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**WORLD  
CONGRESS ON  
AGROFORESTRY**  
—  
DELHI - 2014

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**COMPENDIUM  
OF ABSTRACTS**





# **WORLD CONGRESS ON AGROFORESTRY**

**DELHI - 2014**

## **COMPENDIUM OF ABSTRACTS**

**10-13 FEBRUARY 2014  
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# Abstracts of the 3<sup>rd</sup> World Congress on Agroforestry

## Trees for Life: Accelerating the Impact of Agroforestry

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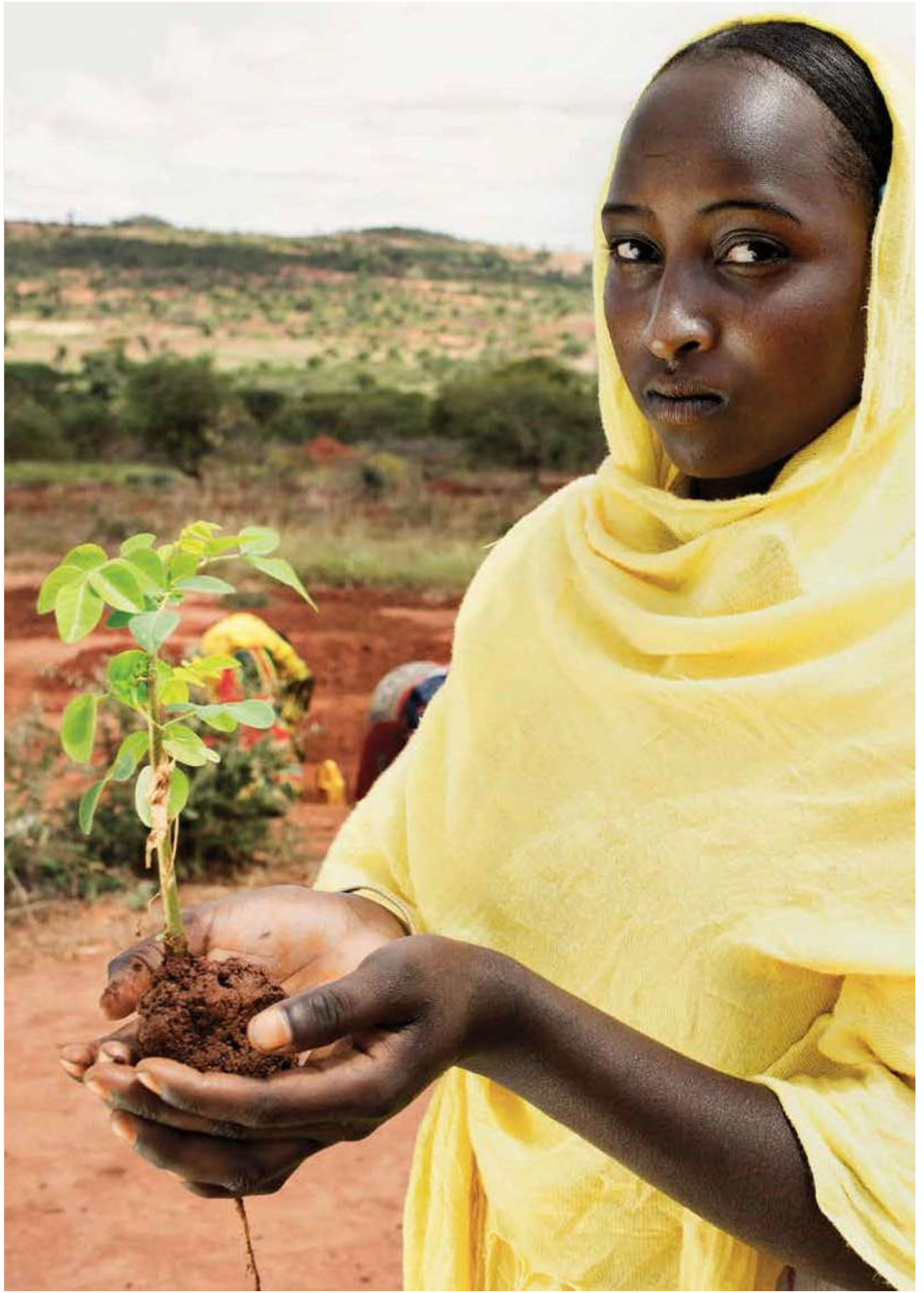
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## Table of contents

