



Daa'imidda Hababka Waxsoosaarka Beeyada Somaliland

Hagaha Maarynta

Anjanette DeCarlo, Ph.D.
Ahmed Derie Elmi, M.Sc.
Stephen Johnson, B.A.

© 2017 Anjanette DeCarlo, PhD, LLC
All Rights Reserved

DeCarlo, A., Elmi, A., and Johnson, S. 2017. Daa'imidda hababka waxsoosaarka beeyada Somaliland. Conserve the Cal Madow, Hargeisa, Somaliland.

Dhaqaalaynta Cal Madow

T +1-802-233-7736
E conservethecalmadow@gmail.com

www.conservecalmadow.org

Aragtida qoraalkani waxa ay u gaartahay qoraaga. Kama turjumayso aragtida CCM, cidda uu ka socdo qoraagu amma ciddii maagelisay garaalkan iyo wixii la hal maala.

Tusmo

Mahadnaq	3
Hordhac	4
1. Geedka Beeyada	5
1.1 Tilmaamo aasaasi ah oo ku saabsan geedka	5
1.2 Meelah uu ka baxo	5
1.3 biqlidda iyo taranka geedka	7
1.4 Sababaha dhimashada dabiiciga ee geedka	7
2. Goosashada iyo Habka Xannaanaynta Geekaa	8
2.1 Syaabaha habboon ee mangaafka	8
2.2 Kaltanka xabko goosashada	8
2.3 habka mangaafka si uu geedku xabko u soo saaro	9
2.4 wax ay tahay in la sameeyo kahor mangaafka	11
2.5 jaantuska hab-dhaqanka ugu wanaagsan	12
3. Nidaamka suuq-geynta iyo xeer dhaqameedka	14
3.1 Nidaamka suuq-geynt beeyada	14
3.2 Lahaanshaha dhulk	15
3.3 Xeer dhaqameedka	15
4. Dhaqangelinta Nidaam waara	18
4.1 Suuq-geyn la ogyahay	18
4.2 Heshiiskii Nagoya iyo Xaqsiinta bulshada	18
4.3 Yaraynta waxyeelada cayayaanka	18
4.4 Higelinta fursado dhaqaale oo la kala doorankaro	19
4.5 Unugga Ilaalinta kaymaha	19
5. Arrimaha u baahan Cilmi baadhis joogta ah	20
6. Tixraacyo	21
7. lifaaqyo	23

Mahadnaq

Soosaarista nuqulkan tilmaaha ah ma ay suurto gasheen la,aanta taageerada iyo wadashaqaynta waxgaradka, odayaasha iyo cuqaasha gobolada beeyadu ka baxdo iyo sidoo kale mas'uuliyiinta shirkadaha kaganacsada dhoofinta beeyada, iyo laamaha dawladda ee aannu wada shaqaynta leenahay.

Waxaan u mahadcelinaynaa Caydiid Xasan iyo Madaxweynaha Jaamacadda Sayniska iy Teknoolajiyadda ee Sanaag, Caaqil Faysal Xassan, Caaqil xasan Godane, Salax Maxamuud Farax, Cabdulraxman Xiisliqi, iyo Cabdi Ducaale.

Waxa kale oo aan u mahadcelinaynaa Barkhad Xassan iyo Asli Maydi Ltd., Mustafe iyo Xassan Xassan iyo Som Gum Trading Ltd., Cabdi Cali, badhasaabka Sanaag, Shukri Ismael, wasiirka deegaanka iyo horumarinta reer miyiga, xuseen Cabdirahman, duq Maydh, Ilhan Jama, wasiirkii hore ee shaqada iyo arrimaha bulshada, Cabdirahman Jamal Ismael, Ahmed Awale, guddoomiyaha Candlelight, Boswellness, Ltd., Rhamis Kent, Dr. Marta Ceroni, iyo Dr. Mary Barkworth.

Maalgelinta waxaa bixiyey the LUSH Sustainability Fund, Asli Maydi Ltd., Boswellness Ltd., iyo the Somaliland Biodiversity Foundation. Wuxaan uuga mahadcelinaynaa taageeradooda.

Hordhac

Beeyadu oo ah xabko ay soosaaraan dhirta afka qalaad laysku yidhaa “*Boswellia* tree species” waxa ay bani aadamku daawo ahaan u isticmaalayeen muddo kumanaan sanno ah. Beeyadu waxay ahayd hadiyad la socotay dhalashadii Nebi Ciise, Wuxaanu oolijiray qubuurihii Masaaridii hore, Boqoradii Xatshepsut (1507-1458 BCE) ayaa la sheegay in ay safar ku tagtay dhulkii loo yaqaanay dhulka udugga si ay beeyo uuga soo hesho. Inkasto oo noocyada kaladuwan ee dhirta beeyadu soo saaraan xabko, waxaa jirta in inyar oo kamid ah noocyadaas ay soo saara xabko tayo iyo tiroba leh, noocyada dhirtani waxa ay kalayihin: *B. carterii*, *B. frereana*, *B. sacra*, *B. papyrifera*, iyo *B. serrata*.

Labada uugu horreeya ee dhirta beeyada oo kala ah *Boswellia carterii* iyo *Boswellia frereana*, waxa laga helaa Somaliland iyo Puntland oo keliya. Inkasta oo ay dadka qaar sheegaan in ay *B. carterii* iyo *B. sacra* ay isku midyihii, waxaa jira cimi-baadhisyo cusub oo sheegaya in ay labadan geed kimikada xabkohoodu aad u kala gedisanyihii, sida lagu sheegay cilmi-baadhistan (Woolley et al. 2012). Noocyada *B. carterii* iyo *B. frereana* waxa ay soo saaraan xabkaha ugu tayada wanaagsan adduunka, waxaana laga sameeyaa saliido, cadaro, waxyalah jidhka lagu qurxiyo iyo daawooyin casri ah. Cilmi-baadhisihii u dambeeyey waxa ay tibaaxayaan in xabkaha beeyada lagasamaynkaro daawooyin lagu dawaynkaro xanuno ay kamidyihiin Kansarka (Chen et al. 2013, Ahmed et al. 2015, Khan et al. 2016).

Beeyadu waa shayga labaad ee uugu ballaadhan waxyalahay ay Somaliland dunida u dhoofiso marka laga reebo xoolaha nool. Kumanaan of iyo bulshooyin tirobadan ay munaafacaadsada kaganacsiga beeyada oo ay guud ahaan sannadkii kasoo xarooto lacag lagu qiyaasay 10 malyuuun oo doolarka maraykanka ah. Dalabka iyo qiimaha beeyadu aad ayuu sare ugu kacay waxii kadambeeyey sannadkii 2010, taas oo ay sabab u tahay daneeyayaasha iyo dadka caalamiga ah ee raba in ay gattaan oo soo batay.

Haba, nasiib-darro dalabka sii kordhaaya ee beeyadu waxa uu cadaadis saaray dadka soo gura beeyada kuwaas oo iskudayeya in ay dhirta ka soo saaraan xabko badan si ay uuga faa’iidystaan baahida loo qabo iyo dalabka kordhay ee beeyada. U kuurgal lagu sameeyey kor u kaca xabkaha beeyada, ayaa lagu ogaaday in dhirta beeyada lagu sameeyey mangaaf xad-dhaaf ah iyo in weliba arrinkale oo walaac leh oo ah in la diiro dhirta. Dhir badan ayaa la xaalufiyey oo gudhay, kuwaas oo ay isu raacday abaar, cayayaan iyo iyo mangaaf xad-dhaaf ah.

Nuqulkani waxa uu tilmaamo maamul oo aasaasi ah kabixinaya hab-nololeedka geedka beeyada iyo sida loo munaafacaadsado, waxa kale oo talo iyo tuslaale kabixinaya sida ugu habboon ee xabko gooshada, kaydinta iyo ilaalinta kaymaha. Kadibna waxa uu talo kabixinaya sida ugu habboon ee loo xannaanaynayo geedka beeyada, si dadka nolol maalmeedkoodu kutiirsanyahayna u raystaaan.

