Tools and approaches for integrated land-use planning and mainstreaming of multiple benefits in sub-national REDD+ planning

UN-REDD PROGRAMME

Report of learning event

Workshop and technical working session convened to promote regional cooperation on REDD+ planning among countries in the Lower Mekong Basin sub-region

2 – 6 October, Hanoi and Xuan Mai

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The workshop and working session described in this report were organised and implemented collaboratively by the UN-REDD Viet Nam Phase II Programme, the Viet Nam Ministry of Planning and Investment, Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ), the Institute of Forest Ecology and Environment (IFEE), and the UN Environment World Conservation Monitoring Centre (UNEP-WCMC) (on behalf of the UN-REDD Programme).

Phase II of the Viet Nam National Programme began implementation in 2013 building on the key achievements of the Phase I programme (2009-2012). It is designed to reduce emissions in six provinces, working with provincial, district and commune authorities, local communities and the private sector, with the objective to "enhance Viet Nam's ability to benefit from future results-based payments for REDD+ and undertake transformational changes in the forestry sector".

The UN-REDD Programme is the "United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation (REDD+) in Developing Countries". The Programme was launched in 2008 and builds on the convening role and technical expertise of the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP) and UN Environment. The UN-REDD Programme supports nationally led REDD+ processes and promotes the informed and meaningful involvement of all stakeholders, including Indigenous Peoples and other forest-dependent communities, in national and international REDD+ implementation.

The UN-REDD Programme provided technical support from the UN Environment World Conservation Monitoring Centre (UNEP-WCMC) for this workshop. UNEP-WCMC is the specialist biodiversity assessment centre of UN Environment, the world's foremost intergovernmental environmental organisation. The Centre has been in operation for over 35 years, combining scientific research with practical policy advice.

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Contents

Acronyms and abbreviations

CIAT	International Center for Tropical Agriculture
EbA	Ecosystem-based adaptation to climate change
FAO	Food and Agriculture Organisation of the United Nations
GHG	Greenhouse gas
GIS	Geographic Information Systems
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GPS	Global Positioning System
IFEE	Institute of Forest Ecology and Environment
INDC	Interim Nationally determined Commitment
ITP-SEA	International Training Programme-Strategic Environmental Assessment
ISPONRE	Institute of Strategy and Policy on Natural Resources and Environment
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
LMB	Lower Mekong Basin
MARD	Ministry of Agriculture and Rural Development
MPI	Ministry of Planning and Investment
MONRE	Ministry of Natural Resources and Environment
NGO	Non-Governmental Organization
NRAP	National REDD+ Action Programme
PAMs	Policies and measures
PDR	People's Democratic Republic
PFES	Payment for Forest Ecosystem Services
PRAP	Provincial REDD+ Action Plan
REDD+	Reducing Emissions from Deforestation and Forest Degradation; 'plus' Conservation of forest carbon stocks, sustainable management of forests; and enhancement of forest carbon stocks
SEA	Strategic Environmental Assessment
SRD	Centre for Sustainable Rural Development
UNDP	United Nations Development Programme
UN Environment	United Nations Environment Programme
UNEP-WCMC	UN Environment World Conservation Monitoring Centre
UN-REDD Programme	United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation (REDD+) in Developing Countries
VFD	Vietnam Forests and Deltas Program
VNUF	Viet Nam National University of Forestry
VUPDA	Viet Nam Urban Planning and Development Association
WWF	World Wide Fund for Nature

Introduction

Overview

This report presents the key messages and outcomes of a learning event, which aimed to promote the exchange of experiences among countries in the Lower Mekong Basin sub-region and build capacity on tools and approaches for integrated land-use planning. The event included a particular focus on the integration of ecosystem services and climate change considerations into planning, and on sub-national REDD+ planning. The learning event consisted of two parts:

1) A **Stock-taking Workshop** on tools and approaches for integrated land-use planning and sub-national REDD+ planning, Hanoi, 2 October 2017;

2) A **Technical Learning Session** on tools and approaches for integrated land use planning and mainstreaming multiple benefits in sub-national REDD+ planning, Viet Nam Forestry University, Xuan Mai, 3-6 October 2017.

Background

The Paris Agreement recognizes the importance of the land-use sector in supporting global efforts to achieve climate goals. Many countries have included forests and/or agriculture within their intended nationally determined contributions (INDCs), as currently almost one quarter of global green-house gas emissions (GHG) are attributed to agriculture, forestry and other land-uses. Land-use planning is the process of setting goals, identifying what activities should be implemented to achieve them, and where to locate these activities in a landscape.

REDD+, which stands for Reducing Emissions from Deforestation and Forest Degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries, is a global initiative aiming to provide positive incentives to developing countries to contribute to climate change mitigation through activities in the forestry and land-use sectors. Operationalising national REDD+ strategies through land-use planning is increasingly viewed as a way to contribute to low-emissions development strategies at the landscape level. The synergies between REDD+'s climate change mitigation potential and other sustainable development initiatives may be realised by harmonising these efforts at the sub-national or landscape level.

Viet Nam is currently in the implementation phase of its REDD+ Programme. During its first National REDD+ Action Programme (NRAP) (2012-2016), the country adopted a sub-national approach, developing Provincial REDD+ Action Plans (PRAPs), tailoring REDD+ policies and measures (PAMs) to address locally specific deforestation and forest degradation drivers and barriers to enhancement activities. PRAPs have been developed in a number of Vietnamese provinces using a range of tools and approaches, including participatory 'theory of change' workshops, spatial analysis and participatory mapping, and analysis of benefits and risks. By the end of 2016, more than ten PRAPs have been formulated and endorsed in Viet Nam.

Experiences in REDD+ planning and implementation in Viet Nam and the region show that REDD+ needs to be understood within the context of initiating or accelerating a transition in how forests are viewed and managed. Interventions must not only address the forest sector but also need to consider overall land and forest-use dynamics over time, the key policies and socio-economic and other factors that are the drivers of this change, and the potential trade-offs between different goals and sectors in a landscape. REDD+ must also be firmly embedded into the overall vision of sustainable development and/or green growth within the country.

These important considerations have been reflected in Viet Nam's revised NRAP, endorsed in April 2017, which aims to "support the development of integrated provincial land use plans (and related land use plans) with effective participation of stakeholders to balance forests and other sectors' objectives". In addition, Viet Nam's new Law on Planning, once effective, will bring fundamental changes to the planning process, requiring an integrated approach to land-use planning. Viet Nam is not alone in seeking to reform its planning processes. In the region, there is growing emphasis on the use of integrated land-use planning approaches that aim to harmonise multiple objectives and functions in landscapes – for environmental, social and economic outcomes - while recognising and minimising trade-offs between them.

