World Association of Soil and Water Conservation

# BULLETIN

VOLUME 26, NUMBER 3 (SEPTEMBER – DECEMBER 2010)

W A S W A C

## IN THIS ISSUE



*The WASWAC Bulletin seeks to keep conservationists worldwide informed of new developments in the field of Soil and Water Conservation and Land Management issues. Please send editorial contributions to the Editor at sskukal@rediffmail.com*

# *Conserving Soil and Water Worldwide*

# Join WASWAC



## *WASWAC Mission:*

*To promote worldwide the application of wise soil and water management practices that will improve and safeguard the quality of land and water resources so that they continue to meet the needs of agriculture, society and nature.*

## *WASWAC Vision:*

***A world in which all soil and water resources are used in a productive, sustainable and ecologically sound manner.***


## Publishers

## *World Association of Soil and Water Conservation*

# President's message

Dear WASWAC members, colleagues and friends,

After two mandate periods as the President of World Association of Soil and Water Conservation, it is a good opportunity to congratulate new WASWAC President, Prof. Li Rui of the Institute of Soil and Water Conservation, Yangling, Shaanxi Province, China, wishing him and new council to continue and improve what we have done up to now.

*At the end of this council term (2008-10) I wish to say big THANKS to all council members of WASWAC who helped me in this voluntary but noble work, for all their work regarding activities and improvement of our Association.*

At this moment I wish to thank Prof. Hans Hurni, former president of WASWAC, who encouraged me and gave great professional and human support especially in the terrible period of 1990s in the Balkan Region. Thanks to Prof. Martin Haigh for nice cooperation, for "Headwater" activities/conferences, supervision and consultancies in joint regional projects and programs, for professional support in organizing conferences, publishing books and for "pushing" me on the road of WASWAC. Special thanks to Samran who helped me as Acting President during the period of my full-professorship paper writing and, later on, as the Immediate Past President up to the end of 2010.

I wish to mention the activities and some results that the Council has achieved in the last 3-year period:

1. WASWC Newsletter in 9 languages, English, Spanish, Chinese, French, Portuguese, Russian, Bahasa, Vietnamese and Arabic. This and other publications are posted on the websites http://waswac.soil.gd.cn/ and www.waswc.org.
2. WASWC HOT NEWS announcing Awards, Funds, Scholarships, Training, Appointments, Jobs and all major Meetings worldwide.
3. The WASWAC Awards Committee agreed for giving grants to the persons that deserved it regarding their outstanding professional work (Norman Hudson Award, Distinguished Researcher Award, Distinguished Extensionist Award, Special Award ).
4. Journal and Proceedings of WASWC (J&P of WASWC)
5. Special Publications: *USLE Story; Carbon; No-Till Farming Systems; Soil and Water Assessment Tool (SWAT).*
6. Photo websites http://community.webshots.com/user/waswc and http://community.webshots.com/user/waswc1 for members' use.
7. Established chance of interaction among members and to consult thousands of experts through the internet, as well as to request for cooperation from around 120 WASWAC officers worldwide. 8. Web services, including web spaces to post Conference Abstracts & Summary Books from technical meetings. 9. Availability of a cooperation package for conference organizers for which a 1-year Guest membership is offered to all participants.
10. Establishing new unit of WASWAC: Student's Forum of WASWAC (established at Belgrade and Skopje Universities).
11. Supporting and organizing LANDCON conferences, including LANDCON 1010 at Xi'an, China during Oct. 11-15, 2010.
12. LANDCON e-LIBRARY activity.
13. Supporting joint programs and projects (WOCAT; initiative of law issues in Balkans; bilateral cooperation between Serbia and China in SWC and SLM cooperation)
14. Establishing a WASWAC Secretariat in Beijing. 15. Election for the new WASWAC President for the period 2011-2013.

The main issues of WASWAC were discussed at LANDCON and Councilors Meeting in Xi'an, China in October of 2010. Besides, several activities were emphasized as the priorities of the new Council in the period 2011-13 such as: structure of new council, membership management, database of all members, amending WASWAC Constitution, website services, activities regarding the Journal to re-establish at IRTCES, dissemination of WASWAC Students' Forum to larger areas, etc. Special attention was on this forum and involvement of young people. The basic aim of these fora is to stimulate young members who will become future experts in SWC and ambassadors of the WASWAC ethos. The idea of this new unit of WASWAC has become more and more possible to get adopted globally.

At this point I would like to wish all of you Happy Holidays Season, good health, good progress in your work and your life. We hope that our joint activities would allow us to eventually reach WASWAC mission targets. Once again I sincerely wish Prof. Li Rui and his new council to prosper and succeed in improving our association, in which I am most happy to act as the Immediate Past President.

**Prof. Miodrag Zlatic**
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## From Editor's Desk

Dear Friends,

This is the last issue WASWAC Bulletin of the year 2010. We are still in the process of transition from WASWAC Newsletter to WASWAC Bulletin with many things still being changed from issue to another as we discuss the things among ourselves, I mean the members of Editorial Team. Our ultimate aim is to come out with a wonderful publication which could be of interest to all the members.

Friends, this has been an important tool of WASWAC to showcase our activities and news of the association. We now invite articles from the eminent personalities regarding the soil and water degradation and management. I repeat my request to all the members to send the research articles on soil and water conservation for publication in WASWAC Bulletin. The research articles are intended to be published in the Research Section of the Bulletin after peer-review by the Editorial Board Members. This issue contains a detailed message from our Immediate Past President, Professor Miodrag Zlatic, who has highlighted various achievement of the WASWAC during his tenure as President.

Friends, we the members of Editorial Board of Bulletin of WASWAC are really sorry for the untimely death of Richard Fowler, an Editor of the Bulletin. I shall be failing in my duty if I do not appreciate the efforts made by Richard Fowler in helping me compile many issues of WASWAC Newsletter.

Friends, your response to the WASWAC Bulletin contents will go a long way in making the things still more interesting and making the editorial board members much more enthusiastic to work.

HAVE A NICE READING

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## Feature

### Gardening without Digging (Les Anwyl)

One of the easiest and most effective ways to improve and build soil fertility in any gardening situation is to use a method known as sheet mulching. Thick layers of mulch are placed directly on the soil, simulating the thick leaf litter and humus found in natural forest systems. Sheet mulch provides multiple benefits, including water retention, weed suppression, slow release of nutrients and increase of beneficial soil organisms.

I first was introduced to this method through a sweet old lady called Esther Deans. She had written a book called *'Growing without digging'*, and was one of the first people in Australia to promote this type of garden. Her simple method enabled anyone to quickly create an extremely productive garden in any soil, even directly over weeds or lawn. The somewhat chaotic garden in illustration 1 is one of my

early mulch gardens, made on shallow sandy soil over solid rock!

