

# Curriculum Vitae



**Dr. Ayoub Ahmed Abdullah Almhhab**

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## Biography

*Ayoub Ahmed Almhhab* was born in 24<sup>th</sup> December 1972 and married. He received the degree of Master ( M.Sc.) of Agricultur Engineering - Agricultur Engineering Department, Sana'a University, Yemen in May 2003 with an excellent degree. and Ph.D. degree in Jan 2009 from the Universiti Technology malaysia (UTM), Malaysia. His research interests include applied Remote Sensing for water resorces, image processing, GIS application, SRTM analysis , terrain modeling , DSS and Water Balance modelling.

## Education

**1993-1997: B.Sc.** In Agricultur Engineering - Agricultur Engineering Department, Faculty of Agriculture, Sana'a University (SUY), Yemen.

**1998-1999 (HD)** High Diploma – Irrigation Engineering, Postgraduate faculty, Science & Technology University (STUY), Sana'a, Yemen.

**2000-2003 Master ( M.Sc.) Title:** [WATER MANAGEMENT IN MICRO WATERSHED IN SANA'A BASIN A CASE STUDY IN SAWAN AREA](#), June 2003, Agricultur Engineering -  
Agricultur Engineering Department, Sana'a University, Yemen

**Supervisor:** *Prof. Dr. Abdolrahman Mohammed Bamatraf*

**Co-Supervisor:** *Associate Prof. Dr. Omar Bamaga* , Sana'a University, Yemen

**2005-2009 Ph.D Thesis Title:** [ESTIMATION OF REGIONAL EVAPOTRANSPIRATION USING REMOTE SENSING DATA TO IMPROVING WATER MANAGEMENT IN ARID AREA](#),  
Jan 2009, Department of Remote Sensing, Faculty of Geo information Science and engineering  
, UTM, Malaysia with 32 published papers.

**Supervisor:** *Assoc. Prof. Dr. Ibrahim Busu*

Department of Remote Sensing, Faculty of Geoinformation Science and Engineering , Universiti Technology  
Malaysia (UTM), Malaysia

**Co-Supervisor:** *Assoc. Prof. Dr. Norkhair ibrahim*

Department of Geoinformatic, Faculty of Geoinformation Science and Engineering , Universiti Technology  
Malaysia (UTM), Malaysia

**Examination committee:**

*Associate Prof. Dr. Khairudin Abdullah*

Dept. of Geophysics, Faculty of Physics, Universiti Sains Malaysia (USM), Malaysia.

*Associate Prof. Dr Ayob Katimon*

Dept. of Hydraulics and Hydrology, Faculty of civil Engineering, UTM, Malaysia.

**Chairman:**

*Associate Prof. Dr. Ab Latif bin Ibrahim*

Department of Remote Sensing, Faculty of Geoinformation Science and Engineering, UTM, Malaysia

### Research Interests

Remote sensing

Geographic Information Systems

Image processing

Terrain modeling and Topographic analysis

Digital Elevation Models (DEM), SRTM / Engineering Applications of DEM

Decision Support System

GIS and databases.

Determination of water balance & monitoring groundwater recharge and Rapid Risk assessment of watershed & crop water requirement.

Irrigation engineering and management.

Watershed Management.

Management of Community Participation for water Resources project.

Water resources management.

### Relevant Competencies and Activities

Programming languages: VB,C++, Matlab

GIS and related softwares: ERDAS IMAGIN, ENVI, , ArcGIS, ArcView GIS, MATLAB,

Remote Sensing and softwares : ERDAS IMAGIN, ENVI, ERDAS, PCI Geomatics,

Microsoft office & Lenex Application

### Recent Publications

International journals:

Almhab, Ayoub and Ibrahim Busu (2009). Estimation of evapotranspiration using fused remote sensing image data and energy balance model for improving water management in arid area.

Computer Engineering and Technology, 2009. Volume 2, 22-24 Jan. 2009 Page(s):529 - 533 .