Part 1 – Stocktaking Workshop

A one-day 'Stock-taking Workshop on tools and approaches for integrated land-use planning and sub-national REDD+ planning' was organized by the Viet Nam Ministry of Planning and Investment (MPI), GIZ and the Viet Nam UN-REDD Phase II Programme on 2 October 2017. This workshop was attended by around 80 participants (16 women) from a range of organisations, including: Vietnamese government ministries and agencies, such as MPI, the Ministry of Agriculture and Rural Development (MARD) and Ministry of Natural Resources and Environment (MONRE); research institutes, such as Institute of Strategy and Policy on Natural Resources and Environment (ISPONRE), Strategy Development Institute (SDI), and Viet Nam Urban Planning and Development Association (VUPDA); civil society organizations, such as WWF and the Centre for Sustainable Rural Development (SRD) and international agencies and projects, such as the GIZ-MARD project 'Conservation and sustainable use of forest biodiversity and ecosystem services in Viet Nam' and the Vietnam Forests and Deltas project (VFD). Participants from the Lower Mekong Basin (LMB) countries of Cambodia, Lao PDR and Myanmar also joined the workshop.

The **objectives** of this workshop were:

- To build understanding among decision-makers and planners on integrated land-use planning and the integration of ecosystem services and climate change into planning frameworks
- To present selected tools and methods for integrated land-use planning, and approaches to integrate ecosystem services and climate change into planning
- To share national and international experiences and best practices in this area
- To identify needs and opportunities in national contexts to institutionalize and operationalize integrated land-use planning and integrate ecosystem services and climate change considerations, and identify practical next steps.

The agenda for the workshop is provided at Annex 1. Presentations covered introductions to the integration of ecosystem services into planning, ecosystem valuation, the role of spatial analysis in integrated land use planning, Viet Nam's proposed Planning Bill, and some case studies from Viet Nam and other countries in the region.

The workshop included several interactive sessions:

- A **panel discussion** on regional and international experiences in integrating ecosystem services and climate change considerations into planning
- A **world café session** allowed participants to visit six different presenters showcasing a range tools and approaches for integrated land-use planning and the integration of ecosystem services and climate change into planning. These included:
  - Using transparent map layers to explore multiple sectors and objectives in a landscape (UN-REDD Programme / UNEP-WCMC)
  - The ValuES project (GIZ)
  - Ecosystem mapping and Terra-i (CIAT)
  - Strategic Environmental Assessments (SEA) (UNDP/ITP-SEA)
  - Ecosystem based Adaptation (EbA) (GIZ)
  - Use of the InVest tool in Viet Nam (ISPONRE)
- A final **group discussion** on challenges and opportunities, as well as ways forward to promote integrated land use planning that considers ecosystem services and climate change.

Photos: Panel discussion and question & answer session in plenary (top); Activities during world café session (bottom) (© GIZ)

The workshop highlighted numerous key issues and recommendations in terms of operationalizing integrated land use planning and promoting the consideration of ecosystem services and climate change in planning processes. There are summarized as follows:

Key challenges/issues:

- *Strengths and limitations of ecosystem valuation*: Ecosystem valuation is a highly useful tool, allowing the communication of ecosystem values and a way to integrate a wider range of these values into decision-making, However, to increase the utility of the approach, we need to consider the purpose of the valuation exercise, as well as the needs and preferences of decision makers, and how to complement economic information with other types of information.

- *Challenges in fostering real cooperation among sectors*: Numerous barriers to cooperation among different sectors in a landscape were discussed, such as difficulties in sharing data, different policy objectives and mandates, and lack of cooperation mechanisms.

- *Lack of capacity/knowledge among policy makers*: Despite significant progress, there remains a lack of knowledge and experience among decision-makers, especially at subnational level, on ecosystem services, valuation, climate change impacts and adaptation, and other key issues.

- *Implementation on plans*: Beyond the challenges in developing integrated land use plans, there is a need to direct resources and focus on the implementation of these plans, i.e. to establish the frameworks and resources to support long-term implementation of plans.

Key opportunities/solutions:

- *Mechanisms to promote collaboration among sectors*: to truly encourage collaboration, especially data sharing, it may be necessary to invoke high-level pressure or mechanisms that require different ministries/agencies to share information and cooperate in land use planning.

- *Slowing development of policies and plans*: In some countries and in some cases, to foster better implementation over the long-term, we should consider including explicit trial implementation phases of new policies and/or plans in the policy development process. Pilot projects may be recommended for regions/provinces with high environmental vulnerability and/or biodiversity importance.

- *Promoting the development of integrated spatial plans*: Integrated spatial planning, including land use planning, with due consideration of ecosystem services and climate change, could help address the challenges of cross-sectoral coordination as mentioned above, as well as raising awareness among stakeholders about ecosystem service values.

- *Establishing checks and balances between sectors/ministries*: Mechanisms and processes that support cooperation between ministries/sectors should also consider the potential imbalance between them, e.g. where certain ministries or sectors are more powerful than others, and can influence planning processes to favor their own goals/interests.

Photos: Final group discussions (© GIZ)

Part 2 – Technical Learning Session

The technical learning session took place between 3 and 6 October 2017 at the Institute for Forest Ecology and Environment (IFEE) at the Viet Nam National University of Forestry (VNUF), in Xuan Mai (see Annex 2 for Agenda).

The primary **objectives** of the session were:

- To provide technical training on spatial analysis and other tools, specifically designed to support integrated land-use planning and mainstreaming multiple benefits in sub-national REDD+ planning;

- To promote regional cooperation and learning on REDD+ spatial planning among countries in the Lower Mekong Basin sub-region.

The session involved 18 participants (5 women) from Viet Nam, Cambodia, Lao PDR and Myanmar (and two observers from GIZ). Participants included representatives of forest and conservation government departments, NGOs and research institutes (see Annex 3 for participants list), and had a range of backgrounds and skills levels in spatial analysis, from complete beginners in GIS, through to intermediate and advanced learners. Although the majority of the participants worked with ArcGIS, participants were given the choice to undertake some of the activities in QGIS[1] (an open-source software) if they preferred. Training materials for a number of exercises were provided to cover both software packages.

The session focused on introducing background concepts, discussions and supporting technical exercises, based around **a model, integrated planning workflow** for subnational REDD+ planning, and exploring how spatial information can feed into this process. Participants learnt about the use of spatial analysis to support the following steps in this workflow:

- Understanding and mapping pressures and threats on forests;
- Identifying and mapping selected multiple benefits of REDD+; and
- Approaches to prioritize potential areas/locations for REDD+ actions

In addition, the participants practiced some basic GPS use and went on a field visit to Ba Vi National Park, learning about forest management and livelihood development activities in and around the park. Finally, the session included some dedicated time for participants to pursue a particular exercise or issue of interest to them and their work in small groups with the trainers. Group discussions for each step of the REDD+ planning workflow provided opportunity for exchange of knowledge between countries.

1. Day 1

1.1 Introduction to the session

Following a welcome to VNUF, and an introductory ice-breaker, the session began with presentations from Charlotte (UNEP-WCMC) on tools to support integrated land use planning. The presentation focused on the role of spatial analysis in REDD+ planning and introduced planning workflows and tools to support this process. The activities covered during the working session were designed to link to different stages in a REDD+ planning workflow.

