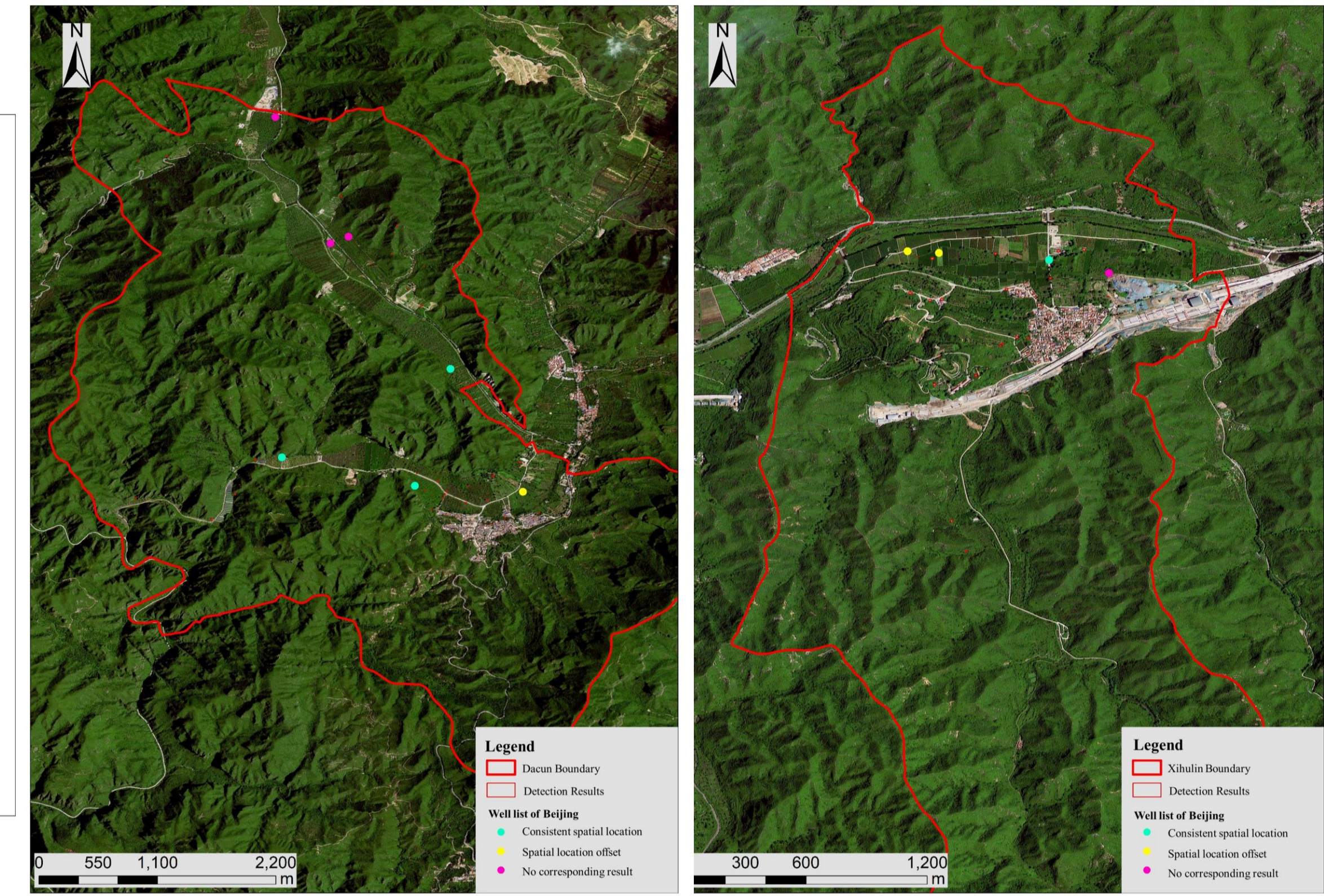
