NEWSLETTER

Vol. 2 - December 2015

News - Forthcoming

- **The Sustainable Land Management "Final Conference 2016"**
  March 07. - 09., 2016, Berlin Germany
  SURUMER contributions

- **Ecosummit 2016**
  August 29. - September 01., 2016, Montpellier, France
  SURUMER session: "Ecologizing agro-industrial tree plantations in the 21st Century- testing ground for transdisciplinary approaches and ecosystem engineering"

- **13th International Symposium on River Sedimentation**
  September 19. - 22., 2016, Stuttgart, Germany
  SURUMER contributions

- **Sustainable Rubber Conference 2016**
  October 17. - 19., 2015, Xishuangbanna Tropical Botanical Garden, China
  Preliminary Program

Conference contributions and meetings

- **PECS Conference**
  November 03. - 05, 2015, Stellenbosch, South Africa
  Oral presentation Häuser, I. et al.: "Ecosystem Service Assessment, integrating multi-, inter- and transdisciplinary results- a case study of rubber production."

- **2nd International Conference on Global Food Security**
  October 11. - 14, 2015, Ithaca, USA
  Oral presentation Cadisch, G. et al.:"Rapid rubber expansion - a threat to food security and essential environmental services?"
  As feedback to the talk a review paper about 'Impact of rubber production on food security' under the leadership of Cadisch, G. was proposed by the conference organizers.

- **LMI LUSES Annual meeting**
  October 10. - 22., 2015, Khon Kaen, Thailand
  Oral presentation I Blagodatskiy, S. et al.: "SURUMER-Sustainable Rubber Cultivation in the Mekong Region."
  Oral presentation II Blagodatskiy, S. et al.: "Carbon stocks and dynamics in rubber dominated watershed in Xishuangbanna, China."

Conference contributions and meetings II

- **International Interdisciplinary Conference on Land Use and Water Quality**
  September 21. - 24., 2015, Vienna, Austria
  Poster presentation Liu, H. et al.: "Impact of land cover change on soil erosion and water yield at plot and watershed level in rubber dominated landscapes."

- **5th International Symposium on Soil Organic Matter**
  September 20. - 24., 2015, Göttingen, Germany
  Oral presentation Blagodatskiy, S. et al.: "Microbial turnover and temperature effect on soil organic matter decomposition: model structure as a crucial factor."
  Poster presentation Lang, R. et al.: "Soil respiration and methane exchange in rubber plantations and rainforest: impact of land use change."

- **Tropentag 2015**
  September 16. - 18., 2015, Berlin, Germany
  SURUMER contributions

- **GfOe Annual Meeting 2015**
  August, 31. - September, 04., 2015, Göttingen, Germany
  Oral presentation Langenberger, G. et al.: "Rubber plantations as repositories for endangered plant species? A case study from SW China."
  Oral presentation Yang, X. et al.: "Assessing the impact of forest-to-rubber conversion: land use carbon dynamic and its ecosystem service benefit evaluation."

- **International Conference of Agricultural Economists**
  August, 08. - 14., 2015, Milan, Italy
  Oral presentation Min, S. et al.:"Adoption of intercropping among smallholder rubber farmers in Xishuangbanna, China."

- **Interdisciplinary congress of experts on the convention on biological diversity** (in German)
  August, 25. - 27., 2015, Vilm , Germany
  Oral presentation Harich, F. et al.: "Asiatische Elefanten und andere Wildtiere im Konfliktfeld zwischen Biodiversitätsschutz und der Ausbreitung landwirtschaftlicher Nutzflächen in Südostasien."

- **Annual Conference of the Society for Tropical Ecology**
  April, 07. - 10., 2015, Zurich, Switzerland
  Oral presentation Harich, F. et al.: "How to benefit from being eaten? Elephant seed disperal experiments with *Dillenia indica* in Southeast Asia."

SURUMER publications

- Golbon, R., Ogutu, J., Cotter, M. et al. (2015) Rubber yield prediction by meteorological conditions using mixed models and multi-model inference techniques. International Journal of Biometeorology, DOI: 10.1007/s00484-015-0983-0.
- Häuser, I., Martin, K., Germer, J. et al. (2015) Environmental and socio-economic impacts of rubber cultivation in the Mekong region: challenges for sustainable land use. CAB reviews 10(027): 1-11.
- He, P. and Martin, K. (in press) Effects of rubber cultivation on biodiversity in the Mekong Region. CAB reviews

For more information on SURUMER interdisciplinary review articles click here

Scientific Topics

Program "Development of a sustainable management concept for rubber production" in cooperation with ASApreneurs and the Einhorn GmbH ready to start Read more...

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Sustainable natural rubber production in Malaysias Kedah State- Mr. Zeiler from "Einhorn" condoms invites G. Langenberger to visit the NR-producing sector Read more...