1. Nolosha Geedka Beeyada

1.1 Tilmaamo asaasi ah oo kusaabsan geedka

Labada nooc ee *Boswellia carterii* iyo *Boswellia frereana* waxa ay katirsanyihii dhirta laysku yidhaahdo Burseraceae ee udugga soosaarta. Nooca kale ee looyaqaanno genus *Boswellia* waxa uu ka sii koobanyahay 20 nooc oo kale oo ku teetsan dhulka joogiisu sarreeyo ee qallalan. Noocyada kala duwan ee beeyada waxaa lagahelaa waddamada; Tanzania, Xeebta foolmaroodi, Jasiiradda carbeed, Madagascar iyo Hindiya. Afar nooc oo geedka beeyada ah aaya kabaxa Somaliland oo kala ah (*B. rivae*, *B. carterii*, *B. frereana*, *B. neglecta*), inkasta oo noocyada kala ah *B. carterii* iyo *B. frereana* ay yihiin kuwa keliya ee si weyn xabkaha looga goosto, sida lagu sheegay qoraalka (Thulin 2006).

Labada nooc ee *B. carterii* iyo *B. frereana* waa dhir gaagaaban oo dherer ahaan gaadhaya 1.5 mitir illaa 8. Nooca *B. carterii* waxa uu yeeshaa hal dhud amma dhawr dhudood oo uu gunta ku yeesho, halka nooca *B. frereana* uu intabadan gunta kuyeesho dhowr dhudood. Labad geedba waxa ay leeyihiin qolof kakacda oo boodhe khafiif ah xigta gudahana casaan xigta. Marka la dhaawaco geedku wuxuu soo daayaa xabag caddaan iyo casaan isugjirta oo udgoon, taas oo adkaata marka ay laydhu ku dhacdo. Dhirtani waxay bixiyaan caleen dhererkeedu gaadhayo 10-30. Caleenta geedka nooc *B. carterii* waa nooc tuuro leh oo cagaar khafiifa. Wuxuu bixiyaa ubax dhererkisu gaadho 6-30cm. Nooca *B. carterii* wuxuu bixiyaa ubax isugu jira caddaan iyo huruud. Nooca *B. frereana* wuxuu isna bixiyaa ubax isugujira casaan, cagaar iyo huruud. Wuxuu bixiyaa midho sida ubbada u qaabaysan , nooca *B. frereana* 6-unug leh iyo 5.5-9 x 3-7 mm, nooca *B. carterii* 3-4 unug leh iyo 8-12 x 3.5-9 mm (Thulin 2006).

1.2 Goobaha ay dhirta beeyadu kabaxdo



Jaantuska 1aad. Goobaha ay kabaxdo beeyadu nooca *Boswellia carterii* (A) iyo *Boswellia frereana* (B) sida ay timaamayaan xogaha iyo warbixnada. Tirooyinka ay qoreen Thulin iyo Warfa (1987).

Geedka beeyada ee Boswellia carterii

Noocan *B. carterii* waxa uu ka baxaa woqooyinka gobolka Sanaag iyo gobolka bari, intabadan waxa uu kuteetsanyahay inta u dhaxaysa buuraha Cal Madow, Cal Miskeet, iyo Cal Bari, Cal

Madow waa xudunta beeyada oo dhan. Waxaa jirta xog keliya oo laga helay galbeedka Somaliland, laakiin lama xaqijin. Dhirtan waxa laga helayaa inta u dhaxaysa 500-1500 oo mitir meters, inkasta oo ay ugu muhiimsantahay 500-1250 mitir. Nooca *B. carterii* waxa uu badanaa kabaxaa dhagaxaan dushood meel jar ah, gaar ahaan dhagaxaanta folkeendu soosaarto. Meelaha biyaha roobku kubadanyihii si teel teel ah ayuu uuga baxaa, laakiin meelaha kale wuxuu badanaa kabaxaa jeexjeexyada buurta ee biyuhu maraan. Waxa ay isk agbaxaa dhirta ay kamidkayihii qudhaca, sogsogta iyo maraaga (Thulin and Warfa 1987, Thulin 2006).



Jaantuska 2aad. *B. carterii* (L), *B. frereana* (R)

Geedka beeyada ee Boswellia frereana

Noocan *B. frereana* waxa uu kabaxaa woqooyinka gobolka Sanaag iyo gobolka Bari is found in northern Sanaag and Bari regions, wuxuu kagayaryahay *B. carterii* dhinaca woqooyin, waxaa laga helaa inta u dhaxaysa 5-750 mitir, inta ugu muhiimsani waa 5-500 mitir. Wuxuu badanaa kabaxaa dhagaxaan dushood meel jar ah, gaar ahaan dhagaxaanta folkeendu soosaarto. *B. frereana* waxa uu badanaa kabaxaa jeexjeexyada biyo mireenka ah, waxa ay iska agbaxaan dhirta sida qudhaca iyo xodayga iyo (Thulin and Warfa 1987, Thulin 2006).

1.3 Taranka Geedka Beeyada

Habka taranka *geedka beeyada* weli aad looma fahmin Somaliland, hase ahaatee waxa ay u muuqataa in uu ubaxeeyo bilaha April-May oo ah bilowga xilli roobaadka. Sidoo kale waxbadan lagama oga habka bacriminta ee geedkan gaar ahaan noocayada kala ah “*B. carterii* iyo *B. frereana*” laakiin nooca looyaqaan *B. serrata* oo Hindya kabaxa iyo nooca kale ee looyaqaan *B. sacra* oo isna kabaxa dalka Cumaan waxa kaqayb-qaata bacrimintiisa intabadan shinnida iyo cayayaan kale oo duula sida balanbaalista, tusbaalaha dukhsiga iyo qudhaanjada, sid uu qoray (Sunnichan et al. 2005, Lippi et al. 2011). Nooca midabka cad ee *B. carterii* waxaa bacrimintiis kaqayb-qaadata shinnida. Hase ahaatee, nooca midabka casaanka xiga leh ee *B. frereana* waxa bacrimiya balanbaalista.

Wuxu midho dhalaan bisha August. Malah midho leh dahaadh mac, waxaana firkiis faafisa dabaysha. Ma jirto wax xog ah oo laga hayo noocyad firkiis amma sida uu u tarmo, inkasta oo ay noocyada kale muujinayaa fir tarma, sida ay qoraalkooda ku sheegeen (Lemenih and Kassa 2011). Cayayaanka oo farabaas ku haya iyo ka xabkaysiga geedka oo xad-dhaaf ah ayaa hoos u dhigtay taranka dhirtan, sida ay qoraalkooda ku sheegeen (Ogbazghi et al. 2006, Rijkers et al. 2006). Beekhaaminta geedkan ayaa aad u hoosaysa inta la ogyahay.

1.4 Dhimashada dabiiciga ah ee Geedka Beeyada

Dhimashada ugu badan ee geedkan waxaa geysta cayayaanka looyaqaan xarka, kaas oo xorda kadibna geedku sidaa ku dhinto. Waxaa jira laba nooc oo xar ah; mid deedka dhexdiis qayb gala iyo mid dhuuxa geedka dalooliya. Abaarta soo noqnoqta ayaa lyana waxa ay kamid tahay waxyaalah sababay in dhirtani xabkaha yarayso, sida ay qoraalkooda ku sheegeen (Strumia et al. 2007). (PDRC 2003).

