



A multistory agroforestry system (GERBA LETA)

Multistorey agroforestry (ອື່ນໂໄເປຍ)

Mitikarsamino Ersha

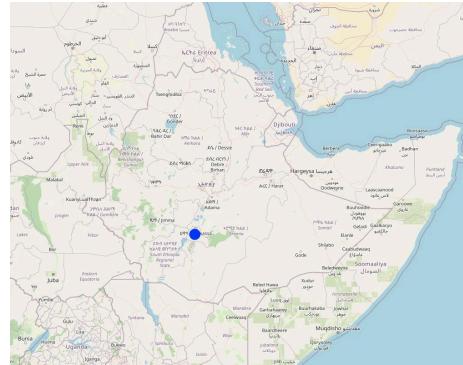
ຄຸກຂອະຫິບາຍ

Multistorey agroforestry is the intentional mixing of trees/shrubs with crops, pastures, and livestock. The practice creates environmental, economic, and social benefits for the end users.

Multistorey agroforestry is the intentional mixing of trees/shrubs with crops and pasture at different levels ("storeys" or heights) and the livestock. The practice creates environmental, economic, and social benefits for the end users. Agroforestry practices provide opportunities to integrate productivity and profitability with environmental stewardship resulting in healthy and sustainable agricultural systems that can be passed on to future generations. Tree litter increases soil organic matter and reduces soil chemical and biological degradation. Tree cover can reduce soil erosion and evaporation from the soil surface. The technology is applied close to the homestead as it demands close follow-up and steady management practices, and that is where tree-crop-livestock integration can be best applied. The farmer whose practice is described here used to be very poor four decades ago. He has planted coffee gradually over the years under shade trees. As a staple perennial food crop, enset was planted also in the mixture. Livestock were also integrated. Eventually, numerous multipurpose tree species, food and fodder crops, and physical structures with productive barriers were integrated into the farming system. As a consequence, a multistorey agroforestry system has been established over years.

The purpose of the technology is to ensure ecological, economic, and social benefits. The rolling landscape of the area necessitates permanent ground cover to reduce the effect of erosive rainfall that degrades the soil. Once established, the technology needs management practices including pruning/stumping of coffee trees, managing other trees, weed control, enrichment planting with coffee and enset, and fertilization of annual and perennial crops. The livelihood of the respondent farmer has been completely changed. He has made a significant accumulation of wealth from producing and sale of tons of unprocessed coffee, avocado fruits and some indigenous bananas. This form of agroforestry creates year-round employment opportunities for proactive farmers. However, subsistence farmers with small parcels give priority entirely to the mono-cropping of cereals and other fast-maturing crops to meet their urgent demand for food. Shortage of land, capital, and a general lack of awareness about the sustainable benefits of the technology are reasons for lack of adoption of the technology.

ສະຖານທີ່



ສະຖານທີ່: Shoye kebele (Kebele - lower administrative level), Sidama, ອື່ນໂໄເປຍ

ຈ່ານວນ ຜົນທີ ທີ່ໃຊ້ ຕັກໂນໂລຢີ ຫິດວິເຄາະ: ຜົນທີ ດຽວ

ການຄັດລົດອົກຜົນທີ ທີ່ອີງໃສ່ຂໍ້ມູນທາງໝົມມືສາດ
• 38.43817, 6.77315

ການຜ່ອນກະຈາຍຂອງຕັກໂນໂລຢີ: ນ້ຳ ມ ມຈຸດ
ສະເພາະ / ແມ່ ສູກ ຊ ວິນທີຂະໜາດ ຈາດອີຍ

ຢູ່ໃນເຂດປ່າສະຫງວນທີ່ບໍ່: ບ່ານແມ່ນ

ວັນທີຂອງການປະຕິບັດ: 1980; 10-50 ປີ ພຶກມາ

ປະເພດຂອງການນໍາມາສະແໜນ

ໄ ໂດຍຜູ້ນະວິດຕະກຳຄົດລົດຂອງໝູ້ຫຼຸກ ທີ່ມີ
ເປັນສູນໄຟ້ຂອງລະບົບຜົນມືອງ (>50 ປີ)