I later came across the method again at Bill Mollison's Permaculture Institute. Big areas of tough and mostly useless bladey grass (*Imperata cylindrica*) were just trampled, covered with cardboard and lightly mulched with straw. Cuttings of sweet potato (*Ipomoea batatas*) were pushed under the cardboard, with their growing tips exposed to the light. In the rich soils of northern New South Wales, rampant sweet potato runners soon covered the mulch, and produced enough tubers to feed an army. Sometimes fruit or nut trees were planted at the same time. They thrived with sweet potato as a groundcover.

*Early mulch garden*

The materials listed below are not always available and can be expensive, so it becomes important to identify locally available material which can be substituted. Various materials can be used, applying the same principles. Some suggestions are given, but be resourceful with what is available to you.

To make a sheet mulch garden, first knock over any tall weeds or woody plants with a brushcutter, or just trample them; don't remove them, as they will quickly decompose under the mulch and add nutrients. A light sprinkle of organic fertiliser or manure is applied to the ground to kick-start microbial activity. A little lime or dolomite may be helpful if the soil is a bit acidic. Overlapping layers of newspaper or cardboard are placed on top to create a barrier that prevents weeds from re-growing. Banana or other large leaves can be used as a weed barrier in place of paper. So can old clothes, blankets, carpet or underlay.

*Water hyacinth layer*

Esther Deans' goal was to encourage gardening amongst the elderly and less mobile). However, for these layers I have also used woodchips, lawn clippings, seaweed, autumn leaves, peanut shells and sugar cane waste, just to name a few. Any weed material which doesn't have ripe seeds or persistent tubers can be used. Here in Chiang Mai, Thailand we have made good use of water hyacinth (*Eichhornia crassipes*), an abundant aquatic weed.

Of course, with different materials the results will vary. Sometimes the straw will be full of weed seeds. Sometimes termites will take the place of worms. Sometimes there is not enough nitrogen. But I can confidently say that with this method, soil fertility and structure will always benefit and water needs will be reduced.

The garden needs a really good watering to get it started, but once wet it conserves moisture. To plant in the garden, make a hole in the mulch, down to the paper, and make a little rip in the paper so that roots can easily find the soil. Fill the hole with a couple handfuls of good compost or soil and then plant seeds or seedlings.

Organic matter will improve the fertility, structure and water holding capacity of any soil. Sheet mulch gardens quickly provide bulk organic matter and create an instant humus-rich layer on top of the soil.

The soil is never exposed to sun or the impact of rain, so it develops structure, especially in the top layer where the feeder roots are. Even with regular watering, the top layer of soil in an unmulched garden goes through wet and dry cycles. In sheet mulched gardens, though, the moisture, humidity and temperature at the surface remain constant. This creates a microclimate conducive to worms and a rich variety of soil organisms, including fungi, which are very important to the nutrient cycle. These microbes convert the straw, lucerne and paper to humus and colloids (dispersed particles), and to readily available plant foods. They also eventually incorporate the organic matter into the soil, effectively doing your digging for you.

The important thing to get right is the appropriate mix of rough fibrous (high carbon) material to nitrogen rich material. With not enough nitrogen, materials will take a long time to break down and will borrow nitrogen from the soil in the process. It is a lot like a compost heap, except that you do not want it to get hot *[Editor: Heat, such as generated in compost heaps, could be harmful to garden plants. Fortunately, materials used in sheet mulched gardens are not piled to the extent that damaging heat is generated]*. The other difference between sheet mulching and a compost heap is that when you have made your compost in a heap, you have to spread it around your garden. But with this method, your compost heap *is* your garden!

*Layering straw*

I have been making paper and mulch gardens for more than twenty years. I have made them in suburbia, deserts, rainforests, swamps, sandy and clay soils. I have made them over thick lawn, weeds, even rock. The method has been successful for establishing trees, perennial gardens, groundcovers and vegetable gardens. I hope you will find it useful in your situation.

*Editor: Les is from Australia and has long been involved with horticulture, especially with nurseries and tropical plants. He was a senior horticulturist at the Royal Botanic Gardens in Sydney before becoming involved with permaculture, after which he worked on many community garden projects in remote Australia. For the past year he has been involved with* ***Fair Earth Farm*** *in Chiang Mai and will soon be returning to Australia where he manages a property for biodiversity and wildlife habitat as well as food production. Les can be reached at* ***didjcripey@yahoo.com****.*

**http://groups.google.com/group/echo-asia-forum**

## Association News

### Staff changes at the WOCAT Secretariat

In February 2011 Dr. Isabelle Providoli joined the WOCAT team in Bern. She has previously worked for 5 years at the International Centre for Integrated Mountain Development (ICIMOD) in Kathmandu, Nepal on Integrated Watershed Management and WOCAT in the Himalayas. She was the focal point for the Himalayan WOCAT network HIMCAT and was already heavily involved in WOCAT work.

The WOCAT Secretariat will consist of five members all with part time assignments for WOCAT: Hanspeter Liniger (50%), Rima Mekdaschi Studer (40%), Isabelle Providoli (55%), Gudrun Schwilch (5%) and Markus Giger (5-10%)

***Announcement of WOCAT Share Fair and 15th Annual WOCAT Workshop and Steering Meeting (WWSM)***

The next WOCAT workshop will be held in Kyrgystan, Central Asia from 21-27 June, 2011. We will start with a 2-day WOCAT Share Fair which will bring together main donors and institutions active in Central Asia. The Share Fair will be followed by the 15th Annual WOCAT Workshop and Steering Meeting (5 days). Call for papers for a special theme issue of MRD on "Central Asian Mountain Societies in Transition."

Mountain Research and Development, in collaboration with University of Central Asia's Mountain Societies Research Centre, is seeking articles that contribute to an understanding of systems and practices most relevant to Central Asian mountain societies in transition. While the theme is intentionally broad, one of the specific suggestions for papers is "Sustainable land management approaches and technologies in mountain areas." The abstracts can be submitted by 31 March, 2011.

## What the Members Say?

Respected Dr. Samran,

How are you, your family and your colleagues? To bring to your notice, we have made a communication by e-mail and you informed me to let you know my home address after I return to my home country when I expressed as I was studying Ph.D. in India. It was at the end of 2009. You have mentioned that you may have something to help my students and colleagues. Therefore, I decided to propose a colleague to be considered as guest member of WASWAC. His Name is Samuel Dagalo and his e-mail address is samueldagalo@yahoo.com. Please kindly consider him as guest member of WASWAC.

Moreover, my postal address is as given below.