<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=4769659&isnumber=4769538>

Almhab, Ayoub and Ibrahim Busu (2008). Estimation of Evapotranspiration with modified SEBAL model

using landsat-TM and NOAA-AVHRR images in arid mountains area, *Asian Modeling and Simulation (AMS) 2008, IEEE computer society ,pp350-355, 2008 IEEE.*

<http://ieeexplore.ieee.org/iel5/4530427/4530428/04530501.pdf?tp=&arnumber=4530501&isnumber=4530428>

Almhab, A. and Ibrahim Busu (2008). the approaches for oasis desert vegetation information abstraction based on medium -resolution Lansat TM image: A case study in desert wadi Hadramut Yemen, *Asian Modeling and Simulation Asian Modeling and Simulation (AMS) 2008, IEEE computer society ,pp356-360, 2008 IEEE,.*

<http://ieeexplore.ieee.org/iel5/4530427/4530428/04530502.pdf?tp=&arnumber=4530502&isnumber=4530428>

Almhab Ayoub, Ibrahim Busu and Arthur Cracknell (2008). Estimation of evapotranspiration using fused remote sensing image data and energy balance model for improving water management in arid mountains area. *International Journal of Remote Sensing. (under publish ). (Abstract paper pdf).*

Almhab A., Ibrahim B. (2008). Evapotranspiration of Grape vines Plantation by remote sensing using the energy balance based algorithms and Landsat TM Images in Arid mountainous Areas . *International Journal of Geoinformation. (under publish ). (full paper pdf).*

Almhab A., Ibrahim B. (2008). Decision Support System for Estimating Actual crop Evapotranspiration using Remote Sensing, GIS and Hydrological Models. *Asian Journal of Geoinformation. (under publish ). (full paper pdf).*

Almhab Ayoub, Ibrahim Busu and Arthur Cracknell (2007). Comparison of evapotranspiration using NOAA-AVHRR and LANDSAT-TM images over Sana'a basin, republic of Yemen, *IIUM Engineering Journal (under publish). (full paper pdf).*

Ayoub Almhab (2005). Consequence of Remote Sensing Data for National Resources Management in Yemen, 2006. *Athawabit journal*, vol.44, pp59-86, Foundation Athwabit , Sana'a, Republic of Yemen. [\(full paper pdf\)](#).

Ayoub Almhab (2005). Relevance of Geographic Information System (GIS) to administrated planning & development in Yemen, 2005. *Athawabit journal*, vol.39, pp59-86, Foundation Athwabit , Sana'a, Republic of Yemen. [\(full paper pdf\)](#)

Almhab A. A. (2004b). Participatory Management & Use Water Resources, *Athawabit a Quarterly journal* vol.38 p41-52dec.2004, Yemen.

International conferences:

- Almhab A., Ibrahim B., (2009), Estimation of evapotranspiration using fused remote sensing image data and energy balance model for improving water management in arid area. ICECS2008, Singapore. ([full paper pdf](#)) <http://www.iccet.org/iccet.toc2.pdf>
- Almhab A., Ibrahim B., (2008), *Estimation of evapotranspiration using fused remote sensing image data and m-sebal model for improving water management in arid mountainous area*. ACRS2008, Sere lank. ([full paper pdf](#))
- Almhab A., Ibrahim B., (2008), *Regional Water Balance Visualization Using Remote Sensing And Gis Techniques with Application to the Arid Watershed Area* . ACRS2008, Sere lank. ([Abstract paper pdf](#))
- Almhab A., Ibrahim B., (2008), *Remote sensing of available solar energy modelling in mountainous areas*. Post graduate seminar alam bena 2008,UTM, Skudai Johor, Malaysia. ([full paper pdf](#))
- Almhab A., Ibrahim B., (2008), *Application of remote sensing data for environmental monitoring in semiarid mountain areas: a case study in yemen mountains*. post graduate seminar alam bena 2008,UTM, Skudai Johor, Malaysia. ([full paper pdf](#))
- Almhab A., Ibrahim B., (2008), *Regional Water Balance Visualization Using Remote Sensing And Gis Techniques with Application to the Arid mountain basin area* . IPGCES 2008,UTM, Skudai Johor, Malaysia. ([Abstract paper pdf](#))
- Almhab Ayoub, Ibrahim Busu (2008). *Decision Support System for Estimating Actual crop Evapotranspiration using Remote Sensing, GIS and Hydrological Models*, Malaysia Remote Sensing Society (MRSS)2008, Kula Lumpur , Malaysia. ([full paper pdf](#))
- Almhab Ayoub and mohammed hakami (2008). INVESTIGATION OF AGROCLIMATIC CHANGE ON ARABIA PENINSULA USING REMOTE SENSING AND GIS, Malaysia Remote Sensing Society (MRSS)2008, Kula Lumpur , Malaysia. ([full paper pdf](#))
- Almhab Ayoub and Ibrahim Busu (2008). *Prediction of Groundwater availability in arid areas using Integration of Remote Sensing, GIS and DSS mapping*, ICEEMAT2008, Kula Lumpur , Malaysia. ([Abstract paper pdf](#))
- Almhab Ayoub, Ibrahim Busu (2008). *Evapotranspiration Estimation using A Normalized Difference Vegetation Index Transformation of two Satellites data in Arid Mountain Areas*, ISG2008, Kula Lumpur , Malaysia. ([full paper pdf](#)). <http://eprints.utm.my/7748/>
- Almhab Ayoub, Ibrahim Busu (2008). *Predicting evapotranspiration from MODIS vegetation indices and*