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[1] http://www.qgis.org/en/site/
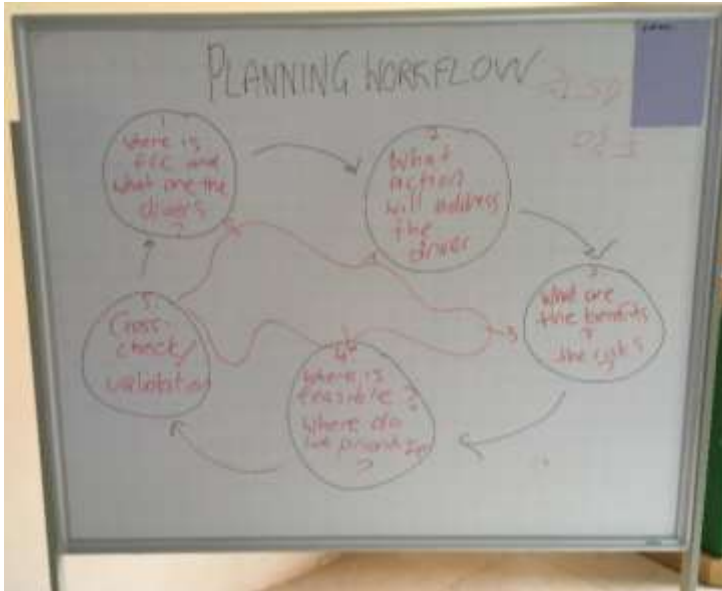
Lucy Emerton (GIZ), then presented on valuation of ecosystem services highlighting ecosystem under-valuation as a constraint to integrated and effective land-use planning and provided some examples of how ecosystem service valuation had been carried out in some example projects (including Cat Tien National Park in Viet Nam). Lucy highlighted some key issues and challenges, such as how trying to derive an economic value for certain biodiversity and ecosystem service aspects may have little meaning for decision-makers, and how highlighting the multiple benefits and avoided costs of environmental degradation can be a powerful tool.

1.2 Technical set-up

After the introductory presentations, Corinna (UNEP-WCMC) and Nguyen Van Thi (IFEE) distributed the materials, checked software and helped participants to install the UN-REDD 'Exploring multiple benefits mapping toolbox' (see Box 1 below). Thi then gave an overview of the Ha Tinh spatial data provided, which were being used as the example datasets in the working session, covering:

- Forest cover change 1995-2010 and 2010-2014
- Forest cover datasets for various years
- Three forest types (protection, production, special use forest)
- Land-use plan to 2020
- Current infrastructure
- Transportation network plan
- Planned mining locations
- Poverty (by commune)
- Population (population density by commune)
- Hydropower basins

Corinna then described additional international datasets provided and where to access the data online:

- Key Biodiversity Areas (KBAs): http://datazone.birdlife.org/home
- IUCN Red List of Threatened Species: http://www.iucnredlist.org/
- Hydrobasins and digital elevation models (DEMs): http://hydrosheds.org/
- Dams and reservoirs: http://www.gwsp.org/products/grand-database/global-reservoir-and-dam-grand-database-project.html
- Fire occurrence: https://firms.modaps.eosdis.nasa.gov/download/
- Baccini 2012 above-ground biomass (no below ground biomass or conversion to carbon provided): http://www.whrc.org/mapping/pantropical/carbondataset_form.htm
- Saatchi 2011 above-ground biomass, below ground biomass and above and below ground biomass carbon: http://carbon.jpl.nasa.gov/; http://carbon.jpl.nasa.gov/data/dataMain.cfm
- Avitable 2015 above-ground biomass: http://www.wur.nl/en/Expertise-Services/Chair-groups/Environmental-Sciences/Laboratory-of-Geo-information-Science-and-Remote-Sensing/Research/Integrated-land-monitoring/Forest_Biomass.htm
- Comparing carbon datasets: https://carbonmaps.ourecosystem.com/
- Worldclim: http://worldclim.org/version2
- World Database on Protected Areas: https://www.protectedplanet.net/
- World Population: http://www.worldpop.org.uk/data/
- OpenDevelopment Mekong: https://opendevelopmentmekong.net/

1.3   Applying spatial workflows to map pressures and threats to forests

Corinna presented on pressures and threats to forest, the main topic for Day 1. This was followed by a group discussion on the kinds of spatial data that can be used to map pressures on forests, including both direct and indirect pressures, and what data may be collected by different sectors.

Photos: Participant's discussing pressures and threats and which sectors might hold the data and presenting back to the wider group
(©UNEP-WCMC)

The theme was continued with a focused activity using GIS to examine the potential relationships between forests and current and future pressures on those forests. Participants split into small teams and carried out some overlays and selections using spatial data on pressures such as roads, mining sites, and hydropower areas in Ha Tinh Province. Participants were asked to think about what analysis steps (see box 2) could be used to help identify potential future pressures and threats e.g. looking at distance of past deforestation from roads to identify forests under threat from planned infrastructure. Two teams shared their final map with the wider group.

Photos: Corinna providing GIS supporting participant's from Myanmar (left); Cambodian participants presenting back to the group (right)
(©UNEP-WCMC)

Box 2: Spatial analysis workflows

Maps for integrated land-use planning require **a clear logic** that can be justified and explained to policymakers and other stakeholders, including those with technical and non-technical backgrounds. Although spatial analysis and participatory approaches complement each other and add value to the planning process, combining the two approaches also adds complexity.

Clearly **identifying and documenting** each step in the analyses is vital, in order to ensure a sound methodology and coherence between the approaches used to develop different maps. Before undertaking any spatial analysis, the question that the analysis will try to answer needs to be clearly formulated and in sufficient detail for the spatial analysis team to develop a map. This involves identifying the sequence of appropriate analytical steps, the input requirements (in terms of data and any criteria) and the expected output from the analysis. Defining a robust spatial logic (a series of technical GIS processing steps) and working out the sequence of those steps into a **spatial analysis workflow** will save time and ensure the analysis is appropriate for the question.

Workflows usually take the form of **a diagram, setting out the inputs, GIS processing steps, criteria and outputs.** They document how the maps have been generated and can record how information from the participatory process and spatial analysis have been combined. A workflow can be used to guide a technician manually through the analysis steps or, if the GIS technician chooses, the sequence of steps can be strung together and run repeatedly (e.g. using tools such as ArcGIS model-builder).

A documented workflow also makes it easier to review and modify analysis (e.g. if new information becomes available) and allows the steps to be shared between technicians and teams

Source: García-Rangel, S., Hicks, C., Ravilious, C., Williamson, A., and Nguyen, T.P. (2017) Integrated land-use planning for REDD+: Combining spatial analysis and participatory approaches in Viet Nam. UN-REDD Viet Nam Phase II Programme, Hanoi.

2. Day 2

2.1 Applying spatial workflows to map potential multiple benefits

The second day focused on the potential multiple benefits of REDD+ actions, and explored some techniques for mapping these. Charlotte presented on ecosystem services, benefits from forests, and multiple benefits of REDD+ (see Box 3) and led a discussion with the group to recap what is REDD+, the five main REDD+ activities and REDD+ actions. For example:

Five REDD+ activities	Example actions
Reducing emissions from deforestation	Reduce conversion pressure through improved land-use planning
Reducing emissions from forest degradation	Provide alternatives to fuelwood from natural forests
Conservation of forest carbon stocks	Improve management of existing protected areas
Sustainable management of forest	Promote reduced impact logging practices
Enhancement of forest carbon stocks	Rehabilitate degraded forests using enrichment planting

REDD+ has the potential to deliver multiple benefits, including a wide range of social and environmental benefits in addition to climate change mitigation. Social benefits from REDD+ implementation can include improved forest governance and increased participation in local decision-making on land use, and in some cases financial improvements to livelihoods. Environmental benefits from securing the many ecological functions of forests can include biodiversity conservation and the provision of ecosystem services that people depend on, such as soil conservation, pollination, and tourism and recreation. However, depending on how REDD+ is implemented, it also carries potential risks, such as pressures on forests being displaced from one area to another, or local communities' access rights to forests being reduced. The UNFCCC asks countries to promote and support the Cancun safeguards and to provide information on how they are being addressed and respected throughout implementation of REDD+ activities. The safeguards were specifically developed to encourage benefits and address potential risks of REDD+. A REDD+ programme that delivers multiple benefits and avoids social and environmental risks can contribute to a range of policy goals beyond climate change mitigation.

