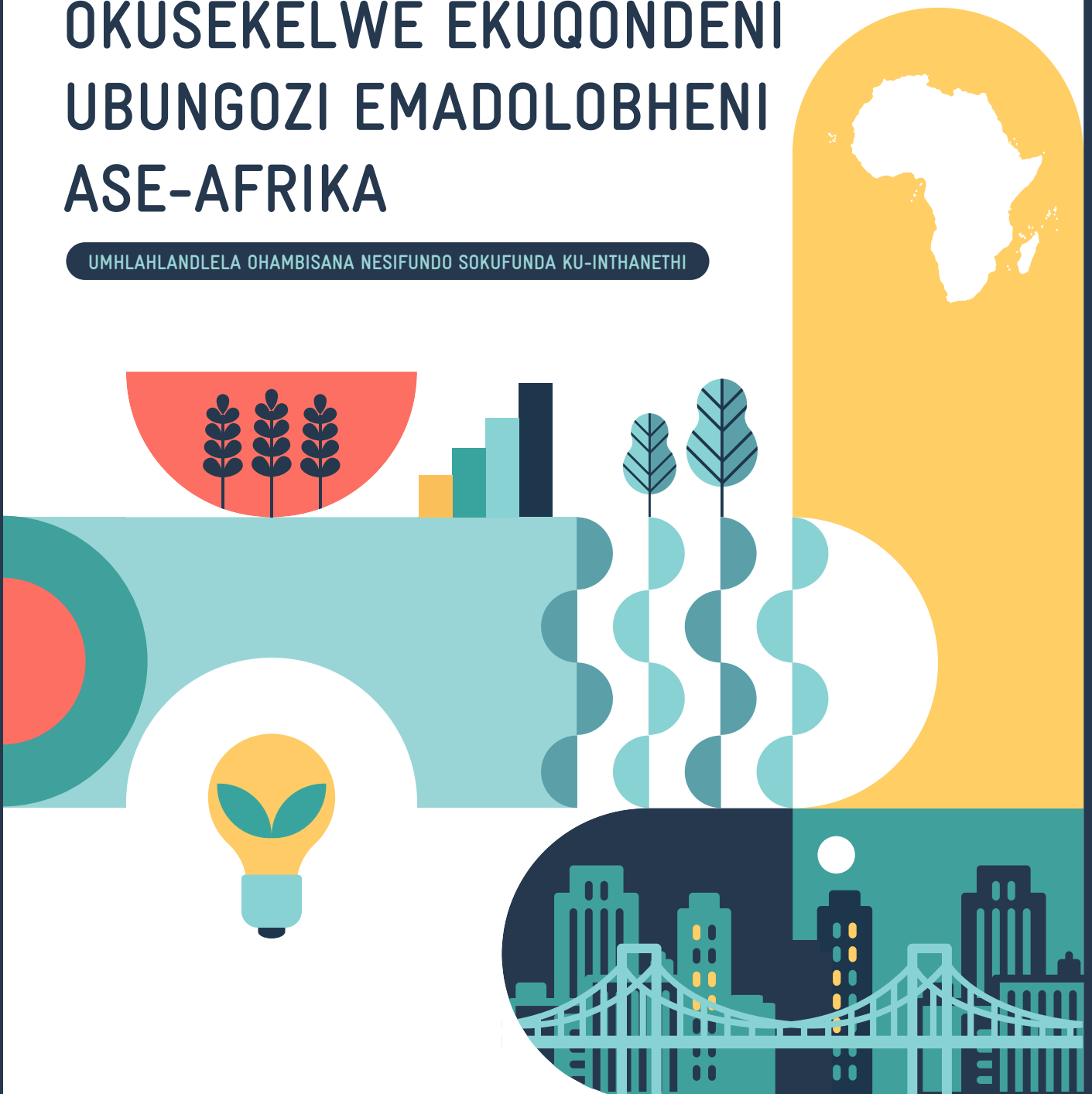


UKUTHUTHUKISWA KWAMADOLOBHA OKUSEKELWE EKUQONDENI UBUNGOZI EMADOLOBHENI ASE-AFRIKA

UMHLAHLANDLELA OHAMBISANA NESIFUNDO SOKUFUNDA KU-INTHANETHI





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Mayelana Nale Manuwali

Le manuwali inikeza isifinyezo esifushane esisekelwe embhalweni sesifundo se-e-learning esithi **Risk-Informed Urban Development (RIUD) in African Cities**. Yakhelwe ukuthi isetshenziswe kokubili ngaphandle kwe-inthanethi naku-inthanethi, futhi ifanele izindawo ezinokuxhumeka kwe-inthanethi okulinganiselwe, okwenza ifinyeleleke kubasebenzisi abaningi.

Le manuwali yengeza esifundweni sedijithali ngokufingqa imiqondo esemqoka ethulwa kumojuli ngayinye, igqamisa ukuqonda okusebenzayo nezibonelo zangempela, futhi isebenzisa ulimi olucacile nolufinyeleleka kalula kuyo yonke imibhalo. Izinto ezibukwayo ezivela esifundweni se-e-learning, okuhlanganisa ama-infographic, imidwebho echazayo, namamephu, zikhonjiswa lapho kufanele khona ukuze zisekele ukuqonda futhi ziqinise imiyalezo esemqoka.

Uhlolojikelele Lwesifundo

Amadolobha ase-Afrika aphakathi kwezindawo zasemadolobheni ezikhula ngokushesha kakhulu emhlabeni. Ukukhula okusheshayo kwamadolobha kwandisa ukubhekana nezingozi ezihlobene nesimo sezulu nezinhlekelele, kuyilapho futhi kubeka ingcindezi eyandayo ezingqalasizindeneni, ezinsizeni zomphakathi, nasezinhlelweni zokuphatha. Ukuguquguquka kwesimo sezulu kuqhubeka nokwandisa izingozi ezikhona, okuhlanganisa izikhukhula, isomiso, amagagasi okushisa, iziphepho, kanye nokwenyuka kwezinga lolwandle. Ngesikhathi esifanayo, izimo zenhlo nezomnotho zidlala indima ebalulekile ekunqumeni ukuthi ubani othinteka kakhulu yilezi zingozi, ngaleyo ndlela zakhe amaphethini obungozi nokumelana nezinkinga phakathi kwabantu basemadolobheni.

Inhloso Yesifundo

Inhloso yalesi sifundo ukuhlinzeka ngolwazi oluyisisekelo mayelana ne-**Risk-Informed Urban Development (RIUD)**. Sihlose ukweseka abathatha izinqumo ekuqondeni ubungozi basemadolobheni ezimweni zase-Afrika, ekuhlanganiseni izindaba eziphathelene nobungozi besimo sezulu nezinhlekelele ezinqubweni zokuhlala amadolobha, nasekuhlonzeni amathuba asebenzayo okuqala izinyathelo. Ngokwenza lokhu, lesi sifundo sifuna ukuqinisa ukuxhumana phakathi kokukhula kwamadolobha, ukuhlolwa kobungozi, ukuphatha kanye nokuxhaswa ngezimali, kanye nezinyathelo zokwakha ukumelana nezinkinga zesikhathi esifushane nesesikhathi eside.





Izethameli Eziqondiwe

Lesi sifundo sihliselwe uchungechunge olubanzi lochwepheshe ababambe iqhaza ekuthuthukisweni kwamadolobha nasekulawulweni kobungozi. Izethameli eziqondiwe zihlanganisa abahleli bamadolobha nabasebenzi bakamasipala, kanye nabenzi benqubomgomo emazingeni endawo, esifundeni, nakazwelonke. Siphinde sifanele ochwepheshe bezentuthuko nabeluleki bezobuchwepheshe, kanye nochwepheshe abasebenza emikhakheni yokuzivumelanisa nesimo sezulu, ukunciphisa ubungozi bezinhlekelele, ukuthuthukiswa kwamadolobha nezindlu, izingqalasizinda, kanye nezinsiza zomphakathi.

Indlela Yokufunda

Lesi sifundo silandela indlela yokufunda eyenziwa umuntu ngamunye ngesivini sakhe, esekelwe kumamajuli, evumela ababambiqhaza ukuthi basebenzisane nokuqokethwe ngokwezidingo zabo nezinhlelo zabo zesikhathi. Sihlanganisa imiqondo esemqoka nezincazelo kanye nezifundo eziyizibonelo ezivela emadolobheni ase-Afrika, kanye nezibonelo ezisetshenziswayo nokuzindla okusebenzayo. Kuso sonke lesi sifundo kugcizelelwa ukubaluleka kwezimo zangempela kanye nezimo zokuthatha izinqumo. Isakhiwo saso siklanyelwe ukweseka kokubili uhambo lokufunda oluhambisanayo kanye nokuqhubeka sisetshenziswa njengencwadi yokubhekisela ngemva kokuphuthulwa kwesifundo.

Mayelana Nale Manuwali

Le manuwali inikeza isifinyezo esifushane esisekelwe embhalweni sesifundo se-e-learning esithi **Risk-Informed Urban Development (RIUD) in African Cities**. Yakhelwe ukuthi isetshenziswe kokubili ngaphandle kwe-inthanethi naku-inthanethi, futhi ifanele izindawo ezinokuxhumeka kwe-inthanethi okulinganiselwe, okwenza ifinyeleleke kubasebenzisi abaningi.

Le manuwali yengeza esifundweni sedijithali ngokufingqa imiqondo esemqoka ethulwa kumajuli ngayinye, igqamisa ukuqonda okusebenzayo nezibonelo zangempela, futhi isebenzisa ulimi olucacile nolufinyeleleka kalula kuyo yonke imibhalo. Izinto ezibukwayo ezivela esifundweni se-e-learning, okuhlanganisa ama-infographic, imidwebho echazayo, namamephu, zikhonjiswa lapho kufanele khona ukuze zisekele ukuqonda futhi ziqinise imiyalezo esemqoka.





Uhlolojikelele Lwesifundo

Amadolobha ase-Afrika aphakathi kwezindawo zasemadolobheni ezikhula ngokushesha kakhulu emhlabeni. Ukukhula okusheshayo kwamadolobha kwandisa ukubhekana nezingozi ezihlobene nesimo sezulu nezinhlekelele, kuyilapho futhi kubeka ingcindezi eyandayo ezingqalasizindeneni, ezinsizeni zomphakathi, nasezinhlelweni zokuphatha. Ukuguquguquka kwesimo sezulu kuqhubeka nokwandisa izingozi ezikhona, okuhlanganisa izikhukhula, isomiso, amagagasi okushisa, iziphepho, kanye nokwenyuka kwezinga lolwandle. Ngesikhathi esifanayo, izimo zenhlo nezomnotho zidlala indima ebalulekile ekunqumeni ukuthi ubani othinteka kakhulu yilezi zingozi, ngaleyo ndlela zakhe amaphethini obungozi nokumelana nezinkinga phakathi kwabantu basemadolobheni.

Inhloso Yesifundo

Inhloso yalesi sifundo ukuhlinzeka ngolwazi oluyisisekelo mayelana ne-**Risk-Informed Urban Development (RIUD)**. Sihlose ukweseka abathatha izinqumo ekuqondeni ubungozi basemadolobheni ezimweni zase-Afrika, ekuhlanganiseni izindaba eziphathelele nobungozi besimo sezulu nezinhlekelele ezinqubweni zokuhlela amadolobha, nasekuhlonzeni amathuba asebenzayo okuqala izinyathelo. Ngokwenza lokhu, lesi sifundo sifuna ukuqinisa ukuxhumana phakathi kokukhula kwamadolobha, ukuhlolwa kobungozi, ukuphatha kanye nokuxhaswa ngezimali, kanye nezinyathelo zokwakha ukumelana nezinkinga zesikhathi esifushane nesesikhathi eside.

Izethameli Eziqondiwe

Lesi sifundo sihliselwe uchungechunge olubanzi lochwepheshe ababambe iqhaza ekuthuthukisweni kwamadolobha nasekulawulweni kobungozi. Izethameli eziqondiwe zihlanganisa abahleli bamadolobha nabasebenzi bakamasipala, kanye nabenzi benqubomgomo emazingeni endawo, esifundeni, nakazwelonke. Siphinde sifanele ochwepheshe bezentuthuko nabeluleki bezobuchwepheshe, kanye nochwepheshe abasebenza emikhakheni yokuzivumelanisa nesimo sezulu, ukunciphisa ubungozi bezinhlekelele, ukuthuthukiswa kwamadolobha nezindlu, izingqalasizinda, kanye nezinsiza zomphakathi.

Indlela Yokufunda

Lesi sifundo silandela indlela yokufunda eyenziwa umuntu ngamunye ngesivinini sakhe, esekelwe kumamojuli, evumela ababambiqhaza ukuthi basebenzisane nokuqokethwe ngokwezidingo zabo nezinhlelo zabo zesikhathi. Sihlanganisa imiqondo esemqoka nezincazelo kanye nezifundo eziyizibonelo ezivela emadolobheni ase-Afrika, kanye





nezibonelo ezisetshenziswayo nokuzindla okusebenzayo. Kuso sonke lesi sifundo kugcizelelwa ukubaluleka kwezimo zangempela kanye nezimo zokuthatha izinqumo. Isakhiwo saso siklanyelwe ukweseka kokubili uhambo lokufunda oluhambisanayo kanye nokuqhubeka sisetshenziswa njengencwadi yokubhekisela ngemva kokuphothulwa kwesifundo.



Imodyuli 1: Ukwethulwa Kwemiqondo Ebalulekile Yentuthuko Yasemadolobheni Ebheka Ubungozi

Inhloso yale Imodyuli

Inhloso yale modyuli ukwakha ukuqonda okufanayo kokuthi izinqubo zokuthuthukiswa kwamadolobha zidala futhi zilolonge kanjani ubungozi, nokuthi kungani ukunciphisa ubungozi kubalulekile ukuze kufezwe ikusasa lamadolobha elisimeme. Le moju yethula imiqondo esemqoka esetshenziswa kuso sonke lesi sifundo futhi inikeza umbono jikelele wamaphethini amanje obungozi emadolobheni ase-Afrika, kanye nezitayela ezisafufusa ezihlobene nokuguquguquka kwesimo sezulu kanye nokukhula okuqhubekayo kwamadolobha.

Ukukhula Kwamadolobha, Izingozi Zesimo Sezulu, Nobungozi Obungalingani

Emadolobheni amaningi ase-Afrika, impilo yansuku zonke iya ngokuya ilolongwa ukuxhumana phakathi kokukhula okusheshayo kwamadolobha, izingozi ezihlobene nesimo sezulu, kanye nobuthakathaka bomphakathi. Imvula encane nje ingaphazamisa ngokushesha ukuhamba kwabantu, izindlela zokuziphilisa, kanye nokufinyelela ezimakethe njengoba imigwaqo igcwala amanzi futhi imisebenzi eminingi yezomnotho engakahleleki iphoqelesa ukuba ime. Kubahlali abaningi basemadolobheni—ikakhulukazi labo abasebenza ezindaweni ezisengozini—ngisho nezehlakalo zesimo sezulu ezincane zingaholela ekulahlekelweni yimali engenayo, ukonakala kwempahla, kanye nokwanda kokungavikeleki. Le miphumela ayibangelwa izingozi zemvelo kuphela, kodwa ihlobene kakhulu nendawo abantu abahlala nabasebenza kuyo, kanye nendlela amadolobha athuthuke ngayo ngokuhamba kwesikhathi.



Umfanekiso 1. Izakhamuzi zasemadolobheni zichayeka ezingozini eziningi ezihlobene nesimo sezulu empilweni yazo yansuku zonke.

Ukukhula okusheshayo kwabantu, izingqalasizinda ezibuthakathaka, ukunwetshwa kwamadolobha okungahlelwanga kahle, kanye nokwanda kwezindawo zokuhlala ezingakahleleki kukhulise kokubili ukubhekana nobungozi kanye nobuthakathaka emadolobheni ase-Afrika. Njengoba izindawo zasemadolobheni zanda, abantu abaningi kanye nezimpahla zabo batholakala ezindaweni ezivame ukukhukhuleka,

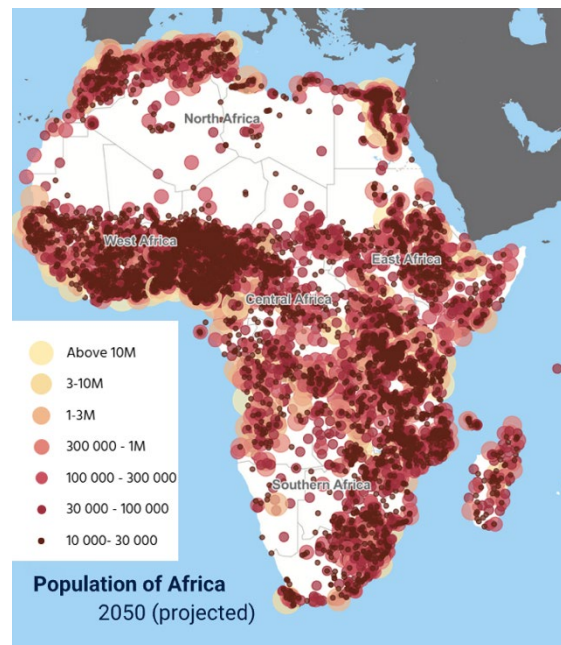


ezindaweni zomhlaba ongazinzile, noma emiphakathini engenazo izinhlelo zokukhipha amanzi, izinsiza eziyisisekelo, kanye nokuvikelwa okwanele. Ngesikhathi esifanayo, amadolobha abhekene nezinhlobo eziningi zobungozi obuxhumene, okuhlanganisa izikhukhula, isomiso, amagagasi okushisa, ukuwa komhlaba, nezivunguvungu, kanye nezingcindezi ezifana nokungazinzi kwezomnotho, izingxabano, ukuwohloka kwemvelo, nokulahleka kwezinhlobonhlobo zezinto eziphilayo. Ukuguquguquka kwesimo sezulu kwandisa lezi zinselelo ngokwandisa imvamisa nobukhulu bezehlakalo ezimbi kakhulu, ukukhuphula amazinga okushisa, nokuguqula amaphethini emvula, okuholela emiphumeleni engalingani phakathi kwemiphakathi futhi kujulise ubuthakathaka obukhona.

Le mojuli ihlola ukuthi izinqubo zokuthuthukiswa kwamadolobha, izingozi zesimo sezulu, nezimo zomphakathi kuhlanguka kanjani ukudala ubungozi emadolobheni ase-Afrika. Ekupheleni kwale mojuli, abafundi bazokuqonda ukuthi ukuthuthukiswa kwamadolobha kwenzeka kanjani nokuthi kungani ukunciphisa ubungozi kubalulekile, bakwazi ukuchaza nokuhlaziya imiqondo esemqoka yobungozi, futhi bahlaziye isimo nezitayela zobungozi ezindaweni zasemadolobheni e-Afrika—okwakha isisekelo sokwakha amadolobha aphephile futhi akwazi ukumelana kangcono nezinselelo.

Ukukhula Okusheshayo Kwamadlobha e-Afrika

I-Afrika iyizwekazi elikhula ngokushesha kakhulu ngokwasemadolobheni emhlabeni. Eminyakeni engamashumi amathathu ezayo, kulindeleke ukuthi inani labantu abahlala emadolobheni ase-Afrika likhule ngezanga elingakaze libonwe ngaphambili, ngokuphindaphinda cishe kabili inani labantu abahlala emadolobheni. Idatha evela ku-Africapolis ikhombisa ukuthi ngo-2050, inani labantu basemadolobheni ezwenikazi lizokhuphuka lisuke ezigidini ezingama-704 liye ezigidini eziyizinkulungwane eziyi-1.4, kanti cishe izingxenye ezimbili kwezintathu zabantu base-Afrika zizobe zihlala ezindaweni zasemadolobheni. Lolu shintsho olukhulu lwabantu luguqula amadolobha ase-Afrika futhi lunezincazelo ezibalulekile mayelana nokuchayeka ebungozini, isidingo sezingqalasizinda, kanye nokumelana kwamadolobha nezinselelo.



Umfanekiso 2. Ukukhula kwesibalo sabantu ezwekazi lase-Afrika, okubikezelwe kuze kufike ku-2050.





Vakashela [i-Africapolis](#) ukuze uthole ulwazi olwengeziwe!

Ubungozi e-Afrika

Njengoba amadolobha ase-Afrika eqhubeka nokukhula, isidingo somhlaba, izindlu, izingqalasizinda, kanye nezinsiza eziyisisekelo siyakhula ngokushesha. Uma ukunwetshwa kwamadolobha kungahlelwanga kahle futhi izindawo zokuhlala ezingakahleleki zikhula ngokushesha kunamandla ezinsiza nezingqalasizinda okuhambisana nazo, abantu abaningi baphoqelesa ukuba baphile ezimweni ezinobungozi obukhulu. Ngenxa yalokho, ukukhula kwamadolobha kungabeka izingxenye ezinkulu zabantu engcupheni enkulu, ikakhulukazi ezindaweni ezichayeke ezingozini zesimo sezulu futhi ezingenakho ukuvikelwa okwanele.

Kulo lonke izwekazi, amadolobha asevele ebhekene nemithelela yokuguquguquka kwesimo sezulu. Nakuba i-Afrika iphakathi kwabafaka isandla esincane kakhulu ekukhishweni kwamagesi abangela ukushisa komhlaba, izingozi ezihlobene nesimo sezulu ziya ngokuya zithinta izindawo zasemadolobheni. Ukwenyuka kwezinga lolwandle, izikhukhula, ukushisa okwedlulele, isomiso, izivunguvungu zothuli, kanye nemvula enamandla sekuvele kuphazamisa amadolobha futhi kulindeleke ukuthi kwande kokubili imvamisa nobukhulu bakho esikhathini esizayo. Lezi zingozi zixhumana nobuthakathaka obukhona emphakathini nasemnothweni, zandise imithelela yazo ezindleleni zokuziphilisa, empilweni, nasekuphepheni kwabantu.