With best regards,

Dr. Guchie Gulie Sulla
Arba Minch University,
Arba Minch Institute of Technology,
Water Resources and Irrigation Engineering Department,
P.O. Box 21, Arba Minch, Ethiopia

## Members' Forum

**Dr R P Shrestha, AIT Bangkok conveys the book release (IGI Global Coverage Area)**

**Land Use, Climate Change and Biodiversity Modeling:** Perspectives and Applications (**Editors:** Yongyut Trisurat, Kasetsart University, Thailand; Rajendra P. Shrestha, Asian Institute of Technology, Thailand; Rob Alkemade, Netherlands Environment Assessment Agency, The Netherlands)

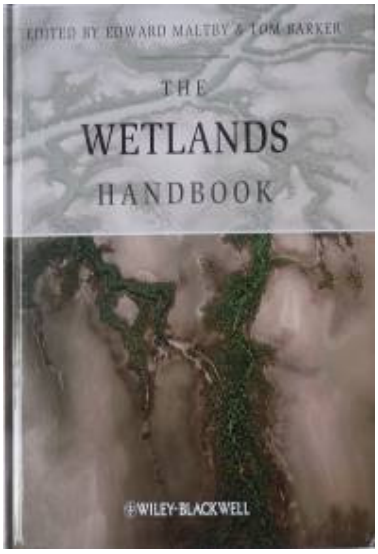
How humans use terrestrial land affects the earth and all life forms on it. Biodiversity loss and climate change are consequences of the same inappropriate and careless uses of land that negatively impact ecosystems on a smaller scale. This reference combines state-of-the-art modeling approaches at various scales with case studies from across the world. These examples help natural resource managers, scientists, and decision makers overcome their fear of models. The case studies show how to translate models into results and illustrate how pro-active implementation can mitigate biodiversity loss. This material will interest individual researchers, but it is also critical for policy-makers committed to the future of the planet. **ISBN: 978-1-60960-619-0, © 2011**

Hardcover: US $180, Online Perpetual Access: US $255

Print + Online Perpetual Access: US $360

**The Wetlands Handbook** (1st Edition): Edited by Edward Maltby and Tom Barker (Wiley-Blackwell; 1,058 pages, Hardback 2009).

The Wetlands Handbook is a colossal achievement – in more ways than one. Weighing in at 2.5 kg, with over a thousand pages enclosed in a volume some 6 cm thick, it is as big as its topic is important. And it is a product that simply exudes authority. The title has every right to be prefaced by the definite article; and the use of the term "first edition" speaks for itself. No doubt the second and further editions will build on this impressive foundation. But this is not a "handbook" in the standard form of the term. While it packs in the technical knowledge, it also carries a strong message and philosophy: The way we look at wetlands (substitute *forests, rangelands, savannahs* as you please – surely the same can be said for each?) needs a significant paradigm change. No longer are we talking about biological resources for simple, specific, benefits, but at ecosystem functions, where human wellbeing resulting from carefully tended living landscapes is key. And this means not preservation for its own sake, but management for multifunctionality.




Ironically the original convention that was set up to protect wetlands – the Ramsar Convention of 1971 – is renowned for two things: one positive, the second less so. Some applaud it for being the first international environmental convention, thus paving the way for those that followed (mainly out of the Rio Conference of 1992 – Biodiversity, Climate Change, Desertification etc), but equally others deride it for being the "birdwatchers agreement". Currently this convention covers a million and a half square kilometres of wetlands, and since the mid 1980s, poorer nations have joined because of a greater emphasis on functional significance (for livelihoods derived from ecosystem services) and the notion of "wise use".

However the convention protects merely around 10% of the world's wetlands; the total area of global wetlands is estimated to be nearly 13 million square kilometres, and that equates to a third of the area under forest globally. Like the forest, wetlands – with their biodiversity and accumulated carbon - are under threat. Nearly one half of all wetlands are said to have been lost in the 20th century alone. Ironically the term "wetlands" was only coined 50 years ago when drainage was fast underway, mostly to make room for farmland.

Its impossible to do justice to such a work in a few sentences. There are 7 sections, 43 chapters, 72 contributors in all and an index that expands to 51 pages. Hardly a topic this reviewer looked for is not present. Even if the terms "governance" and "tenure" are missing from the index, they are present in the text. It's readable and accessible in its double column layout, and replete with diagrams, tables and black and white plates. A couple of oddities however stand out: the 16 colour plates are lost in the centre of this tome, and they are neither of even quality nor of thematic consistency. And either have a full glossary or explain terms in footnote: but why just three pages? These are minor quibbles.

This book is a must for any educational institution that involves itself in the environment. Wetlands have consistently been underestimated in their importance as "diverse ecosystems that link people, wildlife and the environment in special and often interdependent ways through the essential life-support functions of water". No time must be lost in recognising their significance through what the editors terms a "new mature understanding of the primary concerns of society, linking natural and social sciences". Well said! Librarians: leave the internet to its own devices and buy this book. No website can replace essential heavyweight authoritative references as this. Students will lift it off the shelf and dip in. It's fascinating, and the topic is absolutely crucial to the environment: far more so than most of us hereto might have recognised.

William Critchley, Amsterdam, January 2010

## Obituary

**Ahmet Hizal VP for Turkey passed away**

Prof. Dr. Ahmet Hizal died in a traffic accident in the northwestern province of Bolu, Turkey. This e-mail has been sent to inform you. Prof. Dr. Ahmet Hızal was born in Düzce, Turkey on January 1, 1946 and died in a car accident on June 8, 2010. He was the head of Department of Forest Engineering, Faculty of Forestry, Istanbul University. He served as a WASWAC Vice President for Turkey for several years.

**Richard Fowler (WASWAC Councilor from South Africa) passed away**

Richard passed, Editor of WASWAC Newsletter and Bulletin passed away on 24th June 2010. He was suffering from cancer at Stage 4 which is the final stage of growth, so there wasn't very much anyone could do. Despite of treatment with two

cycles of chemotherapy, but Richard passed away in the end. We appreciate his services in the Editorial Board of the WASWAC Bulletin and on behalf of the Editorial Board, we deeply mourn his death and pass on the condolences to his family.