COMPENDIUM .....	i
OF ABSTRACTS .....	i
Table of contents .....	i
Acknowledgements .....	v
Preface .....	vi
Oral presentations .....	1
1.0 South Asia: Agroforestry systems, income and environmental benefits .....	1
1.1 Policy on agroforestry and tree-based farming systems .....	1
1.2 Agroforestry for rural employment and income generation .....	4
1.3 Land reclamation: Biodrainage and salinity control .....	8
1.4 Drylands and agroforestry .....	12
2.0 South Asia: Climate change, multi-functionality, livestock and fish systems .....	16
2.1 Agroforestry for climate change mitigation and adaptation .....	16
2.2 Tropical homegardens: multi-functionality and benefits .....	19
2.3 Tree fodder and animal nutrition .....	24
3.0 The business of agroforestry: applying science .....	28
3.1 The viability of trees as crops: agroforestry, pulp and wood-based enterprises, cocoa, coffee .....	28
3.2 Biofuels: using trees as a sustainable energy resource .....	31
3.3 Improving nutrition through agroforestry: the business case .....	35
3.4 Building livelihoods on tree products .....	38
3.5 Public-private partnerships: adding value to develop markets for producers .....	42
3.6 Valuing the environmental services of trees in the landscape .....	46
4.0 Sustaining development through agroforestry .....	50
4.1 Meeting development challenges with integrated approaches .....	50
4.2 The gender dimensions of applying agroforestry innovation .....	53
4.3 Adapting to climate change .....	57
4.4 Bridging science and development .....	62
4.5 Increasing food production through trees on farms .....	65
4.6 Building development abilities through education and capacity development .....	68
5.0 Applying science to the future of agroforestry .....	72
5.1 Humid multi-strata systems .....	72
5.2 New tools and paradigms .....	76
5.3 Biodiversity and agroforested habitats .....	80

5.4 The agroforestry of dry and degraded lands .....	84
5.5 Temperate agroforestry.....	88
5.6 The social science of agroforestry .....	91
6.0 Sustaining development through agroforestry .....	95
6.1 Policy, governance and international frameworks.....	95
6.2 The ecology and economics of rubber agroforestry.....	98
6.3 The science of scaling up and the trajectory beyond subsistence .....	102
6.4 Landscape approaches.....	105
6.5 Agroforestry, water quality and nutrient export.....	109
6.6 Successful and scalable business models for agroforestry with quantified mitigation and adaptation co-benefits.....	113
Posters.....	116
South Asia Day: Agroforestry systems, income and environmental benefits .....	116
1.1 Policy agroforestry and tree-based farming systems .....	116
1.2 Agroforestry for rural employment and income generation.....	117
1.3 Land reclamation: biodrainage and salinity control .....	135
1.4 Drylands agroforestry .....	138
2.0 South Asia Day: Climate change, multifunctionality, livestock systems and fish systems .....	148
2.1 Agroforestry for climate change mitigation and adaptation .....	148
2.2 Tropical homegardens: multi-functionality and benefits .....	158
2.3 Tree fodder and animal nutrition .....	159
3.0 The business of agroforestry: applying science.....	162
3.1 The viability of trees as crops: agroforestry, pulp and wood-based enterprises, cocoa, coffee .....	162
3.2 Biofuels: using trees as a sustainable energy resource .....	178
3.3 Improving nutrition through agroforestry: the business case.....	187
3.4 Building livelihoods on tree products .....	195
3.5 Public-private partnerships: adding value to develop markets for producers .....	209
3.6 Valuing the environmental services of trees in the landscape.....	210
4.0 Sustaining development through agroforestry .....	217
4.1 Meeting development challenges with integrated approaches.....	217
4.2 The gender dimensions of applying agroforestry innovation.....	234
4.3 Adapting to climate change .....	238
4.4 Bridging science and technology .....	250
4.5 Increasing food production through trees on farms .....	252
4.6 Building development abilities through education and capacity development.....	286
5.0 Applying science to the future of agroforestry: breakthroughs and innovations .....	289
5.1 Humid multistrata systems .....	289

5.2 New tools and paradigms .....	293
5.3 Biodiversity and agroforested habitats.....	303
5.4 Agroforestry in dry and degraded lands .....	312
5.5 Temperate agroforestry.....	325
5.6 The social science of agroforestry .....	332
6.0 Applying science to the future of agroforestry: policy innovation and global issues.....	336
6.1 Policy, governance and international frameworks.....	336
6.2 Ecology and economics of rubber-based agroforestry.....	339
6.3 The science of scaling up and trajectory beyond subsistence.....	339
6.4 Landscape approaches.....	340
6.5 Agroforestry, water quality and nutrient export.....	343
6.6 Successful and scalable business models for agroforestry.....	348
Additional abstracts .....	349
1.0 South Asia: agroforestry systems, income and environmental benefits.....	349
1.1 Policy on agroforestry and tree based farming systems .....	349
1.2 Agroforestry for rural employment and income generation.....	350
1.3 Land reclamation: bio-drainage and salinity control.....	352
2.0 South Asia: climate change, multifunctionality, livestock and fish systems.....	352
2.1 Agroforestry for climate change mitigation and adaptation .....	352
2.2 Tropical home gardens: multifunctionality and benefits .....	361
3.0 The business of agroforestry: applying science.....	362
3.1 The viability of trees as crops: agroforestry, pulp and wood-based enterprises, cocoa, coffee .....	362
3.2 Biofuels: using trees as a sustainable energy resource .....	363
3.4 Building livelihoods on tree products .....	363
4.0 Sustaining development through agroforestry .....	368
4.1 Meeting development challenges with integrated approaches.....	368
4.2 The gender dimensions of applying agroforestry innovation.....	384
4.3 Adapting to climate change .....	385
4.4 Bridging science and development.....	389
4.6 Building development abilities through education and capacity development.....	393
5.0 Applying science to the future of agroforestry: breakthroughs and innovations .....	394
5.2 New tools and paradigms .....	394
5.3 Biodiversity and agroforested areas.....	397
5.4 Agroforestry in dry and degraded lands .....	401
6.0 Applying science to the future of agroforestry: policy innovation and global issues.....	403
6.1 Policy, governance and international frameworks.....	403
6.4 Landscape approaches.....	404



