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Farmers’ and academia’s views”

## How to correctly monitor seedling survival rate in a (semi-)arid Sahel environment at low cost

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### Abstract

For more than a decade, the Great Green Wall initiative has been trying to counter desertification and land degradation in the Sahel region of Africa. Of late, the initiative’s intervention scope has been widened to southern Africa. In all cases, local populations are invited – or goaded as some would claim – to plant trees and shrubs from seed or through nursery-grown plantlets. Most organisations, be they official governmental or non-governmental, that finance and supervise/manage these kind of activities, however, give the impression they are only interested in keeping stock of hectares prepared and planted, but do not monitor nor evaluate survival rates of seedlings or ‘real’ reforestation success rates, so that it is difficult to know how great the green wall is after all these years... The reasons mentioned mainly centre on lack of cheap, cost-efficient monitoring techniques. Traditional field-collected data are labour-intensive, and also need lots of well-trained people in the field. In the absence of accurate, precise and highly-performant satellite imagery-driven systems, we propose a sampling strategy where high-resolution drone-generated images would be collected on a regular basis, and analysed through algorithms (and eventually machine learning/artificial intelligence) that (would) allow to detect, ear-mark and monitor growth and development status and rate of even the smallest seedlings. Theory will be matched with concrete field monitoring-generated data from northern Senegal. Distinguishing small tree seedlings from the surrounding wildlings and herbs/grasses that start growing with each rainy season, remains a challenge that current technology and monitoring systems have not been able to solve...

**Keywords:** Africa, great Green Wall initiative, land degradation, monitoring and evaluation (M&E), reforestation