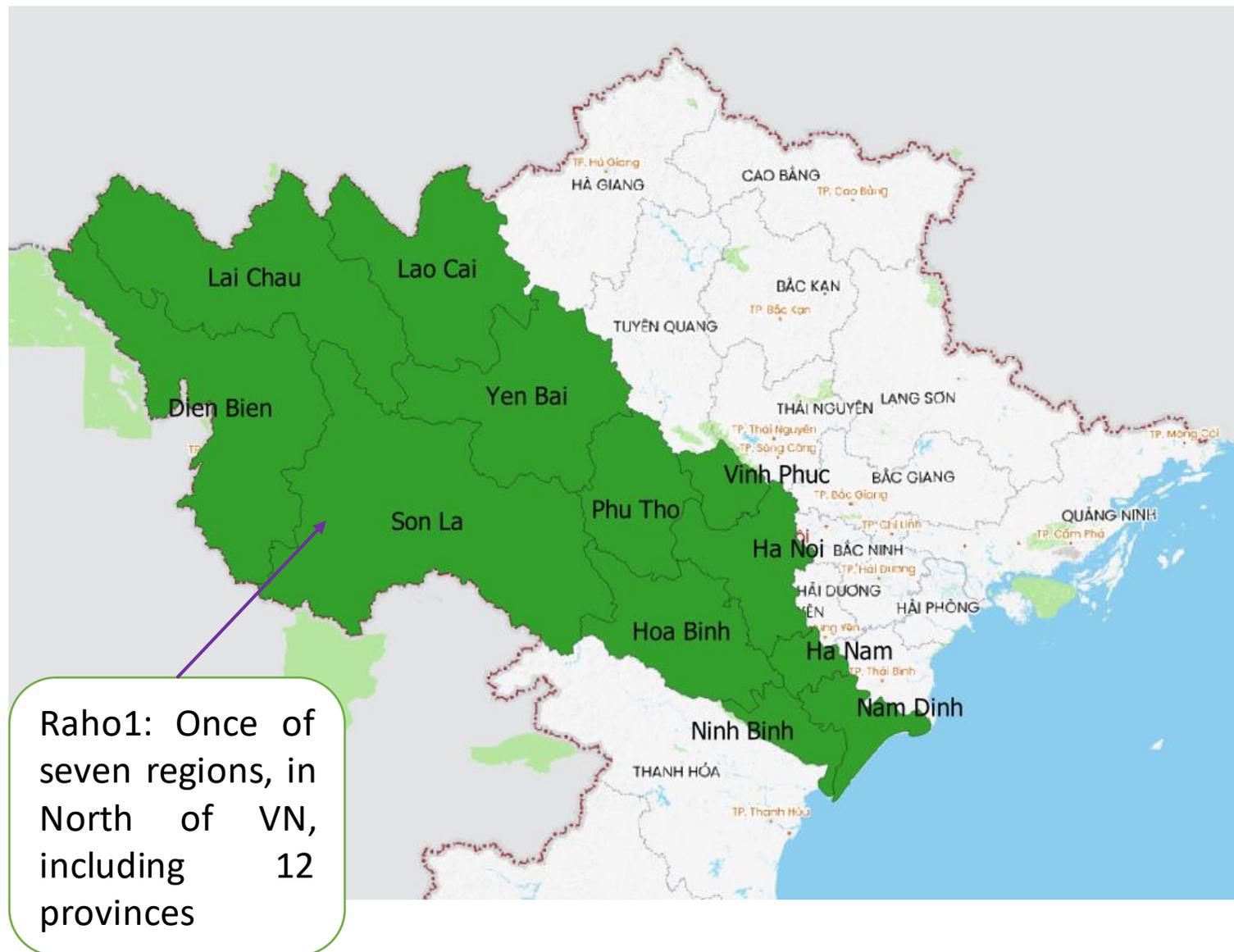
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Ha Noi, Aug-2021

