



Communication & Cooperation  
Development with Concerted Efforts

# ISU News

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Proceedings of International Silk Union

Special Issue of International Think Tank Forum on Silk High-Quality Development & ISU Chairman Meeting



2.8m wide flat screen printing machine with high precision

Secretariat of International Silk Union

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# Report of ISU in 2022

## 2022 国际丝绸联盟工作报告



**张国强 Zhang Guoqiang**

Chairman of ISU  
Chairman of the board of Zhejiang Cathaya International Co., Ltd.  
国际丝绸联盟主席  
浙江凯喜雅国际股份有限公司董事长

In 2022, under the guidance of the Department of Commerce of Zhejiang Provincial and the Overseas NGO Administrative Office of Public Security Department of Zhejiang Province, facing the new challenges posed by Covid-19 epidemic, and adhering to the purpose of "Communication & Cooperation, Development with Concerted Efforts", International Silk Union (ISU) maintained close contact with relevant government departments, industry organizations, enterprises and colleges, so as to serve the development of the international silk industry. There were Eleven aspects of work have been carried out in a targeted manner, making positive contributions to promoting the sustainable development of the silk industry.

### 1. Organize and promote the life cycle accounting of sericulture & silk products

Since the release of the "Proposal for the Comprehensive and Objective Assessment of Life Cycle of Silk Products" in 2021, the sustainable development of silk has been continuously concerned by ISU. On January 18, 2022, the "LCA Working Group Meeting of Full Industry Chain of Sericulture & Silk" was organized and held, inviting more than fifty experts, scholars and corporate representatives from seven countries and regions including China, Italy, France, Brazil, India, Japan and Pakistan. The consensus on "System Construction and International Promotion of Life Cycle Account of Sericulture & Silk Products" was reached. Moreover, as a cooperative unit, ISU jointly undertook the "2022 Central Foreign Trade and Economic Cooperation Special Fund (Sericulture & Silk) Project" with Zhejiang Sci-Tech University (ZSTU) and Soochow University, carrying out

carbon accounting for silk products. With the comprehensive support of governments, organizations and enterprises from all over the world, the project well advanced, and phased exchanges and sharing were maintained. Among them, a series of meetings were organized by the Union, including, seven "Exchanges on the LCA of Sericulture & Silk of entire Industry Chain in China", five "Exchanges on the LCA of Sericulture & Silk of entire Industry Chain in China and Italy", one "International Exchange on Life Cycle Database of Sericulture & Silk". ISU also participated in twice for the "Make the Label Count" about the natural fiber sustainability initiative. In 2022, experts from the project team selected seventeen silk enterprises in the silk production chain, including sericulture, reeling and weaving, printing and dyeing, to carry out carbon footprint accounting, published



Organize and promote the life cycle accounting of sericulture & silk products  
组织推进茧丝绸产品生命周期核算工作



Carry out in-depth investigation and research on the high-quality development of silk industry  
深入开展丝绸产业高质量发展调查和研究



2022年，在浙江省商务厅、浙江省公安厅境外非政府组织管理办公室的指导下，国际丝绸联盟（ISU）面对疫情带来的各项挑战，秉持“交流合作 携手发展”的宗旨，与相关政府部门、行业组织、企业院校保持密切联系，服务国际丝绸产业发展。针对性地开展了11个方面的重点工作，为促进国际丝绸产业高质量和可持续发展做出了积极贡献。

### 一、组织推进茧丝绸产品生命周期核算工作

自2021年发布“全面客观评价丝绸产品生命周期倡议”以来，联盟持续关注丝绸的可持续发展，2022年1月18日，组织召开了“国际蚕桑丝绸全产业链生命周期评价工作组会议”，邀请来自中国、意大利、法国、巴西、印度、日本和巴基斯坦等7个国家和地区的50余位专家学者和企业代表参会，会议达成了联合开展茧丝绸产品生命周期核算体系构建及国际化推广的共识，并作为合作单位与浙江理工大学、苏州大学共同承担了“2022年度中央外经贸专项资金(茧丝绸)项目”开展丝绸产品碳核算工作。

在各国政府、行业组织和企业的支持下，研究工作顺利开展。其中，联盟组织召开了7次“中国茧丝绸全产业链生命周期评价交流会”，5次“中意茧丝绸产品全生命周期核算交流会”，1次“国际蚕桑丝绸生命周期数据库交流研讨会”，参与2次“Make the Label Count”天然纤维可持续倡议活动。2022年，项目组专家在种桑养蚕、缫丝织造和印染处理等丝绸生产环节中选取了17家丝绸企业开展了碳足迹核算。目前已在国际专业期刊上发表相关论文4篇，申请发明专利4件，获软件著作权1项，起草团体标准1项。



Organize member units to participate in the "International Sericultural Commission Congress"  
组织成员单位参加“第26届国际蚕业委员会大会”

four related papers in international scientific and technological journals, applied for four patents of invention, one software copyright, and drafted one group standard.

## 2. Carry out in-depth investigation and research on the high-quality development of silk industry

In order to grasp the development pattern and trend of international silk industry and explore the development path and countermeasures of China's silk industry, ISU secretariat profoundly participated in the 2022 strategic research and consulting project of Chinese Academy of Engineering's "Research Project on Silk Industry High-quality Development in the Context of 'the Belt and Road Initiative'". The secretariat investigated into Zhejiang, Shandong, Jiangsu, Sichuan, Hunan and Guangxi in China, organized more than ten exchanges such as Zhejiang Symposium, Jiangsu Symposium, Nanchong Symposium, Huzhou Symposium, and Symposium on the Development Status and Core Technology's Innovation Routes of Industrial Rearing of Silkworm", participated in five international exchanges in Italy, France, India and

other countries, investigated more than thirty companies, and organized nearly one hundred experts to carry out consulting services more than fifty times.

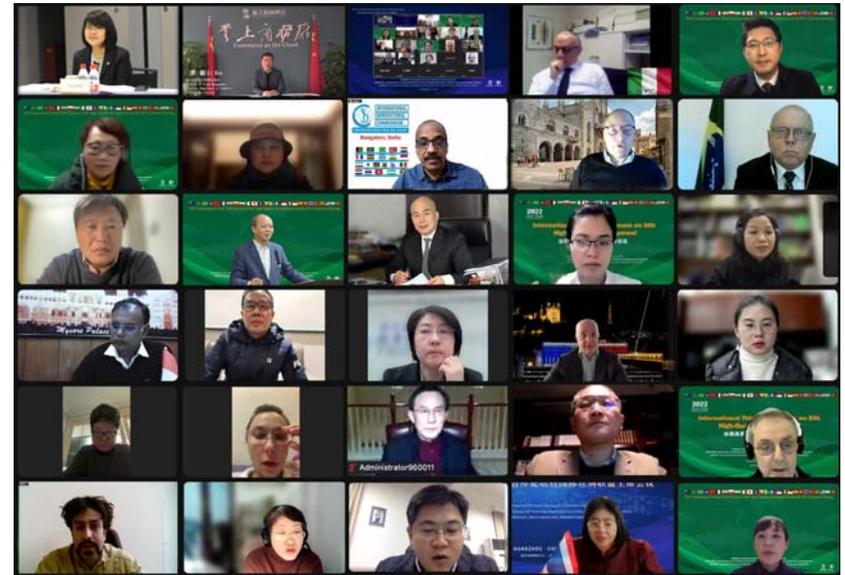
The industrial structure, development scale and technical bottlenecks of the main silk production areas and clusters were systematically mastered by the project team. Furthermore, the key research and analysis have been performed, focusing on industrial rearing of silkworm, the biomedical application of sericulture and silk materials, the digitization, intelligence, and green manufacturing of the silk industry, the technical standard system and the green low-carbon development strategy of silk industry, the competitiveness of the silk industry and the international cooperation strategy.

## 3. Organize to hold "2022 International Think Tank Forum on Silk High-Quality Development and the International Silk Union Chairman Meeting"

In order to stay abreast of the new dynamics of the global silk industry's development paradigm, explore the green and low-carbon development route of the silk industry with focus on the new research, new

technologies and new achievements in the field of silk, and on the international engagement role and cooperation in the industry, so as to facilitate the high-quality development of the silk industry, on December 21, ISU organized and held the "2022 International Think Tank Forum on Silk High-Quality Development and the International Silk Union Chairman Meeting". ISU chairman Zhang Guoqiang and relevant government departments, industry organizations, enterprises and research institutes, totally more than 100 representatives from China, Italy, France, Brazil, Japan, India, Switzerland, Thailand, Vietnam, Iran, the Philippines and other countries and regions, attended the meeting online through the Zoom video platform, and more than 6,500 people watched the conference live.

Li Xin, director of Foreign Trade Division, Department of Commerce of Zhejiang Province, delivered a speech for the conference. The chairman meeting passed the ISU work report in 2022, ISU secretariat introduced the "Statistics on ISU Activities Participation of Member Units". There were six guests from Italy, France, India, Iran, the Philippines and Thailand shared the development trends of silk industry in



Organize to hold "2022 International Think Tank Forum on Silk High-Quality Development and ISU Chairman Meeting"  
组织召开“2022 丝绸高质量发展国际智库论坛暨国际丝绸联盟主席会议”

## 二、深入开展丝绸产业高质量发展调查和研究

为了解国际丝绸产业的发展格局与趋势，探寻中国丝绸产业的发展路径与举措，国际丝绸联盟秘书处深入参与了由副主席单位浙江理工大学承担的 2022 中国工程院战略研究与咨询项目“一带一路”背景下丝绸产业高质量发展研究”，深入中国浙江、山东、江苏、四川、湖南和广西等地，组织召开浙江座谈会、江苏座谈会、南充座谈会、湖州座谈会、“工厂化养蚕发展现状及关键核心技术创新路线”专题研讨会等会议 10 余场，参与意大利、法国、印度等国际交流会 5 次，调研企业 30 余家，组织近 100 位专家开展咨询服务 50 余次。

项目组系统了解了主要丝绸产地和集群的产业结构、发展规模和技术瓶颈，并围绕工厂化养蚕，蚕丝丝绸材料生物医用应用，丝绸产业数字化、智能化、绿色化制造，丝绸行业技术标准体系及绿色低碳发展策略，丝绸产业竞争力及

国际合作策略等进行了重点调研与分析。

## 三、组织召开“2022 丝绸高质量发展国际智库论坛暨国际丝绸联盟主席会议”

为了解世界丝绸产业发展格局新动态，聚焦丝绸领域新研究、新技术、新成果，围绕产业国际分工合作，探讨丝绸产业绿色低碳发展路线，赋能丝绸产业高质量发展，12 月 21 日，联盟组织召开“2022 丝绸高质量发展国际智库论坛暨国际丝绸联盟主席会议”。联盟主席张国强及相关政府部门、行业组织、企业和科研院所等 100 余位代表通过 Zoom 线上参会，6500 余人观看了会议直播，参会代表主要来自中国、意大利、法国、巴西、日本、印度、瑞士、泰国、越南、伊朗和菲律宾等国家和地区。

浙江省商务厅对外贸易管理处处长李新为大会致辞。联盟主席会议通过了 2022 国际丝绸联盟工作报告，通报了国际丝绸联盟成员单位参与活动统计情况，来自意大利、法国、印度、伊朗、菲律宾、

泰国的 6 位嘉宾分享了各国的丝绸产业发展动态。丝绸高质量发展国际智库论坛院士报告、高质量发展和可持续发展三个部分，联盟邀请了中国工程院陈文兴院士，以及来自中国、意大利、日本、巴西、印度的 9 位专家学者分享了各国丝绸在高质量与可持续发展方面的重要进展与成果。

## 四、组织成员单位参加“第 26 届国际蚕业委员会大会”

去年，国际丝绸联盟和国际蚕业委员会签署了合作备忘录，双方旨在信息交流与资源共享等方面加强交流。9 月 8 日，联盟支持国际蚕业委员会在罗马尼亚召开了第 26 届国际蚕业委员会大会，会议以“蚕业科技——一种桑蚕新概念”为主题，共设置桑树、桑蚕、非桑蚕、蚕细菌学、蚕茧后加工技术、蚕业经济、营销和管理、丝绸的非纺织应用、丝绸加工 8 个分会场，邀请了来自中国、印度、泰国、菲律宾、古巴、埃及等国家和地区的 100 余位专家作专题报告和论文分

their countries. The International Think Tank Forum on Silk High-Quality Development set three sessions, including academician's report, high-quality reports, and sustainability reports. ISU invited Academician Chen Wenxing of the Chinese Academy of Engineering, as well as 9 experts and scholars from China, Italy, Japan, Brazil and India to share the important progress and achievements in high-quality and sustainable development of silk in various countries.

#### 4. Organize member units to participate in the "International Sericultural Commission Congress"

Last year, ISU signed a Memorandum of Cooperation jointly with International Sericulture Commission (ISC) aimed at strengthening exchanges in information exchange and resource sharing. On September 8, ISU support the ISC held the 26th International Sericultural Commission Congress in Romania. Focusing on the theme of "Seritech – the New Concepts in Sericulture", a total of eight sub-sessions were set up, including Mulberry, Bombyx mori, Non-mulberry silkworms, Bacology of silkworms/Silkworms in Research, Post-cocoon technology, Economy management and marketing in sericulture, Sericulture in non-textile industry, and Silk processing. More than one hundred experts from China, India, Thailand, the Philippines, Cuba, Egypt and other countries and regions were invited to give special reports and papers. From the perspective of policy support, development scale, variety cultivation of silkworm and mulberry, industrial chain, technology research and development, etc., the participants had in-depth exchanges on the development trend of sericulture and silk industries in

various countries. Representatives from ISU member units of Zhejiang Cathaya Group, Hangzhou Textile Machinery, Guangxi Huahong, Shengzhou Mulsun Biotech, Brazil Bisa Overseas, etc., attended the meeting. Zhang Guoqiang, chairman of ISU, and Jin Feng, R&D manager of Shengzhou Mulsun Biotech, were invited to give a keynote report.

#### 5. Organize member units to participate in the "2022 International Network of Silk Cities and Metropolises"

On November 17, ISU support Intersioe French, the ISU vice-chairman unit, to hosted the "2022 International Network of Silk Cities and Metropolises". The conference was held simultaneously online and offline. Como (Italy) was invited as the honored city. More than fifty industry experts and city representatives from China, France, Italy, Spain, Brazil, India, Uzbekistan and other countries and regions participated in the conference. At the meeting, the basic situation and operating mechanism of the city network were introduced. Focusing on the two major themes of "Culture, creation and development of territories: what is the place for the silk in the industry" and "How can we promote the industry to a young public", Zhang Guoqiang, chairman of ISU, academician Chen Wenxing, vice chairman and director of Education Research Professional Committee of ISU, and Stefano Vitali, vice chairman of ISU, were invited to give a keynote report. As well, ISU secretariat invited guests to participate in the "2022 International Think Tank Forum on Silk High-Quality Development and the International Silk Union Chairman Meeting".

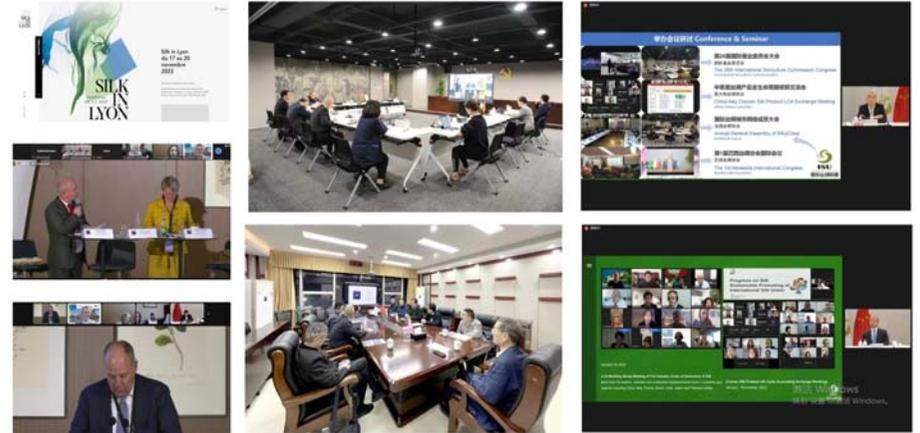
#### 6. Support to hold the "Crossover and Integration:

#### Academic Symposium on Museum Characteristic Development"

In order to further promote the museum's characteristic and high-quality development, and promote the museum's integration and empowerment for the silk fashion industry development, on December 30, ISU supported the vice chairman unit China National Silk Museum (CNSM) to hold an online "Crossover and Integration: Academic Symposium on Museum Characteristic Development". More than 100 scholars and representatives from China, the United States, Italy, Brazil, Spain, Thailand, other countries and regions participated in the conference through Tencent, and more than 20000 people watched the conference live through Sina Weibo and live broadcast platform. The opening ceremony was presided over by Ji Xiaofen, curator of CNSM, Chen Wenxing, vice chairman of ISU, academician of the CAE Member, president of ZSTU, and Liu Shuguang, chairman of the China Museum Association, addressed the conference respectively. The symposium was held in the morning and afternoon, respectively hosted by Zhang Chengming, deputy curator of CNSM, and Li Qizheng, secretary-general of ISU, president of Periodicals Agency of ZSTU. A total of 12 experts and scholars were invited to give keynote speeches, which provided constructive ideas for the future development of the museum around the current situation and direction of the textile clothing theme museum.

#### 7. Support the establishment of the "ZSTU Silk Public Welfare Development Fund"

On October 26, ISU supported ZSTU to launch the "ZSTU Silk Public Welfare Development Fund". Through



Organize member units to participate in the "2022 International Network of Silk Cities and Metropolises" 组织成员单位参加"2022 国际丝绸城市网络成员大会"

享，与会嘉宾就政策支持、发展规模、蚕桑品种培育、产业链条、技术研发等方面深入交流了各国蚕桑产业的发展态势。联盟成员浙江凯喜雅集团、杭州纺织机械、广西华虹、嵊州陌桑高科、巴西 Bisa Overseas 等相关代表参会。联盟主席张国强、嵊州陌桑高科研发经理金丰等受邀作主旨报告。

#### 五、组织成员单位参加"2022 国际丝绸城市网络成员大会"

11月17日，联盟支持副主席单位法国丝绸协会举办了"2022 国际丝绸城市网络成员大会"，会议线上线下同步召开，特邀主办城市为意大利科莫，来自中国、法国、意大利、西班牙、巴西、印度、乌兹别克斯坦等国家和地区的50余位行业专家和城市代表参会。会议介绍了城市网络的基本情况和运作机制，围绕"地域(城市)文化、创新与发展"和"推广丝绸吸引年轻一代"两大主题，联盟主席张国强，副主席兼教育科研专委会主任陈文兴院士，副主席 Stefano Vitali 等受

邀作主题报告，联盟秘书处也邀请与会嘉宾参加"2022 丝绸高质量发展国际智库论坛暨国际丝绸联盟主席会议"。

#### 六、支持举办"跨界与融合：博物馆特色化发展学术研讨会"

为深入推进博物馆的特色化和高质量发展，促进博物馆对丝绸时尚产业发展的融入与赋能，12月30日，联盟支持副主席单位中国丝绸博物馆线上举办了"跨界与融合：博物馆特色化发展学术研讨会"。来自中国、美国、意大利、巴西、西班牙、泰国等国家和地区的100余位学者和代表通过腾讯会议参会，20000余人通过新浪微博和直播平台观看了会议直播。会议开幕式由中国丝绸博物馆馆长季晓芬主持，联盟副主席、中国工程院院士、浙江理工大学校长陈文兴，中国博物馆协会理事长刘曙光分别为大会致辞。研讨会设上午、下午两场，分别由中国丝绸博物馆副馆长张成名，联盟秘书长、浙江理工大学杂志社社长李启正主持，共邀请了12位专家学者发表主

题演讲，围绕纺织服饰专题博物馆的现状与方向，为博物馆的未来发展提供了建设性思路。

#### 七、支持成立"浙江理工大学丝绸公益发展基金"

10月26日，国际丝绸联盟支持浙江理工大学发起"浙江理工大学丝绸公益发展基金"，通过邀请国际上丝绸行业代表性企业、机构和个人共同参与，为丝绸行业的人才培养、科学研究、学术出版、科技文化交流和公益活动等提供支持，促进丝绸行业的良性循环和可持续发展，维护国际丝绸行业的根本利益。基金已支持了丝绸科普短视频、丝绸科技活动、奖教金等项目的开展。

#### 八、编辑出版国际丝绸联盟会刊《ISU NEWS》

为传播国际丝绸产业资讯，分享丝绸行业的新理念、新技术、新成果，2022年，联盟打造了会刊《ISU NEWS》，这是由国际丝绸联盟和全国

the joint participation of representative enterprises, institutions and individuals in the international silk industry, it was expected to provide support for talent training, scientific research, academic publishing, scientific and technological cultural exchanges and public welfare activities in the silk industry, thereby promoting the virtuous circle and sustainable development of the silk industry, and safeguarding the fundamental interests of the international silk industry. The fund has supported the development of short videos of popular science, science and technology activities, faculty fellowship award and other projects in silk.