Workshop on Rubber Management & Responsible Use of Agro-Chemicals successfully conducted Read more...

SURUMER 4th Stakeholder Workshop conducted Read more...

Program "Development of a sustainable management concept for rubber production" in cooperation with ASApreneurs and the Einhorn GmbH ready to start

You want to work on sustainable cultivation of renewable resources and get to know working and production conditions for one of the most important industrial resources worldwide?

In cooperation with the Einhorn GmbH and ASApreneurs, SURUMER offers the possibility to develop a concept of sustainable Rubber cultivation as a case study for a rubber plantation in Malaysia, either in form of an internship or a Master thesis (preferably students of agricultural sciences).

For further information on the project and application procedure and deadline, please check the asa- webpage (in German)

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Current status of the “integrated Ecosystem Service Assessment” Work group

In the course of our interdisciplinary cooperation between SURUMER Subprojects we have concluded a number of joint review articles on the impact of rubber cultivation on socio-economic factors (lead author Inga Hauser, PMC), on Ecosystem Services (Inga Hauser, PMC) as well as on biodiversity (Pia He, SP4). Three more reviews will soon be published on soil related aspects including carbon sequestration (Sergey Blagodatsky, SP1), intercropping potential (Gerhard Langenberger, SP5) and on mammalian wildlife (Franziska Harich, SP6).

Current on going topics within iESA workgroup:

1. Integration of Biodiversity studies into ESS assessments
2. Transdisciplinary ESS assessments as a challenge to interdisciplinary research projects
3. Inclusion of socio-economic assessments and trade-off analyses into bio-physical scenario evaluations

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Comparison of ground-base leaf area index measurements at rubber plantations in Xishuangbanna, China, using light absorption and gap fraction measurement methods

During the wet season from April to July 2014 in Menglun, Xishuangbanna, Yunnan, China measurements and "comparison of ground-base leaf area index measurements at rubber plantation in Xishuangbanna, China, using light absorption and gap fraction measurement methods" were conducted by Alexandra Schappert. This study was part of her ongoing study about Biobased Products and Bioenergy M.Sc. The pervious paragraphs are part of her thesis which she submitted successfully in October 2015.

Hevea brasiliensis is well known to affect the landscape hydrology. Rubber plantations have replaced most of the natural rainforest in Xishuangbanna, Yunnan, China. This land use change may be related to water balance changes. LAI is an important parameter to calculate water consumption for example. Parts of the LAI measurements were a 13 years and 22 years mature rubber plantation (homogenous canopy) and secondary rainforest (heterogeneous canopy). Within this work we focused on the estimation of LAI for the rubber plantations. Due to the habitus of the rubber trees and the plantation system it is a challenge to estimate the LAI.

By using direct and indirect methods at three times of the day (9 am, 1 pm, 5 pm) at different positions around the tree (50 and 100 cm around the trunk) and across the plot we were able to compare the devices according to their suitability for a specific situation. For the direct LAI measurement we used litter fall collection traps.

A light absorption method (SunScan, Delta-T Devices Ltd, Cambridge, UK) and gap fraction methods (LAI2000, LI-COR, Nebraska USA; and hemispherical photography: HemiView, Delta-T Devices Ltd, Cambridge, UK) were used for the non-destructive methods. The devices have different recommended requirements regarding to the weather conditions during the measurements and canopy.

Pic. 1 - 3 - Hemispherical photography method HemiView Delta-T Devices Ltd, Cambridge, UK (left); Gap fraction method LAI2000 LI-COR, Nebraska USA (middle); Light absorption method SunScan Delta-T Devices Ltd, Cambridge, UK (right)

By taking the LAI measured with litter fall traps from the previous year as a reference value, it was possible to give estimation which device, at which position and at which time of the day (including PAR) is able to achieve similar LAI values as the reference LAI. LAI values measured with direct measurements are often higher than LAI values measured with indirect methods because clumping, inclination and gaps in the canopy are mainly related of underestimation of LAI. Indirect methods do not differ between foliage and wooden parts which lead to increased LAI values.

According to our LAI references from 2013 the Young Plantation reached a LAI of 5.64 and the Mature Plantation a LAI of 4.17. As a result SunScan is the recommended technique because this device measured the highest LAI values compared to LAI2000 and HemiView. To achieve LAI values from 4-5 SunScan should be used during midday and bright sun.

The LAI may vary a lot from year to year caused by different climate conditions. Therefore a reference values from the regarding vegetation period should be used for comparison. To estimate the LAI of annual crops is not as complex as for high canopies. Consequently, LAI measurement for rubber plantation is still changeling in order to the specific situation and required accuracy. *(SP2, Schappert)*

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Biodiversity in rubber dominated landscapes - the emerging picture

Considerable progress was made in SP4 concerning the analysis of various biodiversity data for the providing inputs to the modeling and scenario development approaches of SURUMER.

