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Asia-Pacific Network for Sustainable Forest Management and Rehabilitation

PROJECT PROGRESS REPORT

[MONITORING FOREST COVER CHANGE IN MONGOLIA WITH PARTICIPATORY APPROACH PROJECT [2015P5-MN]]

[REPORTING PERIOD-16 of March to 16 of September 2016]

[Executing Agency-ERISC]

[September 2016, Ulaanbaatar, Mongolia]

Basic Information

1.	Project Title(ID)	Monitoring forest cover change in Mongolia with participatory approach project [2015p5-mn]
2.	Supervisory agency (if any)	Ministry of Environment, Green Development and Tourism (MEGDT) of Mongolia
3.	Executing agency	(ERISC)-Environmental Research, Information and Study Center NGO
4.	Implementing agency(s) (if any)	"NUM-ITC-UNESCO" Space Science/Remote Sensing International Laboratory, National University of Mongolia (NUM) Forest communities of Khan Buyan and Buural Domuu, of Bulgan province Mongolia
5.	Project Director:	Ariunzul Yangiv, Tel:976-99175014; Fax: Email: ya_ariunzul@yahoo.com
6.	Reporting Period:	[03/16 to 09/16], Project Year: 2016; √ MYR/ □APR
7.	APFNet total grant (USD):	83 372
8.	APFNet Grant for the Project Year (USD):	65 000
9.	Cumulative expenditure (USD) and expenditure rate for the Year (%)	108 772
10.	Project Progress Summary: This report covers first term of the project implementation from 1st March 2016 to 1st September 2016. The major project activity progress percentage as 84.6% which includes forest cover change detection from the satellite data process those are downloading-correcting-processing progress and filed trip, OJT, in class training in the Bulgan province. But still left activity to buy GPS and high resolution satellite data and Project progress and closure conference also publication dissemination activities didn't complete. That is why we are concluding current general percentage of the Project is 46.9% and progress of the project going under the work plan. For use medium resolution satellite data for the forest cover change detection of Mongolia, we downloaded Landsat scenes from USGS and checked each scenes cloud cover and gap. Forest index calculated on each scene. Forest cover change detection did year by year for 15 province of the Mongolia which covered by forest. Preliminary results validated by first field trip in Bulgan province. Capacity building obtained by on the job training course for personnel from the selected pilot communities and environmental officers and forest units from the Bulgan province, such as use of Remote sensing and GIS and Geoprocessing for forest cover change detection. Public awareness work started by Inception seminars.	
11.	Prepared and Submitted by  Project Director signature Date 2016.10.31	Reviewed and Endorsed by Project Steering Committee Chair signature Date

1. Project overview

A. Project description

Forest cover accounts 9.2 percent of total territory of Mongolia, out of which 70 percent is intensively deteriorated by ageing, fire and insect infestation. This project is aimed to make a validated quantitative assessment of forest cover in Mongolia to assist the Government of Mongolia in development and strengthening of the strategic documents at two levels: national forest resource management plan with production of 30 m resolution Landsat data covering entire territory, and local forest community level strategic documents to adequately manage forest resources, specifically by:

a) Monitoring of forest cover change 2000 through 2015;
b) Determining the current (2014) forest cover of Mongolia, and assessing the accuracy of the result;
c) Making Forest cover mapping of 2015 of selected two forest communities;
d) Assisting in strengthening of strategic management plans for pilot forest communities.

Goal and objectives

In order to facilitate Mongolian decision makers of environmental field to make educated decisions on forest management based on scientifically proven reliable products, the project aims at producing forest cover map for entire economy with use of 30m Landsat data, and resolve existing discrepancies on forest cover estimate of Mongolia; it also aims at development of a comprehensive approach of how high accuracy outputs can be utilized in strengthening the national level forest management plan; as well use developing local forest management plans for the two selected communities. Forest type maps and forest change detection maps will inform environmental and forest related organizations of current status of forest resources, and further study the drives of the forest change that will help decision makers in the policy and decision making process.

Main goal of the project is to assist in development of the strengthened strategic documents at the national and local levels to manage forest resources by making a quantitative assessment of forest cover in Mongolia. The following objectives are set forth to achieve the project goals that include:

- Monitoring forest cover change from 2000 to 2014; (Except 2012)
- Determining forest cover of Mongolia of 2014, and assessing the accuracy of the result;
- Forest cover/type mapping of selected two forest communities based on data of 2016; and
- Strengthening strategic forest management plans for pilot communities.

Target group (s)/ Potential beneficiaries

Two forest communities in Bulgan province, Forest inventory companies/organizations (FIC), forest authorities, forest departments at the higher educational institutes, scientists and researchers in the forest field in Mongolia.

Methodology and approaches:

For use medium resolution satellite data for the forest cover change detection of Mongolia, we downloaded Landsat scenes from USGS and checked each scenes cloud cover and gap. Forest index calculated on each scene. Forest cover change detection did year by year for 15 provinces of the Mongolia which forest covered. Preliminary results validated by first field trip in Bulgan province.

Capacity building obtained by on the job training course for personnel from the selected pilot communities and environmental officers and forest units from the Bulgan province, such as use of Remote sensing and GIS and Geoprocessing for forest cover change detection. Public awareness work started by Inception seminars.

2. Implementation progress, achievements and impacts

Activity 1.1 Data retrieval

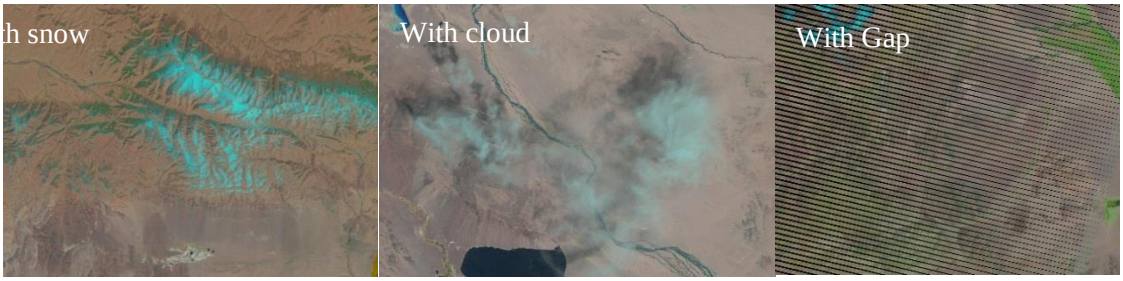
This activity completed already. MODIS EVI 250m and Landsat scenes (119 scenes per year in Mongolia, total 1601 scenes for whole 14 years collected) are collected in the first term of the project.

Data downloaded directly from US Geological Survey (http://glovis.usgs.gov/). We hired 6 people researchers to downloading process by whole Mongolia during 2 months. Total downloaded scenes are (included forested and non-forested area) 1601. There is limited chance to download 2012 data which are totally Landsat 7 ETM scenes are with gap or cloudy files. So percentage of the full process of downloading was down until 89.7%. Remained 11.3% of the data also couldn't found cloudless and with no gap and period from 15th of June to 15 of September. Reason of that we replaced those data by before or after year's data. We are planning replacement 2012 year data by 2015 data. Currently we are calculating total 14 years forest cover in Mongolia.