ໄ ນ້ ລະຍະກົມຜອງ / ການຈົມດາວຕູ
ໄ ໂດຍຜູ້ນະຄູງການ / ການຂອີຍເຫຼືອຈາກພາຍນອກ

ການໂຄຍກເຕັກໂນໂລຢີ

ຄຸດປະສົງຕົມຕໍ່

- ▢ ຂັບປຸງ ການຜະລິດ
- ▢ ຖຸດຜົນ, ປົມງ້ານ, ຜື້ນູ້ ການເຊື້ອມໄຂມຂອງດິນ
- ▢ ການຮະນູນລະບົບນິດ
- ▢ ປົກປັບຮັກສານຄົກ / ນຸ້ມຜົນທີ່ປະສົມປະສານກັບ ເຕັກໂນໂລຢີອີງ
- ▢ ບັນປັບຮັກສາ / ການປັບປຸງຊີ່ວະນາໂຫຼວນ
- ▢ ບຸດຜົນຄວາມສັງເກດ ທາງໆ ຜິ້ນດັກຫຼຸມະຊາດ

ການນໍາມາໃຊ້ຄົນ

ການນໍາມາ ປົນທີ່ມີປະສົມຜາຍ ນິ້ນທີ່ດັວກັນ: ແມ່ນ ກະສົກຄູປົກໂກ ພູບປະສົມ
ປະສານ



ດິນທີ່ປູກຜົດ

- ການປູກຜົດປະຈຸບີ: ຫ້າມຍາຜົດ-ສ້າລີ, Legumes - Haricot beans and other climbing species, Pumpkin and root crops/tuber

- ሪፖርት አንቀጽ 10 በርሃን የኢትዮጵያውያን ስሜ: Ethiopian Birr
- የሚከተሉት ጥና (የመጠቃለውን ደንብ የሚከተሉት ጥና): 1 USD = 53.12 Ethiopian Birr
- መሬታዎች ስራ ስራ የሚከተሉት ጥና: In rural area wage rate vary by type of work: coffee harvest-80 ETB/day, weeding 60 ETB/day. About 70 birr/day, on average.

ገዢ ገዢ ገዢ ስምምነት

1. Land preparation (የ ለይዘዣ ሰዓት) Before and during Belg (short rain) and Meher (long rain) season.)
2. Enset and Coffee planting (የ ለይዘዣ ሰዓት) In Belg and Meher season, respectively.)
3. Planting beans (annual crops) (የ ለይዘዣ ሰዓት) In Belg season)
4. Fodder and other Multipurpose trees planting (የ ለይዘዣ ሰዓት) In Meher (main rainy season).)

አጭና የሚከተሉት ስምምነት ስምምነት (per 4Timad)

ወጪ በርሃን የሚከተሉት ስምምነት	ቤትዕስ ወጪ	පະድິມານ	ጠናከር ተናግኝነት	ጠናከር ተናግኝነት	% ይመሱ ተናግኝነት
ፈጸም					
Land preparation	Oxen plow	16.0	200.0	3200.0	100.0
Planting annual crops	Oxen plow	4.0	200.0	800.0	100.0
Planting perennial crops	PDs	20.0	70.0	1400.0	100.0
Planting fodder crops and trees	PDs	5.0	70.0	350.0	100.0
ሙያ					
Spade	Number	1.0	400.0	400.0	100.0
Hoe	Number	1.0	600.0	600.0	100.0
Digging fork	Number	1.0	500.0	500.0	100.0
ወጪ ስምምነት					
Coffee seedling	number	2500.0	10.0	25000.0	100.0
Enset seedling	number	6000.0	5.0	30000.0	100.0
Tree seedling	number	1500.0	2.0	3000.0	50.0
Beans seed	kg	50.0	42.0	2100.0	100.0
ሸጂ ስምምነት					
NSP fertilizer	kg	100.0	44.0	4400.0	
Urea fertilizer	kg	50.0	44.0	2200.0	
ጠናከር ተናግኝነት በኋላ					73'950.0
ጠናከር ተናግኝነት በኋላ					1'392.13

