



论沙棘在中国水土流失防治中的地位 与作用

The Status and Role of Sea Buckthorn in Soil and Water Loss Prevention
and Control in China

水利部沙棘开发管理中心生态建设处

Ecological Construction Department of Sea Buckthorn Development and
Management Center, Ministry of Water Resources

孙中峰

Sun Zhongfeng

2024.8



目录

Contents

1

中国水土流失得到有效治理
China's soil erosion has been effectively controlled

2

沙棘在水土保持工作的应用
Application of seabuckthorn in soil and water conservation work

3

沙棘在新时代水土流失防治中的作用
The role of seabuckthorn in the prevention and control of soil erosion in the new era

4

沙棘在水土保持工作中的发展展望
Development prospects of seabuckthorn in soil and water conservation work



第一部分

Part 1

中国水土流失得到有效治理
China's soil erosion has been effectively controlled

水土流失面积与强度持续下降

The area and intensity of soil erosion continue to decline

经过多年的不懈努力，我国水土保持工作成效是十分显著的。我国水土流失已经实现了面积由“增”到“减”、强度由“高”到“低”的历史性转变，水土流失状况得到明显改善。

After years of unremitting efforts, the results of soil and water conservation work in China are very significant. China's soil erosion has achieved a historic transformation from "increasing" to "decreasing" in area and from "high" to "low" in intensity, and the situation of soil erosion has been significantly improved.

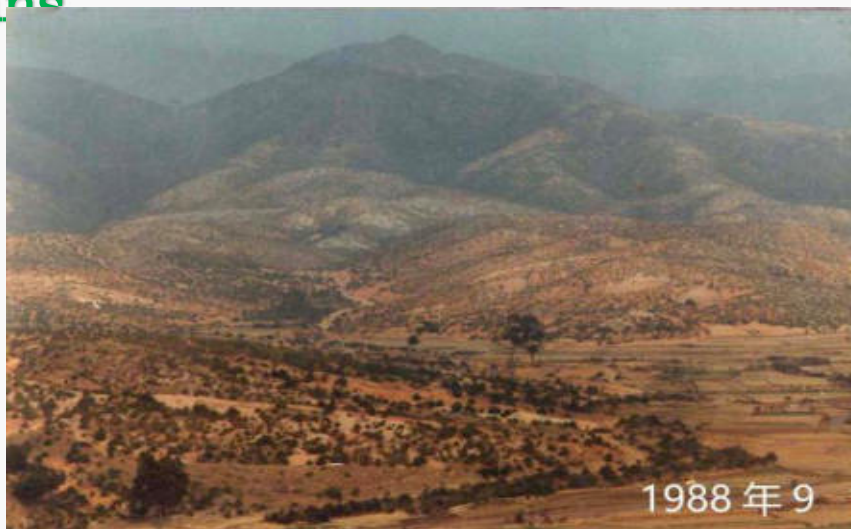


当前水土流失强度以轻度为主，占比78.7%。

The current intensity of soil erosion is mainly mild, accounting for 78.7%.

➤ 福建长汀—火焰荒山变金山银山

Changting, Fujian - Flaming Wilderness Mountains Become Gold and Silver Mountains



长汀水土流失面积由1985年的146.2万亩下降到2018年的36.9万亩，2018年水土流失率7.95%，森林覆盖率提高到79.8%，昔日山光水浊的“火焰山”正成为当地人的“金山银山”。

The area of soil erosion in Changting has decreased from 1.462 million mu in 1985 to 369000 mu in 2018. In 2018, the soil erosion rate was 7.95%, and the forest coverage rate increased to 79.8%. The "Flame Mountain", which used to have clear mountains and turbid waters, is now becoming a "golden and silver mountain" for the local people.

➤ 赣州—昔日“江南沙漠” 今朝山川锦绣

Ganzhou - formerly known as the 'Jiangnan Desert', now boasts beautiful mountains and rivers

赣州水土流失面积已由1980年的111.7万公顷下降到目前的约63万公顷，减少水土流失面积48多万公顷，土壤侵蚀程度由强度向中轻度转变。

The area of soil erosion in Ganzhou has decreased from 1.117 million hectares in 1980 to about 630000 hectares currently, reducing the area of soil erosion by more than 480000 hectares. The degree of soil erosion has shifted from intensity to moderate to mild.