## Ideas and Innovations

**North Carolina State University "Floating Wetlands" (Jim Wise)**

Bill Hunt and the Stormwater Engineering Group from North Carolina State University are studying the use of floating wetlands, which are floating mats planted with wetland plants. They are placed in a water body and improve water quality by taking up nutrients. This innovative best management practice (BMP) could be used on small stormwater management facilities or larger bodies of water. They have installed 16 floating islands in the city of Durham, each 400 square feet of polymer fiber, 10" thick and buoyant enough to support several people and plants. The cost is about $30/square foot. Water will be tested coming in and leaving the ponds to determine pollutant removal capabilities. *http://www.newsobserver.com/2010/04/04/420450/floating-islands-a-pollution-solution.html*

**EPA – New Guide to Improve Stormwater Management to Protect the Health of Local Streams and the Chesapeake Bay**

The Environmental Protection Agency (EPA) has issued a new guide to control urban runoff and to keep pollutants from flooding downstream into the Chesapeake Bay. The guide will evaluate how effective stormwater permits are and will identify areas that should be improved to better control and prevent erosion, sediment, toxic metals, volatile organic compounds and excessive nutrients from entering the Bay (*http://cfpub.epa.gov/npdes/stormwater/munic.cfm*)

**Sustainable Design and Green Building Toolkit for Local Governments**

The U.S. Environmental Protection Agency (EPA) has provided a Sustainable Design and Green Building Toolkit for Local Governments. This document will assist local governments with making their permitting process work for sustainable design and green building. The Toolkit provides information on codes/ordinances that would affect design, construction, renovation, and operation and maintenance of a building. The first section of the Toolkit provides an Assessment Tool and Resource Guide, while the second section of the Toolkit assists with developing an Action Plan for implementing changes in the permitting process.
*(http://www.epa.gov/region4/recycle/green-building-toolkit.pdf)*

**Recycle the Raindrops**

The Recycle the Raindrops website provides crucial information on using rain barrels to recycle your stormwater. They also had the great idea of asking local Chicago artists to create their own works of art on rain barrels. Get ready to be inspired! Now there is no excuse not to have your own rain barrel and no reason to hide it! Just make it a work of art!
(*http://www.recycletheraindrops.org/artists.html*)

**Agroforestry gets unprecedented attention at traditional 'forest' forum**

For the first time in the 100 year history of the event, agroforestry featured prominently at the 23rd International Union of Forest Research Organizations (IUFRO) World Congress in Seoul, Republic of Korea during August. Centre staff addressed the Congress on the potential timber supply from agroforestry, a study into carbon sequestration of agroforestry systems in the Sahel, and results from other work on how agroforestry can help 'bullet-proof' farms in the face of climate change.
**Policy reform needed to realize agroforestry potential**

The new Agroforestry Policy Initiative designed to make agroforestry a key contributor to ensuring food security, reducing poverty and combating climate change, was launched during the IUFRO

Congress in the Republic of Korea in August. Involving FAO and a wide range of partners, the Initiative will support national and local policy reforms that will reduce barriers and improve incentives for private investment in agroforestry.

**North Korea opens its doors to agroforestry**

A pioneering agroforestry project in the Democratic People's Republic of Korea is restoring heavily degraded landscapes and providing much needed food for communities living on the sloping lands. The China office of the World Agroforestry Centre has been well placed to provide technical expertise and training to the project since 2008, earning respect and admiration for its work in training and capacity development.

**10 years to fight desertification**

The Africa launch of the UN Decade for Deserts and the Fight Against Desertification on 16 August provided an opportunity to highlight agroforestry successes in dryland management and soil conservation. Agroforestry is cited in the UN Convention to Combat Desertification as a potential win-win land use system in providing key rehabilitation and other ecosystem services while also generating production and income for land user.

## Issues

### New Hampshire Farm Closes after 378 Years

In 1632, an English settler, John Tuttle, made his way across the pond to the New World. At that time there were only 100 European colonists in what would become the state of New Hampshire. King Charles I granted Tuttle a small land grant in this area. Tuttle felled trees and started a small farm. Over time, the 20 acre farm grew ten-fold; meanwhile the surrounding forest gave way to highways and houses. Eleven generations worked on this land, but the current generation will be the last. The farm, or "Tuttle's Red Barn," which by some accounts is the oldest continually operating farm in the United States, will close.

It was a great run for Tuttle's descendants, most recently siblings Lucy and Will Tuttle, who tilled the land near Dover, NH, for 40 years. Berries, squash, cucumbers, tomatoes, and corn—which made the farm especially legendary—all came from the land. But farming is a tough job, and economics eventually took their toll. On a letter posted on the farm's web site, the Tuttles said some of the reasons were personal: their hearts, imagination, bodies, and minds were exhausted, not to mention their finances.

"Many people are out of work, while a good number of our older customers have lost much of their investment income. Over the past several years, customers have gone from using shopping carts to using shopping baskets to using just their hands to gather what they can afford to purchase."

The farm is now on the market for US$3.35 million. It will be a tough sell: the state designated the farm as conservation land in 2006, so the farm cannot turn into housing tracts or shopping centers, which has turned more of this state of 1.3 million people into an extended suburb of nearby Boston. Despite the increased interest in organic produce, few will jump at the chance to take a shot at farming: agribusiness combined with the increase in local and organic products make for a high entry barrier into this space.

Many will lament the farm's closing, but few would work the long hours required to keep such an operation going. The Tuttles, generation after generation, had a great ride. We should probably thank the Tuttles for sticking to their labor of love as long as they did.
Link to original article: http://www.triplepundit.com/2010/08/new-hampshire-farm-closes-after-378-years/Tuttle's Red Barn website: http://www.tuttlesredbarn.net/

## Mekong dolphins on the brink of extinction

Wild populations of the iconic Mekong giant catfish will be driven to extinction if hydropower dams planned for the Mekong River go ahead, says a new report by WWF. The report, *River of Giants: Giant Fish of the Mekong*, profiles four giant fish living in the Mekong that rank within the top 10 largest freshwater fish on the planet. At half the length of a bus and weighing up to 600kgs, the Mekong River's giant freshwater stingray (Dasyatis laosensis) is the world's largest freshwater fish. The critically endangered and culturally fabled Mekong giant catfish (Pangasianodon gigas) ranks third at up to 3 metres in length and 350kgs. Dam will present unsurmountable barrier for giant fish

"A fish the size of a Mekong giant catfish, simply will not be able to swim across a large barrier like a dam to reach its spawning grounds upstream," said Roger Mollot, Freshwater Biologist for WWF-Laos. "This would lead to the collapse of the wild population of this iconic species."

