Conclusions

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Monitoring forest degradation is a complex process that needs to account for a wide variety of forest characteristics, human activities, and programmatic resources in order to achieve reliable results. This workshop sought to deepen understanding of monitoring forest degradation as it relates to these issues by: a) discussing implications from definitions related to operationalizing forest monitoring degradation; b) assessing case studies with current, and emerging, best practices to detect and monitor forest degradation; and, c) identifying ways forward for forest degradation monitoring demonstration activities.

Forest degradation definitions do matter. However, not all experts agree to what degree definitions need to be clearly established before implementing monitoring activities. For example, a monitoring program generally sets thresholds for detectability and statistical precision when it may be unknown if these attributes are achievable. The process of monitoring often reveals data and trends that were not previously known and refinement of definitions can occur through implementation. Consensus from the workshop does indicate that forest biomass and biomass change must be the key parameters of interest in monitoring forest degradation for REDD+ initiatives.

Case studies that focus on forest degradation monitoring are limited, especially those which focus on Southeast Asia. Efforts to assess and estimate forest degradation must be responsive to the direct drivers that impact forest biomass. The main direct drivers of degradation are selective logging for timber, harvesting for fuel wood, and shifting cultivation. Selective logging has received the majority of attention, as evidenced in the case studies presented. Methods formulated to monitor forest biomass after selective logging range from remote sensing, ground based field measurements, to development of Emission Factors that standardize the impacts of biomass per unit area.

Effective methods to detect forest degradation at adequate levels of precision and repeatability, and at scales of interest, remain elusive. Remote sensing methodologies are often hampered by persistent cloud cover, quick canopy cover re-growth, a lack of expertise in automated processing and/or a lack access to imagery with spatial resolution at scales relevant to degradation drivers. However, remotely sensed imagery is consistently available and covers wide areas that often cannot be accessed. Coupled with ground based field measurements to provide biomass estimates, the use and applicability of remotely sensed data to monitor forest degradation cannot be understated.

While this workshop provided ample lessons from case studies that can help promote forest degradation monitoring initiatives, six gaps in current knowledge remain. First, modeling approaches that integrate both remotely sensed data and ground based field

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measurement data rarely have been tested in tropical forests, if at all (albeit commonly used in temperate forests). Second, fire as a driver of forest degradation is poorly understood. Tropical fire ecology is an undeveloped field of science and little is known of biomass dynamics as it relates to fire regimes. Third, planned selective harvesting for timber impacts forest biomass dynamics in unpredictable ways. Likewise, it is debatable if this type of harvesting can be considered degradation when compared to unplanned harvesting. Fourth, tree plantations may be considered forests in some countries, and agricultural crops in others. In this context, it is possible that conversion could be considered either degradation or deforestation. This raises an important question pertaining to biodiversity safeguards. Fifth, forest re-growth after disturbance needs attention in order to account for net changes in forest biomass dynamics. Lastly, forest degradation monitoring may be feasible and practical at some scales in some places while not others. However, monitoring results will ultimately need to nest within national frameworks of emissions reporting. There is a large gap in knowledge of nesting approaches to indicate how monitoring at sub-national scale can inform national monitoring and reporting initiatives, and vice-versa.

Several key messages emerged from this workshop with strong consensus. The first key message is that demonstration activities to develop forest degradation monitoring methods and tools need more widespread implementation. Demonstration activities should strive to simultaneously address two or more of the knowledge gaps as mentioned above. These activities should occur at scales relevant to national reporting requirements but also where sufficient resources can be directed to provide adequate lessons learned. Further, demonstration activities need to address a range of drivers, forest types and conditions, and socio-economic circumstances in order to compare approaches, input data sources, and costs- all in relation to acceptable levels of precision. Successful demonstrations of forest degradation monitoring are not easy to achieve. Yet they are necessary for providing clarity into future operationalization of forest degradation monitoring programs.

Secondly, forest degradation monitoring programs must be sensitive to the degradation drivers that impact forest biomass. For example, selective logging for timber in tropical wet forest generally has a large impact on biomass in relatively small areas. Harvesting trees for fuel wood has a smaller impact on biomass across large areas. In this context, there may be no ‘one size fits all’ approach to methodology development. Remote sensing and ground based field measurement approaches for selective logging may not be appropriate for fuel wood harvesting, and vice versa.

Thirdly, capacity building and strengthening within partner institutions and civil society organizations needs to incorporate long-term solutions that aim high. Coupling researchers with practitioners and land use managers provides an effective framework for integrating advanced methodologies into forest monitoring programs. Lessons learned are most likely to be meaningful when accomplished through experience combined with trial and error. Programs addressing the key questions of forest degradation monitoring will ultimately reduce costs of technology and methodology transfer, through institutionalizing advanced monitoring frameworks.

Forest degradation monitoring requires a depth of knowledge and understanding in many different disciplines including remote sensing, forest biometrics and mensuration,

sampling theory and strategy, ecology, and modeling. The interdisciplinary nature of forest degradation monitoring makes it a challenging professional endeavor and requires significant commitments in terms of time and resources. This workshop aimed high in bringing together experts for achieving consensus on forest monitoring definitions, thresholds, and methodologies. The achievements included a common definition of the main parameter of interest; consensus that integration of data sources is crucial to take advantage of multiple inputs, and that monitoring approaches must be demonstrated and compared at multiple sites through project initiatives before being operationalized. The workshop organizers hope that the insights and ideas brought forward by this diverse group of experts will be able to influence forest degradation monitoring design initiatives well into the future.