

Land Health and Land Surveillance: An Evidence Based Approach to Land Management

The symposium on land health surveillance drew overwhelming participation from delegates attending the World Congress on Agroforestry at the UNEP Headquarters in Nairobi. This is possibly attributed to the topics hitherto announced in the Technical Sessions Programme. As Chair of the session, Dr. Keith Shepherd gave a preamble to the subject area focusing on the principles of land surveillance which encompasses statistical sampling, standardized measurement protocol and rapid screening tests for measuring health indicators and establishing problem prevalence. Markus Walsh, Sara Scherr, and Brent Simpson from the Earth Institute of Columbia University, Eco-Agriculture Partners USA and Michigan State University, respectively, presented their topics to the auditorium.

Dr. Walsh et. al. presented the topic on *managing ecosystem services in agricultural systems – with highlights on African challenges*. He drew attention to the relationship between ecological footprints (EFT) and the human development index (HDI). Walsh noted that Africa's ecological footprints is about half of the global average, with most of it accruing from agricultural sector as opposed to the industrialized West, whose footprint leans more on waste management. He further reiterated that HDI is exponentially proportional to the ecological footprint but inversely so, with reducing population growth rates, illustrating why Africa lags behind. Unfortunately corresponding increase in EFT has tremendous negative environmental impacts, he said, such as the permanent creation of gullies. Dr. Walsh recommended the need for greater scientific understanding and considerations of trade offs between agricultural provisioning and other economic services. He emphasized the significance of inventorization, assessment and monitoring of systems.

Finn Davey, a partner at Wajibu MS, a Kenyan environmental NGO, presented on *land health monitoring in Kenya's forgotten rangelands*. He described how land health surveillance is being applied to the monitoring of Kenya's rangelands in private ranches and the standardized measurements being made, which include measurements of aboveground vegetation, water infiltration rates, and soil carbon. Finn described how the measurements are being used in partnership with local pastoralists to guide improved pasture management and engage with carbon trading.

He also drew delegates' attention to soil organic carbon, as the largest reservoir which is not monitored. His case in point was the pastoralist Maasai land occupation trends from the 17th to the 20th century, depicting increasing pressure on the fragile lands which has culminated in physical soil degradation. To address these predicament, Finn et. al. instituted land degradation surveillance by looking at bio-physical factors using GPS, soil augering, infiltration measurements and photography in 1000 km² sites.

The topic on *eco-agriculture landscapes to manage risks to land and ecosystems* was presented by Ms. Sara Scherr. Ms. Scherr noted that eco-agriculture aims at restoring degraded landscapes and pastures, integrating perennial vegetation and protecting natural forests. She went further to enumerate key challenges for reducing risks to land degradation as: researching on least-cost solutions; promoting institutional innovation for farmer learning and financial collaboration. Although her project on eco-agriculture has been more on desk studies, her team has been able to identify successful cases, citing the Kikuyu escarpment in Kijabe, Kenya as a good example.

Brent Simpson presented the topic *on landuse transformation, household economics and the potential role of carbon offset market in Morocco*. This is drawn from a report of an on-going project worth US\$. 697.5 Million with components of tree crops (US\$ 300M), artisanal fisheries (US\$ 116M) and artisanal assistance (US\$ 111M) which targets hillside areas with high poverty whilst aiming to transit farming from annual subsistence to high value cropping. Brent noted that the current farmer practice in addressing solutions for land degradation is sporadic, low scale and temporally lengthy. According to him, the biggest challenge lies in reversing rural poverty, by boosting the current income from US\$. 1.56 to US\$. 3.32 per capita per day. He thus emphasized on the need to focus on the three key tenets i.e : rapid change on land restoration, operating from scales of thousands of hectares to hundreds of thousands of hectares; and finally providing incentives that prevents reversals to old 'unhealthy' habits. An assessment of the Net Present Value for the project depicted a negative value of 500,000 Dinars during the first five years, which eventually transforms to positive values of 400,000 Dinars after the fifth year, maturing and levelling off after the tenth year.

In conclusion, it was noted that agroforestry systems can be used to restore land health. Farmers must receive real benefits in making significant changes in their land management practices. Institutional mechanisms must be identified to enable farmers' bridge the financial 'gap' as they transit at scale, and finally, that carbon financial markets are capable of providing part of the solution, but will require additional adaptation to play a significant role in high investment transitions.