First, a review manuscript entitled “Effects of rubber cultivation on biodiversity in the Mekong Region” has been prepared by Pia He and Konrad Martin and was accepted by CAB Reviews (in press). In this paper, we analyzed available data on species richness in rubber plantations compared to natural forest. We concluded that in most cases, monoculture rubber plantations showed to harbor less than half of the species richness in various plant and animal groups compared to natural forest, and often it was found or being assumed that many of these species are unable to exist permanently in rubber plantations. There is clear evidence that the existence of natural forest area is essential for the conservation of large portions of native forest animal species in rubber-dominated landscapes.

From the analysis of bee diversity in the Naban River Watershed National Nature Reserve, Dr. Xiu Wei and Dr. Douglas Chester and others from the Beijing Institute of Zoology, CAS completed and submitted a manuscript entitled “DNA-Based Approaches to the Study of Bee Diversity and Dynamics in Species-Rich Communities from Tropical Southern Yunnan (China)”. This study addresses lack of data on the dynamics of bee diversity and the paucity of available DNA references for bees in the tropics, by development of a framework describing DNA diversity of bees in key habitats within Xishuangbanna. The authors assess the utility of DNA-based description of tropical bee communities and compare to ‘traditional’ (based on morphological identification of specimens) approaches.

The analysis of field collections of bees related to landscape structure conducted by Pia He is currently in progress. Statistical data analysis revealed very interesting results, and we will report on this after completion of the manuscript.

Finally, SP4 and SP5 will additionally contribute to the modeling and scenario generation by providing biodiversity data of beetles, generated from additional field catches in the Naban Nature Reserve. These data are intended to provide a larger picture on the biodiversity effects of rubber cultivation in addition to wild bees. The beetle species are currently identified by the taxonomy group of the Institute of Zoology (CAS, Beijing) and will be completed by January. *(SP4, Martin)*

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Sustainable natural rubber production in Malaysias Kedah State - Mr. Zeiler from "Einhorn" condoms invites G. Langenberger to visit the NR-producing sector

March 19th to 26th, Dr. G. Langenberger visited Malaysia´s Kedah State, invited by 'Einhorn' (http://einhorn.my/), a German start-up from Berlin who is establishing a new condom brand. 'Einhorn' wants to redefine the understanding of sustainability along the whole production chain of natural rubber (NR), which is the major source of condoms. Therefore, the co-founder of Einhorn, Mr. Waldemar Zeiler, was seeking the expertise of agronomical and environmental experts to assess the current situation and set up criteria for an innovative standard of NR production. To that purpose Mr. Zeiler contacted SURUMER, who is currently the biggest research project dealing with questions of ESS-provision and environmental sustainability of rubber, to discuss the options of a long-term co-operation.

Since Malaysia is well known as provider of high-quality healthcare products based on NR, as e.g. surgical gloves or condoms, Mr. Zeiler identified Malaysia as ideal production site to implement the vision of Einhorn. With 'Richter Rubber Technology' (rrt) (http://richterrubber.com/), a leading producer of condoms and respective machinery with a yearly output of more than half a billion condoms, Mr. Zeiler found a partner who is very much interested to contribute to a more sustainable rubber production.

The Malaysian state of Kedah is located in the NW of Malaysia, bordering the Thai provinces of Songkhla and Yala in the North and facing the Malacca Strait along its western shores. With the neighboring State of Penang and its international airport Kedah is very well connected. The state is a major producer of NR and palm oil as well as a traditional rice grower. Economically, Kedah is highly developed and is home to a respective production and processing industry.

The objective of the visit of Dr. Langenberger to Malaysia was the assessment of the local framework conditions for the implementation of the envisaged cooperation, comprising the availability and suitability of plantation sites, official support by the Malaysian Rubber Board (http://www.lgm.gov.my/), as well as the research environment. The one-week trip consisted of a visit to the RichterRubber production site at Kuala Ketil, excursions to the rubber estate of Mr. Steven Te Lim Thee as well as to a newly established rubber-farmers´ cooperative. This program was completed by meetings with high ranking representatives of the Malaysian Rubber Board as Ms. Rosna Binti Abd Razak, State Director of the MRB for Kedah, and Ms. Datuk Dr. Salmiah Ahmad, Director General of the Malaysian Rubber Board, as well as with the State Executive Council of the State Government of Kedah Darul Aman, Mr. Yb. Dato' Dr. Ku Abd. Rahman Ku Ismail.