Participants divided into three groups to identify the REDD+ goals as well as potential social and environmental benefits from three REDD+ actions: forest restoration; improving forest conservation and community forestry. As an added benefit, we also had mooncakes at tea break to celebrate the moon festival! After the report back, Corinna provided some examples of the types of spatial information that can be used to map the presence and/or potential for multiple benefits in a landscape, such as Key Biodiversity Areas (KBAs), species data and poverty data. Remaining in the same groups, participants then discussed how they could map three of the benefits identified for the REDD+ actions discussed.

Photos: Charlotte presenting to introduce the session on ecosystem services, benefits from forests, and multiple benefits of REDD+ (left); Group discussing the REDD+ goals and potential social and environmental benefits for their REDD+ action (right) (©UNEP-WCMC)
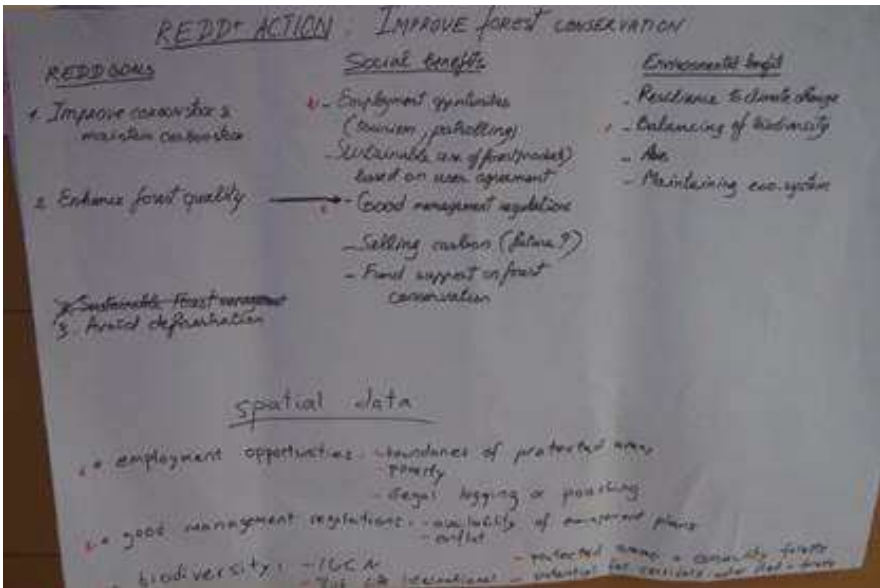

Photos: Result of group discussing the REDD+ action to improve forest conservation and the types of data that could be used to map the benefits (left); mooncakes (right) (©UNEP-WCMC)

Corinna then introduced the UN-REDD Exploring Multiple Benefits Toolbox for ArcGIS, and after lunch participants began work on mapping the distribution of different types of benefits, such as areas important for biodiversity conservation, areas with potential for poverty reduction, and so on. Two teams presented on two of the benefits layers they produced: the Lao team shared their map showing high poverty areas with potential priority forest areas highlighted; and one Cambodian team showed their map of prioritised KBAs. The GIZ team and the other Cambodia team were working on mapping species richness.
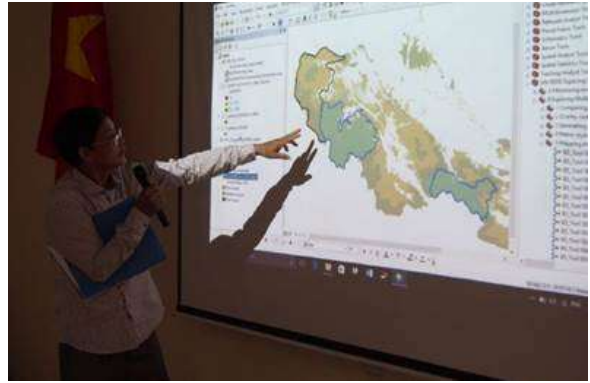
Photos: Participants mapping multiple benefits (left); Presenting result of prioritized KBA mapping (right) (©UNEP-WCMC)

The final task of day two was a discussion about how different kinds of information on forests, pressures and benefits could be combined together, using an exercise building up a map using different information on a whiteboard. Participants then returned to the spatial exercise to add a pressure layer to their benefits layer to see if it would change their prioritization of areas for REDD+.

Photo: Participating in group discussion on combining benefit and pressure layers (©UNEP-WCMC)

3. Day 3

3.1 Field trip to Ba Vi National Park

Day 3 of the working session began with a field visit to Ba Vi National Park. The National Park staff welcomed us and provided an overview of the Park's ecosystem and conservation activities. As well as being home to many species of flora and fauna (including some endemic species), the Park and surrounding areas are working to provide economic development opportunities to local people. Following a walk through the forest, we had lunch at 1000m asl.

Photos: Guided walk, Ba Vi National Park (©UNEP-WCMC)

3.2 GPS exercise at Luot Mountain (forest area in VNUF)

After returning to VNUF, IFEE led the afternoon session to practice using GPS to locate coordinates, record points and measure boundaries. Participants were split into country team and were provided with a coordinate to navigate to using the GPS. Participants had to find an item hidden at the specified coordinate in the forest. Once found the team then walked a boundary around the central coordinate to measure the area and participants recorded points at intervals along the boundary making a note of the vegetation at each coordinate. Some groups took coordinates at regular intervals whilst others took coordinates only when there was a change in direction. Participants were also required to make a written note of coordinate and a description of the forest at each point.

Photos: Participants undertaking GPS exercise in Luot mountain forest area (©UNEP-WCMC)

Once the data collection was complete, the exercise continued inside where IFEE guided participants in uploading their collected GPS data into the GIS software, most participants completed this in ArcGIS and a few used QGIS. Uploading consisted of two approaches 1) manually taking the hand written coordinates and transferring them into an excel spreadsheet along with their descriptions and 2) directly connecting the GPS to the computer and transferring them into ArcGIS or QGIS directly. Participants created a simple map of the area they walked around as well as calculating the area of the boundary in hectares.

ID_	Long	Lat	Description
8	559271	2312571	Mixed plantation, small hill
9	559275	2312585	Slope from road
10	559249	2312560	No undergrowth big trees
11	559211	2312560	Edible Cho
12	559221	2312522	Storm Damage Trees
13	559227	2312509	Cliff near road
14	559250	2312512	Big holeas and broad leaves
15	559262	2312523	Steep slopes
16	559281	2312545	Half ways down slopes
17	559273	2312568	End point or starting point

Photo: Participants transferring GPS data into ArcGIS (left) (©UNEP-WCMC). An example set of GPS data collected (right).