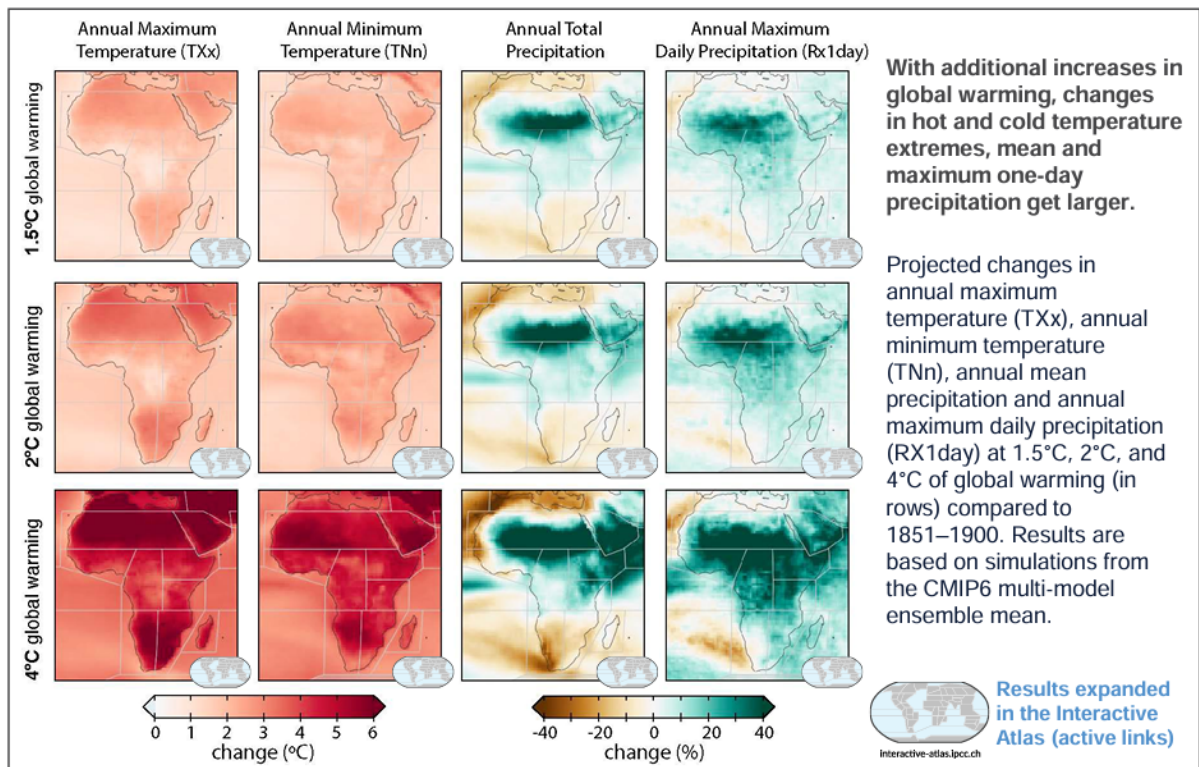
Ukuze uqonde kangcono ukuthi lezi zingozi ziyithinta kanjani impilo yansuku zonke, le vidiyo elandelayo ikhombisa isimo esibhekene nemiphakathi yaseNigeria:

<https://www.youtube.com/watch?v=KYBxTl3ZYsA>

Ukuguquguquka Kwesimo Sezulu Nobungozi Basemadolobheni

Ukuguquguquka kwesimo sezulu kwandisa imvamisa namandla ezehlakalo zesimo sezulu ezimbi kakhulu, kuyilapho futhi kudala izingozi ezintsha futhi kwandisa lezo esezikhona. Ezindaweni zasemadolobheni, le mithelela ibonakala ngokwanda kwezikhukhula nokucindezeleka okubangelwa ukushisa, ukwanda kokushoda kwamanzi nemithelela ehlobene nesomiso, kanye nokwanda komonakalo ezindlini, ezingqalasizindenini, nasezindleleni zokuziphilisa. Amadolobha anezinhlelo zokuhlala ezibuthakathaka kanye nezinsiza zezimali noma zezikhungo ezilinganiselwe abhekana nezinsalelo ezinkulu kakhulu ekuphenduleni lezi zingcindezi, okwenza amaphethini akhona obungozi nobuthakathaka abe makhulu nakakhulu. Ukuze uthole umbono jikelele wemithelela yezingozi ezahlukeneyo zesimo sezulu ezifundeni zase-Afrika, [bheka Umbiko Wesithupha Wokuhlola we-IPCC](#).





Umfanekiso 3. Imithelela yokuguquka kwesimo sezulu, ngokwe-IPCC, ngaphansi kwelayisensi yobunikazi / inqubomgomo yokusetshenziswa ye-IPCC.

Ukuqonda Ubungozi: Imiqondo Ebalulekile

Izingozi (Hazards) zibhekisela ezenzakalweni noma ezinqubweni ezingase zibe yingozi ezingadala umonakalo noma ukuphazamiseka ezindaweni zasemadolobheni.

Esimweni samadolobha ase-Afrika, lokhu kufaka izingozi ezihlobene nesimo sezulu ezifana nezikhukhula, isomiso, amagagasi okushisa, izivunguvungu, kanye nokwenyuka kwezinga lolwandle. Amadolobha aphinde athintwe izingozi ezingahlobene nesimo sezulu, okuhlanganisa izingxabano, ukushaqeka kwezomnotho, kanye nokuwohloka kwemvelo.

Ukuchayeka (Exposure) kuchaza ukuba khona kwabantu, izingqalasizinda, izinsiza, kanye nezimpahla zomnotho ezindaweni ezisengozini yezinhlekelele. Njengoba amadolobha enwebeka, abantu abaningi kanye nezimpahla zabo bangase batholakale ezindaweni ezinobungozi obukhulu, okwandisa amathuba omonakalo nokulahlekelwa lapho izingozi zenzeka.



Ubuthakathaka (Vulnerability) bubhekisela ezintweni zenhlalo, ezomnotho, nezozimba ezithonya indlela abantu nezinhlelo ezithinteka ngayo lapho zibhekene nezingozi. Lezi zinto zingabandakanya amazinga emali engenayo, izinga lezindlu, ukufinyelela ezinsizeni, izinhlelo zokuphatha, kanye nokufakwa komphakathi, konke okuthinta amandla okulindela, ukubhekana, nokululama emiphumeleni yezingozi.

Ubungozi (Risk) buvela ekuxhumaneni phakathi kwezingozi, ukuchayeka, nobuthakathaka. Abumile kodwa buyashintsha ngokuhamba kwesikhathi njengoba izindawo zasemadolobheni zikhula, amaphethini okusetshenziswa komhlaba eshintsha, nezimo zesimo sezulu ziguquka. Ukuqonda ubungozi njengohlelo oluguqukayo kubalulekile ekuhloleni amadolobha ngendlela enolwazi nasekwakheni ukumelana nezinselelo zesikhathi eside.

Ukuhlenganisa Imiqondo Yobungozi: Kusukela Emandleni Okuzivumelanisa Kuya Kumaphethini Ayinkimbinkimbi Obungozi

Ngokwakhela emiqondweni eyisisekelo yezingozi, ukuchayeka, ubuthakathaka, nobungozi, kubalulekile ukuqhubeka nokuhlola ukuthi izingxenye ezahlukene zobungozi zixhumana futhi ziguquka kanjani ngokuhamba kwesikhathi. Ubungozi basemadolobheni abulolongwa kuphela ukuba khona kwezingozi, kodwa futhi namandla abantu, izikhungo, nezinhlelo zokuphendula nokuzivumelanisa, kanye nendlela ubungozi obuqongelelana futhi busabalale ngayo phakathi kwezinhlelo zasemadolobheni ezixhumene.

Amandla okuzivumelanisa (Adaptive Capacity) abhekisela ekhonweni labantu, izikhungo, noma izinhlelo zemvelo lokuzivumelanisa nemithelela yesimo sezulu. Lokhu kufaka izinyathelo ezithathwa ngaphambi, ngesikhathi, nangemva kwezehlakalo eziyingozi, njengokuzilungiselela kusenesikhathi, ukuphendula kahle ngesikhathi sesimo esiphuthumayo, nokululama ngemva kwalokho. Ezimweni zasemadolobheni, amandla okuzivumelanisa angabandakanya izinyathelo ezifana nokwakha kabusha izindlu ngemva kwezikhukhula, ukuthuthukisa izinhlelo zokukhipha amanzi, noma ukuqinisa izinhlelo zokuxwayisa kusenesikhathi nezindlela zokuphendula. Amandla aphezulu okuzivumelanisa anganciphisa kakhulu ubungozi nokulahlekelwa kwesikhathi eside.

Okuhlobene kakhulu namandla okuzivumelanisa **ukuzwela (Sensitivity)**, okuchaza izinga uhlelo oluthinteka ngalo lapho luchayeka ezingcindezini ezihlobene nesimo sezulu. Noma izinhlelo ezimbili zingabhekana nengozi efanayo, indlela ezisabela ngayo ingahluka kakhulu. Ngokwesibonelo, umgwaqo owodwa ungase uqhekeke ngesikhathi segagasi lokushisa kuyilapho omunye oseduze uhlale unjalo ngenxa yokwehluka kwezinto zokwakha, umklamo, noma ukunakekelwa. Ukuzwela kusiza ukuchaza ukuthi



kungani imithelela ihlukahluka phakathi kwezindawo nezingqalasizinda ezichayeke ezimweni ezifanayo.

Ukumelana Nezinsalelo

(Resilience) kuhlangukisa zonke lezi zingxenywe. Esimweni sobungozi bezinhlekelele, ukumelana nezinsalelo kubhekisela ekhonweni lohlelo, umphakathi, noma isizwe esichayeke ezingozini lokumelana, ukumunca, ukujwayela, ukuzivumelanisa, ukuguquka, nokululama emiphumeleni ngendlela esheshayo

nephumelelayo. Lokhu kuhlangukisa ukugcina nokubuyisela izakhiwo nemisebenzi ebalulekile ngokuphathwa kobungozi okusebenzayo. Ngakho-ke, ukumelana nezinsalelo akukhulumi nje ngokululama ngemva kwesigameko, kodwa futhi ngokufunda ezenzakalweni ezedlule nokuqinisa izinhlelo ukuze zikwazi ukubhekana kangcono nezingozi zesikhathi esizayo.



Umfanekiso 4. Umdwebo wobungozi obusakazeka ezinhlelweni, lapho izikhukhula zithinta indawo eyodwa bese zidala imithelela elandelayo ezakhiweni nasezinhlelweni ezingomakhelwane.

Ukuqonda Amandla Ayinkimbinkimbi Obungozi

Izingozi zasemadolobheni azivamile ukwenzeka zodwa. Kunalokho, zivame ukuxhumana phakathi kwemikhakha, izindawo, nesikhathi, zakhe amaphethini obungozi ayinkimbinkimbi kakhulu angandisa imithelela.



Umfanekiso 5. Umdwebo wobungozi obunqwabelanayo, lapho izikhukhula eziphindaphindayo zithinta umphakathi ngaphambi kokuba ululame emiphumeleni yangaphambilini.

Ubungozi bohlelo bubhekisela emiphumeleni elandelayo esabalala ngaphakathi nangaphakathi kwezinhlelo nemikhakha ngokuhamba kwabantu, izimpahla, imali, nolwazi. Isigameko esisodwa esiyingozi singadala ukuphazamiseka okudlulela kude kakhulu nendawo ethintekile ekuqaleni, okungaholela emiphumeleni ebanzi noma ngisho nasekuweni kohlelo ngezikhathi ezahlukeneyo. Ngokwesibonelo, izikhukhula endaweni eyodwa zingaphazamisa ezokuthutha, amaketanga okuhlinzeka, noma izinsiza zomphakathi ezindaweni ezizungezile, okukhombisa indlela izinhlelo zasemadolobheni ezixhumene ngayo ezidlulisela ngayo ubungozi.



Ubungozi obuhlanganayo noma obuqongelelwe benzeka lapho izingozi eziningi zithinta umphakathi ngokulandelana okusheshayo, ngaphambi kokuba kube nokululama esigamekweni esedlule. Ngokwesibonelo, izikhukhula eziphindaphindayo zinganciphisa amandla okubhekana nezimo ngokuhamba kwesikhathi, zandise ukulahlekelwa futhi zijulise ubuthakathaka ngesigameko ngasinye esisha. Ubungozi obuhlanganayo bugqamisa ukubaluleka kwesikhathi sokululama kanye nemvelo eqongelelayo yemithelela.

Ubungozi bezingozi eziningi buchaza izimo lapho izindawo zasemadolobheni zichayeka ezinhlotsheni eziningana zezingozini ngesikhathi esisodwa noma ngokulandelana okusondelene. Amadolobha angase abhekane nenhlanganisela yezikhukhula, amagagasi okushisa,



Umfanekiso 6. Imigwaqo emikhulu nezimboni zichayeka ezingozini eziningi ezenzeka ngesikhathi esisodwa noma zilandelana eduze..

izivunguvungu, izingozi zezimboni, noma ukwehluleka kwezingqalasizinda ngesikhathi esifanayo. Ukuxhumana kwalezi zingozini kungandisa imithelela futhi kwenze imizamo yokuphendula nokuhlela ibe nzima kakhulu.

Isifundo Esiyisibonelo: Ukunciphisa Ubungozi Bezikhukhula Ngokusebenzisa Izixazululo Ezisekelwe Emvelweni eMaputo, eMozambique

Lesi sifundo esiyisibonelo sigqamisa indlela imiphakathi yasogwini esengozini yezikhukhula eMaputo ebhekane ngayo nokwanda kobungozi besimo sezulu ngokuhlanganisa izixazululo ezisekelwe emvelweni nezingqalasizinda zasemadolobheni ezikwazi ukumelana nezinkinga.

IMaputo ibhekane nezikhukhula eziphindaphindayo ngesikhathi zemvula enamandla, ezithinte kakhulu impilo yansuku zonke ezindaweni ezisengozini. Amanzi ezikhukhula ayevame ukuphoqa ukuvalwa kwezikole namabhizinisi endawo, aphazamise ukufinyelela emfundweni, futhi alimaze izakhiwo ezingakhelwanga ukumelana nezehlakalo zesimo sezulu ezimbi kakhulu. Le mithelela



Umfanekiso 7. Imithelela yezikhukhula emiphakathini yasogwini eMaputo.



yathinta kakhulu izingane
nemindeni eholakancane, yandisa
ubuthakathaka benhlalo
nezomnotho.

Ukuze kubhekwanenalezi
zinselelo, iziphathimandla
zendawozabambisana ne-UN-
Habitat, ukuphathwa kwedolobha,
kanye nemiphakathi yendawo
ukuze kusetshenziswe izinyathelo



*Umfanekiso 8. Ama-mangrove abuyiselwe esimweni sawo
nezakhiwo eziphakanyisiwe njengezinyathelo ezihlanganisiwe
zokunciphisa ubungozi bezikhukhula..*

ezihlanganisiwe zokunciphisa ubungozi bezikhukhula. Ingxenye eyinhloko yale ndlela
kwakuwukubuyiselwa kwama-mangrove ogwini. Ama-mangrove asebenza
njengezivikelo zemvelo ezimelene nezivunguvungu ngokumunca amandla amagagasi,
ukunciphisa amandla amagagasi ezivunguvungu, kanye nokunciphisa ubukhulu
bezikhukhula. Njengoba ama-mangrove ekhula kahle ezindaweni zasogwini ezinamanzi
axubile anosawoti namanzi ahlanzekile, lesi sixazululo salungiselelwa ngokukhethekile
izimo zendawo.

Ngasikhathi sinye, kwathuthukiswa izingqalasizinda ezikwazi ukumelana kangcono
nezinkinga, okuhlanganisa ukwakhiwa kwezikole eziphakanyisiwe ezakhelwe ukuthi
zihlale zifinyeleleka futhi ziphephile ngesikhathi sezikhukhula. Lezi zinyathelo
zaqinisekisa ukuqhubeka kwemfundo kuyilapho zinciphisa umonakalo ezakhiweni
zomphakathi.

Ngaphezu kwezingqalasizinda ezibonakalayo, impumelelo yalolu hlelo yancika
ekubambisaneni phakathi kwamazinga ahlukenekukuphatha nemikhakha
ehlukahlukenek. Izinsiza zezimali ezilinganiselwe namandla obuchwepheshe
alinganiselwe ekuqaleni kwabayizinselelo, kodwa ukwesekwa kwamazwe ngamazwe
kanye nokuzibandakanya okuqinile komphakathi kwenza kwaba nokwenzeka
ukusebenzisa izixazululo ezifanele izimo zendawo. Okubalulekile ukuthi lesi sifundo
sikhombisa ukuthi izixazululo ezisekelwe emvelweni azigcini ngokunciphisa ubungozi
bezinhlekelele kuphela, kodwa futhi zinikeza izinzuzo zesikhathi eside zemvelo
nezenhlalo.

Nakuba ukubuyiselwa kwama-mangrove kufaneleka kakhulu ezindaweni zasogwini,
imigomo efanayo ingasetshenziswa nakwezinye izindawo. Ezindaweni zemifula noma
ezindaweni ezingamakhaphozi angaphakathi nezwe, izinhlelo zemvelo ezifana
namakhaphozi anosawoti namakhaphozi amanzi ahlanzekile zingadlala indima efanayo
ekumunceni amanzi ezikhukhula nasekunciphiseni ubungozi. Isipiliyoni saseMaputo
sikhombisa ukubaluleka kokuhlanganisa amasu entuthuko yasemadolobheni ebheka
ubungozi nezimo zendawo zemvelo, zenhlalo nezomnotho.



Izinhlekelele Nokuphathwa Kobungozi Bezinhlekelele

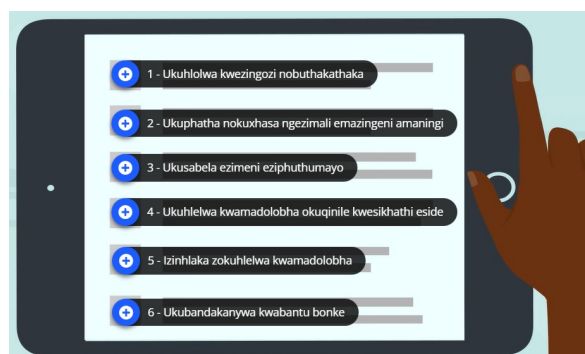
Inhlekelele ukuphazamiseka okukhulu okubangelwa ukuxhumana kwezingozi nokuchayeka nobuthakathaka, okuholela ekulahlekelweni kwabantu, kwezomnotho, noma kwemvelo. Izinhlekelele zenzeka lapho imiphakathi nezinhlelo zingakulungele ngokwanele ukubhekana nezehlakalo eziyingozi. Ngokwesibonelo, isiphepho esinamandla singalimaza izindlu nezingqalasizinda ezibalulekile edolobheni elingenakho ukuhlela okwanele, izinhlelo zokuxwayisa kusenesikhathi, noma izindinganiso zokwakha ezikwazi ukumelana nezinkinga.

Ukuphathwa Kobungozi Bezinhlekelele (DRM) kubhekisela ezinqubweni ezihlelekile zokuklama, ukusebenzisa, nokuhlola amasu, izinqubomgomo, nezinyathelo ezihloselwe ukunciphisa ubungozi bezinhlekelele. I-DRM ayigxili kuphela ekuphenduleni izinhlekelele ngemva kokuba zenzekile, kodwa futhi igxila ekuvimbeleni, ekuzilungiseleleni, nasekunciphiseni ubungozi. Izinyathelo ezisebenzayo ze-DRM zingahlanganisa ukufaka izinhlelo zokuxwayisa kusenesikhathi ngezikhukhula, ukuqinisa ukulungela izimo eziphuthumayo, kanye nokwenza izivivinyo ezijwayelekile zezimo eziphuthumayo ukuze kuthuthukiswe amandla okuphendula.

Indlela Ehlenganisa Konke Yentuthuko Yasemadolobheni Ebheka Ubungozi

I-Risk-Informed Urban Development (RIUD) idinga indlela ehlanganisa konke, exhumanisa ukuhlolwa kobungozi, ukuphatha, ukuxhaswa ngezimali, ukuhlela, kanye nokufakwa komphakathi. Esikhundleni sokubhekana nezingozi zesimo sezulu nezinhlekelele ngokwehlukana, i-RIUD ihlanganisa izindawo eziningi zokungenelela eziqinisa ngokuhlanganyela ukumelana kwamadolobha nezinkinga:

1. Isinyathelo esiyisisekelo kule nqubo ukwenza ukuhlolwa kobungozi besimo sezulu nobuthakathaka. Ukuqonda izingozi ezithile idolobha elibhekene nazo kubalulekile kumasu asebenzayo okuzivumelanisa nesimo sezulu kanye nokuthuthukiswa kwamadolobha. Lezi zihlobo zincipha ekuqoqweni kwedatha okuqhubekayo, olwazini lwendawo, nasekubambisaneni nochwepheshe



Umfanekiso 9. Ukumelwa kwendlela ephelele ye-RIUD esifundweni esiku-inthanethi..





besayensi ukuze kuhlonzwe izingozi ezibalulekile futhi kusekelwe ukuthathwa kwezinqumo.