Current scientific information suggests the Mekong giant catfish migrate from the Tonle Sap Lake in Cambodia up the Mekong River to spawn in northern Thailand and Laos. Any dam built on the lower Mekong River mainstream will block this migration route. The hydropower dam planned on the Mekong River at Sayabouly Province, northern Laos, is a threat to the survival of the wild population of Mekong giant catfish. The Sayabouly Dam is the first lower Mekong River mainstream dam to enter a critical stage of assessment before member countries of the Mekong River Commission advise on whether to approve its construction. (http://wwf.panda.org/wwf_news/news/?uNewsID=194313)

# Discussion Forum

## Chinese Scientists Complete Genome Framework Map of Common Wild Rice

After the high coverage sequencing, splicing and assembly of common wild rice genome, the genome framework map was completed by a research team led by Prof. Gao Lizhi at the Kunming Institute of Botany, Chinese Academy of Sciences (CAS). This is the first wild rice genome sequencing project completed by Chinese scientists and is also the first wild rice genome framework map with high heterozygosity in the world. It was shown that common wild rice genome had nearly 370 million base pairs and contained about 40,000 genes. The sequencing depth was 70 times of the genome size and 92% of the wild rice genome had been covered, as well as more than 90% of the genes. At present, the research team is stepping up the detailed genome map of common wild rice.

Following the indica (9311) genome framework map completed by Chinese scientists, the common wild rice genome framework map and further sequencing of the detailed genome map will promote the large-scale analysis and identification of important functional rice genes to provide unprecedented opportunities for high-throughput mining and utilizing of excellent wild rice genetic resources. It will also boost the improvement of rice varieties and germplasm and make it possible for an in-depth understanding of the origin and acclimation mechanisms of cultivated rice in Asia.

Read the original article at
http://www.kib.ac.cn/jgsz/kyxt/xnsw/zxdt/201008/t20100823_2930825.html

# Summary Reports

## First International Conference of Soil and Roots Engineering Relationships (LANDCON 1005)


About 150 participants from Iran, Pakistan, Turkey, USA, Malaysia, Bangladesh, and Italy took part in the conference organized in Iran. The International Company of Sabalan Eco-Engineering Research (ICSER), together with scientific and applied Supporting World Association of Soil and Water Conservation (WASWC), International Union of Forest Research Organizations (IUFRO), European Geosciences Union (EGU), Tarbiat Modares University, Islamic Azad University- Khozestan Science and Research Branch, Iranian National Retrofitting Center North-West Branch, Natural Rescores Management of Ardebil Province, Ardebil Province Cultural Heritage are organizing in the period 24-26 May, 2010 in Ardebil Province, NW Iran, (having the slogan ”Protect soil, Protect life on only living Planet”).

This conference is the first in the series of LANDCON on soil and roots engineering relationship. The aim of this meeting is to bring together scientific researchers, practitioners, geotechnical and civil engineers, biologists, ecologists, rangeland managers and foresters to discuss current problems in soil and root engineering relationship. Papers will be presented orals and posters on Mechanics of Roots, wind loading on roots system, slope instability, soil erosion with water and wind, soil hydrology, mountain plants ecology, land use planning, Modeling root reinforcement, Failure criteria of roots, Root and soil interaction, catchments management, Ground bio- engineering, Eco-engineering and modeling of root reinforcement.

The objectives of the LANDCON1005 related to presenting some theoretical results, accomplishments and experiments in research, education in Root and Soil engineering relationship; establishing exchanges of ideas, opinions concerning preventing and diminishing the destructive effects of the Soil erosion and landslides; settling the directives for the future actions.

A special award was established for memorial of the famous Iranian Forest Protection Specialist Dr. Ebrahim Adeli with title "1st Late professor Ebrahim ADELI Award", who spent his life for researching and teaching in the field of forest protection. And it was presented to 5 specialists attending this conference (Dr. Habibah Lateh from Malasiaya Dr. Abha Mishra from Thailand, Shariar Sobh Zahedi from Iran, Masoud Alidoust from Iran, Hamideh Shadkami from Iran), and his family.

It was concluded that organic matter (OM) increases soil fertility through its improving physical features of soil and decomposition providing utilizable nutrients to the plants. Organic matter usually increases the WHC of the soil. 1% of increase in OM content enhances WHC by 3.7 percent. This is of great importance for the areas having less precipitation with respect to sustainable feed supply for the animals throughout the grazing period. Study revealed that OM content was of great importance for natural grasslands. OM positively affects the chemical and physical properties of the soil and its overall health. According to the results it can be concluded that the higher the OM content the higher the grassland quality. The optimal distance and depth of plantation for one of the commonly applied plants in reclamation of arid and semiarid rangelands in Iran, but further extensive, intensive and deep studies are required to allow drawing the final conclusion and to get access an applicable field manual for other important rangeland shrub species in any agroclimatic zone.

The slopes that have a plant, first consider the strength of roots in tension. Root strength can be measured by a simple tension test on plant roots. The system root network of species varies can determinable by strength of roots, even within a single species growing in different environments. A vertical root penetration through the bedrock beneath or lateral roots tends to spread because of wet soil with high groundwater level. there are also large differences which can probably be found between root strengths of one species growing in different locations. Long root mobilizing the maximum tensile strength higher than shorter roots due to increased resistance. Tensile resilience root prototype slope can be measured by using tensile force test. The slope of the tensile strength tests on the prototype and a comparison of tensile force tested in potted. Results from testing the root Agave (*angustifolio marginata*) and tea (*acalypha siamensis*) displays a tensile force as part of the

curve described below. Test of tensile force on the agave plant roots (*angustifolio marginata*) and tea (*acalypha siamensis*) in the prototype slope experimental. From the results shown in equations 6, 7, and 8 can be concluded that the tensile force of tea plants increased with increased root diameter inside the prototype slopes with angle ranged from 30 to 40 degrees. Improved tensile force root plant produced by reinforcement root and soil shear strength.

It was also observed that there is opportunity to enhance plant's physiological efficiency through alternative water regimes and through enhanced soil microbial density, which in turn could increase grain yield. In addition, the findings also appeared to help reduce methane emissions from rice plants. It has been reported that between 19% and 90% of the $CH_4$ produced is oxidized, with up to 75% of this oxidation taking place in the rhizosphere. Therefore, it is expected (although it needs to be verified) that the higher root activity rate of rice plant for a longer duration under intermittent irrigation, as reported in some initial field trials would further enhance $CH_4$ oxidation in the rhizosphere and reduce methane emission rate from paddy field. These benefits become more relevant in the prospective scenario where rice production needs to be increased with both reduced water applications and reduced 'climate-forcing' practices.