4.   Day 4

4.1   Further prioritisation of locations for REDD+

On the final day of the working session, Thi (IFEE) helped the participants to complete the exercise on creating a map using GPS points, and one of the teams presented their results.

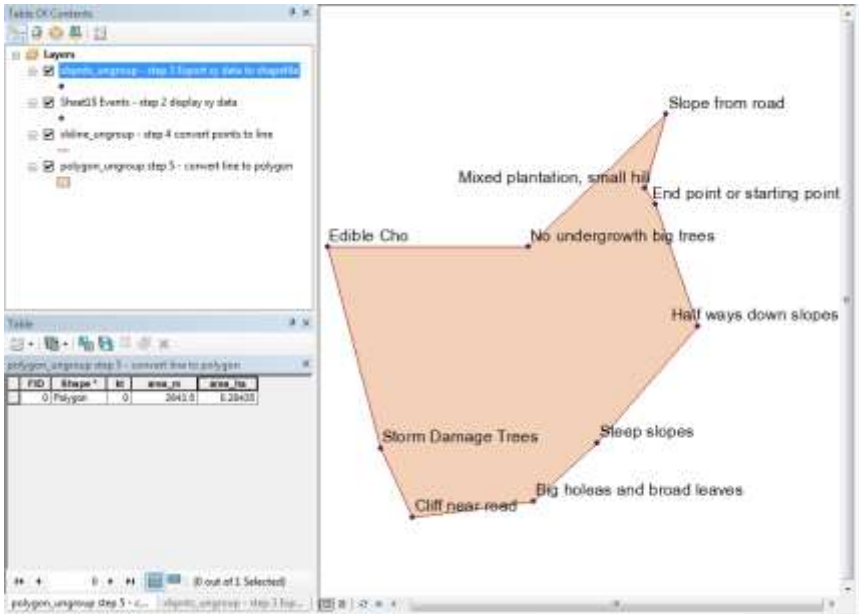*Photo: Thi helping participants to transfer GPS data into GIS (©UNEP-WCMC)*

Photo: Participants presenting results of GPS exercise (left) (©UNEP-WCMC). Figure 1: Participants' GPS map and area calculation in ArcGIS (right).

We then revisited the planning workflow with participant and as a group undertook an exercise to demonstrate how different types of spatial information can be combined to help prioritise areas for certain REDD+ actions.

Participants split into small groups to bring together the different types of spatial information generated in the previous three days. Participants began with the benefit layers generated on Day 2, and added information on forests and pressures from Day 1, they were tasked to prioritise areas for a REDD+ action, either by drawing a polygon on the map (for beginners in GIS) or selecting areas using some spatial analysis tools (for more advanced participants). Two team shared their final maps: one Cambodia team prioritised areas for establishing protected areas for enhancing carbon stocks in degraded forest areas, while one of the Viet Nam teams looked at areas for enhancing carbon stocks in special use forests. The second Cambodia team's map is shown below (Fig. 3), showing areas prioritized for forest conservation with benefits for biodiversity conservation.

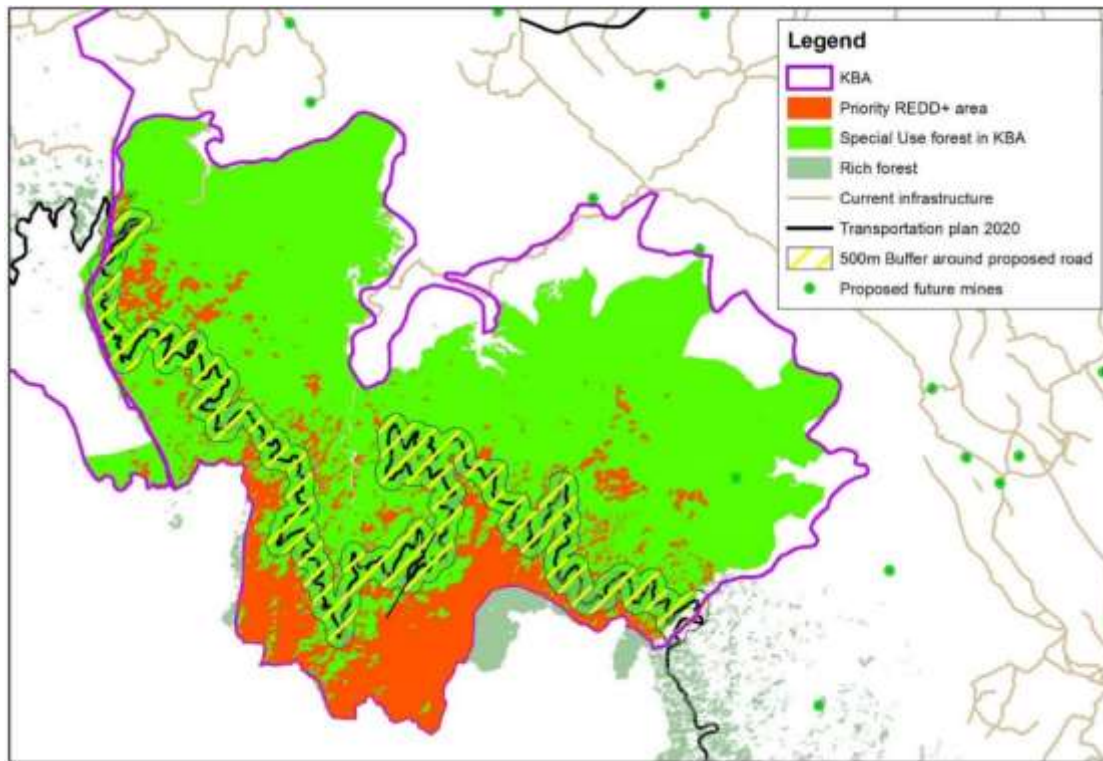*Photo: Participants presenting maps of prioritized areas (©UNEP-WCMC)*

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Figure 3: Example map from Cambodian team prioritizing areas for a REDD+ action to improve forest conservation, where priority area has been defined by selecting rich quality Special Use Forest within KBAs but excluding areas within a 500m buffer of the proposed road

4.2   Coaching session

The rest of the morning was spent in coaching sessions – each participant decided what topic or exercise to pursue, either in GIS or exploring non-GIS approaches, such as cost-benefits analysis and WaterWorld (www.policysupport.org/waterworld).

The other group continued with GIS capacity building exercises related to mapping benefit layers for Soil erosion risk, species richness and poverty alleviation. One group chose to undertake a tutorial for visualization two thematic datasets using a matrix style legend. Support was provided in QGIS and ArcGIS.