➤ 砒砂岩—“土壤中的癌症”得到有效治理

Arsenic sandstone - 'cancer in soil' effectively treated

内蒙古鄂尔多斯市区东胜地处鄂尔多斯高原中部,总面积2200km²,水土流失面积1985km²,占90%。其中号称“地球癌症”的砒砂岩面积1429.7km², 1985年钱正英同志提出“把沙棘建设作为治理黄土高原的突破口”后,揭开了东胜区大搞沙棘资源建设的序幕,东胜区的沙棘资源建设,也由典型示范推向了全面治理、快速发展的新阶段,不仅有效地攻克了人类生命的禁区,为入黄泥沙的减少作出了突出贡献。

Dongsheng City in Ordos, Inner Mongolia is located in the central part of the Ordos Plateau, with a total area of 2200km² and a soil erosion area of 1985km², accounting for 90%. The arsenic sandstone, which is known as the "cancer of the earth", covers an area of 1429.7 kilometers. In 1985, Comrade Qian Zhengying proposed to "use sea buckthorn construction as a breakthrough point for treating the Loess Plateau", which opened the prelude to the large-scale construction of sea buckthorn resources in Dongsheng District. The construction of sea buckthorn resources in Dongsheng District has also moved from a typical demonstration to a new stage of comprehensive governance and rapid development. It not only effectively conquered the forbidden zone of human life, but also made outstanding contributions to the



中强度 medial



轻度 mild

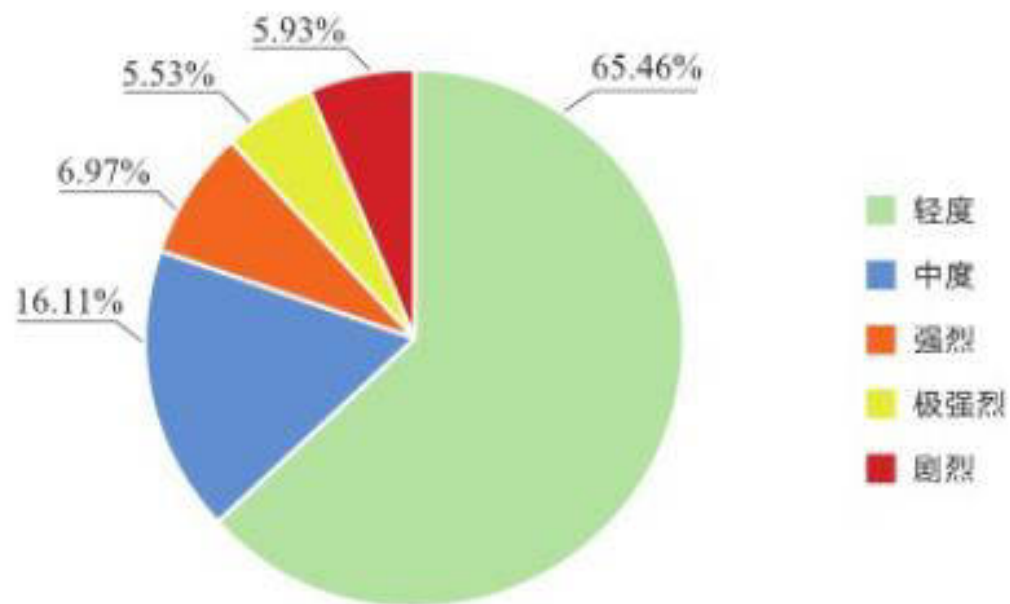


图 1.1-1 全国各强度等级水土流失面积比例图

中国八大水土流失类型区流失面积与强度

The area and intensity of soil erosion in the eight major types of soil erosion zones in China

表 1.2-1 全国水土保持区划一级区水土流失面积和强度

全国水土保持区划一级区	水土流失面积 (km ²)	占区域总面积比例 (%)	各强度等级水土流失面积及比例					
			轻度		中度		强烈及以上	
			面积 (km ²)	比例 (%)	面积 (km ²)	比例 (%)	面积 (km ²)	比例 (%)
东北黑土区	208857	19.20	166876	79.90	25814	12.36	16167	7.74
北方风沙区	1327177	55.25	744235	56.08	249094	18.77	333848	25.15
北方土石山区	153266	19.01	134945	88.05	12788	8.34	5533	3.61
西北黄土高原区	198696	34.56	123224	62.01	49281	24.80	26191	13.19
南方红壤区	126743	10.28	108772	85.82	11396	8.99	6575	5.19
西南紫色土区	131624	25.83	98171	74.59	16117	12.24	17336	13.17
西南岩溶区	174021	24.59	117084	67.28	26000	14.94	30937	17.78
青藏高原区	307196	13.64	226851	73.85	32776	10.67	47569	15.48