ገዢ ገዢ ገዢ ስምምነት

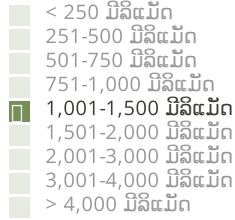
1. Inputs (የ ለይዘዣ ሰዓት) Before the onset of short/long rain.)
2. Management (የ ለይዘዣ ሰዓት) Throughout the year depending on the management types.)
3. Farm tools (የ ለይዘዣ ሰዓት) During off-season.)

አጭና የሚከተሉት ስምምነት ስምምነት (per 4Timad)

ወጪ በርሃን የሚከተሉት ስምምነት	ቤትዕስ ወጪ	පະድິມານ	ጠናከር ተናግኝነት	ጠናከር ተናግኝነት	% ይመሱ ተናግኝነት
ፈጸም					
Enrichment/replacement planting	PDs	5.0	70.0	350.0	100.0
Fertilization	PDs	40.0	70.0	2800.0	100.0
Weeding	PDs	40.0	70.0	2800.0	100.0
ሙያ					
Hoes	number	4.0	600.0	2400.0	100.0
Digging fork	number	4.0	500.0	2000.0	100.0
Spade	number	4.0	400.0	1600.0	100.0
ወጪ ስምምነት					
Coffee seedling for replacement	number	250.0	10.0	2500.0	100.0
ሸጂ ስምምነት					
NSP	kg	100.0	44.0	4400.0	
Urea	kg	50.0	44.0	2200.0	
ጠናከር ተናግኝነት በኋላ					21'050.0
ጠናከር ተናግኝነት በኋላ					396.27

ኤርትራ ማረጋገጫ

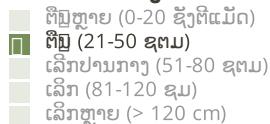
ສະເລ່ຍປະລິມານນ້າປິນປະຈຳປີ



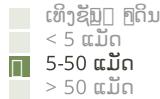
ຄວາມຄ້ອຍຊັ້ນ



ຄວາມເລື່ອກຂອງດົນ



ນ້ຳໃຕ້ດົນ



ຄວາມບູກບູາຍຂອງຊະນິດ



ເຂດກະສິກຳ-ສະພາບອາກາດ



ຂໍ້ມູນຈ່າເພາະກ່ຽວກັບສະພາບອາກາດ

The area receive adequate rainfall.

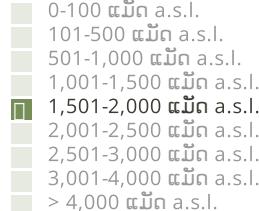
ຂໍ້ອງສະຖານີອຸນິຍົມ: Awassa Meteorology center

The climate is virtually consistent except during the season of El Nino and cyclical shortage that happens once in years.

ສູບແບບຂອງດົນ



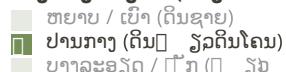
ລະດັບຄວາມສູງ



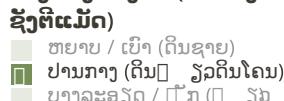
ເຕັກໂນໂລຢີໄຕຕຶກນໍາໃຊ້ໃນ



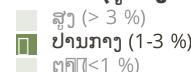
ໂຄງສ້າງຂອງດົນ (ເຕັກນໍາດົນ)



ໂຄງສ້າງຂອງດົນ (ເລົກລົງ 20 ຊັງຕື່ມັດ)



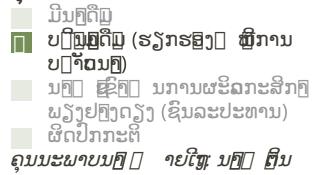
ທາດນິນຊີປູ່ເຕີງໜ້າດົນ



ມິນ້າໜ້າດົນ



ຄຸນນະພາບນ້າ (ການຮັກສາ)



ດິນເລັມເປັນບັນຫາບໍ?



