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APPLICATION OF UAV DRONE TECHNOLOGY IN MINING INDUSTRIES OF NEPAL

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INTRODUCTION

- Topography of Nepal varies from 59m to 8849m above the mean sea level.
- Most of the mines and minerals lies on Himalayan and mountain regions.
- There are very high topography range, steeply slope and cliff area in these regions.
- The total station mine surveying and mapping is the most challenging and incredibly dangerous in mine survey in Nepal.
- Recently, the use of UAV drone has been increased in surface mining survey and mapping.

Prospecting and Opening license issued by Department of Mines and Geology

Fig. a: Prospecting license

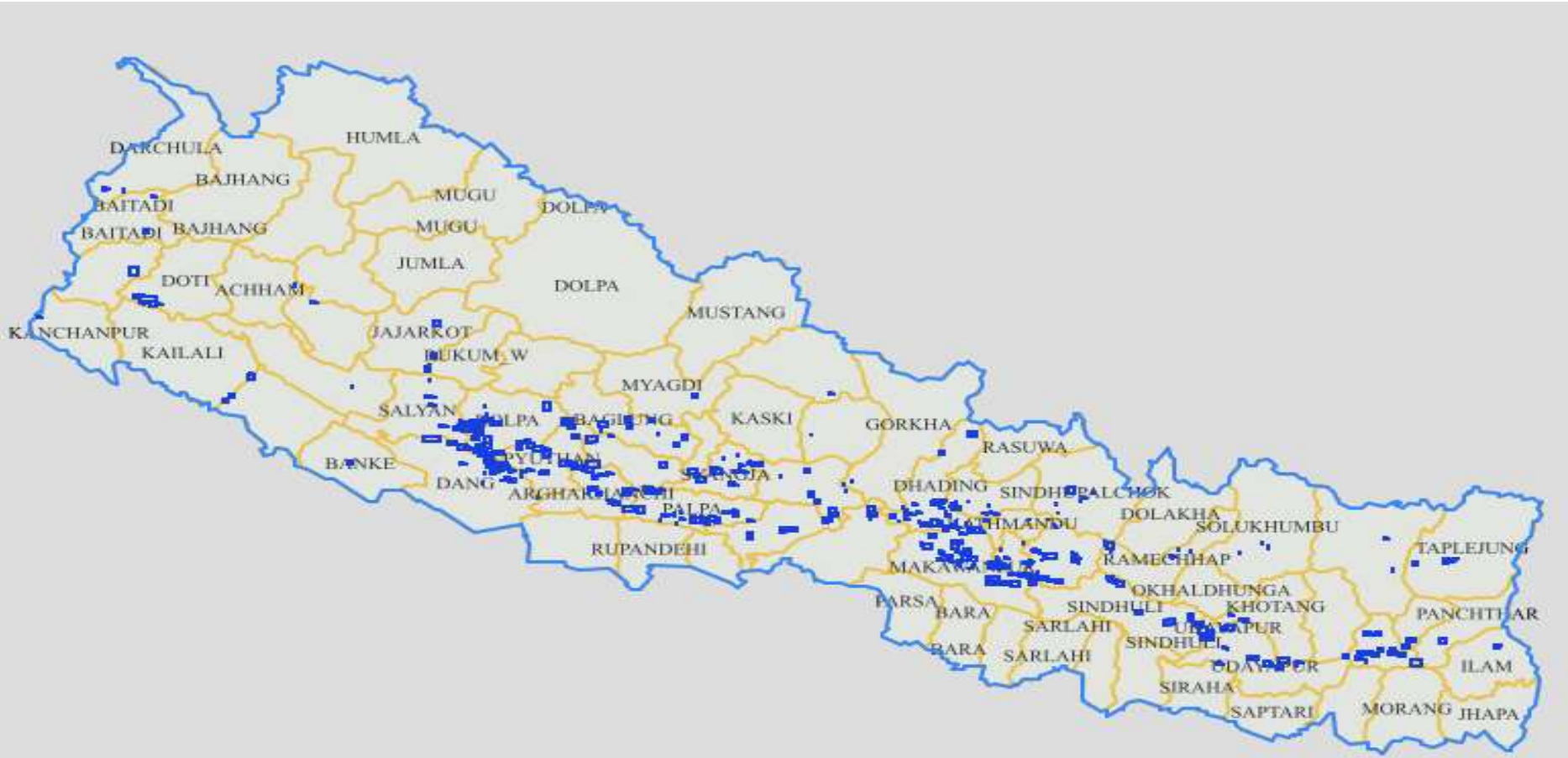


Fig. b:
Opening
license



UAV DRONE TECHNOLOGY APPLICATIONS IN THE MINING INDUSTRY

- Drones in mining provides accurate and comprehensive information on quarry and mine conditions in a short time as well as enhancing the efficiency of large mine sites and quarries.
- **There are two main advantages of using drones in mining industry operations:**
 1. The first drones can conduct a quick inspection of an area in the case of emergency situation and hazard identification.
 2. The second drone can conduct the blockage inspection, explosive and unblocking of blocked box-holes and ore-passes.