黄土高原和北方风沙区的水土流失防治任务依然繁重

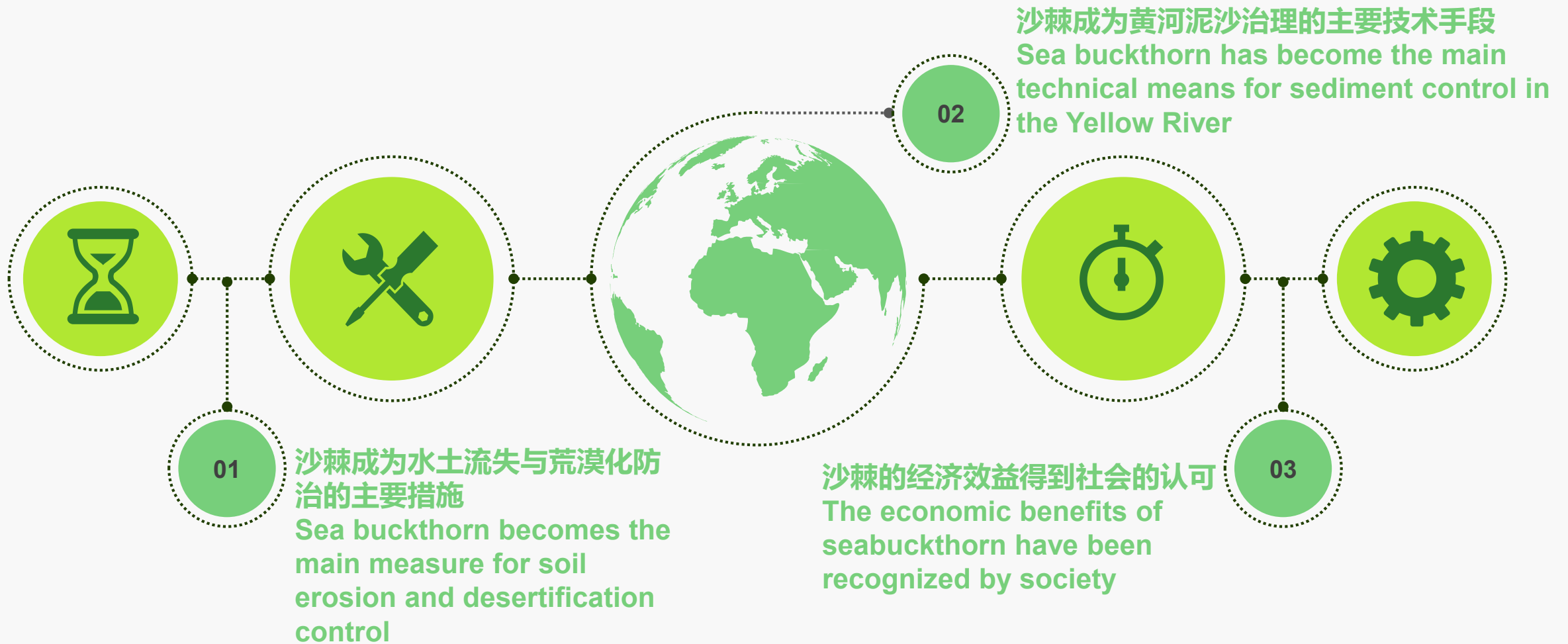
The task of preventing and controlling soil erosion in the Loess Plateau and northern wind blown areas remains heavy



第二部分

Part 2

沙棘在中国水土保持工作的应用
Application of seabuckthorn in soil and
water conservation work



沙棘自身独特的作用与价值，在中国水土流失防治中取得了特殊的地位
Sea buckthorn, with its unique role and value, has gained a special position in the prevention and control of soil erosion in China

沙棘成为水土流失与荒漠化防治的主要措施

Sea buckthorn becomes the main measure for soil erosion and desertification control