2. Munaafacaadsiga iy Xannaanaynta Geedka Beeyada

2.1 Factors Associated with Resin Yield

Inkasta oo geedka beeyadu kabaxo dhul roobku kukala badanyahay, kala sarraynta joogiisuna kala duwantahay, haddan noocyadiisa kaladuwani dhammaan isku si uma soo saaraan xabko, sida lagu sheegay qoraalkan (Eshete et al. 2012, Al-Aamri 2014, Pers. Comm. with 4 landowners). Dhirtu marka ay hesho roob badan ayey soo saartaa xabko badan, kuwa xaalufku kudhacayna way xabko yareeyaan (Pers. Comm. with 4 landowners). Dhirta beeyada kuwooda kabaxa dhulka joogisu sarreeyo, iyo kuwa kabaxa dhinaca woqooyi – arrimahaas waxa lalaxidhiidhiyaa xaddiga roobka oo kubadan dhulka joogisu sarreeyo iyo heerkulka, sida lagu sheegay qoraalkan (PDRC 2003). Dhirta beeyada ee kabaxda dhulka joogisu sareeyo waxa ay soo saarta xabko tayo wanaagsan (PDRC 2003). Dhirta xididkoodo dhagax iyo carro labada aaya ka xabko badan ku xididkood kabaxo dhagaxa oo (Pers. Comm. with 4 landowners)

Samaynta magaafka iyo xilliga lasmaynayaaba waxay saamayn kuleedahay xaddiga xabkaha ee uu geedku soosarayo, haddii xilli khaldan la mangaafdo geed waxa dhacaysa in uu yareeyo xabkiihii uu soosaari-lahaa (PDRC 2003). Si uu u kordho wax soosaarka geedwalba, waa in dhirta la nasiyaa 1 sanno marka 2 sanno oo is xiga uu shaqeeyo, waana in lala sugo mangaafka xilliga ku habboon (PDRC 2003, Farah 1994, Al-Aamri 2014, Appendix 1, row 13). Inkasta oo geedka cabbirkiisu inta uu le'egyahay iyo xabkaha uu soo saarayo aanu xidhiidh weyni kadhexayn, hadana dhirtu way kukaladuwantay xabkaha ay soo saarayaan inta ay le'egyihin (Eshete et al. 2012, Lemenih and Kassa 2011, Al-Aamri 2014, pers. comm. with 4 landowners).

2.2 Kaltanka Xabko goosashada

Noocyada geedka beeyada ee B. carterii iyo B. frereana way ku kaladuwanyihii kalka xabko goosashada.

Nooca B. carterii waxa dhaqan ahaan xabkaha laga gurtaa inta u dhaxaysa bilaha April illaa September (Farah 1994, PDRC 2003, Appendix 1, row 11). Dhirta waxa la mangaafaa inta u dhaxaysa 8 illaa 10 jeer oo ta ugu horreysaa ay tahay 3 illaa 5 jeer oo uu geedku soo saaro xabag yar oo tayadeeduna hosayso (Farah 1994, Appendix 1, row 13 & 14). Mangaafka u horreeyaa waxa uu bar-bilaw u yahay kaltanka geedka xabagta loog tuujinayo, inta uu kaltankani socdo, markasta oo geedka la mangaafdo waxa kordhaya tayada iyo xaddiga xabagta uu geedku soo saarayo. Sida saxda ahi waa in dhirta la mangaafdo 3 bilood oo keliya, haddii kale waa in aanay kabadan 6 bilood (Appendix 1, row 12).

Waxaa jira laba xilli-xabko goosasho oo la isla qaatay: xabko goosashada xagaaga iyo xabko goosashada Dayrta. Waxa la aaminsanyahay in cimilada kululi u wanaagsantahay xabagta uu soo daayo nooca carterii, waayo way ka maydhimi-ogtay xabagta kale ee nooca *frereana*. Sidoo kale, geedka beeyada nooca *carterii* aaya la sheegay in uu Xagaagii soo daayo xabko aad u tayo wanaagsan, halka uu Dayrtii soo daayo xabko tayadoodu hoosayso (Farah 1994, pers. comm. with 1 elder). Dadka dhirta beeyada lehi waa in ay dhirta mangaafaan xilliga Xagaagii oo keliya,

waayo mangaafka dayrtii dhirta ayuubuu waxyeelaynayaa oo uu xaalufinayaa, iyada oo lag yaabo in ugu dambayntii geedku u (Pers. Comm. with 4 landowners).

Nooca B. frereana, marka la barbardhigo, isaga waxa xabkihiisa la goostaa inta u dhaxaysa bilaha August/September illaa June (Farah 1994, PDRC 2003, Appendix 1, row 11). Waxa la mangaafaa 8 illaa 12 jeer, oo kaltan ah, xabagta ugu wanaagsanna waxa uu soo saar kalka u dambeeya. Si kaduwani nooca *B. carterii*, isagu xagaagii wuxuu soo saaraa xabag tayadeedu hoosayso, halka uu dayrtii ka soo saaro mid tayadeedu sarrayso (Farah 1994, pers. comm. with 1 elder).

2.3 Habka Mangaafka

Dhirta beeyadu waxay u koraan si gaabis ah, waxana la mangaafikaraa marka uu geedku gaadho 40 sanno jir, in kasta oo dhirta sida wanaagsan u kortay ee kutaala meelaha roobku kubadanyahay ay xabag ku soo sarikaraan 15 (Appendix 1, row 10). Marka si guud loo hadlo, geedka waxa la mangaafkikaraa marka ay dhumucdiisu kawayntahay 10cm diameter ah (Al-Aamri 2014). Inkasta oo dhirta maanta jirta, iyo kuwii horeba six ad-dhaaf ah loo mangaafay, dhaqan ahaan geedka waxa loosamaynkaraa 6 illaa 10 nabar markiiba, hal amma laba dhinac oo jirrida weyn ah (Appendix 1, row 16). Dhirta yaryar ee markii ugu horreysay la mangaafay waa in aan 3 illaa 4 nabar wax kabada lagu samayn (Appendix 1, row 16). Dhammaan nabarada waxa lagu samaynayaa dhinacyo iska soo horjeeda ee jirrida geedka oo keliya – nabaro laguma samaynkaro laaman geedka, am 150cm baarka sare ee geedka (Al-Aamri 2014, Appendix 1, row 18). Dhirta kutaala dhulka hooseeya, geedka waxa laga dhaawacayaa dhinacyo iska soo horjeeda oo jirrida ah oo dabaysha iyo qorraxda ka gudban. Dhirta kutaala dhulka jooggiis sarreeyo waxa laga dhaawacayaa dhinaca dabaysha eegaya (Pers. Comm. with 5 harvesters).



Jaantuska 3aad. Dhaawicci ugu horreeyey oo si sax ah loo sameeyey, xabagna soo (Bidix) iyo geed si wanaagsan loo maamulay (Midig).

Xeerku waxa weeye, si looga fogaado dhaawacyo xad-dhaaf ah in lagu sameeyo geedka in qofka mangaafaya geedka uu dhaawaca ku seemeyo ugu yaraan in dhudhun ah 4cm, waana in uu kaqaado diirka qolofa sare oo keliya. Kalkasta oo la mangaafayo geedka, nabaradu way sii balladhanayaan hoosna way u durkayaa, ugu badnaa ill 0.25cm iyo cabbirka ugu badnaan 6cm illa 10cm (Appendix 1, row 17).

Guud ahaan dhirta beeyada oo dhammi ma soo saarto xabko wanaagsan, xataa dhirta soo saart xabka wanaagsan, sannaddada qaar ma soo saaraan. Marka dhaawaca u horreya geedka lagu sameeyo, qofku waxa uu eegayaa midabka xabagta uu geedku soo daayo, haddii ay caddaan tahay, isla markiibana uu soo daayo, geedka waa la mangaafayaa. Haddi aanu xabag markaba soo dayn, amma midabka xabagtu casaanyahay, waa in geedka la nasiyaa. (Pers. Comm. with 5 harvesters).

Xabagtu waxa ay ka soo dareertaa nabarka, kadibna way adkaataa. Qofku waa in uu sugaa 15 illaa 20 maalmood inta aanu goosan. Geedka beeyada nooc *B. carterii* xabagiisa waxa la sugayaa 15 illaa 30 maamood inta aan la gurin (Appendix 1, row 13). Nooca *B. frereana* xabagiis qaarbaa nabarka ku dul adkaada, laakiin intabad hoosbay uga dareeraan nabarka. Markasta waxa la goostaa xabagta nabarka ku dul adkaatay, halka inta dareertay laga tago si loo

goosto kalka u dambeeyaa. Nooca *B. carterii* xabagtiisu waxa keliya oo ay ku dul adkaataa nabarka, kalwalbana waa la goostaa. Xabagta waxa keliya oo la goosta marka aanay dhegdhieg lahayn. (Appendix 1, row 19).