2. I-RIUD ephumelelayo iphinde incike ekuphathweni kwamazinga amaningi nasezinhlelweni zokuxhaswa ngezimali. Ukuxhumana phakathi kwamazinga kamasipala, esifunda, kazwelonke, nawomhlaba kusiza ukuqinisekisa ukuthi izindlela ezibheka ubungozi zifakwa ezinqubweni zokuhlela amadolobha. Ukuxhumanisa iziphathimandla ngokuvundlile nangokuma phezulu kwenza kube nokusebenza okuhambisanayo, kuyilapho izindlela ezintsha zokuxhaswa ngezimali—njengezinhlelo zomshwalense, ubambiswano lukahulumeni nezinkampani ezizimele, kanye nama-green bonds—zisekela ukusetshenziswa kwezimali ezitshalwa ekwakheni ukumelana nezinkinga.
3. Ngasikhathi sinye, ukuphendula ezimweni eziphuthumayo kudlala indima ebalulekile ekunciphiseni imithelela yezingozi lapho zenzeka. Ukuxhumanisa izimo eziphuthumayo, izinhlelo zokuxwayisa kusenesisikhathi, kanye nokuhlanganiswa kolwazi lwendawo nolwama-Indigenous kusiza ukuvikela imiphakathi nokunciphisa ukulahlekelwa ngesikhathi sezehlakalo ezimbi kakhulu.
4. Ngaphezu kokuphendula ngokushesha, i-RIUD igcizelela ukuhlela amadolobha okumelana nezinkinga kwesikhathi eside. Lokhu kuhlanganisa ukuhlela nokwakha amadolobha akwazi kangcono ukumelana nezingozi zesikhathi esizayo ngokusebenzisa izinyathelo zemikhakha ethile, njengezixazululo ezisekelwe emvelweni zokuzivumelanisa nezikhukhula nokushisa, ukuphathwa kwamanzi okusimeme ukuze kubhekwane nokushoda kwamanzi, kanye nemigomo yezindlu ezikwazi ukumelana nezinkinga efana nokuthi “build back better” kusetshenziswa izinto zokwakha eziphephile nezinqubo zokuhlela eziqhutshwa umphakathi.
5. Izinhlela eziqinile zokuhlela amadolobha nazo zisekela intuthuko ebheka ubungozi. Amathuluzi okulawula, njengezinguquko zamalungelo omhlaba kanye nezinqubomgomo zokuhlela indawo, asiza ukuphatha intuthuko ezindaweni ezinobungozi obukhulu. Ngesikhathi esifanayo, ubuchwepheshe besimanje—obusukela kuma-smart sensors nasekumodeleni kwesimo sezulu kuya ezinhlelweni zamandla ezingahlukanisiwe—bunganciphisa izindleko, buthuthukise ukusebenza kahle, futhi bunciphise ubungozi.
6. Ekugcineni, ukufakwa kwabantu bonke kufakwa kuzo zonke izingxenye ze-RIUD ephumelelayo. Ukuqinisekisa ukuthi amaqembu asengozini—okuhlanganisa abantu abakhubazekile, intsha, abantu abadala, abafuduki, kanye nabantu abasuswe ezindaweni zabo—afakwa ngendlela enenjongo kubalulekile. Izindlela ezibheka ubulili futhi ezibandakanya abantu, ezilungiselelwe amaqiniso asemadolobheni ase-Afrika, zisiza ukuqinisekisa ukuthi imizamo yokwakha ukumelana nezinkinga ilingana futhi iyasebenza.





Izithiyo Eziyinhloko Entuthukweni Yasemadolobheni Ebheka Ubungozi

Nakuba i-Risk-Informed Urban Development (RIUD) inikeza amathuba abalulekile okuqinisa ukumelana kwamadolobha nezinkinga, amadolobha avame ukubhekana nezithiyo eziningi ezivimba ukusetshenziswa kwayo ngempumelelo. Lezi zinselelo zihlanganisa izindlela zokuhlela, amandla ezikhungo, ukuxhumana, kanye nokuxhaswa ngezimali, futhi kufanele zibhekwane nazo ngendlela ehlanganisa konke ukuze kuvunyelwe ukunciphisa ubungozi ngendlela esimeme.

Izindlela Ezisekelwe Emikhakheni: Imizamo yokunciphisa ubungozi ivame ukugxila emikhakheni ngayinye kunokubhekana nohlelo lwedolobha lonke. Le ndlela ehlukenisiwe inganciphisa ukusebenza kahle, njengoba izingozi zivame ukweqa imingcele yemikhakha. Amasu ahlanganisiwe—njengokuhlanganisa ukuphathwa kwezikhukhula kwesifunda nengqalasizinda eluhlaza—anganikeza ukuvikelwa okuphelele kakhulu, ikakhulukazi ezikhukhuleni ezivela phezulu ezithinta izindawo zasemadolobheni ezisezansi.

Ukuhlela: Ukutshalwa kwezimali okunganele ekuhleleni okugxile ekumelaneni nezinkinga kusalokhu kuyisithiyo esikhulu. Ezimweni eziningi, ukusetshenziswa kwemali okulinganiselwe ekunciphiseni ubungozi kunciphisa ukufinyelela kumshwalense futhi kwandise izindleko zezinhlekelele zesikhathi eside. Ukuqinisa izinqubo zokuhlela nokubeka phambili ukutshalwa kwezimali kusenesikhathi ekunciphiseni ubungozi kungasiza ukunqamula imijikelezo yokubhujiswa, izikweletu, kanye nezinhlekelele zosizo lwabantu eziphindaphindayo.

Ukuxhumanisa Izikhungo: Ukuxhumana okubuthakathaka phakathi kwezikhungo kubeka enye inselelo enkulu. Amadolobha amaningi awanazo izinhlelo ezibanzi zokumelana nezinkinga, izabelomali ezanele, noma izingqalasizinda ezibalulekile. Ukuqinisa izikhungo zedolobha, ukucacisa izibopho, nokuthuthukisa ukuxhumana phakathi kweminyango namazinga okuphatha kuyizinyathelo ezibalulekile ekunqobeni lezi zithiyo.

Izikhala Zamakhono: Iziphathimandla zasemadolobheni zivame ukubhekana nezikhala zamakhono, okuhlanganisa ukushoda kwabasebenzi abaqeqeshiwe kanye nolwazi olulinganiselwe ekuklameni nasekusebenziseni amasu okumelana nezinkinga. Izinselelo ezihlobene nokuxhumanisa, ukufakwa kwababambiqhaza, kanye nokuphoqeelwa kwezinhlelo nazo zinciphisa isenzo esisebenzayo. Ukubhekana nalezi zikhala kudinga imizamo eqondisiwe yokwakha amakhono kanye nokwesekwa kwezikhungo kwesikhathi eside.





Izingqinamba Zezimali: Ukuqoqwa kwezimali zasekhaya okulinganiselwe zokunciphisa ubungozi kusalokhu kuyisithiyi esiyinhloko. Izikhala zokuphatha kanye nezinhlelo zokuxhaswa ngezimali ezihlukene zingenza kube nzima ukuthi amadolobha afinyelele, axhumanise, futhi asebenzise ngokuphumelelayo izimali ezikhona. Ukuthuthukisa ukuphathwa kwezimali nokwandisa ukufinyelela emithonjeni ehluahlukene yezimali kubalulekile ukuze kuvunyelwe ukutshalwa kwezimali okuqhubekayo ekumelaneni

You want to assess your own resilience?

Ikhadi Lokuhlola Lokuhlela Ukumelana Nezinhlekelele le-UNDRR liyithuluzi eliklanyelwe ukusiza imiphakathi ukuhlola ukulungela kwayo kanye namandla ayo okumelana nezinhlekelele nokululama ngemva kwazo. Linikeza uhlaka oluhlelekile lokuhlola izici ezahlukeni zokulawulwa kobungozi bezinhlekelele kanye nokwakhiwa kokumelana nezinhlekelele.

[Libheke lapha.](#)



nezinkinga.

Okubalulekile Okufanele Kukhunjulwe: Ukuqonda Ubungozi Basemadolobheni e-Afrika

Ubungozi basemadolobheni e-Afrika budlula izingozi ezizimele. Bulolongwa indlela amadolobha akhula ngayo, lapho abantu behlala khona, kanye nendlela izinhlelo zenhlo, ezomnotho, nezikhungo ezixhumana ngayo nezingozi zesimo sezulu nezinhlekelele. Ukuqaphela lobu bunzima kubalulekile ekuthuthukiseni izimpendulo, ekuhleleni ngendlela ephumelelayo, nasekuvikeleni labo abasengozini enkulu.

Okubalulekile okuvela kule mojuli kufaka:

- Ubungozi basemadolobheni buyanda emadolobheni ase-Afrika ngenxa yokuxhumana phakathi kwentuthuko esheshayo yasemadolobheni nezimbangela zesimo sezulu eziya ziba namandla.
- Izingozi ziyizinhlelo ezixhumene, okusho ukuthi zixhumene phakathi kwemikhakha futhi zivame ukuthinta kakhulu amaqembu asengozini enkulu.





- Ukunciphisa ubungozi ngempumelelo kuqala ngokuhlonza ukuthi ubani nokuthi yini echayeke kakhulu ezingozini.
- Ukusuka ezinyathelweni ezizimele, ezisekelwe emikhakheni, uye kumasu ahlanganisiwe wedolobha lonke kuholela ekumelaneni okuqinile kwamadolobha nezinkinga.
- Ukunciphisa ubungozi kudinga ukubambisana phakathi kwezikhungo, ukuhlela kwesikhathi eside, kanye nokutshalwa kwezimali okuqondisiwe ekwakheni ukumelana nezinkinga.



Imodyuli 2: Ukuhlolwa Kobungozi

Inhloso Yale Imodyuli

Le imodyuli yethula izisekelo zokuhlolwa kobungozi njengengxenywe esempoka ye-Risk-Informed Urban Development. Ihlola ukuthi yiziphi izinhlobo zedatha ezidingekayo ukuhlola izingozi nobungozi, ukuthi le datha ingatholakala kuphi, nokuthi izindlela ezisebenzayo zokuhlola ubungozi zingasetshenziswa kanjani ezimeni zangempela zasemadolobheni. Le module iphinde igcizelele ukuthi kungani ukuhlanganisa ulwazi lwendawo enqubweni yokuhlola kubalulekile ukuze kuqinisekiswa ukuthi ukuhlaziywa kobungozi kukhombisa amaqiniso omphakathi kanye nolwazi abantu abaluthola empilweni yansuku zonke.

Kungani Ukuhlolwa Kobungozi Kubalulekile Ezimeni Zasemadolobheni

Ukuqonda ubungozi besimo sezulu emadolobheni kudlula nje ukuhlonza izingozi ezifana nezikhukhula noma amagagasi okushisa. Ubungozi bakhiwa ukuthi obani nokuthi yini esengozini, kanye nokuthi amaqembu nezinhlelo ezahlukeneyo zisengozini kangakanani. Isibonelo, ingqalasizinda eyakhelwe “isikhukhula esenzeka kanye eminyakeni eyishumi” ingase ingasasebenziseki uma izimvula ezinkulu zenzeka kaningi, okushiya izinsizakalo ezibalulekile zingafinyeleleki.

Emadolobheni akhula ngokushesha njengeKampala, lezi zimo zibonakala ngokucacile. Izikhukhula zingenza imigwaqo ingahambeki futhi zivimbele izingane ukuthi zifinyelele ezikoleni ezisezindaweni eziphansi, ikakhulukazi lapho ukunwetshwa kwamadolobha



Umfanekiso 10. Imigwaqo egcwele izikhukhula eKampala ivimbela ukufinyelela ezikoleni.



Umfanekiso 11. Ukushisa okukhulu nokungcoliswa komoya kuthinta kakhulu abantu abadala..



nokwakhiwa emagqumeni kushintsha ukugeleza kwamanzi kwemvelo. Ngesikhathi esifanayo, amagagasi okushisa abeka izingozi ezinkulu empilweni, ikakhulukazi kubantu abadala, abangase bangabi nokufinyelela emthunzini, emanzini ahlanzekile, noma ekunakekelweni kwezempilo okwanele. Lezi zibonelo zikhombisa ukuthi ingozi efanayo ingaba nemithelela ehluke kakhulu kuye ngezimo zendawo kanye nobuthakathaka bezenhlalo.

Ukuhlanganisa Idatha Nolwazi Lwendawo Ukuze Kuqondwe Ubungozi

Ubungozi buvela ekusebenzelaneni phakathi kwezingozi, ukuchayeka, nobuthakathaka, futhi imithelela yabo ayisatshalaliswa ngokulinganayo kubantu basemadolobheni. Ngakho-ke, ukuhlolwa kobungozi okusebenzayo akunakuthembela kuphela ezilinganisweni zobuchwepheshe, kumamodeli, noma kumamephu. Nakuba idatha yobuningi—njengobubanzi bezikhukhula, izibikezelo zokushisa, noma amamephu ezingozi—ibalulekile, ayihlali ibamba yonke imithelela etholwa imiphakathi.

Ngakho-ke, le module igcizelela ukubaluleka kokuhlanganisa idatha yobuningi neminingwane esuselwe olwazini lwendawo kanye nolwazi lokuphila kwabantu. Imibono yomphakathi ingaveza ubuthakathaka obufihlekile, ikhombe ukuthi obani abathinteka kakhulu, futhi inikeze umongo izinombolo zodwa ezingase zingawubambi. Ngokuhlanganisa idatha yesayensi nokuqonda kwendawo, ukuhlolwa kobungozi kunganikeza isithombe esiphelele nesingasetshenziswa kangcono sobungozi basemadolobheni. Ekupheleni kwale module, uzoqonda ukuthi yiziphi izinhlobo zedatha ezidingekayo ukuhlola izingozi nobungozi, ukuthi idatha efanele ingatholakala kuphi, ukuthi ungayisebenzisa kanjani indlela esebenzayo yokuhlola ubungozi, nokuthi kungani ulwazi lwendawo luyingxenywe ebalulekile yokuhlaziywa kobungozi okunengqondo emadolobheni ase-Afrika.

Ukuqonda Ubungozi Njengokusebenzisana

Kususelwa ezingxenyeni eziyisisekelo zobungozi ezethulwe ngaphambilini, ubungozi besimo sezulu ezindaweni zasemadolobheni buvela endleleni izingozi, ukuchayeka, nobuthakathaka okusebenzisana ngayo ezindaweni ezithile. Lezi zinto kufanele zibhekwe ndawonye ukuze kuqondwe ukuthi kungani ingozi efanayo ingadala imithelela ehluke kakhulu emadolobheni nasemiphakathini. Ubungozi bungavezwa ngomqondo njengomsebenzi walokhu kusebenzisana:

Ubungozi Besimo Sezulu = f (Ukuchayeka, Ingozi, Ubuthakathaka)





Lokhu kuvezwa kugcizelela ukuthi ubungozi abumisiwe futhi abunakugwemeka. Izinguquko kunoma iyiphi yalezi zingxenye—njengokunciphisa ukuchayeka ngokuhlela kangcono ukusetshenziswa komhlaba, ukwehlisa ubuthakathaka ngemigomo ebandakanyayo, noma ukunciphisa izingozi ngezinyathelo zokuzivumelanisa nesimo sezulu—zinganciphisa ubungozi bonke.

Ngokuhlaziya ukuthi izingozi, ukuchayeka, nobuthakathaka kusebenzisana kanjani ezindaweni ezithile, ukuhlolwa kobungozi kungadlulela ngalé kokwenza amamephu ezingozi ajwayelekile futhi kunikeze imininingwane esekela amasu okuhlisa ubungozi basemadolobheni aqondiswe kahle, ahambisana nomongo, futhi alinganayo.

Ukuhlolwa Kobungozi Njengenqubo Enezici Eziningi

Ukuhlolwa kobungozi kuyinqubo enezici eziningi ehlanganisa amathuluzi nemibono ehluhahlukene. Ezinye izindlela zigxila kudatha yezinombolo namamodeli (quantitative), kuyilapho ezinye zisekelwa ulwazi lokuphila kwabantu nolwazi lomphakathi (qualitative). Ndawonye, zisiza ukubamba ubunkimbinkimbi obugcwele bobungozi basemadolobheni.

Izindlela Ezincike Kwalokho Okuchazwayo (Qualitative Methods): zigxila kokuhlangenwe nakho kwabantu, imibono yabo, nolwazi lwendawo. Zilusizo kakhulu ekutholeni ubuthakathaka obungase bungabonakali kumadathasethi noma kumamephu. Izindlela ezivamile zihlanganisa ukwenza amamephu ngokubamba iqhaza komphakathi, izingxoxo zamaqembu, nokubhalwa phansi kokuhlangenwe nakho kwabantu ngesikhathi sezehlakalo zangaphambilini.

Izindlela Ezincike Ezinombolweni (Quantitative Methods): zithembele kudatha yezinombolo, izinkomba, namamodeli ukuhlaziya izingozi, ukuchayeka, namaphethini obungozi. Izibonelo zihlanganisa ama-risk matrix, izimo zezingozu nezikhukhula, izinkomba, namathuluzi okumodela, asekelayo ukuqhathanisa, ukubeka izinto ezibalulekile kuqala, nokwenza izinqumo ezisekelwe ebufakazini.

Ukuhlanganisa izindlela ze-qualitative ne-quantitative kunikeza ukuqonda okuphelele kobungozi besimo sezulu. Nakuba amathuluzi e-quantitative esiza ukukhomba ukuthi ubungozi bungavela kuphi futhi kanjani, imininingwane ye-qualitative ichaza ukuthi lezi zingozu zitholwa kanjani nokuthi obani abathinteka kakhulu. Ngakho-ke, ukuhlolwa kobungozi akusona isenzo esenziwa kanye kuphela, kodwa kuyinqubo okufanele ivuselelwe njalo futhi ihlanganiswe ekuhloleni amadolobha nasekuhloleni isabelomali ukuze kusekelwe ukuqina kwesikhathi eside.





Indlela Esebenzayo Yesinyathelo Ngesinyathelo Yokuhlola Ubungozi

Ukuhlolwa kobungozi kungasetshenziswa njengenqubo ehlelekile eyakha kancane kancane kusukela ekuqondeni izingozi kuya ekuhloleni ubungozi besimo sezulu bonke. Izinyathelo ezilandelayo zinikeza uhlaka olusebenzayo olungashintshwa ukuze luhambisane nezimo ezahlukene zasemadolobheni.

1) Hlonza Izingozi

Isinyathelo sokuqala ukuhlonza zonke izingozi zesimo sezulu ezifanele ezithinta indawo okukhulunywa ngayo. Lokhu kuhlenganisa kokubili izingozi eseziyenzeka kakade kanye nalezo okulindeleke ukuthi ziqine noma zivele esikhathini esizayo ngenxa yokuguquka kwesimo sezulu. Ukuhlonza izingozi kufanele kusekelwe ekuhlanganisweni kwedatha yesayensi, amarekhodi omlando, kanye nokuhlangenwe nakho komphakathi ukuze kuqinisekiswa ukuthi kokubili izehlakalo ezibhaliwe kanye nezingozi ezibonwa endaweni ziyabanjwa.

2) Hlola Ukuchayeka

Uma izingozi sezihlonziwe, isinyathelo esilandelayo ukuthola ukuthi obani nokuthi yini echayeke kuzo. Lokhu kuhlenganisa abantu, izakhiwo, ingqalasizinda, imisebenzi yezomnotho, kanye nezinsizakalo ezibalulekile. Ukuchayeka kungalinganiswa kusetshenziswa izinkomba ezilinganisekayo ezifana nokuminyana kwabantu, ukubalwa kwezimpahla, idatha yokusetshenziswa komhlaba, noma izinhlelo zolwazi lwezwe (GIS), ezisiza ukukhomba lapho izingozi zihlangana khona nezimpahla zasemadolobheni.

3) Hlola Ubuthakathaka

Ukuhlola ubuthakathaka kuhilela ukuhlaziya ukuthi izinto ezichayekile zizwela noma zisengozini kangakanani emiphumeleni yezingozzi. Lesi sinyathelo sibheka izici zezenhlo ezifana namazinga emali engenayo, iminyaka yobudala, noma ukufinyelela ezinsizakalweni, kanye nokuzinza kwezomnotho nesimo namandla engqalasizinda. Ukuqonda ubuthakathaka kusiza ukuchaza ukuthi kungani izingozi ezifanayo zingaholela emiphumeleni ehluke kakhulu phakathi kwezindawo noma amaqembu abantu.

4) Hlola Ubungozi Besimo Sezulu

Esinyathelweni sokugcina, ulwazi ngezingozi, ukuchayeka, nobuthakathaka luhlanganiswa ukuze kuhlolwe ubungozi besimo sezulu bonke. Lokhu kuhlolwa





kungasebenzisa amathuluzi e-quantitative, iminingwane ye-qualitative evela kochwepheshe nasemiphakathini, noma inhlenganisela yakho kokubili. Ngokombono, ubungozi besimo sezulu bungavezwa njengomsebenzi walezi zingxenye ezintathu:

Ubungozi Besimo Sezulu = f (Ukuchayeka, Izingozi, Ubuthakathaka)

Imiphumela yalesi sinyathelo isekela ukubeka izinto ezibalulekile kuqala, ukuhlela, nokwenza izinqumo, isiza amadolobha ukuthi akhombelapho isenzo sidingeka khona ngokuphuthuma kakhulu ukuze kuqiniseke ukuqina.