#### 8. Edit and publish the ISU proceedings "ISU NEWS"

In order to spread international silk industry information and share new ideas, new technologies, and new achievements in the silk industry, in 2022, ISU created the proceedings "ISU NEWS". As an internal industry journal sponsored by ISU and the China National Silk Information Center, it aimed to focus on silk development from an industry perspective, share the development trends of international sericulture and silk, and ultimately become an crucial exchange platform for the international silk industry. In 2022, focusing on the high quality and sustainable development of silk, emphasizing innovation and development such as intelligent manufacturing, green and low-carbon emission reduction, and cross-integration of industries, "ISU NEWS" shared more than fifty industry information with cutting-edge, scientific and industrial characteristics. In order to enrich the source of articles, ISU secretariat has established continuous cooperation in

journal information sharing with ISC and Ufficio Italiano Seta (UIS) and other organizations.

#### 9. Publicize the ISU member units and key silk enterprises

In order to investigate the operation of the industry and strengthen service effectiveness, in 2022, ISU secretariat visited nearly 20 Chinese member units such as Yayun Sericulture Base of Cathaya Group, High Fashion International, Wensli Group, Jin Fuchun Group, Shengzhou Mulsun Biotech, Zibo Dayanfeng Silk Group and so on. Besides, more than 20 representative silk companies in Zhejiang, Hunan, Guangxi, Sichuan and other places were investigated, and their operation and development situation have been publicized by the platform of World Silk Website. Simultaneously, in terms of silk textile talent training, information resource sharing, platform co-construction, project research, and exchange of visits, ISU secretariat has also actively carried out in-depth exchanges and cooperation with member units such as the China Textile Engineering Society (CTES).

#### 10. Newly develop seven ISU member units from six countries and regions

In 2022, ISU secretariat continued to expand new member countries, absorbing seven representative organizations and enterprises from six countries and regions such as China, India, Spain, Uganda, the Philippines and Hong Kong, China, namely, Shengzhou Mulsun Biotech Co., Ltd., Zhejiang Jasan Holding Group Co., Ltd., Nilima Silks Private Limited, Philippine Textile Research Institute, Visit València, Afro Silk Co., Neo-Concept Group.

So far, more than one hundred and forty companies and organizations from twenty-seven countries and regions have joined ISU, including China, Italy, France, Switzerland, Brazil, Poland, Japan, Turkiye, Thailand, India, Vietnam, Cambodia, Myanmar, Indonesia, Singapore, the United States, Australia, Uzbekistan, Bangladesh, Laos, Iran, Pakistan, Romania, Spain, the Philippines, Uganda and Hong Kong, China.

#### 11. Optimize the construction of ISU secretariat and publicity matrix

On a regular basis, ISU secretariat reported to relevant government departments on the work of union. As well, the secretariat has been supported by policies and platforms such as the 2022 Support Policy of Hangzhou Convention and Exhibition Industry Development, the National Base for International Science and Technology Cooperation in Textiles and Consumer-Goods Chemistry, and the Huzhou Research Institute of ZSTU. In 2022, although in the stage of normalizing the prevention and control of the Covid-19 epidemic, the secretariat actively promoted the work through conference systems, video recording, live broadcast, websites, mailboxes, social software and other channels. Therefore, a total of more than 1,300 emails were sent and received throughout the year, which led to the establishment of an exchange platform for member units to smooth international industrial exchanges.

In 2022, the ISU official website "World Silk Website" published a total of 77 articles, with 27,000 readings. The official WeChat account "World Silk Website" published 138 articles, with 65,000 readings, and accumulated 8,244 followers.



Support to hold the "Crossover and Integration: Academic Symposium on Museum Characteristic Development" 支持举办“跨界与融合：博物馆特色化发展学术研讨会”

丝绸信息中心共同主办的行业性内部刊物，旨在以行业的视角关注产业发展，分享国际蚕桑丝绸的发展动态，打造国际丝绸行业的交流平台。2022年，〈ISU NEWS〉聚焦丝绸高质量和可持续发展，关注智能化智造、绿色低碳减排、产业交叉融合等创新发展，共分享具有前瞻性、科学性和产业性的行业资讯50余篇，为丰富稿源，联盟秘书处还与国际蚕业委员会、意大利丝绸协会等组织建立了持续的期刊资讯共享合作。

#### 九、宣传报道联盟成员单位及重点丝绸企业

为调研产业运行情况，强化服务效能，2022年，国际丝绸联盟秘书处先后走访了凯喜雅集团雅云蚕桑基地、达利国际集团、万事利集团、金富春集团、嵊州陌桑高科、淄博大染坊集团等近20家中国联盟成员单位，并调研了浙江、湖南、广西、四川等地的20余家代表性丝绸企业，通过世界丝绸网等平台宣传报道企业运营和发展情况。同时，联盟秘书处也积极与中国纺织工程学会等成员单位在丝绸纺织人才培养、信息资源共享、平台共建、项目研究、考察互访等方面开展了深入的交流合作。

#### 十、新发展6个国家和地区的7家联盟成员单位

2022年，国际丝绸联盟秘书处持续扩展新成员国家，吸收了来自中国、印度、西班牙、乌干达、菲律宾和中国香港等6个国家和地区的7家代表性组织和企业，分别为嵊州陌桑高科股份有限公司、浙江健盛集团股份有限公司、尼利玛丝绸有限公司、菲律宾纺织研究所、瓦伦西亚城市基金会、埃弗罗丝绸公司和思宏(集团)有限公司。截止目前，共有来自中国、意大利、法国、瑞士、巴西、波兰、日本、土耳其、泰国、印度、越南、柬埔寨、缅甸、印度尼西亚、新加坡、美国、澳大利亚、乌兹别克斯坦、孟加拉国、老挝、伊朗、巴基斯坦、罗马尼亚、西班牙、菲律宾、乌干达和中国香港27个国家和地区的140余家企业和组织加入联盟。

#### 十一、优化联盟秘书处和宣传矩阵建设

国际丝绸联盟秘书处定期向有关政府部门汇报联盟工作开展情况，并得到了2022年杭州市会展业发展扶持政策、国家纺织与日用化学国际科技合作基地、浙江理工大学湖州研究院等政策和平台

的支持。2022年，在常态化疫情防控阶段，秘书处积极通过会议系统、视频录制、在线直播、网站、邮箱、社交软件等渠道，逐步推进秘书处工作，全年共收发邮件1300余封，为成员单位搭建交流平台，畅通国际产业交流。

2022年，国际丝绸联盟官网“世界丝绸网”发布文章77篇，阅读量2.7万次，官微“世界丝绸网”发布文章138篇，阅读量6.5万次，累积关注人数8244人。国际丝绸联盟相关重要活动也在头条号、搜狐号、百家号和企鹅号等自媒体平台进行推广，自2019年创立以来累积阅读量达65.1万次，并建立了“世界丝绸网湖州记者站”“ISU NEWS”等主题专栏。

#### 十二、2023年度工作计划

##### 1. 组织召开“2023 ISU 成员大会”

为进一步增强国际丝绸产业间交流互动，根据国际丝绸联盟章程规定，国际丝绸联盟将在2023年组织召开“2023国际丝绸联盟成员大会”，推选产生新一届国际丝绸联盟组织机构，探讨联盟未来工作规划及发展方向，交流国际丝绸产业发展的新趋势。

##### 2. 开展国际丝绸领域奖项荣誉评选

Some important ISU activities have also been promoted on self-media platforms such as Headline, Sohu, Bajija and Penguin. Since its inception in 2019, it has accumulated 651,000 readings. The three thematic columns of "Huzhou Reporter Station of World Silk Website", "ISU NEWS" and so on have been established.

## 12. 2023 Work Plan

(1) Organize the "2023 International Silk Union Members Assembly"

In order to further strengthen the exchanges and interactions in the international silk industry, and according to the ISU Constitution, the "2023 International Silk Union Members Assembly" will be held in 2023 to elect the new organizational structure, discuss the future work plan and development direction of the Union, and exchange new trends in the development of the international silk industry.

(2) Establish and carry out awards and honors in the field of international silk

In order to promote the sustainable development of the international silk industry and stimulate the innovation and development of the silk industry, ISU intends to establish awards and honors in the field of international silk in culture, education, science and technology, industry, etc., and formulate the implementation measures and selection conditions. Award the organizations, units and individuals globally that made the outstanding contributions to the development of silk industry.

(3) Continue to carry out the "System Construction and International Promotion of Life Cycle Account of Sericulture & Silk Products"

Focusing on the key technologies of the life cycle assessment of the entire industry chain of sericulture and silk, it is planned to continue organize experts from China, Italy, France, India, Brazil and other countries to carry out the research on the life cycle account of sericulture and silk products. Thus, a systematic and scientific accounting system for the environmental performance of sericulture and silk products in the life cycle of the entire industrial chain will be constructed, the "Guideline for the Carbon Footprint Account of Silk Products in the Life Cycle" will be formulated and published, and countermeasures and technical roadmaps for the optimization and regulation of the environmental performance of sericulture and silk products in the life cycle will be proposed, and finally, the assessment system "Beautiful Silk Index (BSI)" will be established.

(4) Organize member units to participate in international silk industry exchange activities

Continue to interact closely with the member units, participate in and support the international silk industry exchange activities of the member units and the countries in which they are located, such as the international activities held by ISC, International Network of Silk Cities and Metropolises, Alliance of International Textile Science & Technology, China International Silk Expo, China National Silk Museum, Brazilian Silk Association, etc. According to the dynamics of the epidemic situation, ISU secretariat will organize member units to participate in special research and industrial inspection activities of related member country in a timely manner.

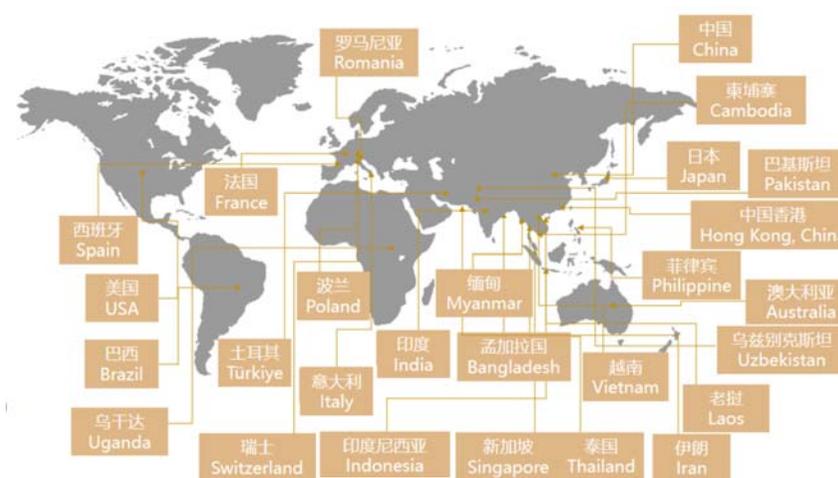
(5) Improve the working

mechanism, optimize the member units, and maintain close relations with more international organizations

Abide by the ISU Constitution, improve the operating mechanism and member management measures. From the aspects of internationalization, cross-border industry, scientific research and innovation, and great textiles, ISU will continue to develop new members and absorb high-quality enterprises and organizations from various silk-producing and consumer countries. Hold regular working meetings of the secretariat and make periodic work reports to the executive members and council members. Strengthen exchanges and interactions with international silk and textile industry organizations, so as to realize resource sharing and promote cross-border cooperation and application in the field of silk and great textiles. Promote the diversified utilization of sericulture and silk resources in carbon neutrality, biomedicine and other fields.

(6) Optimize the secretariat construction and enhance the influence of publicity matrix

Strengthen the construction and development of the media matrix of the official publicity platform "World Silk Website", and enhance the international influence of the journal "ISU NEWS". Through in-depth research on key silk industry clusters and representative enterprises, grasp the characteristics and development needs of member units, and improve the level of international service. Continue to promote and recommend member units and provide industry information to member units, accelerating the healthy and sustainable development of the international silk industry.



为促进国际丝绸产业的可持续发展，激励丝绸产业创新发展，国际丝绸联盟拟在2023年设立国际丝绸领域文化、教育、科技、产业等方面的奖项荣誉，制定相应实施办法和评选条件，面向全球评选对丝绸产业发展做出突出贡献的组织、单位与个人。

3. 继续开展茧丝绸产品生命周期核算体系的构建及国际化推广

围绕茧丝绸全产业链生命周期评价关键技术，继续组织中国、意大利、法国、印度、巴西等国的专家持续开展茧丝绸产品生命周期评价研究，构建全产业链、系统、科学的茧丝绸产品生命周期环境表现核算体系，制定和发布《丝绸产品生命周期碳足迹核算指南》，提出茧丝绸产品生命周期环境表现优化调控的对策与技术路线图，建立“美丽丝绸指数 (BSI)”评价体系。

4. 组织成员单位参与国际性丝绸行业交流活动

持续紧密与联盟各成员单位的互动，参与和支持丝绸纺织领域各国际组织及成员单位及所在国家的国际性丝绸行业交流活动，如国际蚕业委员会、国际丝绸城市网络、国际纺织科技联盟、中国国际丝绸博览会、中国丝绸博物馆、巴西丝绸协会等举办的国际性活动。根据疫情情况，联盟秘书处将适时组织成员单位参加各成员国的专题调研和产业考察活动。

5. 完善工作机制，优化成员单位，与更多国际组织紧密关系

遵循联盟章程，完善运行机制和成员管理办法，从国际化、行业跨界、科研创新、大纺织等方面继续发展新成员，吸收各丝绸生产国和消费国的优质企业

和组织。定期召开秘书处工作会议，向常务理事和理事单位做好阶段性工作汇报。加强与国际丝绸纺织行业组织的交流互动，实现资源共享，促进丝绸与大纺织领域的跨界合作与应用，推广茧丝绸资源在碳中和、生物医药等领域的多元化利用。

6. 优化秘书处建设，提升宣传矩阵影响力

加强官方宣传平台“世界丝绸网”融媒体矩阵的建设与发展，提升会刊《ISU NEWS》的国际影响力。深入调研重点丝绸产业集群和代表性企业，了解成员单位的特色与发展需求，提升国际化服务水平，宣传推荐成员单位，为成员单位提供行业资讯，促进国际丝绸产业的健康可持续发展。

I have the honor to be the Vice President of International Silk Union and the President of Ufficio Italiano Seta, the group that represents the core of the silk textile chain in Italy. We are an important number of small medium-sized companies, very specialized in each aspect of the activities which add value to silk, from twisting to finishing. Our companies are the backbone of Como district, which as you well know, is the hub of silk industry in Europe.

It is a pleasure to meet you today for the meeting that International Silk Union has arranged. We are approaching the end of 2022. Finally this year we have been able to recover the levels of turnover we were used to achieve until the end of 2019.

In the first half of 2022 our exports of silk products increased 35%, in value, and 34% in quantity. Also imports of silk materials and silk grey clothes increased substantially. This is good news, but dark clouds stand out on the horizon. In Europe the war and the upward trend of inflation, that has been caused by the big jump of the quotations of natural gas, have lowered consumers' demand. During the second half of this year, the market has been less satisfactory. At the end of 2022 recovery has stopped and we do not know what will happen next year.

We look ahead and Italian silk industry is very interested in the research that International Silk Union decided to promote some months ago.

Sustainability is a key word today and it has a tremendous impact on the marketing approach of our customers, the brand names. Higg Index is no longer a problem. It was not a serious index, it has been suspended and this is good news for silk community. But we cannot stop the job that we have started some months ago.

At the end of March the European Commission has released its communication regarding "European Union Strategy for Sustainable and Circular Textiles". The idea is to reduce the impact of the production and the consumption of textile products on climate, on water, on energy consumption and on the environment. According to this strategy, textile products placed on the EU market must be long lived and recyclable. According to this strategy, textile products to a great extent must be made of recycled fibres, must be free of hazardous substances and must be produced in respect of social rights and the environment. In the forthcoming months, the European Commission will publish several regulations.

Circular economy, ecodesign, microplastic reduction, reliable green claims, producers responsibility, traceability are target goals.

In Europe textile industry will move from an unregulated sector, driven by low cost and fast production and consumption, to a very regulated industry, with strong focus on sustainability and transparency. This strategy will produce its effects not only on textiles produced in Europe, but also on imports.

Silk community must be aware of this substantial development and must act accordingly. For this reason we have been engaged in supporting the life cycle assessment study that has been carried out by Innovhub, in Italy, and by some universities in China. Our LCA technicians have done an important job of sharing common guidelines, aggregated data and fundamental criteria for reference. This work has taken its time, but now that is almost completed it allows us to examine comparable data and fundamental criteria for reference. This work has taken its time, but now that is almost completed it allows us to examine comparable data and fundamental criteria for reference.

In the sake of silk, I hope it will be the beginning of a concrete cooperation activity for facing future challenges that the market and policy makers are going to introduce.

## Overview of Italian Silk Industry Development 意大利丝绸产业发展概况



**Stefano Vitali**  
Vice Chairman of ISU  
President of Ufficio Italiano Seta  
国际丝绸联盟副主席  
意大利丝绸协会会长

很荣幸作为国际丝绸联盟副主席和意大利丝绸协会的会长发言，意大利丝绸协会是意大利丝绸纺织产业链的核心。科莫有众多中小型企业，专门从事丝绸产业链活动，包括从捻丝到整理的各个方面。这些企业是科莫区的支柱。众所周知，科莫地区是欧洲丝绸业的中心。

很高兴能在国际丝绸联盟组织的会议上见到各位。2022年已接近尾声。今年，我们终于可以恢复到2019年底之前的营业额水平。

2022年上半年，我们的丝绸产品出口值增长了35%，出口量增长了34%。真丝面料和真丝坯布的进口也大幅增长。

这是一个好消息，但同时乌云也萦绕在我们身边。在欧洲，由于战争和由天然气价格暴涨，通货膨胀愈发严重，这就降低了消费者的需求。今年下半年，市场情况差强人意。2022年底，复苏戛然而止，我们不知道明年会发生什么。

展望未来，意大利丝绸行业对国际丝绸联盟几个月前决定推动的研究颇感兴趣。

可持续发展是当今的一个关键词，它对我们的客户、品牌商的营销方式有着巨大的影响。Higg指数也不再是个问题。Higg指数并非一个严谨的指数，好在它已被暂停，这对丝绸界而言是一个好消息。但我们不能停止几个月前已经着手的工作。

3月底，欧盟委员会发布了关于《欧盟可持续和循环纺织品战略》的公告。该战略旨在减少纺织品的生产和消费对气候、水、能源消耗和环境的影响。根据这一战略，到2030年，投放到欧盟市场的纺织产品必须经久耐用且可回收。根据这一战略，纺织品在很大程度上须由再生纤维制成，不得含有害物质，且须在尊重社会权利和环境的前提下生产。根据这一战略，在接下来的几个月里，欧盟委员会将公布几项法规。

循环经济、生态设计、降低微塑料污染、可靠的绿色声明、生产者责任、可追溯性是欧盟委员会要达成的目标。在欧洲，纺织业将从一个由低成本和快产快消驱动的无管制行业，转变为一个颇具规范的行业，高度关注可持续性和透明度。这一策略不仅会对欧洲生产的纺织品产生影响，也会对进口产生影响。

丝绸界必须意识到这一重大发展，并采取相应行动。因此，我们一直全力支持意大利丝绸研究中心和中国一些高校开展的生命周期评估(LCA)研究。我们的LCA技术人员在共享通用指南、汇总数据和制定基本参考标准方面做了颇为重要的工作。这项研究花了不少时间，目前已基本完成。如此一来，我们便可以审查可比数据、认真介绍丝绸产业链对环境的影响。为了丝绸事业，我希望这项研究是开展具体合作活动的开始，希望今后一起应对市场和政策制定者带来的挑战。

## Overview of French Silk Industry Development 法国丝绸产业发展概况

I am here in my function of Vice Chairman of ISU & I am also representing the French Silk industry as vice president of the French textile organization UNITEX and the Co-president of Silky Cities network.

I would like to expose to you the development dynamics of the silk industry in France and the low-carbon transition. And before that, I would like to stress that the silk industry is still a source of creation and innovation, but also a source of meaning, in view of the major challenges facing our society. A few weeks ago, in France, we have highlighted silk, as we do every year, at "Silk in Lyon" Festival from 17 to 20 November. The general public was able to discover how the silk know-how is perpetuated, how the silk industry reinvents itself in many fields of application such as cosmetics, and how its organic origin gives it a powerful asset. After Hangzhou and Kyoto, this edition, which brought together 5,500 visitors, was the opportunity to emphasize the city of Como in Italy as guest of honor of the event.

As regards the dynamics of the French silk industry, the activity of our industry, driven by the luxury sector, has been doing well since the beginning of the year with:

- A well-filled order book in both the fashion and furniture sectors.
- An increase in exports to Europe, China and the United States.
- Companies that are recruiting.

Nevertheless, concerns are hampering this dynamic, first and foremost the war in Ukraine, which

has amplified the shock on energy prices and supplies, reduced the purchasing power of households and the profitability of energy-intensive sectors, which is not favorable to either consumption or industrial production. The rise in energy prices has a major impact on the French production sector, particularly for textile finishers, for whom the share of energy has risen from 10% to 50% of their turnover. The issue of sustainability of the business is at stake today.

The energy crisis and climate change are putting the need for a sustainable transformation of our sector at the heart of our thinking. Energy and climate change are a challenge for competitiveness and long-term sustainable development.

We need to integrate the impact of climate change on each of our activities, measure our carbon impact and define a Climate Strategy compatible with the *Paris Agreements*. In other words, to achieve our greenhouse gas emission reduction targets, we need to be aware of the decarbonization levers, and invest to accelerate the low-carbon transition of our industry.

