Home garden with Canna sp., cassava, banana, yam and cucurbits. Coconuts, sugar palms, mangoes and other fruit trees in the background. (Stefan Graf (Switzerland))

Home gardens for consumption and cash crop production (柬埔寨)

(Khmer)

描

Home gardens, containing tree, shrub, herbs, vine, tuber layers as well as poultry, produce food for household consumption as well as an additional income.

Home gardens are a traditional setting in Cambodia, where they appear around nearly each house. All the seven layers of production occur, with a tree canopy, lower trees, shrubs, herbs, a soil cover, roots and tubers as well as a climbing layer, but not all layers can be found in each garden. The overlapping production allows a high productivity on a small area, and the trees/canopy provide a comfortable microclimate for both humans and livestock. The products of the home gardens are consumed by the family, surplus is given to neighbours or sold, and provide an additional income. One or more of the crops are produced in bigger amounts to serve as a cash crop. It can be coconuts close to the city, mangoes that are processed, sugarcane or vegetables like winged beans for the market, bamboo for handicrafts or constructions. Poultry is free ranging in the home gardens, thus when short annual plants like water spinach are planted they are protected with bamboo or net fences. The poultry, mostly chicken, but as well ducks, Muscovy ducks, and others, forages in the waste and eats bugs and worms.

The home gardens are planted to produce food, to provide additional income source and assure a comfortable microclimate. Medicinal plants, as well as plants for handicrafts like bamboo, are grown in the home gardens. Due to a lack of labour availability on the farms, the gardens are only poorly maintained. Some NGOs try to implement the production of more annual crops in the home gardens, but fail due to this constraint and the fact that leafy vegetables are collected from the wild during the wet season.

When a new house is built, canopy trees like coconuts or sugar palms are planted, sometimes following a square pattern, with other trees in between. In other gardens, no pattern can be found, as trees are planted more randomly, or left growing on their own. The seedlings growing in and around trash piles are transplanted to more suitable places, sometimes seedlings from grafted varieties are bought from the market.
Mainly annual crops, like yam, are fertilized with cow manure or compost before the sowing. Due to a lack of irrigation water, most farmers only grow annuals during the wet season. During the dry season, the vegetables are bought from other provinces or countries.

The analysed area is flat (slope < 2%), tropic (dry and wet season), and the soils are mostly sandy or loamy. The soils on the fields contain little organic matter (low soil fertility, acidification, small amount of cattle, area has been deforested a long time ago) and the groundwater table is rather high (2 m below soil level during the dry season, on the surface during the wet season).
Due to climate change, the rainfalls are more erratic, temperatures rise and droughts are more recurrent. Rice is the predominant crop grown in the area, since it serves as staple food (mix subsistence and commercial activities). Rice is often grown in monocultures and harvested once a year. Once the rice is harvested (dry season), some farmer release cattle to the paddy fields to eat the straw and weeds.

As an addition to rice, most land users grow vegetable and fruits in home gardens (subsistence) and complement their income by producing handicrafts or through off-farm income / remittances from family members working in other places. Gathering of wild food (plants, animals, and mushrooms) is also of importance for the diet. 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 that has detrimental effects on the agricultural activities. Furthermore, the civil war in the 1970s (Khmer Rouge) led to the loss of agricultural knowledge that different NGOs try to re-establish.

地

地点: Kampong Chhnang, 柬埔寨

分析的技术场所数量:

选定地点的地理参考
- 不

技术传播: 均匀地分布在一个区域 (approx. 10-100 平方千)

在永久保护区？:

实施日期: 50多年前 传

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

Home garden with bamboo, coconuts, mangoes and other fruit trees. The concrete pots are used for water storage, the fence to keep off the cattle. (Stefan Graf (Switzerland))

技术分

主要目的

- [x] 改 产
- [ ] 减少、 、恢复土地 化
- [ ] 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
- [x] 创 有 影响
- [ ] 创 有 会影响

土地利用

同一土地单元内 合使 是地农林业

农田

- 一年一作: - 块 作- 、山 、头/ 子 其他块 作- 木 , - 、南 、南
- 多年一作 木林
- 乔木与 木 柑 属 子 果、 壳、 叶果、其他, 果、山 果、 , 木

森林/林地 Tree types: 子

供水

- [ ] 养
- [x] 合
- [ ] 充分

土地退化相关的目的

- [x] 土地 化
- [x] 减少土地 化
- [ ] 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 , Ca 化

