IPBES template for the submission of requests, inputs and suggestions on short-term priorities and longer term strategic needs that require attention and action by IPBES as part of its future work programme.

Name and contact details of individual submitting requests/inputs/suggestions:

Date of submission: 9 January 2019

Submission from: IPBES member:_____

Observer allowed enhanced participation in line with decision IPBES-5/4: _____

MEA(s):

The United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa

United Nations body:_____

Expert on, and holder of, indigenous and local knowledge:_____

Other Stakeholder(s):_____

Please provide the following information for any request and, where relevant, for any inputs and suggestions (additional attachments can also be submitted):

Request/input/suggestion:

Information to accompany requests submitted to the Platform (see also Decision IPBES-1/3 *Procedure for receiving and prioritizing requests put to the Platform*):	
1.	Relevance to the objective, functions and work programme of IPBES: The IPBES has as objective to strengthen the science-policy interface for biodiversity and ecosystem services for the conservation and sustainable use of biodiversity, long-term human well-being and sustainable development, via efforts to a) identify and prioritize key scientific information needed for policymakers on appropriate scales and to catalyse efforts to generate new knowledge; b) perform regular and timely assessments of knowledge on biodiversity and ecosystem services and their interlinkages; c) support policy formulation and implementation by identifying policy-relevant tools and methodologies to enable decision makers to gain access to those tools and methodologies and, where necessary, to promote and catalyse their further development; Connectivity is the basis for the interlinkages between biodiversity and ecosystem services as well as human interactions which can transform the landscape. It is recognized as a central theme in ecology and sustainable development which can help policy makers, land use planners and land managers navigate environmental and socio-economic trade-offs associated with competing demands being placed on land. While considerable scientific information is

	available the numerous and important aspects of this theme, a targeted assessment which compiles this information and organizes it in a way which can lead to policy options would be of benefit to both Governments and the scientific community. In line with decision IPBES-5/3, such an assessment would contribute to the strengthening of the science-policy interface of the 2030 Agenda for Sustainable Development, including the Sustainable Development Goals, the biodiversity-related conventions, and other biodiversity and ecosystem services processes, the Paris climate agreement. An assessment of connectivity would build off the 2018 IPBES thematic assessment report on land degradation and restoration (LDRA), ultimately providing policy makers information that can help them respond to both the direct and indirect drivers of land degradation through positive landscape transformation designed to optimize the spatial mix of potentially competing demands for land and resources. An assessment of connectivity would also contribute to efforts to capitalize on synergies among the multilateral environmental agreements and the pursuit of multiple benefits. Connectivity is multifaceted, influencing the health of ecosystems, the productivity of land, food security, the cycling and sequestration of carbon, the maintenance of biodiversity including the preservation of endangered species and the conservation of migratory species, the quality of wetlands and their interrelationship with uplands, the quality of water for nature and humans, and the migration of species (including humans) when catalysed by environmental change. Moreover, connectivity is directly related to the resilience of socio-ecological systems and thus central to climate change adaptation and the potential success of interventions designed to achieve transformative and sustainable development.
2.	Urgency of action by IPBES in the light of the imminence of the risks caused by the issues to be addressed by such action: As part of their natural functioning, ecological systems remove particulate matter and carbon dioxide from the air, purify surface and ground water, reduce flooding, and maintain biological diversity. The provision of ecosystem services is not static or place-base, but rather involves flows that depend on a network of high-quality land consisting of central hubs interconnected by corridors that provide for the exchange of energy, matter, and movement species across the landscape. This network of connectivity is threatened by land use that may fragment or alter the landscape. Therefore, maintaining ecological connectivity protects the entire socio-ecological system. The IPBES LDRA demonstrated the serious impact of land transformation on biodiversity and ecosystem services and the need for landscape approaches to bring land use and nature into balance. It highlighted pathways towards effective policy response to these transformations, such as the pursuit of land degradation neutrality (LDN). And it highlighted the gaps which must be addressed to pursue a no net loss approach to avoiding, reducing and reversing land degradation, including the key point at which land use and land management decisions are made. It is essential that decision makers have the tools to do the right thing in the right place at the right scale, and a critical aspect of what makes this possible is understanding of the structural and functional connectivity of the land and ecological services as well as socio-cultural systems.
3.	Relevance of the requested action in addressing specific policies or processes: From the perspective of the UNCCD and the 2030 Agenda for Sustainable Development, this request would support country efforts to achieve land degradation neutrality, which is SDG Target 15.3. with multiple benefits extending to SDG goals 2, 6, 11, 12, 13 and 14, among others.
4.	Geographic scope of the requested action, as well as issues to be covered by such action: Connectivity serves as an organizing principle to understand ecological structure and function at scales from individual plants or animals to entire landscapes. It is relevant in all ecosystems and thus the geographic scope is global with utility at the national, sub-national