As a result of these meetings there is a general consensus that the rubber industry needs to be further developed, and that especially the required work force (tappers) causes increasing problems since the laborious work is not very attractive to young people who have better income options in the nearby cities and industries.

Therefore, there is a distinct openness to new ideas as well as the assurance of the respective support to implement such ideas.

For SURUMER this provides options to implement new ideas on a more eco-friendly NR-production. As a first formal outcome of the exchange between SURUMER and Einhorn products GmbH a Memorandum of Understanding has been signed between Einhorn and the University of Hohenheim. *(SP5, Langenberger)*

Pic. 4 and 5 - Discussion with representatives of a rubber farmer community

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Workshop on Rubber Management & Responsible Use of Agro-Chemicals successfully conducted

Land-use in Xishuangbanna experienced a tremendous change from traditional and diverse production schemes for own consumption and local markets to predominantly cash crop production for external markets. Thus rubber became a dominant feature of Xishuangbanna´s landscape. This brought along a considerable wealth to farm owners, but also a dependency on the global markets and its price volatility. This can cause a thread to livelihood if the household solely depends on a single commodity, as it is often the case with rubber. Additionally, monoculture production goes along with the use of considerable amounts of agro-chemicals (fertilizer and pesticides), which, if not carefully applied, can cause environmental but also serious health problems. Since the understanding of the functioning of agro-chemicals is usually restricted and the health impacts are not clear to the users, an exuberant and careless application can often be observed.

This WS therefore was conducted to improve the understanding of agro-chemicals and create awareness concerning their potential negative impacts. Additionally, participants were informed and trained how to safely apply agro-chemicals where needed.

Current best practice in rubber management was presented, but also alternative options. Finally, the objective of the workshop was to better understand the needs and requirements of the participants when it comes to land-use decisions. This will help to tailor further activities to the needs of the participants. *(SP5)*

Pic. 6 - Participants of the Agro-chemical WS Nov. 05-06, 2015 in front of the Mandian Research Centre

For more information on the Workshop please see Annex II

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SURUMER 4th Stakeholder Workshop conducted

On 14th August 2015, SURUMER 4th regional stakeholder workshop has been held in Jinghong, with the great support from our local partner NRWNNR.

Participants were from government bureaus as Xishuangbanna Agricultural Bureau, Bio-industry Development office, Xishuangbanna Environmental Protection Bureau, Xishuangbanna Reclamation Bureau, Xishuangbanna Forest Bureau, and Naban River Watershed National Nature Reserve Bureau; from research institute as Xishuangbanna Tropical Botanic Garden and Yunnan Institute of Tropical Crops; from State Farm as Jinghong Farm Management Board; from enterprise as Jingtai Green Industry Company, and from SURUMER SP8.

First Jue Wang from SP8 introduced the concept and ecosystem services and its importance to human beings, and showed the result of first round of stakeholders' ranking for ESS. Participants discussed why differences between farmers and decision makers occur on ESS ranking.

Pic. 7 - Jue Wang from SP8 introduces the concept and ecosystem services to the participants

Then the results from study project about farmers' willingness to accept land-use change have been presented. The study project shows that there are some factors that affect farmers' willingness to accept land-use changes, based on two cases – water protection and intercropping. Apart from the factors for acceptance, the factors of motivation for changes were also presented. Participants think that these factors are comprehensive and helpful for their work.

Pic. 8 - Participants discuss the presented results

Next was the presentation of the rubber value chain. This presentation included:

- Overview of value chain study within SURUMER;
- Preliminary results of analysis of existing rubber value chains;
- Intermediate conclusions and questions; and
- Next steps in the value chain study.

Results have been showed with graphs.

After the presentation, a decision making tool has been introduced to stakeholders. This tool includes a three-step-procedure with a set of evaluation criteria which stakeholders can use for decision-making. By answering various questions, it should help to understand if farmers can be successful with a certain crop, and if they meet the criteria to participate in the related value chains. Participants have practiced how to use the scheme to help making decision, and they think this tool provide comprehensive view of issues. *(SP8, Aenis/ Wang)*

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Tropentag 2015 - SURUMER contributions

Subprojects involved	Authors	Title	Oral/ Poster
SP1	Lang, R., Blagodatskiy, S., Cadisch, G., Goldberg, S., Xu,J.	Rubber Cultivation weakened the CH4 sink function of tropical upland soil, comparing with rainforest	Poster
SP1	Liu, H., Blagodatskiy, S., Cadisch, G.	Exploring Effects of Aboveground and Belowground Biomass in Soil Erosion during Rubber Dvelopment by Applying Usle Model	Poster
SP8	Wang, J. and Aenis, T.	Ecosystem Services on Southwest China: Local Stakeholders' Priorities	Oral
SP1	Yang, X., Blagodatskiy, S., Xu, J., Cadisch, G.	Meet the Balance of Carbon Emission and Land Use Productivity- Case Study from nanan National Nature Reserve, Xishuangbanna	Poster