水质恶化 - Ha 干旱化Hg 地下含 层 位 变化

SLM组

- 农业林学
- 养 、养 业、家 业、养兔业、养 业
- 家庭 园

SLM措施

植物措施 - V1 乔木和 木 , V2 层 和多年 本

技术图

技术规范

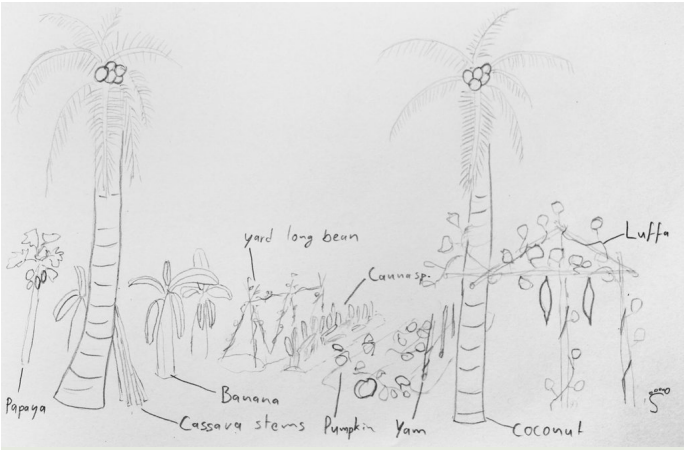
Example of a homegarden with different layers. Coconut palms present the top layer, different vines grow on trellises, bananas and a dwarf papaya form an intermediate layer, pumpkins form the soil cover and Canna represents the edible roots. Many edible wild plants would grow by themselves between the planted ones, and would also be consumed.

Kampong Chhnang
Date: 2014

Technical knowledge required for field staff / advisors: moderate
Technical knowledge required for land users: moderate (Each garden is different.)
Main technical functions: improvement of ground cover, increase in organic matter, increase in nutrient availability (supply, recycling,...), increase of biomass (quantity), promotion of vegetation species and varieties (quality, eg palatable fodder), spatial arrangement and diversification of land use
Secondary technical functions: water harvesting / increase water supply, improvement of water quality, buffering / filtering water, sediment retention / trapping, sediment harvesting, reduction in wind speed

Scattered / dispersed
Vegetative material: T : trees / shrubs, F : fruit trees / shrubs, C : perennial crops
Number of plants per (ha): n/a

Fruit trees / shrubs species: Sugar palm, coconut, mango, custard apple, bananas, limes.
Perennial crops species: Lemon grass, bamboo.
Other species: Eggplants, winged beans, yard long beans, pumpkins, cucumbers.



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 □ 元无 不□ □
- □ □ 劳工□ □ 日平均工5.00成本□

影响成本的最重要因素
The labour is the most expensive in the home gardens. This is problematic as the labour availability is decreasing due to high migration rates.

技术建立活动
1. Planting of the selected trees and other plants. (时□ /□ □ Whole year)

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	10.0	10.0	100.0
设备					
Tools		1.0	20.0	20.0	100.0
植物材料					
seeds		1.0	5.0	5.0	100.0
seedlings		1.0	45.0	45.0	100.0
技术建立所需总成本				**80.0**	
技术建□ 总成本□ □ 元				*80.0*	

技术维护活动
1. Harvesting (时□ /□ □ Depends on the size of the garden and the crops.)
2. Planting and fertilizing (时□ /□ □ Depends on the farmers' preference for a given crop)

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	60.0	60.0	100.0
植物材料					
seeds		1.0	3.0	3.0	100.0
技术维护所需总成本				**63.0**	
技术□ 护总成本□ □ 元				*63.0*	

□ □ □ 境

年平均降雨量

- [ ] < 250□
- [ ] 251-500□
- [ ] 501-750□
- [ ] 751-1,000□
- [x] 1,001-1,500□
- [ ] 1,501-2,000□
- [ ] 2,001-3,000□
- [ ] 3,001-4,000□
- [ ] > 4,000□

农业气候带

- [ ] □
- [x] 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

- [x] □ 平□0-2%□
- [ ] □ □ 3-5%□
- [ ] 平□ □6-10%□
- [ ] □ 坡□11-15%□
- [ ] 崎岖□ 16-30%□
- [ ] □ 峭□31-60%□
- [ ] □ 常□ 峭□60%□

地形

- [x] □ □平原
- [ ] 山□
- [ ] 山坡
- [ ] 山地斜坡
- [ ] □ 坡
- [ ] □ 底

海拔

- [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.