# Background

## ASF outbreaks

- Viet Nam: In the early of February 2019 in Hung Yen province
- In 2019: Total of 8,553 outbreaks from 63 provinces and over 5 million pigs died and culled
- In 2020: Total of 1,596 outbreaks from 50 provinces and over 86 thousand pigs died and culled
- Raho1: In 2019, had 1,975 outbreaks and over 1 million pigs died and culled. In 2020, 397 outbreaks and about 30 thousand pigs died and culled
- The main object of project would be to create risk assessment map for ASF in region

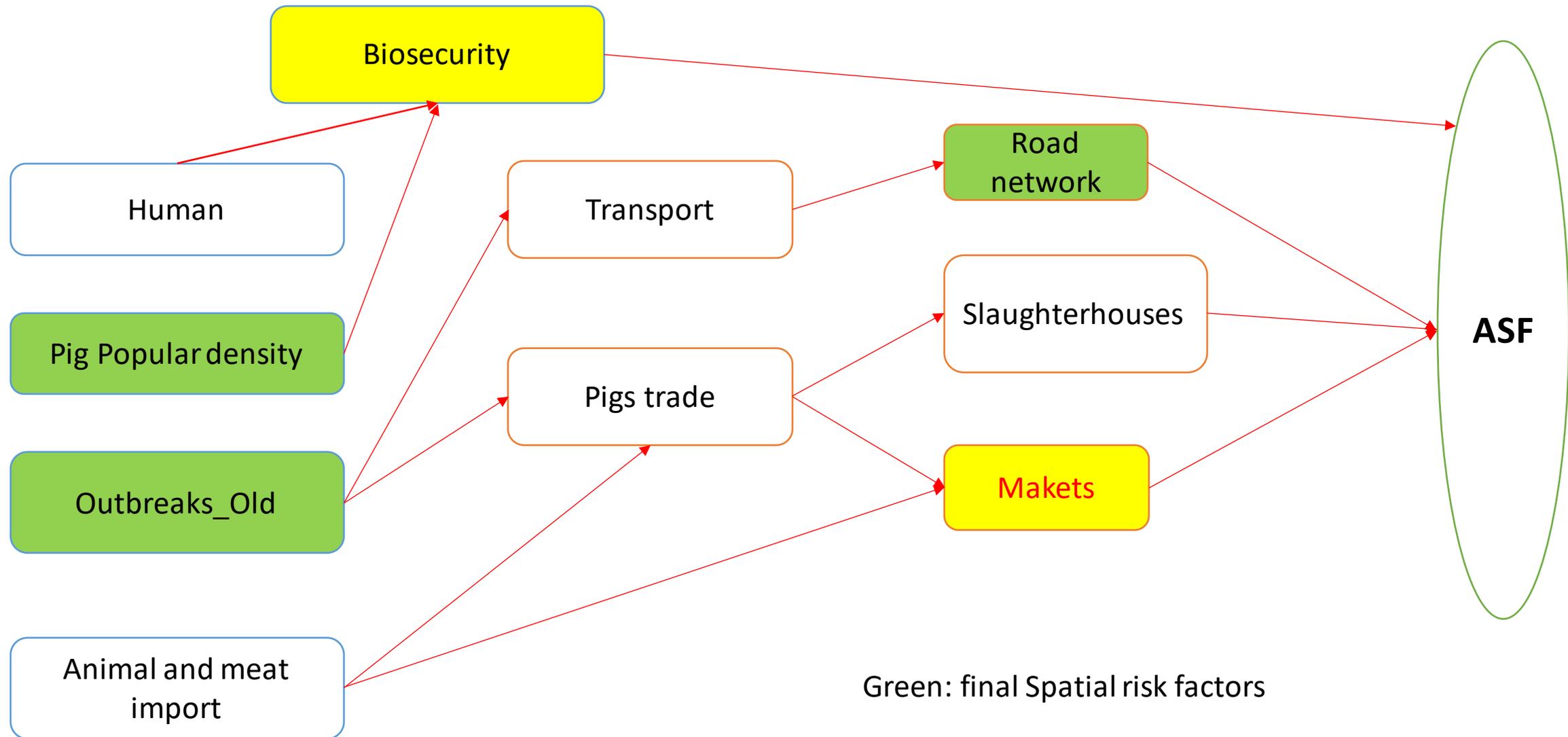


# Methodology

## To list risk factors for ASF

	<b>Risk factor with a spatial component</b>	<b>Risk factor without a spatial component</b>
<b>Risk factor for incursion</b>	<ul style="list-style-type: none"><li>• Pig popular density</li><li>• Outbreaks_Old</li></ul>	<ul style="list-style-type: none"><li>• Biosecurity (in small farms, use discarded food from restaurants,...)</li><li>• Animal and meat import</li></ul>
<b>Risk factor for spread</b>	<ul style="list-style-type: none"><li>• Makets (live animals/ meat)</li><li>• Slaughterhouses</li><li>• Road network (Hight way, International way, water way,...)</li></ul>	<ul style="list-style-type: none"><li>• Transport (animal from disease area to other,</li><li>• Human (vet, or people despose pig disease, ...)</li><li>• Pigs trade/activity (Salemane,...)</li></ul>