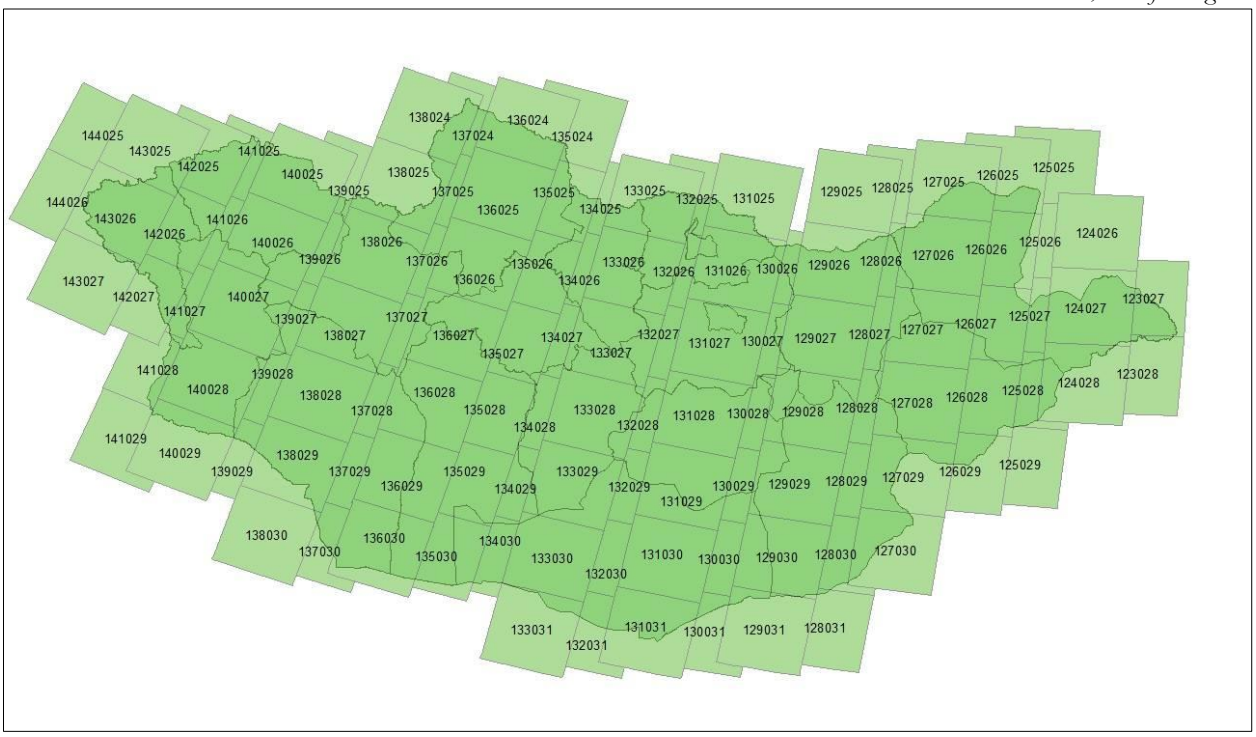
Requirements

- Data period from 15th of June to 15th of September
- Cloud cover less than 10%
- With No gap
- Path from 124 to 144
- Row from 24 to 31
- Period from 2000 until 2015 (Except 2012)

Picture 1. Those are not downloaded:



Picture 2. Landsat data - Path, row of Mongolia



Activity 1.2 Data correction /*Digital Image preprocessing includes/*

1. Project overview

This activity completed already. We used methodology of the Landsat7 Science data users Handbook for correction. Raw data which is directly downloaded from the USGS has digital number from zero to 255 valued.

Geometric correction: We didn't apply geometric correction on the data because all data are L1T type.

Radiometric correction: All kind of correction completed on each scene which are atmospheric correction and dark subtraction and noise etc.

We corrected each data of the 511 scenes by upper flowchart progress in whole Mongolia with forested area.

