Cashew living fence on a ditch next to an irrigation channel (Stefan Graf)

Cashew living fences (柬埔寨)

(Khmer)

描

Living fences of cashew, reinforced with bamboo and/or barbed wire, are used to keep the cattle off the garden or the rice seedbed.

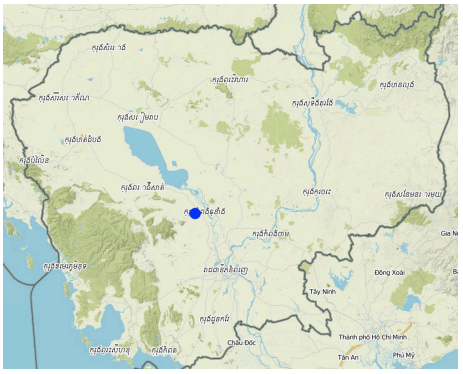
Cashews (Anacardium occidentale) are fast growing, waterlogging tolerant tropical trees that can be used as living fences. The cashews act as fence posts, and are reinforced with bamboo poles and/or barbed wire. The living fences are used to either fence cattle into fields or fence them off, usually around the house. The fenced areas can be planted during the dry season. Without fences, the cattle are free roaming and use to destroy the crops.

Besides fencing the cattle, the purposes of cashew living fences are the production of nuts and fruits, fuel, and soil enhancer. The nuts are sold, but there is no market for the fruits, thus they are fed to cattle or let to rot. The wood is used to cook or to produce charcoal; the ash is added to the compost. The leaves are gathered as well and added to the compost.

Although cashews can stand waterlogged conditions, they prefer a well-drained soil. Thus a small berm is built up on the emplacement of the fence, and sown with cashew seeds spaced from 0.5 to 3 m. Cashews grow faster when directly sown than when transplanted. The spacing varies according to the farmers' purpose. If a higher production of nuts is intended, the spacing is wider; if the fence is more important, the plants are grown closer. Cattle do not eat the leaves and branches, thus do not need protection from grazing. One year after sowing the cashews, the trees are tall enough to act as fence posts and support bamboo pole as well as barbed wire. The bamboo is either gathered from the wild or grown in the fields and home gardens. The bamboo is fixed to the living posts with natural fibers/vines or old clothes, and has to be replaced every two to three years to withstand cattle.

The analysed area is flat (slope < 2%), with a tropical climate (dry season from November to May and wet season from June to October), and the soils are mostly sandy or loamy. The soil has a low fertility, contains little organic matter, and acidifies. The area has been deforested a long time ago, and the groundwater table is rather high (1-2 m during the dry season, on the surface during wet season).
Due to climate change, farmers notice more erratic rainfalls, temperature rises and more recurrent droughts. Rice is the predominant crop grown in the area, since it serves as staple food (mix subsistence and commercial activities). Cattle are usually grazing on the fields after the harvest, without much control. Thus the cattle grazes too often and too much on the same spot, leading to degradation.
The increasing migration rate (the young generation leaves the villages to work in the cities, garment industry or abroad) results in a decrease of available labour force in the area which has detrimental effects on the agricultural activities. Furthermore, the civil war in the 1970s (Khmer Rouge) led to the loss of agricultural knowledge. Several NGOs are trying to re-establish the knowledge.

地



地点: Krang Liav, Rolea Pha-er, Kampong Chhnang, 柬埔寨

分析的技术场所数量:

选定地点的地理参考
- 104.55439, 12.22969

技术传播: 均匀地分布在一个区域 (approx. < 0.1 平方千 10 公)

在永久保护区？:

实施日期: 10-50年前

介绍类型
- [x] 土地使 创新
- [ ] 作为传 >50 年分
- [ ] 在实 / 期
- [ ] 外 干

Cashew living fence on a ditch next to an irrigation channel (Stefan Graf)

Close view on a cashew living fence, with bamboo poles and barbed wire. (Stefan Graf)

技术分

主要目的

- [ ] 改 产
- [ ] 减少、 、恢复土地 化
- [x] 保护 态
- [ ] 合其他技术保护 /下域 区域
- [ ] 保持/提 多 性
- [ ] 低 害
- [ ] 应 候变化 天 及其影响
- [ ] 减 候变化及其影响
- [ ] 创 有 影响
- [ ] 创 有 会影响