Root length density—an important parameter of root morphology reflecting root architecture -- is known to influence not only root-microbial interaction, but also the physiological activity of roots, which plays an important role in increasing plants' photosynthetic capacity. Researchers have demonstrated that the greater efficiency of hybrid and 'super-rice' varieties is due to their higher root-oxidizing activity rate during later growth stages that translates into higher grain yield. These findings reflect the effects of genotype since hybrid varieties are known to have greater root activity than traditional varieties. The process that affects availability of nutrients in the root zone is facilitated by microbes along with other soil and plant factors. It therefore seems that soil microorganisms could make significant contributions by enhancing rhizosphere activity. The environmental control on this root deployment and on their physiological activity needs to be studied in detail to learn about roots plasticity under varying soil environment. The findings also showed that grain yield was similar under autoclaved and EM-applied soil but with different physiological maturity. Plant grown in autoclaved soil showed delayed senescence and prolonged duration of grain filling, whereas EMS showed faster grain filling rate but also faster senescence. In the present study, faster senescence of roots and shoots was apparently encouraged by low soil nitrogen status. Therefore, it appeared that organic matter application to the soil is crucial to capitalize on the benefits associated with increased soil microbial density, so that mineralization can be enhanced and leaching loss of nitrogen can be minimized. These initial findings are opening up many possibilities for better understanding of plants' growth response and root plasticity under varied soil environments which could be exploited and manipulated to enhance crop production through enhanced root/rhizosphere activity. Since SRI agronomic crop management practices are seen to increase root growth and yield from practically any variety, therefore, SRI management practices should be explored in detail to gain a better understanding of roots and rhizosphere activity. Such investigation would be useful to develop alternative crop management practices that will reduce 'climate forcing' and will provide better ecosystem services.

Twenty years after timber harvesting, soil physical properties did not recover. Most disturbances occurred in the high traffic intensity. These results match to pervious study which was conducted in field recovery of soils. According to Webb recovery times extrapolated using a linear recovery model ranged from 80 to 140 yr and averaged 100 year. Non recover porosity of soil in high traffic intensity may be associated by stable of bulk density, soil moisture content at the time of logging elevation of above sea and climatic condition it was attributed to rehabilitation following timber harvesting. According to bio-assay data, the least number of seedlings was recorded in high traffic intensity. This finding is agreed with. According to results in Tasmanian there was a dramatic decline of 52– 80% in the accumulated tree volume in snig track zones when compared to the control zones. Results of bio-

assay showed that number of natural seedling of hardwood in low traffic intensity not only recover but also by about 14.43% greater than undisturbed areas. The impact of heavy traffic can lead to significant changes in the underlying soil physical properties and potentially in long-term growth of trees on these trails. Current study showed that B.D, T.P and number of regeneration in high traffic intensity did not recovered twenty years post logging. Namely that recovery of soil physical and bio properties take more time twenty years in Hyrcanian forest. In order to sustain naturally long-term forest ecosystem and soil areas with minimal disturbance and compaction, it is recommended that predestinate of skid trails, permanent skid trails layout and prevent designate their skid trails in slope terrain specially slope> 20% in cut block be used to complete logging.

Soil compaction is a worldwide problem in production of crop and it should and quantified and managed. Soil compaction can be determined and assessed by cone index, bulk density, aeration, structural characteristics. Root elongation, root density and rooting depth decreased by increasing soil resistance. Increasing soil strength that inhibits root penetration and reduces root elongation rate will reduce plant's yield because nutrition and water will be unavailable to the plants.

Second conference of ICSRER will be organized on 2013. Conference hosting place will be informed later. If any Facilities or research organization can roll as *Host organization of* 2nd ICSRER, please contact with Dr. Bibalani habibibibalani@gmail.com.

## Conference on Sloping Lands for Environment and Livelihood Security

The Soil Conservation Society of India organized its 24th National Conference on Watershed Management with theme "Sloping Lands for Environment and Livelihood Security" at Shillong from 11-13 November, 2010. The Soil Conservation Society of India and Meghalaya State Chapter has jointly organized the mega event. The conference was specially planned to address the issues related to the hilly regions for ecological conservation and simultaneously through scientific management of natural resources to enhance the productivity and production for better livelihood support to the people. Prof. (Dr.) R.C. Laloo, Hon'ble Minister for Soil & Water Conservation, Forest and Environment, Govt. of Meghalaya, was the Chief Guest . Sri R.P. Srivastava, Hon'ble Member of North Eastern Council, Shillong, presided over the the inaugural session. The keynote address was from Dr. (Mrs.) I. K. Barthakur, Hon' able Member of North Eastern Council, Shillong. The welcome address in the inauguration of the National Conference was given by Sri. K.C. Momin Organizing Secretary. In a welcome address Dr Suraj Bhan, Soil Conservation Society President gave brief introduction of the National Conference of the Society and said that the conference topic is fitting the hilly regions of the country. Moreover, the climatic conditions of watersheds in the region are different from any other region in the country, particularly in the rainfall that comes in the region. It is expected that solutions for watershed management in such conditions can be discussed thoroughly. It is just right that we are concerned about livelihood development as a part of Watershed Management, and the environment conservation as a whole.

We all realize and recognize that agriculture continue to be the focal point to India's large and growing population for its sustained food, nutrition and livelihood security. Maintaining health of soil for its various productions, environmental and hydrological functions should be one of the major objectives of the conference. Conservation agriculture, erosion control and amelioration of polluted soil and water shougy is likely to be reduced by 12%. Therefore, not only sustainable development of potential sources of water, but storage, conveyance, application and crop-water-use efficiencies without detriment to environment and natural resource base is imperative. Prof. J.S.Bali said that land leveling (which is called Bench Terracing in the hilly terrain) is one of the best practices of saving soil and water, and putting it to the best use for sustainable high production. If it is not happening, it is not for lack of knowledge by the land holder, but owing to lack of resources.

Farming has become profitless in India, so concluded the Farms and the Farmers Commission, headed by the world famous Agricultural Scientist, Prof. M. S. Swaminathan. Farmers have no resources to invest in high-cost terracing. The Govt of India should bear this expenditure, especially in the difficult terrains of the hills and in other backward regions. In return, the Government will get back the cost incurred, many fold. One rupee worth of extra grain produced , get multiplied in the economy of the country more than 20 times. Bioproduction alone has its limitations in increasing the net income of the farmers. Bio-processing should be done beforemarketing, which itself needs to be improved and made remunerative. There is also need to integrate all the schemes to get synergic effect. The future pattern of land husbandry should, therefore, be Bioindustrial Watershed Management (BIWM). The salient component of Bioindustrial Watershed Management (BIWM) comprises of (i) Soil and Water Conservation (ii) Sustainable high production technology and inputs, for annual and perennial tree crops (iii) Bio-processing of the Watershed Produce (iv) Scientific storage (v) Remunerative Marketing (vi) Infrastructure (vii) And Supporting Services of Credit, Extension, Inputs outlets and Research. BIWM is a feasible way to add value to the produce of the land, to increase net profits and eradicate endemic rural poverty. Prof. Bali concluded by reiterating that all the rural area schemes should be recast and integrated within small watersheds and targets of physical and socio-economic development fixed quantitatively.


