Summary of discussions Week 2 – Policy, Practice and Society knowledge needs

1. Overall Themes Week 2

- Data needs

Participants highligthed as in week 1 difficulties around collating data and indicators at different scales and a strong need for harmonisation of data/knowledge across different sites of land degradation (including a call for standardised tools to do so).

The main cross-cutting themes were:

- To strenghten longer-term monitoring schemes, and associated tools, that take into account decision-makers', practitioners', and stakeholders' needs - as well as include multiple knowledge systems
  - In the above context: the need to explore opportunities to use remote sensing technologies (especially for soil degradation) along with ground-truthing using local communities and citizens with appropriate guidelines and capacity building
- how to best translate data into knowledge and guidance for actions across scales and in format that are usable by various level of policy makers, practitionners, local endusers –
- How to ensure long term monitoring data feed back into scientific study to evaluate whether current practices/policies are working

- Transdisciplinary needs

Although not always labeled as transdisciplinary needs, we gather here the knowledge needs that are related to overall transdisciplinary approaches across all discussion areas, not just the one dedicated to the topic.

The main cross-cutting themes were:

- to better understand how assessments (including IPBES thematic assessments) could be made more relevant to local-level policy-making, practitioners and other stakeholders.

- how to address important questions about trade-offs (e.g. food security at the expense of land preservation), taking into account long-term and cumulative impacts at the local level.
- to explore and consider more the value of indigenous and local knowledge and the potential erosion of traditional practices and its consequences in assessing land degradation
- to explore how to implement stronger, permanent connections and communication between scientists and practitioners (the 'science-practitioner interface'). So far, the target audience and users have mostly been governments, not the "end-users" or people working/restoring/living on the land.

2. Some of the notable ideas:

This are not exhaustive and represent just a few highlights of what has been discussed and illustrate more the above overall themes:

- How can we better exploit the potential of existing new technologies (e.g. remote sensing but also citizen science using smartphone applications) to gather missing/continuous data on land degradation? Can we maximize monitoring approaches based on large amounts of spatiotemporal data through capacity building?
- How can we ensure we have inclusive baseline measures (not only byophysical conditions) of a site pre-restoration to better monitor the effectiveness of restoration strategies on all components including local populations well being?
- Can we compare and contrast local knowledge indicators with higher-level scientific indicators? How do they correlate? What is captured by ILK that is missing in more mainstream science?
- How can promoting responsible consumption behaviours combat land degradation?
- Can we apply specific case studies to local and regional scales (e.g. groups of rural development or agrarian district/region offices)? How can we incentivize ecologically healthy behaviours?
- How can we measure the economic cost of environmental externalities from localised land use? There is need for localised information on the economic cost of various drivers of land degradation.
- How does restoration on land which is 'extremely' eroded or the soil is significantly degraded differ from partially/somewhat degraded lands?
- How can we increase consideration of human well-being in land restoration activities and the application of technologies?
- What happens when we explore social capital in the context of rural areas and the needs it acquires in different rural environments? How can social capital be integrated into strategies of rural development?
- how can we ensure more case studies of good (agricultural) practice and examples of damaging practices are available for reference?

3. Detailed Summary of Discussions by Thread

1. **Knowledge needs in terms of: data, information management, monitoring, indicators and scales that are limiting the current understanding of status and trends of land degradation and restoration**
    a. Collaboration
        - Missing strong collaboration on the synthesis of knowledge and data for degraded areas.
        - Need collaboration with and commitment from end-users/on the ground locals - how do we balance socio-economics with ecology for the people most affected?
    b. Data quality
        - Lack of harmonisation across different 'classes' of degraded areas.
        - Use more existing satellites for remote sensing data.
        - Remote-sensing data too biased towards forest cover/loss. It needs to address non-forest ecosystems.
        - More robust collection, processing, analysis and communication of data is needed - bearing in mind the needs of decision-makers, stakeholders and practitioners.
    c. Access to data
        - Remote-sensing data needs to be more affordable and accessible.
    d. Tools
        - Need for alternative monitoring schemes that include multiple knowledge systems and can be used by land managers and planners.
        - Call for developing more tools for 'standardized geographically-representative entries'.
        - Extend the utility of existing tools to include indigenous and local knowledge and communities.
        - Inexistent remote sensing tools to measure soil degradation indicators (e.g. organic matter content) under dense plant covers.
        - Extended the utility of existing tools to indigenous and local communities.
    e. Integration
        - Longer-term monitoring needs to become an integral part of restoration projects.
        - Need for more coupling of satellite data with ground data.
        - Need to complement monitoring approaches based on large amounts of spatiotemporal data with capacity building and the inclusion of stakeholders.
        - Greater synergy between land restoration activities and vegetation restoration efforts would yield better, more cost-effective results.
        - An integrated approach (biophysical and socioeconomic factors) should also consider the roles of stakeholders and decision-makers at different levels and their needs (e.g. shorter, simplified version of technical assessments).