*meteorological data in arid regions: A case study in Republic of Yemen*, ISG2008, Kula Lumpur , Malaysia. ([full paper pdf](#))

Almhab Ayoub, Ibrahim Busu (2008). Decision Support System for Estimating Actual crop Evapotranspiration using Remote Sensing, GIS and Hydrological Models, *MAPASIA2008*, Kula Lumpur , Malaysia. ([full paper pdf](#))

[http://gisdevelopment.net/proceedings/mapasia/2008/Remotesensinggisandgps/ma08\\_108.pdf](http://gisdevelopment.net/proceedings/mapasia/2008/Remotesensinggisandgps/ma08_108.pdf)

Almhab Ayoub and Ibrahim Busu (2008). Decision Support System for Estimating of Regional Evapotranspiration in Yemen mountainous, *Mountain GIS e-Conference, 14-24 january 2008, online*. ([full paper pdf](#)) <http://www.mtnforum.org/rs/ec/index.cfm?t=cres&econfid=15&startPage=11>

Almhab, Ayoub, Ibrahim Busu (2008). A simple method for estimating of evapotranspiration using remotely sensed data in arid regions: a case study in Yemen Mountains , *MAP Middle East 2008*, Dubai , UAE. ([full paper pdf](#)) <http://gisdevelopment.net/proceedings/mapmiddleeast/2008/index.htm>

Almhab, Ayoub, Ibrahim Busu (2008). *Remotely-sensed Evapotranspiration of arid regions in the central Yemen Mountains with a simple energy balance method* , The Postgraduate Annual Research Seminar 2008 (PARS08), UTM, skudai, johor, Malaysia. ([PARS08 A simple method for estimate ET.pdf](#)). <http://www.pps.fsksm.utm.my/pars08/pars08.htm>

Almhab, Ayoub, Ibrahim Busu, 2008. *Evapotranspiration of arid regions in the central yemen mountains derived from remotely-sensed data with a simple energy balance method*, The Postgraduate Annual Research Seminar 2008 (PARS08), UTM, skudai, johor, Malaysia. ([full paper pdf](#)). <http://www.pps.fsksm.utm.my/pars08/pars08.htm>.

Almhab, Ayoub And Ibrahim Busu (2008). Fusion of landsat tm, noaa-avhrr and dem data for generating evapotranspiration maps in semi-arid regions , 5th international conference on gis (*ICGIS-2008*), Istanbul/Turkey. ([full paper pdf](#)) <http://icgis2008.fatih.edu.tr/?Bilpos&Lang=En>

Almhab A., Ibrahim B. (2008). *Regional Water Balance Visualization Using Remote Sensing And Gis Techniques with Application to the Arid area* . IPGCES 2008,UTM, Skudai Johor, Malaysia. ([abstract paper pdf](#))

Ayoub Almhab and Ibrahim Busu , 2008. Decision Support System for Estimating of Regional Evapotranspiration in arid areas: Application to the Republic of Yemen, International Society for Photogrammetry and Remote Sensing3-11 July 2008, Beijing China. ([Abstract paper df](#)) [http://www.isprs2008-beijing.org/scientific\\_program\\_july10.htm](http://www.isprs2008-beijing.org/scientific_program_july10.htm)