Silk is by nature a renewable material with low environmental impact:

- The silkworm feed on mulberry leaves which do not require a lot of pesticides or fertilizers to grow.
- The mulberry silkworms have been completely cultivated and they are not able to do without humans to care and feed them.
- The cultivation of mulberry

trees doesn't need irrigation, it's a water saving cultivation.

The transformation of this natural material, to the manufacture of the finished fabric, requires numerous processes based on both traditional and modern know-how, which we must question from upstream to downstream with regard to climate change. The resulting strategy is therefore in line with the very principle of the circular economy.

Within this framework, at the level of our profession in France, numerous actions have been undertaken, such as

- Setting up a task force "Revolution for the energy transition of the textile industries".
- Continuation of the carbon footprint assessment of the silk industry and launch of training-actions so that companies take ownership of the approach and can be able to define a climate strategy.
- Participation in environmental display experiments.
- Reflection underway to participate in the collective life cycle analysis study with "Innov Hub — Stazione Sperimentale per la Seta" at the European and international levels.

In conclusion, I would like to make a promise, which is expressed in the light of these studies and work, on a local and international scale, and which is based on our international networks, whether it be the ISU, the ISC or Silky Cities: it is to position silk as a key natural material for sustainability and the circular economy.

**作**为国际丝绸联盟副主席、里昂纺织企业联合会 (Unitex) 副会长和国际丝绸城市网络联合会会长,在此,我代表法国丝绸行业作此发言。

我向大家介绍一下法国丝绸行业的发展动态和低碳转型。尽管当今社会面临着重重挑战,丝绸业仍然是创造和创新的源泉,也是意义价值的源泉。几周前,在法国11月17日至20日举办的“里昂丝绸节”上,我们一如既往地重点放在了丝绸上。期间,公众可以看到丝绸技术是如何流传至今,丝绸业是如何在众多应用领域(如化妆品)中重塑自我的,及其有机来源如何使其成为强大资本的。继分别邀请主宾城市杭州和京都共同举办丝绸节后,本届丝绸节吸引了5500名观众,是一次展示主宾城市——科莫市的大好机会。

关于法国丝绸业的发展动态,在奢侈品行业的推动下,该行业自年初以来一直表现良好,具体表现为:

- 时装和家具领域的订单都很充足;
  - 对欧洲、中国和美国的出口增加;
  - 各企业都在招募人才。
- 然而,各种关切问题正在阻碍丝绸

业的发展。首先是乌克兰战争,它加大了对能源价格和供应的冲击,降低了家庭的购买力和能源密集型部门的盈利能力,这对消费和工业生产都颇为不利。能源价格的上涨对法国的丝绸业产生了重大影响。特别是对纺织加工企业而言,能源所占份额已从营业额的10%升至50%。如今,企业的可持续性问题的迫在眉睫。

能源危机和气候变化在挑战着丝绸业的竞争力和长期可持续发展,这就要求我们,要把丝绸业的可持续转型放在核心位置。

我们需要整合气候变化对我们每项活动的影响,衡量我们的碳影响,并制定符合《巴黎协定》的气候战略。换言之,为了实现我们的温室气体减排目标,我们要意识到脱碳杠杆,并加大投资以加速丝绸业的低碳转型。

从本质上讲,丝绸是一种可再生的材料,对环境的影响很小,具体表现在:

- 蚕以桑叶为食,桑叶的生长无需要大量农药或肥料;
- 桑蚕完全是人工培育的,它们离不开人类的照料和喂养;

• 桑树的栽培不需要灌溉,属于节水栽培。

将这种天然材料转化为成品面料,涉及一系列传统和现代技术流程。考虑到气候变化,我们必须对这些流程从上游到下游对提出质疑。这样一来,由此产生的战略也便符合循环经济的原则。

在这一框架内,法国的丝绸业已经采取了诸多行动,如:

- 成立“纺织工业能源转型革命”特别工作组;
- 继续对丝绸业进行碳足迹评估,并展开培训活动,以便各企业能够掌握这一方法,并能够制定气候战略;
- 参与环境展示实验;
- 在欧洲和国际范围内,与意大利丝绸研究中心一同参与集体生命周期分析研究。

最后,我想根据这些在本土和国际范围内开展的研究和工作,基于国际平台,无论是国际丝绸联盟、国际蚕业委员会,还是国际丝绸城市网络,做出一个表态:将丝绸定位为可持续发展和循环经济的关键天然材料。



**Xavier Lepingle**  
Vice Chairman of ISU  
President of Intersole France  
国际丝绸联盟副主席  
法国丝绸协会会长

# Overview of Indian Silk Industry Development

## 印度丝绸产业发展概况



**Dileep Kumar R**  
Executive Director of ISC  
国际蚕业委员会常务主任

Silk has a long history and tradition of production, consumption and trade through its own weaves and textures in India. Silk carries an important place in the life and culture of Indians and no auspicious ritual is complete without silk. India is the second largest silk producer and the largest silk consuming country in the world. Owing to the high employment potential, low capital requisite and remunerative nature sericulture and silk industry plays a major role in providing livelihood opportunities for millions of people and socio-economic upliftment for large portion of poor tribal farmers of India. The sericulture related activities ensure the livelihood security for over 1.20 million families stretch over in about 75,350 villages across the country. India is the only country in the world to produce all the five known commercial varieties of silk viz., mulberry, tropical tasar, oak tasar, eri and muga and the raw silk production in the country during 2021-22 was 34,923 MT.

### Growth in Mulberry Silk Production

Mulberry is the major silk produced in the country, which accounts for about 74% of total silk production during 2021-2022. The major mulberry silk production comes from southern region of India, wherein sericulture is practiced throughout the year.

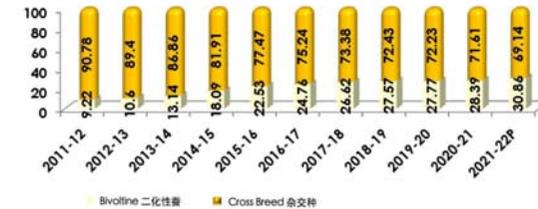
The mulberry area increased from 181,089 ha in 2011-2012 to 245,185 ha in 2021-2022 at a compound annual growth rate of 2.79% (Table 1). During the same period, mulberry raw silk production increased from 18,272 MT to 25,853 MT at a growth rate of 3.21% per annum. In India, with the prevalence of tropical climate, multivoltine mulberry silk has been produced traditionally. The cross breed silk, which is obtained from the hybrid of multivoltine and bivoltine silkworm breeds, is the major type of mulberry silk produced in the country. The cross breed silk production grew at

a modest rate of 0.68% per annum during the period between 2011-2012 and 2021-2022. The fast pace of growth in bivoltine silk production as compared to crossbreed resulted in steep increase in the share of bivoltine silk production in total mulberry silk production from mere 3.69% in 1995-1996 to whopping 15% in 2021-2022.

The increase in the indigenous production of bivoltine silk has helped to reduce the raw silk imports drastically during the last decade.

### Growth in Vanya Silk Production

The non-mulberry silks (tasar, eri and muga) are known as Vanya silks in India. The forest based tasar silk is prominently produced in Central and Eastern regions of India. The North-Eastern states are known for the production of eri and muga silks. The tasar silk production slightly down from 1,590 MT in 2011-2012 to 1,456 MT in 2021-2022 registering a growth rate of -0.80% per annum (Table 2); whereas, eri silk production recorded an annual growth of 8.27% to



Bivoltine share in total mulberry raw silk production (%)  
二化性蚕丝绸在桑蚕生丝生产中的份额 (%)

在印度，丝绸有着悠久的历史、生产和贸易历史和传统。丝绸在印度人的生活和文化中占有重要地位。可以说，没有丝绸，任何祥瑞仪式都是不完整的。印度是世界上第二大丝绸生产国和第一大丝绸消费国。由于就业机会多、所需资金少、报酬高，蚕桑丝绸业在为数百万人提供生计和提高印度大部分贫困部落农民的社会经济地位方面发挥了重要作用。蚕桑相关活动确保了全国约75350个村庄的120多万家庭的生计安全。印度是世界上唯一一个生产所有五种已知商业丝绸品种的国家，即桑蚕丝、热带柞蚕丝、柞蚕、蓖麻蚕丝和姆伽蚕丝。2021-2022年间，印度的生丝产量为34923公吨。

### 桑蚕丝产量的增长情况

桑蚕丝是印度生产的主要丝绸，2021-2022年间占丝绸总产量的74%左

右。桑蚕丝生产主要来自印度南部地区，那里全年都在进行蚕桑养殖。

桑园面积从2011-2012年的181089公顷增至2021-2022年的245185公顷，复合年均增长率为2.79% (表1)。同期，桑蚕丝产量从18272公吨增至25853公吨，复合年均增长率为3.21%。在印度，由于热带气候的盛行，传统上一直在生产多化性桑蚕丝。杂交蚕是由多化性和二化性蚕品种杂交而成的，杂交蚕丝是印度生产的主要桑蚕丝类型。在2011-2012年和2021-2022年期间，杂交蚕丝产量大致以每年0.68%的速度保持小幅增长。

与杂交蚕丝相比，二化性蚕丝产量的快速增长导致二化性蚕丝的产量在桑蚕丝总产量中的份额急剧增加，从1995-1996年的仅3.69%增至2021-2022年的15%。在过去的十年中，本土生产的二化性蚕丝的增加大大减少了生丝的进口。

### 野生蚕丝产量的增长情况

非桑蚕丝 (柞蚕丝、蓖麻蚕丝和姆伽蚕丝) 在印度被称为 Vanya。以森林为基础环境的柞蚕丝主要产于印度中部和东部地区。东北部各州则以生产蓖麻蚕丝和姆伽蚕丝而闻名。柞蚕丝产量从2011-2012年的1590公吨微降至2021-2022年的1456公吨，复合年均增长率为-0.80% (表2)；而蓖麻蚕丝产量则从2011-2012年的3027公吨增至2021-2022年的7359公吨，复合年均增长率为8.27%。在过去十年中，姆伽蚕丝的复合年均增长率为5.98%。

### 丝绸总产量的增长情况

印度的丝绸产量从2011-2012年的23060吨增至2021-2022年的34923吨，复合年均增长率为3.85% (表3)。在此期间，印度桑蚕丝产量大致以每年3.21%的速度增长。另一方面，非桑蚕丝的增

Years 年份	Mulberry Area (ha) 桑园面积 (公顷)	Raw Silk Production (MT) 生丝产量 (公吨)		
		Bivoltine 二化性蚕丝	Cross Breed 杂交蚕丝	Total 合计
2011-12	181089	1685	16587	18272
2012-13	186015	1984	16731	18715
2013-14	203023	2559	16917	19476
2014-15	219819	3870	17520	21390
2015-16	208947	4613	15865	20478
2016-17	216810	5266	16007	21273
2017-18	223926	5874	16192	22066
2018-19	235001	6987	18357	25344
2019-20	239967	7009	18230	25239
2020-21	237578	6783	17113	23896
2021-22P	245185	7978	17875	25853
CAGR*(%)	2.79	15.18	0.68	3.21

Note: CAGR-Compound Annual Growth Rate; P-Provisional  
注: CAGR 指复合年均增长率; P 指暂时

Table 1: Mulberry area & production in India (2011–2022)  
表 1: 印度桑园面积和桑蚕丝产量 (2011-2022)

increase from 3,027 MT in 2011–2012 to 7,359 MT in 2021–2022. Muga silk grew at a rate of 5.98% during last decade.

#### Growth in Overall Silk Production

The silk production in the country grew from 23,060 MT in 2011–2012 to 34,923 MT in 2021–2022 at an annual compound growth rate of 3.85% (Table 3). The mulberry silk production in the country grew at 3.21% per annum during the period. On the other hand, the non-mulberry silks registered higher growth rate of -0.80% by tasar, 8.27% by eri and 6.60% by muga. Among the four varieties of silks, mulberry silk accounted for 79% of the total silk production in the country during 2011–2012. As the non-mulberry silk production grew at a comparatively higher rate than mulberry silk during the period, the share of mulberry silk in the total silk production reduced to 74% in 2021–2022.

#### Growth in Silk Consumption

The raw silk demand has been

growing in the country at 2.30% per annum from 28,743 MT in 2011–2012 to 36,901 MT in 2021–2022 (Table 4). As the domestic production of silk in India is not able to meet the actual requirement of the silk industry, India imports raw silk to fill the demand–supply gap. Out of the total requirement of 28,743 MT of raw silk during 2011–2012, 23,060 MT (80%) was domestically produced and the remaining 5,683 MT (20%) was imported primarily from China.

As there is declining trend in import of raw silk due to increase in domestic silk production especially import substitute bivoltine silk production, the demand–supply gap has been narrowing down over the years. The share of domestically produced silk in the total quantity of silk consumed during 2021–2022 increased to 95% and the share of the imported silk fell down to 5%. It is expected that the country would become self-sufficient in raw silk production by 2025.

#### Prospects of Sericulture Industry in India

The Indian sericulture industry is poised to transform in its structure in many ways – a large producer of multivoltine silk into a bivoltine silk producer, from the largest raw silk importer into self-reliant in raw silk and the largest producer of Vanya or wild silks.

A largest portion of consumption of silk is in the form of saree, which is a traditional product. With the purchasing power of the people increasing and the dressing habits changing, now new products are developed through fabric engineering, blending, designing new fabric structures and employing new processing techniques to meet the needs of domestic as well as international markets.

Attention is also paid on exploring non-traditional uses of silk to add value to the by-products generated in the industry that catapaults the industry into a more profitable and economically viable one.

长率较高, 柞蚕丝为 -0.80%, 蓖麻蚕丝为 8.27%, 姆麻丝为 6.60%。2011-2012 年间, 在四种丝绸品种中, 桑蚕丝占全国丝绸总产量的 79%。由于这一时期非桑蚕丝产量的增长速度相对高于桑蚕丝, 2021-2022 年桑蚕丝在蚕丝总产量中的份额降至 74%。

#### 丝绸消费的增长情况

印度生丝需求大致以每年 2.30% 的速度增长, 从 2011-2012 年的 28743 吨增至 2021-2022 年的 36901 吨 (表 4)。由于印度本土丝绸产量无法满足丝绸业的实际需求, 印度需进口生丝来填补供需缺口。2011-2012 年生丝总需求为 28743 公吨, 其中 23060 公吨 (80%) 为国内生产, 其余 5683 公吨 (20%) 则主要从中国进口。

由于国内丝绸产量的增加, 尤其是进口替代丝绸二化性丝产量的增加, 生丝进口呈下降趋势, 供需缺口逐年缩小。2021—2022 年期间, 印度国产丝绸在丝绸消费总量中的份额增至 95%, 进口丝绸的份额则降至 5%。预计到 2025 年, 印度将实现生丝生产自给自足。

#### 印度养蚕业的前景

印度养蚕业正准备在许多方面进行结构转型——从多化性丝的大型生产国转变为二化性丝绸的生产国, 从最大的生丝进口国转变为自给自足的生丝和最大的野蚕丝生产国。

最大的丝绸消费品是印度传统服装——纱丽。随着人们购买力的提高和穿着习惯的改变, 现在主要通过织物工程、混纺、设计新的织物结构和采用新的加工技术来开发新产品, 以满足国内和国际市场的需求。

此外, 人们还注重探索丝绸的非传统用途, 以增加丝绸副产品的价值, 进而使该行业成为一个利润更高、经济更可观的行业。

Years 年份	Silk Production (MT) 丝绸产量 (公吨)			
	Tasar Raw Silk 柞蚕丝	Eri Spun Silk 蓖麻粗丝	Muga Raw Silk 姆麻丝	Total Vanya 野生蚕丝总量
2011-12	1590	3072	126	4788
2012-13	1729	3116	119	4964
2013-14	2619	4237	148	7004
2014-15	2434	4726	158	7318
2015-16	2819	5060	166	8045
2016-17	3268	5637	170	9075
2018-19	2981	6910	233	10124
2019-20	3136	7204	241	10581
2020-21	2689	6946	239	9874
2021-22P	1456	7359	255	9070
CAGR (%)	-0.80	8.27	6.60	5.98

Note: CAGR-Compound Annual Growth Rate; P-Provisional  
注: CAGR 指复合年均增长率; P 指暂时

Table 2: Vanya silk production in India (2011–2022)  
表 2: 印度野生蚕丝产量 (2011-2022)

Years 年份	Raw Silk Production (MT) 生丝产量 (公吨)			Share in Total Production (%) 百分比	
	Mulberry 桑蚕丝	Vanya 野蚕	Total 合计	Mulberry 桑蚕丝	Vanya 野蚕丝
2011-12	18272	4788	23060	79.24	20.76
2012-13	18715	4964	23679	79.04	20.96
2013-14	19476	7004	26480	73.55	26.45
2014-15	21390	7318	28708	74.51	25.49
2015-16	20478	8045	28523	71.79	28.21
2016-17	21273	9075	30348	70.10	29.90
2017-18	22066	9841	31907	69.16	30.84
2018-19	25344	10124	35468	71.46	28.54
2019-20	25239	10581	35820	70.46	29.54
2020-21	23896	9874	33770	70.76	29.24
2021-22P	25853	9070	34923	74.03	25.97
CAGR(%)	3.21	5.98	3.85		

Note: CAGR-Compound Annual Growth Rate; P-Provisional  
注: CAGR 指复合年均增长率; P 指暂时

Table 3: Total silk production in India (2011–2022)  
表 3: 印度丝绸总产量 (2011-2022)

Years 年份	Domestic Production of Raw Silk (MT) 国内生丝产量 (公吨)	Raw Silk Imports (MT) 生丝进口量 (公吨)	Total Consumption of Raw Silk (MT) 生丝总消费量 (公吨)
2011-12	23060	5683	28743
2012-13	23679	4959	28638
2013-14	26480	3260	29740
2014-15	28708	3489	32197
2015-16	28523	3529	32052
2016-17	30348	3795	34143
2017-18	31907	3712	35619
2018-19	35468	2785	38253
2019-20	35468	3315	39135
2020-21	33770	1804	35574
2021-22P	34923	1978	36901
CAGR(%)	3.85	-9.15	2.30

Note: CAGR-Compound Annual Growth Rate; P-Provisional  
注: CAGR 指复合年均增长率; P 指暂时

Table 4: Raw silk production, import & availability in India (2011–2022)  
表 4: 印度生丝生产、进口和供应情况 (2011-2022)

## Overview of Iranian Sericulture Industry Development

### 伊朗蚕桑产业发展概况



**Reza Sourati Zanjani**

Head of Iran Silk Research Center  
伊朗丝绸研究所所长

Iran Silk Research Center (ISRC), belonging to Agricultural Research Education and Extension Organization (AREEO), aside from formal missions consist of education, extension and researches, its other duties are as follows:

1. Keeping gene resources of mulberry and silkworm. Today we have more than 122 silkworm varieties seven of which are commercial ones (3 Japanese based and 4 Chinese based). Furthermore, we do silkworm breeding and recently we have introduced a new Iranian commercial hybrid, which resulted in significantly more cocoon production.

2. Producing of grandparents in order to present F1 to other public organizations and eventually preparing silk worm eggs for sericulturists.

3. Investigations on silkworm and mulberry in different fields in order to develop sericulture in Iran.

Guilan province led the way in term of silkworm production by 40 percent of production. ISRC is also located in Guilan.

Silkworm production has dramatically decreased in recent years because of cheap price of the cocoon due to dip of carpet exportation as well as function changing the mulberry farms to either residential areas or other farms.

Presently, we have 50000 boxes of silkworm eggs consumption. Each box leads to 40 kg production of cocoons.

#### ISRC researches

1. Pests and diseases of mulberry, silkworm and IPM.

2. Mulberry and silkworm breeding.

3. Horticulture and plant nutrition studies on mulberry.

4. Biological studies on silkworm.

#### ISRC plan for sericulture development

International collaborates with other countries in scientific surveys, research visits and internships, education, exchange of strains and technologies, by-products, etc. ISRC emphasize on by-products because of efficiency and employment. So far, we started this with related organizations in China in the form of memorandum of understanding with YAAS. Also, ISRC welcome every other country for collaboration in above mentioned areas or other recommended ones.



伊朗 (ISRC) 隶属于伊朗农业研究、教育和推广组织 (AREEO), 除教育、研究和推广等常规职责外, 还包括以下职责:

1. 保存桑、蚕基因资源。ISRC 拥有 120 余个蚕品种, 其中 7 个是商业蚕品种 (包括 3 个日本蚕品种、4 个中国蚕品种)。此外, 还进行蚕育种, 近期引进了一种新的伊朗商业杂交种, 进而大大提高了蚕茧产量;

2. 生产原原种, 以便向其他公共组织提供原种, 并最终为蚕农提供蚕卵;

3. 为发展伊朗蚕业, 对不同领域的蚕桑进行调查。

伊朗吉兰省的蚕产量占总产量的 40%, 居全国之首。ISRC 便位于吉兰省。近年来, 由于地毯出口下降导致蚕茧价格低廉, 以及桑园改为住宅区或其他农场, 蚕产量急剧下降。目前, ISRC 使用了 5 万箱蚕种, 每箱可生产蚕茧 40 千克。

#### ISRC 主要研究

1. 桑、蚕病虫害及综合治理;  
2. 桑蚕养殖;

3. 桑树园艺及植物营养研究;  
4. 蚕的生物学研究。

#### ISRC 蚕桑发展计划

在科学调查、研究访问和实习、教育、菌株和技术交流、副产品等方面与其他国家开展国际合作。

ISRC 重视副产品是因为考虑到效率和就业。ISRC 已与中国云南省农业科学院签订谅解备忘录, 开始这项工作。此外, ISRC 期待与各国的私营或公共部门在上述领域或其他推荐领域开展合作。

## Overview of the Philippines Silk Industry Development 菲律宾丝绸产业发展概况

Silk is not a natural-sourced fiber in the Philippines, but something that was introduced to us many years ago. Luzon and Mindanao were the locations they were first introduced.