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International Symposium on River Sedimentation – September 19-22, 2016 in Stuttgart

The 13th International Symposium on River Sedimentation (ISRS 2016) will be held at the University of Stuttgart, Germany from 19-22 September 2016. The symposium series provides an important forum for scientists, engineers and policy-makers from all over the world to share information, exchange ideas and collaborate in the field of erosion and sedimentation processes. The conference offers different special sessions dealing with a great variety on sediment transport issues and river sedimentation problems. SURUMER will be represented in this conference with a special session called: Sustainable Land Management. Participants from the SURUMER project and the SUMARIO project (Sustainable Management of River Oases along the Tarim River) have the chance to present their results on sediment related topics within this special session.

For more information about the symposium please follow this link:

http://www.isrs2016.de/

Please find an overview over the SURUMER contributions below.

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13th International Symposium on River Sedimentation - SURUMER contributions

Subprojects involved	Authors	Title
SP1, SP3, SP4, SP5, SP8, SP9	Aenis, T.; Wang, J.; Hofmann-Souki, S.; Tang, L.; Langenberger, G.; Cadisch, G.; Martin, K.; Cotter, M.; Krauss, M.; Waibel, H.;	Research-praxis integration in South China- the rocky road to implement strategies for sustainable rubber cultivation in the Mekong Region
SP1, SP3, SP5, SP8	Langenberger, G.; Liu, H.; Blagodatskiy, S.; Krauss, M.; Wang, J.; Aenis, T.; Cadisch, G.	Managing rubber plantations towards improved water protection
SP1	Liu, H.; Blagodatskiy, S.; Marohn, C.; Cadisch, G.	Impact of land cover change on soil erosion and water yield in rubber dominated landscape
SP1	Liu, H.; Blagodatskiy, S.; Cadisch, G.	Dynamic change of anti-erosive effectiveness of rubber plantations and ist improvement by herbicide management
SP3	Seitz, L.; Krauss, M.; Azizi, N.; Steinmetz, H.; Wieprecht, S.	Reduction of fine sediment infiltration into rivers by implementing riparian buffer strips in an agricultural dominated area in Southwest China

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Sustainable Land Management "Final Conference 2016" - SURUMER contributions

Subprojects involved	Authors	Title	Oral/ Poster
SP7, SP8, SP9	Aenis, T.; Ahlheim, M.; Shi, M.; Huang, J.; Waibel, H.	Land use, agrobiodiversity and risk perception: an economic analysis of rubber cultivation	Oral
PMC Invest, SP1, SP3, SP4, SP5, SP8, SP9	Aenis, T.; Wang, J.; Hofmann.Souki, S.; Lixia, T.; Langenberger, G.; Cadisch, G.; Cotter, M.; Krauss, M.; Waibel, H.; Liu, F.; Li, Z.;	Research-praxis integration in South China- the rocky road to implement strategies for sustainable rubber cultivation in the Mekong Region	Oral
PMC Invest, SP1, SP3, SP5, SP9	Cadisch, G.; Blagodatskiy, S.; Cotter, M.; Höuser, I.; Langenberger, G.; Liu, H.; Lang, R.; Yang, X.; Krauss, M.; Steinmetz, H.; Seitz, L.; Wieprecht, S.; Waibel, H.; Xu, J.	Integrated landscape and land use management for sustainable rubber cultivation in South-East Asia	Oral
PMC Invest, SP1, SP4, SP5, SP6	Cotter, M.; Harich, F.; Häuser, I.; He, P.; Sauerborn, J.; Langenberger, G.; Martin, K.; Cadisch, G.	Biodiversity and Ecosystem Services - A case study for the Assessment of Multiple Levels of Species and Functional Diversity in a Tropical Cultural Landscape	Oral
SP1, SP3, SP4, SP5, SP7, SP8	Krauss, M.; Azizi, N.; Kuch, B.; Steinmetz, H.; Seitz, L.; Wieprecht, S.; Ahlheim, M.; Cadisch, G.; Martin, K.; Langenberger, G.; Liu, H.; Blagodatskiy, S.; Aenis, T.; Zhou, X.	Integrated Water Resource Management and measures for a more sustainable rubber cultivation	Oral
SP1, SP4, SP5	Langenberger, G.; Feng, L.; Cadisch, G.; Martin, K.	Rubber intercropping revisited	Poster
SP1	Liu, H.; Yang, X.; Blagodatskiy, S.; Marohn, C.; Cadisch, G.; Xu, J.	Integrated modeling of land use management impact on soil conservation and carbon sequestration potential of rubber plantations	Poster

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ANNEX I

Sustainable Rubber Conference 2016 - program

Title: Promoting environmental friendly and socially responsible rubber cultivation

Webpage: http://sustainablerubber.org/

Date: Conference17-19 October, 2016
Workshops 20-21 October, 2016

- SURUMER Stakeholder consultations
- etc.

