Members of the Tchicolongilo Community building and planting a 'Leaky weir' near the Caungo Natural Springs. (Projecto RETESA)

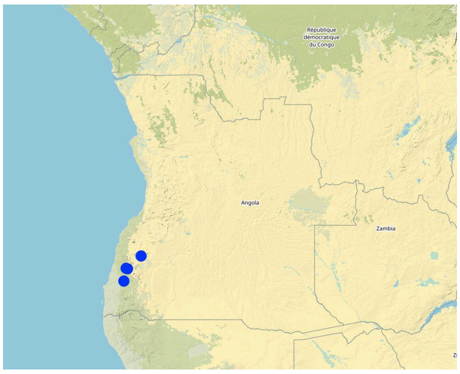
Community supported pasture and rangeland rehabilitation works (ແອນໂກລາ)

ຄຳອະທິບາຍ

Rehabilitation of rangelands involves selection of key pasture and fodder species, and their reintroduction into strategic areas through stakeholder participation. The technology is also supported by communal management plans, which were created to address the root causes of land degradation.

This technology was developed and implemented through the RETESA Project "Land rehabilitation and rangelands management in smallholder agropastoral production systems in south-western Angola". RETESA is a project owned and implemented by the Ministry of Environment of the Government of Angola, with technical and methodological assistance from The Food and Agriculture Organization of the United Nations (FAO), and financed by the Global Environment Facility (GEF).
Inappropriate grazing regimes and poor livestock management by pastoral communities in SW Angola have led to degradation of rangeland and pastoral resources, with perennial grassland species and shrubs having been effectively eliminated. This is despite the fact that the pastoral communities of the area know their environment extremely well and are aware of the land degradation happening around them. Under the project they identified crucial areas for rehabilitation works, selecting mostly areas around water points that have been in use both by local and transhumant herders. Through these works, the local community sought to (a) increase ground cover to reduce sediment loads entering waterways (erosion control), (b) provide shade for livestock, (c) increase forage production and (d) introduce legumes and multipurpose forage trees in areas of high animal traffic. A total of four areas in the Bibala and Virei Municipalities were identified for the activities.
The communities were closely involved in the selection and propagation of plant species for the rehabilitation works. The project field staff also ran field palatability trials with them to confirm that the plants selected met their expectations. These participatory trials were also aimed at enhancing their understanding of livestock nutrition and how it related to animal health. Once the species were chosen, seed was collected by the communities and the Project Technicians, and was multiplied in 32 Agro-Pastoral Field School Nurseries and 2 Government funded Veterinary Research Stations. A total of 15 species were identified, with the grasses Eragrostis superba, Urochloa mosambicensis, and the trees Acacia nilotica, Faidherbia albida, Leucaena leucocephala and Moringa oleifera being the most valued by the communities as forage and multipurpose species. The trees were germinated from seed with success. However, native grass species failed to germinate by standard methods - early field trials having ruled out direct seeding methods. Thus they were multiplied by root division of plants collected from cultivated fields. This avoided removal of grass from natural areas.
As the majority of the areas selected for the rehabilitation works were focused around water points and waterways, the soils were generally alluvial, sandy loams. Precipitation is highest in the areas to the north: it ranges from 600 mm in the upper areas of the Bibala Municipality to 200 mm in the areas to the south in Virei. In general, the vegetation communities could be described as dry sclerophyll woodlands with Colophospermum mopane being the dominant tree species, with forest cover decreasing in height and density as one moves south toward drier areas.
Through close collaboration with the participant communities, three rehabilitation methods were designed and improved upon throughout the Project's duration. Method 1 was used to plant open areas within the rehabilitation zone, Method 2 was employed to introduce and protect concentrated plantings of the selected species in strategic locations within the landscape, and Method 3 was preferred for the recuperation of riparian vegetation and to reduce sediment loads in waterways. The three methods used are described in more detail in the Technical Drawings. To increase the sense of ownership and thus the sustained effectiveness of the rehabilitation works, land management plans and other supporting activities were also carried out.

ສະຖານທີ່



ສະຖານທີ່: Municipalities of Bibala and Virei, Province of Namibe, ແອນໂກລາ

ຈຳນວນ ພື້ນທີ່ ທີ່ໃຊ້ ເຕັກໂນໂລຢີ ທີ່ໄດ້ວິເຄາະ: 2-10 ພື້ນທີ່

ການຄັດເລືອກພື້ນທີ່ ທີ່ອີງໃສ່ຂໍ້ມູນທາງພູມີສາດ
- 13.56537, -14.44931
- 12.91683, -15.04958
- 12.84542, -15.0204
- 12.74792, -15.61841

ການແຜ່ກະຈາຍຂອງເຕັກໂນໂລຢີ: ນຳໃຊ້ ນຈຸດສະເພາະ / ແນ ສີ ທີ່ນ ທີ່ຂະ າດ

ຢູ່ໃນເຂດປ່າສະຫງວນທີ່ບໍ?:

ວັນທີ່ຂອງການປະຕິບັດ: ຕ່ຳກວ່າ 10 ປີ ຜ່ານມາ (ມາເຖິງປະຈຸບັນ)

ປະເພດຂອງການນຳສະເໜີ
- ☐ ໂດຍຜ່ານນະວັດຕະກຳຄິດຄົ້ນຂອງຜູ້ນຳໃຊ້ດິນ
- ☐ ເປັນສ່ວນໜຶ່ງຂອງລະບົບພື້ນເມືອງ (>50 ປີ)
- ☐ ລະຫວ່າງ ທົດລອງ / ການຄົ້ນຄວ້າ
- ☒ ໂດຍຜ່ານໂຄງການ / ການຊ່ວຍເຫຼືອຈາກພາຍນອກ

Planting works being implemented in Kamupapa, Bibala. (Projecto RETESA)

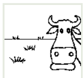
Planting and fence repair around stock water point to improve water quality, stabilise banks and produce forage for dry season, Tchitemo, Bibala. (Projecto RETESA)