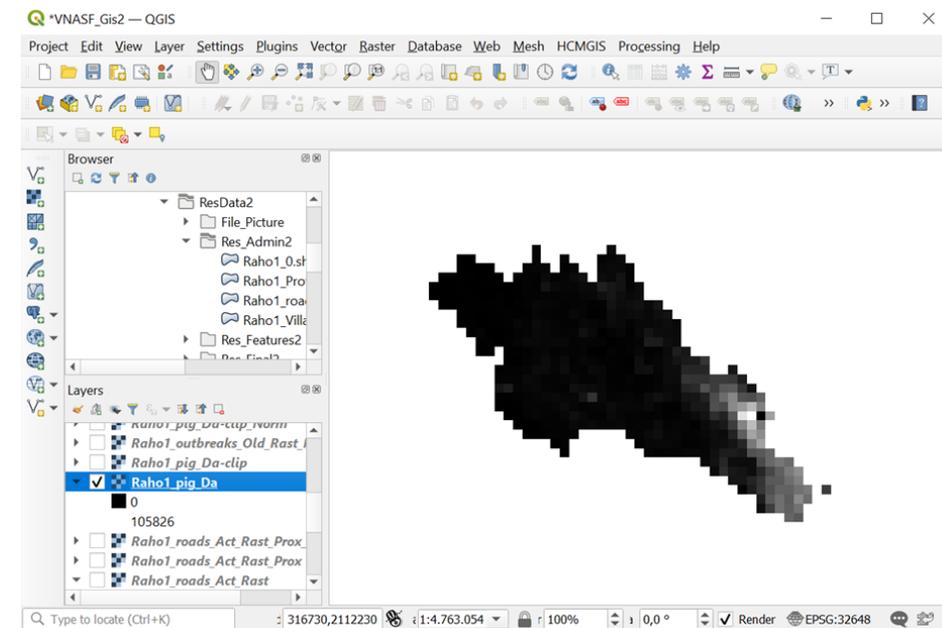
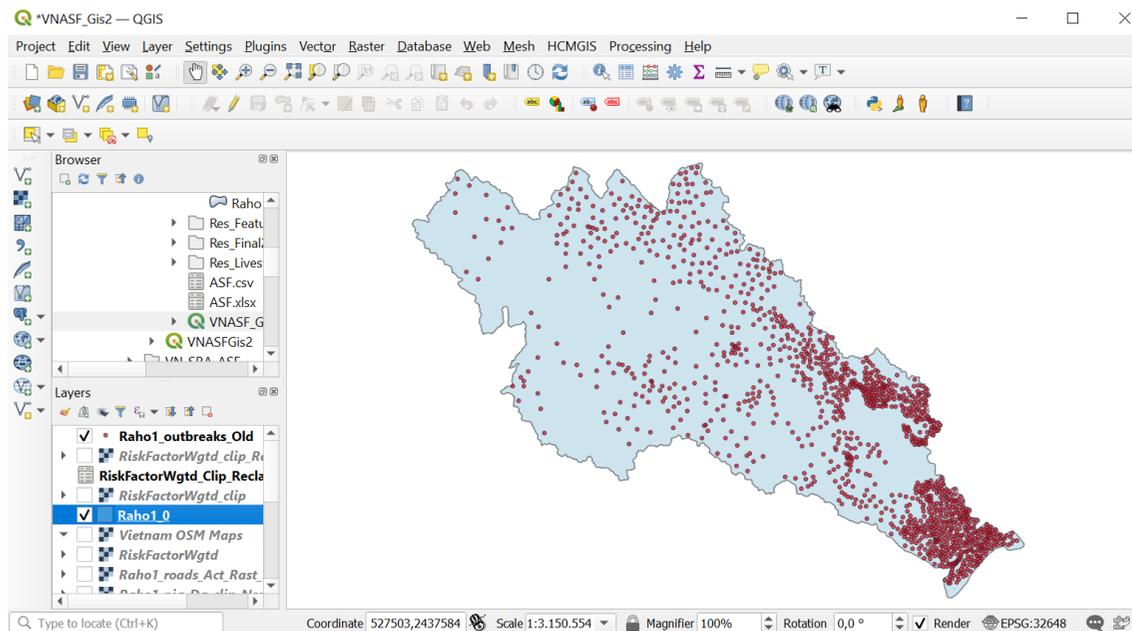
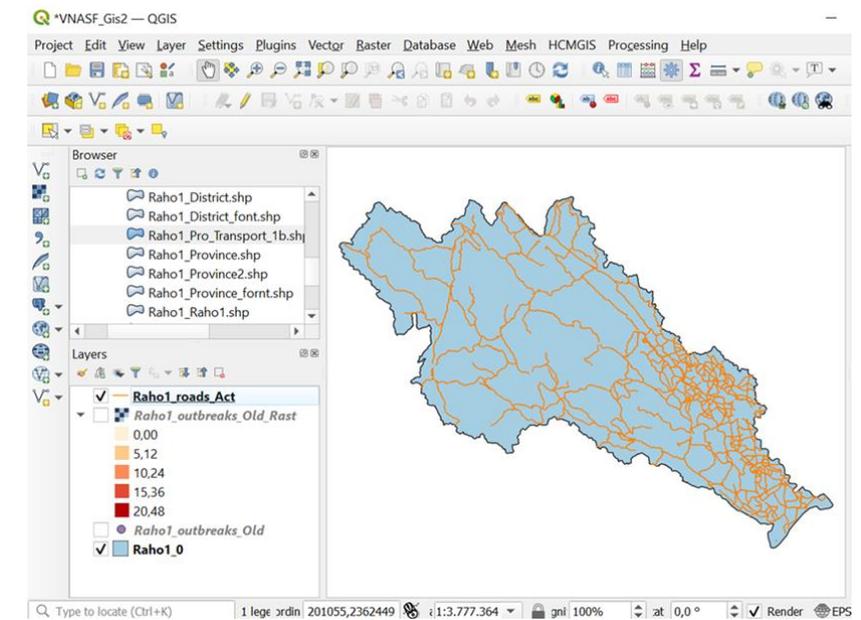
# Final spatial risk factors for incursion and spread of ASF





# Use spatial risk datas

- Road network (Raho1\_roads)
- Pig popular density in Raho1 (Vietnam\_Raho\_pigDen\_FAO)
- Outbreaks\_Old (ASF\_outbreaks\_2019)



# Create final raster risk layer

Raster Calculator

**Raster Bands**

- Raho1\_outbreaks\_Old\_Rast@1
- Raho1\_outbreaks\_Old\_Rast\_Norm\_NoNA@1
- Raho1\_outbreaks\_Old\_Rast\_Norm@1
- Raho1\_pig\_Da-clip\_Norm@1
- Raho1\_pig\_Da-clip@1
- Raho1\_pig\_Da@1
- Raho1\_roads\_Act\_Rast\_Prox@1
- Raho1\_roads\_Act\_Rast\_Prox\_Norm@1
- Raho1\_roads\_Act\_Rast\_Prox\_Norm\_Inv@1
- Raho1\_roads\_Act\_Rast@1