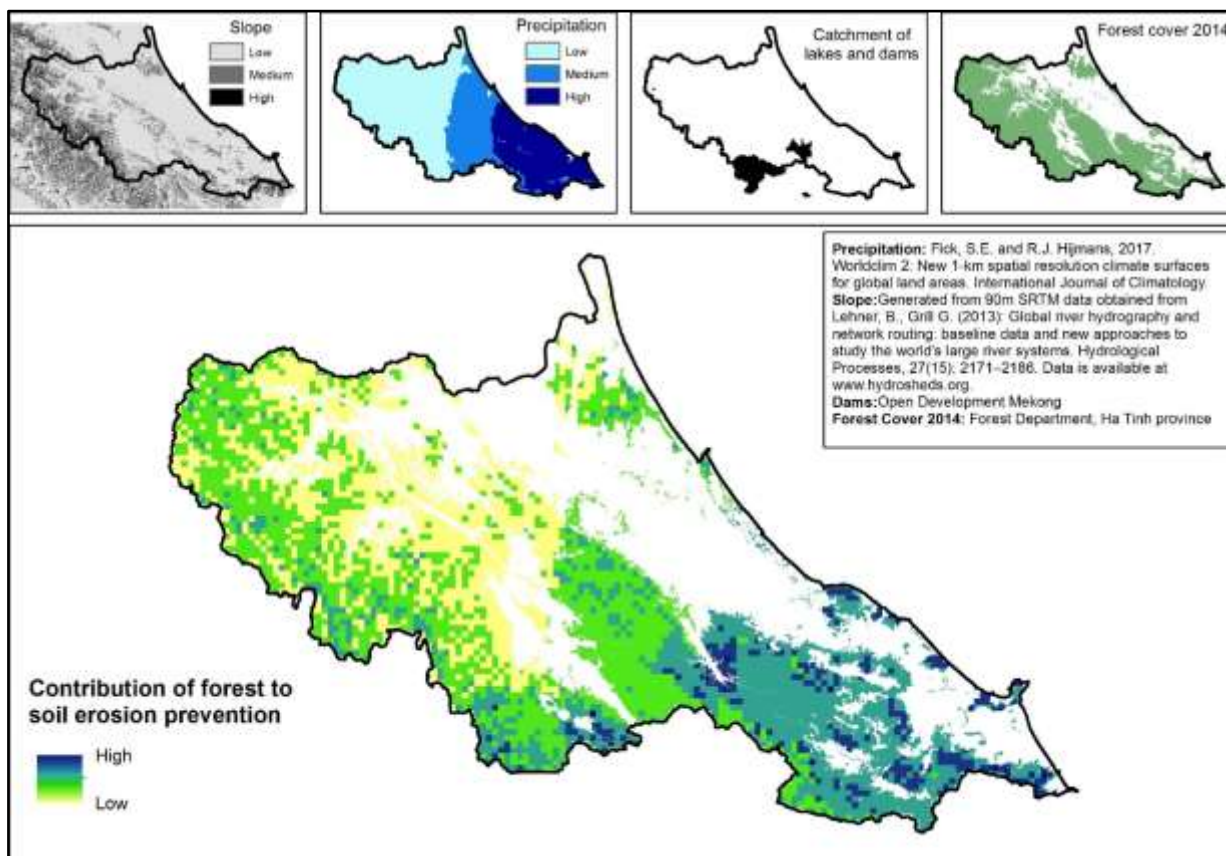*Photo: Corinna providing support in country coaching sessions*
(©UNEP-WCMC)

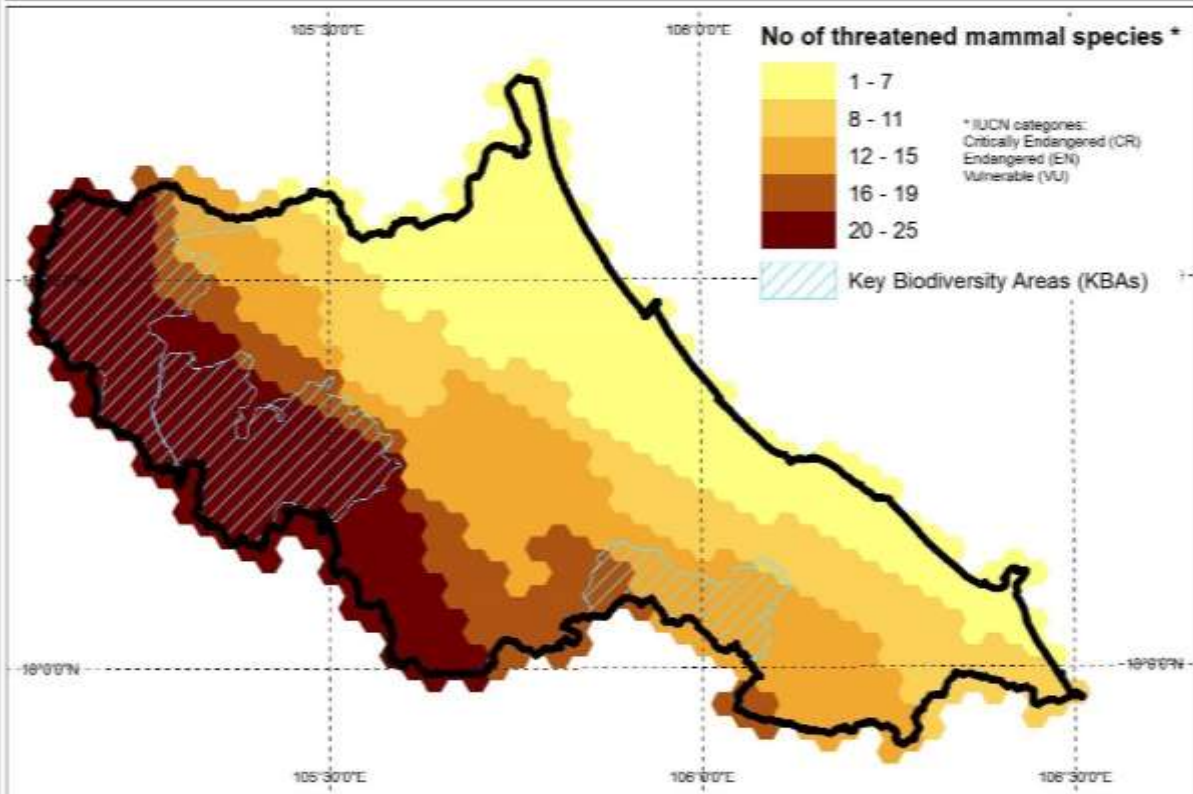*Figure 4: Example map from teams working on soil erosion risk*

4.3   Wrap up session

After lunch, we had a report-back from the non-GIS group for the coaching session, who had examined a cost-benefit analysis approach to support REDD+ planning and the WaterWorld platform. Two participants from the GIS teams also shared their final maps. Borey from Cambodia showed a species richness layer for Ha Tinh Province, overlaid with KBAs. The Viet Nam team mapped poverty rates in the province and prioritised areas for community co-management of forests.

Photo: Borey (Cambodia) presenting species richness map (Figure 5 below) (©UNEP-WCMC)

Areas Important for Biodiversity, Ha Tinh Province, Viet Nam

No of threatened mammal species *

- 1 - 7
- 8 - 11
- 12 - 15
- 16 - 19
- 20 - 25

* IUCN categories:
Critically Endangered (CR)
Endangered (EN)
Vulnerable (VU)

Key Biodiversity Areas (KBAs)

Disclaimer: This map represents a depiction of species distribution for communication and/or conservation planning purposes; it may not equate to either the spread of extinction risk (Extent of Occurrence) or the occupied range (Area of Occupancy) as defined by the IUCN Red List categories and criteria. Note that a taxon may not be evenly distributed within the defined limits of distribution. Ranges, in particular, are mapped as generalized polygons which often include areas of unsuitable habitat, and therefore a species may not occur in all of the areas where they are mapped.