ການ□ ຼຸຍກເຕັກໂນໂລຢີ

ຈຸດປະສົງຕົ້ນຕໍ

- ☑ ປັບປຸງ ການຜະລິດ
- ☑ ຫຼຸດຜ່ອນ, ປ້ອງກັນ, ຟື້ນຟູ ການເຊື່ອມໂຊມຂອງດິນ
- ☑ ການອະນຸລັກ ລະບົບນິເວດ
- ☐ ປົກປັກຮັກສານ□ / ນ□ບ□ ທີ່□ ປະສົມປະສານກັບ ເຕັກໂນໂລຢີອື່ນ□
- ☑ ປົກປັກຮັກສາ / ການປັບປຸງຊີວະນາ□ ັນ
- ☑ ຫຼຸດຜ່ອນຄວາມສ່ຽງ ທາງ□ ພິພັດທ□ມະຊາດ
- ☑ ປັບຕົວຕໍ່ກັບການປ່ຽນແປງດິນຟ້າອາກາດ / ທີ່ຮຸນແຮງ ແລະ ຜົນກະທົບ
- ☑ ຫຼຸດຜ່ອນຜົນກະທົບ ຈາກການປ່ຽນແປງດິນຟ້າອາກາດ
- ☑ ສ້າງຜົນກະທົບ ທາງເສດຖະກິດ ທີ່ເປັນປະໂຫຍດ
- ☐ ສ້າງຜົນກະທົບ ທີ່ເປັນທາງບວກ □ ່ອການສັງຄົມ

ການນໍາໃຊ້ດິນ



ທົ່ງຫຍ້າລ້ຽງສັດ

- ການລ້ຽງສັດແບບເຄິ່ງປ່ອຍ
- Transhumance movements

ປະເພດສັດ: ສັດ□ ອ-ງົວພັນນົມ, ສັດ□ ອ-ງົວພັນຊີ້ນ, ແບ□
ຜະລິດຕະພັນ ແລະ ການບ□ລິການ: ຊີ້ນ, ນ້ຳນົມ

ທິດທາງໄຫຼຂອງນ້ຳ, ນ້ຳ, ດິນທາມ - ທລັ້ອງລະບາຍນ້ຳ, ທິດທາງນ້ຳ, □ ອງເຊື່ອມ□ ຟລ້
ອື່ນ□ (ລະບຸແຈງ): Natural springs

ການສະໜອງນ້ຳ

- ☑ ນ້ຳຝົນ
- ☐ ປະສົມປະສານ ກັນລະຫວ□າງນ້ຳຝົນ ແລະ ນ້ຳຊົນລະປະທານ
- ☐ ນ□ □ ອນ້ຳຊົນລະປະທານ ພຽງຢ່າງດຽວ

ຈຸດປະສົງທີ່ກ່ຽວຂ້ອງກັບການເຊື່ອມໂຊມຂອງດິນ

- ☐ ປ້ອງກັນການເຊື່ອມໂຊມຂອງດິນ
- ☑ ຫຼຸດຜ່ອນການເຊື່ອມໂຊມຂອງດິນ
- ☑ ການຟື້ນຟູ / ຟື້ນຟູດິນທີ່ຊຸດໂຊມ
- ☐ ປັບຕົວຕໍ່ກັບການເຊື່ອມໂຊມຂອງດິນ
- ☐ ບ□□ສາມາດ□ ຊີ

ການເຊື່ອມໂຊມ ທີ່ຕ້ອງໄດ້ເອົາໃຈໃສ່

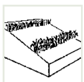
ດິນເຊາະເຈື່ອນ ໂດຍນ້ຳ - Wt: ການສູນເສຍຊັ້ນ□ ຳດິນ / ການເຊາະເຈື່ອນ ພື້ວ□ ຳດິນ, Wr: ແຄມຕາຝັ່ງເຈື່ອນ

ການເຊື່ອມໂຊມ ທາງຊີວະພາບ - Bc: ການຫຼຸດຜ່ອນການປົກຫຸ້ມຂອງພືດ, Bh: ການສູນເສຍ ທີ່ຢູ່ອາ□ ສະຂອງສິ່ງທີ່ມີຊີວິດ, Bq: ປະລິມານ / ອິນຊີວັດຖຸ ຫຼຸດລົງ, Bs: ຄຸນນະພາບ / ການອັດແ□ ນ ຂອງສາຍພັນຫຼຸດລົງ, Bl: ການສູນເສຍ ຈຸລິນຊີ□ ນດິນ

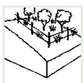
ກຸ່ມການຄຸ້ມຄອງທີ່ດິນແບບຍືນຍົງ

- ການຄຸ້ມຄອງສັດລ້ຽງ ແລະ ທົ່ງຫຍ້າລ້ຽງສັດ
- ການປັບປຸງດິນ / ພືດຄຸມດິນ

ມາດຕະການ ການຄຸ້ມຄອງທີ່ດິນແບບຍືນຍົງ



ມາດຕະການ ທາງດ້ານພືດພັນ - V1: ເປັນ□ ຢືນຕົ້ນ ແລະ ການປົກຫຸ້ມຂອງ□ ມຸ້ມ, V2: ຫຍ້າ ແລະ ພືດສະ□ ູນ□ ົ້ມ□ ຢືນຕົ້ນ