Within the last 50 years, the use of silk as a natural fiber material in Philippine textiles has hit highs and lows and most of the time moving slow and steady. Right now, our annual raw silk demand is still 10 tons, a small requirement compared to other neighboring Asian countries. But even then, our local silk production has difficulty meeting the 10% of the demand. Data and statistics can attest to how this low supply leads the country to continuously import silk products every year, that mainly include raw silk, silk yarn and silk fabric.

We in the Philippines do not wear silk as regularly as how other Asian countries do. For us, silk is a material for apparel or a garment wear worn for special occasions only.

So what makes Philippine silk in demand? It is a textile-fiber material for our traditional handloom weaving. We have various traditional handloom weaving communities all across the country, spread out in Luzon, Visayas and Mindanao, and a good number of them uses silk.

This goes to say that our local market is the fashion and creative industries — they are the designers, the apparel and garment makers who create different forms of silk and silk-blend wearable textiles.

The locations of silk production

in the Philippines is limited. The government continues to rally forward for increase of support for the silk industry to prosper.

Most of the developments of silk is initiated, run and managed by the government. Right now, DOST-PTRI is one of the 3 government offices that have the mandate to increase silk production or the conduct or research and development direction for silk. This government participation will take a while until the private sector is stable enough to handle the tasks henceforth.

One best effort of the government support is the creation of a national policy called the *Philippine Tropical Fabric (PTF) Law* to support the utilization of Philippine-grown and produced natural fibers that include abaca, banana, pineapple and now silk. The fabric should have content of silk at 5% minimum. The law prescribes for the use of the tropical fabric for uniforms of government officials and employees and other special use. So, we talk here of at least 1.8M people mandated to have PTF in their uniforms and official apparel. This will be a big local market year after year. This effort intensifies the government's intention to support the local silk industry while upholding the cultural heritage of using the country's own natural fibers.

In response to this, DOST-PTRI particularly implemented a program bannered under SEDA Pilipinas. This is our local branding of Philippine silk. It is purely a DOST-PTRI initiative. Its implementation paved the way to revitalize or revive the sericulture and

silk production activities in strategic areas in the country.

These areas used to have low to zero activities of sericulture activities prior to year 2018. Today, these areas have either mulberry plantation or silkworm rearing going on. And the interest to sericulture keeps on increasing and expanding to other regions.

The development of silk industry in the country in the last 4 years through this initiative has been the exact thing. The program also leads in providing platform for the convergence or the national meeting of partners through staging of Philippine Silk Summit. Additionally, it also now leads in the creation of a technical working group to come up with the Philippine Silk Road map that will be actively participated by both the government and private sectors, alike.

Here has been our approach to achieving the goals of the program-integration of the silk value chain. The seven place with efforts are being already done or conversations have been currently initiated. The intention is that in these strategic areas in the country, there is the presence of major value chain players, particularly at the least, the source of local silkworm hybrids, silk cocoon production farms and silk processing centers.

The DOST-PTRI continues to strengthen the hybrid egg resources in 2 of these areas with the intention to multiply the hybrid egg centers so that they will be available in the sites of high sericulture interests. We

在菲律宾，丝绸并不是一种本土纤维，而是多年前引进到这里的一种纤维。Luzon、Mindanao 是丝绸首次被引入的地方。

在过去的 50 年里，在菲律宾纺织品中，天然纤维材料丝绸的发展起伏，但整体发展是缓慢而稳定的。目前，菲律宾的年生丝需求量仍为 10 吨，与其他亚洲邻国相比，这一需求量并不高。但即便如此，菲律宾本土的丝绸生产，满足不了需求量的十分之一。数据和统计资料表明，由于本土供应量低，菲律宾每年都要进口丝绸产品，主要包括生丝、丝线和面料。

菲律宾人不像其他亚洲国家那样经常穿着丝绸衣物。对我们来说，丝绸是一种服装面料，或者是只在特殊场合穿着的服装。

那么究竟是什么让菲律宾的丝绸如此受欢迎呢，丝绸是传统手工织机编织的纺织纤维材料。在全国各地都有各种传统的手工织机织造社区，分布在吕宋岛、维萨亚斯岛和棉兰老岛，其中很多社区均将丝绸作为原料。

这就意味着菲律宾的本土市场是时尚和创意产业——设计师、服装和成衣制造商创造着不同形式的丝绸和丝绸混纺可穿戴纺织品。

菲律宾的丝绸生产是有限的，但菲律宾政府人员一如既往地重视对丝绸业的支持，以促进丝绸业的繁荣发展。

丝绸产品的发展项目大都由政府发起、经营和管理。目前，菲律宾已授权三家政府机构，负责加大丝绸生产或促进丝绸研究和发展，律宾科学与技术部纺织研究所 (DOST-PTRI) 便是其中之一。政府参与会持续一段时间，直至私营部门足够稳定，能够处理后续工作。

政府的最大支持是制定一项名为《菲律宾热带面料法》的国家政策，以支持利用菲律宾种植和生产的天然纤维，包括麻蕉纤维、香蕉纤维、菠萝纤维和丝绸，织物中的丝绸含量应不低于 5%。法律规定，热带面料可用于政府官员和雇员的制服及其他特殊用途。因此，菲律宾至少 180 万人须穿着含菲律宾热带面料的制服。年复一年，这将是一个很大的本土市场。这一支持凸显了政府支持本土丝绸业的意图，同时维护了使用

本国天然纤维的文化传统。

DOST-PTRI 特别实施了一项名为 SEDA Pilipinas 的丝绸项目，是菲律宾本土的一个丝绸品牌，DOST-PTRI 的一项倡议。该项目的实施为振兴或恢复国家战略地区的蚕桑和丝绸生产奠定了基础。

2018 年前，菲律宾很多地区的蚕桑活动很少或几乎为零。如今，这些地区或种植桑树、或养蚕。人们对种桑养蚕的兴趣不断增加，种桑养蚕进一步扩展到了其他地区。

在过去的 4 年里，通过这一倡议，菲律宾的丝绸业得到了发展。该项目还通过举办“菲律宾丝绸峰会”，为合作伙伴的汇聚或全国会议提供平台。此外，峰会还牵头成立了一个技术工作组，以制定菲律宾丝绸之路路线图，政府和私营部门都将积极参与其中。

这就是我们实现丝绸价值链一体化目标的方法。菲律宾 7 个地区已经做出努力或已启动对话，旨在在菲律宾的这些战略地区，让主要价值链的参与者，特别是至少有本土的杂交蚕产地、蚕茧生产农场和丝绸加工中心参与进来。



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Senior Science Research Specialist, DOST-PTRI  
菲律宾纺织研究所高级研究员



now have now a total of 20 locally suitable hybrid strains. While we also are aware that other partners in the industry have also their own hybrid lines.

We have also recently explored the method of genome-level evaluation and selection to increase the chance of generating better silkworm strains. This is a new feat that is first in the Philippines, under the SEDA Pilipinas program.

To complete the production of local silk is the intention to increase the number of sericulture farmers in rural communities near and around the hybrid egg source center. In the Philippines, increasing the cocoon supply is to always make sure to have good partnerships with other government and non-government agencies and private entities working with agriculture, processing industry, marketing and creative industries. Partnerships with state universities and colleges were also instrumental in the transfer of sericulture technologies.

The future goal is for cocoon production to be fully initiated,

partnered or managed by the private sectors that will include but not limited to sericulture farmers, weaving communities and garment makers.

One of the most evident contributions of the SEDA Pilipinas of the DOSTPTRI is the establishment of processing centers in the identified key areas for silk development. The last 4 years were focused on the putting up of small-scale reeling Centers in the northern, middle and southern part of the country (as seen in the map). To account, there are already 4 reeling facilities and 3 silk throwing centers under the SEDA Pilipinas Program. The goal is to supply at least 40% of raw silk demand (4tons) in the country from these processing centers starting 2025.

With all the investment so far for Philippine silk development, the way forward is to sustain this development, at the least, with efforts from both the government and private sectors.

With all of DOST-PTRI's contribution to the silk industry upgrading, upskilling and competence build up, research and development

activity is still the core for silk innovation that should be kept to support the progress of the silk industry.

By January 2023, a multi-sectoral collaboration among the 3 government agencies and key stakeholders will formalize the procedure for the crafting of the Philippine Silk Road Map. This document should be our national framework for all short-term and long-term goals of Philippine silk development.

Despite all efforts from the government, the end goal of the Philippine silk industry is to be led, run and managed by the private sector and business enterprise. This is the way for the industry to be economically and socially sustainable.

Meanwhile, we continue to lead in providing the platform for the annual convergence and meeting of silk stakeholders and partners. We are scheduled to have our fourth this coming January 2023 and looking forward to a fruitful creation of the Philippine Silk Road Map.



DOST-PTRI 将继续加强其中两个地区的杂交蚕种资源, 增加杂交蚕种中心的数量, 进而将其用以养蚕业利益高的地方。现在共有 20 个适合本土的杂交品系。DOST-PTRI 也意识到, 该行业的其他合作伙伴也有自己的杂交品系。

DOST-PTRI 最近还探索了基因组水平的评估和选择方法, 以提升优质家蚕品系的几率, 这是 SEDA Pilipinas 项目在菲律宾首次取得的新壮举。

完成本土蚕丝生产的目的在于增加杂交蚕种中心附近农村社区的蚕农数量。在菲律宾, 增加蚕茧供应是为了始终确保与其他政府和非政府机构, 以及与从事农业、加工业、营销和创意产业合作的私营实体建立良好的伙伴关系, 与州立大学和学院的伙伴关系也有助于养蚕技术的转让。

未来的目标是使蚕茧生产完全由私营部门发起、合作或管理, 而私营部门包括但不限于蚕农、织造社区和服装制造商。

SEDA Pilipinas 项目的一大贡献是, 在确定的丝绸开发关键地区建立了加工中心, 过去 4 年的重点是在菲律宾北部、中部和南部建立小型缫丝中心。据统计, 在 SEDA Pilipinas 项目的支持下, 目前已建立 4 个缫丝厂和 3 个缫丝中心。DOST-PTRI 的目标是, 从 2025 年开始, 这些加工中心至少要供应全国 40% 的生丝需求, 即 4 吨。在菲律宾丝绸发展的所有投资中, 未来的方向是在政府和私营部门的努力下, 至少要稳定这种发展。

DOST-PTRI 为丝绸业升级、技能提升和能力建设做出了颇多贡献, 但研发仍然是丝绸创新的核心。DOST-PTRI

将继续坚持丝绸创新, 以支持丝绸业的发展。

到 2023 年 1 月, 3 个政府机构和主要利益攸关方之间的多部门合作将正式确定菲律宾丝绸之路路线图的绘制流程。这份文件应该成为菲律宾丝绸发展所有短期和长期目标的国家框架。

尽管政府做出了种种努力, 但菲律宾丝绸业的最终目标则是由私营部门和商业企业来领导、经营和管理。这是蚕桑丝绸行业实现经济和社会可持续发展的必经之路。

同时, DOST-PTRI 继续带头为丝绸利益相关者和合作伙伴的年度交流提供平台。DOST-PTRI 计划在即将到来的 2023 年 1 月举行第四次会议, 并期待菲律宾丝绸之路地图的创建取得丰硕成果。

## Overview of Thai Silk Industry Development 泰国丝绸产业发展概况



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Sericulture in Thailand has a long history dating back more than 3,000 years. A piece of silk fabric was found on a prehistoric bronze bracelet that is 2,400–3,000 years old. In the present, the Queen Sirikit Department of Sericulture (QSDS) was established under the Ministry of Agriculture and Cooperatives. It is responsible for the overall mission of sericulture which consists of strategy and policy formulation, research and development, conservation and standard certification, technology transfer development and support and marketing to provide a better life for farmers.

For the mulberry cultivation, the QSDS has researched and developed mulberry varieties to provide good quality and a high yield suitable for silkworm feeding and processing

of other products. The data of TAMIS from 2012 to 2021, there are about 83,950 farmers with mulberry cultivation area was about 9,959 hectares. Currently, there are 227 mulberry varieties in Thailand such as KhunPai, Buriram 60, Sisaket 84, Sakonnakhon, Chiangmai, etc. In terms of silkworm, more than 95 percent of the silk produced in Thailand is mulberry silk (*Bombyx mori*). There are three basic varieties in Thailand, each producing a unique silk thread: 1) Polyvoltine 2) Poly-bivoltine and 3) Bivoltine. The silk thread has been divided into 2 categories depending on whether it is reeled by hand or the machine.

According to the Thai Customs Department, production of raw silk yarn in 2021 was 503 tons, down 3.26% from the previous year. Imports amounted to \$4,226,354, up

14.83% compared with previous year. Exports amounted to \$7,637,719, an increase of 54.02% over the previous year. Major markets include the United States, Japan, Italy, the United Kingdom, and France.

The QSDS implements the Thai government's agenda under the BCG model and plans to promote investment to ensure the sustainability of natural resources: development of new skill and the application of biotechnology techniques in sericulture processes and products in Bio economy way, development of the Circular economy in terms of reduce, reuse and recycle based on Green economy. In addition, there is continuous cooperation and academic exchange with the national and international community for the sustainable development of sericulture in the future.

**Background of Sericulture in Thailand**

- More than 3,000 years
- 1976 the foundation for Promotion of Supplementary Occupations and Related Technique
- 1902
- In 2009, The Queen Sirikit Department of Sericulture (QSDS) was established under the Ministry of Agriculture and Cooperatives

“Sericulture is not only the source of extra income for farmers but also the historical and fine culture of the Thai nation that has long been inherited. No matter how the country's economy has changed, development of Sericulture must continue”

Her Majesty Queen Sirikit, the Queen Mother's speech in 1999

**Strategy**

1. Conserving the genetics, inherit wisdom and extending its use for commercial purposes.
2. Research and develop knowledge, technology and innovation to increase production efficiency and increase the value of sericulture products.
3. Enhance the quality of life of farmers and entrepreneurs to ensure stable sericulture career.
4. Develop and promote sericulture production throughout the chain to be efficient, eco-friendly and has been standardized to be recognized internationally.
5. Collaborate in promoting and seeking marketing channels both domestically and internationally.
6. Manage the organization to become a high-performance organization that render public service.
7. Conserving the genetics

泰国的蚕丝绸业历史悠久，可追溯至3000多年前。在2400-3000年前的史前青铜器上，就发现了一块丝绸织物。目前，泰国农业和合作社部设立了泰国诗丽吉王后蚕桑司（QSDS）。泰国诗丽吉王后蚕桑司负责制定养蚕的总任务，包括战略和政策制定、研发、保护和标准认证、技术转让开发和支持以及营销，以为农民提供更好的生活。

在桑树种植方面，QSDS研发了多个桑树品种，以提供适合养蚕和其他产品的优质、高产蚕种。根据TAMIS的

数据，2012年至2021年，约有83950户农民种植桑树，种植面积约为9959公顷。目前，泰国有227个桑树品种，如KhunPai、武里南60、四色菊84、沙功那空桑、清迈桑等。就品种而言，泰国生产的95%以上的丝是桑蚕丝。泰国有多化性蚕、多发二化性蚕和二化性蚕三个基本桑蚕品种，每个品种都能生产出独特的丝线，根据手工缫丝还是机器缫丝，分为两大类。

据泰国海关署统计，2021年丝线产量为503吨，比上年下降3.26%。进口总额为4226354美元，比上年增长

14.83%。出口额为7637719美元，比上年增长54.02%。主要出口市场包括美国、日本、意大利、英国和法国。

QSDS在BCG模式下执行泰国政府的议程，并计划促进投资，以确保自然资源的可持续性，以生物经济的方式在养蚕过程和产品中开发新技能和应用生物技术，在绿色经济的基础上发展减少、再利用和再循环方面的循环经济。此外，QSDS还与国内和国际社会不断开展合作和学术交流，以期实现蚕桑业的可持续发展。

High-Quality Development



Four characteristics of Silk Road Spirit  
丝绸之路精神的四个特征

# Research on High-Quality Development of China's Silk Industry and Progress in International Cooperation

## 中国丝绸产业高质量发展研究及国际合作进展

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The silk industry, as a classic industry with a long history, plays an irreplaceable role in the hearts of the Chinese people. Internationally, silk has also transcended the material level, giving rise to the Silk Road spirit of “peace and cooperation, openness and inclusiveness, mutual learning and mutual benefit”. Therefore, in China, we still attach great importance to the inheritance and innovative development of the silk industry. In September 2020, the Chinese government released the Action Plan for the High-Quality Development of the Sericulture and Silk Industry (2021–2025), a document that proposes that by 2025, China should realize the large-scale mulberry planting and sericulture, the intelligent production of silk, and the

industrialization of the comprehensive utilization of mulberry silk, and gives specific objectives and a schedule.

Since its official launch in March 2022, the strategic consulting and research project of “Research Project on Silk Industry High-quality Development” has conducted a comprehensive and in-depth research on China’s sericulture silk-related key production enterprises, relevant government departments of main producing areas, universities and research institutions, key projects and well-known brands. With the participation and support of the International Silk Union and the International Sericulture Commission, the project also analyzed and assessed the development paradigm and trend of the international silk

industry. The whole report is mainly composed of: (1) the development paradigm and trend of the world silk industry; (2) the new technology of industrial rearing of silkworm; (3) biomedical materials for silkworm and mulberry silk; (4) the intelligent and green silk production technology; (5) the technical standard system and low-carbon development strategy of silk industry; (6) the competitiveness of silk industry and international division of labor cooperation. The report will study and assess the development direction of world silk technology and industry, analyze some core issues in the development of the industry, and make suggestions on relevant policies and measures that should support the development of the industry.

丝绸作为一个具有悠久历史的经典产业，在中国人心中具有无可替代的重要地位；在国际上，丝绸也已经超越物质层面，产生了“和平合作、开放包容、互学互鉴、互利共赢”的丝路精神。所以在中国，我们仍然十分注重丝绸产业的传承和创新发展。2020年9月，中国政府发布《蚕桑丝绸产业高质量发展行动计划（2021-2025）》，这个文件提出到2025年，中国要实现种桑养蚕的规模化、丝绸生产的智能化、桑蚕丝综合利用的产业化，并给出了具体目标和进程表。

“丝绸产业高质量发展研究”战略咨询与研究课题从2022年3月正式启动以来，对中国与蚕桑丝绸相关的重点

生产企业、主产地政府相关部门、高校和研究机构、重点项目和知名品牌等进行了全面且深入的调研；在国际丝绸联盟和国际蚕业委员会的参与和支持下，课题还对国际丝绸产业的发展格局和趋势进行了分析和判断。整个报告主要由“①世界丝绸产业发展格局和趋势”、“②工厂化养蚕新技术”、“③蚕桑丝绸生物医用材料”、“④智能化、绿色化丝绸生产技术”、“⑤丝绸行业技术标准体系及低碳发展策略”、“⑥丝绸产业竞争力和国际分工合作”等部分组成，报告将对世界丝绸技术和产业的发展方向进行研判，对产业发展中的一些关键核心问题进行剖析，对应该支持行业发展的相关政策措施进行建议。



## Industrial Rearing of Silkworm (*Bombyx Mori*) with Formula Feed in All Instars 全龄人工饲料工厂化养蚕

The sericulture was originated from China. Nowadays, the Chinese cocoon production ranks first in the world. As an oligophagous insect, the silkworm (*Bombyx mori*) has been mainly raised by the mulberry leaves for thousands of years, which was easily restricted by various factors, such as the season, climate, environment and labors. Thus, the factory-raised silkworms to produce cocoons has become a dream in the sericulture area.

Japan was the first country to carry out the research and practice of silkworm rearing by the formula feed in the world. Young silkworm rearing by the formula feed was popularized in rural area since the 1970s, which reached above 50% of the total production mass in the following 30 years in Japan. Further, Japanese put forward the vision that factory-raised silkworms by the formula feed for all instars. Eventually, this idea came true successfully in Zhejiang Province, China.

The industrialized silkworm-raising by formula feed for all instars, shortened as factory sericulture, were defined as silkworms rearing by the formula feed instead of mulberry leaves to produce silkworm

cocoons under a high-density and sterile environment with an intelligitized, mechanized, large-scale, standardized, intensive, annual and modern manner. In 2012, Zhejiang Babei Group Co. LTD led and jointly with Zhejiang Academy of Agricultural Sciences and other institutions carried out the research of factory sericulture, which was put into production in 2019 successfully. In 2021, the factory sericulture achieved about 20 tons fresh cocoons daily and 7000 tons fresh cocoons per year, which accounted for 1/3 of total production in Zhejiang Province. The cocoon was in good quality, and the silk quality was above 5A. The production was standardized and retroactive. This was the first known case to achieve the factory sericulture successfully in a large-scale operation.