ການເກີດນ້ຳຕົວມ



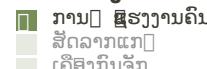
ຄວາມບູກບູາຍຂອງສິງຫີມີ



ລະດັບຄວາມສົງມີ

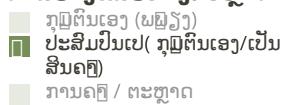


ລະດັບຂອງການບໍ່ເປັນກົນຈັກ

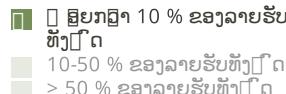


ຄຸນລັກສະນະຂອງຜູ້ນິໂງ ຂີ້ານິນໄລຍີ

ການວາງແນວທາງຕະຫຼາດ



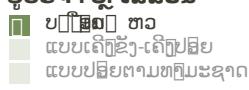
ລາຍຮັບທີ່ໄດ້ມາຈາກກົດຈະກຳ ຮືນໆ ທີ່ບໍ່ແມ່ນການຜະລິດກະສົງ ກຳ



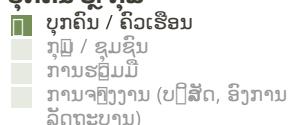
ລະດັບຄວາມສົງມີ



ຢູ່ປະຈຳ ຫົ້ວ ເລວັດ



ບຸກຄົນ ຫົ້ວ ກໍມ



ເຜດ



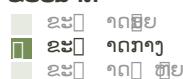
ອາຍ



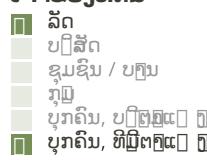
ເຂດຜົນທີ່ການນໍາໃຊ້ຕໍ່ຄົວເຮືອນ



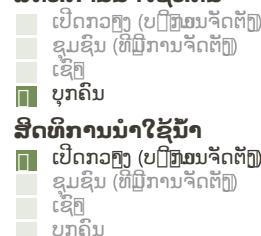
ຂະໜາດ



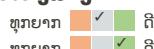
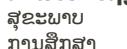
ເຈົ້າຂອງຫົດນິນ



ສົດທີ່ການນໍາໃຊ້ຫົດນິນ



ການເຂົ້າເຖິງການບໍລິການ ແລະ ຜົນຖານໂຄງວ່າງ



ຄວາມຄິດເບັ້ນ

ການຊ່ວຍເຫຼືອ ດັກີມວິຊາການ
ການຈົ່ງງານ (ຕົວຢ່າງ, ການຮັດກິດຈະກຳ
ຂຶ້ນ ຫຼູ້ແມ່ຍິ່ນຜະລັດກະສິກົງ)
ຕະຫຼາດ
ຜະລົງງານ
ຖະໜົນຫົາງ ແລະ ການຂົນສົງ
ການເຄີຍຸນຄຸ ແລະ ສຸຂາພິບານ
ການບໍລິການ ຫາງດົງກົນການເງິນ

ທຸກຍາກ		ດີ

Tap water is accessible some distance away. The deep well the farmer has is not clean for drinking by the household but for cattle and cleaning goods and clothes.

ຜົນກະທີບ

ຜົນກະທີບຫາງສັງຄົມ ແລະ ເສດຖະກິດ ຜົນຜະລິດ

ຫຼັດລົງ ເພີ້ມຂຶ້ນ

ຄຸນນະພາບຂອງຜິດ

ຫຼັດລົງ ເພີ້ມຂຶ້ນ

ຄຸນນະພາບຂອງອາຫານສັດ

ຫຼັດລົງ ເພີ້ມຂຶ້ນ

ຜົນຜະລິດຂອງສັດ

ຫຼັດລົງ ເພີ້ມຂຶ້ນ

ຄວາມສັງເກດ ຕັ້ງປົງຜະລິດ

ເພີ້ມຂຶ້ນ ຫຼັດລົງ

ຄວາມ ຈຳກັດ ຂອງຜົນຜະລິດ

ຫຼັດລົງ ເພີ້ມຂຶ້ນ

ເນື້ອທີ່ການຜະລິດ (ທີ່ເປັນ ປົກພິດ ສູງ) / ນິ້ນ
ການຈັດການຄຸປຸດອໍາທີ່ເປັນ
ການຜະລິດຜະລົງງານ (ເຊັ່ນ: ນິ້ນ, ຊົວະ
ພາບ)