**Result Layer**

Output layer: F:\ResData2\Res\_Final2\RiskFactorWgtd

Output format: GeoTIFF

Selected Layer Extent

X min: 205941,21370      X max: 667898,79500

Y min: 2196320,59870      Y max: 2526578,68530

Columns: 275      Rows: 197

Output CRS: Project CRS: EPSG:32648 - WGS 84 / U

Add result to project

**Operators**

+ \* sqrt cos sin tan log10 (

- / ^ acos asin atan ln )

< > = != <= >= AND OR

abs min max

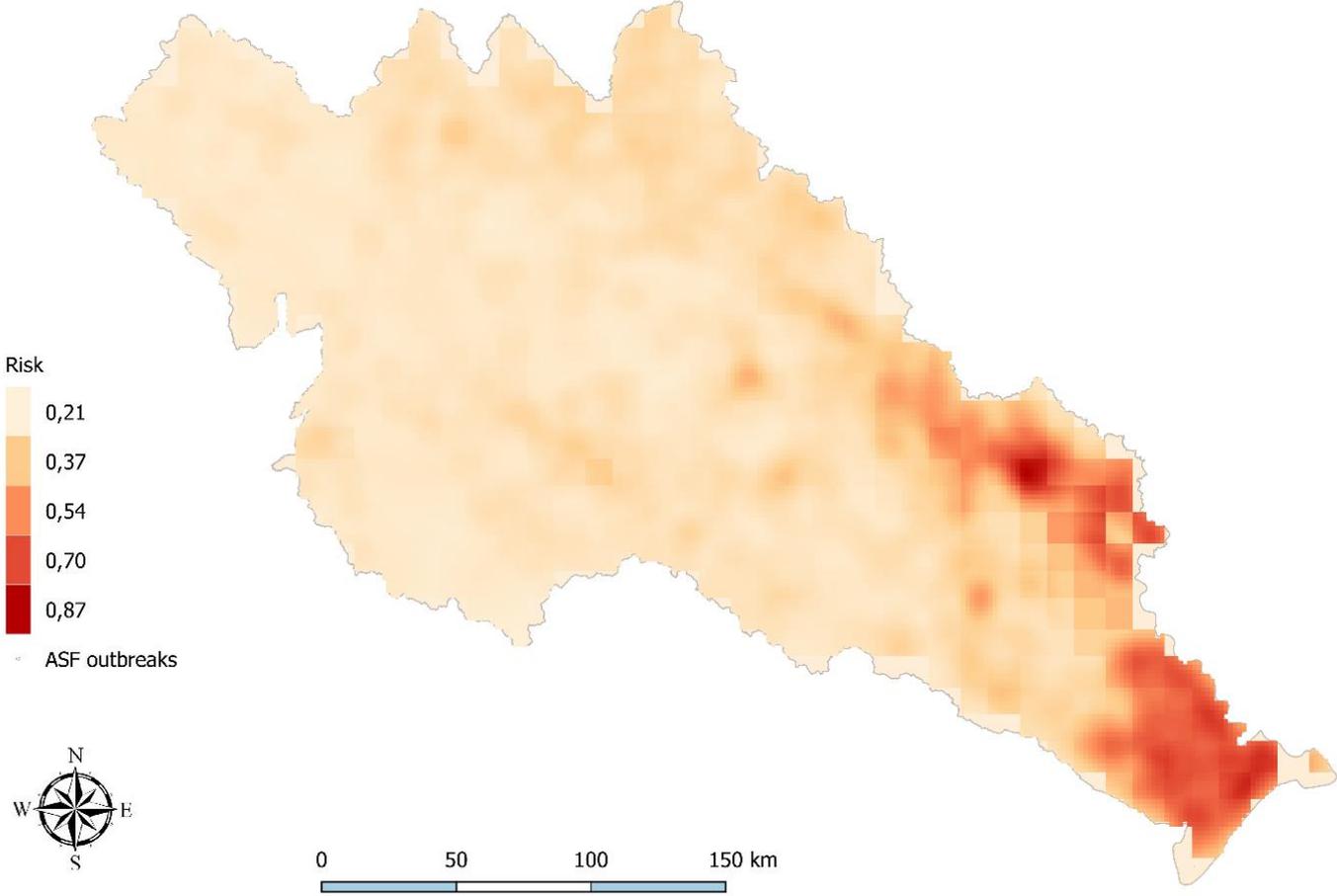
**Raster Calculator Expression**

```
("Raho1_roads_Act_Rast_Prox_Norm_Inv@1"*0.25)+("Raho1_pig_Da-clip_Norm@1"*0.28)+("Raho1_outbreaks_Old_Rast_Norm_NoNA@1"*0.47)
```