Throughout the research and development process, the key and core technologies in the factory sericulture included: Silkworm variety. It has bred the silkworm variety which was specialized and suitable for formula feed for all instars, and developed the supporting technologies such as silkworm eggs production, artificial hatching and uninterrupted eggs supply and guarantee all the year-round, etc. Formula feed. The low-

cost feed formulas were developed to be suitable for application in a large-scale production, and its corresponding production equipments and processing technologies. Feeding technology and equipment. To precisely control the silkworm rearing environment, a series of intelligitized feeding technologies were developed for high-density silkworm rearing and the high-effective equipment for daily sericulture operation. Disease prevention and control. The automatic cleaning and disinfection system, the real-time and high-effective monitoring system and disease prevention technologies were developed.

At present, factory sericulture is still in its infancy, but its industrial concept to develop modern agriculture broke the shackles of traditional sericulture production "depend on Heaven for food", which is enough to encourage people. The future development of factory sericulture is not only extremely important to ensure the supply of raw silk cocoons, but also may even bring reshaping changes to the industrial pattern of the entire sericulture industry because it breakthrough the traditional production mode of the sericulture industry for thousands of years.

蚕 丝业起源于中国，目前，中国的蚕茧产量居全世界首位。家蚕 (*Bombyx mori*) 属寡食性昆虫，数千年来一直以新鲜桑叶为主要食物来源，养蚕生产易受到季节、气候、环境、劳动力等多种因素制约。因此，以工业化方式生产蚕茧成为了产业界的梦想。

日本是世界上最早开展人工饲料养蚕研究和实践的国家，自上世纪 70 年代开始在农村推广小蚕人工饲料育，此后的 30 年间占比达到总生产规模的 50% 以上。并且，提出了全龄人工饲料工厂化养蚕的构想。这一构想最终在中国的浙江省成功实现。

全龄人工饲料工厂化养蚕（简称：工厂化养蚕）以人工饲料代替桑叶，在

可控的环境条件下进行高密度、无菌饲养生产蚕茧，是一种智能化、机械化、规模化、标准化、集约化、周年化的现代养蚕方式。2012 年，浙江巴贝集团主导并联合了浙江省农业科学院等单位一起开展了工厂化养蚕产业化研究，2019 年成功投产，2021 年起实现了日产约 20 吨鲜茧的周年产业化运行，年总产量约 7000 吨，占浙江省总量的三分之一，蚕茧品质优良、丝质达到 5A 以上、产品标准化可追溯。这是目前全世界已知的首个实现最大规模产业化生产运行的工厂化养蚕成功案例。

纵观研发历程，工厂化养蚕的关键核心技术包括：(1) 蚕品种。育成适于全龄人工饲料工厂化饲养的专用蚕品种，并研发出配套的蚕种繁育技术、人工解



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国家蚕桑产业技术体系杭州综合试验站站长

化技术、全年不间断供种保障技术等；(2) 人工饲料。适于大规模产业化生产实用的低成本人工饲料配方，以及相应的人工饲料生产设备、加工工艺等；(3) 饲养技术与装备。养蚕环境精准控制，适于高密度养蚕的智能化饲喂技术、日常养蚕操作高效机械化设备等；(4) 病害防控。自动化清洗消毒系统，实时高效蚕病监测和防病技术体系等。

目前，工厂化养蚕仍处于起步阶段，但其以工业理念发展现代农业，突破了传统养蚕生产“靠天吃饭”的桎梏，足以鼓舞人心。工厂化养蚕未来的发展不仅对保障真丝原料茧的供应极为重要，甚至可能因其颠覆了几千年来传统蚕桑产业生产模式，从而对整个蚕桑丝绸产业的产业格局带来重塑性变革。

## Research and Product Development of Medical Biomaterials Based on Silk Proteins

### 基于蚕丝蛋白的医用生物材料研究及产品开发



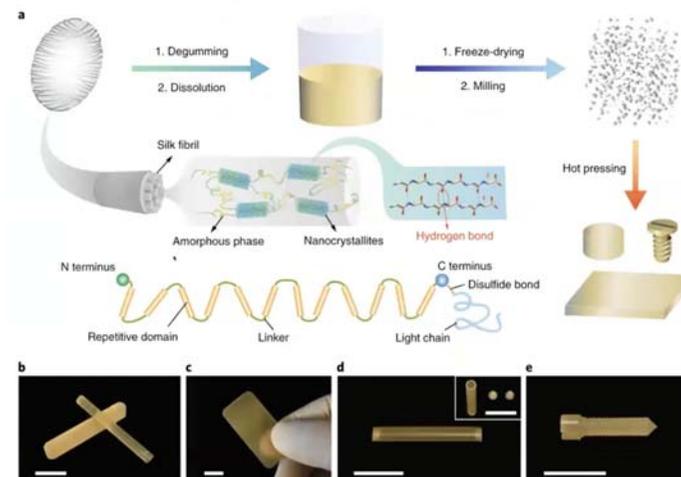
王晓沁 Wang Xiaoqin

Distinguished Professor of Soochow University  
Chief Scientist of Silk Protein Biotechnology of Cathaya Group  
苏州大学特聘教授  
凯嘉雅集团丝素蛋白生物科技首席科学家

Silk fibroin is a large molecular weight structural protein extracted from silk cocoons. After degumming, silk fibers are dissolved by lithium bromide, calcium chloride and other reagents, and then salt ions are removed by dialysis and other methods to obtain pure silk fibroin solution. Silk fibroin solution can be processed into sponge, gel, nanoparticle, transparent film and other material forms through freeze-drying, air-drying, ultrasonic, emulsification and other methods. It has strong plasticity, excellent mechanical properties, biodegradability, and the degradation products can be absorbed by the human body with good biocompatibility. It has wide application prospects in medical devices, drug delivery, tissue engineering and other fields. The main research direction of our team is to

regulate the structure and function of silk fibroin, extract and preserve silk fibroin on a large scale, and fabricate nanobiomaterials and cell scaffolding materials on this basis, which can be directly used for tissue filling and repair or as a carrier for stable embedding and slow controlled release of bioactive molecules (such as anti-oxidation agents, polypeptide drugs, nucleic acids, etc.). First, silk fibroin with different molecular weights were developed and prepared through protein purification process with proprietary technology, and then silk fibroin powder that can be stored at room temperature for a long time was obtained by optimizing the drying process, so as to realize large-scale preparation and diverse applications of silk fibroin raw materials for the first time. Furthermore, supported by the national key research and development program "Large-scale manufacturing and product development of low

immunogenic collagen and silk fibroin", we successfully developed silk fibroin wound repair gel and sponge materials for hemostasis and adhesion prevention of surgical wounds and regeneration and repair of skin wounds. According to the development requirements of medical devices and pharmaceutical products, the structural induction and material properties of silk fibroin proteins were systematically studied, so as to provide diversified and high-quality raw materials for the development of different biomedical products. The successful commercialization of these materials will open a development path with the full industrial path and comparable to collagen and hyaluronic acid for the biomedical applications of silk fibroin protein, which has far-reaching significance for the development of the entire silk industry and healthcare industry.



丝素蛋白是一种从蚕丝中提取的大分子量结构蛋白质，蚕丝经过脱胶后被溴化锂、氯化钙等试剂溶解，然后通过透析等方式去除盐离子，得到纯净的丝素蛋白溶液。丝素蛋白溶液可以通过冷冻干燥、超声、乳化、自然干燥等方法制备出海绵、凝胶、纳米颗粒、透明薄膜等多种材料形式，可塑性强、机械性能优良、可生物降解，且降解产物可被人体吸收，生物相容性好，在医疗器械、药物递送、组织工程等领域均有广泛应用前景。本团队主要研究方向为丝素蛋白的结构和功能调控、丝素蛋白的规模化提取、保存，并以此为基础构建纳米载体材料和细胞支架材料，直接用于组织填充修复或作为载体用于生物活性分子（如抗氧化剂、多肽药物、核酸等）的稳定包埋及缓释。首先通过自主知识

权的蛋白纯化工艺开发制备出不同分子量的丝素蛋白溶液，进而通过优化干燥工艺获得可以常温长期保存的丝素蛋白干粉，从而首次使丝素蛋白原料的大规模制备和市场化应用得以实现。进而，依托国家重点研发计划“低免疫原性胶原、丝素蛋白工程化制备技术及其产品研发”的支持，开发出丝素蛋白伤口修复凝胶及修复支架材料，用于手术创面止血防粘连及皮肤伤口的再生修复；并根据医疗器械和药物产品开发要求，对丝素蛋白的结构诱导性能和材料性能进行综合研究，从而为不同生物医用产品的开发提供多样化、高品质的原料选择。这些新型材料的成功转化将为丝素蛋白医用原料的市场化应用探索出一条可比肩胶原蛋白和透明质酸的全产业链开发路径，对整个蚕丝行业和医疗大健康领域的发展具有深远的意义。

# Trade Scale and Market Structure of the Raw Silk Market in the Modern World

## 近代世界生丝市场的贸易规模与市场结构



顾国达 Gu Guoda

Director of Institute of International Economics  
浙江大学国际经济研究所所长

The modern period from the Opium War in 1840 to the founding of the People's Republic of China was an era of significant changes in the pattern of the world sericulture & silk industry. Raw silk, the highest grade of fiber material, was traded as if it were a chip today. Nevertheless, there is a lack of systematic research on the trade scale of raw silk market in modern world and the change of the status of major trading countries. For this reason, it is of great academic value to clarify the scale of trade in the world silk market in modern times, the position of Chinese silk in the world silk market, and the changes in the relative positions of major silk exporters and importers. Based on the statistics of China Customs, the chronology of foreign trade of Ministry of Finance of Japan, the trade statistics from the Italian Ministry of Agriculture, Industry and Commerce, the trade statistics from Customs, together with the estimation of the raw silk trade volume of other

countries by the Silk Association of Lyon, France, this paper established a time-series database of world raw silk trade volumes for the 70-year period from 1870 to 1939. On this basis, the relative status changes of China, Italy and Japan and their positions in the world raw silk market are quantitatively analyzed. Such conclusions are drawn:

1. With the development of the silk industry and silk weaving industry in the modern world, the trade volume of the raw silk market in the modern world roughly showed an increasing trend although it increased or decreased in different years and periods. 1929 was a record year for the trade volume of the raw silk market in the modern world, and the world trade volume of raw silk reached 52,714.2 tons that year.

2. In the 70 years from 1870 to 1939, the total trade volume of the world raw silk market read 1621310.2 tons, among which the shares of imports from the United States,

France, Italy and the United Kingdom read 50.4%, 21.4%, 5.1% and 5.0%, respectively; the shares of exports from Japan, China, Italy and France read 47.6%, 27.4%, 11.9% and 6.5%.

3. The modern world raw silk market is an oligopoly of supply and demand, with its main import consumers being the United States, France, the United Kingdom and Italy. Its main exporting countries are Japan, China, Italy and France. Among them, Italy and France are both importers and exporters, which have different roles in different periods.

4. As the silk industry in Italy and France went into recession earlier due to the substantial increase of labor cost after industrialization, the influence of silkworm pebbles, and the competition of cash crops such as grapes and olives, the competition of raw silk export in the modern world market was mainly launched between China and Japan.

鴉片战争以后至新中国成立百余年间近代，是世界蚕桑丝绸业格局显著变化的时代，生丝作为最高级的纤维材料，其贸易地位犹如今天的芯片。而至今对于近代世界生丝市场的贸易规模及主要贸易国的地位变化缺乏系统的研究，因此，明确近代世界生丝市场的贸易规模，中国生丝在世界生丝市场上的地位，以及主要生丝出口国和进口国之间的相对地位变化，具有重要的学术价值。本文利用历年中国海关统计，日本大藏省外国贸易年表，意大利农工商务省的贸易统计，法国、英国和美国海关的贸易统计，结合法国里昂丝绸协会对其他国家生丝贸易量的估算，建立了1870-1939年的



70年间世界生丝贸易量的时间系列数据库，并以该数据库为依据，定量分析了中国、意大利和日本的相对地位变化，及其在世界生丝市场上的地位。结论如下：

1. 随着近代世界蚕业和丝织业的发展，近代世界生丝市场的贸易量虽在不同年份和时期有所增减变化，但基本呈现增长趋势，1929年为近代世界生丝市场贸易量创记录年，该年生丝贸易量达到52714.2吨。

2. 1870-1939年的70年中世界生丝市场的贸易总量为1621310.2吨，其中美国、法国、意大利和英国进口量所占的比例分别为50.4%、21.4%、5.1%和5.0%；日本、中国、意大利和法国的出口量所

占的比例分别为47.6%、27.4%、11.9%和6.5%。

3. 近代世界生丝市场是供求寡头垄断的市场，其主要进口消费国为美国、法国、英国和意大利；其主要出口国为日本、中国、意大利和法国；其中意大利和法国既是进口国又是出口国，在不同时期具有不同的角色特点。

4. 由于意大利和法国的蚕业由于工业化后劳动成本的大幅提高，受桑蚕微粒子病的影响，以及葡萄和橄榄等经济作物的竞争，较早地进入衰退，因此，在近代世界生丝市场上，生丝出口的竞争主要是由中国和日本之间所展开的。

## Targeted Immobilization of Bioactive Peptides on Silk Fibroin-based Biomaterials

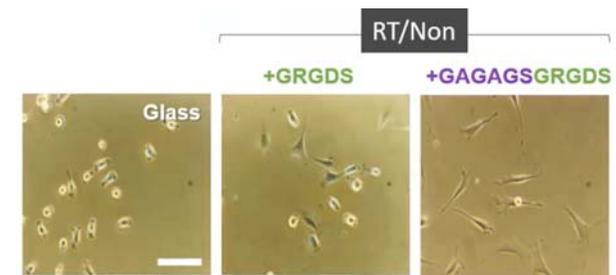
### 生物活性肽在丝素蛋白基生物材料上的靶向固定



橋本 朋子 Tomoko Hashimoto

Associate Professor of Faculty of Textile  
Science and Technology Shinshu University  
日本信州大学纤维学部副教授

Bombyx mori silk fibroin (SF)-based biomaterials are thought to be useful in the tissue engineering field due to their good biocompatibilities. Heavy chains of silk fibroin have highly repetitive crystalline regions which contain GAGAGX sequences. These GAGAGX sequences form  $\beta$ -sheet structures in materials. In this study, bioactive peptides containing GAGAGS sequence were immobilized on SF-based biomaterials by stimulation-induced structural changes of silk fibroin molecules under treatments with alcohol aqueous solutions. Analysis of immobilization efficiencies and functions of peptides were performed. Results indicated that peptides were immobilized via the GAGAGS sequence on the SF-based materials and played a role in the cell behavior. This reagent-free immobilization approach is thought to have high potential for the development of functional SF-based biomaterials for tissue regeneration/repairs.



由于家蚕丝素蛋白基生物材料具有良好的生物相容性，人们认为其在组织工程领域具有重要的应用价值。重链丝素蛋白具有高度重复的结晶区域，其中包含 GAGAGX 序列。这些 GAGAGX 序列在材料中形成  $\beta$ -片层结构。在这项研究中，含有 GAGAGS 序列的生物活性肽在酒精水溶液的处理下，通过刺激诱导丝纤维蛋白分子的结构变化，被固定在 SF 基生物材料上。研究还分析了肽的固定化效率和功能。结果表明，肽通过 GAGAGS 序列固定在丝素蛋白基材料上，并在细胞行为中发挥了作用。人们认为，这种无需试剂的固定化方法在开发用于组织再生 / 修复的功能性丝素蛋白基生物材料颇具潜力。

## Study on Life Cycle Assessment of Italian Silk 意大利丝绸生命周期评价研究



**Graziano Elegir**  
Head of Innovhub Silk Division  
意大利丝绸研究中心主任

The presentation is to share with you some considerations regarding the new European Textile strategy as well as some preliminary results of the LCA study conducted in cooperation with Soochow University under the coordination of ISU.

In Europe, sustainable production is becoming an essential requirement in all EU industrial sectors, the change in consumers' behavior as well as new strategies and regulations will significantly affect the textile sector, silk will not be an exception.

*EU Strategy for Sustainable and Circular Textiles* published in 2022 and *New Ecodesign for Sustainable Products Regulation (ESPR)* are tightly connected and probably among the most relevant challenges for the textile sector to cope with in the next years.

*New Ecodesign for Sustainable Products Regulation* describes

the general framework imposing ecodesign requirements on products intended for sale on EU markets. It emphasizes the importance of ecodesign by stating that Design may determine up to 80% of the environmental impact of a product across its lifecycle. Furthermore, it is mentioned that specific requirements for products or group of products are expected, textiles are included in this group of products.

*EU Strategy for Sustainable and Circular Textiles* implements the commitments of the *European Green Deal*, the new circular economy action plan and the industrial strategy emphasizing social and environmental sustainability.

This strategy follows up with the 2020 *Circular Economy Action Plan* and the 2021 update of the *EU Industrial Strategy* that identify textiles as a key product value chain with an urgent need and a strong potential for the transition to sustainable and

circular production, consumption and business models.

Some of the actions connected with Textile sustainability strategy are highlighted below:

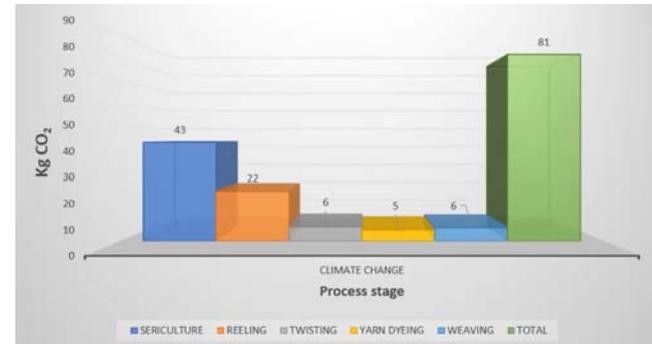
### Actions on sustainable production and consumption

- Empowering consumers in the green transition and ensuring the reliability of green claims (2022)
- Avoid greenwashing statements
- Product Environmental Footprint Category Rules for apparel and footwear (2024)
- Use of Environmental footprint method

### Actions under the Ecodesign for Sustainable Products Regulation following its adoption

- Mandatory performance requirements for the environmental sustainability of textile products (2024)

Benchmark based on LCA



Climate change (kg CO<sub>2</sub> eq/kg of silk)  
气候变化 (每千克丝绸二氧化碳当量)

本报告将与大家分享关于欧洲纺织新战略的一些思考，并分享意大利丝绸研究中心在国际丝绸联盟统筹下与苏州大学合作进行的生命周期评估研究取得的一些初步结果。在欧洲，可持续生产正在成为欧盟所有工业领域的基本要求，消费者行为的变化以及新的战略和法规将对纺织行业产生重大影响，丝绸也不例外。

2022年发布的《欧盟可持续和循环纺织品战略》和《可持续产品新生态设计法规》(ESPR)密切相关，或将是纺织行业在未来几年要应对的一大重要挑战。

新的《可持续产品新生态设计法规》

描述了对有意在欧盟市场销售的产品实施生态设计要求的总体框架。该项法规强调了生态设计的重要性，指出设计可决定产品整个生命周期中高达80%的环境影响。此外，该项法规还提到了对产品或产品组的特定要求，纺织品包括在其中。

《欧盟可持续和循环纺织品战略》实施了《欧洲绿色协议》、新的循环经济行动计划和强调社会和环境可持续性的工业战略。

战略是对《循环经济行动计划》(2020年)和《欧盟工业战略》(2021年更新)的跟进，后者将纺织品确定为一个关键的产品价值链，在可持续和循

环生产、消费和商业模式过渡方面有着迫切的需求和巨大的潜力。

以下将重点介绍与纺织品可持续发展战略相关的一些举措：

### 关于可持续生产和消费的举措

- 在绿色转型中赋予消费者权力并确保绿色声明的可靠性 (2022年)
- 避开洗绿声明
- 服装和鞋类产品环境足迹分类规则 (2024年)
- 使用环境足迹法

### 《可持续产品生态设计法规》通过后采取的举措

- 对纺织品环境可持续性的强制

•Mandatory requirements concerning green public procurement and Member State incentives (2024)

Based on LCA and/or Ecolabel

**Actions on waste challenges**

Extended Producer

Responsibility requirements for textiles with eco-modulation of fees and measures to promote the waste hierarchy for textile waste (2023)

In this context, it is important to highlight the following considerations. First, use of general environmental claims, such as “green”, “eco-friendly”, “good for the environment will not be allowed if not supported by strong documentation. Furthermore, the use of single stage assessment or certification (e.g. biobased, recyclable, plastic free, biodegradable and compostable) will not be sufficient to claim “sustainability”. In contrast, Life Cycle Assessment (LCA) likely will be considered the main tool to support sustainability claims. It is also relevant to remind that LCA can be carried out using different methodologies, using single parameter criteria (carbon footprint and water footprint) or to multi-parameter criteria such as for Environmental Product Declaration (EPD) and Product Environmental Footprint (PEF).

EU Textile strategy indicates that “The use of Environmental Footprint methods is considered as a way to substantiate and communicate environmental claims, demonstrating compliance with the more general rules on consumer protection”. In Europe the Product Environmental footprint (PEF) methodology will become one of the main requirement for supporting environmental claims.