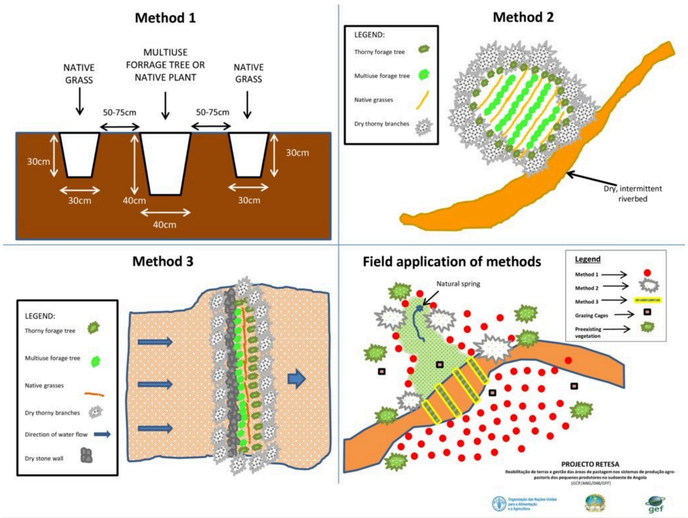


ມາດຕະການ ທາງດ້ານການຄຸ້ມຄອງ - M2: ການປ່ຽນແປງ ການຈັດການ ຄຸ້ມຄອງ / ລະດັບຄວາມ□ າແ□ ນ

ເທັກນິກການແຕ້ມຮູບ

ຂໍກໍານົດທາງເທັກນິກ

Planting is typically based on three different methods, as seen in the figure above.
- Method 1 relies on placing a leguminous, multipurpose tree species in the ground with two native grass species to each side of the tree. The holes are dug and a small amount of manure is placed in the bottom of the hole, adding some water if it is readily available. Then the trees and grasses are planted and well-watered. Finally, a branch or two of thorny shrubs or trees are placed over the plants to protect them from being grazed (where possible, dead branches should be used, rather than cutting living plants).
- Method 2 requires the creation of an enclosed, protected area which is then planted at high densities, preferably in low-lying areas where adequate soil moisture is available. Dry, dead branches from thorny trees and shrubs are used to create the enclosures and provide protection to these plantings.
- Method 3 is based on the creation of a 'leaky weir', which is a small stone barrier, horizontal to the flow of water (on the contour) planted with a mixture of native riparian species. This is intended to slow the flow of water and stimulate the recovery of riparian vegetation. The plants are also protected with dry, dead branches from thorny trees and shrubs in this method.
To increase their effectiveness, it is recommended that the three methods be combined within the landscape, as seen in the 4th slide 'Field application of methods'.



Author: Projecto RETESA

ການຈັດຕັ້ງ ແລະ ບ□າລຸງຮັກສາ: ກິດຈະກ□, ວັດຖຸດິບ ແລະ ຄ□□ ຊ້□ຍ

ການຄຳນວນ ປັດໃຈການຜະລິດ ແລະ ຄ່າໃຊ້ຈ່າຍ

- ຄິດ□ ລ□□ ຊ□ຍ: ຕ□ໍ□ ວ□ຍ ທີ□ ຊື່ຕໍ່ປະຕິບັດ ເຕັກໂນໂລຢີ (ຫົວ□ ວ□ຍ:**3345 seedlings produced, delivered and planted** volume, length: **3345 units**)
- ສະກຸນເງິນທີ□ ຊ□ລັບການຄິດ□ ລ□□ ຊ□ຍ: **USA**
- ອັດຕາແລກປ□ຽນ (ເປັນເງິນ ໂດລາ): 1 USD = ບ□ີຂໍ້ມູນ
- ຄ□ແຮງງານສະເລຍ ຂອງການຈ□ງແຮງງານຕ□ີ□6 Dollars

ປັດໄຈທີ່ສຳຄັນສຸດທີ່ສົ່ງຜົນກະທົບຕໍ່ຄ່າໃຊ້ຈ່າຍ

The activities and costs given were those needed to produce and plant 3,345 trees and grasses in the 4 rehabilitation areas. Given that 3.345 plants were produced at a cost of $3284.75, the cost per plant produced and planted in the field is $0.98. Seedlings avaliable through local, government nurseries were $2.00 per unit, but only exotic ornamentals were avaliable. However, it can be expected that in other contexts and locations, it would be cheaper to buy seedlings instead of training communities and creating numerous small scale nurseries, though clearly these communities will not appropriate the process as well as if they were involved from the beginning.

ກິດຈະກຳການສ້າງຕັ້ງ

1. Meetings and field visits with participant communities to identify plant species and their uses (□ ລຍະເວລາ⁄ ຄວາມຖີ່□Best during growing season)
2. Further meetings to decide on which species are to be multiplied and arrange seed collection (□ ລຍະເວລາ⁄ ຄວາມຖີ່□Near end of growing season)
3. Seed collection and transportation (□ ລຍະເວລາ⁄ ຄວາມຖີ່□When seed is available (varies with species))
4. Instalation of irrigation systems (□ ລຍະເວລາ⁄ ຄວາມຖີ່□Most communiites need a water extraction and distribution system to create nurseries)
5. Delivery of nursery supplies and instalation of shade cloth (□ ລຍະເວລາ⁄ ຄວາມຖີ່□Nurseries should have water access and shade)
6. Planting of seeds and care for seedlings at nursery (□ ລຍະເວລາ⁄ ຄວາມຖີ່□Formed part of Agro-Pastoral Farmer Field School activities)
7. Identification of planting areas and timing (□ ລຍະເວລາ⁄ ຄວາມຖີ່□Should be at beginning of rainy season, or when soil moisture permits)
8. Organisation of materials and tools (□ ລຍະເວລາ⁄ ຄວາມຖີ່□At least 1 week before the planting)
9. Planting day (preparation of planting holes and transplanting of seedlings) (□ ລຍະເວລາ⁄ ຄວາມຖີ່□2 days maximum was seen to be optimal)
10. Watering until the plants are established (□ ລຍະເວລາ⁄ ຄວາມຖີ່□Usually a maximum of 3 watering over 1 week after the plantings)
11. Follow up visits to make sure management agreements are being respected and plants are not being eaten by stock until they are ready (□ ລຍະເວລາ⁄ ຄວາມຖີ່□Plants should not be grazed for at least 6 months from planting time until they are well established)

ປັດໄຈນຳເຂົ້າໃນການຈັດຕັ້ງ ແລະ ຄ່າໃຊ້ຈ່າຍ (per 3345 seedlings produced, delivered and planted)

ລະບຸ ປັດໃຈ ນຳເຂົ້າ ໃນການຜະລິດ	ຫົວໜ່ວຍ	ປະລິມານ	ຕົ້ນທຶນ ຕໍ່ ຫົວໜ່ວຍ (USA)	ຕົ້ນທຶນທັງໝົດ ຂອງປັດໃຈ ຂາເຂົ້າ ໃນການ ຜະລິດ (USA)	% ຂອງຕົ້ນທຶນ ທັງໝົດ ທີ່ຜູ້ນຳ ໃຊ້ທີ່ດິນ ໃຊ້ ຈ່າຍເອງ
ແຮງງານ					
Project Technicians/Drivers/Consultants, etc	Person-days	30.0	20.0	600.0	
Plant identification activities and seed collection	Person-days	10.0	6.0	60.0	100.0
Plant nursery creation and plant production	Person-days	16.0	6.0	96.0	100.0
Participation during planting days	Person-days	25.0	10.0	250.0	90.0
ອຸປະກອນ					
Vehicle	Trips	10.0	40.0	400.0	
Nursery supplies (including water system which also supplies water to Farmer Field School)	Materials	1.0	800.0	800.0	10.0
Planting supplies (shovels, hoes, wheelbarrows, etc.)	Materials	1.0	120.0	120.0	
Other improvements to water point (fencing, cement blocks, cement, hoses, etc.)	Materials	1.0	250.0	250.0	