ຫຼັດລົງ ເພີ້ມຂຶ້ນ

ອຸປະສົງ ເຮັດ ອຸປະຂຶ້ນ

ຫຼັດລົງ ເພີ້ມຂຶ້ນ

ນິ້ນ ສັດລົງງານ

ຫຼັດລົງ ເພີ້ມຂຶ້ນ

ຄົງ ອຸປະ ບັດ ຈູ່ຂີ້ນ ນການຜະລິດກະ
ສິກົງ

ເພີ້ມຂຶ້ນ ຫຼັດລົງ

ລາຍຮັບ ຈາກການຜະລິດ
ຄວາມຫຼາກຫຼາຍ ຂອງແຫຼ່ງກິລາຍຮັບ
ນິວຽກປັ້ງ

ຫຼັດລົງ ເພີ້ມຂຶ້ນ

ຫຼັດລົງ ເພີ້ມຂຶ້ນ

ເພີ້ມຂຶ້ນ ຫຼັດລົງ

ຜົນກະທີບຫາງສັງຄົມ ວັດທະນະທຳ
ການຄຸປະກັນ ສະບຽງອາຫານ / ຖຸປະຍຸປຸປັ
ກິນ

ຫຼັດຜອນ ບັນບຸງ

ສະພາບຫາງດົງສູຂະພາບ
ສິດທິ ນການໂຫຼຸດ ອື່ນ ຫຼື ນົມ

ອຸປະແຮງຂຶ້ນ ບັນບຸງ

ອຸປະແຮງຂຶ້ນ ບັນບຸງ

It is difficult to guess the increment by weight of perennial crops such as Enset. Of course, the performance is much better in the agroforestry system with intensive management and application of organic fertilizers. The integration also ameliorates the microclimate of the area and makes the situation ideal for the crops.

In the agroforestry system, a combination of livestock manure, tree litter, and a mixed cropping system contributes to soil fertility and soil health which improves crop quality.

Increased with improved soil fertility and soil healthy.

Livestock access to feed during the dry spell when communal grazing land is denuded of grass. Furthermore, agroforestry promotes a cut-and-carry feeding system that strengthens reliance on one's feed reserves at disposal. This goes with the intensification of livestock production.

The practices rather improve the resilience of the crop as it creates an ambient environment.

The integration increase product diversity.

Cattle manure is used for the production of heat and light energy through the application of biogas technology.

Agroforestry's contribution to drinking water availability and water quality was not measured and was beyond the scope of respondents to comprehend and address the questions except the merely conceptual reflection. Of course, the technology reduces runoff and recharges the ground water which directly contributes to the availability of surface water for livestock.

Fertilizer supply changed more to organic than chemical fertilizer. The foliage of tree litter and in situ decomposition of organic matter added substantial value to the restoration of soil fertility.

Increased management demand with gradual increase of the integration of tree crops and the overall size of the land is remarked by the farmer.

Land users generate reasonable income from the integration of different perennial and annual crops as well as livestock.

The technology immensely contributed to SLM by covering the farmland with perennial trees and crops and by incorporating the physical structure into the practice.

ຜົນກະທຶນທຳລະວົບນິເວດ

ການຊຸດຄູ / ເຕັກກັນຖີ (ການໂຫຼຂອງຫຼັດຜອນ, ທີ່ມະ ແລະ ອິດິນ)
ການໂຫຼຂອງຫຼັດຜອນ ອິດິນ
ການລະບາຍນິ
ຊັ້ນຫຼັດຜອນ / ປິມ / ນິກ

ຫຼັດຜອນ ✓ ພັບປຸງ

ເຜິດຂີ້ງ ✓ ຖຸດລົງ

ຫຼັດຜອນ ✓ ພັບປຸງ

ທີ່ສູງ

The groundwater table is estimated to increase as the ground cover promotes the infiltration and vertical movement of the intercepted rain on a gradual basis.