适应性广

Wide adaptability

根系的固土与固氮

Soil fixation and nitrogen fixation of roots

树冠截留、降低风速

Tree crown interception and reduction of wind speed

先锋种群、改善生态环境

Pioneer population, improving ecological environment

地上一把伞，地面一条毯，地下一张网

An umbrella on the ground, a blanket on the ground, and a net underground

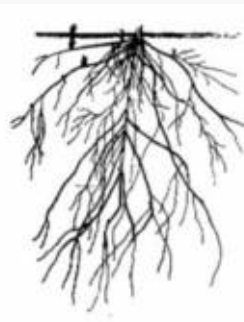


图2 肉刺7年生沙棘根系

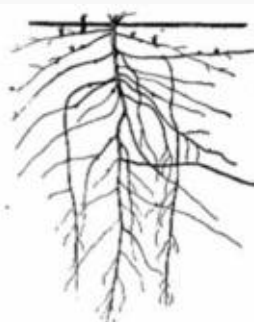
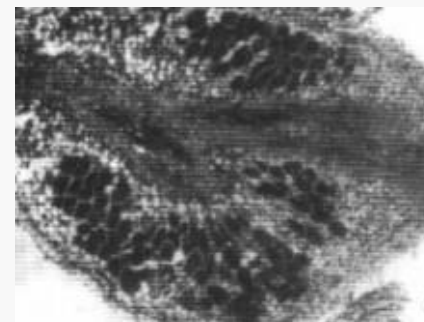


图3 黑刺7年生沙棘根系



沙棘成为黄河泥沙治理的主要技术手段

Sea buckthorn has become the main technical means for sediment control in the Yellow River



总面积1.67万平方公里，集中分布在晋陕内蒙古接壤地区的黄河两岸
黄河输入泥沙达3.5亿吨，其中粒径大于0.05mm的粗沙约2.8亿吨

我中心作为法人先后实施了三期沙棘工程，国家财政投入资金6.91亿元，种植沙棘800万亩

内涵：种植一种植物，再造一片生态、培育一项产业、树立一个品牌、占领一块市场、致富一方百姓

砒砂岩水土流失严重
Severe soil erosion in arsenic sandstone

沙棘在黄河泥沙治理中作用突出
Sea buckthorn plays a prominent role in sediment control of the Yellow River

形成黄土高原治理的沙棘模式
Developing a seabuckthorn model for the management of the Loess Plateau

Sea buckthorn has become the main technical means for sediment control in the Yellow River



The total area is 16700 square kilometers, concentrated on both sides of the Yellow River in the border areas of Shanxi, Shaanxi, and Inner Mongolia. The Yellow River inputs 350 million tons of sediment, including about 280 million tons of coarse sand with a particle size greater than 0.05mm

Severe soil erosion in arsenic sandstone



As a legal entity, our center has implemented three phases of sea buckthorn projects, with a national financial investment of 691 million yuan, planting 8 million acres of sea buckthorn

Sea buckthorn plays a prominent role in sediment control of the Yellow River



Connotation: Planting a plant, rebuilding an ecosystem, cultivating an industry, establishing a brand, occupying a market, and enriching the people

Developing a seabuckthorn model for the management of the Loess Plateau

沙棘的经济效益得到充分认可

The economic benefits of seabuckthorn have been fully recognized



沙棘全身都是宝。沙棘为药食同源植物。沙棘的根、茎、叶、花、果，特别是沙棘果实含有丰富的营养物质和生物活性物质，可以广泛应用于食品、医药、轻工、航天、农牧渔业等国民经济的许多领域。

经《国际沙棘发展报告（2022版）》统计，我国现有涉及沙棘企业5000多家，年产值近300亿元。

Sea buckthorn is a treasure all over its body. Sea buckthorn is a medicinal and edible plant. The roots, stems, leaves, flowers, and fruits of seabuckthorn, especially the fruit of seabuckthorn, contain abundant nutrients and bioactive substances, which can be widely used in many fields of the national economy such as food, medicine, light industry, aerospace, agriculture, animal husbandry, and fish industry.



According to the International Sea Buckthorn Development Report (2022 Edition), there are currently over 5000 sea buckthorn enterprises involved in China, with an annual output value of nearly 30 billion yuan.