	levels. Moreover, connectivity can be assessed from the perspective of both nature and humans, offering the opportunity to overlay research on both ecological and human connectivity, which is essential to making the underlying science useful to policy makers, land use planners and land managers.
5.	Anticipated level of complexity of the issues to be addressed by the requested action: Research to date on connectivity has been multifaceted, conceptually and topically varied, addressing different scales. In this sense knowledge of the many aspects of connectivity is scattered and uneven. Moreover, the establishing the linkages between ecological and human connectivity would be essential to the support of decision maker; research helping establish these linkages is relatively limited. These factors suggest an assessment of connectivity should be considered complex.
6.	Previous work and existing initiatives of a similar nature and evidence of remaining gaps, such as the absence or limited availability of information and tools to address the issues, and reasons why IPBES is best suited to take action: There is considerable research on the multiple facets of connectivity, however there have been relatively few attempts to bring that research together in the form of an assessment. There are some multi-country and multi-organizational initiatives of note, including the European Cooperation in Science and Technology (COST) action "Connecteur (ES1306) - Connecting European connectivity research" (https://connecteur.info/), the European Commission FP7 project "SCALES -Securing the Conservation of biodiversity across Administrative Levels and spatial, temporal, and Ecological Scales" (http://scales.ckff.si/scaletool/?menu=4),LandScope America—a collaborative project of NatureServe and the National Geographic Society (http://www.landscope.org/focus/connectivity/Step%2010/). On the human connectivity side, there is the UN Habitat initiative "Implementing the new Urban Agenda by strengthening Urban-Rural Linkages" (https://unhabitat.org/books/implementing-the-new-urban-agenda-by-strengthening-urban-rural-linkages/).
7.	Availability of scientific literature and expertise for IPBES to undertake the requested action: There is extensive scientific literature on all of the multiple facets of connectivity.
8.	Scale of the potential impacts, and potential beneficiaries of the requested action: Connectivity can be assessed from the scale of individuals to ecosystems and from the scale of hillslopes to entire biomes. Moreover, is valuable for understanding processes and impacts influencing biodiversity and ecosystem services at local, subnational, national and global levels.
9.	Requirements for financial and human resources, and potential duration of the requested action: The financial and human resources needed may change depending on the approach that will be chosen to undertake the assessment. The assessment should ideally be ready by 2020
10.	An identification of priorities within multiple requests submitted: From the perspective of the UNCCD, this should be considered a priority. Moreover, in discussions with other MEAs it has also been identified as a priority.
11.	Any other relevant information (including a list of any attachments provided): See Annex "Connectivity

Annex – Draft proposal for a potential future IPBES assessment

Connectivity

Connectivity is recognized as a central theme in ecology and sustainable development which can help policy makers, land use planners and land managers navigate environmental and socio-economic trade-offs associated with competing demands being placed on land. While considerable scientific information is available for the key interrelated aspects of this theme, a targeted assessment which compiles this information and organizes it in a way which can lead to policy options would be of benefit to both Governments and the scientific community.

An assessment of connectivity would better position policy makers, land use planners and land managers to navigate the competing demands being placed on land resources by providing essential information necessary to ensure the integrity and health of ecosystems as well as the sustainability of the benefits these ecosystems provide to people. This would have the potential to help ensure interventions can deliver multiple environmental and social benefits and would facilitate land use planning and management decisions in the framework of land degradation neutrality (LDN).

What is connectivity?

Although there are a number of different definitions of connectivity, it is typically described along a spectrum of low to high for either structural or functional connectivity. Structural connectivity is a physical attribute (e.g. the configuration of land-cover types or habitats) and consists of patches, connecting features (e.g., corridors), barriers, and measures such as size, isolation, and fragmentation. Functional connectivity is the degree to which the landscape facilitates or impedes movement among resource patches from the perspective of the organism. Connectivity can therefore be assessed at the level of individual species as well as entire communities taking into account factors such as trophic interactions and energy flows, among others, from local to regional scales, contributing to a global assessment. In this way a thematic assessment of connectivity would support policy and practice through improved understanding on how a landscape can promote the linkage and flows among the fundamental components ecological networks (e.g., soil, water, biota).

Why is connectivity important?

As part of their natural functioning, ecological systems remove particulate matter and carbon dioxide from the air, purify surface and ground water, reduce flooding, and maintain biological diversity, all process which ensure the integrity and resilience of socio-ecological systems, supporting both natural habitat and human wellbeing. The provision of ecosystem services is not static spatially or temporally, but rather involves flows that depend on a network of high-quality land consisting of central hubs interconnected by corridors that provide for the exchange of energy, matter, and movement of species across the landscape. This network of connectivity is threatened by land use that may fragment the landscape. Therefore, maintaining ecological connectivity protects the entire socio-ecological system.