f. Scale
    - ‘Data rich but currently information poor’ – need for better ‘processing chains and downstream application development’ for the local level.

g. Misc
    - Need ways of contrasting and comparing local knowledge indicators with higher-level scientific indicators.
    - ‘How to best create baseline value for polluted areas to define pollution levels?’
    - Need for more leadership in conservation

2. Knowledge needs related to drivers/causes of land degradation

- Incorporate an ecosystem-based approach to restore ecosystem functions including socio-economic perspectives.
- Need for a standardized baseline to assess levels of degradation and restoration to differentiate between ‘land improvements’ and ‘land degradation, for example.
- More case studies of good (agricultural) practice should available to everyone, as well as examples of damaging practices.
- Greater linkage between local, national, and international actions is needed.
- Need for a better understanding of climate solutions which may in fact be having unintended negative consequences, causing land degradation in some cases (e.g. bioenergy).
- More research on institutions required to detect institutionally-driven problems.
- Early warning systems (similar to those for floods, tsunamis) for biodiversity needed.
- Call for more research on use of mineral fertilisers for climate mitigation.
- Necessary awareness-raising to encourage more responsible consumption.
- ‘When developing strategies for restoration of degraded lands at the local-scale, there is a clear need to identify more distant drivers that may be significant barriers to ecological restoration’.

3. Knowledge needs related to impacts and consequences of land degradation and restoration

a. Trade-offs
    - Address important questions about how society makes decisions about trade-offs when land is transformed (e.g., for food security).
    - When trade-offs are assessed, longer-term and cumulative impacts need to be taken into consideration.
    - Local-level assessments need to be integrated into monitoring to identify trade-offs.

b. Harmonisation
    - Local-level assessments should identify ecosystems with similar trends to enable generalizations across different contexts.

4. **Knowledge needs related to facilitating factors and possible solutions for avoiding land degradation, and restoring land (reducing and reversing land degradation)**
    - Connections and communication between scientists and practitioners need to be stronger; target audience and users are often governments rather than practitioners.
    - Greater alignment between science and policymaking is necessary to ensure that the research is relevant to ground realities.
    - A greater recognition of the value of indigenous and local knowledge is needed.
    - IPBES thematic assessments need to be more relevant to local-level policy-making – including regional or country-level concerns.
    - Generate a CBD strategy as method to prevent land degradation supported by policy analysis to provide a multidisciplinary perspective and stakeholders.
    - Greater integration of social science in land restoration is necessary.
    - Lack of knowledge on how to tackle land which is 'extremely' eroded or the soil is significantly degraded.
    - Baseline measures of a site pre-restoration are needed to better monitor the effectiveness of restoration strategies.
    - Need to know more about local communities conditions, taking into account the erosion of traditional practices in many places.
    - 'Land degradation assessment should [...] consider a more holistic approach where human perceptions and other human-induced forces on land, as well as their spatial and temporal scale, are recognised'.
    - More consideration of human well-being in land restoration activities.
    - 'Do mechanisms such as technical guidelines help?'
    - Need for consideration of factors such as inadequate infrastructure and financial incentives in trying to engage practitioners in and with research.
    - Integrating management of landscapes and seascapes can be useful in considering sustainable use and conservation

5. **Knowledge needs related to transdisciplinary approaches**

    a. Generation of permanent channels of communications at different spatial scales
        - At local and regional scales focusing in specific case studies (e.g. groups of rural development or agrarian district/region offices).
        - At national level translacional groups including different representatives of stakeholders.
    b. Need to explore different areas after identification of critical issues e.g. agronomy, plantation, or livestock.
    c. Need to explore technological updates; suggestion to attempt information gathering through application "Remote Sensing".