土地利用

同一土地单元内 合使 是地/林 业

农田

- 乔木与 木 果

牧场

供水

- [ ] 养
- [x] 合
- [ ] 充分

土地退化相关的目的

- [ ] 土地 化
- [x] 减少土地 化
- [x] 修复/恢复严 化 土地
- [ ] 应土地 化
- [ ] 不

解决的退化问题

土壤风蚀 - Et 土 失

化学性土壤退化 - Cn 力下 和有机 含 下

生物性退化 - Bc Bl 土寿命损失

SLM组

- 农 合

SLM措施

植物措施 - V1 乔木和 木 层

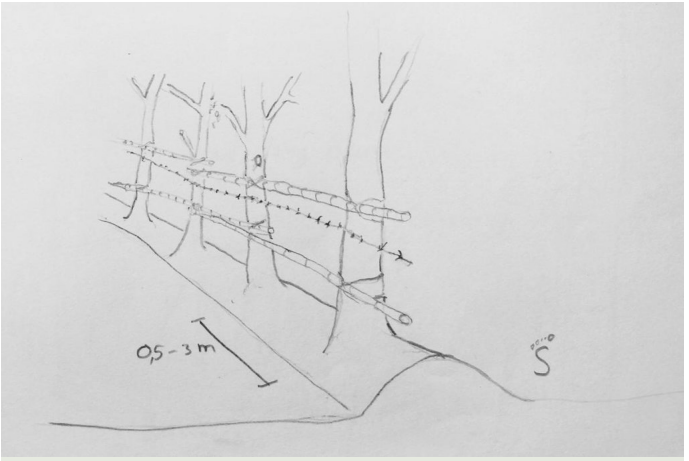
技术图

技术规范

On a dike cashews (Anacardium occidentale) were planted a few years back. After they grew up, the fence was done with barbed wire and bamboo poles.
Kampong Chhnang
Date: 2014

Technical knowledge required for field staff / advisors: low
Technical knowledge required for land users: low
Main technical functions: increase of biomass (quantity), spatial arrangement and diversification of land use
Secondary technical functions: increase in organic matter, increase in nutrient availability (supply, recycling,...), improvement of water quality, buffering / filtering water, reduction in wind speed

Aligned: -along boundary
Vegetative material: T : trees / shrubs, F : fruit trees / shrubs
Vertical interval within rows / strips / blocks (m): 0.5-3m
Fruit trees / shrubs species: Cashew, seeded.



Author: Stefan Graf, Switzerland

技术建□ 与□ 护□ □ 动、投入和□ □

投入和成本的计算

- □ □ □ 成本为□
- 成本□ □ 使□ □ **不适用**币□
- □ □ □ 换□ 为1 □ 元元 不□ □
- □ □ 劳工□ □ 日平均工5.00成本□

影响成本的最重要因素

The costs are most determined by the availability of bamboo. If it is not grown in the garden, it has to be gathered in the forest that is related to time consuming transportation. Or barbed wire has to be purchased. Note: The time used to gather the leaves for the compost or to cut the branches to make charcoal/ash as soil amendment was not included in the recurrent activities as these activities are neither related to the main purpose of living fences nor done by all the farmers applying this technology.

技术建立活动

1. Building small bound to sow the cashews. (时□ /□ □ Dry season, before sowing)
2. Sowing cashews on the bounds (时□ /□ □ Beginning of rainy season)
3. Gathering bamboo in the forest, building the fence (时□ /□ □ None)

技术建立的投入和成本

对投入进行具体说明	单位	数量	单位成本 (不适用)	每项投入的总成本 (不适用)	土地使用者承担的成本%
劳动力					
labour		1.0	17.5	17.5	100.0
设备					
tools		1.0	12.0	12.0	100.0
barbed wire		1.0	21.0	21.0	100.0
植物材料					
seeds		1.0	1.0	1.0	100.0
技术建立所需总成本				**51.5**	
技术建□ 总成本□ □ 元				*51.5*	

技术维护活动

1. Gathering bamboo in the forest, building the fence (时□ /□ □ Every 2-3 years)

技术维护的投入和成本

对投入进行具体说明	单位	数量	单位成本 (不适用)	每项投入的总成本 (不适用)	土地使用者承担的成本%
劳动力					
labour		1.0	3.0	3.0	100.0
技术维护所需总成本				**3.0**	
技术□ 护总成本□ □ 元				*3.0*	