(1)



(2)



(3)



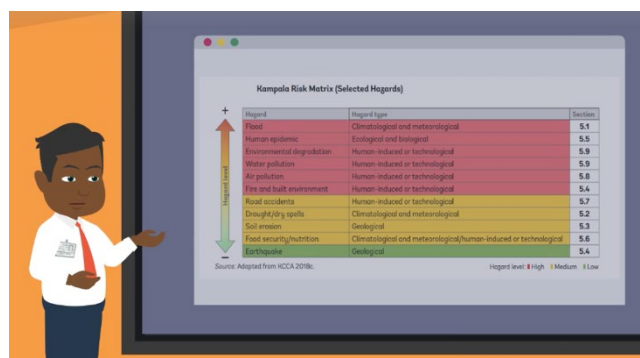
Umfanekiso 12. Inqubo yezinyathelo ezine yokuhlola ubungozi

Case Study:

Ukusebenzisa Ukuhlolwa Kobungozi Engozini Yezikhukhula eKampala, Uganda

Lesi sifundo sesibonelo sikhombisa ukuthi ukuhlolwa kobungozi besimo sezulu kusetshenziswa kanjani eKampala ukubhekana nezikhukhula eziphindaphindayo nokuhola izinyathelo zasemadolobheni eziqondisiwe. Idolobha libhekana nezikhukhula ezivamile ngezikhathi zezimvula ezinkulu, ikakhulukazi ezindaweni eziphansi kanye nasezindaweni ezazingamakhaphozi kodwa esenziwe zakhiwa kakhulu njengoba ukunwetshwa kwamadolobha kuqhubeka. Lezi zimo ziphazamisa impilo yansuku zonke, zilimaza ingqalasizinda, futhi zithinta kakhulu imiphakathi esengozini.

Iphuzu elibalulekile lokuqala enqubweni yokuhlola ubungozi yaseKampala ukuhlonza izingozi eziningi. Nakuba izikhukhula ziyingozi ebonakala kakhulu, ukuhlolwa kuphinde kubheke ezinye izingozi ezixhumene nazo ezifana nokungcola, isomiso, nokuqubuka kwezifo. Ukuze kubanjwe lobu bunkimbinkimbi, idolobha lakha i-risk matrix



Umfanekiso 13. I-matrix yobungozi ebonisa izingozi ezikhethiwe ezihlobene nesimo sezulu nezingahlobene naso eKampala.

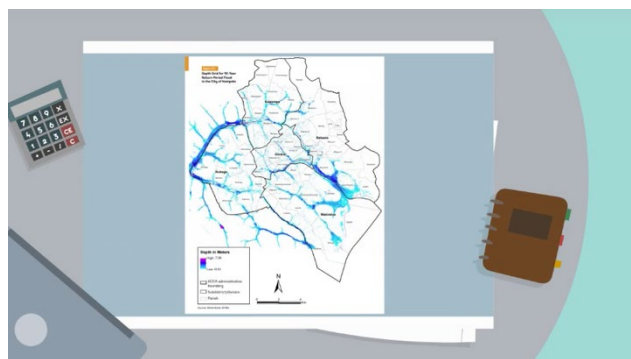


esekelwe ezelulekweni zochwepheshe, ukubeka amazanga ngokubamba iqhaza, nokuhlolwa kwezingozi. Le ndlela ixhumanisa ingozi ngayinye nezimbangela zayo eziyinhloko futhi isiza ukuveza ukuthi imisebenzi yabantu ingakhulisa kanjani ubungozi bezinhlelo.

Uma izingozi sezihlonziwe, ukuhlolwa kushintsha kugxile kusuka engozini uqobo kuya ekutheni obani nokuthi yini echayeke kakhulu futhi ebuthakathaka kakhulu.

Kunokusebenzisa izixazululo ezifanayo kulo lonke idolobha, iKampala ihlanganisa ulwazi lwezingozi nedatha yokuchayeka nobuthakathaka ukuze ibeke phambili izinyathelo lapho zidingeka khona kakhulu. Lokhu kuvumela izinsiza ezilinganiselwe ukuthi ziqondiswe emiphakathini ebhekene nobungozi obukhulu kakhulu.

Ukwenziwa kwamamephu ezimo zezikhukhula kudlala indima ebalulekile kule nqubo. Isibonelo, amamephu ezimo zezikhukhula zeminyaka eyishumi asetshenziswa ukubonisa imithelela engase ibe khona nokuhola ukwenziwa kwezinqumo. La mamephu asekela ukutshalwa kwezimali okuqondisiwe, njengokufakwa kwezinhlelo ezingcono zokukhipha amanzi



Umfanekiso 14. Ukwenza amamephu wezimo zobungozi bezikhukhula kusekela ukutshalwa kwezimali okuqondisiwe

ezindaweni ezivame ukukhukhuleka, okusiza amanzi ukuba ahambe ngokuphepha futhi kunciphise ubungozi emakhaya, ezikoleni, nasezingqalasizindeneni ezibalulekile.

Isici esichaza indlela yaseKampala ukuhlanganiswa kwamathuluzi e-quantitative nolwazi lwendawo kanye nolwazi lokuphila kwabantu. Amamephu namamodeli ahambisana neminingwane yomphakathi esiza ukuchaza ukuthi ubungozi butholakala kanjani phansi. Izindaba ezivela kubahlali—njengezingane ezingakwazi ukufinyelela esikoleni ngesikhathi sezikhukhula—zinikeza umongo obalulekile idatha ye-quantitative iyodwa engase ingawubambi. Ngokuhlanganisa ukuhlaziywa kwesayensi nemibono yendawo, ukuhlolwa kobungozi kukhiqiza ukuqonda okuphelele nokusebenzisekayo kobuthakathaka basemadolobheni, kuvumela izinyathelo ezisebenzayo futhi eziphendula emiphakathini.

INFORM Subnational Risk Model

Isifunda se-Southern African Development Community (SADC) sibhekene nobungozi obukhulayo obuvela ezikhukhuleni, ezomisweni, eziphephweni ezinkulu, nasekuzamazameni komhlaba, okuqiniswa ukuguquka kwesimo sezulu. Lobu bungozi bakhiwa inhlanganisela yezimo zendawo, izingcindezi zesimo sezulu, kanye nezici



zezomnotho. Ngakho-ke, ukuqinisa idatha yobungozi nokumodela kubalulekile ukuze kusekelwe intuthuko, ukuphepha, nokukhula okusimeme, kuyilapho kuncishiswa ubumpofu esifundeni.

I-INFORM Subnational Risk Model iyithuluzi lokuhlola ubungozi elenzelwe sonke isifunda se-SADC elihlinzeka ngokuhlaziywa okunemininingwane ezingeni lesifundazwe, likamasipala, noma kwamanye amazinga angaphansi kukazwelonke aqhathanisekayo. Livumela abenza izinqumo ukuthi bahlole futhi baqhathanise ubungozi ngaphakathi kwezwe elilodwa noma phakathi kwezifunda, lisekela ukuhlela okuqondiswe kangcono futhi okusekelwe ebufakazini.

Le modeli iyasetshenziswa futhi yethulwa esifundeni se-SADC nge-Resilience Initiative Africa (RIA), ngokubambisana neHhovisi likaNobhala le-Southern African Development Community (SADC). Ngokuhlanganisa idatha yezingozi, ukuchayeka, nobuthakathaka, i-INFORM Subnational model isekela ukwenziwa kwezinqumo mayelana nokulungela izinhlekelele, ukuphendula, kanye nezinhlelo zentuthuko, ikakhulukazi ezimeni lapho izinsiza zilinganiselwe futhi ubungozi buhluka kakhulu ngaphakathi kwamazwe.

Iphakheji eligcwele lokuqeqesha liyatholakala, elichaza indlela yokwakha nokusebenzisa i-INFORM Subnational Risk Index ukuze kusekelwe ukuphathwa kobungozi bezinhlekelele kanye nezinhlelo zentuthuko.

[Chozoza lapha ukuze ufinyelele ukuqeqeshwa.](#)

Ezinye Izindlela Zokuhlola Ubungozi

Ngaphezu kwezindlela zokuhlola ubungozi ze-qualitative ne-quantitative, amadolobha angasebenzisa izindlela ezihambisanayo ezahlukahlukene ukuze aqonde kangcono ubungozi besimo sezulu bamanje nobesikhathi esizayo.

Ukumodela kwendawo kusebenzisa amamephu, idatha yezwe, namasu okuhlaziya athuthukile ukukhombisa lapho ubungozi besimo sezulu bugxile khona. Lawa mathuluzi asiza amadolobha ukukhomba amaphethini wendawo, ukubonisa imithelela engase ibe khona, nokwakha amasu okuzivumelanisa aqondiswe ezindaweni ezithile, engqalasizindeneni, noma emaqenjini abantu.

Elinye iqoqo lamathuluzi abalulekile lihlukanisa izindlela zentuthuko yezomnotho nezenhlalo kanye nezindaba zezimo ezingase zenzeke, njenge-**Shared Socioeconomic Pathways (SSPs) kanye ne-Representative Concentration Pathways (RCPs)**.

Ubungozi abukho endaweni engenalutho; bakhiwa ukuthuthuka kwezomnotho, kwezenhlalo, nakwezepolitiki ngokuhamba kwesikhathi. Izindlela zezimo ezingase zenzeke zisiza ukuhlola ikusasa elihlukahlukene elingenzeka, isibonelo ukuthi idolobha





liyatshala yini ekuqineni, ukuthi ukukhishwa kwegesi kuyakhuphuka noma kuyehla, nokuthi imithelela yesimo sezulu ingashintsha kanjani ngaphansi kwezindlela ezahlukeni zentuthuko. Lezi zindaba zisekela ukuhlela kwesikhathi eside ngokusiza abenza izinqumo ukuthi balungiselele ubungozi obuningi obungenzeka. Ulwazi olwengeziwe ngama-SSPs nama-RCPs luyatholakala [lapha](#).

Inhloso Yokusebenzisa Izindlela Ezengeziwe

Ndawonye, lezi zindlela ezengeziwe zivumela amadolobha ukuthi ahlanganise ukuhlaziya kwendawo, izitayela zesikhathi esizayo, nezibikezelo zochwepheshe ukuze ukuhlolwa kobungozi kube namandla futhi kubheke phambili. Zisiza abahleli ukuthi badlulele ngalé kwezimo zamanje futhi balindele ukuthi ubungozi bungashintsha kanjani ngokuhamba kwesikhathi.

Ukuze uthole uhla olubanzi lwezindlela namathuluzi angase afaneleke ezimeni ezahlukeni zasemadolobheni, amadolobha angabheka le database evulekile:

<https://cramse.adaptationcommunity.net/>

Okubalulekile Okufanele Kukhunjulwe: Ukuhlolwa Kobungozi Emadolobheni Ase-Afrika

Ubungozi basemadolobheni ase-Afrika bakhiwa ukusebenzisana phakathi kwezingozi zesimo sezulu, ukuchayeka, nobuthakathaka, kanye nendlela amadolobha akhula futhi athuthuka ngayo ngokuhamba kwesikhathi.

Ukuqonda nokuhlola ubungozi kubalulekile ekuhleleni ikusasa lasemadolobheni elisebenzayo, elibandakanyayo, futhi eliqinile.

Okubalulekile okufanele kukhunjulwe kule module kuhlanguka:

- Ubungozi buyisiphambano sezingozi, ukuchayeka, nobuthakathaka, futhi abunakuchazwa ngokuhlaziya izingozi kuphela.
- Ukuhlolwa kobungozi kuyinqubo enezici eziningi ehlanganisa amathuluzi ahlukahlukene, imithombo yedatha, nemibono ukuze kuboniswe amaqiniso ayinkimbinkimbi asemadolobheni.
- Ukuhlanguka izindlela ze-quantitative ne-qualitative kunikeza ukuqonda okuphelele kobungozi besimo sezulu, kubamba kokubili imithelela elinganisekayo kanye nolwazi lokuphila kwabantu.
- Ukuhlolwa kobungozi kudinga ukuvuselelwa njalo futhi kuxhaswe ngezimali ngendlela eyanele; uma kungenjalo, kungaba yisidala futhi kungasebenzi njengoba izimo zasemadolobheni nobungozi besimo sezulu kushintsha.



Imodyuli 3: Ukubusa Nokuxhaswa Ngezimali Kokuthuthukiswa Kwamadolobha Okusekelwe Olwazini Lwengcuphe

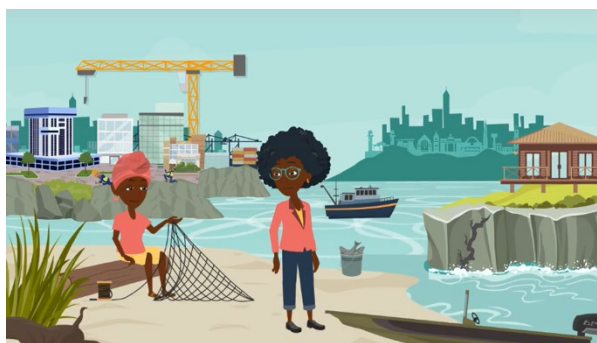
Inhloso Yale Imodyuli

Le imodyuli igxile ezingxenyeni zokubusa nokuxhaswa ngezimali ekuthuthukisweni kwamadolobha okusekelwe olwazini lwengcuphe, i-Risk-Informed Urban Development (RIUD). Nakuba ukuqonda ingcuphe nokuhlola izingozi kuyizinyathelo zokuqala ezibalulekile, ukunciphisa ingcuphe emadolobheni ekugcineni kuncike ekutheni izinqumo zenziwa kanjani, obani ababandakanyekayo, nokuthi izinsiza zabiwa kanjani. Le module ihlola ukuthi amazanga nezinhlobo ezahlukene zokubusa akha kanjani amandla amadolobha okumelana nezimo ezinzima, nokuthi kungani izindlela zokuxhasa ngezimali zibalulekile ekuguquleni ukuhlolwa kwengcuphe kube yizenzo ezisebenzayo.

Kungani Ukubusa Nokuxhaswa Ngezimali Kubalulekile Ekuqineni Kwamadolobha

Emadolobheni ase-Afrika, ingcuphe ayisabalali ngokulinganayo kuphela—iphinde iphathwe ngendlela engalingani. Njengoba kubonakala e-Accra, ukuchayeka ezingozini ezifana nokuguguleka kogu lolwandle kuhlobene kakhulu nezinqumo zokuhlela, amandla ezikhungo, kanye nezinto ezibekwa phambili ekutshalweni kwezimali. Ingqalasizinda yokuvikela, njengezindonga zolwandle noma izinhlelo zokukhipha amanzi, ivame ukugxiliswa ezindaweni ezinenani eliphezulu kwezomnotho, kuyilapho eminye imiphakathi iqhubeka nokuba sengozini enkulu.

Izakhiwo zokubusa zinquma ukuthi obani abavikelwayo, ukuthi zingcuphe zabobani ezibekwa phambili, nokuthi izinqumo ziqondiswa kanjani phakathi kwemikhakha namazinga kahulumeni. Ngesikhathi esifanayo, uxhaso lwezimali lunquma ukuthi ukuvikelwa kungafinyelela kude kangakanani, yiziphi izinyathelo ezisetshenziswayo, nokuthi imizamo yokunciphisa ingcuphe iyaqhubeka yini ngokuhamba kwesikhathi. Ngaphandle koxhaso olwanele, ngisho nezinhlelo



Umfanekiso 15. Ukuguguleka kogu nokuvikelwa okungalingani e-Accra.



eziklanywe kahle zihlala zingasetshenziswa; ngaphandle kokubusa okusebenzayo, ukutshalwa kwezimali kungase kuqinise ukungalingani okukhona esikhundleni sokunciphisa ingcuphe.

Ukusuka Olwazini Lwengcuphe Kuya Esenzweni

Le module igqamisa uguquko olusuka ekuqondeni ingcuphe luye ekuthatheni izinyathelo ngayo. Ihlola ukuthi izinhlelo zokubusa ziyithinta kanjani inqubo yokuhlela nokwenza izinqumo, ukuthi izibopho zisatshalaliswa kanjani phakathi kwezikhungo nababambiqhaza, nokuthi amathuluzi ezimali nezabelomali asekelwa—noma avimbele—kanjani imizamo yokunciphisa ingcuphe. Le module iphinde igcizelele indima yamandla omphakathi kanye nezinqubo ezibandakanyayo ekuqinisekiseni ukuthi ukuqina akusilo ilungelo labambalwa kuphela, kodwa kungumphumela owabiwa idolobha lonke.

Ekupheleni kwale module, uzoqonda ukuthi amazinga ahlukeneyo okubusa asebenzisana kanjani ukuphatha ingcuphe yasemadolobheni, ukwazi ukukhomba ababambiqhaza nezikhungo ezibalulekile ezibandakanyeka ekwenzeni izinqumo ezisekelwe olwazini lwengcuphe, futhi uqonde ukuthi izindlela zokuxhasa ngezimali nezokwenza izabelomali ziyithonya kanjani impumelelo nobulungiswa bamasu okuqinisa amadolobha.

UKUBUSA / UKUPHATHA

Sisho Ukuthini Ngokubusa?

Amahholo edolobha amele ukusebenzisana phakathi kweziphathimandla zikahulumeni nabanye abadlali ekubekeni izinto ezibalulekile kuqala nasekuthatheni izinqumo ezithinta idolobha lonke.

Izakhiwo zomthetho zibonisa uhlangothi olusemthethweni lokubusa, okuhlanganisa imithetho, iziqondiso, izimiso, nezindlela zokuqapha eziqondisa futhi zihlele ukuthathwa kwezinqumo emazingeni ahlukeneyo.

Amagumbi emihlangano agcizelela ukuthi ukubusa nakho kuyinqubo yokuthatha izinqumo ebandakanya ababambiqhaza abaningi, lapho izikhulu zikahulumeni, imiphakathi, izinhlangano zomphakathi, kanye nomkhakha ozimele behlangana khona ukuze baxoxe ngezindlela futhi bavumelane ngezixazululo.

Amahhovisi okuhlela abonisa uhlangothi lwamasu lokubusa, lapho izinsiza ezifana nezimali nezinhlelo zemisebenzi zabelwa khona ukuze kusekelwe ukunciphisa ubungozi nokuqina kwamadolobha.



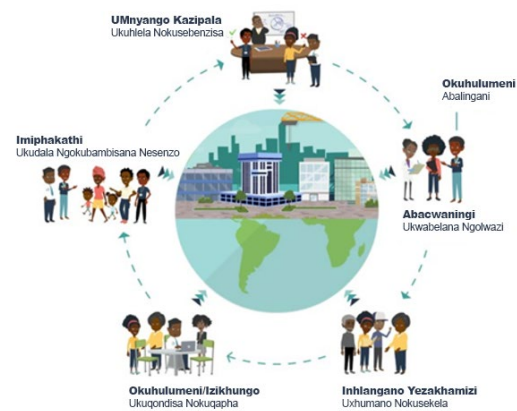
Ndawonye, lezi zinto zikhombisa ukuthi ukubusa akukhulumi ngezikhungo kuphela, kodwa kumayelana **nokuthi izinqumo zenziwa kanjani, obani ababandakanyekayo kuzo, nokuthi izinhloso ezihlanganyelwe zilandelwa kanjani.**

Ubukhulu Bokuphatha

Ukuphatha ubungozi besimo sezulu kusebenza ngezindlela ezimbili ezihambisanayo:

Ukuphatha okuvundlile (Horizontal governance) kubhekisela ekusebenzisaneni phakathi kwemikhakha ehlukene, amaqembu endawo, kanye nemiphakathi esebenza ngokubambisana. Kugcizelela ukwabelana ngolwazi, izibopho, kanye nezinsiza phakathi kwabalingani abasezingeni elifanayo.

Ukuphatha okuqondile (Vertical governance) kuchaza indlela izinqumo nezinqubomgomo ezihamba ngayo phakathi kwamazinga ahlukene — kusukela kuhulumeni kazwelonke kuya kubaholi bamadolobha bese kwehla kuye emiphakathini yendawo. Ukuxhumana okuhle phakathi kwala mazinga kuqinisekisa ukuthi amasu ayahambisana kuwo wonke amazinga.



Umfanekiso 16. Ababambiqhaza kwezokuphatha ababandakanyeka Ekuthuthukisweni Kwamadolobha

Ababambiqhaza Bokuphatha

Ukuphathwa kobungozi kuwumthwalo ohlanganyelwayo. Wonke umuntu unendima okufanele ayidlale, okuhlanganisa iminyango kamasipala, ohulumeni bakazwelonke, abacwaningi, izinhlangano zomphakathi, kanye nemiphakathi uqobo lwayo. Ukuphatha okusebenzayo kuhlanganisa laba babambiqhaza ukuze amadolobha akwazi ukusebenza ngokubambisana ekwakheni ukuphepha, ukubandakanywa, kanye nokuqina.

Ukuphatha Ubungozi Basemadolobheni Okubandakanyayo

Ukuphatha ubungozi basemadolobheni okubandakanyayo kubalulekile ukuze kuqinisekiswa ukuthi izintshisekelo, ukukhathazeka, kanye nezidingo zabo bonke ababambiqhaza namaqembu abantu ngaphakathi kwadolobha ziyabonwa futhi zibhekwanenazo. Ukuphatha ubungozi okusebenzayo kudlula ukuhlela



kwezobuchwepheshe; kufuna ngenkuthalo ukufaka labo abathinteka kakhulu ezingozini zesimo sezulu ezinqubweni zokuhlola ubungozi kanye nokwenza izinqumo.