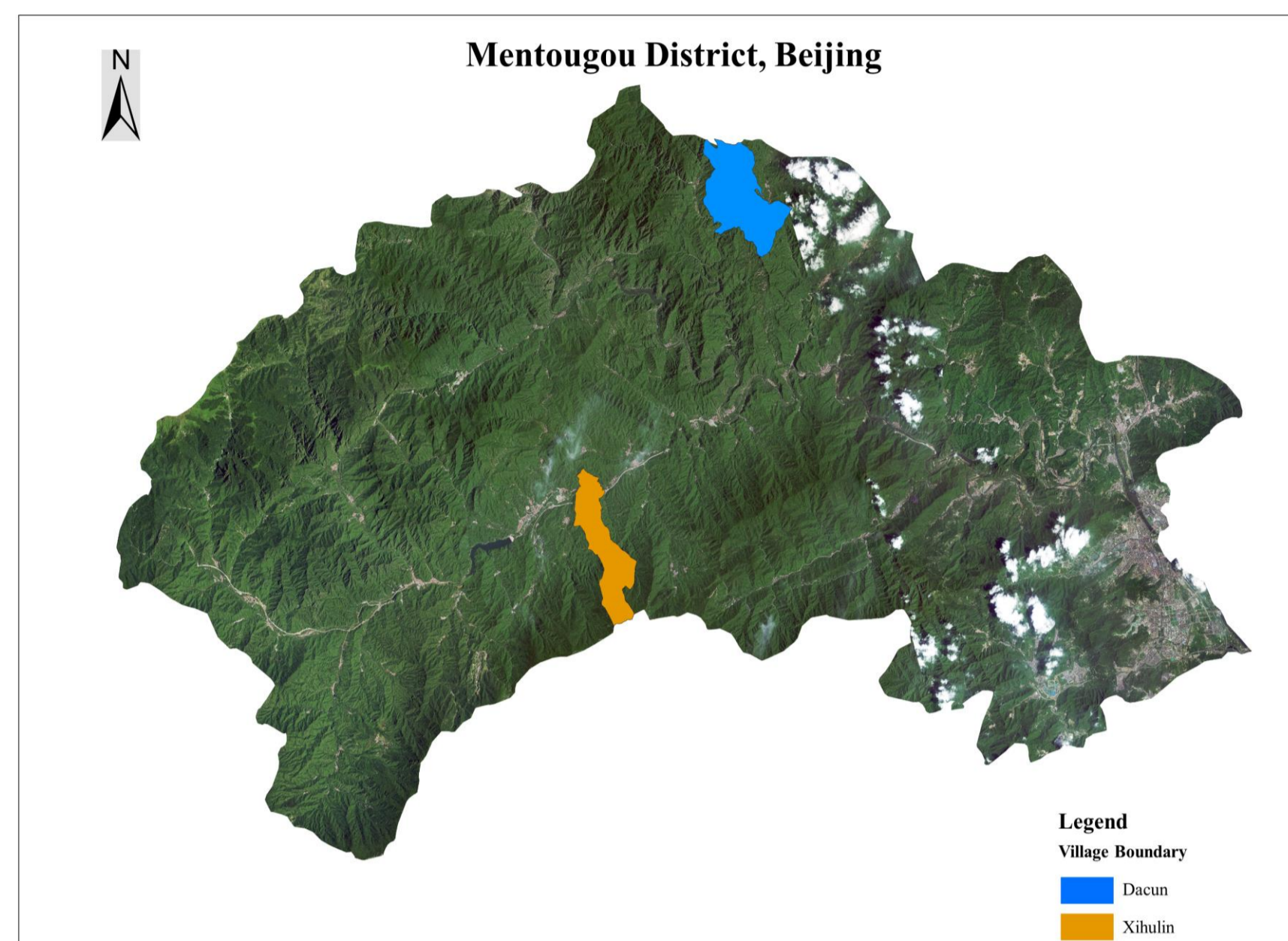