- Ayoub Almhhab, Ibrahim Busu, Arthur Cracknell, 2008, fusion of landsat tm, noaa-avhrr and dem data for generating evapotranspiration map in semi-arid regions, International Society for Photogrammetry and Remote Sensing 3-11 July 2008, Beijing China ([Abstract paper pdf](#)) [http://www.isprs2008-beijing.org/scientific\\_program\\_july9.htm](http://www.isprs2008-beijing.org/scientific_program_july9.htm)
- Almhhab Ayoub, Ibrahim Busu (2007). Estimation of regional scale evapotranspiration for arid area using NOAA-AVHRR application in republic of Yemen, *MAPASIA2007*, Kula Lumpur, Malaysia. ([full paper pdf](#)) <http://www.gisdevelopment.net/proceedings/mapasia/2007/PosterSession/ma07226.pdf>
- Almhhab Ayoub, Ibrahim Busu and Norkhair ibrahim (2007). Estimation of regional evapotranspiration for Arid Areas Using LANDSAT Thematic Mapper Images data: A Case Study for Grape Plantation, *ISG & GPS/GNSS 2007*, Johor, Malaysia. ([full paper pdf](#)). <http://eprints.utm.my/4681/>
- Almhhab Ayoub, Ibrahim Busu and Arthur Cracknell (2007). Comparison of regional evapotranspiration using NOAA-AVHRR and LANDSAT-TM images: a case study in an arid area in the Sana'a basin, republic of Yemen, *The 28<sup>th</sup> Asian Conference on Remote Sensing (ACRS) 2007* P.N. 93, Kuala Lumpur, Malaysia. ([full paper pdf](#)) <http://www.ionicsoft.com/images/gallery/mest2007finalannouncement1194857107.pdf>
- Almhhab Ayoub and Ibrahim Busu (2007). *Application of remote sensing data for environmental monitoring in semiarid mountain areas: a case study in Yemen mountains*, Asian post graduate seminar in built environment 2007, 3-5 December 2007, Faculty of the built environment, university of Malaya, Kuala Lumpur, Malaysia. ([full paper pdf](#)).
- Almhhab Ayoub and Ibrahim Busu (2007). Comparison of regional evapotranspiration using NOAA-AVHRR and LANDSAT-TM images: a case study in an arid area in the Central of Yemen mountains, *Middle East spatial technology 4th conference & exhibition*, Al-Bahrain Kingdom. ([full paper pdf](#)) <http://www.ionicsoft.com/images/gallery/mest2007finalannouncement1194857107.pdf>
- Almhhab Ayoub, Ibrahim Busu and Kalifa Alromathi (2007). Fusion of Landsat TM, NOAA-AVHRR and DEM data For generating evapotranspiration Maps In Semi-Arid Regions, 3<sup>rd</sup> International Conference “*Earth from Space – the Most Effective Solutions*” December, 4-6, 2007. Moscow Region Vatutinki recreation center of the Russian, Russian. ([full paper pdf](#)) [http://scanex.com/ru/news/News\\_Preview.asp?id=n21793201](http://scanex.com/ru/news/News_Preview.asp?id=n21793201)
- Almhhab Ayoub, Ibrahim Busu and Norkhair ibrahim (2006). Development of Vegetation and Land Use By Remote Sensing Method in Wadi Tuban Abyan Area - Yemen, *1st Regional Postgraduate Conference*

on Engineering and Science (RPCES 2006), Johore, 26-27 July, Johor ,Malaysia. ([full paper pdf](#))

Almhab A. A. (2003). *Water Management in Microwatershed a case study in Sawan area*, MSc Theses, Sana'a University, Yemen.

Almhab A. A., Bamatraf A. M., Bamaga O. (2004a). *Assessment of Water Budget of Sawan small watershed-Sana'a basin*, the science conference-2004, Yemen Sciences Research Foundation(YSRF), Yemen.

Almhab A. A., Yaya A. M., Bamaga O. (2004c). *Relevance of GIS and RS in national resources study and planning in Yemen*, the first conference about the education agriculture development in Yemen, Sana'a University, Yemen Sana'a.

Almhab A.A. (2004). Estimation of crop water requirement for Coffee crop in different regions of Yemen, the first national workshop about Coffee in Yemen, Ministry of Agriculture and Sana'a University, Sana'a Yemen

Almhab A.A. (2005b). *Technical Information(TI) practical on agricultural plan for example Geographic Information System(GIS)*, International symposium on technical information practical, Sana'a university, Sana'a Yemen.