d. Need for permanent channels of communications - between practitioners, policy-makers, scientists and indigenous and local communities - at different spatial scales; possibly conserving some sort of 'spatial hierarchy'.
e. Should we have a CBD approach to land degradation?
f. 'Are the technologies we use socially acceptable'?
g. Need to know how social capital materializes in the context of rural areas, what needs it acquires in different rural environments, and how it can be integrated into strategies of rural development.
h. Lack of evidence regarding 'the relationship between increasing agricultural production through agricultural approaches and probable gains in food production and food security'.
i. 'Funders and implementers need to understand and develop a simple but an achievable food production and food security model, which integrates traditional and modern understanding of the activities'.
j. More coordination and alignment between government policies, commercial activity and civil society organisations is necessary.

4. Examples of existing platforms and projects

1. **Knowledge needs in terms of: data, information management, monitoring, indicators and scales that are limiting the current understanding of status and trends of land degradation and restoration**
    a. The revolution of ecological remote sensing
        - An example of a fruitful partnership:
          Natural Capital Project and Google with the Global Forest Watch https://www.globalforestwatch.org/
        - Regarding satellite data collection alternatives to NASA and USGS exist such as Europes's Sentinell satellites; Dove satellites; the Sentinel-2-satellites, etc.
    b. Participatory monitoring systems: opportunities and constraints
        - "Alternative monitoring frameworks could benefit from regional networks for land degradation monitoring". Example: the MAP Biomas alert system http://alerta.mapbiomas.org/ is a geographically-representative alert platform that provides a framework for validation of alert entries developed by the Brazilian SEEG (the green-house gas emissions); reference: https://www.nature.com/articles/sdata201845
        - tools for standardized geographically-representative entries to achieve accurate, harmonized methodologies such as the KoBoToolbox https://www.kobotoolbox.org/ . KoBo Toolbox provides an online platform to gather real-time remote data while reporting of geographically-representative data.
        - LandSense platform developed by IIASA and partners. LandSense is a tool that allows citizens to monitor land cover change in different manners (innovative EO technologies, mobile devices, community-based environmental monitoring, data collection, interpretation and information delivery systems).

        - Long-term monitoring possible tools: the Copernicus Land Monitoring Service https://land.copernicus.eu/ . This type of tools still have the need to be modified and adapted to local level and the specific land degradation issues.
        - Spatial data should be provided through geospatial standards such as the Open Geospatial Consortium (OGC) standards (a foundation of metadata) and initiatives like INSPIRE Directive https://inspire.ec.europa.eu/ should be looked at closely and supported.

2. **Knowledge needs related to drivers/causes of land degradation**
    a. Environmental impacts from soil degradation
        - Invest in awareness-raising to act upon land degradation prevention: ex of the European Land and Soil Alliance; the online training programme by FAO, UNCCD or Elion Foundation working in China on Teh Kubuqi desert.
    b. Why the "Early Warning System for Biodiversity"?
        1. Conservation Leadership Training: it aims to collaborate with the Pacific Biodiversity Conservation Institute (PBI) for Conservation Leadership to strengthen leaders, organizations, coalitions and networks.
3. **Knowledge needs related to impacts and consequences of land degradation and restoration**
    a. Better understanding of how to manage trade offs between different benefits when determining degradation.
        - local-level assessments need to identify ecosystems with similar trends to generalize information at a global level; in the case of dry-lands, there is the Drylands Development Paradigm that informs policies globalwise http://science.sciencemag.org/content/316/5826/847
4. **Knowledge needs related to facilitating factors and possible solutions for avoiding land degradation, and restoring land (reducing and reversing land degradation)**
    a. Restoration
        i. restoration as a social and natural science: ex of the **Satoyama Initiative "Socio-ecological landscapes and seascapes (SEPLS)" r**ecognised by decision CBD/COP/DEC/14/8 (CBD 2018); an integrated approach in landscapes and seascapes production. This initiative's objective is to building a harmonious relation between people and nature linked to local culture and knowledge. It includes a strategy that integrates management of land, water and living resources to promote conservation and sustainable use in an equitable way.
    b. Need to reconcile gap between academics and practitioners
        i. Online forum to sharing short summaries or videos of scientific research to engage different audiences. E.g. PARTNERS Facebook page and website, addresses forest restoration through their content http://partners-rcn.org/