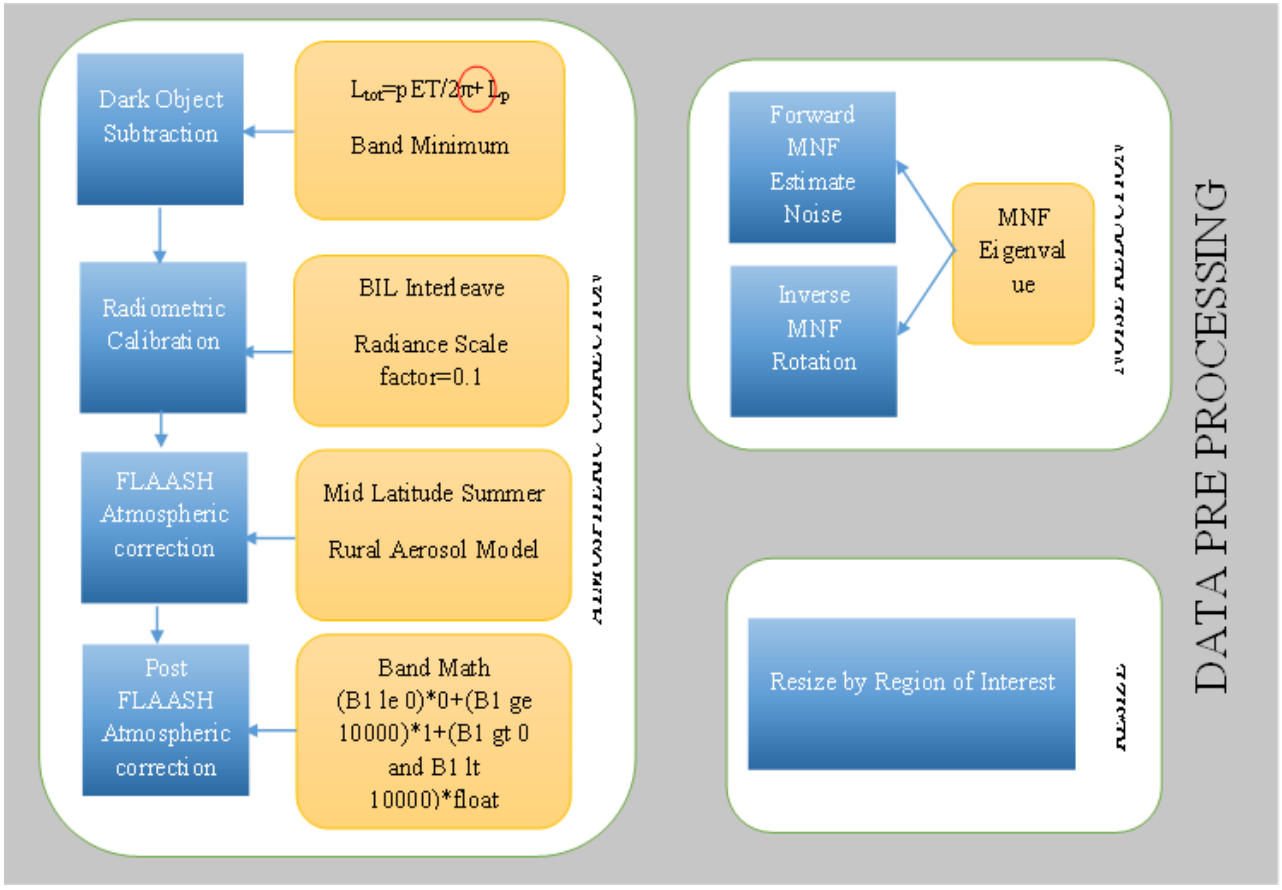


Figure № 1. Flowchart of the correction process

Picture 3. Comparison of the raw data and corrected data

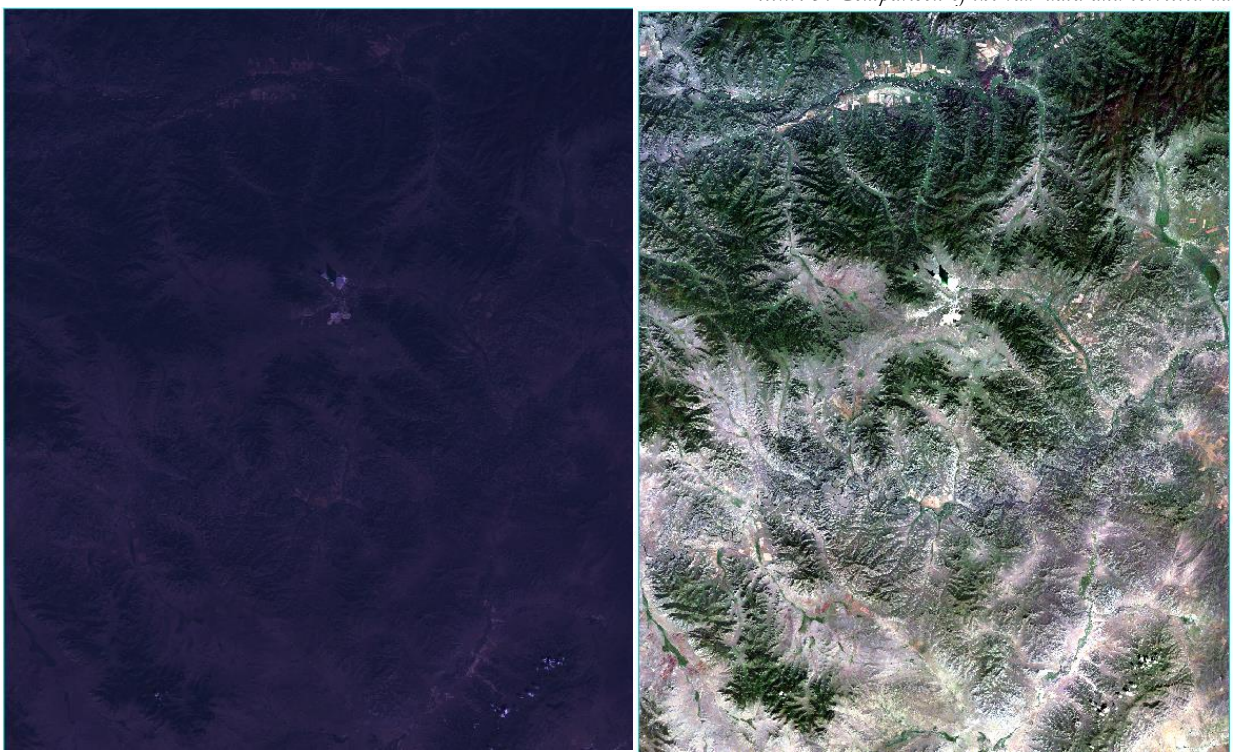
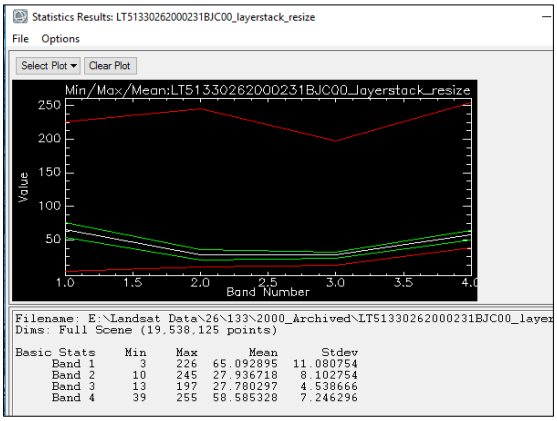
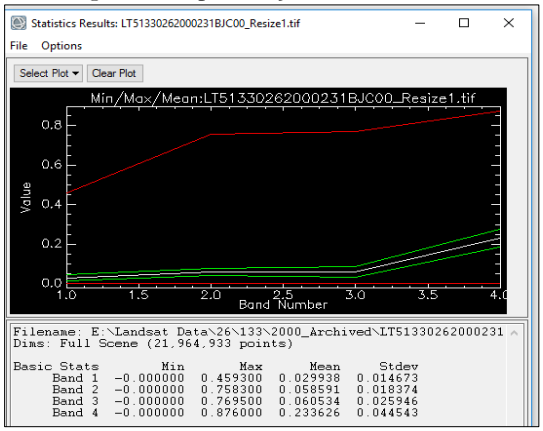


Figure 2. Comparison of the raw data and corrected data statistic





Activity 1.3 Forest cover change detection

This activity completed already. All vector file produced by forest covered each scene in Mongolia. We studied a lot of methodology for define forest area clearly. Remote sensing study based on the photosynthetic reactions of vegetation:

6CO2 + 6H¬2O + light energy → C6H12O6 + 6O2(11-1)

Green plants absorb from 0.35μm to 0.7μm electromagnetic wave very well.

We have completed studies about all kind of the vegetation indexes and other tree related indexes study which we referred below.

Remote sensing of the vegetation:

We studied following vegetation indices:

1) Simple ratio:

$$[SR=(\varrho_{red}/\varrho_{nir})]$$

2) Normalized difference vegetation index:

$$[NDVI=(\varrho_{nir}-\varrho_{red})/\ (\varrho_{nir}+\varrho_{red})]$$

3) Triangular vegetation index:

$$[TVI=0.5*(120*(\varrho_{nir}-\varrho_{green}))-200*(\varrho_{nir}-\varrho_{green})]$$

4) Soil adjusted vegetation index:

$$[SAVI=((1+L)*(\varrho_{nir}-\varrho_{red}))/(\varrho_{nir}+\varrho_{red}+L)]$$

5) Atmospherically resistant vegetation index:

$$[ARVI=(\rho^*_{nir}-\rho^*_{rb})/(\rho^*_{nir}+\rho^*_{rb})]$$

6) Soil and Atmospherically resistant vegetation index:

$$[SARVI=(\rho^*_{nir}-\rho^*_{rb})/(\rho^*_{nir}+\rho^*_{rb}+L)]$$

7) MODIS Enhanced vegetation index:

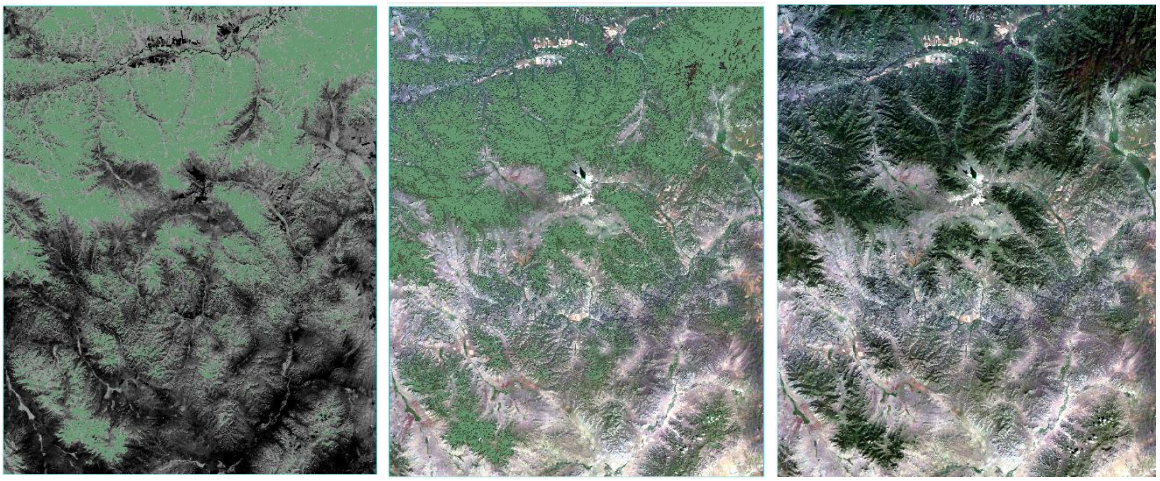
$$[EVI=(\rho^*_{nir}-\rho^*_{red})/(\rho^*_{nir}+c_1\rho^*_{red}-c_2\rho^*_{blue}+L)*(1+L)]$$

8) Forest Index:

$$[FI=((\rho_{nir}-\rho_{red}-L)/(\rho_{nir}+\rho_{red}))*((c_1-\rho_{nir})/(c_2+\rho_{green}))]$$

We have chosen FOREST INDEX by the methodology after the Digital image processing. Currently we have completed that progress in total 714 scenes produced by vector file of the forest index.

Picture 4. Forest vector file visibility



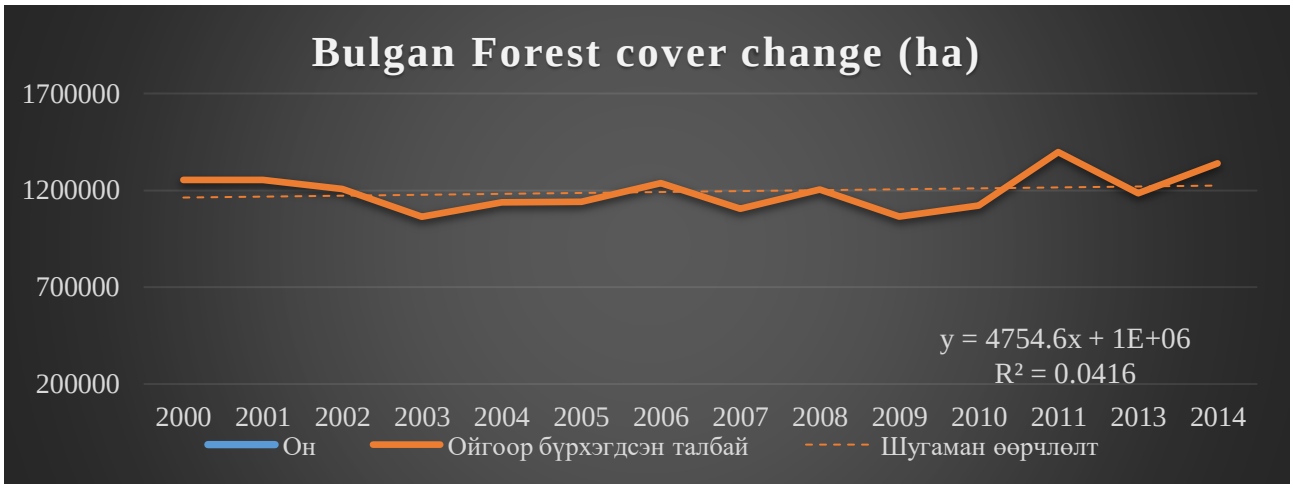
Activity 1.4 Forest cover mapping – Digital Image Processing

This activity has 70% in progress. Currently we are mosaicking all the forest area by each province for each year. We are mosaicking by province because of computer couldn't produce mosaicking by whole Mongolia. For the whole Mongolia with forested area are 15 provinces and on the time 2 pilot communities and Bulgan, Selenge, Darkhan provinces forest cover vector files are 14 years completed and 7 province's forest cover vector file processing in progress such as Khuvsgul, Arkhangai, Khentii, Tuv, Zavkhan, Dornod, Bayanulgii. Forest cover change detection made by (Francesca Bovolo, and Lorenzo Bruzzone, University of Trento) XD = X2 − X1 method.