The spectrum of the issues deliberated in the conference were: (1). Global Warming, Climate Change, Bio-diversity and Aforestation-Status, adoption and mitigation (2). Soil Conservation technologies- ractices, Policy, Strategy and Legislation in Context to IWMP, (3). Shifting Cultivation Management-Role of Horticulture Crops, Product Diversification there of incorporating Organic and Precision Farming Technology along with Farming System Approach, (4). Rainwater Conservation and Harvesting- Water Resources Development and Management, Hydrological and Bio-Physical Watershed Models, (5). Sustainable Watershed Management- Role of Socio-Economic Development, People's participation, Role of Women in Self Help Groups and other Rural Institutions (6). Special Problem Areas- Mined-spoil, land slides, glaciers movement and other geo-environmental hazards-Status, practices and innovative control technologies. (7). Planning, Implementation, Monitoring & Evaluation-Status, Research, Capacity Building and Role of IT Technologies Application.

During the National Conference on Watershed Management a book entitled 'Mountain Ecosystem and Man' was released by Prof. (Dr) R.C. Laloo, Hon'ble Minister for Soil & Water Conservation, Forest and Environment, Govt. of Meghalaya state. Apart from these serious technical discussions there were occasions for light entertainment to break the monotony which was organized during the evening of 12 November, 2010 at Club, where very entertaining traditional cultural glimpses of the state were presented.

## Research Section

**NIBGE Identifies New Cotton Leaf Curl Disease Virus**

Cotton leaf curl disease (CLCuD) is a major problem of cotton in Pakistan as it can destroy 15-20% of the total crop. It is caused by begomo viruses in association with a disease-specific symptom determining satellite (Cotton leaf curl *Multan betasatellite* [CLCuMB]) and, in some cases, a non-essential alphasatellite. Scientists at the National Institute for Biotechnology and Genetic Engineering (NIBGE) cloned these components from six samples collected from Sindh. The full-length sequence analysis of six begomovirus clones showed that one is an isolate of *Cotton leaf curl Kokhran virus* (CLCuKV), a virus previously shown to be associated with CLCuD in the Punjab.

Five other clones showed less than 90% nucleotide sequence identity to several known begomoviruses associated with CLCuD. These viruses are the isolates of a newly identified begomovirus, for which scientists propose the name Cotton leaf curl Shahdadpur virus (CLCuShV). Further identification indicated that this virus is actually of recombinant origin and the virus complex causing CLCuD in Sindh is distinct from that in the adjacent Punjab province.

See the original article at
http://www.pabic.com.pk/The%20scientist%20of%20NIBGE%20have%20identify%20a%20new%20recombinant%20virus%20responsible%20for%20the%20Cotton%20leaf%20curl%20disease%20virus%20%28CULCud%29%20in%20Sindh,%20named%20as%20Cotton%20leaf%20curl%20Shahdadpur%20virus%20%28CLCuShV%29.html

**University of the Philippines Readies Borer-Free Eggplant**

The University of the Philippines is in high hopes to commercialize its first-ever locally developed genetically modified (GM) eggplant in the next two years once it has passed the rigorous and robust science-based safety assessments set by the Philippine biotech regulatory framework. The fruit and shoot borer-resistant (FSB-R) eggplant, also called Bt (*Bacillus thuringiensis*) eggplant, being developed by the Institute of Plant Breeding of the University of the Philippines Los Baños (UPLB), is currently under multi-location trials in seven sites within the country including Pangasinan, Laguna, Camarines Sur, Iloilo, Leyte, Davao City, and Cotabato. The multi-location trial is one of the several levels of safety assessments where the biotech product performance and safety to environment are being evaluated before it undergoes to another series of evaluation prior to commercial release.

According to Dr. Desiree Hautea, FSB-R/Bt eggplant project leader, the development of FSB-R/Bt eggplant in the Philippines started through the granting of royalty-free license to UPLB from the Indian Maharashtra Hybrid Seeds Company Limited (Mahyco), to use its eggplant lines as source of FSB-R trait for the Philippine eggplant variety. Through this public-private partnership, UPLB scientists started the research in 2003 and underwent contained trials in UPLB-IPB, confined field trials in 2007, and now, the current multi-location trial all over the country. The Bureau of Plant Industry from the Department of Agriculture is spearheading the safety assessment of biotech crops under the field trial stage.

The FSB-R/Bt eggplant developed through modern biotechnology, produces a natural protein that makes it resistant to FSB, the major pest problem in eggplant production. "In the Philippines, damage by FSB results in yield losses from 54-70%, and to date, there is no available commercial varieties resistant to this pest. Through the development of FSB-R/Bt eggplant, farmers may double its income by 200 percent and gain an additional of Php 50,000 per hectare of production," said Dr. Hautea. Likewise, she stressed that insecticide application may lessen up to 72 times per season and may decrease spraying that accounts to 24% of production cost.

Eggplant is one of the major vegetable crop in the country in terms of area and volume of production, and small-scale farmers are expected to benefit most from the promising FSB-R/Bt eggplant technology.

For related information regarding this article, visit University of the Philippines Newsletter at http://www.up.edu.ph/upnewsletter.php?issue=66&i=1209. To learn more about the Bt eggplant project in the Philippines, visit http://isaaa.org/programs/supportprojects/abspii/research/default.asp. For more news updates on biotechnology, visit the SEARCA Biotechnology Information Center website at http://www.bic.searca.org/, or e-mail bic@agri.searca.org.

## Scientists Crack the Apple Genome

Professor Riccardo Velasco of Edmund Mach Foundation in Italy and other scientists have finally decoded the genetics of Golden Delicious domesticated apple variety. Genomic events led to the discovery that apple originated from the mountains of southern Kazakhstan where *Malus sievers,* the wild ancestor of apple, is still present.

The genes were sequenced to search for target genes that code for disease resistance and favorable taste, with the hope of contributing to food security of nations in the future.

The complete article in Italian is available at http://www.fondazioneedmundmach.it/pn_default.jsp?area=48&ID_LINK=2278. The highlights of this study is available for subscribers of Nature Genetics at http://www.nature.com/ng/journal/vaop/ncurrent/full/ng.654.html.

## Launch of European Project DROPS - Development of Drought Tolerant Plants

A scientific collaboration among the 15 European public and private partners in eight European countries, Australia, Turkey and the United States in a project called DROPS, was recently launched in a seminar at the Institut National de la Recherche Agronomique (INRA) at Montpellier, France. The project will address issues on the scarcity of water resources through the development of drought tolerant and water efficient varieties.