Indlela ebandakanyayo yokuphatha ubungozi basemadolobheni ihlanganisa:

- Ukubandakanya amaqembu ancishwe amathuba kanye nalawo asengozini enkulu ekuhloleni ubungozi, ukuze kuqashelwe ubungozi namakhono awo akhethekile.
- Ukuqaphela abesifazane, izingane, kanye nentsha njengamaqembu abalulekile, njengoba bevame ukubhekana nezingozi zesimo sezulu ngendlela ehlukile futhi ngokungalingani.
- Ukubandakanya imiphakathi ngokuqondile ekwenzeni izinqumo ezihlobene nobungozi, kunokuba ibhekwe kuphela njengabamukeli bolwazi noma bezinhlelo zokungenelela.
- Ukuqinisekisa ukuxhumana ngobungozi okucacile nokufinyeleleka kalula, kusetshenziswa imiyalezo elula nezindlela eziningi zokufinyelela kubabukeli abahlukahlukene.
- Ukusebenzisa ubuchwepheshe bolwazi kanye nezinkundla zokuxhumana, okuhlanganisa amathuluzi okuqoqa ulwazi emphakathini (crowdsourcing), ukuze kuqoqwe idatha yasendaweni futhi kuthuthukiswe ukuqwashisa.
- Ukukhuthaza izinkundla zokuphatha ngogesi (**e-governance**) ezifinyeleleka kalula, eziklanyelwe ukuba zisebenziseke futhi zibe lula ukuzisebenzisa, ukuze kuvunyelwe ukubamba iqhaza okubanzi ezinqubweni zokuphatha ubungozi.

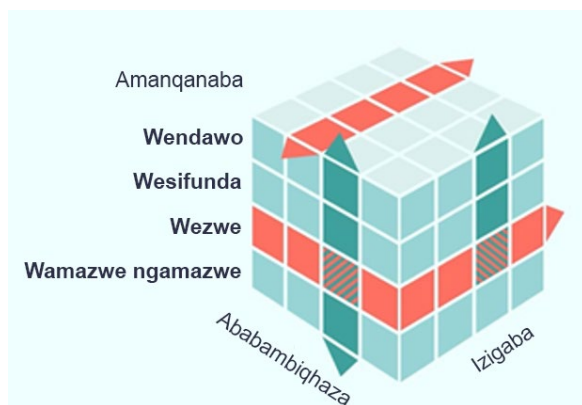
Isimo sezulu esihle ekusebenzeni

Lesi sihloko sethula izifundo zezimo zangempela ezivela emadolobheni ahamba phambili, sibonisa ukuthi ukuphatha okusebenzayo, ukuthathwa kwezinqumo ngobuhlakani, kanye nokubambisana phakathi kwababambiqhaza kungasiza kanjani ukubhekana nobungozi besimo sezulu ngendlela ephumelela kakhudlwana.

Ngezibonelo ezingokoqobo, sibonisa ukuthi amadolobha athuthukisa kanjani ukuhlanganisa imisebenzi, ukuhlela, kanye nokutshalwa kwezimali ukuze akhe izindawo zasemadolobheni eziphephile, ezimelana kangcono nezinhlekelele, futhi eziluhlaza kakhudlwana. Izifundo ezabiwe zingakhuthaza abenzi bezinqubomgomo, abahleli, kanye nabasebenzi bezokuthuthukisa ukuthi baqinise ukuphathwa kwesimo sezulu emadolobheni abo.

[Yibheke lapha.](#)





Umfanekiso 17. Izingxenye zokuphatha ekulawulweni kobungozi basemadolobheni..

Ubukhulu Bokuphatha Ekulawuleni Ubungozi Basemadolobheni

Ukuphatha ubungozi basemadolobheni kusebenza ngobukhulu obuhlukahlukene, okukhombisa indlela izinqumo ezenziwa ngayo, ukuthi obani ababandakanyekayo, nokuthi yiziphi izingxenye zempilo yedolobha ezithintekayo. Ukuqonda lobu bukhulu kusiza ukucacisa indlela ukuphatha okusebenza ngayo empeleni.

Amazinga Okuphatha Emadolobheni: izinqumo ezihlobene nokulawulwa kobungozi basemadolobheni zenziwa emazingeni ahlukahlukene, okuhlanganisa izinga lendawo, lesifunda, likazwelonke, kanye nelamazwe ngamazwe. Ukuphatha okusebenzayo kudinga ukuxhumana nokusebenzisana phakathi kwala mazinga ukuze kuqinisekiswa ukuthi izinqubomgomo nezenzo ziyahambisana futhi ziyasekelana.

Ababambiqhaza Ekuphatheni Amadolobha: ukuphatha amadolobha kubandakanya izinhlobonhlobo zababambiqhaza, okuhlanganisa ohulumeni, amabhizinisi, izinhlangano zomphakathi, abacwaningi, kanye nemiphakathi. Umuntu ngamunye noma isikhungo ngasinye sinendima ekubumbeni izinqumo zasemadolobheni, ngokuletha ulwazi, izinsiza, ukuqapha, noma ikhono lokuqalisa izinhlelo.

Imikhakha Ebandakanyekayo: ukuphatha ubungozi kuphinde kweqe imikhakha eminingi, njengemvelo, ezokuthutha, ukwakha, ezolimo, neminye. Njengoba ubungozi besimo sezulu buthinta izingxenye eziningi zempilo yasemadolobheni, isenzo esihlelelekile phakathi kwemikhakha sibalulekile ukuze kuncishiswe ubuthakathaka futhi kwakhiwe ukuqina.

Izinyathelo Ezibalulekile Zokuphatha Ekuthuthukisweni Kwamadolobha Okusekelwe Ebungozini

Manje njengoba sesinokuqonda okucacile kokuthi ukuphatha kusho ukuthini, singabheka ukuthi kusebenza kanjani empeleni. Ukuphatha ukuthuthukiswa kwamadolobha okusekelwe ebungozini kulandela uchungechunge lwezinyathelo ezixhumene ezisiza amadolobha ukuhlela izinqumo, izinsiza, kanye nezibopho.



1. **Yakha Umbono Nomgomo Wedolobha:** ukunciphisa ubungozi kuvame ukugxila emikhakheni ethile kunokubheka uhlelo lwedolobha lonke. Umbono wedolobha owabiwe usiza ukukhuthaza izindlela ezihlanganisiwe—njengokuhlanganisa ukuphathwa kwezikhukhula kwesifunda nengqalasizinda eluhlaza—ukuze amadolobha avikelwe kangcono ezingozini ezifana nezikhukhula ezivela ezindaweni ezingenhla komfula.
2. **Bhala Futhi Wakhe Ukuvumelana Ngezinqubomgomo Nezinhlelo:** amazwe amaningi atshala imali encane kakhulu ekuqineni, okwandisa ukulahleka okubangelwa izinhlekelele kanye nezindleko zokululama. Ukwakha ukuvumelana mayelana nezinqubomgomo zokunciphisa ubungozi kusiza ukunqamula imijikelezo yokubhujiswa, izikweletu, kanye nokuhlupheka kwabantu.
3. **Chaza Imijikelezo Yokuhlela Ukuthuthukiswa Kwamadolobha:** amadolobha amaningi awanazo izinhlelo zokuqina eziqediwe, izabelomali ezanele, noma ingqalasizinda ebalulekile. Ukuqinisa imijikelezo yokuhlela, izikhungo, kanye nezinsiza kubalulekile ukuze kubhekwane nalezi zikhala futhi kuthuthukiswe ukuqina kwesikhathi eside.
4. **Yakha Amasu Entuthuko Nokuqina:** iziphathimandla zasemadolobheni zivame ukubhekana nokushoda kwabasebenzi abaqeqeshiwe kanye namasu acacile okuqinisa ukuqina. Ukuxhumana okungcono, ukubandakanywa kwababambiqhaza, kanye nokuphoqelelwa kwezinhlelo kuyizihluthulelo zokunqoba lezi zinselele zesakhiwo.
5. **Chaza Izindima Nezibopho:** ukuhlanganiswa kwezimali zasekhaya zokunciphisa ubungozi kuvame ukuba buthakathaka, futhi izikhala ekuphatheni zenza kube nzima ukuthi amadolobha afinyelele futhi axhumanise uxhaso lwezimali. Izindima ezichazwe ngokucacile zisiza ukuthuthukisa ukuziphendulela nokuphathwa kwezinsiza.
6. **Chaza Izinhlelo Zokuqalisa Nezabelomali:** imisebenzi ecacile, izikhathi ezibekiwe, kanye nokwabiwa kwesabelomali kubalulekile ukuze izinhlelo namasu aguqulwe abe yizenzo ezibonakalayo.

Ucwaningo Lwesibonelo: Freetown, Sierra Leone

Manje njengoba sesinokuqonda okucacile kokuthi ukuphatha amadolobha kusho ukuthini nokuthi amazanga ahlukene, ababambiqhaza, kanye nemikhakha kusebenzisana kanjani, lesi sigaba sihlola ukuthi le migomo isebenza kanjani empeleni. Icala laseFreetown likhombisa ukuthi izinhlelo zokuphatha kanye nezinqumo zezimali zilolonga kanjani ikhono lamadolobha lokulawula ubungozi besimo sezulu nokwakha ukuqina.



Ukukhula Kwamadolobha, Ubungozi Bokushisa, Nezinselele Zokuphatha eFreetown

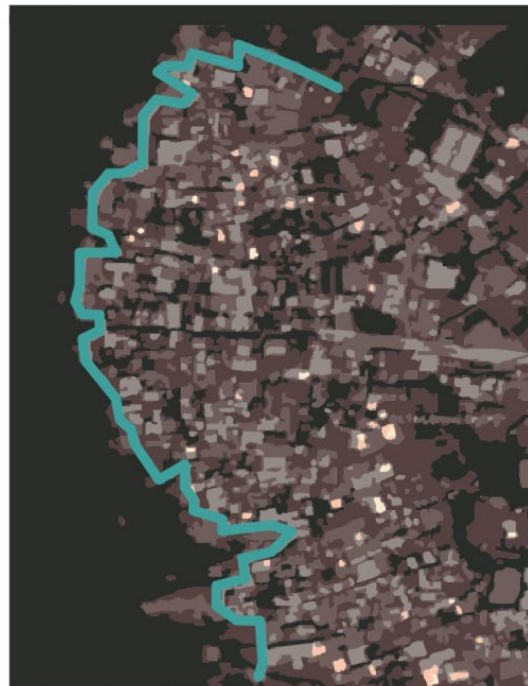
IFreetown, inhlokodolobha yaseSierra Leone, ibhekane nokukhula okusheshayo kwabantu, yanda cishe izikhathi ezingamashumi amahlanu ezizukulwaneni ezimbili ezedlule. Njengoba idolobha likhulile, izindawo ezinkulu zamahlathi zishintshwe intuthuko yasemadolobheni. Lokhu kulahleka kwezembozo zezihlahla kuqinise ubungozi besimo sezulu, ikakhulukazi ukushisa okukhulu, okube nomthelela ezifweni ezihlobene nokushisa, ukwanda kokufa, kanye nokulahleka kokukhiqiza.

Ukusabela kweFreetown — **i-Heat Action Plan** — kukhombisa ukuthi ukusebenzisana phakathi kwamazinga ahlukene okuphatha kuyisinyathelo esibalulekile sokwenza amadolobha aqine kakhulu ekuguqukeni kwesimo sezulu.

Thompson Bay Informal Settlement



May 2015



June 2022

Umfanekiso 18. Ukuthuthukiswa kwezindawo zokuhlala ezingahlelekile eThompson Bay, (C) Eugenia Kargbo.

I-Heat Action Plan: Ukuxhumanisa Ukuphatha Ukuze Kube Nokuqina Kwasemadolobheni

Ukuphendula ekwandeni kobungozi bokushisa, iDolobha laseFreetown lakha [i-Heat Action Plan](#), ekhombisa ukuthi ukusebenzisana phakathi kwamazinga okuphatha kubalulekile ekwakheni ukuqina kwasemadolobheni. Lolu hlelo lugxile ezinhlosweni ezintathu eziyinhloko:



- Ukubandakanya abantu baseFreetown ukuze kukhuliswe ukuqwashisa ngobungozi bokushisa nezixazululo ezingaba khona, kuyilapho kuxhunyaniswa abalingani nama-ejensi amaningi edolobha ukuze basebenze ndawonye ngempumelelo.
- Ukwakha izinyathelo zokuzivumelanisa nokushisa ezilinganayo nezisimeme, kugxilwe kakhulu ekuvikeleni amaqembu asengozini enkulu kuyilapho kuqiniswa ukuqina kwasemadolobheni kwesikhathi eside.
- Ukuhlanganisa izimali nobambiswano ukuze kuqinisekiswa ukuthi izinhlelo zokuphatha ziguqulwa zibe yizenzo ezisebenzayo phansi emphakathini.



Le ndlela ikhombisa ukuthi ukuphatha akukhona nje ukubeka izinqubomgomo, kodwa futhi kumayelana nokuhlanganisa izikhungo, izinsiza, kanye nababambiqhaza ukuze kuqaliswe lezo zinqubomgomo.

Isibonelo Sokuphatha Nezimali Ezisebenza Empeleni: #FreetownTheTreeTown

Esinye isinyathelo esibonakalayo esisekela isu elibanzi laseFreetown lokubhekana nokushisa nesimo sezulu yi-[#FreetownTheTreeTown](#). Lolu hlelo luhlose ukutshala, ukukhulisa, nokulandelela ngedijithali izihlahla eziyizigidi ezinhlanu kanye nokubuyisela amahlektha omhlaba angu-5,000 ngo-2030. Le mizamo inikela ekubambeni cishe amathani angu-100,000 e-carbon dioxide, kuyilapho iphinde inciphise ubungozi bemvelo njengokushisa okukhulu, izikhukhula, kanye nokudilika kwenhlabathi.

Lolu hlelo lulandela indlela esekelwe kudatha yokubuyisela izihlahla emadolobheni. Ngokulandelela izihlahla, ukuqinisekisa, ukusebenzisa amathokheni edijithali, kanye nokutshalwa kwezimali okunomthelela, lolu hlelo luqinisekisa ukuthi isihlahla ngasinye esitshalwayo sinikela ngendlela elinganisekayo ekuqineni kwesimo sezulu. Impumelelo yalo incike kunethiwekhi eqinile yabalingani nabaxhasi bezimali, okugqamisa ukubaluleka kokuxhumanisa, uxhaso lwezimali olusha, kanye nesibopho esabiwe ekuphatheni isimo sezulu sasemadolobheni.

Ake Sikhulume Ngesikhathi: Umjikelezo Wokulawulwa Kobungozi Bezinhlekelele

Ukulawulwa kobungozi bezinhlekelele akukhona kuphela ngalokho okwenzeka ngesikhathi senhlekelele. Kuhlangukisa nalokho amadolobha akwenzayo ngaphambi kokuba izinhlekelele zenzeke nangemva kokuba imiphumela isenzekile, kusetshenziswa izifundo ezifundiwe ukuze kuncishiswe ubungozi besikhathi esizayo.



Lesi sikhathi sibonakala emjikelezweni wokulawulwa kobungozi bezinhlekelele, oxhumanisa:

Ukulungela: izenzo ezenziwa ngaphambi kwenhlekelele ukuze kulungiselelwe ukuphatha inkinga engase ivele. Ezingozini ezilindelekile, lokhu kuvame ukuba yindawo eyinhloko yokuqala.

Ukusabela: izenzo ezisheshayo ezenziwa ngesikhathi senhlekelele nangokushesha ngemva kwayo ukuze kusindiswe izimpilo futhi kuncishiswe imiphumela ephuthumayo.

Ukuvimbela: izinyathelo eziklanyelwe ukunciphisa noma ukugwema imiphumela yezinhlekelele zesikhathi esizayo, ngokwehlisa ubungozi ngaphambi kokuba izingozi ziphenduke izinkinga ezinkulu.



Umfanekiso 19. Umjikelezo wokulawulwa kobungozi

Ukululama: imizamo yokubuyisela izinsizakalo, izindlela zokuziphilisa, kanye nemisebenzi ejwayelekile ngemva kwenhlekelele, kuyilapho kuqiniswa ukuqina kwesikhathi esizayo.

Ngokuhlanganyela, lezi zigaba zikhombisa ukuthi ukulawulwa kobungozi bezinhlekelele okusebenzayo kuyinqubo eqhubekayo, hhayi isenzo esenziwa kanye kuphela, nokuthi izinqumo ezenziwa ngaphambi kwezinhlekelele zibaluleke njengokusabela ngesikhathi esiphuthumayo.

UXHASO LWEZIMALI

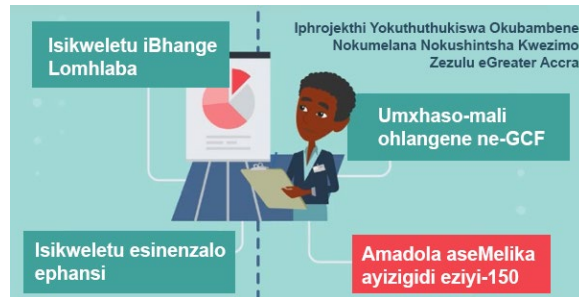
Ucwaningo Lwesibonelo: Ukuxhasa Ngezimali Ukuthuthukiswa Kwamadolobha Okusekelwe Ebungozini e-Accra, Ghana

Ukuchayeka kwe-Accra ezingozini zesimo sezulu kubunjwa ukukhula kwayo okusheshayo kwasemadolobheni kanye nendawo yayo esogwini. Njengoba idolobha landa, abantu abaningi baya ngokuya behlala ezindaweni eziphansi nezingenawo amasu ahlelekile eduze nogu nasezindaweni zezikhukhula. Ukuguguleka kogu, izikhukhula, kanye nokungabi bikho kwenhlanzeko eyanele kusongela amakhaya, izindlela zokuziphilisa, kanye nezinsizakalo eziyisisekelo, ikakhulukazi emiphakathini engenayo imali eningi enezinsiza ezimbalwa zokubhekana nalezi zingozi.

Ukuze kubhekwanalezi zinselele, idolobha lisebenzisa uhlelo lwe-**Greater Accra Resilient and Integrated Development (GARID) Project**, oluhlanganisa ukuthuthukiswa kwengqalasizinda nokwenza ngcono izinsizakalo zasemadolobheni.

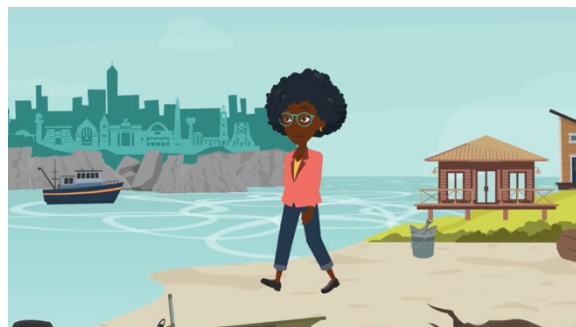
Izenzo ezibalulekile zihlanganisa ukwandisa umthamo womgudu wokuhambisa amanzi i-**Odaw drainage channel**, ukuthuthukisa ukubanjwa kwamanzi ezikhukhula ezindaweni ezingenhla, ukwethula uhlelo lokubikezela izikhukhula, kanye nokuqinisa ukuqoqwa kwemfucuza eqinile ezindaweni ezingahlinzekwa kahle ukuze

kuncishiswe ubungozi bezempilo nenhlanzeko obuhlobene nezikhukhula. Ngokuhlanganyela, lezi zinyathelo zihlose ukuthuthukisa izimo zokuphila zasemadolobheni kuyilapho kuncishiswa ubuthakathaka ezingozini zesimo sezulu.



Umfanekiso 20. Ukuchayeka kogu e-Accra, lapho ukukhula kwamadolobha nokuguguleka kogu kwandisa khona ubungozi besimo sezulu emiphakathini..

Uxhaso lwezimali ludlala indima ebalulekile ekwenzeni lezi zinhlelo zokungenelela zenzeke. Iphrojekthi ye-GARID isekelwa ngendlela yokuxhasa ngemithombo ehlanganisiwe, okuhlanganisa imali ebolekiwe evela ku-**World Bank**, uxhaso oluyisibonelelo oluvela ku-**Green Climate Fund (GCF)**, kanye nengxenywe yemali ebolekiwe enezimo ezivumayo. Le nhlanganisela yamathuluzi ezimali ivumela idolobha ukuthi litshale imali ngezinga elikhulu kuyilapho ligcina izindleko zesikhathi eside zilawuleka.



Umfanekiso 21. Isakhiwo sokuxhaswa ngezimali esixubile sephrojekthi ye-GARID.

Okuhlangenwe nakho kwe-Accra kukhombisa ukuthi ukuqina kwasemadolobheni okusebenzayo kuncike ezikhungweni eziqinile, ukuhlela okuhlelekile, kanye nokufinyelela kuxhaso lwezimali oluzinzile. Lapho iziphathimandla zendawo, imiphakathi, kanye nabalingani bamazwe ngamazwe besebenza ndawonye, ukuqina kwesimo sezulu kuba yingxenywe yendlela idolobha elikhula ngayo—kusiza ukuqinisekisa ukuthi intuthuko ivikela abantu kunokuba ibabeke engcupheni enkulu.



Ukuxhasa Ngezimali Ukuthuthukiswa Kwamadolobha Okusekelwe Ebungozini

Njengoba sibonile ezibonelweni, uxhaso lwezimali oluqinile noluhluhlukenene lubalulekile ekulawuleni ubungozi besimo sezulu nasekuguquleni izinhlelo zibe yizenzo. Amadolobha akuvamile ukuthi athembele emthonjeni owodwa kuphela woxhaso; kunalokho, ahlanganisa amathuluzi ezezimali ahlukahlukene ukuze asekele ukulungela, ukuvimbela, ukusabela, kanye nokululama.