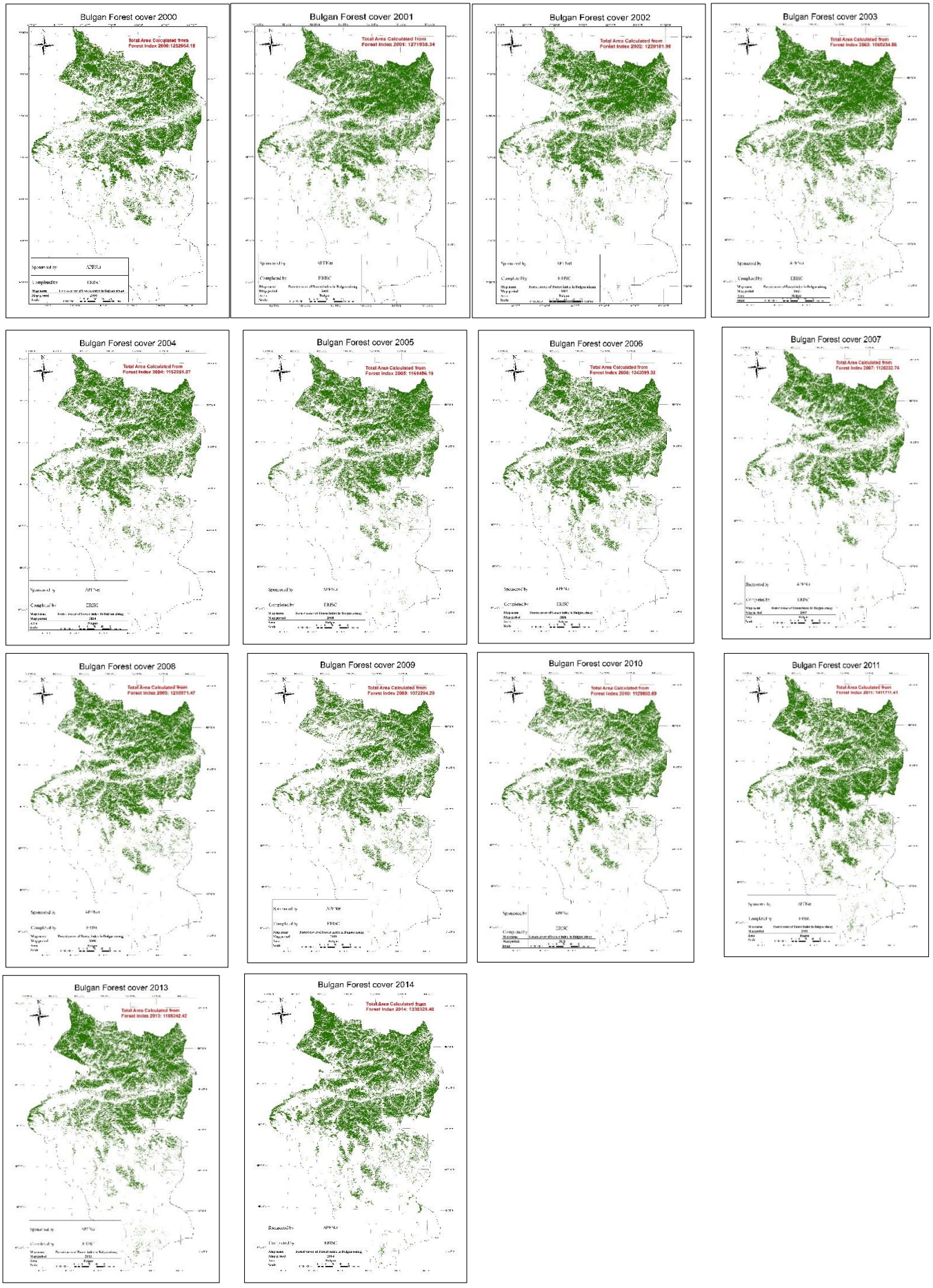
Table 1. Forest covered area change of the Bulgan province

Year	Forest covered area (ha)	Bush	Shrub	Forested area
2000	1275310.42	16857.31	5488.95	1252964.16
2001	1288079.54	28585.89	5812.57	1253681.08
2002	1243282.09	32755.48	3958.06	1206568.55
2003	1101114.78	32384.40	3960.03	1064770.34
2004	1162233.96	20331.40	4270.12	1137632.43
2005	1172664.24	26266.93	4651.89	1141745.41
2006	1252245.38	11612.00	4479.88	1236153.50
2007	1139776.59	30708.46	3336.54	1105731.59
2008	1229418.41	20016.02	3800.09	1205602.30
2009	1081233.08	13865.02	2706.63	1064661.43
2010	1137067.17	9714.73	4493.52	1122858.92
2011	1422017.00	15907.86	8655.87	1397453.27
2013	1209803.00	19879.28	5985.35	1183938.37
2014	1361614.77	17206.62	6087.67	1338320.48

Figure №2. Timely changing graph of Bulgan province



Picture 4. Bulgan forest cover change from 2000 to 2014



Activity 1.5 Forest inventory data collection, validation

Forest inventory data collection, validation activity going on 70%. All data collected from inventory company for project. Validation completed on 2 pilot communities and 2 provinces. We token 15 province's forest taxation data of the 2015 from Forest research development center /FRDC/. FRDC create integrated database for Mongolian forest inventory companies all data. They integrate 16 entities data such as forest exploration research center data and forest taxation data and Biological department of NUM data etc.

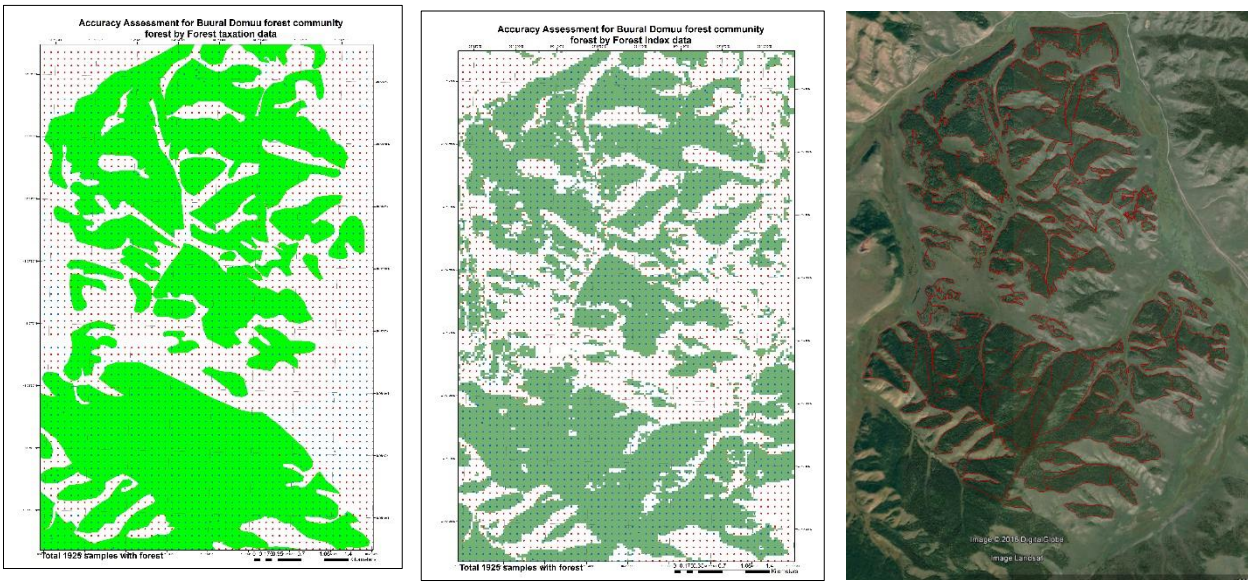
All data prepared for the project and classified 4 class as fired and insect affected and shrubs and forested area. That class uses forest taxation data verified in the Bulgan province and 2 pilot communities.