Jaantuska 4aad. Dhir si xad-dhaaf ah xabko looga gurtay. Dhirtan waxa kuyaala dhaawacyo badan

Geedka oo dhaawacyo badan loo geysto oo aan la nasin waxa ay keentaa xaaluf iyo in uu geedku dhinto (Pers. Comm. with 1 elder, Appendix 1, row 2), waxaa dhacda tayo xumo ku timaada xabkaha iyo geedka oo isna caafimaadkiisu xumaado haddii isaga oo aan xilligiisii gaadhin la mangaaf, ama lagala habsaamo mangaafka sidii kaltanka dhaqanku ahaa (Farah 1994). Waxaa jirta in farsamada jaqeentyu marka hore kordhiso xabkaha uu soo daayo geedku, si ku meelgaadh ah, haseyeeshe waxa ay dhaxalsiisaa geedka cimri degdeg (Farah 1994, PDRC 2003). Waxaa iyana lamid ah gubista diirkha geedka meelaha la dhaawaco (Farah 1994).

2.4 Xanaanaynta xabkagurashada kaddib

Xabkaha waxaa lagu soo guraa sallado, kaddibna waxa lagu cabbeeyaa kiishash bac ah oo waxa lagu raraa baabuur geysa bakhaarada kala-hufka iyo kala-haadinta, halkaas oo lagu kala nadiifyo. Haddi xabkaha qorrax ladhigo way iksu dhalaalaan, taas oo adkaysa hawsha kala-hufka. Sidoo kale, haddii lagu kaydiyo xabkaha meel huur ah oo kulul, meel aan nadiif ahayn amma lagu raro baabuur aan sagxaddiisu nadiif ahayn oo saliid iyo baatrool leh waxa ay dhammaan waxyelbynayaan tayada xabkaha, taas oo keenikarta qiimo-dhac (Lemenih and

Kassa 2011). Sidaa awgeed, waxa lagama maarmaan ah in dadka xabkaha soo guraa hubiyaan qodobadan hoos kuqoran:

- In xabkaha laga ilaaliya qorraxda tooska ah, laguna kaydiyo meel qabow oo hadh ah.
- Weelka lagu kaydinayo xabkaha waa inu nadiifyahay, afkana kaxidhmo amma daboolmo
- Bakhaarada lagu kaydinayo beeyada iyo baabuurta lagu raraayo waa in laga ilaaliyo naaftada, batroolka, milixda, saliidaha kala duwan IWM.

In tallabooyinka la raacaa waxa ay gacan ka geysanaysaa in beeyadu suuq iyo qiimo wanaagsan yeelato

2.5 Best Practices for Harvesting Frankincense

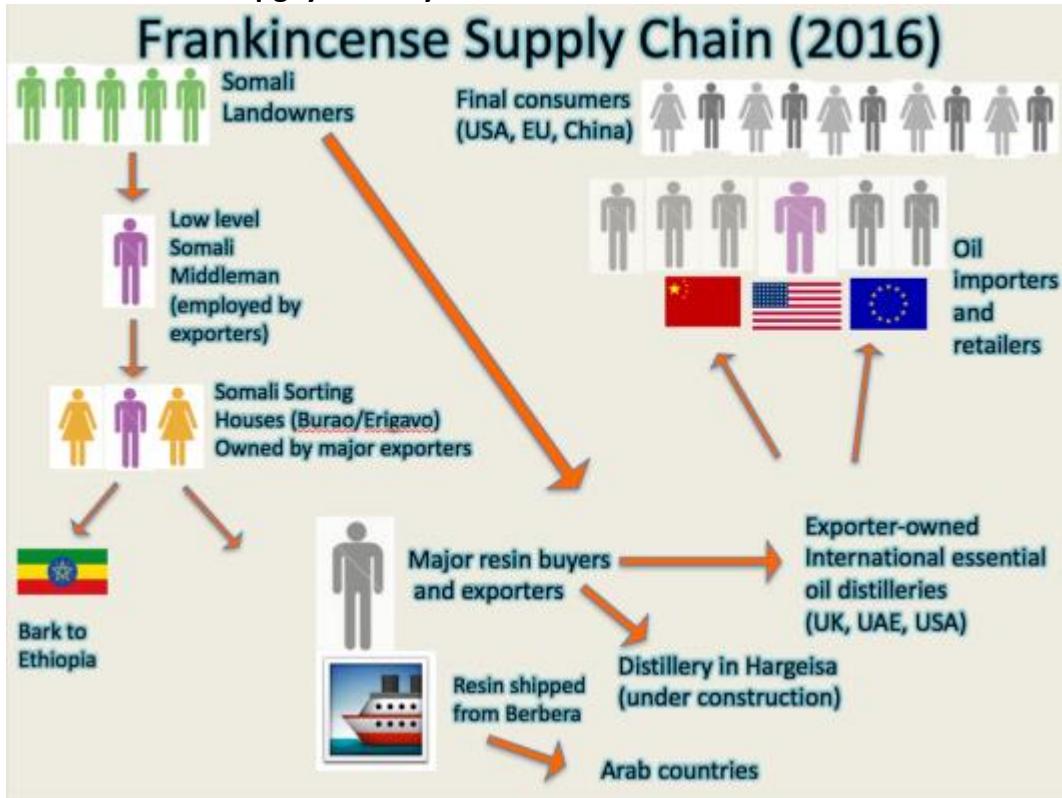
Copyright Anjanette DeCarlo, PhD, LLC.

	B. Carterii (Beeyo)	B. Frereana (maydi)
Da'da ugu horraysa ee la guro	Geedku 15-40 gu' marka uu jiro ayaa la irmaaniyaa (la jafi) Waxa keliya oo la jafi karaa geedka dhererkisu ka weyn yahay 10 sentimitir	Geedku 15-40 sano markuu jiro ayaa la irmaaniyaa (la xoqaa) Waxa keliya oo la jafi karaa geedka dhererkisu ka weyn yahay 10 sentimitir
Xiliga la guro	Bisha afraad ilaa bisha tobnaad	Bisha sagaalaad ilaa bisha Lixaad
	Gurista xiligan ka baxsani waxay aad u waxyeelaynaysaa dhirta	Gurista xiligan ka baxsani waxay aad u waxyeelaynaysaa dhirta
Nasinta dhirta (daynta dhirta)	Dhirta waxa la jafaya laba sano, kaddibna waxa la nasinayaa hal sano Dhirta oo dhammi ma dhalaan xabag wanaagsan Marka la jafayo geedka haddii caanuhu aanay si dhakhso ah uga soo dareerin, geedka waa la daynayaa Haddii xabagtu ay casaan noqoto geedka waa la daynayaa	Dhirta waxa la jafaya laba sano, dabadeedna waxa la nasinayaa hal sano Dhirta oo dhami ma dhasho xabag wanaagsan Marka la jafayo geedka haddii caanuhu aanay si dhakhso ah uga soo dareerin, geedka waa la daynayaa Haddii xabagtu ay casaan noqoto geedka waa la daynayaa
Inta wareeg (jeer) ee la irmaaninayo	8-10 jeer ayaa la irmaanaynayaa 3-5ta wareeg ee ugu horreeya waxay dhalaysaa xabag wax yar. Waxay wax badan dhalaysaa wareega 6-8aad 15-20 maalmoo ayaa u dhexeeyaa wareegyada la irmaaninayo	8-12 jeer ayaa la irmaanaynayaa Waxay wax badan dhalaysaa wareegyada ugu dambeeyaa 15-30 maalmood ayaa u dhexeeyaa wareegyada la irmaaninayo
Tirada la xoqayo	Geedkiiba waxa laga jafaya saddex,lix ilaa sagaal meelood, waxay ku xidhan tahay xajmiga geedka Dhirta yar yar waxa la jafaya ilaa saddex meelood, lagamana badin karo Dhirta waaweyn waxa la jafaya tobantilaa labiyo tobantilaa meelood	Geedkiiba waxa laga sarayaa 3,6, ama 9 meelood, waxana ay ku xidhan tahay xajmiga geedka Dhirta yar yar waxa laga jafaya ilaa 3 meelood, lagamana badin karo Dhirta ugu da'da weyn, sarniinkooda lagamana badin karo 10-12 meelood.