Expression valid

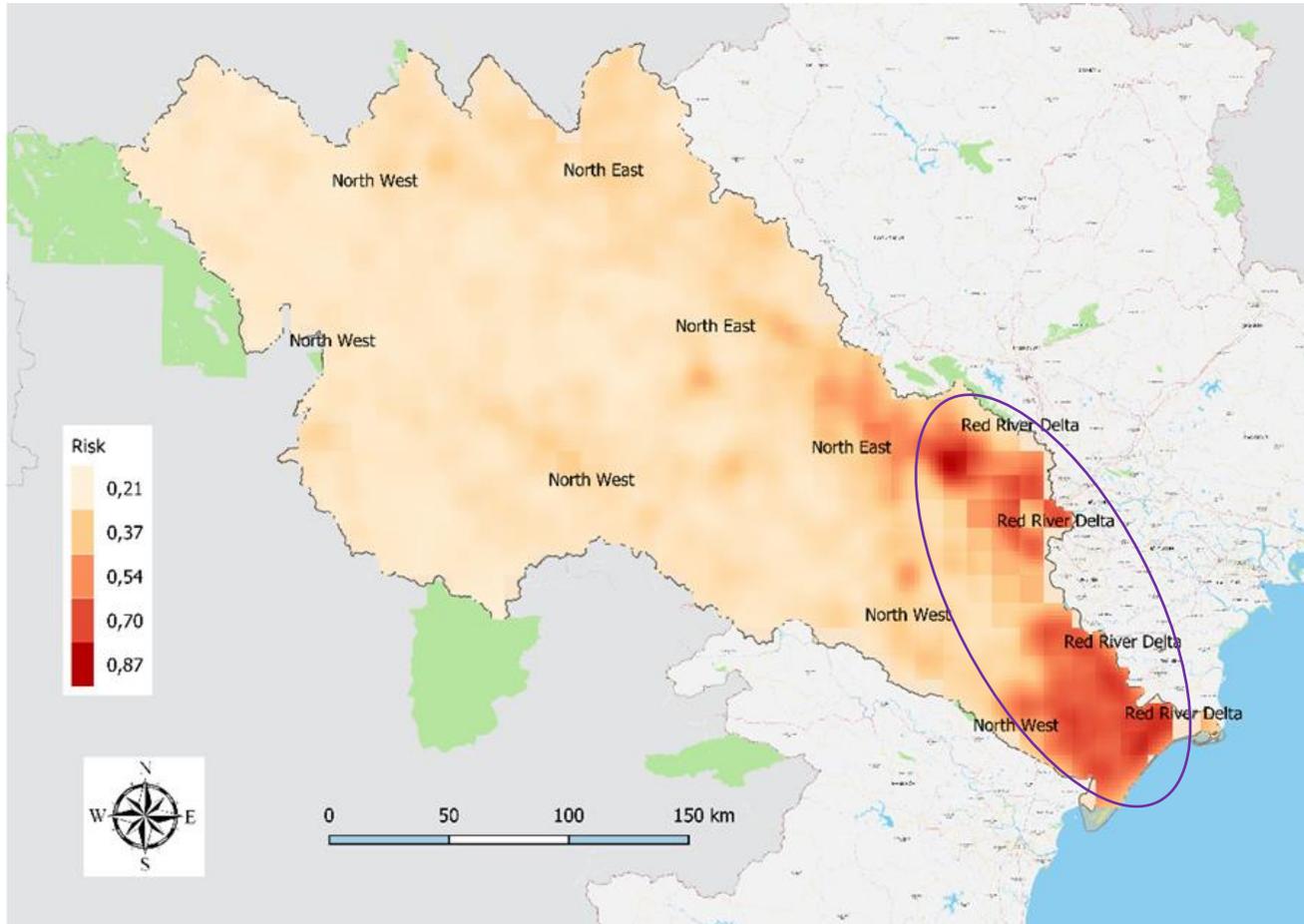
OK Cancel Help

# Result and discussion



Spatial risk assessment map for suitability incursion ASF in Raho1 region (VN)

# Result and discussion



- Highest risk area
  - ✓ Red River Delta area (RRD)
  - ✓ Total pigs and pig popular density most in region

Spatial risk assessment map for suitability incursion ASF in Raho1 region (VN)