Surface mining area from Google Earth image Used drone and flight plan



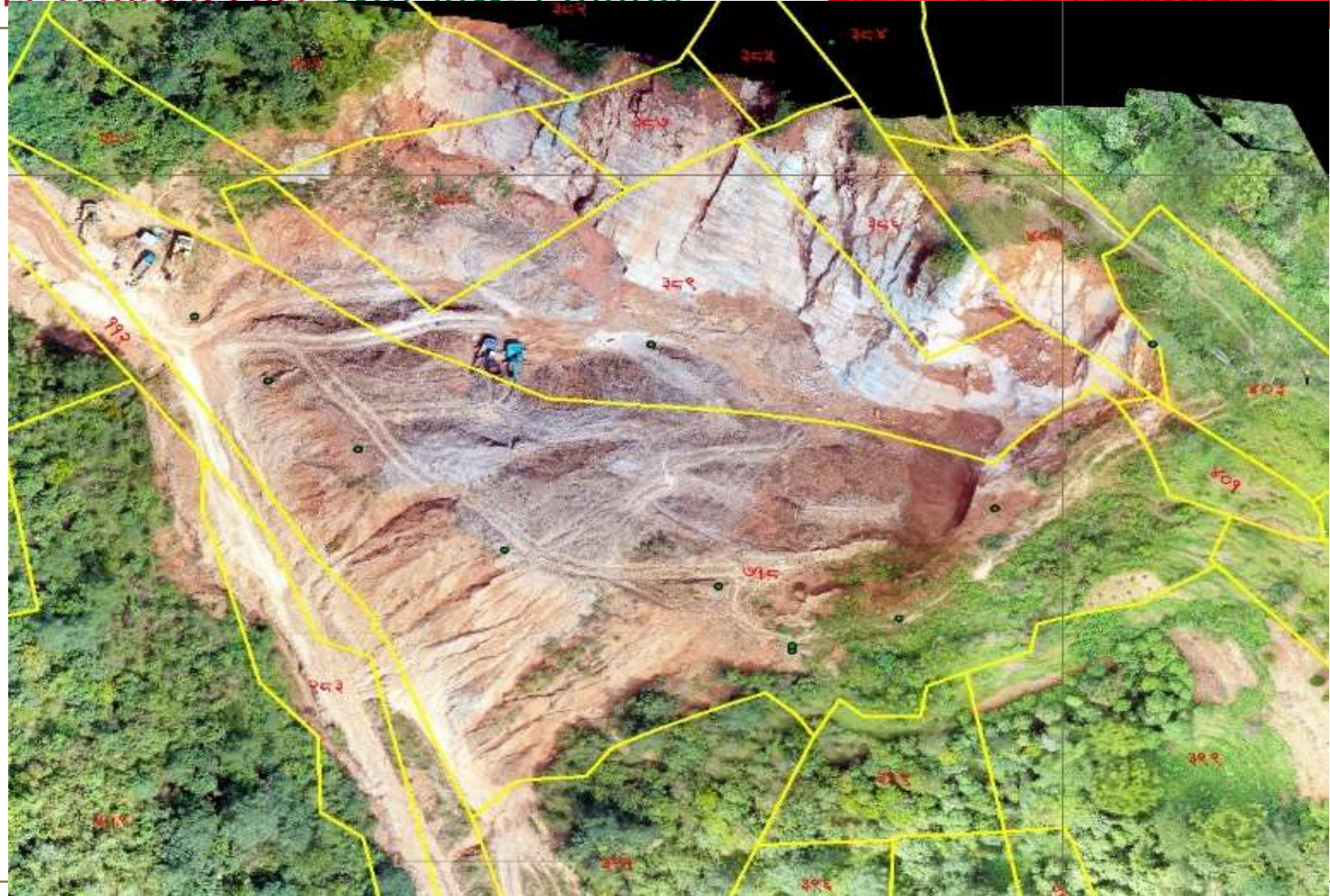
APPLICATION OF UAV DRONE TECHNOLOGY IN SURVEYING AND MAPPING

- Control points are monumented, signalized which are established by DGPS, RTK , PPK or/ total station survey connecting to national control networks.
- UAV drone technology is widely used in surveying and mapping sector like Municipal mapping, hose Numbering, Glacial study, Mining.
- The UAV drone capture the continuous stereo image data of the mining sites.
- The collected image data all the mining areas using UAV drone, and checking the data collection then the image processing will be conducted using Pix4D photogrammetry software.



Photographs of surface mining area

Orthophoto of Surface Mining Area



CHALLENGING OF UAV DRONE TECHNOLOGY USING IN MINING INDUSTRIES

- The drone mapping image gap or discontinuity capturing is the challenges of mining.
- The engineering geological mapping covers strikes, dips, features notation, type of rocks, faults etc which is challenging.
- The challenges and repeated work of the mining industries is blasting which involved with the safety risks and could be inspected and controlled by drones.
- The drone can be used to reduce, control and management the mining dust and moisture.

BENEFITS OF UAV DRONE TECHNOLOGY USING IN MINING INDUSTRIES

- High Resolution Image Capturing
- Quicker Data Collection
- Increase work Efficiency
- Economy (Cost Effective Approach)
- Higher Accuracy
- Worker Security

CONCLUSION

- UAV drone technology is a commonly used for surveying and mapping, monitoring, 3D mapping, blasting management.
- Fixed-wing and rotary-wings drones are the most commonly used drones in the mining industry.
- Nepal has a high variation altitude with High Mountain and Himalayan region, so there are so many difficulties survey and mapping by human manpower using total station.
- UAV drone technology using in surveying and mapping in the mining industry then save time and money as well as human life and can achieve cm accuracy.

Thank you for your Attention!!!