Maps (traced onto paper from projected images for management purposes)	Materials	1.0	10.0	10.0	
Food and Refreshments	Per person	25.0	2.5	62.5	
ຝຸ່ນ ແລະ ຢາຊີວະພາບ					
Manure (50 grams per sack, 12.500 sacks)	Kilos	625.0	0.25	156.25	100.0
ວັດສະດຸກໍ່ສ້າງ					
Shade-cloth	m2	320.0	1.5	480.0	
ຕົ້ນທຶນທັງໝົດ ໃນການຈັດຕັ້ງປະຕິບັດ ເຕັກໂນໂລຢີ				**3'284.75**	
ຄ່າໃຊ້ຈ່າຍທັງໝົດ ສໍາລັບການສ້າງຕັ້ງເຕັກໂນໂລຢີ ເປັນສະກຸນເງິນໂດລາ				*3'284.75*	

ກິດຈະກຳບຳລຸງຮັກສາ

1. Meetings to ensure management agreements are being respected. (□ ລຍະເວລາ/ ຄວາມຖີ່:Once every 3 to 6 months, especially before and after rainy season.)
2. Repairs and replacement of nursery supplies. (□ ລຍະເວລາ/ ຄວາມຖີ່:Once a year.)
3. Replanting of dead seedlings (□ ລຍະເວລາ/ ຄວາມຖີ່:Just before and during rainy season.)

ປັດໄຈນຳເຂົ້າໃນການບຳລຸງຮັກສາ ແລະ ຄ່າໃຊ້ຈ່າຍ (per 3345 seedlings produced, delivered and planted)

ລະບຸ ປັດໃຈ ນຳເຂົ້າ ໃນການຜະລິດ	ຫົວໜ່ວຍ	ປະລິມານ	ຕົ້ນທຶນ ຕໍ່ ຫົວໜ່ວຍ (USA)	ຕົ້ນທຶນທັງໝົດ ຂອງປັດໃຈ ຂາເຂົ້າ ໃນການ ຜະລິດ (USA)	% ຂອງຕົ້ນທຶນ ທັງໝົດ ທີ່ຜູ້ນຳ ໃຊ້ທີ່ດິນ ໃຊ້ ຈ່າຍເອງ
ແຮງງານ					
Visits to sites and tour of planting areas.	Person-days	4.0	20.0	80.0	50.0
Driver.	Person-days	1.0	20.0	20.0	
Replanting of dead seedlings	Person-days	2.0	6.0	12.0	100.0
Watering	Person-days	14.0	6.0	84.0	100.0
ອຸປະກອນ					
Vehicle	Trips	1.0	40.0	40.0	
Watering cans and buckets	Materials	4.0	5.0	20.0	
ຕົ້ນທຶນທັງໝົດ ທີ່ໃຊ້ໃນການບຳລຸງຮັກສາ ເຕັກໂນໂລຢີ				**256.0**	
ຄ່າໃຊ້ຈ່າຍທັງໝົດ ສໍາລັບການບົວລະບັດຮັກສາເຕັກໂນໂລຢີ ເປັນສະກຸນເງິນໂດລາ				*256.0*	

ສະພາບແວດລ້ອມທຳມະຊາດ

ສະເລ່ຍປະລິມານນ້ຳຝົນປະຈຳປີ

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

ເຂດກະສິກຳ-ສະພາບອາກາດ

- [ ] ຄວາມຊຸ່ມ
- [ ] ເຄິ່ງຄວາມຊຸ່ມ
- [x] ເຄິ່ງແຫ້ງແລ້ງ
- [ ] ແຫ້ງແລ້ງ

ຂໍ້ມູນຈຳເພາະກ່ຽວກັບສະພາບອາກາດ

In the past, the rainy season started in October or November and ran until May. However, the rains in the last few years have fallen in January to April.

ຊື່ຂອງສະຖານີອຸຕຸນິຍົມ: None in the area.

ຄວາມຄ້ອຍຊັນ

- [ ] ພື້ນທີ່ຮາບພຽງ (0-2%)
- [ ] ອ່ອນ (3-5 %)
- [x] ປານກາງ (6-10 %)
- [ ] ມ້ອນ (11-15 %)
- [ ] ເນີນ(16-30%)
- [ ] □ຊັນ (31-60%)
- [ ] ຊັນຫຼາຍ (>60%)

ຮູບແບບຂອງດິນ

- [ ] ພູພຽງ / ທົ່ງພຽງ
- [ ] ສັນພູ
- [ ] ເປີ້ນພູ
- [ ] ເນີນພູ
- [x] ຕີນພູ
- [x] ຮ່ອມພູ

ລະດັບຄວາມສູງ

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

ເຕັກໂນໂລຢີໄດ້ຖືກນຳໃຊ້ໃນ

- [ ] ລັກສະນະສວດ
- [ ] ລັກສະນະກົງ
- [x] ບ□ກ່ຽວຂ້ອງ

ຄວາມເລິກຂອງດິນ

- [ ] ຕື້ນຫຼາຍ (0-20 ຊັງຕີແມັດ)
- [x] ຕື້ນ (21-50 ຊຕມ)
- [ ] ເລິກປານກາງ (51-80 ຊຕມ)
- [ ] ເລິກ (81-120 ຊມ)
- [ ] ເລິກຫຼາຍ (> 120 cm)

ໂຄງສ້າງຂອງດິນ (ເທິງໜ້າດິນ)