The project will use multi disciplinary approach combining physiology, genetics, modeling with field tests and phenotyping platforms in the development of drought resistant corn, wheat, durum wheat and sorghum. Results of the project which is funded by the EU's Framework Programme for Research and Development will be distributed to breeders through the participation of seed companies and professional association of breeders.

The original news article in French can be viewed at http://www.inra.fr/presse/lancement_du_projet_europeen_drops_2010_2015

NOTE: We intend to include peer-reviewed research papers from our members on various aspects of natural resource management from the next issue onwards. The Editors invite the original research papers from the members for publication in WASWAC Bulletin.

## Few wise words

**Most Valuable Assets**

Your attitude can be your most valuable asset. For it is with your attitude that you make use of all the other assets. If you have a well-developed skill but don't take the Initiative to use it, you might as well not even have that Skill. If you have great opportunities and fail to take Advantage of them, they won't be of any value to you.

In fact, you do have more than enough intelligence and skill To reach any goal you set for yourself. You do have ways to Access the resources necessary to achieve anything that You're fully committed to achieving.

The defining factor is your attitude. Because your attitude Determines what you do with each moment, and those moments, All added together, form the substance of your life.

And your attitude is yours to choose. It ultimately depends Not on any outside factors, but on what you decide to make It.

You have a whole world full of good things going for you. Adopt an attitude that enables you to always make the best of what you have.

**(Ralph Marston)**

## Miscellaneous

### Featured News

The United Nations declared 2010 to be the International Year of Biodiversity (IYB). Throughout the year countless initiatives will be organized to disseminate information, promote the protection of biodiversity and encourage organizations, institutions, companies and individuals to take direct action to reduce the constant loss of biological diversity worldwide. The official global launch was held in Berlin on 11 January, organized by German Chancellor, Angela Merkel. At that event Julia Marton-Lefèvre, Director General of IUCN, reminded us that "Well managed natural resources are crucial to sustainable development, supporting peaceful communities, encouraging well-balanced economic growth and helping reduce poverty". The launch of the year, under the slogan 'Biodiversity is Life, Biodiversity is Our Life,' is just the first in a series of global events and celebrations that include the observance of the International Day for Biological Diversity on 22 May under the theme Biodiversity for Development and Poverty Alleviation, a special high-level meeting of the General Assembly of the United Nations on biodiversity in September, and others.

**WASWAC members are requested to send news about anything concerning SWC, e.g. funds, awards, publications, websites, exhibitions, technical meetings, to publish with us by sending to** sskukal@rediffmail.com, aroraspau@yahoo.co.in, and mmjsingh@yahoo.com

## *Members/Contributors for WASWAC Bulletin*

**The following members have been our contributors to WASWAC newsletter and we expect them to continue this service for WASWAC Bulletin also. The next issue will list the names of the contributors for WASWAC Bulletin only.**

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## INFORMATION ABOUT MEMBERSHIP IN WASWAC

1. Individual membership: US$5/yr for developing countries; US$10 for developed countries and persons working in international organizations worldwide. Payment of the fee for 4 years at the same time will enable the membership to be valid for 5 years.
2. Life membership: US$80 for developing countries; US$160 for developed countries and persons working in international
organizations worldwide.

3-1. Organization membership (OM): For universities, research and implemental institutions, government agencies, NGOs,
societies, associations and international organizations, etc. Persons belonging to an Organization member will receive the same online products and services as the other two above categories: $100/ yr for an organization with up to 150 persons; $150/ yr for an organization with up to 300 persons;

$200/ yr for an organization with up to 500 persons; and $10/ yr for an additional 100 persons or part thereof. Local organizations in developing countries can request to pay at a lower rate.
3-2. Organization subscription (OS): is the same as the Organization membership but the organization wants to limit its involvement only as a subscriber.
3-3. Organization cooperation (OC): is the same as the Organization membership but the organization wants to limit its involvement only as a cooperator, without paying a fee. Any organization can be a cooperator for 1-2 years before deciding to join as OM or OS if desired.

4. Gift membership: US$5/ yr worldwide, to be purchased by anyone to give to colleagues, friends, students, etc.

You may ask sombatpanit@yahoo.com about your membership status, i.e. up to which year you have paid. Then you may send your membership fee to either John Laflen or me or any other address in the following list:

**a.** Dr. John M. Laflen, Treasurer, 5784 hwy 9, Buffalo Center, IA 50424 U.S.A. Phone: +1-641-561-2324. Fax: +1-641-584-2265 Attn: J.M. Laflen. laflen@wctatel.net. He can receive money from US and Canadian members through Personal Check, Money Order, or Bank Draft (payable to WASWAC), and can receive VISA and MasterCard credit cards and Bank Draft (payable to WASWAC) from all over the world. For sending money through a bank, please give the following information to your bank:
- Foreign wires: United Bankers Bank, 1650 West 82nd Street, Bloomington, MN 55431, U.S.A. Routing number 091 001 322; Swift Code UBBKUS41; for benefit of First National Bank of Volga; account number 091 402 552; further credit World Soil #703-488.
- Domestic wires: United Bankers Bank, 1650 West 82nd Street, Bloomington, MN 55431, Routing number 091 001 322; for benefit of First National Bank of Volga; account number 091 402 552; further credit World Soil #703-488.
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IMPORTANT NOTES: 1. DO NOT write the word 'WASWAC' in your remittance document, as it will cause a problem, since this is an alternative account that supplements the official one (a, as above).
2. Do not deduct the bank fee from your side from the amount of money to send.
3. For sending money by wire/bank transfer or check please add US$8 per transaction to compensate for the charge at the receiving bank in Bangkok. This additional charge is NOT applicable for the payment of membership fee(s) of US$50 or more.
**c.** You can also send to Dr. Samran Sombatpanit (use the address as shown in b.) through the **Western Union worldwide money transfer service**. Learn how to send from www.westernunion.com. Their service is quick and the transfer fee has been much reduced from the earlier time. Also as in (b), please do not deduct the money transfer fee from the amount to send but do not have to add US$8 as shown in (b3) above. Please write to sombatpanit@yahoo.com to show your intention before sending.

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**United Kingdom:** Mike A. Fullen, School of Applied Sciences, University of Wolverhampton, Wolverhampton WV1 1SB, U.K. Phone: +44-1902-322410, Fax: +44-1902-322680, M.Fullen@wlv.ac.uk. He can receive money from within the UK in pound sterling equivalent to the rates stated above. Cheques should be made payable to the University of Wolverhampton. You may use the most recent exchange rate for converting US$ into GBP.

***Note: For the convenience of all parties you are advised to sign up as a Life member or to pay for several years (e.g. 4 years and get 5 years) in one time. Contact sombatpanit@yahoo.com if you have any problem.***

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