Hosted by: Xishuangbanna Tropical Botanical Garden (XTBG)
Chinese Academy of Sciences, China

SURUMER project: Sustainable Rubber Cultivation in the Mekong Region

World Agroforestry Centre (ICRAF), East & Central Asia regional office

China Chamber of Commerce of Metals, Minerals & Chemical Importers & Exporters (CCCMC)

Venue: Xishuangbanna Tropical Botanical Garden (XTBG)
(http://english.xtbg.cas.cn/) Menglun Township, Mengla County
Yunnan Province 666303, PR China

Objectives

Increasing demand for natural latex, coming largely from China, has driven a massive expansion in the area under rubber cultivation from 5.5 M ha in 1983 to 9.9 M ha in 2012, mostly in mainland SE Asia. A large part of this expansion has been realised through the conversion of natural forests, including secondary and pristine forests, to monoculture plantations. Impacts on ecosystem services have included loss of biodiversity, impaired water provisioning, reduced soil health, increased erosion and increased green house gas emissions, but their magnitude and potential mitigation strategies have not yet been fully assessed. Moreover, responding to exceptionally high prices in the late 2010s, farmers planted rubber on marginal land that are unlikely to be profitable in the long-term. In addition, increased incidence of extreme events, as a consequence of climate change, and potential pest outbreaks are expected to exacerbate the problem. Although rubber income has brought wealth to some, it has also engendered severe social costs with respect to others, including poor labor conditions, eviction and lost access to resources resulting in increased poverty and decreased food security for those affected.

The environmental and social consequences of current rubber cultivation practices, international rubber market developments and climate change threaten the sustainability of the industry in the region.

The Platform on Sustainable Rubber aims to promote research and facilitate communication among researchers, government agencies and industry groups concerned with the sustainability of rubber cultivation. The goal of this conference is to share information in a multi-disciplinary, multi-stakeholder setting with a view to promoting environmental friendly and socially responsible rubber cultivation.

Keynote speakers (proposed)

- Professor Jefferson Fox, East West Centre, University of Hawaii
- Professor Thomas Giambelluca, Dept. Geography, University of Hawaii
- Stefanie Goldman (to be confirmed)
- Dr Eric Penot, CIRAD
- Beijing Rubber Study Group (TBA)
- Professor Andreas Neef, University of Auckland

Symposia (suggested topics)

Modeling changes and impacts

Session: Documenting land-use change – remote sensing approaches
Session: Modeling of impacts and scenarios
…

Ecology of monoculture rubber plantations

Session a: Impacts of rubber cultivation on plant and animal biodiversity
Session b: Rubber and ecosystem function
…

Socio-economic of rubber dominated landscapes

Session a: Impacts of conversion to rubber on SDGs
Session b: Prospects and risks under different socio-economic conditions
…

Future developments of rubber based systems

Session a: Adaptation and mitigation to climate change

Session b: Rubber agroforestry: Options for private and public benefit

…

Policy options of environmentally sustainable and socially responsible rubber

Session a: Land-use planning and implementation

Session b: Incentive options towards environmentally sustainable rubber

…

Cross-boarder rubber trade and investment and consequences for sustainable rubber

Session a: Foreign investments versus land grabbing

Session b: Developing industry guidelines for sustainable rubber

…

Registration fee

175 US$ / RMB 1075

	PROGRAMME	
Date	**Time**	**Activity**
16 October 2016	14:00	Registration of participants
	16:00	Opening ceremony
	17:00	Keynote presentation
	18:00	Reception
17 October 2016	08:30	Keynote presentations
	10:00	Coffee break
	10:30	Parallel symposia

	12:00	Lunch
	13:00	Parallel symposia
	15:00	Coffee break
	15:30	Parallel symposia
	17:30	End of day
18 October 2016	All day	Field excursions
19 October 2016	08:30	Keynote presentations
	10:00	Coffee break
	10:30	Parallel symposia
	12:00	Lunch
	13:00	Parallel symposia
	15:00	Coffee break
	15:30	Parallel symposia
	18:00	Conference dinner
20-21 October 2016		WORKSHOP: SURUMER-Stakeholder Dialogue
20 October 2016		WORKSHOP: CCCMC Guidelines for Chinese companies investing in rubber overseas

Accommodation:

There are a range of hotels options in Menglun from the 5-star Anatana Hotel immediately outside the garden, XTBG's own 3-star hotel located in the gardens and range of local business hotels in town. XTBG will assist in booking hotels for participants.