- [x] ຫຍາບ / ເບົາ (ດິນຊາຍ)
- [ ] ປານກາງ (ດິນ□ ຽວດິນໂຄນ)
- [ ] ບາງລະອຽດ / □ັກ (□ ຽວ)

ໂຄງສ້າງຂອງດິນ (ເລິກລົງ 20 ຊັງຕີແມັດ)

- [x] ຫຍາບ / ເບົາ (ດິນຊາຍ)
- [ ] ປານກາງ (ດິນ□ ຽວດິນໂຄນ)
- [ ] ບາງລະອຽດ / □ັກ (□ ຽວ)

ທາດອິນຊີຢູ່ເທິງໜ້າດິນ

- [ ] ສູງ (> 3 %)
- [ ] ປານກາງ (1-3 %)
- [x] ຕ່ຳ□(<1 %)

ນ້ຳໃຕ້ດິນ

- [ ] ເທິງຊັ້ນ□ ຄູດິນ
- [x] < 5 ແມັດ
- [ ] 5-50 ແມັດ
- [ ] > 50 ແມັດ

ມີນ້ຳໜ້າດິນ

- [ ] ເກີນ
- [ ] ດີ
- [ ] ປານກາງ
- [x] ທຸກຍາກ / ບ□□ມ

ຄຸນນະພາບນ້ຳ (ການຮັກສາ)

- [ ] ມີນຄູດີມ
- [x] ບ□ນຄູດີມ (ຮຽກຮອ້ງ□ ທີ່ການບ□ຳບັດນຄູ)
- [ ] ນຄູ□ ຊື່ຄູ□ ນການຜະລິດກະສິກຄູ ພຽງຢຄູງດຽວ (ຊົນລະປະທານ)
- [ ] ຜິດປົກກະຕິ

ຄຸນນະພາບນຄູ□ າຍເຖິງ:

ດິນເຄັມເປັນບັນຫາບໍ່?

- [x] ແມ□ນ
- [ ] ບ□□ແມ□ນ

ການເກີດນ້ຳຖ້ວມ

- [x] ແມ□ນ
- [ ] ບ□□ແມ□ນ

ຄວາມຫຼາກຫຼາຍຂອງຊະນິດ
- [ ] ສູງ
- [x] ປານກາງ
- [ ] ຕ່□

ຄວາມຫຼາກຫຼາຍຂອງສິ່ງທີ່ມີຊີວິດ
- [ ] ສູງ
- [ ] ປານກາງ
- [x] ຕ່□

ຄຸນລັກສະນະຂອງຜູ້ນຳ□ ໃຊ້ດິນການນຳ□ ໃຊ້ເທັກໂນໂລຢີ

ການວາງແນວທາງຕະຫຼາດ
- [x] ກຸ້ມຕົນເອງ (ພໍພຽງ)
- [ ] ປະສົມປົນເປ(ກຸ້ມຕົນເອງ/ເປັນສິນຄ້າ)
- [ ] ການຄ້າ / ຕະຫຼາດ

ລາຍຮັບທີ່ໄດ້ມາຈາກກິດຈະກຳອື່ນໆ ທີ່ບໍ່ແມ່ນການຜະລິດກະສິກຳ
- [ ] □ ໜ້ອຍກວ່າ 10 % ຂອງລາຍຮັບທັງ□ ດ
- [x] 10-50 % ຂອງລາຍຮັບທັງ□ ດ
- [ ] > 50 % ຂອງລາຍຮັບທັງ□ ດ

ລະດັບຄວາມຮັ່ງມີ
- [x] ທຸກຍາກຫຼາຍ
- [ ] ທຸກຍາກ
- [ ] ສະເລ່ຍ
- [ ] ຮັ່ງມີ
- [ ] ຮັ່ງມີຫຼາຍ

ລະດັບຂອງການຫັນເປັນກົນຈັກ
- [x] ການ□ ແຮງງານຄົນ
- [ ] ສັດລາກແກ□
- [ ] ເຄື່ອງກົນຈັກ

ຢູ່ປະຈຳ ຫຼື ເລລ້ອນ
- [ ] ບ□ ເລື່ອນ□ ຫາ
- [x] ແບບເຄິ່ງຂັ້ງ-ເຄິ່ງປ່ອຍ
- [ ] ແບບປ່ອຍຕາມທຳມະຊາດ

ບຸກຄົນ ຫຼື ກຸ່ມ
- [x] ບຸກຄົນ / ຄົວເຮືອນ
- [ ] ກຸ່ມ / ຊຸມຊົນ
- [ ] ການຮ່ວມມື
- [ ] ການຈ້າງງານ (ບ□ ລິສັດ, ອົງການລັດຖະບານ)

ເພດ
- [x] ຜູ້ຍິງ
- [x] ຜູ້ຊາຍ

ອາຍຸ
- [ ] ເດັກນ້ອຍ
- [x] ຊາວ□ ນຸ່ມ
- [x] □ ວາງຄົນ
- [ ] ຜູ້ສູງອາຍຸ

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

ຂະໜາດ
- [ ] ຂະ□ າດນ້ອຍ
- [ ] ຂະ□ າດກາງ
- [x] ຂະ□ າດ□ ຫຍ່

ເຈົ້າຂອງທີ່ດິນ
- [ ] ລັດ
- [ ] ບ□ ລິສັດ
- [x] ຊຸມຊົນ / ບ້ານ
- [ ] ກຸ່ມ
- [ ] ບຸກຄົນ, ບ□ ໍ່ມີໃບ□ ໍ□
- [ ] ບຸກຄົນ, ທີ່ມີໃບ□ ໍ□

ສິດທິການນຳໃຊ້ທີ່ດິນ
- [x] ເປີດກວ້າງ (ບ□ ໍ່ມີການຈັດຕັ້ງ)
- [ ] ຊຸມຊົນ (ທີ່ມີການຈັດຕັ້ງ)
- [ ] ເຊົ່າ
- [ ] ບຸກຄົນ

ສິດທິການນຳໃຊ້ນ້ຳ
- [x] ເປີດກວ້າງ (ບ□ ໍ່ມີການຈັດຕັ້ງ)
- [ ] ຊຸມຊົນ (ທີ່ມີການຈັດຕັ້ງ)
- [ ] ເຊົ່າ
- [ ] ບຸກຄົນ