6.5 Agroforestry, water quality and nutrient export.....	406
6.6 Successful and scalable business models for agroforestry with quantified mitigation and adaptation co-benefits.....	407
Annex 1: List of posters presented.....	410
Annex 2: Congress Committees .....	427
Annex 3: Congress Agenda .....	430

### ***OP2.1.3. CO<sub>2</sub> sequestration estimation for the Litsea-Cassava agroforestry model in the central highlands of Vietnam***

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The Litsea-Cassava agroforestry model has been popularly practiced in the Central Highlands of Vietnam, producing a stable volume and contributing significantly to household income. This model overcomes the shortcomings of mono-cultivation of cassava on land under shifting cultivation; and according to many cycles, the model helps store carbon. It is therefore it is significant in reducing the greenhouse effect, which has become a global concern in recent years. In order to estimate the environment value of stored carbon of this model, the experimental method involves: sample plot, destructive sampling, conducting chemical laboratory tests to determine the stored carbon in the components of the tree; and then using multi-variables to estimate the biomass and stored carbon in the agroforestry models. This procedure forms the basis of predicting the CO<sub>2</sub> concentration in woody trees in the agroforestry model according to the age period, the cycle, and different combinations. The cycle of Litsea business varied over the 5-10 year period, while absorbed CO<sub>2</sub> in the agroforestry model varied from 25 to 84 tonnes per hectare. Within cycle two and three of this model, maintaining 2-3 shoots/stump of Litsea will have the greatest effect not only on productivity, but also on absorbed CO<sub>2</sub>.

**Keywords:** *agroforestry, cassava, CO<sub>2</sub> sequestration, Litsea glutinosa*

### ***OP2.1.4. Assessment of carbon stocks and fractions under agroforestry plantation in the hilly ecosystems of northeast India***

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Soil organic carbon (SOC) degradation is very common in northeast India due to shifting cultivation on hill slopes coupled with unscientific management practices and high rainfall in this region. Agroforestry has a potentially important role to play in climate change mitigation through increased carbon storage in the above ground biomass and below ground soil. A 25-year-old agroforestry plantation consisting of four multipurpose tree species (MPTs) (*Michelia oblonga*, *Parkia roxburghii*, *Alnus nepalensis* and *Pinus kesiya*) maintained at ICAR Research Complex for NEH Region, Umiam, were compared with a control plot (without tree plantation) for soil organic carbon (SOC) stocks and fractions. Soil samples were collected from 0-15, 15-30, 30-45, 45-60 and 60-75 cm and analyzed for SOC stocks and fractions. MPTs showed significant influence on SOC stocks with the mean values ranging from 47.8 to 60.2 Mg ha<sup>-1</sup> and followed the order: *A. nepalensis*>*M. oblonga*>*P. kesiya*>*P. roxburghii*>Control. Land conversion from fallow to agroforestry plantation significantly enhanced the total organic carbon (TOC), particulate organic carbon (POC), KMnO<sub>4</sub> oxidizable C (labile C) and microbial biomass carbon (MBC) fractions in soil. The increase in these fractions was greater with *A. nepalensis* compared to other MPTs including control. Overall, on average, MPTs increased the TOC, POC, labile C and MBC by 26.3, 54.9, 27.1 and 34% respectively relative to the control plot. Similarly, approximately 17% increase in SOC stocks was observed under MPTs compared to control. All these C fractions including SOC stocks decreased significantly with soil depths. The increased values of lability index and carbon management index under MPTs revealed that land conversion from fallow to agroforestry plantation have more sensitivity to the changes in SOC and other C fractions in soil. The labile soil carbon fractions were significantly ( $P<0.05$ ) correlated with TOC indicating that the changes in TOC content of