Connectivity is a fundamental feature of the functioning of coupled human and environmental systems. It is the basis for the interlinkages between biodiversity and ecosystem services as well as human interactions which can transform –in both positive and negative ways– the land upon which all life depends. It serves as an organizing principle to understand structure and function at scales from individual plants

or animals to entire communities and landscapes. The concept of land-based connectivity also helps to organize thinking about interactions among processes occurring at different scales, such as when processes at one scale are overridden by processes at another. Transformation, or state change occurs when fine-scale processes fail to adjust to new external conditions through resource use or redistribution at the finer scale.

Why would an assessment of connectivity be relevant to decision makers?

Keeping land in balance: The emergence of the land degradation neutrality (LDN) paradigm places more importance on the value of connectivity to decision making. Defined as "a state whereby the amount and quality of land resources necessary to support ecosystem functions and services and enhance food security remain stable or increase within specified temporal and spatial scales and ecosystems", the goal of LDN is maintaining or enhancing the land resource base - in other words, the stocks of natural capital associated with land resources and the ecosystem services that flow from them. LDN starts from the premise that land is limited and thus interventions to avoid, reduce and reverse land degradation in each land type in each country should ensure, at minimum, no net loss into the future. LDN requires the evaluation of the cumulative impacts of land use and land management decisions, meaning the implementation of LDN should be planned for and managed at the landscape scale, simultaneously considering all land units of each land type and their interactions and ecological trajectories. Understanding and ultimately managing for the integrity of land-based connectivity is thus central to minimizing trade-offs and optimizing the positive impact of land use and land management decisions and the prioritization of restoration efforts.

The key to ensuring science contributes to actionable policy options is identifying critical entry points which would benefit from well-targeted scientific assessment. The 2018 IPBES thematic assessment on land degradation and restoration demonstrated the serious impact of land transformation on biodiversity and ecosystem services and the need for landscape approaches to bring land use and nature into balance. It highlighted pathways towards effective policy response to these transformations, such as the pursuit of LDN. It also highlighted the gaps which must be addressed to pursue a no net loss approach designed avoid, reduce and reverse land degradation, including the key point at which land use and land management decisions are made. It is essential that decision makers have the tools to do the right thing in the right place at the right scale, and a fundamental aspect of what would make this more possible and effective is an understanding of the structural and functional connectivity of the land.

Achieving multiple benefits: An assessment of connectivity would also contribute to efforts to capitalize on synergies among the multilateral environmental agreements and the pursuit of multiple benefits. Connectivity is multifaceted, influencing the health of ecosystems, the productivity of land, the cycling and sequestration of carbon, the maintenance of biodiversity including the preservation of endangered species and the conservation of migratory species, the quality of wetlands and their interrelationship with uplands, the quality of water for nature and humans, and the migration of species (including humans) when catalysed by environmental change. Moreover, connectivity is directly related to the resilience of socio-ecological systems and thus central to climate change adaptation and the potential success of interventions designed to achieve transformative and sustainable development. Finally, better understanding of land–sea ecological connectivity can provide the scientific bases for managing the interaction (convenience or hindrance) of important physical, chemical and biological processes occurring between terrestrial and marine ecosystems.

From science to practice: Connectivity is not only theoretically important, but practical in terms of how decision makers pursue positive transformational change. At the regional-scale (sub-national, national and supra-national), and for any given ecosystem or habitat type, structural attributes, such as habitat extent and connectivity, will greatly influence resilience, ecosystem service provision and restoration effectiveness. The integrated analysis of the socio-economic impacts and opportunities that could arise from the restoration of specific ecosystems and the associated changes in key landscape structural attributes will inform the prioritisation of target areas for restoration at these broader scales. At the local-landscape scale, potential target areas for restoration can be structured by a variety of assemblages of habitat types and land uses, each of them resulting in specific restoration costs and benefits. This enhances the capacity of decision makers to plan in a more holistic manner, optimizing the spatial mix of interventions in order to achieve multiple objectives while navigating the inevitable trade-offs which come from competing demands on land.

What are the essential facets of connectivity that should be considered in such an assessment?

Among the many facets of connectivity, there are six interacting considerations that should be taken into account: 1) landscape connectivity – the degree to which the landscape facilitates or impedes movement among resource patches, 2) ecological connectivity – connectedness of ecological process across multiple scales including process related to highly dispersive species, highly interactive species, disturbance regimes and hydro-ecological flows, 3) habitat connectivity – connectedness of between patches of suitable habitat for an individual species, 4) evolutionary processes connectivity, including the degree of habitat fragmentation, the presence of remnant habitat stepping stones and opportunities to rehabilitate connections in the context of climate change and other threats, 5) socio-ecological connectivity – the interaction between humans and their choices about how to manage the land and ecological systems, and 6) connectivity and the governance of multilevel social-ecological systems.