Cabirka la xoqayo	Xoqidda ugu horreysaa kama badan karto, 3 cm x 6 cm am a (3 Xunood x 6 xubnood) Wareeg kasta oo geedka la xoqaa wuxuu sii weyneeyaa xoqiddii hore Xoqidda ugu dambeysa lagama badin karo 6cm x 10 cm (6 xubnood x 10 xubnood) oo uu nabarku leekaanayo.	Jafidda ugu horreeyaa kama badan karo 3 xubnood 6 xubnood Wareeg kasta oo geedka la jafayo wuxu weyneeyaa jafkii hore Jafka ugu dambeeya lagama badin karo (6 xubnood ilaa 10 xubnood)oo uu nabarku leekaanayo
Meesha laga jafay ama irmaanaysiinayo	Waxa laga jafi Kara uun jirrida Meelaha laga irmaaninayo waxa laysu jirsiinaya ugu yaraan ilaa 30 xubnood Meelaha jooggoodu gaaban yahay, dhirta waxa laga xoqayaa meelaha cadceedda iyo dabaysha ka jeeda.	Waxa laga jafi ama irmaaninaya jirrida oo keliya Meelaha laga irmaaninayo waxa laysu jirsiinaya ugu yaraan ilaa 30 xubnood
	Meelaha jooggoodu sarreeyo, dhirta waxa laga xoqayaa labada dhianca ee dabayl-dhaca u jeeda	
Guridda Xabagta xijiga	Guridda xabagta waxa loo dhexaysiinaya 15-20 maalmood.	Guridda xabagta waxa loo dhexaysiinaya 15-30 maalmood.
	Xabagta waxa la guri karaa uun marka no noqoto mid aan isku dhegin ama is-jiidjiidan	Xabagta waxa la guri karaa uun marka no noqoto mid aan isku dhegin ama is-jiidjiidan
	Gurida xabagta waxa loo dhexaysiinaya wakhti	Xabagta ku taal halka la irmaaniyay waa la gurayaa wakhti kasta, laakiin xabagta ka soo dareeraysa ee biyaha ah waxa la gurayaa wareegga u dambeeya

3. Suuq-geynta iyo Xeer dhaqameedka

3.1 Nidaamka Suuq-geynta Beeyada



Jaantuska Saad. Nidaamka suuq-geynta beeyada ee Somaliland 2016.

Ganacsato Somali ah iyo kuwo caalami ah oo ka ganacsada dhoofinta beeyada ayaa la gorgortama dadka leh dirla beeyada, kuwaasi oo jaangooya suuqayada caalamiga ah beeyada iyo qiimeheeda, isla markaana saamayn ku leh hawlaho xabko gurista. Hadaba, xidhiidhka ka dhixeeyeen dak iska leh dhirta beeyada iyo kuwa dhoofiya waa mid muhiimaddiisa leh, si loo gaadho suuq-geyn waarta.

Dalabka iyo baahida beeyadu waa uu sii kordhaayey dhawrkii sanno ee u dambeeyey. Asli Maydi waxa ay ahayd shirkadda ugu weyn ee dhoofisa beeyada shanti sanno ee u dambeeyey (sida ay tilmaamaantay xog hordhac ah oo laga helay diiwaanka shirkadda maraakiibta ee Maersk). Shirkadaha ka ganacsada dhoofinta beeyada oo ay kamidyihiiin Asli Maydi Ltd., Som Gum Trading Ltd. (Internationally Maydi Frankincense), NeoBotanika, Ismael Imports (Internationally Böswellness) iyo Luban dhammaantood waxa ay toos uga soo iibsadaan beeyada dilaaliiin ayaga u shaqaysa oo u dhixeeyeen ayaga iyo dadka dhirta beeyada leh. Tiro kamid ah shirkadahan ayaa beeyada ka gurta dhir iyo dhul ay iskood u leeyihiin. Xaddi beeyo ah oo aan la ogeyn inta ay le'egtahay, balse lagu qiyasay 30% ayaa ka soo gala Puntland Shirkadaha qaar ayaa kukala hufa xabkaha bakhaaro ay leeyihiin amma kireysteen. Intabaden kala hufka iyo kala haadinta xabkaha waxa lagu sameeyaa magaalada Burco, inkasta oo Ceerigaabana in kamid ah lagu sameeyo. Kaddibna xabkaha waxa loo raraa wershado ay shirkaduhu kuleeyihiin wadamada UK, UAE, USA, iy Midawga Yuru, halkaas oo laga tuujiyo

xabkaha salido faa'iido badan leh . Si loogu faa'iideeyo dhaqaalah dalka, shirkadda NeoBotanika ayaa xarun lagu farsameeyo xabkaha ka dhistay Hargeysa, inkasta oo aanay weli si buuxda u halwelin. Dhinaca kale, hadhaaga laga dhilo xabka oo tayo ahaan hooseeya waxa fooy ahaan loogu iibgeeyaa dalka Itoobiya.

Marka lakala sifeeyo, saliidaha laga seemeyo iyo hadhaadiga kaleba waxa iibsada shirkado kale oo kasameeya, cadaro, daawooyin, waxyalah laysku qurxiyo iyo udugyo kale (Jaantuska 5aad). Baahida iyo dalabka saliidaha laga sasmeeyo beeyada ayaa kor u kacay, kaddib markii cilmi-baadhis la sameeyey lagu sheegay in saliida lag tuujiyo beeyada ay tahay mid faa'iido badan (Moussaieff and Mechoulam 2009; Prakash et al. 2014; Carmarda et al. 2007; Banno et al. 2006; DoTerra 2016).

3.2 Nidaamka Lahaanshaha Dhulka

Somaliland, dhulka shakhsiyaa ma leh, laakiinse waa hantida reerka. Kuwa hayst qaybo kamid ah dhulka, micneheedu ma ah in ay dhulka leeyihiin, ee waxa ay leeyihiin khayraadka kuyaal. Marka laga hadlayo beeyada, dadku waxaa ay kala leeyihiin kooxo dhir ah oo kutaal goobo laysal yaqaan, markaa dhirtaa ayey dadku leeyihiin, laakiin dhulka malaha. Qarniyadii hore dhirta beeyada bulshada ayaa lahayd, ilaa markii dambe uu boqorku u ogolaaday dadka qaar in ay koox dir ah yeeshaan oo ay munaafacaadsadaan, xilligaas oo aan taariikhda saxda ah lahayn una dhaxaysay sannadihii 1809-1818 (PDRC 2003).

Maanta , gooboaha ay dhirta beeyadu kabaxdo dhammantood waxa iska leh shakhsiyaa, kuwaas oo sii kala dhaxla, jiilka uu kadambeyo. Dumarka ma dhaxlikaraan dhul, sida uu dhigayo xeer dhaqmeedku, laakiin tani waxa ay ka soo horjeeddaa shareecada. Dhulkaan waxaa ka shaqaysankara qofka iska leh, amma cidda uu ka kireeyo, sid badanaaba dhacda. Kiradu waxa ay noqonkarta mid qofku uu muddo kiraysto oo uu lacag ka bixiyo, amma shuraako ka dhaxaysa qofka dhulka leh iyo qofka kashaqaynaya xabko gurista. Waxa layaab ah in arrintan kiraynta dhirtu ay ka hor imanayso shareecada Islaamka.

3.3 Xeer dhaqameed

Xeer dhaqameedku waa nidaam garsoor oo ku dhisan dhaqanka Somalida. Wax lala yaabo ma aha in xeerkan ay kujiraan, qaybo ku saamsan dhirta beeyada, iyo xabko gurashad.