Transportation:

There will be a pick-up/drop-off service from/to the airport and a shuttle service each day from hotels to the conference venue.

Organizing Committee

Chair: Chen Jin (XTBG)

Secretary: Rhett D Harrison (ICRAF)

Alice Hughes (XTBG)

Georg Cadisch (SURUMER)

Sun Lihui (CCCMC)

Academic Committee

Co-Chair: Georg Cadisch (SURUMER)

Co-Chair: Xu Jianchu (ICRAF)

Thomas Aenis (Humboldt Universität Berlin)
Alain Brauman (IRD)
Jefferson Fox (East West Center)
Rhett D Harrison (ICRAF)
Alice Hughes (XTBG)
Gerhard Langenberger (SURUMER)
K. Martin (University of Hohenheim)
Tan Zheng-Hong (XTBG)
Philippe Thaller (CIRAD)

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ANNEX II

Workshop

Rubber Management & Responsible Use of Agro-Chemicals

at

Mandian Education Centre

November 5-6, 2015

Naban River Watershed National Nature Reserve

Pic. 9 - Participants of the Agro-chemical WS Nov. 05-06, 2015 in front of the Mandian Research Centre

Background & Objectives of the WS

Land-use in Xishuangbanna experienced a tremendous change from traditional and diverse production schemes for own consumption and local markets to predominantly cash crop production for external markets. Thus rubber became a dominant feature of Xishuangbanna´s landscape. This brought along a considerable wealth to farm owners, but also a dependency on international markets and their price volatility. This can cause a thread to livelihood if the household solely depends on a single commodity, as it is often the case with rubber. Additionally, monoculture production goes along with the use of considerable amounts of agro-chemicals (fertilizer and pesticides), which, if not carefully applied, can cause environmental but also serious health problems. Since the understanding of the functioning of agro-chemicals is usually restricted and the health impacts are not clear to the users, an exuberant and careless application can often be observed.

With this WS we therefore want to improve the understanding of agro-chemicals and create awareness concerning their potential negative impacts. Additionally, we want to inform and train the participants how to safely apply agro-chemicals where needed.

We also will present the current best practice in rubber management, but also alternative options. Finally, we want to better understand the needs and requirements of the participants when it comes to land-use decisions. This will help to tailor further activities to the needs of the participants.

05.11.2015, Thursday

09:00 – 09:30: Opening & introduction

- NRWNNR( )
- Short introduction into NRWNNR-SURUMER-cooperation (Liu Feng)
- Presentation of objectives, program and trainers (NRWNNR)

09:30 – 12:00: Dr. Ai Wenhan and Dr.Chang Jianwei present first-hand experience with pesticides

(Tea break: 10:30 – 10:45)

Pic. 10 - Examples for demonstration and discussion: Pesticides available in a single shop in GalanBan, Jinghong. The shop did not offer any kind of protective gear whatsoever.

Objectives & expected results: The use of pesticides is a common practice of cash crop production. Due to a poor understanding of the risks pesticides are often applied carelessly. Dr. Ai and Dr. Richard will therefore talk about their personal experience with pesticide poisoning in their daily work and discuss risks, safety measures, but also first aid measures with the participants. As a result the participants should be aware about the symptoms of poisoning, first aid measures, but also long-term damages. They should also be clear about proper safety equipment and safety procedures when applying pesticides.

Pic. 11 - Dr. Ai Wenhan & Dr. Chang Jianwei present background information on pesticide poisoning

Pic. 12 - Participants studying the handouts related to the doctors presentations

12:00 – 13:30: Lunch break (Man Dian)

13:30 – 17:00: Presentation of findings of SP3 (Manuel Krauss & Hongxi Liu)

(15:00 – 15:15: Tea break)

Objectives & expected results: SP3 conducts studies on water management and quality, respectively. In this presentation the results will be presented and the consequences for water usability will be discussed. This comprises an overview of pesticides, their modes of function, as well as their riskiness to man and the environment. The participants shall be sensitized for the impacts of agro-chemicals on water, and also the fact that the pollution with pesticides can often not be smelled or tasted and might therefore cause hidden long-term risks. Measures to safeguard drinking water sources will be described and discussed.

Pic. 13 - Ms. Hongxi Liu (SP1) and Mr. Manuel Krauss (SP3) explain the impacts of land-use practices on stream ecology and water quality, respectively. They also introduce the idea of water protection zones.

Pic. 14 - Tasting the difference: Participants in a dilution experiment illustrating the fact that substances as pesticides might be in drinking water without being tasted (in this case the experiment was conducted with Coke!)