ການເຂົ້າເຖິງການບໍລິການ ແລະ ພື້ນຖານໂຄງລ່າງ

ສຸຂະພາບ	ທຸກຍາກ ✓	ດີ
ການສຶກສາ	ທຸກຍາກ ✓	ດີ
ການຊ່ວຍເຫຼືອ ດ້ານວິຊາການ	ທຸກຍາກ ✓	ດີ
ການຈ້າງງານ (ຕົວຢ່າງ, ການເຮັດກິດຈະກຳອື່ນ ທີ່ບ□ □ ແມ່ນການຜະລິດກະສິກຳ)	ທຸກຍາກ ✓	ດີ
ຕະຫຼາດ	ທຸກຍາກ ✓	ດີ
ພະລັງງານ	ທຸກຍາກ ✓	ດີ
ຖະ□ ນົນຫົນທາງ ແລະ ການຂົນສົ່ງ	ທຸກຍາກ ✓	ດີ
ການດື່ມນ້ຳ ແລະ ສຸຂາພິບານ	ທຸກຍາກ ✓	ດີ
ການບໍລິການ ທາງດ້ານການເງິນ	ທຸກຍາກ ✓	ດີ

ຜົນກະທົບ

ຜົນກະທົບທາງສັງຄົມ ແລະ ເສດຖະກິດ

ການຜະລິດອາຫານສັດ

ຫຼຸດລົງ ✓ ເພີ່ມຂຶ້ນ

ປະລິມານ ກ່ອນການຈັດຕັ້ງປະຕິບັດ ການຄຸ້ມຄອງ ທີ່ດິນແບບຍືນຍົງ: Low rangeland production
ປະລິມານ ຫຼັງການຈັດຕັ້ງປະຕິບັດ ການຄຸ້ມຄອງ ທີ່ດິນແບບຍືນຍົງ: Slight improvement
Difficult to measure. Rehabilitation works and the management plans for the rangeland areas have led to some improvement, though the droughts affecting the area during the interventions significantly affected rangeland fodder production.

ຄຸນນະພາບຂອງອາຫານສັດ

ຫຼຸດລົງ ✓ ເພີ່ມຂຶ້ນ

ປະລິມານ ກ່ອນການຈັດຕັ້ງປະຕິບັດ ການຄຸ້ມຄອງ ທີ່ດິນແບບຍືນຍົງ: No crop residues or fodder plantings used
ປະລິມານ ຫຼັງການຈັດຕັ້ງປະຕິບັດ ການຄຸ້ມຄອງ ທີ່ດິນແບບຍືນຍົງ: Crop residues and fodder plantings incorporated in cropping areas
The process allowed Project Technicians to educate communities on the use of crop residues as fodder and the planting of multiuse trees within cropping areas to provide green fodder in the dry season. The reintroduction of drought tolerant, quality indigenous grasses should also lead an increase in fodder production over the coming year.

ຜົນຜະລິດຂອງສັດ

ປະລິມານ ກ່ອນການຈັດຕັ້ງປະຕິບັດ ການຄຸ້ມຄອງ ທີ່ດິນແບບຍືນຍົງ: No planning for dry season grazing, apart from transhumance movements
ປະລິມານ ຫຼັງການຈັດຕັ້ງປະຕິບັດ ການຄຸ້ມຄອງ ທີ່ດິນແບບຍືນຍົງ: Crop residues and other cultivated forages produced for those

ຫຼຸດລົງ ✓ ເພີ່ມຂຶ້ນ

animals that stay
The transhumance movements of livestock are still seen as the most adequate solution to changes in natural rangeland production, though most families leave behind some animals with the main family unit. These animals are now receiving the quality feed they need to remain productive and healthy.

ການຈັດການຄຸ້ມຄອງທີ່ດິນ

ອຸປະສັກ ✓ ເຮັດ□ ງ່າຍຂຶ້ນ

ປະລິມານ ກ່ອນການຈັດຕັ້ງປະຕິບັດ ການຄຸ້ມຄອງ ທີ່ດິນແບບຍືນຍົງ: No management plans in place for commonly managed natural resources
ປະລິມານ ຫຼັງການຈັດຕັ້ງປະຕິບັດ ການຄຸ້ມຄອງ ທີ່ດິນແບບຍືນຍົງ: Participatory land management plans have been negociated and agreed
Simplified land management plans based on traditional livestock movements and cropping seasons have been negotiated and agreed by local stakeholders and municipal Administrators.

ນ້ຳດື່ມ ມີຄຸນນະພາບ

ຫຼຸດລົງ ✓ ເພີ່ມຂຶ້ນ

ປະລິມານ ກ່ອນການຈັດຕັ້ງປະຕິບັດ ການຄຸ້ມຄອງ ທີ່ດິນແບບຍືນຍົງ: Livestock and communities drink from same water
ປະລິມານ ຫຼັງການຈັດຕັ້ງປະຕິບັດ ການຄຸ້ມຄອງ ທີ່ດິນແບບຍືນຍົງ: Separate water drinking points for livestock and community
Unrestricted access of livestock to community domestic water points led to waterborne diseases and poor water quality. Separating livestock and domestic use has improved community health.

ມີນ້ຳ□ ສີ່ດລ້ຽງ

ຫຼຸດລົງ ✓ ເພີ່ມຂຶ້ນ

In addition to restricting livestock access to main water bodies, new drinking troughs have been built with community support.

ຄຸນນະພາບ ຂອງນ້ຳ ສຳລັບລ້ຽງສັດ

ຫຼຸດລົງ ✓ ເພີ່ມຂຶ້ນ

By separating livestock drinking points and domestic water points, waterborne illnesses have been reduced. In at least one area a water tank and new drinking trough have been built with community support.

ຜົນກະທົບທາງສັງຄົມ ວັດທະນະທຳ

ຄວາມຮູ້ກ່ຽວກັບ ການຄຸ້ມຄອງ ທີ່ດິນແບບຍືນຍົງ / ການເຊື່ອມໂຊມຂອງດິນ

ຫຼຸດຜ່ອນ ✓ ປັບປຸງ

ປະລິມານ ກ່ອນການຈັດຕັ້ງປະຕິບັດ ການຄຸ້ມຄອງ ທີ່ດິນແບບຍືນຍົງ: No education or training on land degradation
ປະລິມານ ຫຼັງການຈັດຕັ້ງປະຕິບັດ ການຄຸ້ມຄອງ ທີ່ດິນແບບຍືນຍົງ: Education and training on land degradation issues and rehabilitation methods
The majority of communities that have gone through the process now understand how poor land management leads to land degradation and steps they can take to reduce it.