Marka uu arrin soo baxo, waxa kulmaya odayaal xeer-beegti ah oo ka fadhiisanaya arrinka ayaga oo waafajinaya xeerka. Tusaale ahaan, haddii arrinku ku saabsanyaay dhul beeyo, waa in ay ka fadhiisataan oo ay xukun kasoo saaraan. Dadka xabkaha soo gura, kuwa dhulka beeyadu kabaxdo leh iyo ganacsataduba waa in ay u hoggaansamaan xukunka xeer-beegtida (PDRC 2003). Arrimaha ugu muhiimsani waa sida hoos ku xusan:

- **Gaafeysi (Xakamaynta kaltanka):** haddii dhir beeyo ay leeyihiin dad kabadan hal qof, sida dad badan oo walaalo ah, waa in ay si xaq ah u qaybsadaan wixii kasoo baxa dhirtaas, iyaga oo ku kaltamaya xilliyada ay xabkuhu soo go'aan.
- **Awaaji (Qandaraaska kirada):** qadaraaska kiradu waa heshiis dhexmara qofk dhirta beeyada iskaleh iyo qofka ka xabkasanaya. Kireystuhu waa in uu kubixiyo kiro

xilliyeedka wakhtigeeda, waana in uu u ilaaliyo oo xannaaneeyo geedka. Qofka dhirta leh waa in aanu dhirta ka kireyn qof kale inta heshiiskan lagu jira, heshiiskana waa in aanu jebin, sabab la'aan.

- Nidaamka Munaafacaadsiga:
 - Xaalufin: Qofka xabkaysanayaa waa in aanu si xad-dhaaf ah geedka u dhaawicin, oo uu tixgeliyaa baaxadda geedka iyo xaaladdiisa, waana in aanu xabko ka raadin geedk tiro kabadan inta loogu talagalay halkii xilliba. .
 - Jaqeyn: tani waa geedka oo hoos loo jafo isla meeshii doorkii hore laga dhaawacay, si uu xabko badan u soo saaro. Inkasta oo ay farasamadi marka u horreysa shaqayso, haddan waxa ay geedka ku keentaa xaaluf iyo in uu dhinto. Xeer dhaqameedku arrintan wuu mamnuucay.
 - Qayo or Tarara'yn: Dadka xabkaysanayaa waa in aanay dhaawac u geysan diirka difaaca geedka, taasi waxa ay u nugleynaysaa geedk in uu xar galo
 - Jarista Laamaha geedka: Xooluhu way jecelyhiin caleenta geedka beeyada, hase ahaatee, dadka xabkaha gura iyo cidkalettona xoolaha uma garaacikarto, tani waxa ay geedka u nugleynaysaa in uu xar galo
 - Gaa'hin: Dadka xabkaha guraa waa in ay ay hal sanno nasiyaan geedka beeyada nooca B. frereana, marka laba sanno oo is xiga xabko laga gurto.
- Qandaraaska iibka: dhaqan ahaan, ganacsadata beeyadu waxa ay siisiyaan dadka xabkaha soo gura waxyaalah ay u baahanyihiin sida raashin iyo daruuriyaad kale oo dayn ah, kahor inta aan la gaadhin xilliga xabko gurashada. Marka la gaadho xilliga xabko goosashada qofku xabkaha waxa uu u geynayaa oo uu ka iibinayaa qofkii sii deymiyey. Sida hadda jirta, dadka beeyada soo guraa waxa ay qiimaha kala sii heshiyaan qofka ganacsatada ah, inta aan la gaadhin xilliga goosashada. Xeer dhaqameedku waxaa ku waajibinayaa labada dhinacba in aany heshiiska jebin
- Aas Hiji: Boqork amma ciidd awoodda maamulka lehi waxa ay dhirta beeyad kwareejinkartaa qofka leh. Boqorku amma isaga ayaa la wareegikara amma cidkale ayuu kuwareejinkaraa. Sidii uu sameeyey boqor Cismaan, markii uu bixiyey Diyah (1865-1927), isaga oo dhul beeyo kwareejiyey qoyskii reer Sha'ib, kuna wareejiyey qabiilka Dir.
- Fadhi (Xaqa deggeneha) haddii qof degenaal meel in muddo ah, sida 30 sanno iyo dheeraad oo ka shaqaysanaayey xabkahana kaguranaayey, waxa uu leeyahay xuquuq, Qofka dhirta lihina ma eryikaro, kiradana kuma kordhinkaro, haddii uu dhintana, carruurtiis ayaa kasii dhaxlaysa . inta ay dhirtu kirotahay, qofkaasi waxa uu xaq u leeyahay in isaga laga kireeyo. Tani intabadan waxa ay keenta, haddii muddadu dheeraato in qofkaasi uu isasiyo dhirta, taas oo marka ay dhacdo ay odayaashu xalliyaa.
- Dhaxal rag keliya ah: Intabada ragga oo keliya ayaa kala dhaxla dhirta beeyada. Dumarku ma dhaxlikaraan. Hasayeeshee, xeerku waxa uu kuwaajibinayaa ragga wax dhaxla in dhaqaalaha kasoo gala iibka xabkaha beeyada ay wax ka siiyan gabdhaha ay walaalaha yihiin ee u baahan taageero. Xukunkani waxa uu kahor imanayaan shareecada Islaamka. Sannadkii 2003 odayaashu arrintan dadka way ka wacyigeliyeen, cumaduna aabay u cambaareeyeen. Inkasta uu uu xukunani jira, hadana waxa uu u muuqdaa mid sii diciifaya.

- Hadhiino (Kiro keliya): Haddi cid dhir beeyo ah lahayd gabadh keliyi ka nooshahay, waxa ay xaq u leedahay in kirada dhirta ay qaadato inta ay nooshahay. Marka ay dhimato, waxa dhaxlaya, rag cidda ugu xigta reerkooda. Carruurteeda wiilal iyo gabadho midna ma dhaxlayo dhirta.
- Kiro kasaarid: Qofka dhirta beeyada lihi wuu kajoojinkaraa, kana saarikaraa kireystaha, haddii uu kireystuhu kukaco waxyaalah hoos kuqoran :
 - Haddii uu bixin waayo kiro xilliyeedda
 - Haddii uu kireeyaha kuqabsado dhulkiisa
 - Haddii uu si xad-dhaaf ah u xaalufiyo dhirta
 - Haddii uu soo sheegiwaayo wixii waxyeelo ah ee gaadha dhirta
 - Amma,haddii uu kula heshiinwaayo mulkiilaha

4. Hirgelinta Nidaam jirikara

4.1 Suuq-geyn la xaqijinkaro

In si wanaagsan loo maamulo dhirta beeyada, waxa ay u baahantahay in dhamaan dhinacyada ku lugleh, sida shirkadaha iibsada beeyada iyo dadka soo gura xabkaha ay kawada shaqeeyaan ilaalinta iyo xanaanaynta dhirta beeyada, si loo helo beeyo joogto ah, oo lagu iibsado qiimo wanaagsan, si dhirtana loo nasiyo. Taasina waxa ay u baahantahay in la dejiyo nidaam suugeyn waarta, oo la garankaro hannaanka xidhiidhsan ee sooguraha xabkaha illaa macmiilka u dambeeya ee munaafacaadsada beeyada

Dadka xabkaha soo gura waxa habboon in ay raacaan tilmaamaha kuqoran nuqulka hab-dhaqanka wanaagsan qaybtiisa 2aad. Xabkastayaasha la xaqijiyo In ay habkan raacaan, marka kormeer lagu sameeyo, waxa ay qiimo sare kuhelidoonaan xabkohooda, shirkadaha kaganacsada dhoofinta beeyadu waxa ay jawaanada lagu dhoofiyoo beeyadaas ku qoridoonaan shaabbad caddaynaysa in la xaqijeyey tayada beeyadaas. Shirkaduhu waa in ay hubinyaa in dadka xabkaha soo guraa ay raacaan talooyinkan. Haddii ay raaciwaayaan talooyinka lagu ilaalinayo dhirt beeyada, waa in aanay shirkaduhu waxba ka iibsan. Waa in marka muddo la joogaba la hubiyaa xaaladda dhirta beeyada, si loo hubiyo in aan dhirta la xaalufin, xabka goosashaduna ay waafaqsantahay dhaqaalaynta geedka. Tan waa in ay soo caddaysaa cid seddexaad oo aan ahayn shirkadaha iyo dadka xabkaha soo gura.