Ukulawulwa kobungozi basemadolobheni kungaxhaswa ngemithombo eminingana eyinhloko:

- **Izimali zomphakathi:** lokhu kuhlenganisa izimali zikazwelonke zosizo lwezinhlekelele nezemvelo, kanye namathuluzi afana nama-**green bonds**, asiza ukuqondisa izinsiza zomphakathi ekutshalweni kwezimali okuqinisa ukumelana nesimo sezulu.
- **Izabelomali zomasipala:** amadolobha angaba izimali zawo—njengentela, izimali ezikhokhwayo, kanye nezinkokhelo zezinsizakalo—ukuze axhase izinyathelo zendawo zokunciphisa ubungozi kanye namaphrojekthi okuqinisa ukuqina.
- **Eminy eimithombo:** ukwesekwa kwamazwe ngamazwe kudlala indima ebalulekile, okuhlenganisa izibonelelo, izimali ezibolekiwe ezinezimo ezivumayo, kanye noxhaso oluvela kubasizi abanikelayo olunikezwa amabhange entuthuko nezinhlangano zosizo lwabantu.
- **Ukutshalwa kwezimali kwangasese kanye noxhaso lwezimali oluxubile:** ukunciphisa ubungozi kungasekelwa futhi ngamabhizinisi endawo, abatshalizimali, kanye nobambiswano phakathi kukahulumeni nezinkampani ezizimele, ngokuvamile kuhlenganiswa izinsiza zomphakathi nezangasese ukuze kwabelwane ngobungozi futhi kuhlenganiswe ukutshalwa kwezimali okukhulu.



Ngokuhlanganyela, le mithombo yoxhaso lwezimali yenza amadolobha akwazi ukusuka ekuqwashiseni ngobungozi aye ezenzweni ezibonakalayo, kuqinisekiswa ukuthi izinyathelo zokuqina azihlelwa kuphela kodwa zixhaswa ngendlela esimeme.





Ukutshala Izinsiza Zedolobha Ekunciphiseni Ubungozi Bezinhlekelele

Uma uxhaso selutholakele, inselele elandelayo ukuthi amadolobha azitshala kanjani izinsiza zawo ukuze anciphise ubungozi futhi avikele abantu ezinhlekeleleni. Ukutshalwa kwezimali okusebenzayo kugxila kokubili ezidingweni eziphuthumayo nasekuqineni kwesikhathi eside, kuqinisekiswa ukuthi izinsiza zifinyelela lapho zidingeka kakhulu.

Ukuhlonza ubuthakathaka kuyisinyathelo sokuqala. Ukuqonda lapho ubungozi bukhulu khona kusiza amadolobha ukuthi aqondise izimali ngobuhlakani. Lokhu kudinga ukuhlaziywa okusekelwe kudatha okuhlanganiswe nokubandakanya umphakathi ukuze kubanjwe imibono ehlukene futhi kugwenywe ukushiya amaqembu asengozini ngemva.

Ukuqinisa ingqalasizinda eyisisekelo kubalulekile ukuze kuvikelwe izimpahla ezibalulekile zedolobha ezifana nemigwaqo, izibhedlela, kanye nezikole. Ukutshala imali engqalasizindeni eqinile nehlakaniphile kusiza amadolobha ukumelana nezinhlekelele nokululama ngokushesha ngemva kwezimo eziphuthumayo.

Ukwakha amandla omphakathi kudlala indima ebalulekile kuzo zonke izigaba zokulawulwa kobungozi bezinhlekelele. Ukuqina kuyakhula lapho imiphakathi inikwa amandla, amanethiwekhi endawo esekelwa, futhi omakhelwane bekwazi ukuncika komunye nomunye ngaphambi, ngesikhathi, nangemva kwezinhlekelele.

Ukuxhumanisa izimo eziphuthumayo kuqinisekisa ukuthi lapho izinhlekelele zenzeka, izimpendulo ziyashesha futhi ziyasebenza. Amaqembu alungiselelwe, izibopho ezicacile, kanye nezindlela eziqinile zokuxhumanisa kuyizihluthulelo zokusindisa izimpilo nokunciphisa imiphumela.

Ukululama okusheshayo nokwesekwa komphakathi kusiza imindeni nemiphakathi ukuthi yakhe kabusha ngokushesha ngemva kwezinhlekelele. Ukwesekwa ngesikhathi esifanele kuqinisa ukubumbana komphakathi futhi kunciphisa imiphumela yesikhathi eside.

Ekugcineni, ukwakha amandla esikhathi eside ngokubambisana phakathi kwabaholi bedolobha, amabhizinisi, kanye nemiphakathi kudala ukuqina okuhlala njalo futhi kulungiselela amadolobha ukubhekana nezinsalela zesikhathi esizayo.





Amaphuzu Abalulekile: Ukuphatha Noxhaso Lwezimali Lokuthuthukiswa Kwamadolobha Okusekelwe Ebungozini

Ukuqina kwasemadolobheni akuncikile kuphela ekuqondeni ubungozi, kodwa futhi kuncike endleleni amadolobha ahlela ngayo izinqumo, axhumanisa ngayo ababambiqhaza, futhi aqoqa ngayo izinsiza ukuze asebenze ngalezo zingozi. Ukuphatha noxhaso lwezimali kulolonga ukuthi obani abavikelwayo, ukuthi izenzo zithathwa nini, nokuthi izimpendulo zingasebenza kangakanani ngokuhamba kwesikhathi.

Amaphuzu abalulekile avela kule module ahlanganisa:

- Edolobheni ngalinye, amaqembu amaningi ahlukene asiza ukwenza izinqumo zokugcina abantu bephephile. Wonke umbambiqhaza unendima — ukulawula ubungozi kudinga wonke umuntu.
- Ukuphatha ubungozi basemadolobheni okubandakanyayo kubaluleke kakhulu ukuze kucatshangelwe izintshisekelo, ukukhathazeka, kanye nezidingo zabo bonke ababambiqhaza kanye nabantu abasedolobheni.
- Iqembu ngalinye libhekana nobungozi ngendlela ehlukile, ngakho ukulalela wonke amazwi kusiza ukudala izixazululo ezingcono nezilungile.
- Umjikelezo wokulawulwa kobungozi bezinhlekelele uhlanganisa ukuvimbela, ukulungela, ukusabela, kanye nokululama.
- Uxhaso lwezimali oluqinile luyisihluthulelo sokulawula ubungozi besimo sezulu. Amadolobha adinga izabelomali ezicacile nezimali ezifinyeleleka kalula ukuze alungiselele izinhlekelele, aphenandle ngempumelelo, futhi alulame.



Module 4 – Ukuvimbela Nokulungela

Inhloso Yale Module

Le module igxile ekuvimbeleni nasekulungeleni njengezingxenye ezibalulekile zokulawulwa kobungozi bezinhlekelele emadolobheni. Ihlola ukuthi amadolobha angazilindela kanjani izingozi, anciphise imithelela ngaphambi kokuba izinhlekelele zenzeke, futhi aqinise ikhono lawo lokuphendula ngezinhlelo zokuxwayisa kusenesikhathi. Le module igqamisa ukuthi kungani ulwazi olufika ngesikhathi, ukuxhumana okucacile, kanye nezinhlelo ezibandakanyayo kubalulekile ekuvikeleni izimpilo nezindlela zokuziphilisa—ikakhulukazi ezimeni zasemadolobheni ezikhula ngokushesha.

Kungani Ukuvimbela Nokulungela Kubalulekile

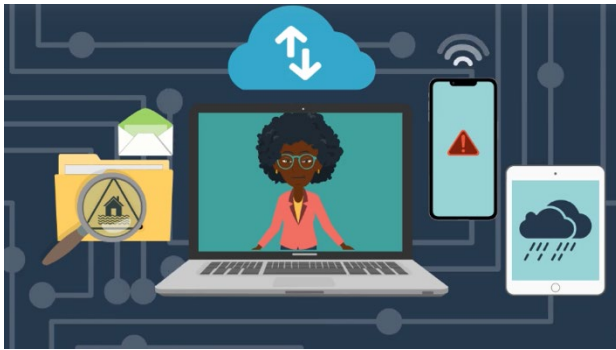
Amadolobha abhekana nezingozi ezihlukene kakhulu, ezibunjwa yindawo akuyo, ingqalasizinda, kanye namaphethini entuthuko. ECairo, isibonelo, uMfula iNile ungumthombo obalulekile wamanzi nokuphila kwezigidi zabantu—kodwa ungaphinde ube umthombo wobungozi lapho ikhwalithi yamanzi iba yimbi noma ukungcola kwanda.



Umfanekiso 22. Imiphakathi yasemadolobheni eseduze noMfula iNayile ibhekana nokuchayeka kwansuku zonke

ECairo, akuyona yonke imiphakathi ethola ulwazi olufanayo noma izinga elifanayo lokuvikelwa. Nakuba ukungcola kungase kuqashwe eduze kwamahhotela noma ezindaweni ezinenani eliphezulu, izakhamuzi ezisezindaweni ezingahlelekile noma ezingahlinzekwa kahle zivame ukuthembela ezimpawini ezibonakalayo—njengokushintsha kombala noma iphunga—njengendlela yazo kuphela yesixwayiso. Lokhu kukhombisa ukuthi ubungozi abuphathelene nengozi uqobo kuphela, kodwa futhi buphathelene nokuthi ubani othola ulwazi, nini, futhi ngaziphi iziteshi.

Ukuvimbela nokulungela kuhlose ukubhekana nalesi sikhala. Ngokuhlonza izingozi kusenesikhathi, ukuqapha izinkomba ezibalulekile, nokuqinisekisa ukuthi ulwazi lufinyelele kuwo wonke umuntu ngesikhathi, amadolobha anganciphisa umonakalo ngaphambi kokuba izinhlekelele zande. Lokhu akusebenzi kuphela ezikhukhuleni naseziphephweni, kodwa futhi nasezingozini ezingabonakali kalula njengokungcoliswa kwamanzi, amagagasi okushisa, noma amazinga aphansi amanzi.



Umfanekiso 23. Izinhlalo zokuxwayisa kusenesikhathi zisiza ukuqapha ubungozi nokwabelana ngolwazi ngesikhathi.

Ekupheleni kwale module, uzoba nokuqonda okucacile kokuthi ziyini izinhlelo zokuxwayisa kusenesikhathi nokuthi zisebenza kanjani, izinhlobo zobungozi basemadolobheni eziklanyelwe ukubhekana nazo, kanye nezidingo ezibalulekile zokumisa izinhlelo zokuxwayisa kusenesikhathi ezisebenzayo esimweni sedolobha lendawo. Lolu lwazi luzokusiza ubone

ukuthi ulwazi olufika ngesikhathi nokulungela kunganciphisa kanjani ubungozi futhi kuvikele abantu basemadolobheni ngaphambi kokuba izingozi ziphenduke izinhlekelele.

Izinhlalo Zokuxwayisa Kusenesikhathi Emadolobheni Nasezindaweni Zasemadolobheni

Uhlelo lokuxwayisa kusenesikhathi (**Early Warning System – EWS**) lusiza abantu, imiphakathi, kanye neziphathimandla zendawo ukuthi basabele ngokushesha lapho ingozi iseduze. Nakuba zivame ukuhlotshaniswa neziphepho noma izikhukhula, izinhlelo zokuxwayisa kusenesikhathi zibalulekile futhi kumagagasi okushisa, isomiso, ukungcola, noma amazinga aphansi amanzi. Ngokuhlanganisa idatha yokuqapha, ulwazi lobungozi, kanye nokuxhumana okucacile, ama-EWS ahlose ukuqinisekisa ukuthi izixwayiso zifika kubantu ngesikhathi ukuze bathathe isinyathelo.

Izinhlalo zokuxwayisa kusenesikhathi zibaluleke kakhulu emadolobheni, lapho ubungozi bungakhula ngokushesha futhi imithelela isatshalaliswe ngokungalingani. Isenzo sesikhathi esifushane sisindisa izimpilo: izixwayiso ezifika ngesikhathi zivumela izimpendulo ezisheshayo nezisindisa ukuphila ezikhathini ezibucayi ngaphambi kokuba inhlekelele yenzeke. Ngesikhathi esifanayo, ama-EWS afaka isandla ekuqineni kwesikhathi eside ngokusekela ukuzivumelanisa nokuguquka kwesimo sezulu, esiza amadolobha ukuthi alungise izindlela zawo zokusebenza futhi anciphise ubuthakathaka ezingozini ezivela kaningi.

Izinhlalo zokuxwayisa kusenesikhathi nazo zidlala indima ebalulekile ekunikeni imiphakathi amandla ngolwazi. Izibikezelo zesimo sezulu nesimo sezulu ezinembe, uma zixhunywa ngokucacile, zisiza abantu baqonde ubungozi obuguqukayo futhi benze izinqumo ezinolwazi—kokubili ekuphenduleni ngokushesha nasezinhlelweni zesikhathi eside zokubhekana nezimo. Lokhu kubaluleke kakhulu ezindaweni zasemadolobheni lapho kungesiyo yonke imiphakathi ethola izinga elifanayo lolwazi noma lokuvikelwa.



Ngokuvamile, izinhlelo zokuxwayisa kusenesikhathi ezisebenzayo azincikile kuphela kubuchwepheshe, kodwa futhi zincike ekuxhumaneni okubandakanyayo, ukwethembana, kanye nekhono lokufinyelela kuwo wonke amaqembu ngaphakathi kwedolobha. Lapho izixwayiso zihamba ngokushesha kunomonakalo, amadolobha alungela kangcono ukuvimbela izinhlekelele ukuthi zingaphenduki izinkinga ezinkulu.

Izinsika Ezine Zohlelo Lokuxwayisa Kusenesikhathi

Uhlelo lokuxwayisa kusenesikhathi oluqinile lwakhiwa ngezinsika ezine ezixhumene, zonke ezibaluleke ngokulinganayo ekunciphiseni imithelela yezehlalo, yezomnotho, kanye neyemvelo yezehlakalo ezimbi kakhulu. Uma insika eyodwa ibuthakathaka noma ingekho, izixwayiso zingase zingaholeli esenzweni esifika ngesikhathi noma esisebenzayo.



1. Ukuqapha Izingozi, Ukuzithola, Nokuzibikezela

Izinhlelo zokuxwayisa kusenesikhathi zithembele kumathuluzi nobuchwepheshe obuthembekile ukuqapha izingozi eziningi, ukuthola izimpawu zokuqala, nokubikezela imithelela engase ibe khona. Ukuqapha nokuhlaziya okuqhubekayo kwenza kube nokwenzeka ukulindela ukuthi yini engase yenzeke, kuvumele imiphakathi neziphathimandla ukuthi zithathe isinyathelo ngaphambi kokuba kube sekwephuzile.

2. Ulwazi Lobungozi

Ukuxwayisa kusenesikhathi okusebenzayo kudinga ukuqonda okucacile kokuthi ubani nokuthi yini echayekile, ebuthakathaka, futhi esengozini. Lokhu kuhlenganisa ukwenza amamephu nokuhlola ubungozi bezinhlekelele ukuze kuhlonzwe izingozi umphakathi obhekene nazo, ukuthi yimaphi amaqembu asengozini enkulu, nokuthi yiziphi izinsiza ezikhona zokuphendula. Ulwazi oluqinile lobungozi luqinisekisa ukuthi izixwayiso zifanele futhi ziqondiswe kahle.

3. Ukusabalalisa Nokuxhumana Ngezixwayiso

Izixwayiso nolwazi lobungozi kufanele kufinyelele ngokushesha kuwo wonke umuntu odinga ukuthatha isinyathelo, okuhlenganisa abantu abahlala ezindaweni ezikude noma ezisengozini. Lokhu kudinga imiyalezo ecacile nengaguquki, kanye nokuxhumana okuqinile phakathi kwezikhungo, ukuze ulwazi luthembeke, luqondwe, futhi kusetshenzwe ngalo.



4. Ukulungela Nekhono Lokuphendula

Izixwayiso zisindisa izimpilo kuphela uma ziholela esenzweni. Ukulungela namandla okuphendula kuqinisekisa ukuthi abantu nezikhungo bayazi ukuthi kufanele basabele kanjani ngokushesha nangempumelelo lapho kukhishwa isixwayiso. Lokhu kuhlenganisa ukuqeqeshwa okuvamile, izivivinyo, kanye nemfundo ukuze ulwazi luguqulwe lube yimpendulo efika ngesikhathi futhi ehlelekile.

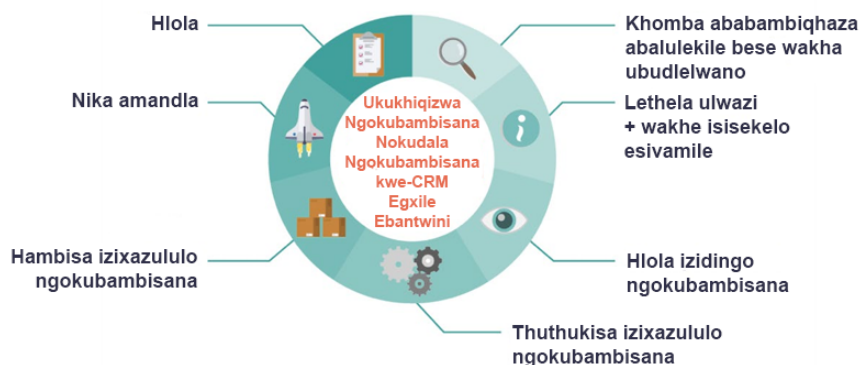
Ubuchwepheshe Bezinhlelo Zokuxwayisa Kusenesikhathi

Izinhlalo zokuxwayisa kusenesikhathi zithembele kubuchwepheshe obuhlukahlukene ukuze zithole izingozi kusenesikhathi, ziqaphe izinguquko, futhi zidlulise izexwayiso ngesikhathi ukuze abantu neziphathimandla bathathe isinyathelo.

- **Iziteshi zesimo sezulu** ziqapha izimo zomkhathi ukuze zithole futhi zilindele izehlakalo zesimo sezulu ezimbi kakhulu ngaphambi kokuba iziphepho zenzeke.
- **Izinhlalo zokuxwayisa kusenesikhathi nge-tsunami** zikala amagagasi omsindo namazinga amanzi zisebenzisa ama-hydrophones ukuze zithole ukunyakaza kolwandle okungajwayelekile.
- **Imishini yokuqapha ukuzamazama komhlaba** ithola amagagasi amancane okushaqeka angakhombisa ukuqala kokuzamazama komhlaba.
- **Imibhoshongo yezokuxhumana nama-antenna** kudlulisa idatha nezixwayiso kusuka ezinzwaneni kuya kuziphathimandla nasemiphakathini, kuqinisekisa ukuthi izexwayiso zifinyelela kubantu ngokushesha.



Ngokuhlanganyela, lobu buchwepheshe busekela izixwayiso ezifika ngesikhathi futhi busiza ukuguqula ulwazi lobungozi lube isenzo sangaphambi kwesikhathi.



Umfanekiso 24. Umdwebo wezinto ezakha ukubambisana komphakathi.



Ukunquma Ubungozi Bezinsensa Zokuxwayisa Kusenesikhathi

Ukuhlola ubungozi kusiza amadolobha anqume ukuthi yiziphi izingozi ezidinga izinhlelo zokuxwayisa kusenesikhathi nokuthi izinsensa kufanele zibekwe kuphi. Ngokukuqonda kokubili amathuba okuthi isehlakalo senzeke kanye nomthelela ongase ube nawo, amadolobha angabeka ubungozi ngokubaluleka futhi abele izinsiza ngempumelelo enkulu.

Idolobha ngalinye kufanele lichaze imingcele yobungozi ecacile ukuze kunqunywe ukuthi izexwayiso ziqaliswa nini nokuthi isimo sithathwa nini njengenhlekelele. Lokhu kubaluleke kakhulu ngoba ngisho nezehlakalo ezincane noma zesikhathi esifushane, uma zenzeka kaningi, zingaba nomthelela omkhulu oqongelelekayo ngokuhamba kwesikhathi.

Ithuluzi elivamile lokusekela le nqubo i-**likelihood–impact matrix**, esiza ukuqondisa izinqumo zokuthi izixwayiso zikhishwe nini, izimpendulo zihlelwe nini, futhi imizamo yokulungela igxilwe kuphi—ikakhulukazi ezingozini ezivamile futhi ezingaba zimbi kakhulu.

Khumbula: imingcele yobungozi incike kakhulu esimweni sendawo. Isibonelo, isexwayiso segagasi lokushisa singase siqaliswe ku-30°C kwelinye idolobha, kanti kwelinye idolobha elinesimo sezulu esihlukile singase sisebenze ku-25°C. Okubalulekile ukuthi izimo zendawo, ukuchayeka, kanye nobuthakathaka kubumba kanjani ubungozi.

Ukuthenjeka	Phezulu				
	Okulinganiselayo				
	Phansi				
	Okungabalulekile				
		Okungabalulekile	Okuncane	Okulinganiselayo	Okukhulu
Umthelela					

Umfanekiso 25. I-matrix yokunquma ubungozi, ngokwe-WHO, (C) EC-OIE.



Ucwaningo Lwesibonelo: Ukuxwayisa Kusenesikhathi Ngokungcoliswa Kwamanzi eCairo, Egypt

UMfula iNile udlula enhliziyweni yeCairo futhi ubalulekile empilweni yansuku zonke yezigidi zabantu. Ngesikhathi esifanayo, uthwala imfucuza evela emapulazini, ezimbonini, nasemakhaya, okudala ubungozi obukhulu kodwa obuvame ukungabonakali emiphakathini ehlala osebeni lwawo. Kubahlali abaningi, ukungcola kuba sobala kuphela lapho amanzi eshintsha umbala noma iphunga—okuvame ukuba sekwephuzile ukuvimbela umonakalo.