开发沙棘，
利国利民。
刘子英
九八年元月



第三部分

Part 3

沙棘在新时代水土流失防治中的作用
The role of seabuckthorn in the prevention and
control of soil erosion in the new era

沙棘在黄河生态保护与高质量发展的作用突出

The prominent role of seabuckthorn in ecological protection and high-quality development of the Yellow River



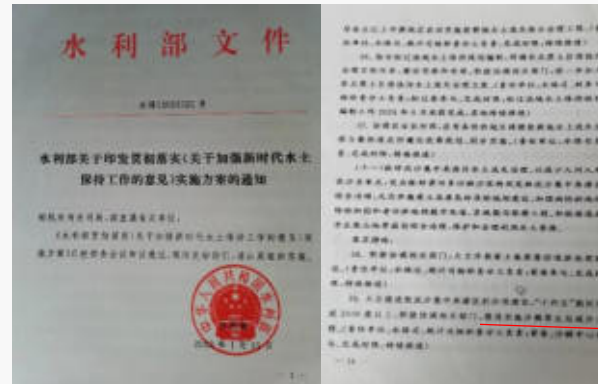
沙棘模式的认可
Recognition of seabuckthorn pattern



在国家行业顶层管理文件中明确
Clearly state in the top-level management documents of the national industry



列入今后十年黄河片区规划
Include in the planning of the Yellow River area for the next decade