4.2 Heshiiskii Nagoya (Nagoya Protocol) Iyo xaqqa bulshada

Heshiishka caalamiga ah ee loo yaqaano Nagoya (The Nagoya Protocol) Waa heshiis digaya in khayraadka debiiciga ah sida beeyada, ay dheeftiisa si xaq ah u wadaagaan cidda soo wadasaartaa. Heshiiskan fulintiisu waa u muhiim jiritaanka suuq-geyn waarta oo ay beeyadu yeelato musqbalka, waayo heshiiskani waxaa uu shirkadaha kaganacsada beeyada farayaa in ay faa''iidada ay sameeyaan waxkuceliyaan bulshada danyarta ah ee xabkaha soo gurta. Tan waxa kamid ah in qiime sare xabkaha lagaga iibsado dadka sosaara, dadkaasnai waafajiyaaan xabko gurista habka suuqgeyn waarta oo la xaqijinkaro. Faa'iidooyinka kale waxaa kamid ah in bulshada dib wax loogu soo celiyo. In la maalgeliyo adeegyo bulsho, sida laga sameeyey deegaanka Virunga oo katirsan dalka Jamhuuriyadda Dimoqraadiga ah ee Congo (DRC) dhaqaalahan waa in ay bixiyaan shikadaha caalamiga ah ee beeyada iibsada iyo shirkadaha dhoofiya. Maamulka dhaqaalahaas waa in ay kawada qaybqaataan shirkadadaha beeyada dhoofiya iyo bulshada deegaanku. Dhaqaalahaas waxa lagu maalgelinkaraa adeegyo bulsho, sida biyo, caafimaad, waxbarasho, fayo-dhawr IWM.

4.3 Yareynta Samaaynta dhibaatada Cayayaanka

Cayayaanka halista ku ah dhirta ee sababa in geedku dhinto waa xarka. Xaalufinta iyo abaartu waxa ay yareeyaan xabgtii uu geedku soo saarilahaa, taasina waxa ay hoos u dhigtaa awooddii geedku xarka iskaga difaacilahaa. Haddii geedka la jafo wax ay fursad siisa xarku in uu galo. Haddii meelo kooban laga dhaawaco geedka sida ku xusan qaybta 2aa Nuqulka talooyinka Habboon, waxa yaranaysa khatarta xarka. Sidoo kale waxa habboon oo la samaynkaraa in dhaawaca geedka la duubo amma dhoobo lagu dhejiyo, si xarka looga ilaaliyo, loona yareeyo dhimashada dhirta

4.4. Hirgelinta fursado kale oo dhaqaale

Kaymaha laga guro beeyada ee Somaliland waxa ay wajahayaan laba culays oo ah dadkii oo kordhaaya iyo dhirtii oo yaraanaysa. Dad badan xabkaha beeyadu waxa ay u tahay il-dhaqaale oo muhiim. Hadaba in la nasiyo dhirta oo culayska laga qaado waxa ay u baahantahay in la abuuro fursado dhaqaale oo kale.

Waxa la dhiirigelinkaraa in deegaanka hawlo dib u dhireyn ah laga fuliyo, oo dadka deegaanka lagu gunneeyo. Waxa kale oo lasamaynkaraa in dadka lagu dhiirigeliyo samaynta ilo-kale oo dhaqaale, sida wax soo saarka malabka, beero, iyada oo la beerayo dalagyada u adkayst abaarta sid; timirta iyo yicibta

Sidoo kale waxa bulshada loo samaynkaraaraa in la siiyo daymo yaryar oo ay soo celiyaan kolba inyar, iyo in loo maalgeliyo ganacsiyo yaryar oo bilow ah. Tani waxa ay fursad siindoontaa dhalinyarada shaqo-laanta ah, waxa kale oo ay dhiirgelinaysaa in ay daku fursado kale oo dhaqaale abuuraan.

4.5 Unugga Ilaalinta Keymaha iyo fulinta ciqaabta xadgudubyada

Xaalufinta dhirta iyada oo si xad-dhaaf ah xabko looga gurayo, waa dhibka ugu badan ee dhaca Xataa haddii daka leh dirta beeyada iyo kuwa kireystaabaa ay si habboon oo nidaamka waafaqsan u gurtaan xabkaha, waxa marwalba jira xabko gurasho sharcidarro ah, taas oo waxyeelo u geysata dhirta. Sidaa awgeed, waxa muhiim ah in la sameeyo Unugga Ilaalinta Keymaha, kaas oo ay wada maalgeliyaan dawladda iyo ururada madaxa bannaan . Unuggani waxa uu kormeer kusamayndoona deegaanada laga gur beeyada. Waa uu isticmaali karaa diyaaradaha aan duuliyaha lahayn, waana in ay xidh xidhaan dadka dhirta jara ee sharcidarada ku shaqaysta. Sidoo kale waa in ay dawladdu mamnuucdaa in dhirta la diiro oo qolofta la dhoofiyi, ciddi lagu qabtana waa in la xidho.

5. Arrimaha u baahan cilmi baadhis joogta ah

Waxa cilmi baadhis u baahan dhinacyo badan oo ku saabsan hab nololeedka, iyo dhaqaalah dhirta, cilmi baadhisyadaasi waxa ay tahay in ay diiradda saaraan:

- Badinta dhirta beeyada iyo siyaabaha loo beerikaro
- Saamaynta ficalada dhaawicdda dhirt iyo sida ay u saamayso kiimikada xabkaha iyo jiritaanka musqabalka ee geedka.
- Muhiimadda macdanaha nafaqeeya ciidda iyo xidhiidhka ka dhexeeya jiritaaka mustaqbal ee geedka beeyada beeyada
- Xakamaynta xarka iyo cayayaanka kale
- Sida ugu wanaagsan ee loo hirgelinayo heshiiska caalamiga ah ee Nagoya (the Nagoya Protocol) iyo sidii shirkaduhu faa'iidada bulshada wax ugu celinlahaayeen.

6. References

- Ahmed, H. H., Abd-Rabou, A. A., Hassan, A. Z., & Kotob, S. E. (2015). Phytochemical Analysis and Anti-cancer Investigation of *Boswellia serrata* Bioactive Constituents In Vitro. *Asian Pacific Journal of Cancer Prevention: APJCP*, 16(16), 7179–7188.
- Banno, N., Akihisa, T., Yasukawa, K., Tokuda, H., Tabata, K., Nakamura, Y., ... Suzuki, T. (2006). Anti-inflammatory activities of the triterpene acids from the resin of *Boswellia carteri*. *Journal of Ethnopharmacology*, 107(2), 249–253. <https://doi.org/10.1016/j.jep.2006.03.006>
- Camarda, L., Dayton, T., Di Stefano, V., Pitonzo, R., & Schillaci, D. (2007). Chemical Composition and Antimicrobial Activity of Some Oleogum Resin Essential Oils from *Boswellia* spp. (Burseraceae). *Annali Di Chimica*, 97(9), 837–844. <https://doi.org/10.1002/adic.200790068>
- Chen, Y., Zhou, C., Ge, Z., Liu, Y., Liu, Y., Feng, W., ... Wei, T. (2013). Composition and potential anticancer activities of essential oils obtained from myrrh and frankincense. *Oncology Letters*, 6(4), 1140–1146.
- Eshete, A., Sterck, F. J., & Bongers, F. (2012). Frankincense production is determined by tree size and tapping frequency and intensity. *Forest Ecology and Management*, 274, 136–142. <https://doi.org/10.1016/j.foreco.2012.02.024>
- Farah, A. Y. (1996). *Milk of the Boswellia Forests: Frankincense Production Among the Pastoral Somali*. (T. H. af Ornas, Ed.). Uppsala, Sweden: Environmental Policy and Society.
- Frankincense Oil Uses and Benefits | doTERRA Essential Oils. (n.d.). Retrieved February 7, 2017, from <https://doterra.com/US/en/blog/spotlight-frankincense-oil>
- Khan, M. A., Ali, R., Parveen, R., Najmi, A. K., & Ahmad, S. (2016). Pharmacological evidences for cytotoxic and antitumor properties of Boswellic acids from *Boswellia serrata*. *Journal of Ethnopharmacology*, 191, 315–323. <https://doi.org/10.1016/j.jep.2016.06.053>
- Lemenih, M., & Kassa, H. (2011). *Management guide for sustainable production of frankincense: A manual for extension workers and companies managing dry forests for resin production and marketing*. Center for International Forestry Research (CIFOR), Bogor, Indonesia. Retrieved from <http://www.cifor.org/library/3477/management-guide-for-sustainable-production-of-frankincense-a-manual-for-extension-workers-and-companies-managing-dry-forests-for-resin-production-and-marketing/>
- Lippi, M. M., Giuliani, C., Gonnelli, T., & Bini, L. M. (2011). Floral color changes in *Boswellia sacra* Flueck. (Burseraceae): A dialogue between plant and pollinator. *Flora - Morphology, Distribution, Functional Ecology of Plants*, 206(9), 821–826. <https://doi.org/10.1016/j.flora.2011.04.008>