ຜົນກະທົບຕໍ່ລະບົບນິເວດ

ປະລິມານນ້ຳ

ຫຼຸດລົງ ✓ ເພີ່ມຂຶ້ນ

Improved ground cover and the return of riparian vegetation would increase infiltration rates and decrease evapotranspiration rates and restore the micro water cycle. But this is also a long term process.

ຄຸນນະພາບນ້ຳ

ຫຼຸດລົງ ✓ ເພີ່ມຂຶ້ນ

ປະລິມານ ກ່ອນການຈັດຕັ້ງປະຕິບັດ ການຄຸ້ມຄອງ ທີ່ດິນແບບຍືນຍົງ: Low
ປະລິມານ ຫຼັງການຈັດຕັ້ງປະຕິບັດ ການຄຸ້ມຄອງ ທີ່ດິນແບບຍືນຍົງ: Low in short term, improved in long term
Revegetation of river plains and river banks should lead to improved water quality though it will be a long term effect if the rehabilitation areas are respected.

ການ□ ຫຼຂອງນ້ຳ□ ຄີດິນ

ເພີ່ມຂຶ້ນ ✓ ຫຼຸດລົງ

ປະລິມານ ກ່ອນການຈັດຕັ້ງປະຕິບັດ ການຄຸ້ມຄອງ ທີ່ດິນແບບຍືນຍົງ: No method to deal with the high surface runoff rates in the area
ປະລິມານ ຫຼັງການຈັດຕັ້ງປະຕິບັດ ການຄຸ້ມຄອງ ທີ່ດິນແບບຍືນຍົງ: A method has been devised for reducing surface runoff rates.
The 'leaky weir' method (Rehabilitation method 3) has shown promise over the duration of the Project and could be applied at other landscape levels to reduce surface runoff.

ການປົກຄຸມຂອງດິນ

ຫຼຸດຜ່ອນ ✓ ປັບປຸງ

The reintroduction of native grasses in the area should lead to improved ground cover, binding the soil and reducing erosion rates.

ການສູນເສຍດິນ

ເພີ່ມຂຶ້ນ ✓ ຫຼຸດລົງ

The reintroduction of native grasses in the area should lead to improved ground cover ratios, binding the soil and reducing erosion rates.

ການປົກຫຸ້ມຂອງພືດ

ຫຼຸດລົງ ✓ ເພີ່ມຂຶ້ນ

ປະລິມານ ກ່ອນການຈັດຕັ້ງປະຕິບັດ ການຄຸ້ມຄອງ ທີ່ດິນແບບຍືນຍົງ: Reduced number of poor quality grass species
ປະລິມານ ຫຼັງການຈັດຕັ້ງປະຕິບັດ ການຄຸ້ມຄອງ ທີ່ດິນແບບຍືນຍົງ: Communities capacitated in plant multiplication methods
Apart from the rehabilitation works themselves, the local communities have been capacitated with methods to approach and deal with land degradation.

ມວນຊີວະພາບ / ຢູເທິງຊັ້ນດິນ C

ຫຼຸດລົງ ✓ ເພີ່ມຂຶ້ນ

ຄວາມຫຼາກຫຼາຍຂອງພືດ

ຫຼຸດລົງ ✓ ເພີ່ມຂຶ້ນ

The reintroduction of native and leguminous plants has improved plant diversity both within rehabilitation areas and cultivated lands.

ຜົນກະທົບ ຂອງ□ ພະຍຸແລ້ງ

ເພີ່ມຂຶ້ນ ✓ ຫຼຸດລົງ

ການປ່ຽນແປງ ອາກາດ □ ນິຍົມແລບ

ຮຸນແຮງຂຶ້ນ ✓ ປັບປຸງ

The works around the water points over time should lead to increase in vegetative cover, shade, habitat and reduced temperatures.

ຜົນກະທົບນອກສະຖານທີ່

ຄວາມອາດສາມາດ □ ນການີກຂວາງ / ການກັ່ນຕອງ (ໂດຍດິນ, ພືດພັນ, ດິນທາມ)

ຫຼຸດຜ່ອນ ✓ ປັບປຸງ

ການວິເຄາະຕົ້ນທຶນ ແລະ ຜົນປະໂຫຍດ

ຜົນປະໂຫຍດເມື່ອທຽບກັບຄ່າໃຊ້ຈ່າຍໃນການສ້າງຕັ້ງ

ຜົນຕອບແທນ □ ນ□ ລຍັ້ນສັ້ນ	ຜົນກະທົບທາງລົບຫຼາຍ	✓ (4)	ຜົນກະທົບທາງບວກຫຼາຍ
ຜົນຕອບແທນ □ ນ□ ລຍະຍາວ	ຜົນກະທົບທາງລົບຫຼາຍ	✓ (6)	ຜົນກະທົບທາງບວກຫຼາຍ

ຜົນປະໂຫຍດເມື່ອທຽບກັບຄ່າໃຊ້ຈ່າຍບໍາລຸງຮັກສາ

ຜົນຕອບແທນ □ ນ□ ລຍັ້ນສັ້ນ	ຜົນກະທົບທາງລົບຫຼາຍ	✓ (4)	ຜົນກະທົບທາງບວກຫຼາຍ
ຜົນຕອບແທນ □ ນ□ ລຍະຍາວ	ຜົນກະທົບທາງລົບຫຼາຍ	✓ (6)	ຜົນກະທົບທາງບວກຫຼາຍ

ການປ່ຽນແປງສະພາບດິນຟ້າອາກາດ

ການປ່ຽນແປງດິນຟ້າອາກາດ ເທື່ອລະກ້າວ

ປະລິມານນໍ້າຝົນປະຈໍາປີ ຫຼຸດລົງ	ບໍ່□ດີປານໃດ	✓	ດີຫຼາຍ	
ປະລິມານນໍ້າຝົນຕາມລະດູການ ຫຼຸດລົງ	ບໍ່□ດີປານໃດ	✓	ດີຫຼາຍ	ລະດູການ: ລະດູ□ ບ□ນ້ໍາ