Umfanekiso 26. Ukuqapha ubungozi bokungcoliswa kwamanzi eduze noMfula iNayile eCairo yasemadolobheni.

luqalisa ngokuzenzakalelayo izexwayiso esikhungweni sokulawula imvelo, luvumele iziphathimandla ukuthi zithole ukungcola kusenesikhathi kunokuthembela ezimpawini ezibonakalayo kuphela.

Uma isexwayiso sesikhiqiziwe, idatha yezinsensa iqhathaniswa namasampula aselebhu ukuze kuqinisekise ukungcoliseka. Uma ukungcola kuqinisekisiwe, izixwayiso zithunyelwa emikhandlwini yendawo, eziphathimandleni zezempilo, nasezinkampanini zamanzi, kuvumela isenzo esisheshayo. Laba babambiqhaza bangavala izindawo zokungenisa amanzi ezithintekile, bakhiphe izeluleko zezempilo zomphakathi, noma banqande ukusetshenziswa kwamanzi ukuze kuncishiswe ukuchayeka futhi kuvinjelwe eminye imithelela.

Ukuqinisekisa ukuthi izixwayiso zifinyelela kuwo wonke umuntu kuyingxenye ebalulekile yohlelo. Ngaphezu kwezexwayiso zedijithali, idolobha lisebenzisana nemikhandlu yendawo, ama-mosque, umsakazo, kanye nezimemezelo ngezipikha ukuze lixhumane ngobungozi nemiphakathi enokufinyelela



Umfanekiso 27. Kusukela ekuqapheni kuya esenzweni: inqubo yokuxwayisa kusenesikhathi ngokungcoliswa kwamanzi.

okulinganiselwe ku-inthanethi noma ekusebenziseni ama-smartphone. Inhloso icacile: akekho okufanele aphuze, ageze, noma asebenzise amanzi angaphephile ngenxa yokuthi akasitholanga isixwayiso.

ECairo, izinhlelo zokuxwayisa kusenesikhathi zidlula ukubikezela izikhukhula kuphela. Zidlala indima ebalulekile ekutholeni ubungozi bemvelo obufihlekile, zixhumanisa ukuqapha kwesayensi nezakhiwo zokuphatha kanye nesenzo somphakathi, futhi ziqinisekisa ukuthi ulwazi olufika ngesikhathi—hhayi izingozi—luqondisa indlela abantu abaphila ngayo nomfula wabo.



Umfanekiso 28. Amalungu omphakathi eqoqa, ehumusha, futhi abelana ngolwazi lwesimo sezulu.

Ukuhlaziywa Kwezinhlelo Ukuze Kusetshenziswe Izinhlelo Zokuxwayisa Kusenesikhathi

Izinhlelo zokuxwayisa kusenesikhathi ezisebenzayo zincike ekuphathweni okubandakanyayo kwedatha nokwenziwa kwezinqumo. Lokhu kusho ukuhlanganisa ukuxhumana okuqondile nokuvundile, kanye nokubamba iqhaza okuvela ezingeni lomphakathi, ukuze kuqinisekiswa ukuthi ulwazi luhamba kahle ukusuka ekuqapheni luye esenzweni.

Kuye ngohlobo lwengozi, idatha yokuxwayisa kusenesikhathi eqhutshwa endaweni kanye nokwenziwa kwezinqumo kungasekela izindima ezihlukahlukene nokusabalalisa okusheshayo, kusize izexwayiso zifinyelele emiphakathini ngezindlela ezifika ngesikhathi, ezithembekile, futhi ezingenziwa izenzo.

Ukuhlaziywa Kwezinhlelo Okugxile Kubantu Empeleni

Ukuhlaziywa kwezinhlelo kuba nempumelelo enkulu kakhulu lapho kubandakanya imiphakathi ngenkuthalo. Kuhlelo lwe-**Developing Risk Awareness through Joint Action (DARAJA)**, oluqaliswe emadolobheni afana neDar es Salam, abesifazane abasezindaweni ezingahlelekile babamba iqhaza ekuqoqeni ukufundwa kweziteshi zesimo sezulu futhi basebenze eduze nochwepheshe bezimo zezulu. Ulwazi luyaqinisekiswa bese lubuyiselwa emuva, luvumele imiphakathi ukuthi iqonde ubungozi bezikhukhula futhi ithathe isinyathelo kusenesikhathi.



Le ndlela ikhombisa ukuthi ukuhlaziywa kwezinhlelo okugxile kubantu kuqinisa izinhlelo zokuxwayisa kusenesikhathi ngokuxhumanisa ulwazi lwendawo, ubuchwepheshe bezobuchwepheshe, kanye nokuxhumana okucacile—kuqinisekisa ukuthi izixwayiso azikhiqizwa kuphela kodwa ziyaqondwa futhi ziyasetshenziswa.

Izindawo Ezibalulekile Zokutshalwa Kwezimali Ezinhlelweni Zokuxwayisa Kusenesikhathi Ezisebenzayo

Uhlelo lokutshalwa kwezimali lohlelo lokuxwayisa kusenesikhathi olusebenzayo (**Early Warning System – EWS**) lugxila ekuqiniseni izindawo eziningana ezibalulekile nezixhumene ezisebenza ndawonye ukuze zisindise izimpilo futhi zinciphise imithelela yezinhlekelele. Ukutshala imali kulezi zindawo—kanye nokulinganisa izindleko zazo—kusiza ukuqinisa ukuphathwa kobungozi basemadolobheni nokwakha ukuqina kwesikhathi eside.

Izindawo ezibalulekile zokutshalwa kwezimali zihlanganisa:

- **Ukuqinisa izikhungo nezinqubomgomo**, ukuze kuqinisekiswa izibopho ezicacile nokuxhumanisa.
- **Amanethiwekhi okuqapha**, okuhlanganisa ukuqapha kwesimo sezulu namanzi.
- **Ingqalasizinda ye-IT** yokusekela ukuqoqwa, ukugcinwa, nokucutshungulwa kwedatha.
- **Izikhungo zedatha ezihlanganisiwe** ezixhumanisa ulwazi phakathi kwama-ejensi.
- **Izinsizakalo zokubikezela nokumodela** ukuze kulindelwe izingozi nemithelela.
- **Ukuhlolwa kwezingozi nobungozi** ukuze kuhlonzwe okubalulekile nemingcele.
- **Ukubikezela okusekelwe emtheleleni** ukuze kuguqulwe idatha ibe izixwayiso ezingasetshenziswa.
- **Izinhlelo zokuxhumana ngobungozi nokusabalalisa** ukuze kufinyelelwe kubo bonke abantu.
- **Ukwakha amandla omphakathi** ukuze kusekelwe ukulungela kanye nesenzo sendawo.

Ingqalasizinda Yokuxwayisa Kusenesikhathi

Ingqalasizinda yokuxwayisa kusenesikhathi ithuthuka ngokuhamba kwesikhathi futhi idinga ukutshalwa kwezimali ngezigaba. Amadolobha angacabanga ngokuthuthukiswa kwe-EWS ngokwezinyathelo zesikhathi esifushane, ukutshalwa kwezimali kwesikhathi esifushane kuya kwesiphakathi, kanye nesimo sohlelo lwesikhathi esizayo.

Isikhathi esifushane





Esikhathini esifushane, amadolobha kufanele:

- Agcine ukuhlolwa kobungozi, ukuchayeka, nobuthakathaka kwedolobha lonke kuvuselelwe njalo, kanye nerejista yezindawo ezishisayo zobungozi.
- Aqinisekise ukuthi ingqalasizinda ye-GIS nokuzwa okukude iyatholakala ukuze isekele i-geodatabase.

Lezi zenzo zinikeza ulwazi oluyisisekelo oludingekayo ukunquma ukuthi izinsensa nezinhlelo zokuqapha zidingeka ngokuphuthumayo kuphi.

Izindawo Zokutshalwa Kwezimali Zesikhathi Esifushane Kuya Kwesiphakathi

Esikhathini esifushane kuya kwesiphakathi, amadolobha kufanele agxile ekuqiniseni ukuxhumanisa nezinhlelo zedatha ngokuthi:

- Kube ne-Task Force yedolobha noma yesifunda sedolobha ye-EWS engahlelekile, esiza ukuxhumanisa ukuqapha idatha yomhlaba phakathi kwama-ejensi futhi ifake uhlelo oluncane lokuqapha isimo sezulu namanzi.
- Kwakhiwe ingqalasizinda yedatha yendawo ezingeni le-ejensi ehlelelwe izingozi.
- Kuqinisekiswa ukuthi izabelomali ezincane zokulungisa iziteshi ze-hydrometeorological zifakwa ezabelweni zokusebenza kweminyango.
- Kucaciswe izibopho zezikhungo ekumiseni iziteshi zokuqapha nasekuqoqweni kwedatha.

Isimo Sesikhathi Esizayo Ngaphansi Kwesimo Sesikhathi Esifushane

Uma kubhekwa phambili, amadolobha angaqhubeka nokuqinisa ukusabalalisa nokufinyelela kwe-EWS ngokuthi:

- Atshale imali ezinhlelweni eziqoqwa emphakathini ezifana nomakhalekhukhwini nezinkundla zokuxhumana ukuze kube nenethiwekhi yokusabalalisa izinsizakalo ze-EWS.
- Abandakanye umkhakha wangasese ekusabalaliseni izixwayiso nasezinsizakalweni zokuxwayisa umphakathi.

Izinqubo Zokuxhumanisa Izimo Eziphuthumayo

Ukuxhumanisa izimo eziphuthumayo okusebenzayo kuncike ezakhiweni ezicacile, izibopho ezichaziwe, amandla okusebenza, kanye noxhaso lwezimali oluqinisekisiwe. Ngokuhlanganyela, lezi zinto ziqinisekisa ukuthi izixwayiso zingaguqulwa zibe isenzo esifika ngesikhathi nesixhumene ngesikhathi senhlekelele.

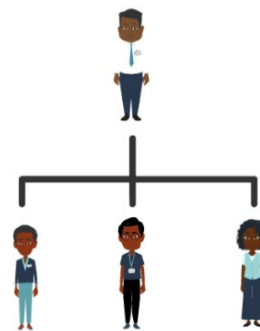




Isinyathelo sokuqala esibalulekile ukusungula isikhungo sokuxhumanisa izinhlekelele, esihlonjise ngamathuluzi adingekayo, ingqalasizinda, kanye nezinhlelo zokuxhumana. Ezimweni eziningi, lesi sikhungo sisebenza eceleni kwesikhungo sikazwelonke sokuxhumanisa, okwenza ukuxhumana okuqinile okuqondile kube kubalulekile ukuze kuqinisekise ukuthi ulwazi luhamba kahle phakathi kwamazinga kahulumeni.

Izakhiwo ezicacile zokuyala nobuholi nazo zibalulekile ngokulinganayo. Izibopho kufanele zinikezwe umholi oqokwe ngokusemthethweni wesikhungo sokuxhumanisa izimo eziphuthumayo, onegunya lokwenza izinqumo ezibucayi, okuhlanganisa ukumemezela ukuqala nokuphela kwempendulo yenhlekelele.

Amandla okusebenza phansi emphakathini nawo kufanele aqinisekise. Lapho kungenzeka khona, amayunithi okuphendula ezimweni eziphuthumayo ezingeni lendawo kufanele asungulwe futhi ahlonyiswe kahle. Lokhu kuhlanganisa ukuhlela imisebenzi yokutakula, imizila yokuphuma, kanye nemishini yezimo eziphuthumayo, lapho izinsizakalo ezifana nomnyango wezicishamlilo zidlala indima esemqoka emizamweni yokuphendula.



Ekugcineni, ukuxhumanisa izimo eziphuthumayo kudinga uxhaso lwezimali oluzinzile. Izabelomali zemisebenzi yokuxhumanisa izimo eziphuthumayo kufanele zihlanganiswe ngokuphelele esabelweni sonyaka sedolobha, kuqinisekise ukuthi

amandla okulungela nokuphendula awancikile kuxhaso lwezimali olungahleliwe noma olutholakala kuphela ngezikhathi eziphuthumayo.



Ukuthuthukiswa Kohlelo Lokuphendula Ezimweni Eziphuthumayo

Izinhlelo zokuxwayisa kusenesikhathi zisebenza kuphela uma imiphakathi nayo yazi ukuthi kufanele isabele kanjani uma kukhishwa isixwayiso—yiziphi izenzo okufanele zithathwe, kufanele iye kuphi, futhi ubani onesibopho. Uhlelo lokuphendula ezimweni eziphuthumayo lusiza ukuguqula izixwayiso zibe isenzo esifika ngesikhathi nesixhumene, lunciphise umonakalo nokudideka ngesikhathi sezinkinga.



Ukuze kwakhiwe lolu hlelo, amadolobha angacabanga ngezimo zesikhathi esifushane, zesikhathi esiphakathi, nezangesikhathi esizayo, ngayinye igxile ekuqiniseni kan cane kancane ukuxhumanisa, ukuxhumana, kanye namandla ezikhungo.

Isimo sesikhathi esifushane

- Sungula i-**Emergency Coordination Task Force**.
- Thuthukisa inethiwekhi yokusabalalisa ngomakhalekhukhwini yezinsizakalo ze-hydrometeorological.
- Bandakanya umkhakha wangasese ekusabalaliseni izixwayiso nasezinsizakalweni zokuxwayisa umphakathi.



Umfanekiso 29. Umjikelezo wokulawulwa kwezinhlekelele.

Isimo sesikhathi esiphakathi

- Thuthukisa inqubo yokumemezela izinhlekelele, indlela ezixhunyiwa ngayo, kanye neqembu lokuphendula.
- Yakha amandla omnyango ekuhlaziyeni nasekusabalaliseni idatha nolwazi kubasebenzisi babo bemikhakha efanele.
- Thuthukisa ikhono lokusabalalisa ngomsakazo, ithelevishini, nangomakhalekhukhwini.

Isimo sesikhathi esizayo

- Thuthukisa uhlelo lokuphendula olusekelwe emtheleleni oluvunyelwene ngalo nababambiqhaza kanye nomphakathi obanzi.
- Gcina futhi uthuthukise inkundla yabahlinzeki nabasebenzisi bezinsizakalo ze-hydrometeorological.
- Sebenzisana nama-ejensi entuthuko ukuthuthukisa ukuqwashisa komphakathi nezinto zokufinyelela emphakathini.
- Thuthukisa izinqubo nama-**Standard Operating Procedures (SOPs)** ngesikhathi sezimo eziphuthumayo.
- Hlela imikhankaso yokuxhumana nokuqeqeshwa kwabaholi bendawo.

Ukuziphatha, Ukuxhumana Nolwazi Ezinhlelweni Zokuxwayisa Kusenesikhathi

Izinhlelo zokuxwayisa kusenesikhathi ezisebenzayo azincikile kuphela kubuchwepheshe, kodwa futhi zincike endleleni abantu abamukela ngayo, ababelana



ngayo, futhi abenza ngayo ngolwazi. Ukuxhumana, ukuziphatha, nokuhamba kolwazi kunquma ukuthi izixwayiso ziyaqondwa yini futhi ziholeda yini esenzweni esifika ngesikhathi. **Crowdsourcing** kanye ne-**crowdsensing** amathuluzi ahambisanayo aqinisa izinhlelo zokuxwayisa kusenesikhathi ngokubandakanya umphakathi ngokuqondile ekuqapheni ubungozi, ekwabelaneni ngolwazi, nasekusekeleni ukwenziwa kwezinqumo:

- **Crowdsourcing** isebenzisa ukubamba iqhaza komphakathi ukusiza ukuxazulula izinkinga nokusekela izinqumo ngaphambi, ngesikhathi, nangemva kwesehlakalo. Izibonelo zihlanganisa ukubika imigwaqo evalekile, ukuhumusha ulwazi lwezindawo zokukhosela, ukwenza amamephu emizila ephephile, noma ukusiza ukubeka phambili izidingo zosizo.
- **Crowdsensing** isebenzisa idatha eqoqwe ngokungaqondile noma ngokuzenzakalelayo kancane kumadivayisi abantu nezinsensa ezilula—njenge-GPS, ama-accelerometers, noma izinzwa zekhwalthi yomoya noma yamanzi—ukukala izimo zesikhathi sangempela. Lokhu kungahlanganisa ukuthola amaphethini okuzamazama, ukujula kwezikhukhula, ukwanda okungazelelwe kwekhwalithi yomoya embi, noma izindawo ezishisa kakhulu, kusize iziphathimandla ziqalise izixwayiso kusenesikhathi nezimpendulo ngokushesha.

Ngokuhlanganyela, lezi zindlela zithuthukisa ukuxhumana, zandisa ukufinyelela kwedatha, futhi zisiza ukuqinisekisa ukuthi izinhlelo zokuxwayisa kusenesikhathi zigxile kubantu, ziyaphendula, futhi ziyabandakanya, ikakhulukazi ezindaweni zasemadolobheni eziguquka ngokushesha.

Ukuxhumana Ngobungozi

Ukuxhumana ngobungozi kubalulekile ukuze kuqinisekise ukuthi izixwayiso zicacile, kulula ukuziqonda, futhi zingaguqulwa zibe izenzo. Izinhlelo ezilula ezifana namarobhothi omgwaqo nama-siren zingasetshenziswa ukuxwayisa abantu ngokushesha.

Imiyalezo yobungozi ingaphinde ifakwe amakhodi ngemibala, isuke ebungozini obuphansi iye kobuphezulu, ukuze isize abantu babone kalula izinga lengozi futhi basabele ngendlela efanele.

Ingozi ephansi

Ingozi ephakathi

Ingozi ephezulu

Ingozi enkulu kakhulu





Ukusabalalisa, Ukuxhumana Nabahlinzeki Bezinsizakalo Zomakhalekhukhwini, i-SMS, Nezinkundla Zokuxhumana

Izinhlalo zokuxwayisa kusenesikhathi ezisebenzayo zincike eziteshini eziqinile zokusabalalisa eziqinisekisa ukuthi izixwayiso zifinyelela kubantu ngokushesha, ngokucacile, nangamapulatifomu asebevele bewasebenzisa. Ukuxhumanisa izinhlelo zokuxwayisa kusenesikhathi nabahlinzeki bezinsizakalo zomakhalekhukhwini, izinsizakalo ze-SMS, nezinkundla zokuxhumana kusiza ukuguqula ulwazi lobungozi lube imiyalezo efika ngesikhathi futhi engasetshenziswa ngamaqembu nezimo ezahlukene.

Isimo sesikhathi esifushane:

- Thuthukisa izinto zokuqwashisa nomkhankaso wokuthuthukisa ukuxhumana ngobungozi.
- Yakha inkundla yabahlinzeki nabasebenzisi bezinsizakalo ze-EWS.
- Thuthukisa izinqubo nama-**Standard Operating Procedures (SOPs)**.
- Bandakanya ababambiqhaza abafana namanyuvesi, izinhlangano zomphakathi (**CSOs**), iminyango kahulumeni, ama-NGO endawo, nezikole.

Izimo zesikhathi esiphakathi kuya kwesizayo:

- Thuthukisa uhlelo oluhlanganisiwe lokuphendula olusekelwe emtheleleni nababambiqhaza kanye nomphakathi obanzi, olunezindlela zokusabalalisa.
- Hlonza futhi ufake amakhodi ezindaweni eziphephile zokuphuma kanye nemihlahlandlela eya kulezo zindawo.

Ukuhlelela Isabelomali Sokutshalwa Kwezimali ku-EWS

Ukutshalwa kwezimali ezinhlelweni zokuxwayisa kusenesikhathi kuyehluka kakhulu ngezindleko, kuye ngohlobo lwengqalasizinda, ukuxhumanisa, kanye nobuchwepheshe obubandakanyekayo. Ezinye izingxenye zingaqaliswa ngezinsiza ezilinganiselwe, kuyilapho ezinye zidinga ukuzibophezela okukhulu kwezimali zesikhathi eside.



Ezingeni eliphansi lokutshalwa kwezimali kukhona izinsizakalo zokubikezela nokumodela, ezivame ukwakhela kudatha ekhona namandla ezobuchwepheshe ukuze kuthuthukiswe ukuhlaziywa kobungozi nokwenziwa kwezinqumo.





Izinga eliphakathi lokutshalwa kwezimali liyadingeka ekuqiniseni izikhungo nezinqubomgomo, ezikhungweni zedatha ezihlanganisiwe, ekuhloleni izingozi, ezinhlelweni zokubikezela ezisekelwe emthelweni, nasekuqiniseni amandla omphakathi, kanye nasezinhlelweni ze-IT nezinhlelo zokuxhumana ngobungozi nokusabalalisa. Lezi zinto zigxile ekuqiniseni ukuxhumanisa, ukuphathwa kwedatha, iziteshi zokuxhumana, kanye namandla abantu ukuze izixwayiso zibe ezithembekile, ziphathwe kahle, futhi zabelwane ngempumelelo nabantu.

Ezingeni eliphezulu kakhulu lokutshalwa kwezimali kukhona amanethiwekhi okuqapha, njengeziteshi ze-hydrometeorological, izinsensa, kanye nemishini yokuqapha.

Ukuqonda lawa mazinga ahlukene okutshalwa kwezimali kusiza amadolobha abeke phambili izenzo, ahlele ukutshalwa kwezimali ngokuhamba kwesikhathi, futhi aklame izinhlelo zokuxwayisa kusenesikhathi ezisebenzayo futhi ezingokoqobo ngokwezimali.

