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AGRICULTURE & INNOVATION

Planning tool for reindeer husbandry

Technology development in reindeer herding

Reindeer herding practices in Lapland (Sweden) take place in vast remote areas. A lack of mobile networks and the mountainous terrain make communications very difficult and prevent adaptation of conventional GPS tracking. An Operational Group is working to develop a digital planning tool for reindeer herders that can be used in areas with or without access to mobile internet.

This Operational Group (OG) was set up in 2017, it is led by Dalvvadis Economic Association and involves 20 groups of reindeer herders, several local villages and a university. The 'reindeer husbandry planning tool' they are developing aims to reduce cost and optimise work when gathering reindeer during husbandry activities. "Our idea is to combine of an off-the-shelf drone technology and a customised mobile app with a new communication architecture, to create a planning tool," says Kerstin Kemlén from the OG.

The planning tool will allow reindeer herders to coordinate their field work, track and manage their herds, even in remote areas that lack internet connectivity. It could also integrate new and existing herd tracking solutions for real-time monitoring, and be able to record and share field information from the grazing areas with other reindeer herders and organisations.

Mr Grasic, developer and test coordinator in the OG, tells us "The project will develop/is developing the following innovative products:

- **Drone module**: A hovering drone equipped with relaying module and antenna will relay data from reindeer GPS tracking collars, communication masts and other reindeer herders in the surrounding area to the herder on the ground. Thus, significantly extending coverage of relevant ICT services in remote regions lacking conventional ICT infrastructures.

- **Reindeer GPS collar**: Custom built with long range radio technology and extended battery life up to 2 years.
- **Pocket Node**: The pocket node is used as an interface between the mobile app and custom-built long-range radio network. Anyone carrying this pocket node on the field is able to share

location, track reindeer and exchange messages with other reindeer herders on the field without being connected to the internet.

- **Reindeer herding mobile app**: An app for Apple, Android and Windows mobile platforms that will integrate GPS tracking service and short messaging system.

During the summer of 2019, Dalvvadis Economical Association started testing a long-range radio network in the northern parts of Sweden. The reindeer herders involved are currently testing dozens of custom-built GPS-collars on their reindeer, together with pocket nodes, drone relays, several base stations and mobile application. Currently, the system is being tested under a harsh winter Arctic conditions.

"The third prototype of the system is now being developed and tested. The key challenges so far have been altering national drone flying rules, issues with collected GPS traces ownership, challenging integration of Cloud-based tracking solutions, battery lifetime and harsh winter conditions causing ice formation on GPS collars and antennas, brittle plastics and water vapour condensations." Says Samo Grasic.

Contact:
Kerstin Kemlén (project manager): **Kontakta@kerstinkemlen.se**
Samo Grasic (developer and test coordinator) **samo@grasic.net**
Photos: Provided by the Operational Group.