Title: Irrigated-well room recognition based on high resolution remote sensing image and deep learning algorithm

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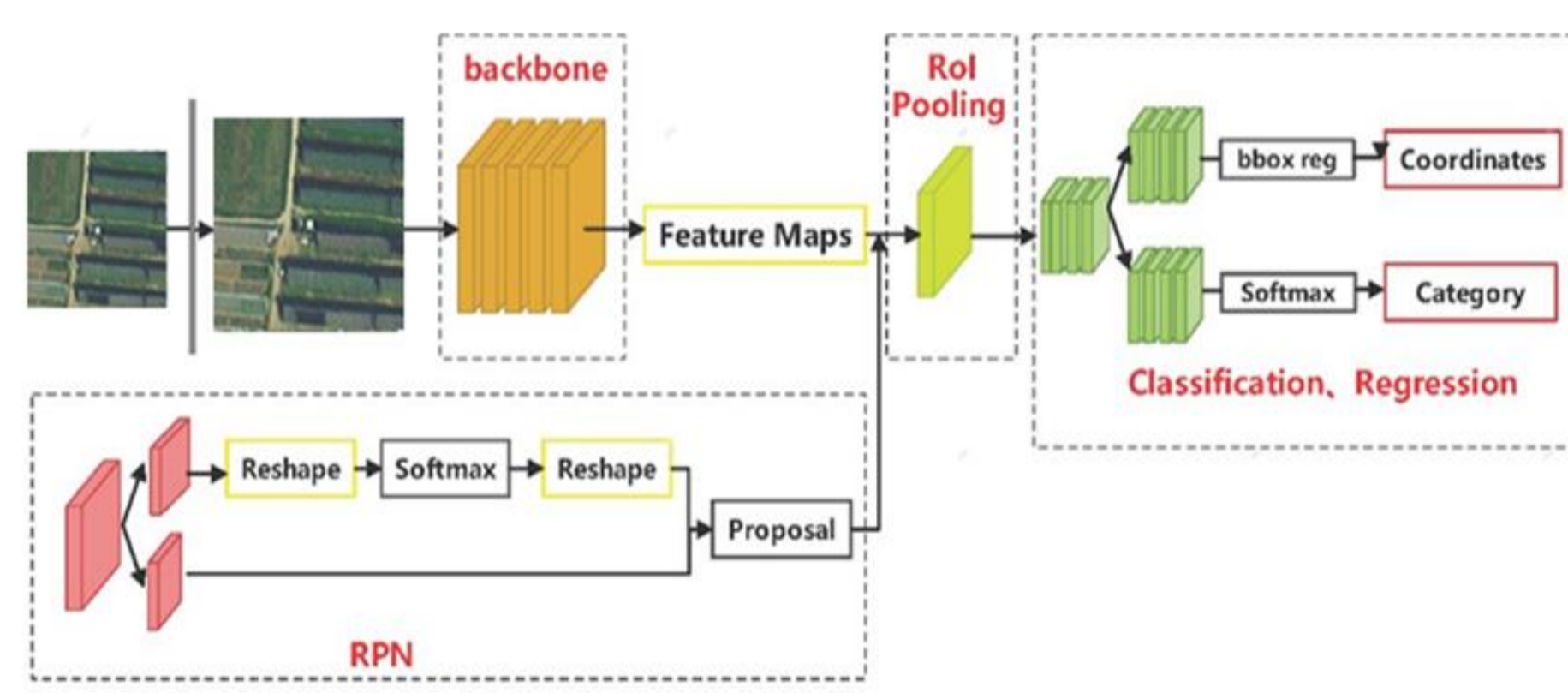
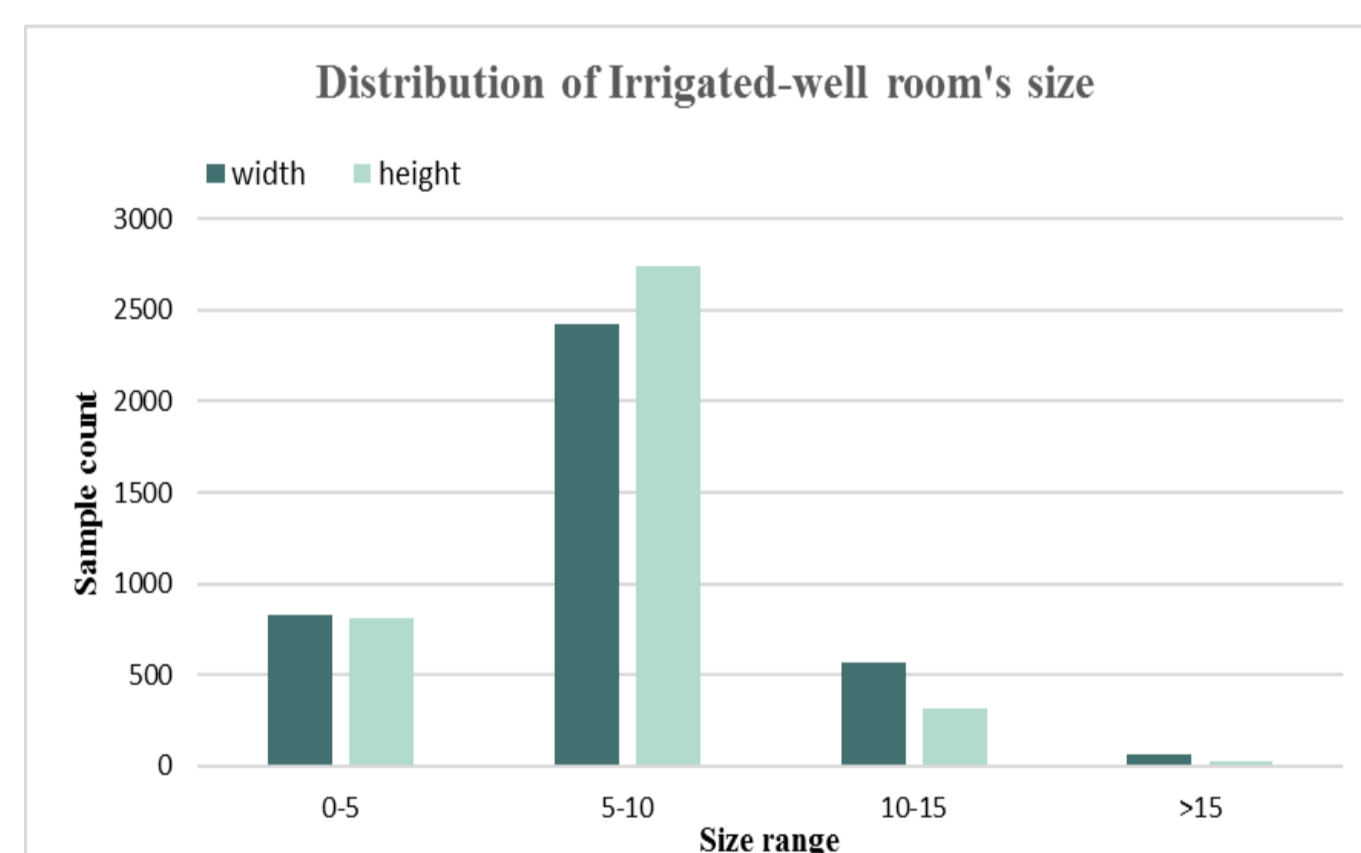
Objectives

