making the boots on the ground more effective:
THE POTENTIAL OF UAV'S IN AGRICULTURE DEVELOPMENT

It's no secret field time is expensive. Development projects that aim to improve agriculture production often have a large number of farmers. We are talking 30,000 or more. **It is no surprise that when you truly target the poor it is often hard to reach them.** You might have to arrive in an all-terrain vehicle. Or walk over streams. It might take an hour or more if the farmer's field is inaccessible by motor vehicle. Maybe you have to take a donkey as terrain is too steep to walk easily. These are common scenarios if we are truly targeting the most marginalized.

A single field agent can have 50 or more farmers in such hard to reach places. This agent performs training on various new agriculture management practices, manages demonstration plots, delivers improved varieties of plants, and conducts regular monitoring, amongst other activities. It makes sense that, to save time and money, field agents often meet with farmers in one location and conduct project activities as a group. This can also improve the adoption rate of new practices. But that is hard to monitor without walking each famer's field no matter how remote or hard-to-reach.

And sometimes even that isn't enough. Take Bossou Antionette's cashew farm that she sharecrops in Benin. Monitoring projects usually means asking farmers if they have tried the new management practices. But this just measures the farmer's perception. Not the reality in the farmers' fields or the challenges faced there. Maybe in a corner of Bossou Anntonette's farm there's invasive weed

that keeps coming back and she gave up on that corner, because well . . . it is exhausting, and nothing seems to work permanently. Perhaps she may not mention that to a project monitor. When asked, she would just answer, **"Weeding is one of my biggest problems, cutting is a lot of work."**

That's what she told me about the farm she sharecrops. We count this as a success because she tried weeding. That box is checked. This doesn't mean that such monitoring is bad, it just means it is subject to such human error and we can't always go to every corner of every farm to confirm these reports.

Technology can help. **Many studies show that using images or pictures provides a more accurate measure of field conditions than even highly trained agriculture practitioners on the ground.** Until recently, such high resolution imagery came from satellites and was out of the reach of many development programs because of cost and cloud cover. But now, the low cost of unmanned aerial vehicle (UAVs) – which can fly below clouds -- means that development programs can increasingly access high resolution imagery.

So far UAVs have been mainly used in emergencies. But last week CRS, in collaboration with NetHope, flew a UAV over cashew farms in central Benin. **The images told us immediately that there was a need to thin out trees in some places.** We could see where there is space available to plant more trees and how many could be planted, where there had been burning, and areas for follow-up due to invasive weeds or other problems. This is just

from a first look at the image. Further analysis might tell us even more. With this information, the field agent can use his limited and expensive time to pinpoint areas that need an in-person visit.

This imagery can even tell us where about a corner of Bassou Antoinette's farm that has a weeding problem, one that we did not see even though we walked the boundary of her plot.