Data sources:
IUCN 2016. The IUCN Red List of Threatened Species. Version 2016.3. http://www.iucnredlist.org. Downloaded on 15/03/2017. BirdLife International (2017]). World Database of Key Biodiversity Areas. Developed by the KBA Partnership. Available at www.keybiodiversityareas.org. [Accessed 29/09/2017].

Figure 5: Example species richness map produced by the Cambodian team

The wrap-up session included some discussion of useful take-home lessons from the week; for example:

- Interest in doing cost-benefits analysis to support REDD+ planning, if data is available (Myanmar)

- Adapting the planning workflow to local-level participatory land use planning activities, e.g. identifying activities for communities to protect the environment (Lao PDR)

- Making use of the helpful international datasets available on biodiversity (Germany)

- Utilising GIS in development planning processes (Viet Nam)

Following the presentation of certificates of participation. Participants were provided with a number of additional tutorials and resources for ArcGIS and QGIS, and completed a feedback survey on the event (see Annex 4 for a summary of the results). Phuong (UN-REDD) closed the session with thanks to the participants, organisers and trainers.

Photo: Presentation of certificates (©UNEP-WCMC)

5. Next Steps and additional resources

Participants expressed their interest on applying the techniques and tools shared at the working sessions to their regular activities as forest practitioners. This could include selecting areas to scale up particular interventions, evaluate zoning, mapping different types of forest use and prioritize areas for 'payments for forest ecosystem services' (PFES). In the near future, IFEE and the UN-REDD Viet Nam Phase II Programme will develop a handbook on spatial planning for sub-national REDD+ planning. This will be focused on experiences with PRAP development in Viet Nam, and aimed at students and practitioners within the country as well as internationally; it will be available in both Vietnamese and English.

Annex 1 - Agenda for Stocktaking Workshop

Workshop on Integrated Spatial Planning:
Integrating Ecosystem Services and Climate Change into Planning
Hanoi Club, 76 Yên Phụ Street, Tây Hồ, Hà Nội
Monday, 2nd October 2017

Time	Topic	Responsibility
8:00	Registration	
8:30	Welcome Speech	Chairs
8:50	Setting the scene: integrated land-use planning & spatial planning (REDD+ landscape approach)	Charlotte Hicks, UNEP-WCMC
9:10	International experiences for integrating ecosystem services and climate change into spatial and economic planning	Lucy Emerton, ValuES/GIZ
9:40	Viet Nam Planning Bill: what is being proposed for integrated spatial planning to deliver on development goals and challenges	MPI
10:00	Coffee Break	
10:15	Achievements and challenges in integrated land-use & spatial planning in the region: Cambodia, Lao PDR and Myanmar	Country Representatives
10:45	Panel Discussion: key considerations and challenges for promoting integrated spatial planning	All Participants
12:00	LUNCH	
13:00	Interactive Sessions: Tools & Approaches for Integrated Land-use Planning and the integration of Ecosystem Services and Climate Change into spatial planning - Transparent map layers (UN-REDD) - ValuES (GIZ) - Ecosystem mapping and Terra-i (CIAT) - Strategic Environmental Assessments, SEA (UNDP/ ITP SEA) - Ecosystem based Adaptation, EbA (GIZ) - InVest (ISPONRE)	UN-REDD: Charlotte Hicks GIZ-ValuES: Lucy Emerton CIAT: Pablo Imbach SEA : Jiri Dusik EbA: Ivo Litzenberg ISPONRE: Manh Lai
14:50	Coffee Break	
15:10	Group Discussions: Integrated Spatial Planning -- Integrating Ecosystem Services and Climate Change into Planning: - Key considerations for the policy/legal framework - Practical ways forward and next steps	All Participants
16:15	Plenary: sharing discussion results	All Participants
16:45	Summary and Conclusion	Chairs

Annex 2 - Final Agenda Technical Learning session

Time	Topic and presenter/facilitator
Day 1 – Tues 3 October	
08:15 – 09:30	Departure from Hanoi to Viet Nam National University of Forestry, Xuan Mai
09:30 – 10:00	Registration and receive materials
10:00 – 12:00	**1. Introduction** • Welcome & introductions (20 mins – UN-REDD/WCMC) • Run through agenda (10 minutes - UN-REDD) • Integrating ecosystem & cc into planning (20 mins - GIZ) • Presentation & discussion: what is an integrated land use planning workflow and what spatial analysis tools are available to support these processes? (30 mins – WCMC) • Q&A (10 mins) • Check USB, datasets and software: guided exploration of what data we have from different sectors (20 mins – IFEE & WCMC)
12:00 – 13:30 ---- Lunch	
13.30 – 15.15	**2. Pressures on forests** • Cont. with software check if needed (15 mins) • Presentation: what are current/future pressures on forests and why do we need to integrate information from different sectors? (20 mins – WCMC) • Group discussion: what kinds of data from different sectors can help us to map current/future pressures on forests? (30 mins – WCMC) **3. Overlaying spatial information on pressures** • Introduction to exercise: Working in pairs to overlay forest-cover change for the province with different sectoral layers (transport, hydropower, mining, plantation concessions, etc.) • Aiming to answer a question like 'Which forest areas may be under the most pressure from future development?' or 'Which driver is potentially having the greatest impact on forests'? *Start exercise*
15:15 – 15:30 ---- Tea/coffee break	
15:30 – 17:00	• Cont. with exercise. • Report back from the exercise on pressures: Pairs can volunteer to show their map towards the end for feedback. (2-3 pairs per report-back; by the end of the whole session all pairs should have reported back at least once) • Discussion: where do analyses on pressures on forests fit into the planning workflow? How can they be combined with other types of information?
Day 2 – Weds 4 October	
08:30 – 10:00	**4. Identifying multiple benefits** • Presentation: multiple forest values and benefits of REDD+ (20 mins – WCMC) • Group exercise on identifying benefits (45 mins – WCMC) • Quick reporting – what types of benefits have the groups identified? (15 mins)
10:00 – 10:15 ---- Tea/coffee break	
10:15 – 12:00	• Short presentation: what spatial data can be used for mapping benefits? (10 mins – WCMC) • In the same groups, discuss what spatial data would you use to map the benefits you identified? Which can't/should not be mapped? (30 mins) • Report back: What are 3 key benefits your group identified and what data you would use to map them (20 mins) **5. Mapping multiple benefits** • Introduction to the multiple benefits toolbox (45 mins WCMC)
12:00 – 13:30 ---- Lunch	
13:30 – 15:15	• Exercise on mapping a benefit in pairs: aiming for at least one complete benefit layer per pair. Each pair can choose a layer to work on, and this should be shown in relation to forest / forest cover change. These may include:

	a) Areas important for biodiversity (e.g. PAs + KBAs) b) Poverty alleviation potential c) Species richness d) Hydropower/PES e) Control of soil erosion risk….
15:15 – 15:30 ---- Tea/coffee break	
15:30 – 17:00	• Exercise cont. How can we combine the information on forests, pressures and multiple benefits to prioritise areas for feasible REDD+ implementation? Each pair to carry out a basic prioritisation for a simple, example action. • Report back on exercise; pairs can volunteer to show their work.
Day 3 – Thurs 5 October	
07:45 – 8:00	Departure from Viet Nam National University of Forestry to Thien Binh Hotel
8:00 – 9:30	Drive to Ba Vi National Park
9:30 – 10:00	Presentation by National Park (30 mins)
10:00 – 11:30	Visit Ba Vi National Park
11:30 – 12:30---- Lunch at Ba Vi Restaurant	
12:45 – 14:15	Departure from Ba Vi National Park to Luot mountain (in VNUF)
14:30 – 16:00	**Field trip (IFEE)** - Divide into 4 groups (2 VNs, 2 international) and then go to Luot mountain to practice GPS (60 min for each group) - Rapid identification of the area on the field - Determine the coordinates of points (by GPS)
16:00 – 17:30	Exercise: Updating shape files using GPS information (half-day)
Day 4 – Fri 6 October	
08:30 – 10:00	- Finish GPS exercise (if needed) **6. Country/team coaching (IFEE & WCMC)** • Each country group can bring their own data and pose a problem they want to address, with assistance from the facilitators. Or they can choose a tutorial to work through using their country data. (Participants will advise the facilitators by Day 2 on what topic or tutorial they want to cover so that preparations can be made)
10:00 – 10:15 ---- Tea/coffee break	
10:15- 12:00	• Coaching cont.
12:00 – 13:30 Lunch	
13:30 – 14:45	Wrap up session: - What has each country group/team been working on? - What lessons from the session will they take home? - Present certificates - Fill in survey
15:00	Session close

Annex 3 - Technical learning session participants list

No	Name	Organization	Country	Gender
Facilitators				
	Nguyễn Thanh Phương	UN Environment UN-REDD Viet Nam	Viet Nam	Male
	Charlotte Hicks	UNEP-WCMC	UK/Australia	Female
	Corinna Ravilious	UNEP-WCMC	UK	Female
	Vũ Thị Kim Oanh	IFEE	Viet Nam	Female
	Nguyễn Văn Thị	IFEE	Viet Nam	Male
	Lã Nguyên Khang	IFEE	Viet Nam	Male
	Nguyễn Thanh Tùng	Interpreter	Viet Nam	Male
IFEE				
	Trần Quang Bảo	Vice Rector of VNUF	Viet Nam	Male
	Lê Sỹ Doanh	Director of IFEE	Viet Nam	Male
	Phạm Văn Duẩn	Deputy Director of IFEE	Viet Nam	Male
Participants				
No	Name	Organization	Country	Gender
1	Mr. Than Naing Win	Forest Department	Myanmar	Male
2	Mr. Si Thu Aung	Forest Department	Myanmar	Male
3	Mrs. Hout Naborey,	Chief of Forest Inventory office/Technical staff of MRV,GDANCP	Cambodia	Female
4	Mr. Net Norint	Vice Chief of Forest Inventory office/Technical staff of MRV,GDANCP	Cambodia	Male
5	Mr. Chin Pich	Chief of domain, map and geography office of FiA/MAFF	Cambodia	Male
6	Mr. Phann Phearum	Senior Technical officer of FiA/MAFF	Cambodia	Male
7	Mr Bounhome Souannhaphanh	NREIC, MONRE	Lao PDR	Male
8	Mrs. Khanhkham Douangsila	Promote Sustainable Natural Resource Use Association (PSNUA)	Lao PDR	Female
9	Mr. Choyria Machang	SAEDA-AGRISUD	Lao PDR	Male
10	Tăng Quỳnh Anh	Policy on Natural Resources and Environment (ISPONRE)	Viet Nam	Male
11	Trần Thị Thu Huế	Policy on Natural Resources and Environment (ISPONRE)	Viet Nam	Female
12	Vũ Thị Minh Huệ	Research Institute of Land Administration	Viet Nam	Female
13	Trần Anh Tuấn	Vietnam Institute for Development Strategy	Viet Nam	Male
14	Phạm Minh Hiền	Vietnam Institute for Development Strategy	Viet Nam	Male
15	Trịnh Minh Hiếu	Vietnam Institute for Development Strategy	Viet Nam	Male
16	Hoảng Thọ Vương	Vietnam Institute for Development Strategy	Viet Nam	Male
17	Rebecca Younan	GIZ, Viet Nam	Germany	Female
18	Dirk Hoffman	GIZ, Viet Nam	Germany	Male
Technical support / Logistics				
	Nguyễn Quang Huy	IFEE	Viet Nam	Male
	Lê Sỹ Hoà	IFEE	Viet Nam	Male
	Bùi Thanh Tùng	IFEE	Viet Nam	Male

	Trần Thị Hiền Lương	IFEE		Viet Nam	Female
	Nguyễn Thị Ánh Vân	IFEE		Viet Nam	Female
	Nguyễn Thị Thanh Loan	IFEE		Viet Nam	Female
	Đoàn Thị Mỹ Dung	IFEE		Viet Nam	Female

Annex 4 - Summary of feedback survey results

After the technical learning session, the participants filled out an online questionnaire to provide feedback on this part of the event. The key results are discussed below:

- 19 questionnaires were submitted (suggesting one sent by mistake), from 32% women (6 participants), 68% men (13 participants). Regarding **their engagement in the REDD+ process**, the majority stated that they do either occasionally participate in REDD+ meetings and related events (68%) or that they are regularly engaged with REDD+ as part of daily work (18%).

- On the **effectiveness of the session**, 61% (11 participants) found it very effective, 33% (6 participants) moderately effective and 6% ineffective (1 participant). 50% (9 participants) thought the event was very effective in increasing their **knowledge on GIS and spatial analysis** in relation to integrated land-use planning for REDD+. The other 50% found it moderately effective.

- Regarding how participant knowledge on GIS topics improved as a result of the event:
  - 72% felt that their knowledge on the types of data for mapping multiple benefits of REDD+ received high improvement
  - For topics such as how spatial analysis can contribute to REDD+ planning, mapping drivers of deforestation and degradation, how to use GPS, and how to use raster/vector data, around 50-55% of respondents noted high improvement
  - 17% noted little to no improvement in their knowledge of vector data use, while 50% noted moderate improvement in the use of workflows.

- 61% (11 participants) were overall very satisfied with the event and 39% (7 participants) were overall moderately satisfied.

- Asked about the **effectiveness of the combination of methodologies** used during this event overall, 78% (14 participants) found it effective and 22% (4 persons) found it neutral. If able to restructure the event, the majority of the participants (56%) would prioritise group exercises. 22% would not make any changes, 17% would include more lectures or presentations and 6% would prioritise discussions.

- As a result of the workshop, participants were planning to undertake the following **actions** when returning home:
  - Share the gained knowledge (3 participants)
  - Apply and practice GIS techniques (6 participants)
  - Evaluation of land use/cover to identify deforestation and forest degradation for restoring the degradation area.
  - Check for relevant structures, institutions and people involved in REDD+ also reflecting on the role/potential role of academia.

- Other **comments, feedback or recommendations i**ncluded the need to better align the background/skills levels of participants, request for better logistics (accommodation, food, travel and DSA) and the wish for further training in the future.