

Table 6. Local and global data sources, models and metrics for evaluating Ecosystem Vitality and Ecosystem Services indicators.

| Major indicator | Sub-indicator | Metrics/models | Local and site-scale datasets & models | Global and regional datasets & models |
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| Ecosystem Vitality | | | | |
| <i>Water Quantity</i> | Deviation from natural flow | AAPFD (Gehrke et al., 1995), Hydrologic Deviation (Ladson et al., 1999) | River gauges, hydrological models such as SWAT, HSPF, GSFLOW, etc. | Calibrated instance of Global Hydrologic Models/Land Surface Models such as VIC, WaterGAP, etc. |
| | Groundwater storage D=depletion | % Area affected | Monitoring wells | GRACE satellite data, land subsidence studies using SAR |
| <i>Water Quality</i> | Water Quality Index (from TSS, TN, TP and others) | Aggregate of parameter missing WQ targets with frequency and amount with which targets are not met | Local monitoring station, Water quality models such as QUAL, WASP, etc. | NA |
| <i>Drainage Basin Condition</i> | Extent of Channel Modification | Lateral Connectivity: % modified; Longitudinal Connectivity: Dendritic Connectivity Index (Cote et al., 2009) | Aerial Photography, Government database | LandSAT imagery, SAR (like Sentinel 1) imagery, GRand (Global Reservoir and Dam) Database |
| | Land cover naturalness | Naturalness Index based on land cover, 0-100 scale | Aerial Photography, Local survey for Land use | MODIS land cover, Global Forest Change database, ESA CCI land cover products |
| <i>Biodiversity</i> | Change in number and population size of species of concern | % Change in number of species and abundance | Local survey | IUCN Red List, national and regional threatened species lists, Global Population Dynamics Database; Global Invasive Species Database |
| | Change in number and population size of invasive & nuisance species | % Change in number of species and abundance | | |

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| Ecosystem Services | | | | |
| <i>Provisioning</i> | Water supply reliability | Aggregate of sites affected, frequency and amplitude of gap between water supply and demand | Government regulation records, Water supply and demand models such as WEAP | Water availability information from Global Hydrologic Models/Land Surface Models. Demand estimates based on changes in soil moisture, evapotranspiration, etc. (Nazemi and Wheater, 2015) |
| | Biomass for consumption | Amount of production or area contributing to biomass, frequency and amplitude of gap between biomass supply and demand | Local monitoring data | NA |
| <i>Regulation & Support</i> | Sediment regulation | Aggregate of areas affected, frequency and amount of changes in sediment deposition and erosion thresholds | Reservoir operation and regulation records, hydrological models, Ecosystem service models such as InVEST, ARIES | LandSAT or other high resolution imagery, SAR surveys |
| | Water quality regulation | Aggregate of parameter missing WQ targets with frequency and amount with which targets are not met | Local monitoring stations and authorities | NA |
| | Flood regulation | Aggregate of sites affected, frequency and amplitude of floods compared to demand | Hydrological models and hydraulic models such as HEC-RAS,etc | NRT Global flood mapping, Global flood risk models (Ward et al, 2015) |

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| | Disease regulation | Aggregate of areas affected, incidence ratio and case-to-fatality ratio | Local monitoring and authorities; WADI modelling approach | Resources such as compiled by WHO, Global Infectious Disease and Epidemiology Network (GIDEON), generalized global models from Yang et al (2012) |
| <i>Cultural</i> | Conservation/ cultural heritage sites | Area (can be weighted by perceived value) | Government regulation records | World Database on Protected Areas |
| | Recreation | Person-use days or travel costs | Local survey | Geotagged photographs from social media sites |