In 2021, our sustainability team

has supported Ufficio Italiano Seta concerning the data collection in Italy for the development of a global LCA study of the silk supply chain coordinated by ISU. During this timeframe we have visited several Italian companies and discussed with them the best possible way to collect suitable and representative data for conducting an LCA study that may be used by our industry to cope with the stringent upcoming EU regulation. The scope of our work was to investigate the Italian silk supply chain within the framework of the modular approach suggested by ISU technical committee. We have carried out the work adopting the PEF general guidelines and the Environmental footprint method in order to evaluate all different impact categories of the method. The study relies on field-data collected from several manufacturing companies mostly from Como silk district. Eleven companies covering different phases of the silk supply chain have been interviewed to collect data from 2021 production, part of the work is still in progress. The main indicators used in the study are electrical energy, natural gas, water, chemicals and waste, however also raw material transportation (from China) and packaging were included in the study.

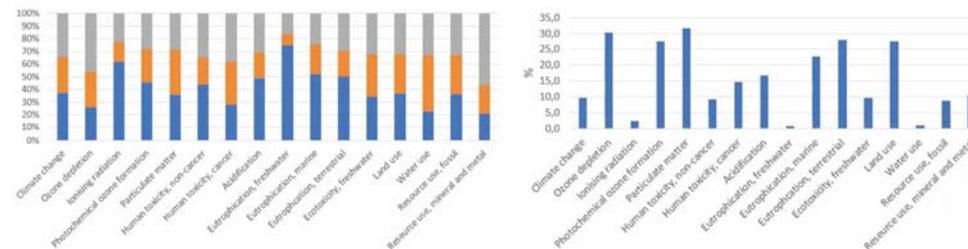
100 kg of output was adopted as functional unit for comparison with previous studies. So far, we have elaborated a draft calculation for the following modules:

- Module D – Yarn twisting;
- Module E – Yarn dyeing;
- Module F – Weaving;
- Whereas for Module G (fabric dyeing) and H (fabric printing) the work is still in progress but it will be available soon.

Basically, what we report in this study is the impact of the Italian silk value chain including the transportation of the raw material from China. We refer to draft calculation because the upstream process (sericulture is not yet included) and some of the Italian data need to be refined and added to achieve the final value. The results of our draft calculation, conducted on a fabric manufactured with yarn dyeing process, show that in percentage the yarn dyeing stage is the most impacting stage for all impact categories except for two of them, ionizing radiation and Ecotoxicity freshwater. For the latter, yarn twisting is instead the most impacting.

According to ISO 14040/14044 normalization and weighting factors are optional in LCA studies especially for comparison between products. However, in this context it is interesting to apply them in order to understand which are the most impacting categories for this section of the value chain.

The results show that, using normalization and weighting factors of Environmental footprint method, climate change and use of fossil resources are by far the most impacting categories. The impact of transport from China to Italy is significant in some categories, as it ranges from 1% up to 30%, with respect to Climate change and fossil resources it represents approximately 10% of the total impact. On the contrary, the impact of local transportation is limited. Of course, these preliminary results will need to be integrated with the Chinese results concerning sericulture and reeling to get a global picture.



Fabric made with yarn deyld(blue-twisting; yellow-yarn dyeing; grey-weaving) 色纱面料 (蓝色-捻线; 黄色-色纱; 灰色-织造)

Impact of international transport 国际运输的影响

性性能要求 (2024 年)

基于 LCA 的基准

•有关绿色公共采购和成员国激励措施的强制性要求 (2024 年)

基于 LCA 和 (或) 生态标签

**应对废物挑战所采取的措施**

生产者责任延伸制要求, 对费用进行生态调节, 并采取措施促进纺织品废物的等级制度 (2023 年)

关于这点, 重要的是要强调以下考虑因素。首先, 如果没有强有力的文件支持, 不得使用诸如“绿色”“生态友好”“对环境有益”之类的一般性环境声明。其次, 使用单一阶段评估或认证 (如生物基、可回收、无塑料、可生物降解和可堆肥) 不足以声明“可持续性”。相比之下, LCA 可能会被认为是支持可持续性声明的主要工具。同时, LCA 可以通过不同的方法开展, 可以使用单一参数标准 (碳足迹和水足迹), 也可以使用多参数标准, 如环境产品声明 (EPD) 和产品环境足迹 (PEF)。

欧盟纺织品战略指出, “人们认为使用环境足迹方法是证实和传达环境声明的一种方式, 表明其符合关于消费者保护的更为普遍的规则”。在欧洲, 产品环境足迹 (PEF) 方法将成为支持环境声明的前提。

2021 年, 为开展由国际丝绸联盟统筹的丝绸供应链全球生命周期评估研究, 研究中心可持续发展团队在数据收集方面为意大利丝绸协会提供了支持。期间, 拜访了几家意大利公司, 并与其讨论了收集合适且有代表性的数据的最佳方法, 以便进行 LCA 研究。由此, 丝绸行业便可利用这些数据来应对即将到来的严格的欧盟法规。团队的工作范围是在 ISU 技术委员会建议的模块方法框架内调查意大利的丝绸供应链情况。采用 PEF 一般准则和环境足迹方法开展工作, 以评估该方法的所有不同影响类别。这项研究依赖于从几家制造公司收集的实地数据, 这些公司大多来自科莫丝绸区。团队调研了涵盖丝绸供应链不同阶段的 11 家公司, 以收集 2021 年生产的数据, 部分工作仍在进行中。研究使用的主要指标有电能、天然气、水、化学品和废物, 也包括原材料运输 (来自中国) 和包装。

为了与之前的研究进行比较, 团队将 100 千克的产量作为功能单位。我们已对以下几个模块进行了初步的计算:

- 模块 D——纱线捻结
- 模块 E——纱线染色
- 模块 F——织造
- 模块 G (织物染色) 和 H (织物印花) 的工作仍在进行中, 其结果很快就会计算出来。

意大利丝绸研究中心在这项研究报告中是意大利丝绸价值链, 包括从中国运输原材料这一环节的影响。这里指的是计算草案, 要实现最终价值, 还需对上游过程 (养蚕尚未包括在内) 和意大利的一些数据加以完善和补充。对采用纱线染色工艺生产的织物进行的草案计算结果表明, 从百分比上看, 纱线染色阶段是所有影响类别中影响最大的阶段, 电离辐射和淡水生态毒性这两个类别除外。就后者而言, 纱线捻结是影响最大的。

根据 ISO 14040/14044, 在 LCA 研究中, 标准化和加权因子是可选的, 特别是在比较产品时。然而, 在这种情况下, 对其加以利用, 进而知晓哪些是对价值链这一部分影响最大的类别, 意义非凡。

结果表明, 使用环境足迹方法的归一化和加权因子可以推导出, 气候变化和化石资源的使用是迄今为止影响最大的类别。从中国到意大利的运输对某些类别的影响很大, 从 1% 到 30% 不等, 对气候变化和化石资源的影响约占总影响的 10%。相反的, 当地交通的影响是有限的。当然, 要获得一个较为全面的结果, 这些初步结果还需与中国的养蚕和缂丝结果结合起来。

Over the last two decades, the European Commission has been driving a process of implementation of life cycle thinking in European product policies and the life cycle approach has become a major lever for guiding European policies and investments towards the environmental sustainability goals that the European Union has committed itself to.

According to *PEF Guide* launched in 2021 a systemic perspective is needed to support decisions that have effects on the sustainability of policies, production systems and services in order to avoid unexpected environmental, social or economic collateral effects, as product life involves different geographical areas or stages of the value chain of a product or service. *PEF Guide* states in bold letters that it is necessary to avoid so-called "burden shifting" and the application of life cycle thinking is the way to reach it.

In January 2022, after signing an MoU with ISU the ISC has contacted ECDGE – European Commission Directorate-General for Environment in Brussels to remark the regret that draft of the *Environmental Footprint Category Rules – PEF CR* uses same data source used for Higg Index and a document with explanations of why silk industry has serious objections to Higg Index was sent with the message along with information that first workshop of technical experts of ISC and ISU was held in January 18th 2022 in order to undertake the schedule to elaborate LCA studies on silk by using the PEF methodology and in the meantime, ISC has asked the ECDGE to exclude silk from present PEF CR.

ISC's request to have silk excluded from PEF was in the agenda for January's 2022 Technical

Secretariat meeting but unfortunately the meeting didn't get to it as, according to one participant, "much of the meeting was spent discussing whether or not micro plastics should be included as an impact in PEF. The ECDGE staff as well as Quantis staff said "Yes, accounting for micro plastics is a must – but the method for measuring micro plastics is too immature to adopt now".

In March, 2022 ISC and ISU have been informed that in the presentation that Ratti SpA gave to the Technical Secretariat about the PEF supporting study of a silk scarf has shown pertinent concerns that ISC and ISU raised about the data quality for silk's supply chain: "Right now, literature regarding the cultivation of mulberry trees and silkworm rearing is outdated and often of low scientific-technical value. Furthermore, we would appreciate being told the literature sources beforehand".

In May 2022, as ISC request to have silk removed from PEF until representative data is produced by LCA specialists of ISC and ISU was not answered, we managed to get a virtual meeting with Mr. Baptiste Carriere Pradal – Technical Secretariat of the PEF for Apparel and Footwear to renew our request. After due arrangements a virtual meeting was settled with participation of Mr. Rick Li – Secretary General – ISU – China, Dr. Jianmei Xu (Mrs) – Silk LCA expert – Soochow University – China, Mr. Dileep Kumar – Executive Director – ISC – India, Dr. Amit Kumar – Silk LCA expert – Central Silk Board – India Mr. Baptiste Carriere Pradal – Technical Secretariat of the PEF, Mrs. Veronica Bates Kassatly – VBK – Independent Analyst – United Kingdom and Mr. João Berdu – Vale da Seda – Brazil.

Further to the request of having

silk excluded from PEF until LCA made by silk experts under PEF rules were made, we have asked Mr. Pradal to inform us once representative silk LCA are ready to whom we must send them. We have also requested the inclusion of technical experts from ISC and ISU for the external review of data delivered related to silk and also the access to data sets that, due to the lack of more suitable data, were used on the first draft of this PEF CR.

We were guided by Mr. Pradal to contact ECDGE and Ecoinvent, a private company contracted by tender to provide datasets for the EC, to get access to datasets related to silk, no response was received from Ecoinvent and Mr. Pradal informed us in June 2022 that ECDGE would send a reply to ISC request of access to data sets about silk also sent in May. No message arrived prior to summer vacation and in September 2022 we received a message from ECDGE – European Commission Directorate-General for Environment with link and guidance to reach data sets related to silk. Software used to share the files was not easy to handle but ISC technicians have managed to open it and a reply with comments over the technical weakness of datasets was sent to ECDGE by ISC pointing out the flaws of several LCA and stating that ISC and ISU LCA experts were working in the production of data sets for silk as per the PEF CR guidelines and they would be available in another 2-3 years.

In December 2022 another request to have silk removed from PEF until representative LCA are presented, as requested by ISC in January 2021 was sent to ECDGE – European Commission Directorate-General for Environment and Technical Secretariat of the PEF for Apparel and Footwear.

在过去的20年里，欧盟委员会一直在推动欧洲产品政策中实施生命周期思维的过程。生命周期方法已经成为指导欧洲政策和投资实现欧盟承诺的环境可持续性目标的主要杠杆。

根据2021年发布的《欧盟产品环境足迹(PEF)指南》，由于产品生命周期涉及产品或服务不同地理区域或价值链阶段，需要从系统性视角来支持对政策、生产系统和服务的可持续性有影响的决策，以避免意外的环境、社会或经济附带影响。该指南用加粗字体指出，有必要避免所谓的“负担转移”，而应用生命周期思维是实现这一目标的途径。

2022年1月，在与ISU签署谅解备忘录后，ISC已与总部位于布鲁塞尔的欧盟委员会环境总局(ECDGE)取得联系。对《产品环境足迹类别规则》(PEFCR)草案使用与Higg指数相同的数据源表示遗憾，并向ECDGE发送了一份文件，解释了丝绸行业为什么极为反对Higg指数，并告知ISC和ISU的首届技术专家研讨会已于2022年1月18日召开，研讨会旨在利用PEF方法对丝绸进行LCA研究。同时，ISC已经要求ECDGE将丝绸从目前的PEFCR中删除。

ISC要求将丝绸排除在PEF之外的请求已列入1月份技术秘书处会议的议

## Connection between the ISC & ISU and the European Commission Directorate-General for Environment in 2022 2022年ISC和ISU与欧盟委员会环境总局的对接

Joao Berdu  
Project Manager of Vale da Seda  
巴西丝绸谷项目负责人



程，但遗憾的是，会议并未讨论这个问题，据一位与会者称，“会议大部分时间都在讨论是否应该将微塑料作为一种影响纳入PEF。ECDGE和Quantis的工作人员称：“是的，对微塑料进行核算是一必须的——但测量微塑料的方法还太不成熟，现在还不能采用”。

2022年3月，ISC和ISU获悉，在Ratti SpA向技术秘书处提交的关于PEF丝绸支持研究的报告中，ISC和ISU对丝绸供应链的数据质量提出了相关关切：“目前，关于桑树种植和养蚕的文献已经过时，科学技术价值较低。”

2022年5月，ISC请求在ISU和ISC的生命周期评估专家提供代表性数据之前将丝绸从PEF移除，而未得到答复，我们设法与PEF服装和鞋类技术秘书处的Baptiste Carriere Pradal先生进行了一次线上会议，以重申请求。经安排，线上会议得以确定，与会者包括ISU秘书长李启正、中国苏州大学丝绸生命周期评估专家许建梅博士、ISC常务主任Dileep Kumar、印度中央蚕业局丝绸生命周期评估专家博士Amit Kumar、PEF技术秘书处代表Baptiste Carriere Pradal、英国独立分析师Veronica Bates Kassatly - VBK和巴西丝绸谷项目负责人Joao Berdu。

在丝绸专家根据PEF规则制定LCA之前，我们要求将丝绸排除在PEF

之外，并向Pradal先生表示在代表性丝绸LCA研究出来后即可提交。我们还请求邀请ISC和ISC的技术专家对所提供的与丝绸有关的数据进行外部审查，并请求获得由于缺乏更合适的数据而在本PEFCR初稿中使用的数据集。

在Pradal先生的指导下，我们联系了ECDGE和Ecoinvent（一家通过招标签约为欧共体提供数据集的私营公司），以获取与丝绸相关的数据集，但没有收到Ecoinvent的回复，Pradal先生于2022年6月通知我们，ECDGE将回复ISC访问有关丝绸数据集的请求，请求也于5月发出。暑假之前，我们没有收到任何消息。2022年9月，我们收到了ECDGE的一条消息，其中提供了访问丝绸相关数据集的链接和指南。用于共享文件的软件不容易操作，但ISC的技术人员还是设法对其进行了操作，ISC还向ECDGE发送了一份答复，对数据集的技术缺陷提出了意见，指出了几个LCA的缺陷，并指出ISC和ISU的LCA专家正在按照“PEFCR指南”为丝绸制作数据集，且再过2-3年就可以使用这些数据集了。

2022年12月，按照ISC在2021年1月提出的要求，我们向ECDGE和服装和鞋类PEF技术秘书处提出了另一项要求，即在提交有代表性的LCA之前，将丝绸从PEF中删除。

# Life Cycle Assessment Study of Indian Silk in 2022

## 2022 年印度丝绸生命周期评价研究



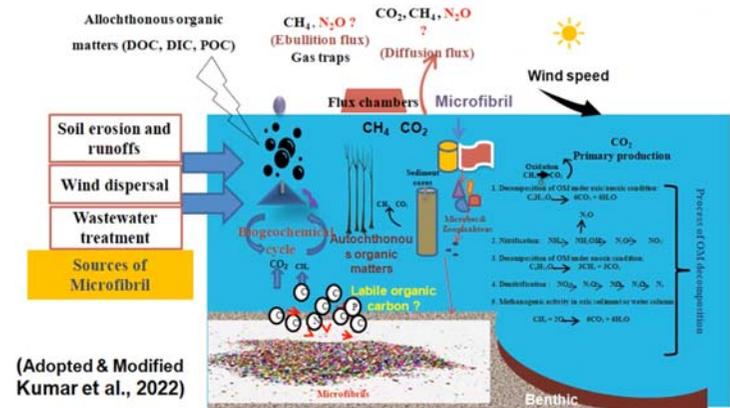
**Amit Kumar**  
Scientist of Central Sericultural Research & Training Institute, Central Silk Board  
印度中央蚕丝绸中央蚕业研究培训院研究员

Sericulture in India has proved to be an ideal avocation for inclusive development of rural populace especially the weaker sections of the society addressing equity distribution from urban rich to rural poor and a way for women and tribal empowerment. Indian silk industry comprised more than 1.2 million sericulturist families and 8.5 million people. Indian silk production systems as group are highly heterogeneous, the range of products is wide and production systems vary within product groups as well. However, there are some common traits. Indian silk comprises four types of silk i.e., Mulberry, Muga, Eri and Tasar. The mulberry silk is the largest contributor to the Indian silk industry and is produced in different climatic conditions i.e., tropical, sub-tropical and temperate; with irrigation variabilities i.e., rainfed and irrigated; cropping pattern; varied input recommendation; machineries variation and product manufacturing process etc. Thus, consideration of

the mulberry silk production system as monotonous is not the true depiction. Additionally, the cradle-to-grave approach is essential to know the actual imprint of the net environmental burden, net resource utilization as well as the synergetic benefits of any product towards claiming its long-term benefits/consequences. Keeping this, India is putting sincere efforts for collecting the factual information/data related to production of silk product and consumption through scientific methodology provided by the respective apex agencies such as PEF, IPCC etc.

India has initiated LCA research entitled "Life Cycle Analysis of the mulberry silk: A national Assessment". The investigation is prepared as per the standard international guidelines such as product environment footprints (PEF) and its embedded other respective guidelines. Investigation is focused on three climatic conditions i.e., tropical, sub-tropical and temperate; four sectors (Pre-cocoon; Post cocoon;

Fabric production and Consumers) to bring out the factual information related to the cradle-to-grave in the respective geographical regions from north to south. Apart from this, the observations related to variabilities such as rainfed and irrigated; cropping pattern; varied input recommendation; machineries variation and product manufacturing process etc. and their respective EF variabilities are also imparted under Indian LCA research. Presently data collection and experimental observation from the climate & sector-specific stakeholders related to the greenhouse gases effluxes, carbon, nitrogen, water, energy footprints, environmental pollution and eutrophication etc. is under process. For this a stranded greenhouse gases laboratory is under development stage and a research team of the 14 scientific staff has been deployed to complete LCA research timely. India is focusing towards the net environmental burden, net resource utilization as well as the synergetic benefits of silk products.