- Irrigated-wells' quantity and spatial distribution are significant to the construction of modern water management policies and standards.
- There are problems of unclear base numbers, while the traditional method relies on manual field acquisition.
- Based on the high-resolution remote sensing images in different periods and well verification data in Beijing, using deep learning algorithm to identify the location of suspected irrigated-well.



Methods

- We created well room detection dataset, which includes 3653 images.
- Combining with auxiliary information such as well building size and surrounding geographical environment, improved Faster RCNN and YOLO v7 models, and proposed an algorithm for automatic detection of irrigated-well.
- Precision, recall rate were used to evaluate model performance.



Conclusions

- Faster RCNN model is better than YOLO v7 in terms of identifying agricultural irrigated-wells.
- Compared with modern facility agriculture and orchard forest land type, the irrigated-well room recognition effect is better under the environment of traditional cultivated land type.
- Relying on existing remote sensing image resolution (0.8m) and detection sample datasets, it is not possible to accurately locate integrated irrigated-well room with extremely small areas using recognition algorithms.

Results

- The recall rate of improved Faster RCNN model and YOLO v7 were 73% and 68% respectively.
- To demonstrate the migration ability of the proposed method, 20 typical villages were randomly selected according to the principles of independent spatial location distribution and large differences in land use types. The recall rate of irrigated-wells' room was 20%-75%