ການຍອມຮັບ ແລະ ການປັບຕົວ

ອັດຕາສ່ວນຂອງຜູ້ຊົມໃຊ້ທີ່ດິນໃນເຂດພື້ນທີ່ທີ່ໄດ້ຮັບຮອງເອົາເຕັກໂນໂລຢີ

- [x] ກໍລະນີດຽວ / ການທົດລອງ
- [ ] 1-10%
- [ ] 11-50%
- [ ] > 50%

ທັງໝົດນັ້ນ ມີໃຜແດ່ທີ່ສາມາດປັບຕົວຕໍ່ເຕັກໂນໂລຢີ, ມີຈັກຄົນທີ່ໄດ້ຮັບການກະຕຸກຊຸກຍູ້ ແລະ ອຸປະກອນ?

- [x] 0-10%
- [ ] 11-50%
- [ ] 51-90%
- [ ] 91-100%

ໄດ້ມີການດັດແປງເຕັກໂນໂລຢີ ເພື່ອປັບໃຫ້ເຂົ້າກັບເງື່ອນໄຂການປ່ຽນແປງບໍ່?

- [ ] ແມ□ນ
- [x] ບ□□ແມ□ນ

ໄດ້ປ່ຽນແປງເງື່ອນໄຂຫຍັງແດ່?

- [ ] ການປ່ຽນແປງດິນຟ້າອາກາດ / ຮຸນແຮງ
- [ ] ຕະຫຼາດມີການປ່ຽນແປງ
- [ ] ມີແຮງງານ (ຕົວຢ່າງ, ເນື່ອງຈາກການເຄື່ອນຍ້າຍແຮງງານ)

ບົດສະຫຼຸບ ແລະ ບົດຮຽນທີ່□ ໄດ້ຮັບ

ຄວາມເຂັ້ມແຂງ: ທັດສະນະມູມມອງ ຂອງຜູ້ນໍາໃຊ້ທີ່ດິນ

- Communities learn about plants' role in the wider ecosystem, how to select and multiply key fruit, fodder or timber species and should see an increase in their horticultural and livestock production, leading to improved nutrition or income.
- Done properly, it can be a cost-effective and reliable way to produce the plants needed within family units.

ຄວາມເຂັ້ມແຂງ: ທັດສະນະມູມມອງ ຂອງຜູ້ປ້ອນຂໍ້ມູນເອງ

- When the plants are produced in collaboration with the local pastoral communities, the benefits are wide ranging, promoting

ຈຸດອ່ອນ / ຂໍ້ເສຍ / ຄວາມສ່ຽງ: ທັດສະນະມູມມອງ ຂອງຜູ້ນໍາໃຊ້ທີ່ດິນ ວິທີການແກ້ໄຂແນວໃດ

- Can require stable supply of water, and labour costs can increase if water sources are not easily accessible. Locate nurseries near reliable and accessible water sources.
- Can require permanent residence, so as to be able to care for plants until they are developed and placed in the ground at the proper date in the calendar (before or during rainy season). Not easy in nomadic cultures.

everything from environmental awareness to technical and practical knowledge.
- It remains a cost-effective way of improving key productive species and increasing community resilience.
- Increasing biomass and introducing better management cycles contribute to reducing land degradation and improve nutrient and energy cycling.

- Early attempts often fail to produce lasting results. Concentrate early efforts on small experimental plots so as to fine-tune planting methods and timing.

ຈຸດອ່ອນ / ຂໍ້ເສຍ / ຄວາມສ່ຽງ: ທັດສະນະມຸມມອງ ຂອງຜູ້ປ້ອນຂໍ້ມູນ ເອງວິທີການແກ້ໄຂແນວໃດ

- The technology is usually not suitable for large areas of land (>1,000 hectares). Compliment any rehabilitation efforts with improved management plans which are developed with stakeholder input and approval.
- Plant losses are typically high, especially if rains fail to arrive, or if the year is abnormally dry. Watch weather forecast to try and focus planting campaigns on those days with a high probability of rain.
- Local species are often not valued by local officials and technicians, leading to a predominance of exotic species in rehabilitation works. Undertake awareness and training sessions which highlight the value and uses of native species with local land users and administrative officials.

ເອກກະສານອ້ີງອີ

ການລວບລວມ
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ບຸກຄົນທີສຳຄັນ
Nicholas Euan Sharpe - ຜູ້ຊ່ຽວຊານ ດ້ານການຄຸ້ມຄອງ ທີ່ຍືນແບບຍືນຍົງ
Txaran Basterrechea - ຜູ້ຊ່ຽວຊານ ດ້ານການຄຸ້ມຄອງ ທີ່ຍືນແບບຍືນຍົງ

ການບັນຍາຍລາຍລະອຽດ ໃນຖານຂໍ້ມູນ ຂອງ WOCAT
https://qcat.wocat.net/lo/wocat/technologies/view/technologies_3141/

ຂໍ້ມູນການເຊື່ອມໂຍງຂໍ້ມູນການຄຸ້ມຄອງການນຳໃຊ້ດິນແບບຍືນຍົງ
n.a.

ເອກກະສານ ແມ່ນໄດ້ອ້ານວຍຄວາມສະດວກໂດຍ

ສະຖາບັນ
- FAO Angola (FAO Angola) - ແອນໂກລາ

ໂຄງການ
- Book project: Guidelines to Rangeland Management in Sub-Saharan Africa (Rangeland Management)
- Reabilitação de terras e gestão das áreas de pastagem nos sistemas de produção agro-pastoris dos pequenos produtores no sudoeste de Angola (RETESA)

ເຊື່ອມໂຍງກັບ ຂໍ້ມູນຕ່າງໆ ທີ່ກ່ຽວຂ້ອງທີ່ມີ
- FAO in Action: Using indigenous knowledge to reverse land degradation in Angola.: http://www.fao.org/in-action/using-indigenous-knowledge-to-reverse-land-degradation-in-angola/en/