□ □ □ 境

年平均降雨量

- ☐ < 250□ □
- ☐ 251-500□ □
- ☐ 501-750□ □
- ☐ 751-1,000□ □
- ☑ 1,001-1,500□ □
- ☐ 1,501-2,000□ □
- ☐ 2,001-3,000□ □
- ☐ 3,001-4,000□ □
- ☐ > 4,000□ □

农业气候带

- ☐ □ □ □
- ☑ 半□ □
- ☐ 半干旱
- ☐ 干旱

关于气候的规范

1486.45 mm 2013 in Kampong Chhnang
Thermal climate class: tropics. 27-35°C

斜坡 **地形** **海拔** **.....应用的技术**

- [x] 平0-2%
- [ ] 3-5%
- [ ] 6-10%
- [ ] 11-15%
- [ ] 16-30%
- [ ] 31-60%
- [ ] >60%

- [x] 高原
- [ ] 山
- [ ] 山坡
- [ ] 山地斜坡
- [ ] 坡
- [ ] 底

- [x] 0-100 m a.s.l.
- [ ] 101-500 m a.s.l.
- [ ] 501-1,000 m a.s.l.
- [ ] 1,001-1,500 m a.s.l.
- [ ] 1,501-2,000 m a.s.l.
- [ ] 2,001-2,500 m a.s.l.
- [ ] 2,501-3,000 m a.s.l.
- [ ] 3,001-4,000 m a.s.l.
- [ ] > 4,000 m a.s.l.

- [ ] 凸形情况
- [ ] 凹 情况
- [ ] 不 关

土壤深度

- [ ] 常 0-20厘
- [x] 21-50厘
- [ ] 中 厚 30-80厘
- [ ] 81-120厘
- [ ] 常 > 120厘

土壤质地（表土）

- [x] 中 壤土、 土
- [x] 中 壤土、 土
- [ ] 土

土壤质地（地表以下>20厘米）

- [ ] 中 壤土、 土
- [ ] 土

表土有机质含量

- [ ] >3%
- [x] 中 1-3%
- [x] 低 <1%

地下水位

- [x] 上
- [ ] < 5
- [ ] 5-50
- [ ] > 50

地表水的可用性

- [x] 好
- [ ] 中
- [ ] 匮乏/ 有

水质（未处理）

- [x] 不 处
- [ ] 仅供农业使
- [ ] 不可

盐度是个问题吗？

- [ ] 是
- [ ] 否

洪水发生

- [ ] 是
- [ ] 否

物种多样性

- [x] 中
- [ ] 低

栖息地多样性

- [x] 中
- [ ] 低

应 技术 土地使 征

市场定位

- [x] 合 商业
- [ ] 商业/市场

非农收入

- [ ] 低于全 收入10%
- [x] 收入 10-50%
- [ ] > 收入 50%

相对财富水平

- [ ] 常
- [x] 平均 平
- [ ] 丰富
- [ ] 常丰富

机械化水平

- [x] 手工作业
- [x] 力 引
- [ ] 机 化 动

定栖或游牧

- [ ] 定
- [ ] 半
- [ ]

个人或集体

- [x] 个人/家庭
- [ ] 团体/ 区
- [ ] 合作
- [ ] 员工 公司、政府

性别

- [x] 女人
- [x] 人

年龄

- [ ] 儿
- [ ] 年人
- [ ] 中年人
- [ ] 年人

每户使用面积

- [ ] < 0.5 公
- [ ] 0.5-1 公
- [x] 1-2 公
- [ ] 2-5公
- [ ] 5-15公
- [ ] 15-50公
- [ ] 50-100公
- [ ] 100-500公
- [ ] 500-1,000公
- [ ] 1,000-10,000公
- [ ] > 10,000公

规模

- [ ] 小
- [x] 中
- [ ] 大

土地所有权

- [ ] 州
- [ ] 公司
- [x] 村庄
- [ ] 团体
- [x] 个人 未命名
- [ ] 个人 有命名

土地使用权

- [ ] 入 无
- [x] 区 有
- [x] 个人

用水权

- [x] 入 无
- [ ] 区 有
- [ ] 个人

进入服务和基础设施的通道

健康	好
教	好
技术援助	好
就业 例如 农	好
市场	好
	好
和交	好
和卫 施	好
服务	好

影响

社会经济影响

作 产	增加
木材 产	增加

Due to shading and root competition.