.....应用的技术

- [ ] 凸形情况
- [ ] 凹□ 情况
- [ ] 不□ 关

土壤深度

- [ ] □ 常□ 0-20厘□
- [x] □ 21-50厘□
- [ ] 中□ □ 度□50-80厘□ □
- [ ] □ 81-120厘□ □
- [ ] □ 常□ > 120厘□ □

土壤质地（表土）

- [ ] □ □□ □ □ □ □ □
- [x] 中□ □ 壤土、□ 土□
- [ ] □ □□ □ □ □ □ 土□

土壤质地（地表以下>20厘米）

- [ ] □ □□ □ □ □ □ □
- [x] 中□ □ 壤土、□ 土□
- [ ] □ □□ □ □ □ □ 土□

表土有机质含量

- [ ] □ >3%□
- [x] 中□ 1-3%□
- [x] 低□ <1%□

地下水位

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

地表水的可用性

- [ ] □ □
- [ ] 好
- [ ] 中□
- [x] 匮乏/□ 有

水质（未处理）

- [ ] □ 好□ □ □
- [x] 不□ □ □ □ □ □ □ □ 处□
- [ ] 仅供农业使□ □ □ □ □
- [ ] 不可□

□ □ □ 参□ □

盐度是个问题吗？

- [ ] 是
- [ ] 否

洪水发生

- [ ] 是
- [ ] 否

物种多样性

- [ ] □
- [ ] 中□
- [x] 低

栖息地多样性

- [ ] □
- [ ] 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] □ □
- [x] 平均□ 平
- [ ] 丰富
- [ ] □ 常丰富

机械化水平

- [x] 手工作业
- [ ] □ 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□
- [x] 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

- [x] 小□ □ □
- [ ] 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
□ 料□ 产 □ 增加
木材□ 产 □ 增加
□ 产故□ □ □ 增加 □ 低
产品多□ 性 □ 增加
□ □ □ □ 可□ 性 □ 增加

Bioremediation of groundwater.

□ □ □ □ □ □ 增加 □ 低

if more perennials (trees) are planted.

收入来□ □ 多□ 性 □ 增加

Otherwise only rice is grown. Bamboo is used for handicraft.

工作□ 增加 □ 低

Depending on crops. Most home garden crops have an excellent cost/benefit ratio.

社会文化影响

□ 品安全 □ □ □ 减少 改□
健康□ 况 恶化 改□

Together with food collected from the wild, improves the mainly rice based dishes.

contribution to human well-being

decreased increased

Increased income, income diversification, food security, food diversification

生态影响

□ □ □ 增加

Bioremediaiton of groundwater.

土壤□ □ 层 减少 改□

Permanent soil cover

养分循□ /□ □ □ 增加

Nutrients from groundwater are returned to the cycle.

土壤有机□ /地下C □ 增加

If the leaves are not burnt.

□ □ /地上C □ 增加
□ □ 多□ 性 □ 增加
动□ 多□ 性 □ 增加
□ □ 增加 □ 低

场外影响

地下□ /□ □ □ □ 染 增加 减少

Bioremediation of groundwater.

□ 冲 □ □ 力□ 按土壤、□ □ 、□ 地划分□ 减少 改□

Bioremediation of groundwater.

□ 力搬□ □ □ □ 增加 减少

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□ 增加 □ 常不好 □ 常好

气候有关的极端情况（灾害）

局地暴□

局地□ 暴
干旱
□ □ 和□ □ □ □ □ □ □ □

□ 常不好 □ 常好
□ 常不好 □ 常好 □ □ □ 未□
□ 常不好 □ 常好
□ 常不好 □ 常好 □ □ □ 未□

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%
- [x] > 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%
- [x] 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
- To produce fruits and vegetables for home consumption
- Many types of fruits and vegetables can be produced on a small area of land, for home consumption and to sell the surplus
- The home gardens are close to the houses, all the members of the family can help, and it is possible to look at the house at the same time

弱点/缺点/风险: 土地使用者的观点如何克服
- Lack of water for irrigation Build household ponds
- Insects are attracted to the crops, and spread when crops are grown together Use integrated pest management
- Prices sometimes drop for seasonal crops, like mangoes, and farmers cannot sell the crop Process the fruits (e.g. drying) so they can be preserved

长处: 编制者或其他关键资源人员的观点
- Increased food security and health
- Diversification of income sources
- Improvement of the soil fertility where farmers use compost

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
- Lack of good varieties and selection, lack of knowledge about grafting fruit trees Organize seed exchange, organize grafting and seed saving trainings
- Lack of knowledge about fertilization, not all farmers know about the benefits of compost or manure. Leaves are often burned in the home gardens Provide composting and mulching training

参□ 文□

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WOCAT数据库中的完整描述
https://qcat.wocat.net/zh/wocat/technologies/view/technologies_1628/

链接的SLM数据
不□ □

文件编制者

机构
- 不□ □

□ □
- 不□ □

主要参考文献

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