第22卷第3期 2009年9月 沙棘 HIPPOPHAE Vol. 22 No. 3 Jun. 2009

沙棘在黑土区恢复生态、治理水土流失中的作用
申友华, 苏品朋

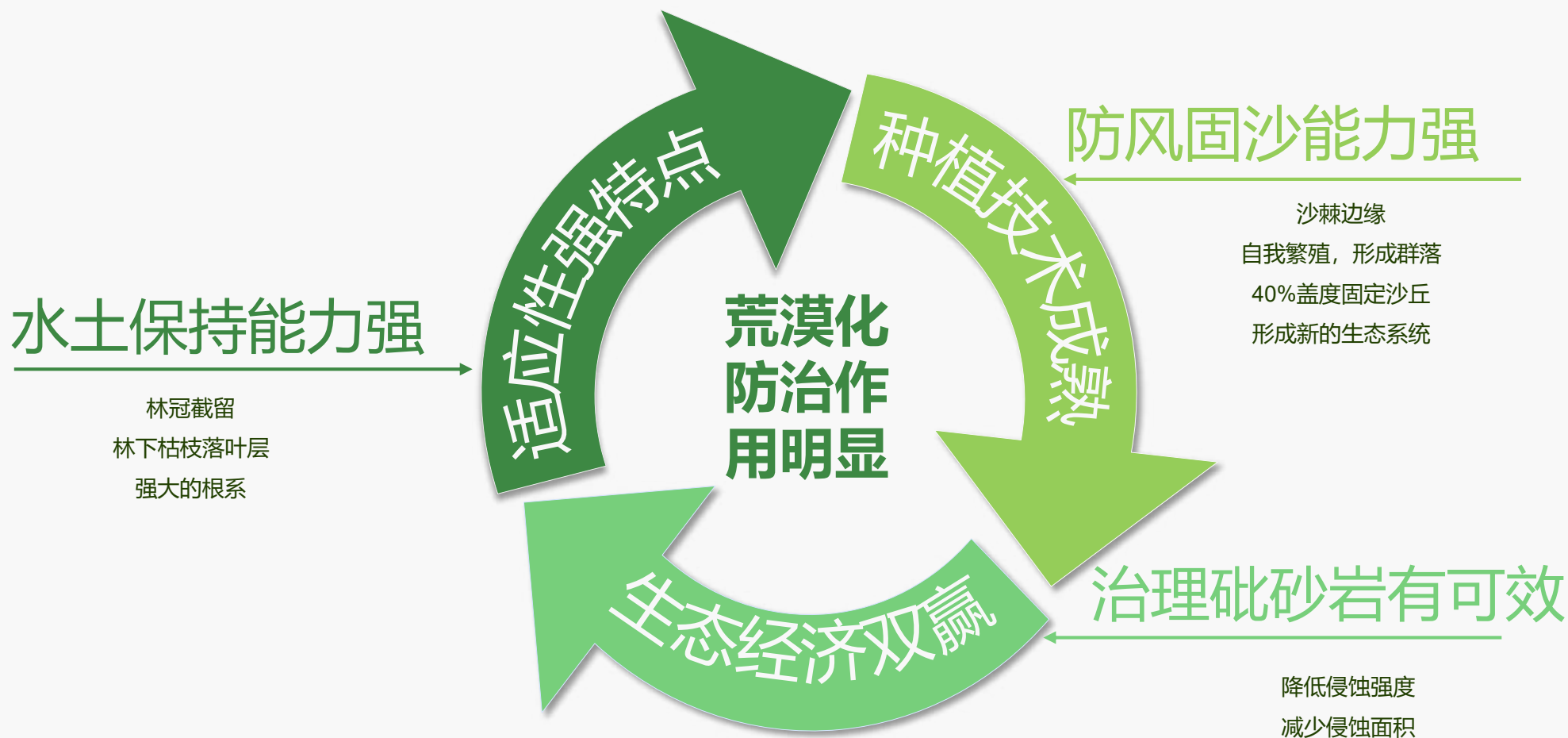
砒砂岩区水土流失治理的“沙棘模式”
曹建忠

第18卷第3期 2005年9月 沙棘 HIPPOPHAE Vol. 18 No. 3 Sep. 2005

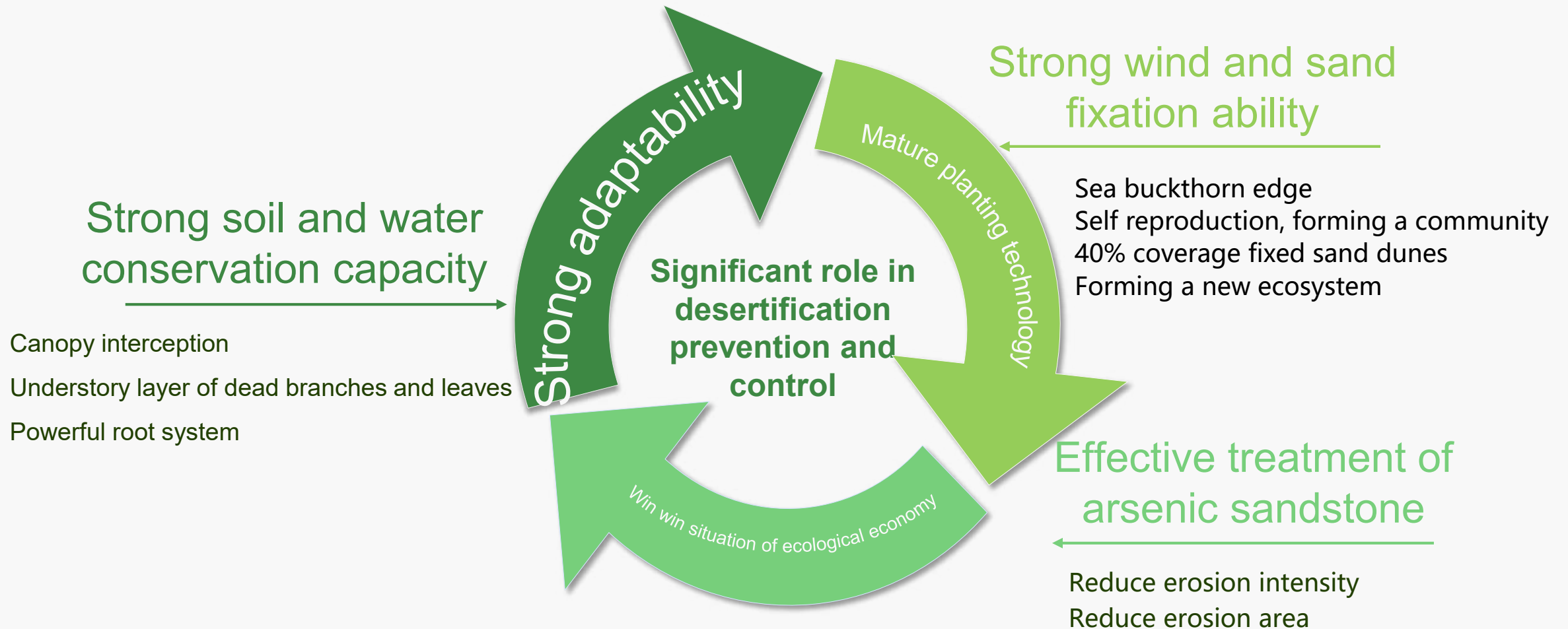
浅论黄土高原水土流失治理与沙棘生态建设
张青

中国水土保持 2009年第10期 2009年10月 2009-10-10

沙棘在荒漠化防治作用



The role of seabuckthorn in desertification control



沙棘在荒漠化防治作用

水土保持能力强

林冠截留

林下枯枝落叶层

强大的根系

沙棘林冠层对降雨有截留作用，据相关资料所录，辽西地区天然沙棘林截留率为49%，另有研究从沙棘林截留从8.5%至60%不等，同林龄及郁闭度呈显著相关。

枯枝落叶层覆盖于土壤表面，一方面可起到截持降水、减少产流的作用，另一方面还可起到减少土壤侵蚀、增强土壤抗冲刷能力的作用。有研究观测得到，5年生人工沙棘林枯枝落叶的厚度可以达到0.3 cm，枯枝落叶的蓄积量可以达到1.19 t/hm²，在一定程度上可以减缓降雨对土壤的溅击侵蚀力，当沙棘林地枯枝落叶层厚度达到2 cm时林地无降雨侵蚀发生；与荒坡相比，沙棘林地内土壤表层（0~5 cm）的抗冲性能提高27.0%~43.5%。

一是沙棘根部分蘖能力强，其垂直根系一般可向下深扎2~3 m，同时侧根向四周水平扩展，长度、粗度常常超过主根，进而在土壤中交织成由根系组成的立体网，将土壤牢牢地固定住；二是沙棘根部组成的立体网一方面可以很好地保持土壤中的水分，使其生长水分环境适宜，另一方面沙棘的根瘤菌可以进行固氮作用，从而能够为自身及附近的草类提供良好的氮素生长环境，而草类生长良好也能提高土壤的水土保持效果；三是沙棘繁殖速度较快，在其繁殖区域能够较好地郁闭成林，从而能够有效减弱雨水对地面的冲刷作用，防止水土流失。

The role of seabuckthorn in desertification control

Strong soil and water conservation capacity



Canopy interception

Understory layer of dead branches and leaves

Powerful root system

The crown layer of seabuckthorn forests has a interception effect on rainfall. According to relevant data, the interception rate of natural seabuckthorn forests in western Liaoning is 49%. Other studies have shown that the interception rate of seabuckthorn forests ranges from 8.5% to 60%, which is significantly correlated with forest age and canopy density.

The layer of dead branches and leaves covering the soil surface can not only intercept precipitation and reduce runoff, but also reduce soil erosion and enhance soil resistance to erosion. Research has observed that the thickness of dead branches and leaves in a 5-year-old artificial seabuckthorn forest can reach 0.3 cm, and the accumulation of dead branches and leaves can reach 1.19 t/hm², which can to some extent slow down the erosive force of rainfall on soil. When the thickness of the dead branches and leaves layer in seabuckthorn forest reaches 2 cm, there is no rainfall erosion in the forest; Compared with barren slopes, the anti erosion performance of the soil surface layer (0-5 cm) in seabuckthorn forests is improved by 27.0% -43.5%.