Mohsin, A.-A. (2015). *Sustainable harvesting of Frankincense trees in Oman*. Saarbrücken: LAP Lambert Academic Publishing.

Moussaieff, A., & Mechoulam, R. (2009). Boswellia resin: from religious ceremonies to medical uses; a review of in-vitro, in-vivo and clinical trials. *Journal of Pharmacy and Pharmacology*, 61(10), 1281–1293. <https://doi.org/10.1211/jpp.61.10.0003>

Ogbazghi, W., Bongers, F., Rijkers, A., & Wessel, M. (n.d.). Population structure and morphology of the frankincense tree *Boswellia papyrifera* along an altitude gradient in Eritrea (PDF Download Available). *Journal of Drylands*, 1, 85–94.

PDRC. (2003). *Somali Customary Law and Traditional Economy: Cross Sectional, Pastoral, Frankincense, and Marine Norms*. Puntland Development Research Centre. Retrieved from http://www.jccp.gr.jp/_src/sc2372/3_SomaliCustomaryLaw20andTraditionalEconomy.pdf

Prakash, B., Mishra, P. K., Kedia, A., & Dubey, N. K. (2014). Antifungal, antiaflatoxin and antioxidant potential of chemically characterized *Boswellia carterii* Birdw essential oil and its in vivo practical applicability in preservation of *Piper nigrum* L. fruits. *LWT - Food Science and Technology*, 56(2), 240–247. <https://doi.org/10.1016/j.lwt.2013.12.023>

Rijkers, T., Ogbazghi, W., Wessel, M., & Bongers, F. (2006). The effect of tapping for frankincense on sexual reproduction in *Boswellia papyrifera*. *Journal of Applied Ecology*, 43(6), 1188–1195. <https://doi.org/10.1111/j.1365-2664.2006.01215.x>

Strumia, F., Dapporto, L., Dellacasa, M., & Scaramozzino, P. L. (2007). Notes on some insects associated to frankincense tree (*Boswellia sacra* Flückiger, 1867, Burseraceae) in Dhofar (Sultanate of Oman). *Atti Soc. Tosc. Sci. Nat., Mem., Serie B*, 114, 135–139.

Sunnichan, V. G., Mohan Ram, H. Y., & Shivanna, K. R. (2005). Reproductive biology of *Boswellia serrata*, the source of salai guggul, an important gum-resin. *Botanical Journal of the Linnean Society*, 147(1), 73–82. <https://doi.org/10.1111/j.1095-8339.2005.00349.x>

Thulin, M. (2006). *Flora of Somalia Volume 3* (illustrated edition edition). Kew: Royal Botanic Gardens, Kew.

Thulin, M., & Warfa, A. M. (1987). The Frankincense Trees (*Boswellia* spp., Burseraceae) of Northern Somalia and Southern Arabia. *Kew Bulletin*, 42(3), 487–500. <https://doi.org/10.2307/4110063>

Woolley, C. L., Suhail, M. M., Smith, B. L., Boren, K. E., Taylor, L. C., Schreuder, M. F., ... Young, D. G. (2012). Chemical differentiation of *Boswellia sacra* and *Boswellia carterii* essential oils by gas chromatography and chiral gas chromatography–mass spectrometry. *Journal of Chromatography A*, 1261, 158–163. <https://doi.org/10.1016/j.chroma.2012.06.073>

7. Appendix 1:

Row	Issue	Total Participants: 179	
		Participants	Sources
1	High levels of overharvesting	49	12 (EFE/CF 10/9; GB 10/8; MMH 10/11; GBC 10/12; RQ 10/13; AJC 10/13; BWP 10/15; GE 10/10; BH 9/30, HSH 10/23; BOS 11/2; GBCH 10/12; NBC 10/20; AMW 10/12)
2	Adult trees are dying	38	8 (IJ 10/6; EFE/CF 10/7; GB 10/8; MMH 10/11; RQ 10/13; BWP 10/15; GBC 10/12; GE 10/10)
3	Lack of industry regulation/cooperation causing conflict	49	13 (BH 9/30; EFE/CF 10/9; GB 10/8; MMH 10/11; GBC 10/12; IJ 10/6; BWP 10/15; NBC 10/20; AJC 10/13; AD/A 10/5; HSH 10/23; AMW 10/14; BOS 11/2)
4	Distrust of the World Bank and other NGOs	86	5 (BAM 10/6; MMC 10/11; GBC 10/12; RQ 10/13; AJC 10/13)
5	Distrust of Central (Hargeisa) government	76	6 (BAM 10/6; GBC 10/12; RQ 10/13; MP 10/19; HSH 10/23; AJC 10/13)
6	Feel that companies have abandoned them	25	3 (MMC 10/11; RQ 10/13; AJC 10/13)
7	Communities need projects (Infrastructure, education, clinics, etc.)	52	3 (EFE/CF 10/9; GBC 10/12; RQC 10/13)
8	Dwindling resin output and quality	42	6 (MMC 10/11; MH 10/16; NBC 10/20; GBC 10/12; HSH 10/23; BOS 11/2)
9	Multi-level cooperation necessary to protect trees	26	5 (GBC 10/12; NBC 10/20; BH 10/20; HSH 10/23; AJC 10/13)
	Total Participants: 23		
	Traditional Practices	Participants	Sources
10	Age of first harvest is 40 years or ~ 10cm	3	3 (Al-Aamri 2014; GE 10/10; MSM 1/27)
11	Tapping cycle is May-Oct for carterii and Sept-May for frereana	9	4 (IJ 10/6; GB 10/8; HSH 10/23; GE 10/10) + Farah 1994; PDRC 2003

12	No more than 6 months of tapping; 3 months is ideal	6	MMS 1/16, MK 1/17, MSM 1/27
13	8-12 tapping cycles for <i>frereana</i> , 8-10 for <i>carterii</i> ; 15-30 day intervals	7	PDRC 2003; Farah 1994; MSM 1/27; MK 1/17; HSH 10/23; MK 1/20; Al-Aamri 2014
14	Last cycles yield best resin	3	PDRC 2003; Farah 1994; MSM 1/27
15	Trees must be rested after 2 years of tapping	5	PDRC 2003; Farah 1994; MSM 1/27; GE 10/10; Al-Aamri 2014
16	No more than 10-12 wounds/tree	11	EFE/CF 10/9, GE 10/10, MSM 1/27, Al-Aamri 2014; Eshete et al. 2012
17	Wounds should be small and shallow	9	MMS 1/16, GE 10/10, MSM 1/27, Al-Aamri 2014, Eshete et al 2012, Farah 1994
18	Wounds in a channel on opposite sides of the tree	5	GE 10/10, CF 10/9, Al-Aamri 2014; Eshete et al. 2012, MSM 1/27
19	Gather resin at each cutting interval, when non-sticky	7	PDRC 2003; Farah 1994; MSM 1/27; MK 1/20; HSH 10/23; MK 1/17; Al-Aamri 2014