As some tree species such as avocados consume large amounts of water for transpiration needs, the degree of evaporation reduction of the practices is counterbalanced by the integration of the high-consumers with low-consumer species. Overall, agroforestry has a positive impact on evaporation reduction.

ການລະເຕີຍອາຍ

ເຜິດຂີ້ງ ✓ ຖຸດລົງ

ຄວາມຮູ້ພິຂອງດິນ
ການປົກຄຸມຂອງດິນ
ການສົນສະຍົນ
ການຫັ້ນທຶນຂອງດິນ
ການລັດໄຟ ປູຂອງດິນ
ວິງຈອນ ຂອງສ້ານອາຫານໂນ ນິກ

ຫຼັດລົງ ✓ ເຜິດຂີ້ງ

ຫຼັດຜອນ ✓ ພັບປຸງ

ເຜິດຂີ້ງ ✓ ຖຸດລົງ

ຫຼັດລົງ ✓ ເຜິດຂີ້ງ

ເຜິດຂີ້ງ ✓ ຖຸດຜອນ

Nutrient cycling is highly improved because different tree species may penetrate the impervious soil layer and bring the nutrient to the surface via tree litter, fix atmospheric nitrogen, and add to the soil.

Highly increase, though not measured for this particular farm.

The cause of soil acidity can be diverse including the soil parent materials. However, agroforestry has positive acidity-reducing factors by improving soil fertility and soil health.

ອິນຊີວັດຫຼັດຜອນ C

ຫຼັດລົງ ✓ ເຜິດຂີ້ງ

ດິນສີປີ

ເຜິດຂີ້ງ ✓ ຫຼັດຜອນ

ການປົກຫຼຸງຂອງຜິດ
ມວນຊີວະພາບ / ຢູ່ທີ່ເຊັ່ນດິນ C
ຄວາມຫຼາກຫຼາຍຂອງຜິດ

ຫຼັດລົງ ✓ ເຜິດຂີ້ງ

ຫຼັດລົງ ✓ ເຜິດຂີ້ງ

Highly increased because of the combination of trees/shrubs with food crops and fodder crops.

ສາຍຝັນຫຼັງທີ່ປີ
ຄວາມຫຼາກຫຼາຍຂອງສັດ
ສາຍຝັນ ທີ່ປົ່ງປະໂຫຍດ (ນັກຄົກ, ຊີໂກ
ກະເຕືອນ, ຜູ້ປະສົມເກະສອນ)
ຄວາມຫຼາກຫຼາຍ ທາງດົມທີ່ຢູ່ອາໄຫານ ແລ້ວ
ສິງເກີດ
ການຄວບຄຸມສັດຕູຜິດ / ບະຍາດ

ເຜິດຂີ້ງ ✓ ຫຼັດຜອນ

ຫຼັດລົງ ✓ ເຜິດຂີ້ງ

ຫຼັດລົງ ✓ ເຜິດຂີ້ງ

ຫຼັດລົງ ✓ ເຜິດຂີ້ງ

ຫຼັດລົງ ✓ ເຜິດຂີ້ງ

Agroforestry hosts the predators and prey and creates balanced food chains that reduce the degrees of pest development.

It is a climate-smart agriculture by its virtue that increase carbon sequestration as a regenerative agriculture.