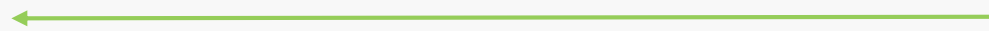
One is that seabuckthorn roots have strong tillering ability, and their vertical roots can generally be deeply rooted 2-3 meters downwards. At the same time, the lateral roots expand horizontally in all directions, often exceeding the length and thickness of the main root, and then interweave into a three-dimensional network composed of roots in the soil, firmly fixing the soil; The second is that the three-dimensional network composed of seabuckthorn roots can effectively maintain soil moisture, making the water environment suitable for its growth. On the other hand, seabuckthorn rhizobia can fix nitrogen, providing a good nitrogen growth environment for themselves and nearby grasses. Good grass growth can also improve soil and water conservation; Thirdly, seabuckthorn has a fast reproduction rate and can be well enclosed into forests in its breeding area, effectively reducing the erosion effect of rainwater on the ground and preventing soil erosion.

沙棘在荒漠化防治作用

The role of seabuckthorn in desertification control

防风固沙能力强

Strong wind and sand fixation ability



沙棘边缘

Sea buckthorn edge

自我繁殖，形成群落

Self reproduction, forming a community

40%盖度固定沙丘

40% coverage fixed sand dunes

形成新的生态系统

Forming a new ecosystem

➤ 提高土壤水分含量

Increase soil moisture content

➤ 增加土壤养分含量

Increase soil nutrient content

➤ 改良土壤

Improve the soil

➤ 防风固沙、改善生态环境

Windproof and sand fixation, improving ecological environment

沙棘在荒漠化防治作用

The role of seabuckthorn in desertification control

治理砒砂岩有可效

Effective treatment of arsenic sandstone

←

降低侵蚀强度

Reduce erosion intensity

减少侵蚀面积

Reduce erosion area

➤ 减少泥沙流失

Reduce sediment loss

➤ 有效治理砒砂岩

Effective management of arsenic sandstone



第四部分

Part 4

沙棘在水土保持工作中的发展展望
Development prospects of seabuckthorn in soil
and water conservation work