Almhab A. A., Bamatraf A. M., Bamaga O. (2005). *Assessment of water budget in small watershed a case study Sawan area-Sana'a basin*. The Third Conference of Environment and National Resources 2005. Taiz University, Yemen.

### Research Activities

- ❖ Estimation of Regional Evapotranspiration using Remote Sensing data in Arid Areas, (Thesis PhD) research,2005 – 2008:
- ❖ Estimation of evapotranspiration using fused remote sensing image data and energy balance model for improving water management in arid area. (2009).
- ❖ Comparison of evapotranspiration using NOAA-AVHRR and LANDSAT-TM images over Sana'a basin, republic of Yemen, (2008).
- ❖ Fusion of Landsat TM, NOAA-AVHRR and DEM data for generating evapotranspiration maps in semi-arid regions, (2007).
- ❖ Estimation of Evapotranspiration with modified SEBAL model using Landsat-TM images in arid mountains area (2007).
- ❖ Estimation of Evapotranspiration with modified SEBAL model using NOAA-AVHRR images in



arid mountains area, (2007).

- ❖ Evapotranspiration of Grape vines Plantation by remote sensing using the energy balance based algorithms and Landsat TM Images in Arid mountainous Areas. (2007).
- ❖ Evapotranspiration Estimation using A Normalized Difference Vegetation Index Transformation of two Satellites data in Arid Mountain Areas, (2008).
- ❖ Predicting evapotranspiration from MODIS vegetation indices and meteorological data in arid regions: A case study in Republic of Yemen, (2008).
- ❖ A simple method for estimating of evapotranspiration using remotely sensed data in arid regions: a case study in Yemen Mountains , (2008).
- ❖ The approaches for oasis desert vegetation information abstraction based on medium -resolution Lansat TM image: A case study in desert wadi Hadramut Yemen, (2008).
- ❖ Remote sensing of available solar energy modelling in mountainous areas. (2008).
- ❖ Application of remote sensing data for environmental monitoring in semiarid mountain areas: a case study in yemen mountains. (2008).
- ❖ Investigation of agroclimatic change on Arabia peninsula using remote sensing and GIS, (2008).
- ❖ Prediction of Groundwater availability in arid areas using Integration of Remote Sensing, GIS and DSS mapping, (2008).
- ❖ Decision Support System for Estimating Actual crop Evapotranspiration using Remote Sensing, GIS and Hydrological Models, (2008).
- ❖ Decision Support System for Estimating of Regional Evapotranspiration in Yemen mountainous, (2008).
- ❖ Regional Water Balance Visualization Using Remote Sensing And Gis Techniques with Application to the Arid area . (2008).
- ❖ Application of remote sensing data for environmental monitoring in semiarid mountain areas: a case study in Yemen mountains, (2007).
- ❖ Development of Vegetation and Land Use By Remote Sensing Method in Wadi Tuban Abyan Area - Yemen, (2006).
- ❖ Research on crop water requirements of different Crops for different regions in Republic of Yemen, 2003-2004.
- ❖ Irrigation efficiency of various irrigation systems in Sana'a basin, reports 2001, 2004.

- ❖ Geographic information system and metrological database in Yemen, 2003.
- ❖ Water Management in small watershed at Sana'a basin –a case study in Sawan area (thesis M.Sc) 2003.
- ❖ Geographic information system and dam's database in Yemen, 2002.
- ❖ Doing Programs to Water Resources Monitoring & Water Structures Monitoring in Yemen, 2000 till present.
- ❖ Integrated Watershed management in Sawan watershed –Sana'a basin, 2000.
- ❖ Water crises in Yemen and its effect on development, 2000.
- ❖ Design irrigation system for a 4-hectare farm under condition of Sana'a Basin,1(theses HD.), 1999
- ❖ Watershed Management in Republic of Yemen, 1999.
- ❖ Evaluation Surface Irrigation systems & modern Irrigation systems in Faculty Agriculture Farm, Sana'a University, (theses B.Sc.), 1997.