Validation

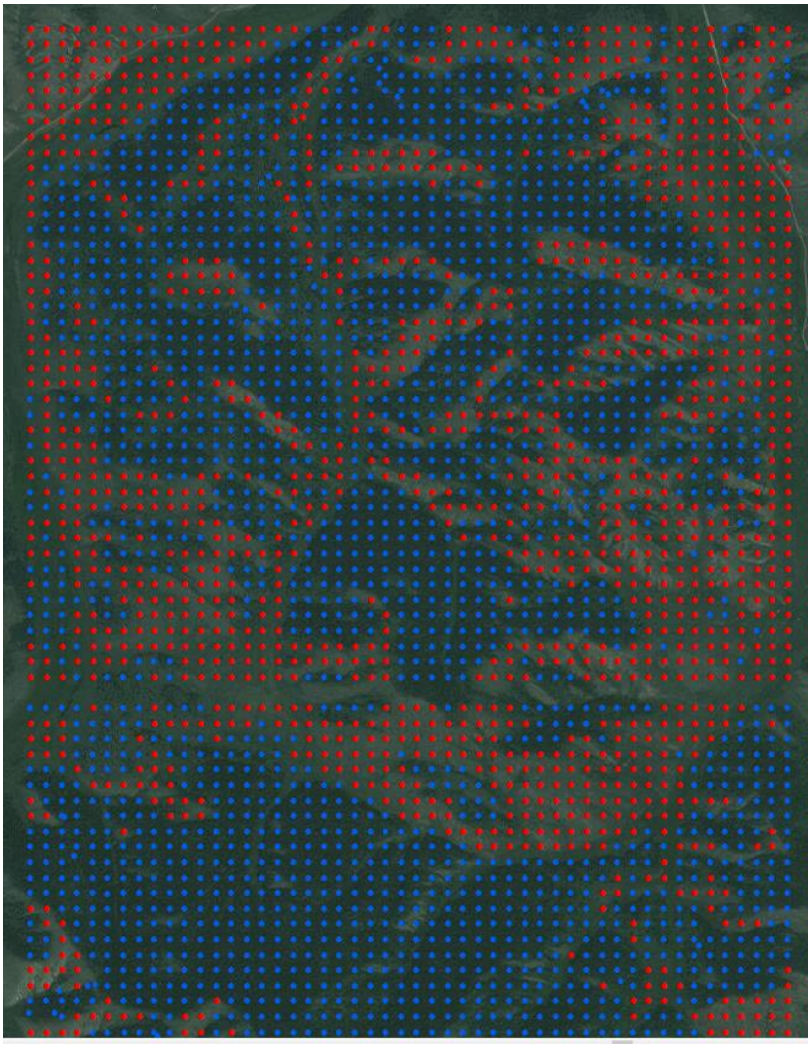
Currently we completed accuracy assessment on two forest communities' area further have plan with to do in Bulgan province by random sampling method.

Picture 5. Buural Domuu forest community's comparison map.

a) 2005 taxation map b) forest index calculated map 2005 c) Google earth Pro map 2005



Picture 6. Buural Domuu forest community area accuracy assessment with 4615 samples by 1hectar on the Google Earth map. Blue dots are representing forested area and red dots are non-forested area.



Output 2. Mapped forest types of pilot community forests

Activity 2.1 Data retrieval/ procurement

This activity goes on zero percent. We studied IKONOS data and couldn't buy the data because of the IKONOS is inactive recent years and there is no data for 2 pilot communities on 2015 and 2016. In that reason we are suggesting the high resolution satellite data or we can change the location of the data in this project which may be near location from the Ulaanbaatar. May be we hear the response about that from the APFNet.

Activity 2.2 Data correction/ processing

This activity goes on zero percent.

Activity 2.3 Field data collection

This activity completed by 100 percent. Project team and researchers and students and community members together went to field trip on two pilot community fields by collect data 2 times which is most growing season of the forest means July and forest has most vivid looks from the satellite season means September. We have been prepared data sheets which include following information before we go to field trip:

- Coordinates
- Elevation
- Navigation
- Type of the tree
- Average height of the forest
- Diameter of the tree
- Canopy diameter
- Site feature
- Age of the forest
- Distance between the trees
- Number of the tree on the 30x30meter area (which is Landsat pixel area)
- Average fall of the year
- Air temperature
- Population
- Herders number and number of livestock
- Type of the logging

Sample area chosen by random selection with purlieu and forestry division and forest type and features measures average height, average canopy and forest structure.

Field trip holds on Khanbuyan and Buural Domuu forest communications from 13th of July 2016 to 17th of July 2016. Measurement taken by all kind of measurement and observation based on multi-purpose forest inventory approach using Landsat produced data. It included all researcher of the ERISC with forest community's members and randomly picked up and measured 500 points.

Followings are used equipment for field trip: GPS ETRX 30, Tape measures meter (50m), Compass, Noted stake, Tree altimeter, Tree crown meter, Tree canopy meter

Picture 7. Researchers measured features of the tree on community area by field trip.

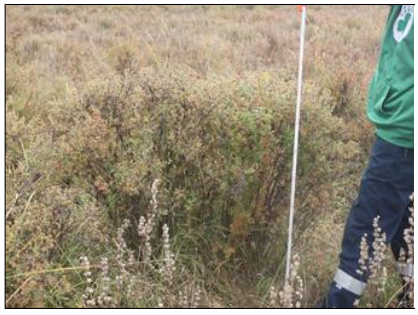








Second Field trip

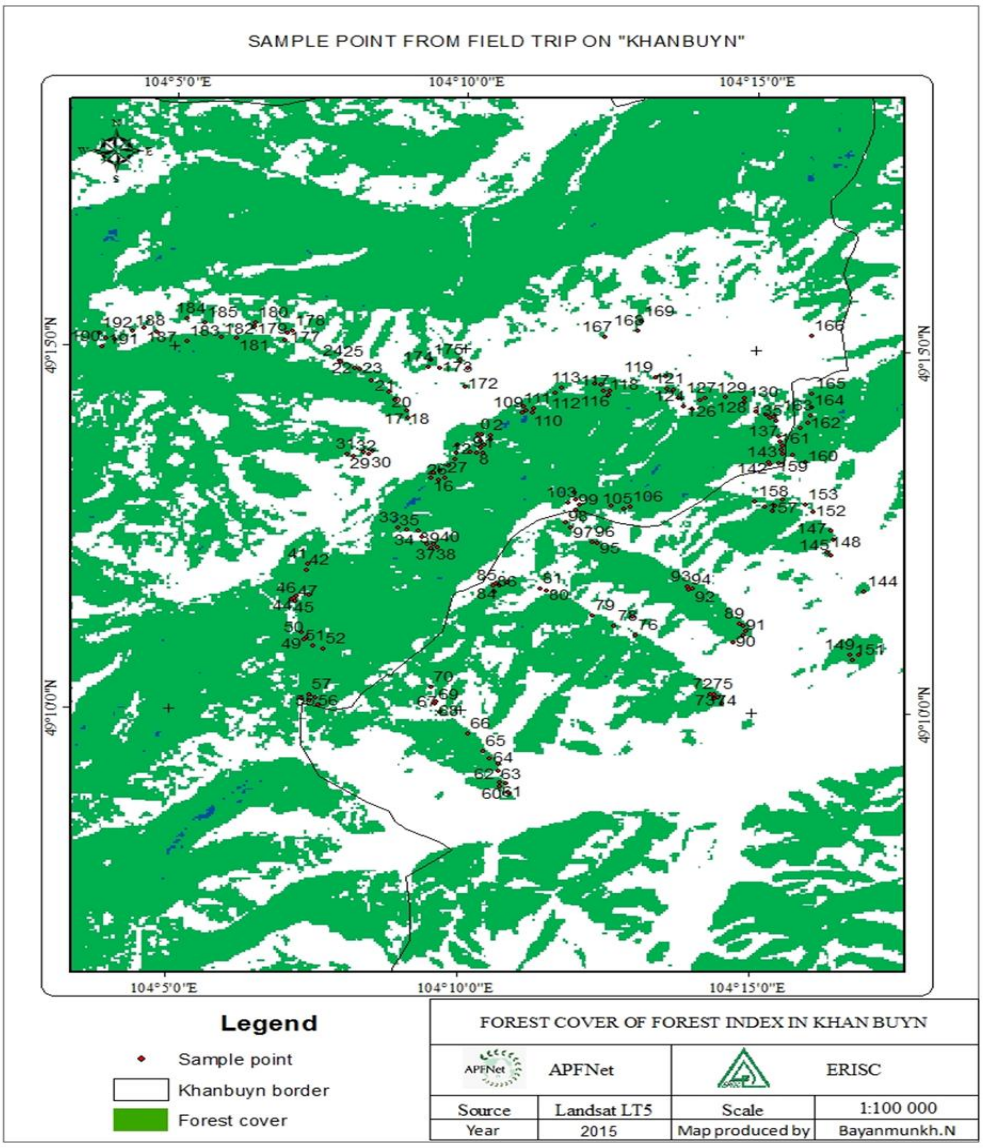





Activity 2.4 Validation

Validation completed on the Landsat satellite data but didn't complete on the IKONOS data. However we collected all necessary data and measures from the field trip. That is why we can do validation or comparison on high resolution satellite data after we bought and process data. We produced forest cover from the Landsat data by 14 years on Khanbuyan and Buural Domuu communities and validated by field trip. We have chosen validation data specially forest area on the site but it hasn't forest on satellite data also vice versa.