ຜົນກະທຶນວິກຂອງລົມ
ການລະເຕີຍອາຍການບອນ ແລະ ອາຍຜິດ
ເຮືອນແກງ

ຫຼັດລົງ ✓ ເຜິດຂີ້ງ

ຫຼັດລົງ ✓ ເຜິດຂີ້ງ

ຫຼັດລົງ ✓ ເຜິດຂີ້ງ

Even if the impact of agroforestry plays a positive reduction

ຄວາມຮູ້ນັດງ ຂອງລົມ
ການປົງປັງ ອາກາດ ໂນ ວິຫຼາຍ

ຫຼັດລົງ ✓ ເຜິດຂີ້ງ

ຫຼັດຜອນ ✓ ພັບປຸງ

Even if the impact of agroforestry plays a positive reduction

ຜົນກະທຶນວິກຂອງລົມ
ນິນຖື (ນິກ, ປິມ, ນິກປຸງ)
ນິນຖື ຫຼັດຜອນ ນລະດຸແກງ (ລວມຫັ້ງ ມີ
ນິກ ຫຼູ້ອີຍ)
ນິກປຸງເມື່ອຂົດລູ່ປົງຖື (ທີ່ປົ່ງປະໂຫຍດຖະໜາ) ກ
ການຫັ້ນທຶນ ຂອງດິນຕະກອນ ຢູ່ຂົດລູ່ປົງຖື
ມິນລະພິດ ທາງນິກ / ນິກ ປິມ

ຫຼັດລົງ ✓ ເຜິດຂີ້ງ

ຫຼັດຜອນ ✓ ເຜິດຂີ້ງ

ເຜິດຂີ້ງ ✓ ຖຸດລົງ

ເຜິດຂີ້ງ ✓ ຖຸດລົງ

ເຜິດຂີ້ງ ✓ ຫຼັດຜອນ

- surrounding.
- It reduces risks of crop failure owing to climate variability. Also, boost the biodiversity of trees, crops, and habitat diversity that host various living creature in the biosphere as well pedosphere. This is related to carbon sequestration, emission reduction, proper ecosystem function, and overall ecological contribution.
- Failure to select tree species with desirable characteristics
Trees/shrubs with the following desirable characteristics need to be considered:
 - Deep root system to draw water & nutrients.
 - Easy to propagate, & high biomass producers, palatable, provide more green manure, & high survival percentage.
 - Adaptable to close spacing like in hedgerows.
 - Good sprouting & positive response to pruning.
 - High coppicing and pollarding capacity.
 - Highly dense in some areas and slightly sparse in some part of the farm. Try to maintain the spacing and distribution of suitable species composition.
 - Trees and shrubs less used as livestock feed except during the shortage period Promote feeding the diverse fodder trees to the livestock to ensure their access and benefited from trees/shrubs as well than rely only on grass family.

ເອກະສານອົງອີງ

ການລວບລວມ
GERBA LETA

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ຢັບປຸງລ່າສຸດ: April 22, 2024

ບຸກຄົນທີ່ສໍາຄັນ
Afra Gabiba - ຜູ້ອຳນວຍ ຫຼິກິນ

ການບັນຍາຍລາຍລະອຽດ ໃນຖານຂໍ້ມູນ ຂອງ WOCAT
https://qcat.wocat.net/lo/wocat/technologies/view/technologies_6621/

ຂໍ້ມູນການເຊື່ອມໄຍງ້ຂໍ້ມູນການຄຸ້ມຄອງການນໍາໃຊ້ຄົນແບບອື່ນຍິງ
Approaches: Integrated Agroforestry System https://qcat.wocat.net/lo/wocat/approaches/view/approaches_6622/

ເອກະສານ ແມ່ນໄດ້ອ່ານວຍຄວາມສະດວກໂດຍ

ສະຖັບ

- Alliance Bioversity and International Center for Tropical Agriculture (Alliance Bioversity-CIAT) - ເຄີນຢາ
- ໂຄງການ
 - Soil protection and rehabilitation for food security (ProSo(i))

ການອົງອີງທີ່ສໍາຄັນ

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ເຊື່ອມໄຍງ້ກັບ ຂໍ້ມູນຕ່າງໆ ທີ່ກ່ຽວຂ້ອງທີ່ມີ

- The Center for Subtropical Agroforestry (CSTAF): <http://www.cstaf.ifas.ufl.edu/>
- World Agroforestry (ICRAF): <https://www.worldagroforestry.org>; <https://www.cgiar.org/research/center/world-agroforestry-centre/>

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