### Employment Record

3/8/2005 to 12/1/2009 PhD research student , Department of Remote Sensing, Faculty of Geoinformation Science and Engineering , Universiti Technology Malaysia (UTM), Malaysia

1/5/2000- to 2005 Ministry of Agriculture & Irrigation (MAI) General Directorate of Irrigation, Central Unit for Water Monitoring.

1/8/2003 to 1/6/2005 Assistance Teacher of Agriculture Engineering Department, Faculty Agriculture, Sana'a University, Sana'a, Yemen.

21/1/2002 to 30/8/2002 Water & Environment Center, Sana'a University, Sana'a Basin Well inventory Survey Project.

1/5/1998-2000 Ministry of Agriculture & Irrigation (MAI) General Directorate of ate Farm Machinery, land conservation Division.

### Additional Professional Activities

Teaching three subjects in Agricultural of Engineering Department, Faculty of Agriculture, - Sana'a University. These are:

- 1- Meteorology – lab classes
- 2- Survey Engineering
- 3- Thermodynamics Engineering

### Honours

- First Rank Award of High Diplomat in Irrigation Engineering projects, postgraduate faculty, University of science and Technology Yemen. June 1999.
- First Paper Award of National RS&GIS workshop (YRSGIS) of YEMEN at Conference of “Science”, April 2004.
- PhD Scholarship grant from Islamic Development Bank, Merit Scholarship, 2005-2008.

### International Organizations Member

- IEEE member
- Malaysia Remote Sensing and GIS A society (MRSS) member
- Yemen Engineering Syndicate member
- National Renewable Energy member

### Languages

Arabic (Mother Language)

English

## Training

- ❖ Training Course on:
- ❖ ISO 14001 Environmental Management Systems (EMS), School of Professional and Continuing Education (SPACE UTM), October 2007, UTM, Johor, Malaysia.
- ❖ Mastering English Through effective communication (METEC), School of Professional and Continuing Education (SPACE UTM), Degree++, August 2007, UTM, Johor, Malaysia.
- ❖ Develop your entrepreneurial spirit “Marketing Perspective”, School of Professional and Continuing Education (SPACE UTM), August 2007, UTM, Johor, Malaysia.
- ❖ Problem Solving & Decision Making, School of Professional and Continuing Education (SPACE UTM), September 2007, UTM, Johor, Malaysia.
- ❖ Matlab for the beginners/intermediate, School of Graduate Studies (SPS)- EUTM, January 2007, UTM, Johor, Malaysia.
- ❖ Visual C++ Software programme, School of Graduate Studies (SPS)-UTM, December 2006, UTM, Johor, Malaysia.
- ❖ English Language, Academic writing, Three semesters, School of Graduate Studies (SPS)- UTM, August 2005 to December 2006, UTM, Johor, Malaysia.
- ❖ International Seminar on Geodesy & GNSS Applications, FKSG, UTM on 17th Feb 2009.
- ❖ Training Course on Environment Impact Assessment (EIA), Sana’a Basin water management project, Sana’a, 10/2004
- ❖ Social research & involvement Teams, local experts for Sana’a Basin water management project, Sana’a, 6-7/2004
- ❖ Training Course of English Language, Modern American Language Institute (MALI), Sana’a, November 2003 to April 2004, Sana’a Yemen.
- ❖ Workshop on the Remote Sensing and Geographical Information system in Yemen "Current Situation and Future Wishes" Sana’a 3/2003.
- ❖ Technical Information Industry & Telecommunication forum, Sana’a, 7/2003
- ❖ Training Course of AutoCAD program, Sana’a, 2/2003.
- ❖ Training Course of Geographical Information system (GIS) & data Bases, Sana’a, 8/2002-11/2003.
- ❖ Seminar on uses of AutoCAD civil survey Programs in Irrigation Project Planning and Design, Sana’a,

9/2002.

- ❖ Training Course of the Modern Method about Development Coffee Produce in Yemen, Sana'a, 6/2001.
- ❖ Training Course on " Operation and Maintenance of Modern Irrigation Schemes", Sana'a, 10/1999
- ❖ Participation of workshop on Water Resources Policy Sana'a October 2000.
- ❖ Workshop on "Towards a National Watershed Management Policy", Sana'a 12/1999.
- ❖ Participation in many symposia, seminars and conferences related to RS, GIS, water & Environment.