Picture 8. Collected sample points from the Khanbuyn forest community for the Aaccuracy assessment



Picture 9. Collected sample points from the Buural Domuu forest community for the Accuracy assessment

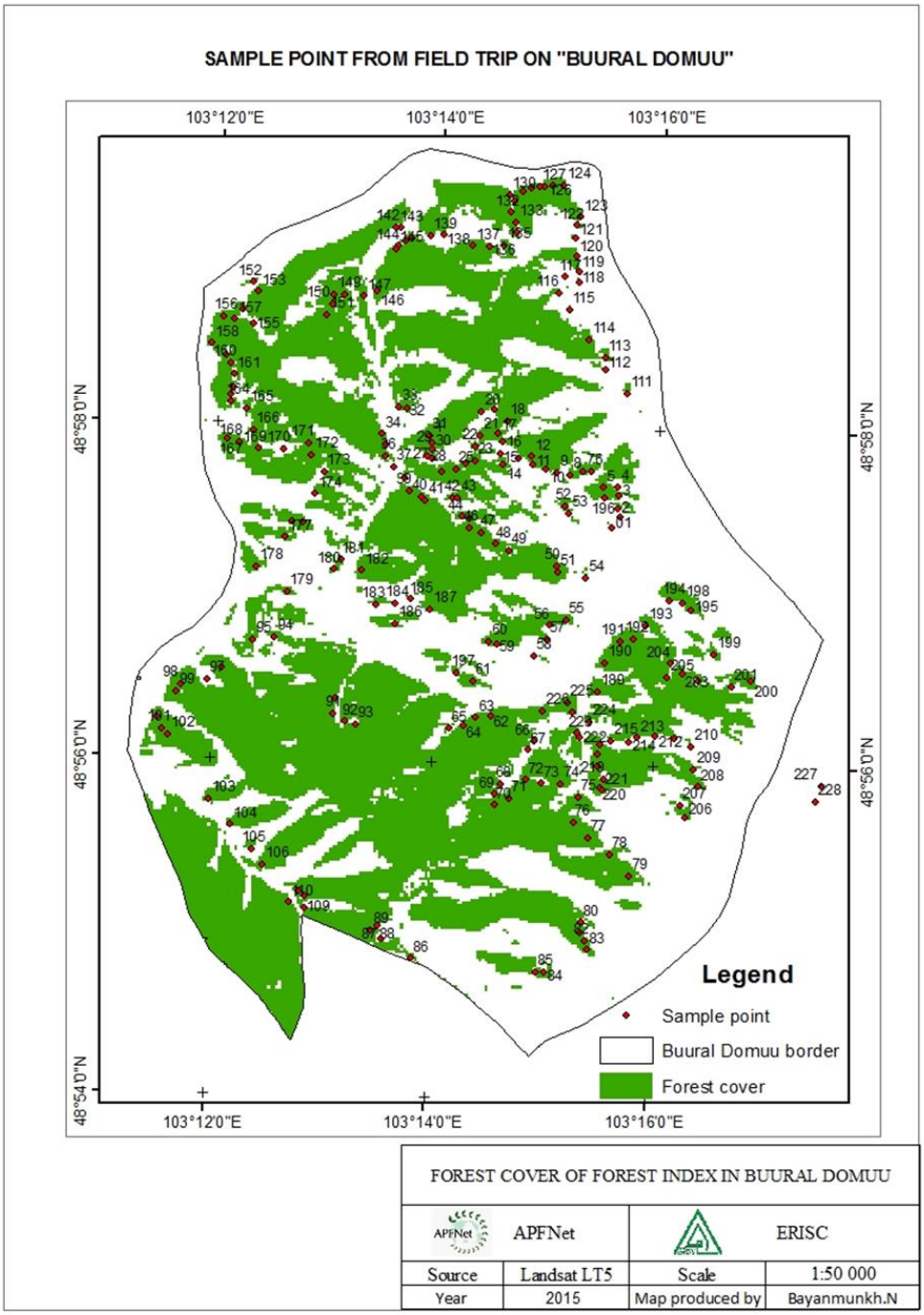


Table 2. Accuracy assessment

	In situ FOREST	In situ NON FOREST	Total	
Landsat FOREST	1664	317	1981	83.99
Landsat NONFOREST	261	2373	2634	90.09
Total	1925	2690	4615	41.71
			87.4756	

Output 3. Extension and Application of the new method

Activity 3.1 Human capacity strengthening

This activity completed as 100 percent. One time Inclass training and 2 times On the Job Training completed on Environmental and Tourism Department which locates center of the Bulgan province. 95 persons participated in geminated number on those training.

3.1.1 In class training

In class training organized named as "Usage of the satellite data on the forested area and processing method" on Environmental and Tourism Department of the Bulgan province from 19th of September to 21st of the September. In this training 35 persons participated from the Environmental officers and specialists of the Environmental and Tourism Department and Inspection agency experts of the Bulgan and forest community members of the Bulgan province. We taught about following subjects those are Landsat data free downloading process and overlay GPS collected data on the satellite data, guidance how to work with Google Earth and georeferencing method, guidance to use GIS for forest management plan. Also gave elementary understanding about GIS and Remote Sensing. Results of the training, participants studied and made own forest map of their region.

Picture 10. In-class training for strengthens professional ability of local specialists each and separately:

We assessed learning outcomes after the training course to define the knowledge gained by the questionnaire was anonymous 5-question questionnaire, 9 Questions about the training.

Table 3. Assessment of the training from the participants attached on following table:

№	Question	Could	Couldn't	I don't know
1.	Could you taken fundamental knowledge of the Remote Sensing?	100%	-	-
2.	Could you taken fundamental knowledge of the GIS?	94,7%	-	5,3%
3.	Have you taken forest map of your province?	89,5%	10,5%	-
4.	Did you have Landsat data which include your area? And did you have registered USGS website?	89,5%	10,5%	-
5.	Total average	**93.4%**	**10.5%**	**5.3%**

47.4 % of the participants evaluate our Class training's achievement of the goal as very good and 47.4 % as good and 5.2% as medium. 94.7% of the participants could take a deserved result from the training and 5.3% is couldn't reach enough. Participants have 100% satisfied with teacher Ariunzul.Ya and Undram.G's /CEO of the ERISC/ lecture and 57.9% has having good mark on Narangerel.Kh /Researcher of the ERISC/. 100% of the participants wanted to take next training on their province.

OJT-2 times

Main purpose: OJT of "Monitoring Forest Cover Change in Mongolia with Participatory Approach Project" was given to general knowledge about the Remote sensing and GIS and GPS and calculate forest area and mapping forested area for forest community members and local environmental officers and for forest unit members of Khanbuyan and Buural Domuu forest communities of Bulgan province during 16th of July to 20th of July 2016. We put following aims for strengthen applicant's professional quality.

- Introduce about APFNet activity and structure and general purposes.
- Introduce about ERISC activity and structure and Project general purposes and roles of participants of Project.
- Meet and take suggestions about the forest management plan from the all members of Khanbuyan forest community of Khangal soum of Bulgan province
- Meet and take suggestions about the forest management plan from the all members of Buural Domuu forest community Bugat soum of Bulgan province
- Give a general knowledge of GPS equipment for forest community
- Give a general knowledge of GPS tracking, find the points and put that information in the computer and how to calculate area of the map etc.
- To teach techniques of mapping using GPS and Georeferencing
- Teach methodology to insert GPS data into the taxation map
- Teach the opportunity to use free satellite data for the forest communities.
- How to apply GPS data on the satellite data?

