

Same understanding about main deteriorating factors, determining pasture status and resources and long term informed policy making are essential for improvement of pasture management.

Pasture monitoring methodology has been approved to standardize all pasture monitoring activities on a nationwide. Under this situation a requirement has arisen to train environmental, ecological, land and pasture management lecturers and teachers of university in this newly developed and officilized methodology and update them about the tendency and new methodology of natural resource management.

**Objective of the training:** train universities of lecturers in the standard methodology of pasture monitoring and application of pasture monitoring data base for the purpose of upscaling the knowledge and skills to students and experts

**Duration:** 14 days

**Attendants :** University lecturers specialized in environment, ecology, land management and pasture management

**Curriculum**

subjects	Hour	Agenda
Лекц		
Up to date tendency in natural resource management and its application	60 minutes	To train application of monitoring methodology
Ecological potential and ecological units	60 minutes	To train ecological potential based pasture monitoring methodology
Key requirements for updating national pasture monitoring system	30 minutes	To train key requirements for updating pasture monitoring system
National pasture health monitoring methodology	60 minutes	To train key indicators of monitoring assessment
Methodology for soil assessment in the framework of desertification monitoring	60 minutes	To train key indicators for soil monitoring
Pasture health monitoring methodology	60 minutes	To train key requirements of pasture health monitoring
Pasture monitoring data base, advantage , date entry and interpretation	60 minutes	To introduce structure and work principle of data base
Seminars		
National pasture health monitoring methodology	60 minutes	To train methodology for assessment of pasture health
Soil monitoring assessment methodology	60 minutes	To train key indicators of soil monitoring
Ecological unit and its analysis	30 minutes	To train the methodology for identification of ecological units
Criteria for pasture health assessment, methodology	60 minutes	To train in 17 criteria of pasture health monitoring
Application principle of data base	60 minutes	To instruct how data enters and checked
Vegetation coding	30 minutes	To train principles of vegetation coding
Primary data entry in data base	120 minutes	To introduce primary data of pasture monitoring
Data analysis and interpretation	120 minutes	To train primary data analysis and interpretation
Field work		
Field pasture monitoring	5 days	Skills in making field monitoring in pasture
Field soil monitoring	5 days	Knowledge of method and methodology
Field identification of ecological unit	2 days	Skills of using soil assessment methodology
Field pasture monitoring assessment	2 days	Skills of assessing the key pasture health indicators
Data base application	2 days	Skills of primary data entry, check and application
Evaluation	1 day	skills assessed as to how well attendants

**Field practice**

**1. Field pasture monitoring practice :**

This covers pastures of different vegetation types and with varying degrees of degradation (luscious, degraded, sand covered). The focus subjects are as follows:

1. Key criteria for pasture monitoring observation sites, locating monitoring units at the

observation sites, locating the lines and marking starting and ending points in the lines,

2. Marking starting and ending spots,
3. Photo documentation and labeling,
4. Instruction for filling in record sheets,
5. Recording linear recording, analyzing surface and subsurface, top soil and recording in sheets,
6. Measuring the distances between perennial plants, recording in the sheets,
7. Methodology for locating vegetation sample taking sites, sample taking (grassy, bushy and woody plants), drying and weighing the samples ,

### **2. Field soil monitoring and assessment practice :**

Field practice of soil monitoring and assessment is conducted simultaneously at observation sites captured by pasture monitoring. It focuses on the following subjects::

1. Top soil status, erosion, degradation and water absorb rate,
2. Soil stability,
3. Water absorb rate(circle method),
4. Methodology for estimating soil density(Penetrometer),

### **3. Field practice of analyzing ecological units:**

This field practice is conducted in different types of pastures which had been covered by monitoring practice. .

1. Landscape type,
2. Topography and direction,
3. Soil thickness and strata, morphological recording,
4. Methodology for feel analysis of soil mechanic structure (Modified from S.J. Thien. 1979. *A flow diagram for teaching texture by feel analysis*),
5. Methodology for soil colour analysis (*Munsell soil color charts, 2000*),
6. Methodology for soil structure, degree and size
7. Methodology for gravel content (*Classification of United States department of Agriculture*)
8. Method for analysis of carbonization

### **4. Field pasture health monitoring:**

Methodology for pasture health analysis using the following 17 criteria:

1. Water flow
2. Extent of soil erosion to wind ,
3. Size of eroded sites
4. Gallying in pasture lands
5. Wind impact on soil
6. Thinning and exacerbation of top soil
7. Top soil erosion and its resilience
8. Distribution of vegetation
9. Soil density
10. Structure and classification of plants
11. Depletion and degradation of plants
12. Amount of algae

13. Yearly harvest,
14. Multiplying plants
15. Rehabilitation of perennial plants

#### **5.000 Field data base :**

The following subjects will be captured in the field data base:

1. Checking primary data and correcting data error
2. Creating files in data base
3. Entry of background data: location of observation sites, vegetation classification, top soil, erosion and degradation degrees, water absorb rate of vegetation cover, pasture degradation degree and grazing situation,
4. Linear recording: listing plant species, entry of linear recording data,
5. Data on distances between plant bases,
6. Entry of yield data
7. Checking and correcting the data
8. Primary data interpretation: vegetation cover, top soil, distances between plant bases, yield
9. Summary of the data and conclusion
- 10.

#### **Reference**

1. Jeffrey E. Herrick, Justin W. Van Zee, Kris M. Havstad, Laura M. Burkett and Walter G. Whitford. Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems. Volume I: Quick Start. USDA-ARS Jornada Experiment Range, Las Cruces, New Mexico, USA. 2009. Web site: [http://usda-ars.nmsu.edu/monit\\_assess/PDF\\_files/Quick\\_Start.pdf](http://usda-ars.nmsu.edu/monit_assess/PDF_files/Quick_Start.pdf)
2. Jeffrey E. Herrick, Justin W. Van Zee, Kris M. Havstad, Laura M. Burkett and Walter G. Whitford. Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems. Volume II: Design, supplementary methods and interpretation. USDA-ARS Jornada Experiment Range, Las Cruces, New Mexico, USA. 2009. Web site: [http://usda-ars.nmsu.edu/monit\\_assess/PDF\\_files/Volume\\_II.pdf](http://usda-ars.nmsu.edu/monit_assess/PDF_files/Volume_II.pdf)
3. Mike Pellant, Patrick Shaver, David A. Pyke, Jeffrey E. Herrick. Interpreting Indicators of Rangeland Health (Version 4), BLM, Denver, Colorado, USA, 2005. Website: [www.blm.gov/nstc/library/techref.htm](http://www.blm.gov/nstc/library/techref.htm)
4. Field Book for Describing and Sampling Soil, 2002
5. Munsell, Soil color charts, 2000
6. Rangeland database. USDA-ARS Jornada Experiment Range, Las Cruces, New Mexico, USA, 2010.
7. V.I. Grubov. Manual for recognizing the plants in Mongolia. Ulaanabaatar, 2008.
8. Mongolian Society for Rangeland Management. National Pasture Monitoring Method and Methodology. Ulaanabaatar, 2009.
9. Mongolian Society for Rangeland Management. Photo Reference of Dominant Species of Pasture Vegetation in Mongolia, Ulaanabaatar, 2010.