加强沙棘基础性研究

Strengthen the fundamental research on seabuckthorn



完善相关标准
Improve relevant standards



培育适宜品种
Cultivate suitable varieties



研究产品
Research Products



配套设备
Supporting equipment

基础性工作
Basic work

加强沙棘基础性研究

Strengthen the fundamental research on seabuckthorn



培育适宜品种
Cultivate suitable varieties

基础性工作
Basic work



加强沙棘基础性研究

Strengthen the fundamental research on seabuckthorn



研究产品
Research Products

基础性工作
Basic work

淘宝网热卖
Taobao.com

沙棘

搜索

—限时秒杀 马丁靴 女装 无线耳机 卫衣 女手表 运动鞋女 厨具 戒指 手机壳

沙棘原浆
生命能源

总黄酮含量高
Vc.Vi.Ve.Vk
SOD.辅酶
必需脂肪酸
ω-3.6.7.9

20g
100%NFC全果原浆

天猫 龙巢沙棘原浆100%nfc鲜果籽榨富含黄酮VC沙棘油内...
¥ 699
龙巢保健品旗舰店
月销 1000+

天然VC 酸甜美味
—5倍5味 纯净配方—

P1000+

天猫 SINE信谊雀巢玉涛辛研P1000即食型益生元沙棘鲜果原浆6月...
¥ 59.9
信谊保健食品旗舰店
月销 100+

100%沙棘原浆
免疫 三高 糖尿

天猫 新疆沙棘原浆500ml3箱(共30瓶) 官方旗舰店正品纯...
¥ 399
松飞海科养生旗舰店
月销 300+

100%沙棘原浆 天然VC宝库
—60%VC 天然VC宝库—

4.5 配料表只有沙棘鲜果

天猫 北京同仁堂健康青源堂牌沙棘原浆果汁沙棘汁内蒙占正...
¥ 594
同仁堂健康大药房
月销 200+

8斤 含籽含油全果生榨

天猫 整箱8斤沙棘原浆官方旗舰店正原沙棘汁自榨鲜果生榨果汁果...
¥ 199
指南针旗舰店
月销 200+

沙棘原浆鲜果生榨沙棘油
果汁100原浆官方旗舰店内蒙...

298 拍2件 送同款沙棘9瓶
天猫甄选假一赔十

天猫 沙棘原浆鲜果生榨沙棘油果汁100原浆官方旗舰店内蒙...
¥ 899
李农旗舰店
月销 1000+

NFC小果沙棘原浆
[VC宝库] 597VC含量最高

真原浆无添加

天猫 莫里优选官方旗舰店正品沙棘原浆VC原汁小果青海NF...
¥ 45.9
莫里优选官方旗舰店
月销 1000+

沙棘原浆1000ml
加野小果沙棘汁非内蒙合果油...

2斤 拍4袋(8斤)更划算

天猫 沙棘原浆1000ml|拒绝添加野小果沙棘汁非内蒙合果油...
¥ 56.8
山谷牧场旗舰店
月销 1000+

内蒙古小果原浆(60瓶*50ml)
官方正品 假一赔十

288

天猫 沙棘原浆官方旗舰店生榨沙棘鲜果油沙棘汁原浆内蒙小...
¥ 699
百千旗舰店
月销 1000+

内蒙古野生沙棘果

3斤装 冷藏车送货 次日送达

3斤内蒙沙棘果小果鲜果纯果正原浆野生甜酸新鲜水果

¥ 109
冰鲜原浆
月销 1000+

加强沙棘基础性研究

Strengthen the fundamental research on seabuckthorn



配套设备
Supporting equipment

基础性工作
Basic work



沙棘果榨汁机
Sea buckthorn fruit juicer



沙棘果压油机
Sea buckthorn fruit oil press machine

加快沙棘栽植技术的集成示范与推广，形成优质原料林
Accelerate the integrated demonstration and promotion of
seabuckthorn planting technology, and form high-quality raw
material forests



适应发展阶段的资源林体系建设
Construction of Resource Forest
System Adapting to the
Development Stage

The background is a solid green color with a decorative border of various green leaves and leaflets scattered around the edges. The leaves are rendered in a flat, stylized manner with visible veins.

谢谢观看

Thanks for listening