- Initial step to teach how to calculate change detection of the forest in the satellite data.
- Give a general knowledge of Remote sensing for forest community
- Install Remote sensing and GIS software on personal computers or notebooks
- Print-out self-prepared maps of the forest
- Teach the download free satellite data
- Define the period of the next OJT

First OJT has 33 participants whose are 4 people from the Khanbuyn forest community, 3 people from the Buural Domuu community, other has 26 people from the Environmental and Tourist Department of the Bulgan completed on from 16th July to 20th July in Bulgan province.

Second OJT has 14 participants whose are 2 people from the Khanbuyn forest community, 2 people from the Buural Domuu community, other has 14 people from the Environmental and Tourist Department of the Bulgan completed on from 15th September to 18th September in Bulgan province.

The first training purpose was to give fundamental knowledge about the GIS and RS and GPS and how to use those techniques and second training purpose was ensure the first training knowledge.

On-Job training completed members with Ariunzul.Ya as consultant and Undram.G as the coordinator, researchers Baynmonkh.N /doctorate/, Narangerel.Kh /master/, Erdenechimeg.E, Ermuun.B, Gantulga.E, Lhagvasuren.I /practice student/.

1. "Khanbuyan" forest community: Completed OJT-1 at Khanbuyan forest community of the Khangal soum and hang up with community members about forest management plan and introduced project and organizations and made training about GPS. We met all members of the two communities and gave following information:

- The advantage of our implementing project
- Further using satellite data for the forest
- Take a suggestion about forest management plan

Short information of "Khanbuyan" forest community

Khanbuyan forest community located in Khangal soum of Bulgan province and established with 15 members on 25th of November 2011. It covers 5000 hectare forested area.

Short information of "Buural Domuu" forest community

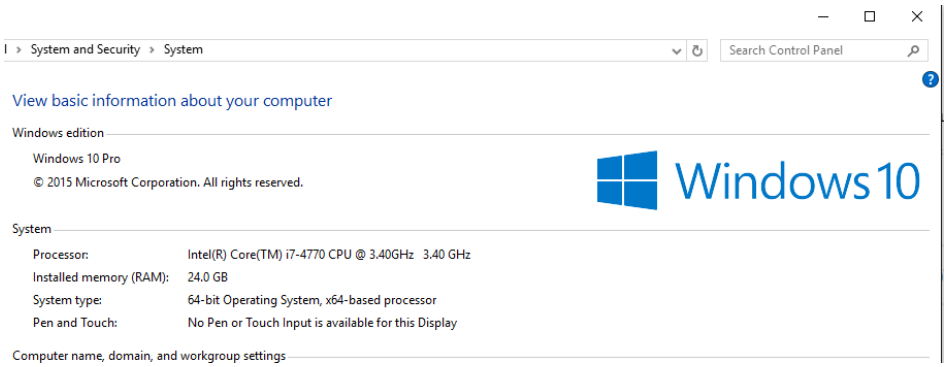
Buural Domuu forest community located in Bugat soum of Bulgan province and established with 11 members on 16th of July 2012. It covers 700 hectare forested area.

Picture 11. On the job training pictures

Activity 3.2 Technical device strengthening

This activity completed at 90%. Total 10 pieces technical equipment should bought during this project, which are 6 personal computers and 4 GPS's. The project team bought 6 following performance personal computers:

Picture 12. Personal Computer Performance



But purchase the GPS price was 60$ on the project planning year and now it is 360$. Reason of that project team suggesting to increase the GPS price to 360$. Currently any GPS didn't bought and renting 2 GPS for training.

Activity 3.3 Review and improvement of the forest management plans of the 2 pilot communities

This activity going on 25% at this time. Currently we are analyzing and comparing 2 chosen forest communities management plan with other forest community's forest management plan.

Activity 3.4 Guideline preparation

This activity going on 25% at this time. However, we prepared guidelines for OJT and Inclass training, but there is need to be improved. That is why project team planning to prepare guideline after the all processing.

Output 4. Increased public awareness

Activity 4.1 Preparation of TV program

Project team preparing 20 minutes TV program, after we got project results.

Activity 4.2 Deliverable Publishing

This activity goes on 10% at this time. Project team planning to publish 2 scientific papers. Project Coordinator Undram.G presented on seminar named as "Workshop on Environmental and Energy" organized by Institute for strategic studies, Keio alumni association in Mongolia. Project Researcher Bayanmunkh.N presented on Global Land Programme 3rd Open Science Meeting presentation name "Spectrum of the index Landsat satellite on defining area covered by forest" in S45 session Biomass monitoring and modelling in the context of land system change from 24th to 27th October in Beijing China.

Activity 4.3 Project output promotion

This activity goes on 25% at this time. Project director Ariunzul.Ya and consultant Batchuluun.TS gave a speech on MNTV and Parliament TV, ETV, TV5 by Project Inception seminar. Project coordinator Undram.G gave a speech on Olzii TV and Eco TV by Inclass training of the Bulgan province. We are planning to promote project result cooperate with MEGDT.

Activity 1 Stakeholder workshops

Environmental Research and Information Study Center (ERISC) NGO organized an Inception Seminar of Monitoring Forest Cover Change in Mongolia with Participatory Approach [Project ID:2015P5-MN] granted by APFNet and ERISC on 24th of March 2016 at Round Hall, 1st Building of National University of Mongolia. As we planned 50 people from 24 organizations, attended people are total of 73 people of 28 organizations attended the seminar.

Local organizations from 7 organizations from Zuunmod and Batsumber soum of Tuv province and Bugat and Khangal soum of Bulgan province and public organizations Ministry of Environment, Green Development and Tourism of Mongolia, General Agency for Specialized Investigation, The Administration of Land Affairs, Geodesy and Cartography, Forest Exploration Research Center and Agency for Specialized Investigation of Tuv province, Environmental Center of Bulgan province etc.

Not invited, but attended people have an interest with the project are 6 people from rural area and 11 people of relevant organizations from Ulaanbaatar. The GIZ REDD+ project of "National Forest Inventory of Mongolia" team leader and Senior Advisor of Forest Monitoring and Analysis Dan O Altrell attended by own request. Mongolian National Broadcasting, Parlament TV, ETV, Televisions reported about the seminar.

18 recommendations and questions commented at the seminar.

Workshop participants valued the importance of the work planned by the project, and highlighted ambitious volume of work to be covered within a relatively short time and gave advice to cooperate with other projects as UN-REDD, GIZ REDD+.

Picture 13. Inception seminar photos

Activity 2 Monitoring, Evaluation and auditing

Activity 2 Monitoring, Evaluation and auditing

Project Leader monitoring daily work of the Project. We prepared project progress by percentage for Project Progress Report. Financial monitoring and Auditing will be done by Atlanta Balance Audit LLC.

3. Challenges, issues and project responses

Following challenges face on project reporting period.

a) Project purpose is to define forest cover from 2000 to 2014. But 2012 there is no usable data available on USGS earth explorer by whole Mongolia because of gap and cloud. We need to clarify can we have switch the year from 2012 to 2015.
b) Also there is trouble to find the data of the IKONOS on two forest community area. We contacted with Apollo Mapping LLC which sales high resolution satellite data worldwide. But they gave us

response no data from the IKONOS with our two communities area. That is why we have a request to change high resolution satellite with same resolution.

c) In the project plan there is noticed GPS price as 60$ but Mongolian current market the GPS price is 360$. Currently we didn't buy any GPS. Only rent 2 GPS for project activity.
d) Mongolia is a vast landscape country and we are facing too much Landsat data correction and processing. Project team working by 6 days for 8 hours/each day working on 6 computers full time. We are planning to finish processing in 2016.
e) UNREDD of the United Nations National program put up to use with project results. We are requesting for decision to cooperate with this organization to use open data of the project.

4. Project management

Project team has members with Project Leader as Ariunzul.Ya and Coordinator Undram.G, accountant Enkhtuya.E, daily working employers whose are NUM-ITC-UNESCO lab researcher Bayanmunkh.N, Erdenechimeg.E Narangerel.Kh, Gantulga.E alumni of the APFNet scholarship master students Batchimeg.B, Gunjargal.B. Students Ermuun.B and Lhagvasuren.I studied Landsat data correction and processing by part time.

NUM-ITC-UNESCO laboratory teachers Tsolmon.R and Enkhjargal.N cooperated with Inclass training.