Friday, November 06, 2015

09:00 – 11:45: Rubber Management & Agro-chemical Training

Managing rubber (Xiao Chun Yun, Yunnan Institute of Tropical Crops)

- Objectives & expected results: Rubber plantations cover considerable areas of the nature reserve and Xishuangbanna, respectively, and are of utmost economic importance. But the profitability of rubber plantations strongly depends on the international rubber price which is highly volatile. It is therefore important, that the management of rubber is up to date and based on the highest standard. As observed during our field work there is still room for improvements. Ms. Xiao Chun Yun from YITC will therefore present the actual state of the art of rubber growing.

Agro-Chemical training (Mr. Deng, Xishuangbanna State Agricultural Bureau)

- Objectives & expected results: The application of agro-chemicals in rubber plantations is a common feature, and often practiced indiscriminately. Since agro-chemicals, especially pesticides, cannot only harm man and the environment, but are also expensive, it is reasonable to only apply them where really necessary and only at an application rate required for success. Since herbicide application is a common feature with considerable impacts on erosion, alternative options as improved weed management will be discussed and criteria for farmer acceptance assessed.

Pic. 15 - Mr. Deng Caimin from the State Agricultural Bureau explains pesticide categories and their risks

Pic. 16 - Mr. Deng Caimin, State Agricultural Bureau, and Ms. Duan Lijuan dress up a volunteer with protective gear

11:45 – 12:00: Farmer Survey – are snakes an obstacle in rubber management?

- Objectives & expected results: When talking to rubber farmers about the natural undergrowth in rubber plantations you will often hear that the undergrowth promotes snake occurrence. Therefore, the question arises if this might be the reason for the prevalent clear-weeding of rubber plantations. At the same tame there is hardly any documented proof of a 'snake-problematic' occurring in rubber plantations due to the undergrowth. It is therefore the objective of this survey to get a better picture of the real situation concerning snake encounters and incidents, respectively. To that purpose a simple questionnaire has been developed which will be filled in under the guidance of Ms. Lijuan Duan.

Preliminary result: Interestingly, the majority of farmers doesn't see any problems in snakes, but rather mention centipedes as dangerous animals in the field.

12:00 – 13:30: Lunch break(Man Dian)

13:30 – 17:00: Field excursion to Naban (Naban C) SP5

- Demonstration of brush cutter use: The majority of weeding activities in rubber management are based on the use of herbicides. Besides the problematic use of pesticides in general, clear-weeding considerably contributes to erosion and thus soil degradation. One alternative to herbicide-usage might be mechanical weeding with brush cutters.
- Farmers usually prefer herbicides to control the natural vegetation in rubber plantations, although brush cutters might be an efficient alternative. Besides the investment costs a lack of quality and related safety problems have been mentioned as reasons. In 2016 SP5 intends to conduct a study testing the suitability of brush cutters under the given socio-economic and environmental conditions (steepness, soils) of NRWNNR.

Pic. 17 - Demonstration of brush cutter

- Presentation of SURUMER-demo-sites and intercropping trials, respectively: Rubber production was very profitable in the past due to extraordinary high market prices caused by the economic growth of the emerging markets, especially that of China. This caused a strong preference of monoculture rubber as well as an expansion of rubber plantations to problematic/marginal sites as steep slopes (>23°) and high elevations (>900m). This causes considerable economic problems when rubber prices drop. The SURUMER-intercropping demo sites intend to provide a show case of an alternative approach based on medium- to long-term management of native-tree intercropping in the rubber interrows.

Pic. 18 - Dr. Langenberger from SP5 – Agro-ecological diversification explains the consideration for the selection of the tree species (in this case *Parashorea sinensis*)

Pic. 19 - Mr. Liu Feng, Scientific Director of NRWNNRB explains the tree intercropping concept applied at the Naban demo site

Pic. 20 - Ms. Xia Chu Yun (left) from the Yunnan Institute of Tropical crops (YITC) presents the current state of the art of rubber growing

17:00: Feedback (Naban Station)

17:30: Visit NNNR New Exhibition Hall

Evening: Fair well party at Naban

List of participants

Overall participants

- NRWNNR (5)
- SURUMER (6)
- Village Committee Leaders (6)
- Village Leaders (33)
- Community Representatives (11)

SURUMER (6)

- Dr. Gerhard Langenberger
- Ms. Jue Wang, PhD cand. SP 8
- Ms. Xueqing Yang, PhD cand. SP 1
- Ms. Hongxi Liu, PhD cand. SP 1
- Ms. Lijuan Duan, project facilitator
- Mr. Manuel Krauss, Coordinator SP3

Trainers (4)

- Medical Doctors (2)
    - Dr. Ai Wenhan
    - Dr. Chang Jianwei
- State Agriculture Bureau(1) (pestcides)
    - Mr. Deng Caimin
- YITC (1) (Rubber Management)
    - Ms. Xiao Chun Yun

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