印度养蚕业是农村人口包容性发展的理想职业，特别是社会弱势阶层，解决了城市富人与农村穷人之间的公平分配问题，是增强妇女和部落赋能的一种方式。印度丝绸业涉及 120 多万户蚕农家庭和 850 万人口。印度丝绸生产系统是高度异质的，产品范围广泛，组内的生产系统也各不相同，但也有一些共同之处。印度丝绸包括四种，有桑蚕丝、姆伽蚕丝、蓖麻丝和柞蚕丝。桑蚕丝是印度丝绸业的最大贡献者：(1) 可在不同的气候条件下生产，如热带、亚热带和温带；(2) 具有灌溉可变性，如雨养或灌溉；(3) 具有不同的种植模式；(4) 具有多种投入建议；(5) 设备变更和产品制造工艺影响等。因此，将桑蚕丝生产系统视为单调乏味的并不准确。此外，“从摇篮到坟墓”的方法对于了解净环境负担、净资源利用以及任何产品在宣称其长期效益/后果方面的协同效益的实际影响至关重要。鉴于此，印度正通过 PEF、IPCC 等相关顶级机构提供的科学方法，认真收集与丝绸产品生产和消费相关的事实信息/数据。

印度启动了一项名为“桑蚕丝生命周期分析：国家评估”的 LCA 研究。调查是根据标准的国际准则进行的，如产品环境足迹及其嵌入的其他相应准则。调查的重点在于三种气候条件，即热带、亚热带和温带；四个环节，即茧前、茧后、织物生产和消费者，旨在从北到南的各个地理区域中获得与“从摇篮到坟墓”有关的真实信息。除此以外，在印度的 LCA 研究中，还提出了与雨养和灌溉、种植模式、不同的投入建议、机器变更和产品制造流程等变量有关的观察，以及各自的环境足迹变量。目前，我们正在从气候和特定部门利益攸关方收集有关温室气体外排、碳、氮、水、能源足迹、环境污染和富营养化等方面的数据和实验观测。一个曾被搁置的温室气体实验室正在重启建设阶段，我们已部署 14 名科研人员组成的研究团队，及时完成 LCA 研究。印度正专注于净环境负担、净资源利用以及丝绸产品的协同效益。

# Life Cycle Assessment of Silk Products from Cradle to Gate: Methodology and Illustrates

## 丝绸产品全产业链生命周期评价：方法与实例

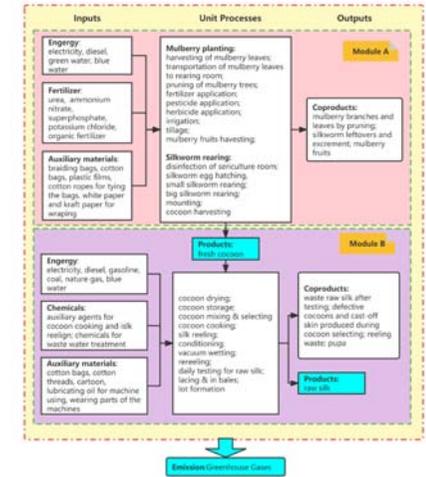
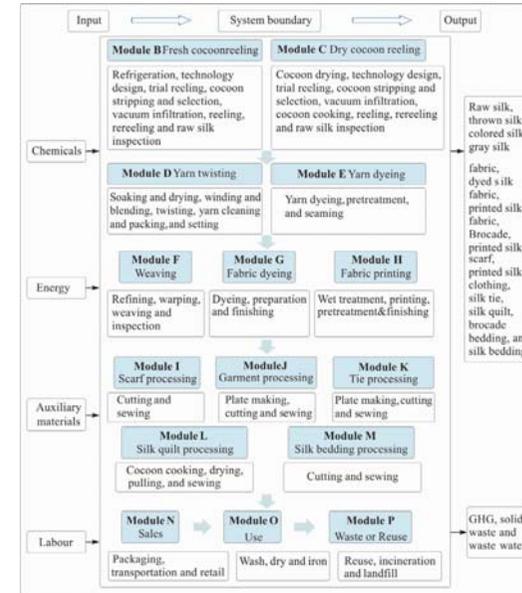


**许建梅 Xu Jianmei**  
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苏州大学副教授

To objectively and fairly evaluate the environmental impact of silk products, our research group conducted a comprehensive data survey on the whole industrial chain of dyed or printed silk fabrics from sericulture, silk reeling, weaving, to printing and dyeing, involving 6 enterprises. Based on the life cycle assessment (LCA) method, we studied the accounting model of carbon sequestration in mulberry plantation; The method and model of electricity allocation among each unit process in the reeling and weaving process were established; the rules and methods for carbon emission allocation between byproducts and primary products were established; the effect of nitrogen fertilizer application on water eutrophication in mulberry planting and its accounting model were explored; finally, based on these models and algorithms, the carbon footprint and water footprint

of the whole industrial chain of dyed or printed silk fabrics were calculated. The results showed that during the sericulture stage, the carbon sequestration produced by mulberry planting was  $17.38 \pm 7.45$  kg CO<sub>2</sub>e/ha/year in the 100-year assessment period, and the greenhouse gas emissions of fresh cocoon products were low. Nevertheless, as more than 10 kg fresh cocoons were needed for each 1 kg of silk fabric, the carbon emissions during the sericulture stage for 1 kg of silk fabrics will be over 10 times higher. In the silk reeling stage, the carbon footprint of raw silk varies greatly due to different production modes, for instance, and the carbon emissions of plants using natural gas to generate steam are nearly three times higher than those using biomass fuel. The main source of greenhouse gas emissions in the thrown and weaving process is the electricity. At this stage, the carbon footprint is

highly related to the specifications of the silk fabric, especially the thickness of the fabric, and the number of twists. The water consumption in the dyeing and finishing stage is large, however, the carbon footprint is not high because of the high dyeing and finishing efficiency and the relatively lower consumption of dyes and auxiliaries. The research results of the water footprint indicated that enterprises can effectively control the footprint of water eutrophication and water acidification through sewage treatment in various industrial stages. Only the water footprint in the sericulture stage needs to be controlled by adopting sustainable management modes of mulberry plantations, such as using drip irrigation and reducing the use of nitrogen fertilizer to reduce the footprint of water scarcity, water eutrophication and water acidification.



为 了对丝绸产品的环境影响进行客观公正的评价，本团队对染色绸或印花绸面料对栽桑养蚕、缫丝、织造、印染进行了全产业链进行了全面的数据调研，涉及了 6 家企业。本团队基于生命周期评价 (LCA) 方法研究了桑园固碳的核算模型；建立了在缫丝、织造过程中电力在各个单元过程中进行分配的方法与模型；建立了丝绸产品生产过程中副产品与主产品之间进行碳排放分配的规则与方法；探索了桑园管理中氮肥施用产生的水富营养化影响与核算模型；最后基于这些模型与算法核算了染色绸或印花绸面料全产业链碳足迹和水足迹核算。结果表明在栽桑养蚕阶段桑树种植可产生固碳在 100 年评价期内为  $17.38 \pm 7.45$  kg CO<sub>2</sub>e/ha/year，鲜茧产品的温室气体排放较低，但是因每 1 kg 丝绸面料需要超

过 10 kg 以上的鲜茧原料，所以桑蚕阶段的碳排放具有放大效应；在缫丝阶段，生丝产品的碳足迹相差较大，使用天然气产生蒸汽的工厂要比采用生物质燃料的工厂碳排放高出近三倍；捻线丝生产与织造过程的温室气体排放主要来源是电力的使用，此阶段碳足迹大小主要由坯绸的规格特别是坯绸的平方米克重、强弱捻等高度相关；染整阶段的用水量较大，但是因染整效率高，每 kg 坯绸使用染料助剂相对不高，所以碳足迹并不高。水足迹研究结果表明，在各工业阶段企业通过污水处理已可以有效控制水富营养化、水酸化足迹，只有桑蚕阶段的水足迹需要注意改变桑园管理模式，如采用滴灌、减少氮肥使用来降低水稀缺足迹，水富营养化和水酸化足迹。

# Profiles Technical Guideline for the Quantification and Report of the Life Cycle Carbon Footprint of Silk Products (Work Draft)

## 桑蚕丝绸产品生命周期碳足迹核算技术指南 (征求意见稿) 概述



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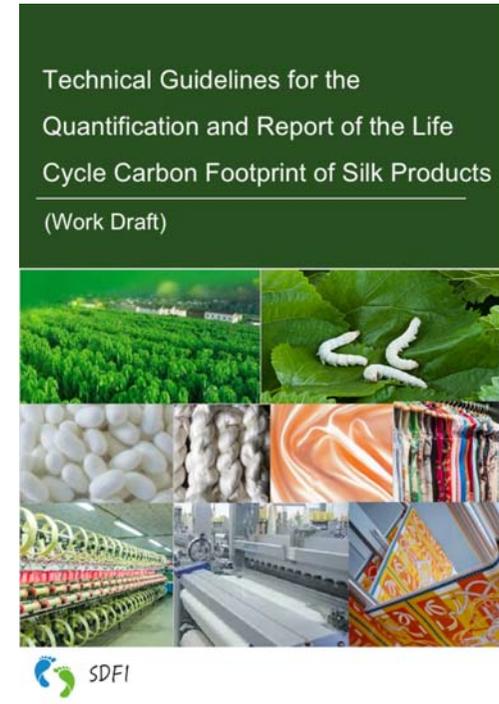
Climate change arising from anthropogenic activity has been identified as one of the greatest challenges facing the world and will continue to affect business and citizens over future decades. The 70th session of the UN General Assembly adopted and officially launched Sustainable Development Goals (SDGs), including "Take urgent action to combat climate change and its impacts", calling on all countries to take active actions and strive to achieve the goals of the agenda by 2030. Accounting and reporting of the life-cycle carbon footprint of products can help effectively respond to the impacts of climate change caused by human activities.

Silk products are favored by

consumers because of their profound culture, comfortable performance and precious attributes. A comprehensive understanding of greenhouse gas emissions in the life cycle of silk products is of important reference significance for green design, green production and green consumption of silk products. These Guidelines provide detailed provisions on the scope, system boundary, data, accounting methods and other aspects of the carbon footprint accounting and reporting of silk products in the life cycle, providing a reference scheme for quantifying and reporting the carbon footprint of silk products in the life cycle.

The purposes of these Guidelines include:

- Enhances the credibility, consistency and transparency of silk product life cycle carbon footprint accounting.
  - Facilitates the development and implementation of greenhouse gas (GHG) management strategies and plans for cocoon and silk enterprises.
  - Facilitates cocoon and silk enterprises to take practical actions to reduce the life cycle carbon footprint of silk products.
- Applications of these Guidelines include:
- Carbon footprint accounting, reporting and communication of silk product life cycle.
  - Carbon label application of silk products.



由人类活动引起的气候变化已被确定为世界面临的巨大挑战之一，并将在未来几十年继续影响经济和民生。第70届联合国大会通过并正式启动了包括“采取紧急行动应对气候变化及其影响”等17项全球可持续发展目标(Sustainable Development Goals, SDGs)，呼吁各国采取积极行动，努力在2030年之前实现议程目标。对产品生命周期的碳足迹进行核算与报告，有助于对人类活动造成的气候变化影响作出有效应对。

桑蚕丝绸产品因其深厚的文化、舒适的性能和珍贵的属性而深受消费者青睐，全面了解桑蚕丝绸产品生命周期的温室气体排放情况，对于其产品的绿色设计、绿色生产和绿色消费具有重要的参考意义。本指南在桑蚕丝绸产品生命周期碳足迹核算的范围、系统边界、数据来源、核

算方法等方面做出详细规定，为量化和报告桑蚕丝绸产品生命周期的碳足迹提供了参考方案。

本指南的目的有：

- 加强桑蚕丝绸产品生命周期碳足迹核算的可信度、一致性和透明度；
- 促进丝绸企业制定和实施温室气体排放管理战略和计划；
- 促进丝绸企业采取实际行动，减少桑蚕丝绸产品生命周期的碳足迹。

本指南的应用包括：

- 桑蚕丝绸产品生命周期的碳足迹核算、报告与交流
- 桑蚕丝绸产品碳标签的应用。

## "2022 International Think Tank Forum on Silk High-Quality Development and the ISU Chairman Meeting" was Held Online “2022 丝绸高质量发展国际智库论坛暨国际丝绸联盟主席会议”线上召开

In order to enable the high-quality development of the silk industry after understanding the new trends in its development pattern and discussing its green development route, "2022 International Think Tank Forum on Silk High-Quality Development and the International Silk Union Chairman Meeting" was held online on December 21. The conference was sponsored by International Silk Union (ISU) and Zhejiang Sci-Tech University (ZSTU), organized by National Base for International Science and Technology Cooperation in Textiles and Consumer-Goods Chemistry, and supported by International Sericultural Commission (ISC), Ufficio Italiano Seta (UIS), Intersiole France, Brazilian Silk Association, etc.

More than 100 representatives from China, Italy, France, Brazil, Japan, India, Switzerland, Thailand, Vietnam, Iran, the Philippines and other countries and regions, attended the meeting online through the Zoom video platform, also including Zhang Guoqiang, ISU chairman, Li Xin, director of Foreign Trade Division, the Department of Commerce of Zhejiang Province, Chen Wenxing, vice chairman of ISU and academicien of Chinese Academy of Engineering (CAE). In addition, more than 6400 people watched the conference live.

At the conference, ISU Secretariat presented The ISU Report in 2022 and Work Plan in 2023, introduced the statistics on ISU activities participation of member units. Six silk industry representatives from Italy, France, India, Iran, the Philippines and Thailand introduced the development of the silk industry in their respective countries. Focusing on the two themes of high quality and sustainable development, moreover, ten experts and scholars from China, Italy, Japan, Brazil and India made thematic reports respectively, sharing new research, technologies and achievements such as industrial rearing of silkworm, biomedical silk, raw silk trade and silk life cycle assessment.

(Source: ISU Secretariat)

为了解世界丝绸产业发展格局新动态、探讨丝绸产业绿色低碳发展路线，赋能丝绸产业高质量发展，12月21日，“2022 丝绸高质量发展国际智库论坛暨国际丝绸联盟主席会议”线上成功召开。会议由国际丝绸联盟和浙江理工大学主办，国家纺织与日用化学国际科技合作基地承办，国际蚕业委员会、意大利丝绸协会、法国丝绸协会和巴西丝绸协会等支持。

浙江省商务厅对外贸易管理处处长李新、国际丝绸联盟主席张国强、国际丝绸联盟副主席、中国工程院院士陈文兴及相关政府部门、行业组织、企业和科研院所共 100 余位代表参会，6400 余人观看了会议直播，参会代表主要来自中国、意大利、法国、巴西、日本、印度、瑞士、泰国、越南、伊朗和菲律宾等国家和地区。

会议作了 2022 年国际丝绸联盟工作报告及 2023 年工作计划，通报了国际丝绸联盟成员单位参与活动情况，来自意大利、法国、印度、伊朗、菲律宾和泰国的 6 位丝绸行业代表分别介绍了各国的丝绸产业发展情况，围绕高质量和可持续发展两大主题，来自中国、意大利、日本、巴西和印度的 10 位专家学者分别做了主题报告，分享了工厂化养蚕、丝绸生物医用、生丝贸易、丝绸生命周期评价等新研究、新技术和新成果。

(来源：国际丝绸联盟秘书处)

## "2022 China Silk Conference and the 2nd High-Quality Development Conference of China Sericulture and Silk Industry" was Held in Guangxi “2022 中国丝绸大会暨第二届中国桑蚕茧丝绸产业高质量发展大会”在广西召开

In order to apply the new development philosophy, create a new pattern of development and promote the development of China's sericulture and silk industry to a new level, "2022 China Silk Conference and the 2nd High-Quality Development Conference of China Sericulture and Silk Industry" was held in Yizhou District, Hechi City, Guangxi Province on November 25. The conference was sponsored by China Silk Association, Investment Promotion Bureau of Guangxi Zhuang Autonomous Region, China Council for the Promotion of International Trade Guangxi Committee, Hechi Municipal Committee of the CPC and the People's Government of Hechi Municipality, organized by Hechi Yizhou District Committee of the CPC, Yizhou District People's Government. More than 200 people attended the meeting, including leaders of relevant departments, experts and scholars from well-known universities, industry associations, and representatives of leading entrepreneurs in sericulture and silk industry.

The conference arranged a number of important updates such as a release of Xinhua·Hechi Sericulture and Silk Industry High-Quality Development Index, reports by 5 experts and scholars, speeches by 5 representatives of key enterprises, a ceremony marking the lifelong achievement award of the national sericulture and silk industry of 35 representatives and the signing of two strategic cooperation projects.

(Source: China Silk Association)

为践行新发展理念，构建新发展格局，推动中国茧丝绸产业发展再上新台阶，11月25日，“2022 中国丝绸大会暨第二届中国桑蚕茧丝绸产业高质量发展大会”在广西河池市宜州区召开。会议由中国丝绸协会、广西壮族自治区投资促进局、中国国际贸易促进委员会广西分会、河池市委、河池市人民政府主办，河池市宜州区委员会、河池市宜州区人民政府承办。茧丝绸相关部门领导，知名院校、行业商协会专家学者代表，茧丝绸行业领军企业家代表 200 余人参会。

会议发布了新华·河池桑蚕茧丝绸产业高质量发展指数，特邀 5 位专家学者作主题报告，5 位重点企业代表作主旨发言，35 位茧丝绸行业代表获“全国茧丝绸行业终身成就奖”，会议还签署了 2 项战略合作项目。

(来源：中国丝绸协会)

## "2022 International Network of Silk Cities and Metropolises" was Held Online and Offline in France "2022 国际丝绸城市网络成员大会"在法国线上线下召开



On November 17, 2022 International Network of Silk Cities and Metropolises, sponsored by Unitex Lyon, Intersoie France and the metropolis of Lyon, was held in Lyon, France. More than 50 experts and city representatives from China, France, Italy, Spain, Brazil, India, Uzbekistan and other countries and regions attended the meeting. Como was specially invited as the "guest of honour", which is in Italy. As the members of ISU, chairman Zhang Guoqiang, vice-chairman and academician Chen Wenxing, as well as the director of Education and Scientific Research Committee, honorary secretary-general Fei Jianming and secretary-general Li Qizheng were invited to attend the meeting online. And vice chairmen Stefano Vitali, Xavier Lépingle were present, while the latter is director of the ISU Fashion Design Professional Commission. In addition, the operation mechanism of "International Network of Silk Cities and Metropolises" was introduced during the conference. Moreover, chairman Zhang Guoqiang introduced the international development experience of ISU from the five aspects of conference and seminar, research and consultation, international cooperation, sustainable research and member services. Director Chen Wenxing introduced the research on high-quality development of China's silk industry and progress in international cooperation. Additionally, representatives of silky cities such as Lyon (France), Como (Italy), Nanchong (China), Bangalore (India), Valencia (Spain) and Samarkand (Uzbekistan) held in-depth exchanges on the two themes of "Culture, creation and development of territories: what is the place for the silk in the industry?" and "How can we promote this industry to a young public?"

(Source: ISU Secretariat)

11月17日，由里昂纺织企业联合会、法国丝绸协会和里昂大都会主办的“2022 国际丝绸城市网络成员大会”在法国里昂顺利召开。来自中国、法国、意大利、西班牙、巴西、印度、乌兹别克斯坦等国家和地区的 50 余位行业专家和城市代表参会。本次特邀嘉宾城市为意大利科莫。国际丝绸联盟主席张国强，副主席兼教育科研专委会主任陈文兴院士，副主席 Stefano Vitali，副主席兼时尚设计专委会主任 Xavier Lépingle，名誉秘书长费建明，秘书长李启正等分别受邀线上、线下参会。会议介绍了“国际丝绸城市网络”的运作机制，张国强主席从会议研讨、调研咨询、国际合作、可持续研究和服务成员五个方面介绍了国际丝绸联盟的国际化发展经验。陈文兴主任介绍了中国丝绸产业高质量发展研究及国际合作。法国里昂、意大利科莫、中国南充、印度班加罗尔、西班牙瓦伦西亚、乌兹别克撒马尔罕等丝绸城市代表围绕“地域（城市）文化、创新与发展”和“推广丝绸吸引年轻一代”两大主题，展开了深入交流。

(来源：国际丝绸联盟秘书处)

## Como was Invited as a "Guest of Honour" of Silk in Lyon 科莫市作为特邀城市出席法国里昂丝绢节



Since 2018, Unitex Lyon, Intersoie France and the metropolis of Lyon have organized the Silk in Lyon festival at the Palais de la Bourse. The "Festival de la Soie" shows to the final consumers the phases that are part of the cycle of the textile chain, from sericulture to textile finishing. French companies offer their products and seminars and conferences are organized, open to everyone. The fourth edition of Silk in Lyon took place in the period 17–20 November 2022 and on the occasion the city of Como was invited, as a "guest of honour".

Como, as is well known, is very active in all phases of the textile chain for the enhancement of silk and it is an absolute point of reference for the fashion system in the world.

In the context of the Palais de la Bourse, Como introduced the exhibition "A man's backbone – the history of ties" which highlighted one of the most representative silk product of Como silk tradition. Until the second half of the last century the 80% of the tie production in Europe came from the silk district of Como. At first neckwear was worn by nobles and then, after the economic boom, when the sector expanded on an industrial scale, ties became accessible to all social classes. The title of the exhibition, "A man's backbone", is inspired by a quote of the Italian author Gabriele D'Annunzio, who said that the tie is the front backbone of a man, meaning that without it a man is not really a man and cannot stand upright.

The style and the meaning of wearing a tie have developed through years. In the exhibition Como Silk Museum showed the tie from its creation, the naked tie, to its most original declinations, thanks to the use of unusual materials. Whether printed, operated or giant, ties have always been a way to asserting one's personality.

Furthermore, in the context of the event of Lyon, the second meeting of SilkyCities was organized on 17 November. The association aims to bring together the cities of the world that identify with silk and wish to enhance it. Delegations from Bangalore, Como, Nanchong, Lyon, Parana and Samarkand took part to the plenary meeting.

(Source: Ufficio Italiano Seta)

自2008年以来，里昂纺织企业联合会、法国丝绸协会和里昂大都会会在里昂市政厅举办了里昂丝绢节。丝绢节面向终端消费者展示了纺织品链周期的一部分，从种桑养蚕到纺织整理。法国企业提供了展示产品，期间还组织了研讨会，向所有人开放。第四届里昂丝绢节于2022年11月17日至20日举办，意大利科莫市被邀请作为“特邀嘉宾”。

众所周知，科莫在纺织链的各个环节都非常活跃，以夯实丝绸产业，是世界时尚体系的标杆参考。

在市政厅，科莫举办了“男性的骨干——领带发展史”展览，突出了科莫丝绸传统最具代表性的丝绸产品之一。直到上世纪下半叶，欧洲80%的领带产量来自科莫丝绸区。首先是由贵族们系上领带，后来随着经济繁荣，领带行业以工业化规模扩张，所有社会阶层都可以使用领带。展览标题“男性的骨干”灵感来自意大利作家加布里埃尔·达南齐奥的一句话，他说领带是男性的前缘骨干，没有它就称不上真正的男性，无法挺直。

领带的风格和意义多年来不断发展，在展览中，科莫丝绸博物馆展示了从裸体领带的创作到最原始的描述，感谢使用了不寻常的材料。无论是印刷、手工，还是大牌，领带总是一种肯定个性的方式。

此外，里昂丝绢节期间，国际丝绸城市网络会议于11月17日召开，网络旨在将世界上具有丝绸标识并希望加强丝绸的城市聚集在一起，班加罗尔、科莫、南充、里昂、巴拉那和撒马尔罕等代表团参加了会议。

(来源：意大利丝绸协会)

## "Crossover and Integration: Academic Seminar On Museum Characteristic Development" was Held Online “跨界与融合：博物馆特色化发展学术研讨会”线上召开

In order to promote the characteristic and high-quality development of museums, and assist museums in integrating and enabling the development of China's silk fashion industry, on December 30, "Crossover and Integration: Academic Symposium on Museum Characteristic Development" was held online, which was planned by China National Silk Museum (NSM). The seminar was sponsored by China National Silk Museum and Zhejiang Sci-Tech University (ZSTU), organized by Journal of Silk, School of Fashion Design & Engineering of ZSTU, and supported by famous museums and industries at home and abroad such as International Silk Union, China Academy of Art, the Museum at FIT, China National Silk Archives in Suzhou, Brazilian Silk Association, Shanghai Textile and Clothing Museum, Como Silk Museum, Suzhou Silk Museum, Colegio del Arte Mayor de la Seda, Queen Sirikit Museum of Textiles and Style 3D. Overall, more than 100 scholars and representatives from China, the United States, Italy, Brazil, Spain, Thailand and other countries attended the conference through Tencent Meeting, and more than 20,000 people watched the conference through Sina Weibo and live streaming platforms.