# Result and discussion

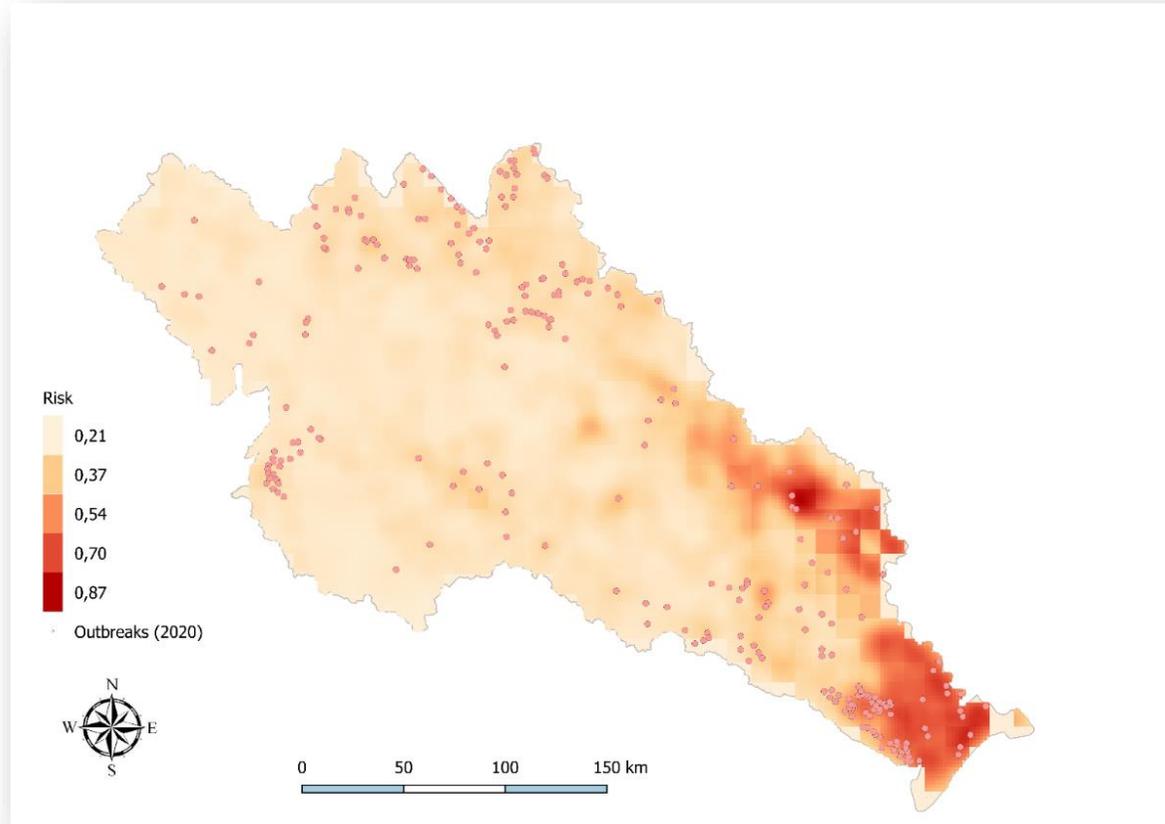


Figure A: Risk assessment map and ASF outbreaks in 2020

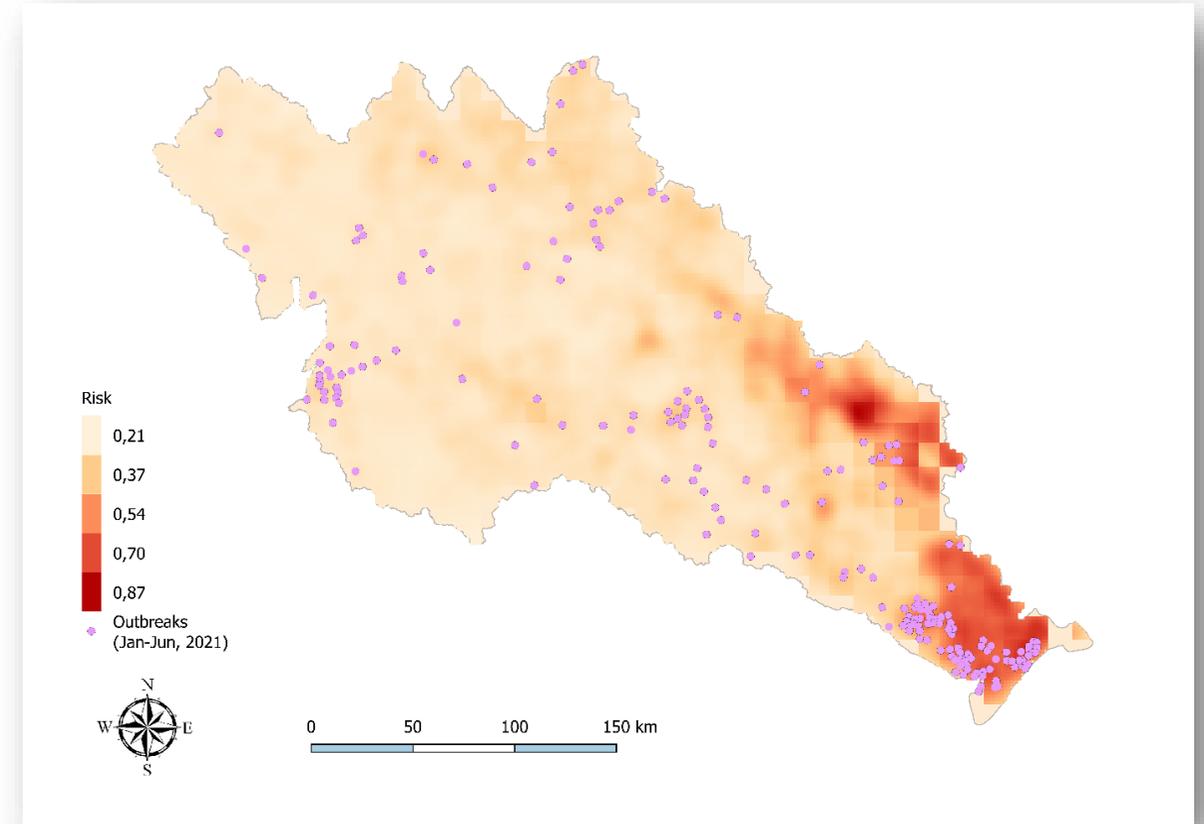


Figure B: Risk assessment map and ASF outbreaks in 2021 (Jan-Jun)

- Add outbreaks in 2020-2021
  - A large amount of outbreaks located in RRD area

# Discussion and Conclusion

- Future
  - ✓ Improve prediction of SRA for ASF with more information, spatial risk data and answers data to use

Thanks for your attention