We hired consultant Doctor Batchuluun.Ts who was focal point of the APFNet for purpose of define project participants for Inception seminar and to give first concept about the project for participants and field trip approach, Inclass training approach, and define forest area and usage of the taxation data for the project.

We hired once time consultant Narantuya.D for purpose of define project participants for Inception seminar and to give first concept about the project for participants because it was pretty important to give same understanding for participants. We are planning to hire consultant Narantuya.D for next step of the project which analyses remote sensing results.

4.2 Communication and reporting:

Reporting project activity to Project administrators and MEGDT. Richard Metcalfe who is International consultant of the UNREDD Mongolia National Programme and Khongor Tsogt who is National consultant of the UNREDD Mongolia National Programme are interesting to way to use project result for their program.

4.3 Monitoring and evaluation:

Project Leader and Coordinator defining project progress in every project quarter and analyzing expected results and ways tilting or not. This reporting period project is fit on project planned purpose. But some of the planning wasn't finish on time.

4.4 Sharing, networking and dissemination:

Forest unit and forest community members and forest officers of the Bulgan province studied way to use ArcGIS software and project methodology. Furthermore, we are going to prepare manual or guideline for the project progress when project got result. Project progress shared by 5 broadcasting TV.

5. Budget and financial management

5.1 Approved budget and actual expenditure during the reporting period, clarifying any budget category with expenditure variance exceeding 10%.

Total grant of the project is 108772 USD and 83372 USD grant from the APFNet, 25400 USD from the ERISC NGO. APFNet transferred 65000 USD on 1st of March 2016 and current account balance is 29397.19 USD. As of 1st September 2016, the project financing from APFNet 35,690.00 USD, has been financing from ERISC NGOs 16,900.00 USD. 12000 USD of the 35690 USD from the APFNet payed directly into the consultancy fees and tax. Most of the remained expenditure spent for Bulgan in situ job. Most of the 16900 USD from the ERISC paid for office rent, employers salary and tuition fees and other management costs.

Project consultant payment planned as project document is 20000 USD but that payment wasn't separated from the project activity. Reason of that project team went to Bulgan field trip and OJT Inclass training and validation as possible as we can for fit on planned finance.

Implementation progress, achievements and impacts

On schedule: □ YES /√ NO				On budget: √YES / □ NO						
On target to meet yearly targets: √YES /□ NO										
Outputs/Activities (based on approved AWP)	Projected Completion Date	Actual Completion Date	Delivery Rate (%)	Projected budget (USD) (based on approved AWP)		Actual cumulative expenditure (USD)		Balance (USD)		Delivery Rate (%)
				APFNet	ERISC	APFNet	ERISC	APFNet	ERISC	
Project Management activities										
Activity 1.1 Stakeholder workshops				10,620.00						
Inception workshop	First quarter /2016.03.01-2016.06.01/	2016.03.24	100%	3,654.00	-	3,654.00	-	0	-	100%
Progress workshop	Second quarter /2016.06.01-2016.09.01/	Not completed	0%	3,426.00	-	0	-	3,426.00	-	0
Completion workshop	Fourth quarter /2016.12.01-2017.03.01/		0%	3,540.00	-	0	-	3,540.00	-	0
Activity 1.2 Monitoring, and Auditing	Project year	In progress	30%	4,000.00	-	2,800.00	-	1,200.00	-	70%
Activity 3. Reporting and management	Project year	Always In progress	50%	1,050.00	10,000.00	0	5,000.00	1,050.00	5,000.00	0
Total			36%							
Output 1. Quantified forest cover of Mongolia										
Activity 1.1 Data retrieval	First quarter /2016.03.01-2016.06.01/	2016.07.01	90.5%	-	-	-	-	-	-	-
Activity 1.2 Data correction	First quarter /2016.03.01-2016.06.01/	2016.07.01	91.5%	-	700.00	-	700.00	0	0	100%
Activity 1.3 Forest cover change detection	Project year	In progress	91%	-	4,200.00	-	4,200.00	0	0	100%
Activity 1.4 Forest cover mapping DIP	Project year	In progress	70%	4,000.00	4,200.00	0	4,200.00	4,000.00	0	50%
Activity 1.5 Forest inventory data collection, compilation, Accuracy assessment	Last quarter /2016.09.01-2017.03.01/	In progress	80%	10,302.00	1,400.00	0	1,400.00	10,302.00	0	
			84.6%							
Output 2. Mapped forest type of pilot communities										
Activity 2.1 Data retrieval/ procurement	First quarter /2016.03.01-2016.06.01/	Not completed	0	5,600.00	-	0	-	5,600.00	-	0
Activity 2.2 Data correction, processing	First Second Third quarter /2016.03.01-2016.12.01/	Not completed	0	4,000.00	2,800.00	0	0	4,000.00	2,800.00	0
Activity 2.3 Field data collection	Last part of the project 2016.09.01-2017.03.01	First field trip 1week between 2016.07.11-2016.07.17 Second field trip 1week between 2016.09.12-2016.09.18	100%	8,460.00	1,400.00	8,460.00 /Payed 4,000.00 USD for 2 Consultants with tax/	1,400.00	0	0	100%
Activity 2.4 Validation	Last part of the project 2016.09.01-2017.03.01	In progress	80%	2,000.00	700.00	1,176.00 /Include a payment for consultant/	0	824.00	700.00	80%
			45%							

Table 3

Output 3. Extension and application of new method										
Activity 3.1 Human capacity strengthening	First quarter /2016.03.01-2016.06.01/ Third quarter /2016.06.01-2016.09.01/	First OJT 3days between 2016.07.19-2016.07.21 Second OJT 3days between 2016.09.09-2016.09.11	100%	6,040.00	-	6,040.00 /Include 2 times payment for consultant/	-	0	-	100%
		Inclass training 3 days between 2016.09.19-2016.09.21	100%	2,760.00	-	2,760.00 /Include a payment for consultant/	-	0	-	100%
Activity 3.2 Technical device strengthening	Third quarter /2016.06.01-2016.09.01/	March 2016	6 PC-100%	10,800.00	-	10,800.00	-	0	-	100%
		-	4 GPS-0%	240.00	-	0	-	240.00	-	0
Activity 3.3 Review and upgrade of the forest management plan	First quarter /2016.03.01-2016.06.01/ Last part of the project 2016.09.01-2017.03.01	In progress	25%	4,000.00	-	0	-	4,000.00	-	0
Activity 3.4 Guideline preparation, publishing	Last part of the project 2016.09.01-2017.03.01	In progress	20%	3,500.00	-	0	-	3,500.00	-	0
			57.5%							
Output 4. Increased Public Awareness										
Activity 4.1 Preparation of TV program	Last part of the project 2016.09.01-2017.03.01	Not started	0	3,500.00	-	0	-	3,500.00	-	0
Activity 4.2 Deliverable publishing	Last 3 quarter /2016.06.01-2017.03.01/	In progress	10%	2,000.00	-	0	-	2,000.00	-	0
Activity 4.3 Project output promotion	Last quarter /2016.12.01-2017.03.01/	In progress	25%	500.00	-	0	-	500.00	-	0
			11.7%							
Total			46.9%	83,372.00	25,400.00	35,690.00	16,900.00	47,682.00	8,500.00	

6. Conclusions

Project progress going as annual work plan. Currently project is completed by 46.9% of the total work. Although percentage is reducing because of the high resolution satellite data and GPS and progress seminar and closure seminar but we have accomplished by 84.6% as basic work of the project which is satellite data processing. We are concluding project team has completed a lot of work in short time period except some work delayed for a while.

Too much time lapse for Landsat correction and processing because of Mongolia has vast area landscape. Although we bought best performance personal computer, but still speed is not enough for processing.

The expected outcomes of the project are considered to play an important role in Mongolian national forest sector database. As a manifestation of that UN-REDD Mongolia National Programme of the UN very interests project activity and results by numerical times visit and introduce our project progress as presentation for Mongolian forest organization in the progress seminar of the UNREDD and suggest to cooperate with ERISC.

We need three solutions from the APFNet:

- Can we switch the 2012's Landsat data as 2015 data because of USGS Landsat failure?
- Also can we change the IKONOS high resolution satellite data by same resolution satellite data for example pleiades, Quickbird in the 2 forest community's area?
- GPS price was planned wrong and we are suggesting the price into 360$ by 4 GPS.

Project team concluding project will complete on time as we planned. But some work has probably delayed schedule. For example, guidelines and TV broadcast.

REPORTED:

PROJECT TEAM

2016.09.20