Liu Shuguang, director-general of Chinese Museums Association, and professor Chen Wenxing, the academician of CAE and president of ZSTU, respectively delivered speeches at the forum. In addition, 12 experts and scholars provided constructive ideas for the future development of museums, focusing on the development status and direction of museums with the theme of textile and clothing. And The Guide for World Silk Textile Museums was released at the seminar.

(Source: China National Silk Museum)

为推动博物馆特色化和高质量发展，以博物馆发展融入中国丝绸时尚产业并为产业发展赋能。12月30日，由中国丝绸博物馆发起策划的“跨界与融合：博物馆特色化发展学术研讨会”线上成功召开。会议由中国丝绸博物馆与浙江理工大学联合主办，《丝绸》杂志社、浙江理工大学服装学院承办，并得到了国际丝绸联盟、中国美术学院、纽约时装学院博物馆、苏州中国丝绸档案馆、上海纺织服饰博物馆、巴西丝绸协会、意大利科莫丝绸博物馆、苏州丝绸博物馆、西班牙瓦伦西亚丝绸博物馆、泰国诗丽吉王后纺织博物馆、浙江凌迪数字科技有限公司等国内外知名博物馆和行业的支 持。共有来自中国、美国、意大利、巴西、西班牙、泰国等国家的100余位学者和代表通过腾讯会议参会，2万余人通过新浪微博和直播平台观看会议。

中国博物馆协会理事长刘曙光先生，中国工程院院士、浙江理工大学校长陈文兴教授分别为此次论坛致辞。12位专家学者围绕纺织服饰专题博物馆的发展现状与方向，为博物馆的未来动态提供了建设性思路，会议还发布了《世界丝绸纺织博物馆指南》。

(来源：中国丝绸博物馆)

## ISU Profiles

International Silk Union (ISU) is an international and specialized non-profit social organization in which enterprises and related organizations from the silk producing and consuming countries participate voluntarily. The secretariat is located in Hangzhou, China. Since its foundation in October 2015, there have been more than 140 enterprises and organizations from 27 countries and regions joining ISU, including China, Italy, France, Switzerland, Brazil, Poland, Japan, Turkiye, Thailand, India, Vietnam, Cambodia, Myanmar, Indonesia, Singapore, the United States, Australia, Uzbekistan, Bangladesh, Laos, Iran, Pakistan, Romania, Spain, the Philippines, Uganda and Hong Kong(China), among which there are 46 executive member units and 11 vice chairman units. Especially China Textile Engineering Society, Ufficio Italiano Seta, INTERSOIE France, Brazilian Silk Association, Vietnam Sericulture Association, Cambodia Silk Sector Promotion and Development Commission, and Iran Silk Research Center have joined as countries or regions, and their influence radiates to the world's major silk enterprises and research institutions. In 2020, ISU was included in the "Yearbook of International Organizations", Union of International Associations(UIA), becoming the first silk international organization in the UIA with the secretariat being located in China. In 2021, ISU signed a strategic cooperation agreement to establish a dialogue partnership with International Sericulture Commission (ISC), an intergovernmental international organization.

Adhering to the purpose of "Communication & Cooperation, Development with Concerted Efforts", ISU actively docks international exchanges and cooperation, holds international conferences, organizes international inspections, and establishes the professional committees in silk field including History Culture, Education Research, Technical Innovation, Fashion Design, etc. In order to smooth information exchanges, ISU establishes the official website of "World Silk Website" and Self-Media Matrix, hosts the proceeding of *ISU News*, co-hosts the professional journal of *Journal of Silk*, which integrates the journals, official bilingual websites, WeChat, Toutiao, Sohu, Baijia and Tencent, etc., promoting the international integration and development of silk culture and industry. The chairman of ISU is Zhang Guoqiang, chairman of the board of Cathaya group. The secretary-general of ISU is Li Qizheng, director of Hangzhou Oriental Silk Culture and Brand Research Center, and president of Periodicals Agency of Zhejiang Sci-Tech University.

## Executive Members

- 01 Italian Silk Office (Italy)
- 02 High Fashion International Limited (Hong Kong, China)
- 03 The Thai Silk Company Limited (Thailand)
- 04 Fabric Plus Pvt. Limited (India)
- 05 Hoi An Silk Group (Vietnam)
- 06 Bisa Overseas (Brazil)
- 07 Maruhachi Kiito Co., Ltd. (Japan)
- 08 Spun Silk World Co., Ltd. (Thailand)
- 09 Zhejiang Cathaya International Co., Ltd.
- 10 China National Silk Museum
- 11 Guangdong Silk-Tex Group Co., Ltd.
- 12 Zhejiang Sci-Tech University
- 13 Jiangsu SOHO International Group Corp.
- 14 Shanghai Silk Group Co., Ltd.
- 15 Shandong Silk Group Co., Ltd.
- 16 Guangxi Silk Group Co., Ltd.
- 17 Hangzhou Oriental Silk Culture and Brand Research Center
- 18 National Engineering Laboratory for Modern Silk (Suzhou)
- 19 State Key Laboratory of Silkworm Genome Biology (Southwest University)
- 20 Institute of Sericultural Research, Chinese Academy of Agricultural Science
- 21 China National Silk and Garments Quality Supervision Testing Center
- 22 China Cocoon & Silk Exchange
- 23 Sichuan Academy of Silk Sciences
- 24 Zhejiang Jiaxin Silk Co., Ltd.
- 25 Shandong Hirun Investment Group Co., Ltd.
- 26 Wensli Group Co., Ltd.
- 27 Silk Road Holding Group Co., Ltd.
- 28 Zhejiang Zhongwei Silk Group Co., Ltd.
- 29 Xinyuan Cocoon Silk Group Co., Ltd.
- 30 Zibo Daranfeng Silk Group Co., Ltd.
- 31 Chongqing Wintus New Star Enterprises Group

- 32 Yunnan Baoshan Ligen Silk Group Co., Ltd.
- 33 Zhejiang Golden Eagle Co., Ltd.
- 34 Zhejiang Meorient Business Exhibition Co., Ltd.
- 35 INTERSOIE France (France)
- 36 Cambodia Silk Sector Promotion and Development Commission (Cambodia)
- 37 Vietnam Sericulture Association (Vietnam)
- 38 Brazilian Silk Association (Brazil)
- 39 Matsumura Co., Ltd. (Japan)
- 40 Kailpar Engineering Co., Ltd (India)
- 41 THM International Import & Export Pte Ltd. (Singapore)
- 42 Sichuan Nanchong Liuhe Group Co., Ltd.
- 43 Sichuan Sachem Textile Co., Ltd.
- 44 Trudell Fashion Group (Switzerland)
- 45 PT. Sutra Alam Nusantara (Indonesia)
- 46 Shanghai Pudong Technology Entrepreneurship Promotion Center

## Executive Members

- 01 Asian Silk Alliance
- 02 Coponat SA (France)
- 03 Hokusei Sangyo Co., Ltd. (Japan)
- 04 Kyauk Se Silk Co., Ltd. (Burma)
- 05 Crown Textile Pte Ltd. (Indonesia)
- 06 Sovereign Crown Pte Ltd. (Australia)
- 07 Chuwa Co., Ltd. (Japan)
- 08 Yokohama Matsumura Co., Ltd. (Japan)
- 09 Zhejiang Academy of Science & Technology for Inspection & Quarantine
- 10 Jixiang Idea Silk Co., Ltd.
- 11 Rizhao Haitong Silk Group Co., Ltd.
- 12 Anhui Jingjiu Silk Joint Stock Company
- 13 Shenzhen China Silk Enterprise Limited
- 14 Guangxi Huahong Silk Share Co., Ltd.
- 15 Jiangxi Lvdong Silk Technology Industrial Co., Ltd.
- 16 Hubei Yilian Sericulture Technology Co., Ltd.
- 17 Ankang Bashan Silk Co., Ltd.
- 18 Liaoning Caiyi Wild Silk Products Co., Ltd.
- 19 Jin Fuchun Group Co., Ltd.
- 20 Sichuan Ftfourish Silk Co., Ltd.
- 21 Wujiang City Dingsheng Silk Group Co., Ltd.
- 22 Zhejiang Huzhou Meiyue Knitting Co., Ltd.
- 23 Zhejiang Misai Silk Co., Ltd.
- 24 China Silk Capital Nanchong Silk Culture Institute
- 25 Chun'an Cocoon & Silk Co., Ltd.
- 26 Chongqing Sunfeel Intelligent Technology Co., Ltd.
- 27 Hangzhou Textile Machinery Co., Ltd.
- 28 Sichuan Silunxing Import & Export Trading Co., Ltd.
- 29 Shandong Guangtong Silkworm Group Co., Ltd.
- 30 Hangzhou Wanfu Trading Co., Ltd.
- 31 Suzhou Taifa Coloured Thread Weaving Co., Ltd.
- 32 Hangzhou Niteer Weave Co., Ltd.
- 33 Hangzhou Yihui Cultural Creative Co., Ltd.
- 34 Journal of Silk
- 35 Sichuan Ygor Textile Co., Ltd.
- 36 Huzhou Ling Silk Institute
- 37 Hangzhou World Silk Co., Ltd.
- 38 Nanchong Yin Hai Silk Co., Ltd.
- 39 SentoSaSilk (Cambodia)
- 40 Artisan Angkor Co., Ltd. (Cambodia)
- 41 Institute of Nature Fibers and Medicinal Plants (Poland)
- 42 Zhejiang Meijiabiao Garment Co., Ltd.
- 43 VESITH DEVY Silk Association (Cambodia)
- 44 Jinchengjiang Xinxing Cocoon Silk Co., Ltd.
- 45 Suzhou Embroidery Research Institute Co., Ltd.
- 46 Tongxiang City Heshan Weiwei Textile Co., Ltd.
- 47 Hangzhou I Yu In Soul Garments Co., Ltd.
- 48 Hangzhou Jin Yiming Textile Silk Co., Ltd.
- 49 Hangzhou Vocational and Technical College
- 50 Beijing Kaili Silk Co., Ltd.
- 51 Guangxi Guilhe Group Co., Ltd.
- 52 Zhejiang Huazhi Silk Co., Ltd.
- 53 Hangzhou Hualong Weaving Machine Co., Ltd.
- 54 Huzhou Institute of Quality and Technical Supervision and Testing (National Cocoon and Silk Quality Supervision Inspection Center)
- 55 Huzhou Baby Sericulture Co., Ltd.
- 56 Hangzhou Newjixiu Silk Co., Ltd.
- 57 Hangzhou Jixiang Import and Export Co., Ltd.
- 58 Vietnam Sericulture Corporation - Joint Stock Company (Vietnam)
- 59 August Silk Inc (USA)
- 60 Dokoh Shoji Co., Ltd. (Japan)
- 61 Nanchong Shang Hao Mublerly Tea Co., Ltd.
- 62 Suzhou Xiancan Silk Biotech Co., Ltd.
- 63 Huzhou Mu Chen Culture Development Co., Ltd.
- 64 Hangzhou Aurora Industrial Co., Ltd.

- 65 Guangxi Cocoon & Silk Exchange Co., Ltd.
- 66 Shengzhou City Necktie Association
- 67 Maidilang Group Co., Ltd.
- 68 Hangzhou Honghua Digital Technology Stock Co., Ltd. (China)
- 69 Kei Meas Handicrafts (Cambodia)
- 70 Lao Sericulture Co., Ltd. (Laos)
- 71 Uzbek Research Institute of Natural Fibers (Uzbekistan)
- 72 Technology Center of Nanning Customs District
- 73 Tarim University
- 74 Hand Touch (Bangladesh)
- 75 Color Silk (Cambodia)
- 76 Profits Fund Global Holding Ltd. (Hong Kong, China)
- 77 Sichuan Antai Cocoon Silk Group Co., Ltd.
- 78 Zhejiang Canyuan Home Textile Co., Ltd.
- 79 Zhejiang Light Industrial Products Inspection and Research Institute
- 80 Hangzhou China Silk Town
- 81 Qianteng Exhibition (Suzhou) Co., Ltd.
- 82 Suzhou Institute of Trade & Commerce
- 83 China Textile Engineering Society (China)
- 84 Filande Levade SA (Switzerland)
- 85 Bahauddin Zakariya University College of Textile Engineering (Pakistan)
- 86 Iran Silk Research Center (ISRC)
- 87 SS Bursa Koza Tarim Satis Kooperatifleri Birligi (KOZABIRLIK)
- 88 Italtexil Sarata SRL (Romania)
- 89 Shengzhou Mulsun Biotech Co., Ltd.
- 90 Zhejiang Jason Holding Group Co., Ltd.
- 91 Nilima Silks Private Limited (India)
- 92 Philippine Textile Research Institute (the Philippines)
- 93 Visit Valencia (Spain)
- 94 Afro Silk Co. (Uganda)
- 95 Neo-Concept Group (Hong Kong, China)

## 常务理事单位

- 01 意大利丝绸协会 (意大利)
- 02 达利国际集团有限公司 (香港)
- 03 The Thai Silk Company Limited (泰国)
- 04 Fabric Plus Pvt. Limited (印度)
- 05 Hoi An Silk Group (越南)
- 06 Bisa Overseas (巴西)
- 07 丸八生糸株式会社 (日本)
- 08 Spun Silk World Co., Ltd. (泰国)
- 09 浙江凯喜雅国际股份有限公司
- 10 中国丝绸博物馆
- 11 广东省丝绸纺织集团有限公司
- 12 浙江理工大学
- 13 江苏苏豪国际集团股份有限公司
- 14 上海丝绸集团股份有限公司
- 15 山东省丝绸集团有限公司
- 16 广西丝绸 (集团) 有限公司
- 17 杭州东方丝绸文化与品牌研究中心
- 18 现代丝绸国家工程实验室 (苏州)
- 19 家蚕基因组生物学国家重点实验室 (西南大学)
- 20 中国农业科学院蚕业研究所
- 21 国家丝绸及服装产品质量监督检验中心
- 22 中国茧丝绸交易市场
- 23 四川省丝绸科学研究院
- 24 浙江嘉欣丝绸股份有限公司
- 25 山东海润投资集团有限公司
- 26 万事利集团有限公司
- 27 丝绸之路控股集团有限公司
- 28 浙江中维丝绸集团有限公司
- 29 鑫缘茧丝绸集团股份有限公司
- 30 淄博大染坊丝绸集团有限公司
- 31 重庆宏美达欣实业 (集团) 有限公司

- 32 云南保山利根丝绸有限公司
- 33 浙江金鹰股份有限公司
- 34 浙江米奥兰特商务会展股份有限公司
- 35 法国丝绸协会 (法国)
- 36 柬埔寨丝绸行业促进发展委员会 (柬埔寨)
- 37 巴西丝绸协会 (巴西)
- 38 越南蚕桑协会 (越南)
- 39 松村株式会社 (日本)
- 40 Kailpar Engineering Co., Ltd (印度)
- 41 THM International Import & Export Pte Ltd. (新加坡)
- 42 四川南充六合集团有限责任公司
- 43 四川顺成纺织品有限公司
- 44 Trudell Fashion Group (瑞士)
- 45 PT. Sutra Alam Nusantara (印度尼西亚)
- 46 上海浦东技术创新促进中心

## 理事单位

- 01 亚洲丝绸联盟
- 02 Coponat SA (法国)
- 03 北西产业株式会社 (日本)
- 04 Kyauk Se Silk Co., Ltd. (缅甸)
- 05 Crown Textile Pte Ltd. (印度尼西亚)
- 06 Sovereign Crown Pte Ltd. (澳大利亚)
- 07 中和株式会社 (日本)
- 08 横浜松村株式会社 (日本)
- 09 浙江省检验检疫科学技术研究院
- 10 嘉兴埃迪尔丝绸有限公司
- 11 日照海通茧丝绸集团有限公司
- 12 安徽京九丝绸股份公司
- 13 深圳华丝企业股份有限公司
- 14 广西华虹蚕业股份有限公司
- 15 江西省绿冬丝科实业有限责任公司
- 16 湖北怡莲蚕桑科技股份有限公司
- 17 安康巴山丝绸有限责任公司
- 18 辽宁采逸野蚕丝制品有限公司
- 19 金富春集团有限公司
- 20 四川朗瑞丝绸有限公司
- 21 吴江市鼎盛丝绸有限公司
- 22 浙江湖州梅月针织有限公司
- 23 浙江米赛丝绸有限公司
- 24 中国绸都南充丝绸文化研究会
- 25 淳安县茧丝绸有限公司
- 26 重庆祥飞智能科技有限公司
- 27 杭州纺织机械有限公司
- 28 四川丝纶兴进出口贸易有限公司
- 29 山东广通蚕种集团有限公司
- 30 杭州九富贸易有限公司
- 31 苏州泰发花线织造有限公司
- 32 杭州尼特尔纺织有限公司
- 33 杭州一慧文化创意有限公司
- 34 《丝绸》杂志社
- 35 四川依格罗纺织品有限公司
- 36 湖州绉绸研究所
- 37 杭州天下丝绸有限公司
- 38 南充银海丝绸有限公司
- 39 SentoSaSilk (柬埔寨)
- 40 Artisan Angkor Co., Ltd. (柬埔寨)
- 41 Institute of Nature Fibers and Medicinal Plants (波兰)
- 42 浙江美嘉标服饰有限公司
- 43 VESITH DEVY Silk Association (柬埔寨)
- 44 金城江新兴茧丝有限公司
- 45 苏州刺绣研究所有限公司
- 46 桐乡市河山伟业纺织有限责任公司
- 47 杭州衣语无香服饰有限公司
- 48 杭州金怡明纺织丝绸有限公司
- 49 杭州职业技术学院
- 50 北京凯丽丝绸有限公司
- 51 广西桂合集团有限公司
- 52 浙江华芝丝绸股份有限公司
- 53 杭州华龙纺织机械有限公司
- 54 湖州市质量技术监督检测研究院 (湖州市纤维质量监测中心、国家茧丝质量监督检验中心)
- 55 湖州宝宝蚕业有限公司
- 56 杭州新洁绣丝绸有限公司
- 57 杭州吉祥进出口有限公司
- 58 Vietnam Sericulture Corporation - Joint Stock Company (越南)
- 59 August Silk Inc (美国)
- 60 同兴商事株式会社 (日本)
- 61 南充尚好桑茶有限公司
- 62 苏州先蚕丝绸生物科技有限公司
- 63 湖州沐晨文化发展有限公司
- 64 杭州奥罗拉实业有限公司
- 65 广西大宗茧丝交易市场有限责任公司
- 66 湖州市领带行业协会

- 67 麦地郎集团有限公司
- 68 杭州宏华数码科技股份有限公司
- 69 Kei Meas Handicrafts (柬埔寨)
- 70 Lao Sericulture Co., Ltd. (老挝)
- 71 Uzbek Research Institute of Natural Fibers (乌兹别克斯坦)
- 72 南宁海关技术中心
- 73 塔里木大学
- 74 Hand Touch (孟加拉国)
- 75 Color Silk (柬埔寨)
- 76 利达丰环球控股有限公司 (中国香港)
- 77 四川安泰茧丝绸集团有限公司
- 78 浙江蚕缘家纺股份有限公司
- 79 浙江省轻工业品质量检验研究院
- 80 杭州中国丝绸城
- 81 鸢腾会展 (苏州) 有限公司
- 82 苏州经贸职业技术学院
- 83 中国纺织工程学会
- 84 Filande Levade SA (瑞士)
- 85 Bahauddin Zakariya University College of Textile Engineering (巴基斯坦)
- 86 Iran Silk Research Center (ISRC) (伊朗)
- 87 SS Bursa Koza Tarim Satis Kooperatifleri Birligi (KOZABIRLIK) (土耳其)
- 88 Italtexil Sarata SRL (罗马尼亚)
- 89 嵊州陌桑高科股份有限公司
- 90 浙江健盛集团股份有限公司
- 91 Nilima Silks Private Limited (印度)
- 92 Philippine Textile Research Institute (菲律宾)
- 93 Visit Valencia (西班牙)
- 94 Afro Silk Co. (乌干达)
- 95 思宏集团有限公司 (中国香港)

## 世界丝绸网

世界丝绸网（www.worldsilk.com.cn）是国际丝绸联盟的官方信息发布平台，以“交流合作 携手发展”为运营理念，现设有官方网站、微信公众号、头条号、搜狐号、百家号、企鹅号等信息发布平台，旨在通过发布产业资讯、传承丝绸文化、加强沟通交流、服务企业联合、推动产业升级，促进国际丝绸产业的可持续健康发展。



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