Used as fuel and charcoal.

□ □ □ 产□ 例如□ 力发□ 、□ □ 发□ □

□ 低 增加

Firewood production.

□ □ □ □ □ □

增加 □ 低

Quality, trough bioremediation of groundwater. Difficult to quantify.

收入来□ □ 多□ 性

□ 低 增加

If spaced, production of cashew nuts and apples.

社会文化影响

□ 品安全 □ □ □

减少 改□

Improved self-sufficiency on firewood.

contribution to human well-being

decreased increased

Every additional income source/diversification increases the human well-being.

生态影响

□ 发

增加 □ 低

But increased evapotranspiration.

养分循□ /□ □

□ 低 增加

Nutrients are picked up from the groundwater, and put back into the cycle.

土壤有机□ /地下C

□ 低 增加

Leaves used for compost.

□ □ /地上C

□ 低 增加

有□ □ □ □ 捕□ □ 、□ □ 、传□ □ □

□ 低 增加

Wormcasts could be seen under the trees. Difficult to quantify.

□ 息地多□ 性

□ 低 增加

Tree layer.

□ □

增加 □ 低

场外影响

地下□ /□ □ □ 染

增加 减少

Bioremediation difficult to quantify.

□ 力搬□ □ □ □

增加 减少

Slowing down of wind speed.

成本效□ 分析

与技术建立成本相比的效益

□ 期回报 □ 常□ □ 常□ 极

□ 期回报 □ 常□ □ 常□ 极

与技术维护成本相比的效益

□ 期回报 □ 常□ □ 常□ 极

□ 期回报 □ 常□ □ 常□ 极

□ 候变化

渐变气候

年□ 趋加 □ 常不好 □ 常好

气候有关的极端情况（灾害）

局地暴□ □ 常不好 □ 常好

局地□ 暴 □ 常不好 □ 常好

干旱 □ 常不好 □ 常好

□ □ 和□ □ □ □ □ □ □ □ □ 常不好 □ 常好

其他气候相关的后果

□ □ □ □ 期 □ 常不好 □ 常好

□ □ 和□ 应

采用该技术的地区内土地使用者的百分比

- 单例/实□
- 1-10%
- 11-50%
- > 50%

在所有采用这种技术的人当中，有多少人在没有获得物质奖励的情况下采用了这种技术?

- 0-10%
- 11-50%
- 51-90%
- 91-100%

最近是否对该技术进行了修改以适应不断变化的条件？

- 是
- 否

什么样的变化条件？

- 候变化极 候
- 不断变化 市场
- 劳动力可 性 例如 于

和吸取 教

长处: 土地使用者的观点

- Cattle are fenced in or off. The cattle do not enter the home gardens of the neighbours and cannot escape on the rice fields.
- Branches can be used as firewood or to make charcoal, and the leaves can be used as compost
- Production of fruits and nuts.

长处: 编制者或其他关键资源人员的观点

- Reduced wind speed.
- Bioremediation of groundwater.
- Increased soil cover.

弱点/缺点/风险: 土地使用者的观点如何克服

- Shading of crops nearby. Cut back the cashews since they are pollarding trees. However, this will drastically reduce the fruit production.
- Root competition with other trees. Plant next to shallow rooted crops.
- No more market for cashew apples as there is an overproduction. Process as wine or dry. Can also be fed to cattle.

弱点/缺点/风险: 编制者或其他关键资源人员的观点如何克服

参 文

编制者
Stefan Graf

Editors

审查者
Deborah Niggli
Alexandra Gavilano

实施日期: Oct. 27, 2014

上次更新: March 8, 2019

资源人
Stefan Graf - SLM专业人员
Lean Hak Khun - SLM专业人员
Bin Sreytouch - SLM专业人员
Khonhel Pith - SLM专业人员

WOCAT数据库中的完整描述
https://qcat.wocat.net/zh/wocat/technologies/view/technologies_1643/

链接的SLM数据
不

文件编制者

机构

- Local Agricultural Research and Extension Centre (LAREC) - 柬埔寨
- Society for Community Development in Cambodia (SOFDEC) - 柬埔寨

- 不