Amaphuzu Abalulekile: Ukuvimbela Nokulungela

Le module ihlanganisa imiqondo esemqoka yokuvimbela nokulungela, ikhombisa ukuthi izinhlelo zokuxwayisa kusenesikhathi zisiza kanjani amadolobha alindele ubungozi, axhumane ngokucacile, futhi athathe isinyathelo ngesikhathi. Amaphuzu angezansi afingqa ukuthi ama-EWS asebenza kanjani empeleni nokuthi kungani ebalulekile ekunciphiseni imithelela yezinhlekelele ezimeni zasemadolobheni.

- **Izinhlelo Zokuxwayisa Kusenesikhathi** zilandela izinyathelo ezine: ukuqapha, ulwazi lobungozi, isixwayiso, kanye nokuphendula.
- Zibhekana nezingozi eziningi, zisiza iCairo ukulawula kokubili ukwanda kokungcola kanye nesomiso/ukugeleza okuphansi kwamanzi okuhambisana nokushisa.
- Imingcele esekelwe emthelweni iguqula idatha yezinsensa ibe imiyalelo ecacile ethi “yenza lokhu manje”.
- Izexwayiso kufanele zisebenzise ulimi olulula, izithonjana, neziteshi eziningi ezifana ne-SMS, umsakazo, izipikha, kanye ne-WhatsApp.
- Izindima ezijwayezwe kusengaphambili kanye nezenzo zamahora amabili okuqala ziqinisekisa ukuthi izixwayiso ziguquka ngokushesha zibe isenzo sangempela.





Imodyuli 5: Ukuqina Kwamanzi Emadolobheni

Inhloso Yale Modyuli

Le modyuli yethula umqondo wokuqina kwamanzi emadolobheni futhi ichaze ukuthi kungani uya ngokuya ubaluleka ezimeni zasemadolobheni ase-Afrika njengoba ingcindezi yesimo sezulu, ukukhula okusheshayo kwamadolobha, kanye nesidingo esikhulayo kubeka umthwalo omkhulu ezinhlelweni zamanzi. Ihlola ukuthi ubungozi bamanzi bubunjwa kanjani ukusebenzisana phakathi kokuguquguquka kwesimo sezulu, ukuthuthukiswa kwamadolobha, ingqalasizinda, kanye nokutholakala kwezinsiza, futhi ihlola amasu amadolobha angawasebenzisa ukuqinisa ukuqina. Ekupheleni kwale modyuli, abafundi bazoqonda ukuthi izinhlelo zamanzi zisebenza kanjani ezindaweni zasemadolobheni, bazise ubungozi obuyinhloko obuzithintayo, futhi bathole ukuqonda okucacile kwezinqubo nezidingo ezihilelekile ekwakheni ukuqina kwamanzi emadolobheni ngezinyathelo ezingokoqobo.

Ubungozi Bamanzi Emadolobheni Ase-Afrika

Kuyo yonke i-Afrika, ukutholakala kwamanzi kuyehla ezifundeni eziningi, kuyilapho ubungozi obuhlobene namanzi buba bukhulu kakhulu. Amanye amadolobha abhekana nezikhukhula ezisheshayo eziyingozi noma ukunyuka kwezinga lolwandle, kuyilapho amanye kufanele abhekane nemvula encane kakhulu, isidingo esikhulayo, kanye nezinqolobane zamanzi ezibuthakathaka. Lezi zingcindezi zibonakala kakhulu ezindaweni zasemadolobheni ezomile, lapho amazinga aphantsi ezinqolobaneni zamanzi, imvula eguquguqukayo, kanye nokutholakala okulinganiselwe kwamanzi emvelo kubeka ingcindezi eqhubekayo ezinhlelweni zasemadolobheni.



Umfanekiso 30. Ukushoda kwamanzi nezinsalele zokuhlizekwa kwamanzi asemadolobheni eWindhoek.

Emadolobheni anokushoda kwamanzi njengeWindhoek, lezi zinselele ziyaqina ngenxa yokusebenzisana phakathi kwesimo sezulu nokukhula kwadolobha. Isomiso asithinti

ukunikezwa kwamanzi kuphela; siphinde sibe nemiphumela ebanzi ekuvikelekeni kokudla, ezindleleni zokuziphilisa, nasekuzinzeni komphakathi. Njengoba ukukhula kwabantu nokwanda komnotho kuqhubeka, isidingo samanzi singakhula ngokushesha kunokunikezwa kwawo. Maphakathi naleli khulu leminyaka, izidingo zamanzi emadolobheni anjalo kulindeleke ukuthi zikhule kakhulu, okukhombisa ukuthi





ukuthuthukiswa kwamadolobha kungakwandisa ngokushesha kanjani ukucindezeleka kwamanzi lapho izinyathelo zokuqina zingekho.

Ngakho-ke, ukuqina kwamanzi kudinga okungaphezu kokwandisa ukunikezwa kwamanzi kuphela. Kuncike endleleni amadolobha ahlela ngayo, aphatha ngayo, futhi avikela ngayo izinhlelo zawo zamanzi lapho ebhekene nokungaqiniseki. Ukuqonda ukuthi kwenzekani lapho imikhawulo yamanzi ihlangana nokukhula kwamadolobha kusiza ukucacisa ukuthi kungani izinhlelo zamanzi eziqinile zibalulekile emadolobheni aphephile futhi asimeme.

Ingcindezi Yamanzi Emadolobheni Ase-Afrika

Isidingo samanzi asemadolobheni e-Afrika kulindeleke ukuthi sikhule ngezanga eliphindwe kathathu kunesilinganiso somhlaba wonke, siqhutshwa ukukhula okusheshayo kwabantu, ukwenziwa kwezimboni, kanye nokukhuphuka kwamazinga okuphila. Ngesikhathi esifanayo, ingqalasizinda ehlinzeka amadolobha ase-Afrika isivele ingaphansi kwengcindezi enkulu. Izinkampani eziningi zamanzi kulo lonke izwekazi zibhekana nokushoda okuqhubekayo kwezinsizakalo, amazinga aphezulu amanzi angangenisi mali, kanye namandla alinganiselwe okuhlaza amanzi angcolile. Ngenxa yalokho, isidingo samanzi sikhula ngokushesha kakhulu kunezinhlelo eziklanyelwe ukuwahlinzeka.

Amanzi angangenisi mali abhekisela emanzini akhiqiziwe noma ampontshiwe kodwa alahleke ngaphambi kokuba afinyelele kumthengi, ngokuvamile ngenxa yokuvuza, ukuxhumeka okungekho emthethweni, noma amaphutha okulinganisa. Lokhu kulahleka kunciphisa kakhulu ukusebenza kahle kwezinhlelo zamanzi zasemadolobheni futhi kwandisa ingcindezi ezinsizeni zamanzi esezivele zilinganiselwe.

Uhlelo Olungaphansi Kwengcindezi

Kuyo yonke i-Sub-Saharan Africa, izinhlelo zamanzi sezivele zilwa ukuhlangabezana nezidingo zabantu basemadolobheni abakhula ngokushesha. Njengamanje, kuphela **amaphesenti angu-27** ezakhamuzi zasemadolobheni anokufinyelela ezinsizakalweni zamanzi okuphuza aphethwe ngokuphepha (WHO, 2021). Ngesikhathi esifanayo, izinkampani zamanzi zivame kulahlekelwa phakathi kwamaphesenti **angu-30 no-50** okunikezwa kwazo kwamanzi ngaphambi kokuba afinyelele kubathengi (African Development Bank, United Nations Economic Commission for Africa, & African Union, 2000).

Lokhu kulahleka kukhombisa ingqalasizinda egugile, ukulungiswa okunganele, kanye nokungasebenzi kahle kwezinhlelo eziningi zamanethiwekhi amanzi asemadolobheni.





Ngaphandle kokutshalwa kwezimali okuphuthumayo kanye nokuguqulwa kwezikhungo, ukukhula okuqhubekayo kwamadolobha okuhlanganiswe nengcindezi yesimo sezulu kungenzeka kwandise igebe phakathi kwesidingo samanzi nokunikezwa okuthembekile. Leli gebe lingakhulisa ukungalingani ekufinyeleleni ezinsizakalweni zamanzi futhi likhulise ubuthakathaka kukho kokubili ukushoda kwamanzi nobungozi obuhlobene namanzi emadolobheni.

Ukuguquka Kwesimo Sezulu Kubumba Kabusha Ubungozi Bamanzi Emadolobheni

Ngaphambi kokuhlola izixazululo, kubalulekile ukuqonda ukuthi ukuguquka kwesimo sezulu kuguqula kanjani izinselele zamanzi amadolobha ase-Afrika asevele ebhekene nazo. Lezi zingcindezi azizona nje izingozi zesikhathi esizayo; sezivele zenzeka namuhla futhi kulindeleke ukuthi ziqine emashumini eminyaka azayo. Ngakho-ke, ukuguquka kwesimo sezulu kubumba kabusha indlela ubungozi bamanzi obuvela ngayo futhi busebenzisane ngayo ngaphakathi kwezindawo zasemadolobheni.



Ukuguquka kwesimo sezulu kuthinta izinhlelo zamanzi emadolobheni ase-Afrika ngezindlela eziningi. Le mithetha isebenzisana nezingcindezi ezikhona ezifana nokukhula okusheshayo kwamadolobha, imikhawulo yengqalasizinda, kanye nokufinyelela okungalingani ezinsizakalweni. Ngenxa yalokho, ukuguquka kwesimo sezulu kusebenza njengento eqinisa ubungozi bamanzi obukhona kanye nobuthakathaka.



Izinqubo eziningana ezibalulekile ezihlobene nesimo sezulu sezivele zithonya izinhlelo zamanzi emadolobheni:

Ukuguquguquka Kwemvula: amaphethini emvula aya ngokuya eba nzima ukuwabikezela emadolobheni ase-Afrika. Izikhathi ezinde zesomiso zinciphisa ukutholakala kwamanzi, kuyilapho izikhukhula ezivame kakhulu futhi ezinamandla zingagcwala izinhlelo zokukhipha amanzi nokuhlinzeka. Lo mjikelezo ushiya izinkampani zamanzi nesikhathi esincane sokululama phakathi kwezehlakalo ezimbi kakhulu futhi wandisa ingcindezi engqalasizindeneni esivele ibuthakathaka.

Ukuchayeka Kwasogwini: amadolobha asogwini aya ngokuya echayeka ekunyukeni kwezinga lolwandle, ukuguguleka kogu, kanye nokungena kosawoti emanzini angaphansi komhlaba. Njengoba amanzi anosawoti engcolisa izinqolobane zamanzi ahlanzekile, amanzi okuphuza aphephile aba nzima futhi abize kakhulu ukuwathola, ebeka enye ingcindezi ekunikezweni kwamanzi asemadolobheni asevele alinganiselwe.



Ukushoda Kwamanzi Okuqhubekayo: amadolobha asezindaweni ezomile nezomile kancane abhekana nokushoda kwamanzi kwesikhathi eside okuqhutshwa ukwehla kokugcwaliswa kabusha kwama-aquifer kanye nokuncintisana okukhulayo ngezinsiza zamanzi ezilinganiselwe. Ngesikhathi esifanayo, ukwanda okusheshayo kwamadolobha kusheshisa isidingo ngesikhathi ukuvuselelwa kwemvelo kwemithombo yamanzi kuhamba kancane.



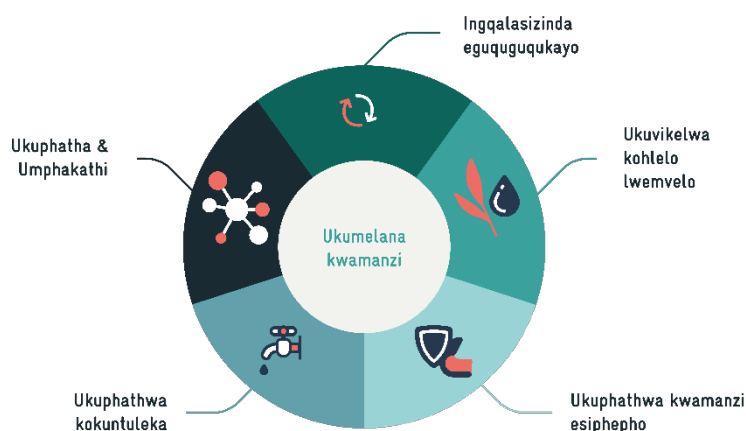
Amazinga okushisa aphezulu/amagagasi okushisa: asheshisa ukuhwamuka emifuleni, emachibini nasenhlabathini, futhi izindawo eziluhlaza zoma ngokushesha. Izimo zezulu ezishisayo + amazinga aphansi amanzi kungaphinde kugxilise ukungcola futhi kudale izinkinga zekhwalthi yamanzi.



Isimo Sezulu Njengento Ephindaphinda Usongo: ukuguquka kwesimo sezulu akusebenzi ngokuhlukana. Kunalokho, kukhulisa ubuthakathaka obukhona ngaphakathi kwezinhlelo zasemadolobheni. Ingqalasizinda ebuthakathaka, ukukhula okusheshayo kwamadolobha, kanye nokungalingani kusebenzisana nezingcindezi zesimo sezulu ukwandisa izikhala zokufinyelela emanzini, kwandise kokubili ubungozi bezenhlalo nobezomnotho emadolobheni.

Ukuqonda Ukuqina Kwamanzi

Ukuqina kwamanzi kusho ukuqinisa izinhlelo zamanzi ukuze zihlale ziphephile ngaphansi kwengcindezi yesimo sezulu futhi zingabi sengozini kakhulu ezingozini ezihlobene namanzi ezifana nesomiso, izikhukhula, noma ukunyuka kwezinga lolwandle.



Umfanekiso 31. Izakhi ezisemqoka zokuqinisa ukumelana



Ukuqina kwamanzi kunezici eziningi. Kuhlenganisa ukwenza izinhlelo zamanzi ziguquguquke futhi zikwazi ukuzivumelanisa nezimo, kuyilapho kuvikelwa futhi kusetshenziswa izinhlelo zemvelo ngezindlela ezithuthukisa kokubili ukunikezwa kwamanzi nekhwalithi yawo. Ngokuhlanganyela, lezi zinto zisiza amadolobha abhekane nokungaqiniseki futhi avikele ukuphepha kwamanzi kwesikhathi eside.

Izinhlelo Zamanzi – Amanzi Avela Kuphi?

Izinhlelo zamanzi zasemadolobheni zixhumanisa imithombo yamanzi yemvelo nengqalasizinda yabantu eqoqa, ihlanze, igcine, futhi isabalalise amanzi emadolobheni. Ukuqonda lezi zingxenywe ezixhumene kubalulekile ekwakheni izinhlelo zamanzi eziqinile ezikwazi ukuzivumelanisa nezingcindezi zesimo sezulu kanye nesidingo esikhulayo.

Izinhlelo zamanzi zasemadolobheni zincike emithonjeni nasezingqalasizindenini eziningana ezixhumene ezilawula ukutholakala nokunikezwa kwamanzi. Izingxenywe eziyinhloko yilezi:

1. Amanzi Asemkhathini Naqandisiwe

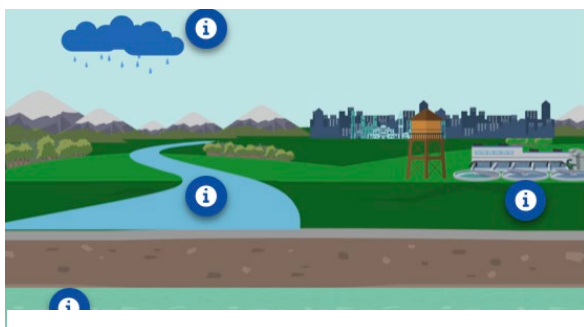
Le ngxenye yohlelo ihlanganisa amanzi asemkhathini njengemvula, inkungu encane, iqhwa, nenkungu, kanye namanzi aqandisiwe agcinwe eqhweni lezintaba naseqhweni lesizini. Le mithombo ilawula ukugeleza kwemifula futhi igcwalise kabusha izinhlelo zamanzi ngokuhamba kwesikhathi, okwenza ibe ebalulekile ekunikezweni kwesikhathi eside.

2. Izinhlelo Zamanzi Angaphezulu

Amanzi angaphezulu ahlenganisa imifula, imifudlana, amachibi, nezinqolobane zamanzi. Lena yimithombo yamanzi ebonakala kakhulu emadolobheni nasezolimo, kodwa ithinteka kakhulu ekuguquguqukeni kwesimo sezulu, ukungcola, kanye nokusetshenziswa ngokweqile.

3. Amanzi Angaphansi Komhlaba Namanzi Aluhlaza

Amanzi angaphansi komhlaba agcinwe kuma-aquifer kanye namanzi aluhlaza agcinwe ezitshalweni akha izinqolobane ezifihlekile kodwa ezibalulekile. Asekela izinhlelo zemvelo, ezolimo, nokunikezwa kwamanzi emadolobheni, ikakhulukazi ngesikhathi sesomiso lapho amanzi angaphezulu ehla.



Umfanekiso 32. Izingxenywe zohlelo lwamanzi





4. Ingqalasizinda Yamanzi Asemadolobheni

Ingqalasizinda yamanzi asemadolobheni ihlanganisa izinqolobane zamanzi, izikhungo zokuhlanza amanzi, kanye nezinhlelo zokusabalalisa eziqoqa, zigcine, zihlanze, futhi zilethe amanzi emadolobheni. Ukuqina kwazo kunquma ukuthi izinsiza zemvelo zingafinyelela yini ngokuthembekile emiphakathini.

Indlela Izinhlelo Zamanzi Asemadolobheni Ezisebenza Ngayo

Ngaphambi kokuxoxa ngokuqina, kubalulekile ukuqonda ukuthi amadolobha awathola kanjani amanzi awo empeleni. Izindawo zasemadolobheni zithola amanzi kokubili emithonjeni yemvelo—njengamanzi angaphansi komhlaba, imifula, amachibi, namaxhaphozi—kanye nengqalasizinda eyakhiwe, okuhlanganisa izinqolobane zamanzi, amadama, nezinhlelo zokugcina amanzi. Le mithombo ivame ukutholakala kude kakhulu nomngcele wedolobha, okusho ukuthi ukuphathwa kwamanzi asemadolobheni kuncike endaweni enkulu exhumene.

Ukuze kwakhiwe ukuqina, amadolobha kufanele ahlele futhi aqaphe zonke izinsiza zamanzi ezingaba khona ezixhumene nohlelo lwedolobha. Ukuqonda ukuthi amanzi avela kuphi kubaluleke njengokuphatha ukuthi asetshenziswa kanjani. Ingqalasizinda yamanzi asemadolobheni yakhelwe ukukhipha, ukugcina, ukuhlanza, nokusabalalisa amanzi ngokuphepha kubantu. Amanethiwekhi okusabalalisa—okuhlanganisa amathangi okugcina, iziteshi zokumpompa, nezinhlelo zokulawula umfutho—aqinisekisa ukuthi amanzi angafinyelela ngokuthembekile emakhaya, emabhizinisini, nasezinsizakalweni zomphakathi kulo lonke idolobha.

Umjikelezo Wokwakha Ukuqina Kwamanzi Asemadolobheni

Amadolobha aba aqinile lapho ephatha ngenkuthalo izinhlelo zawo zamanzi ngokuhlela, ukubandakanya, ukuklama, kanye nokutshalwa kwezimali kwesikhathi eside. Ukuqina kwamanzi akuhambi ngomugqa oqondile; kunalokho, kungumjikelezo wezenzo eziqinisa.

Ukuhlelela amanzi kusho ukufaka amanzi ekuhlelweni kwamadolobha nasekwenziweni kwezinqumo. Lokhu kuhlanganisa ukuphatha ukusetshenziswa komhlaba, ukuvikela izindawo ezibamba amanzi, ukuhluhanisa imithombo yokunikezwa kwamanzi, kanye nokutshala imali engqalasizindenini enciphisa imithelela yezikhukhula. Ukuhlela kusiza amadolobha azilungiselele ukungaqiniseki kunokuphendula kuphela lapho izinkinga sezivele zenzeka.

Ukubeka imiphakathi esengozini phambili kubalulekile uma ukuqina kwamanzi kufanele kunciphise ukungalingani. Izinqubomgomo kufanele zandise ukufinyelela



okuphephile emanzini nasezindleleni zokuthuthwa kwendle kubantu abachayeke kakhulu, zithuthukise ukufinyeleleka ngokwezindleko, futhi zifake ulwazi lwendawo ekwenziweni kwezinqumo. Uhlelo luqinile kuphela uma luvikela labo abasengozini enkulu.

Ukuklama izixazululo ngezinga elikhulu kusho ukudlulela ngale kwamaphrojekthi ahlukene. Ukuklama okuqinile kuhlenganisa ukuthuthukisa ingqalasizinda, ukufaka izixazululo ezisekelwe emvelweni, kanye nokuqinisa izikhungo ukuze izinto ezintsha zisetshenziswe kulo lonke uhlelo lwamanzi asemadolobheni.

Ukutshala imali yesikhathi eside kuyadingeka ukuze kugcinwe ukuqina. Ohulumeni nabalingani kudingeka bahambisane nokutshalwa kwezimali nokuphepha kwamanzi kwesikhathi eside, kuyilapho kuqinisekiswa ukulungiswa, obala, nokufinyelela ngokulinganayo. Ngaphandle koxhaso oluqhubekayo, imizamo yokuqina iyancipha ngokuhamba kwesikhathi.

Izingcindezi Ezibalulekile Ezinhlelweni Zamanzi Asemadolobheni

Ubuthakathaka bamanzi asemadolobheni bubunjwa izingcindezi ezisebenzisanayo zabantu, zemvelo, zengqalasizinda, kanye nezokuphatha. Lezi zinto zithonya kokubili ukutholakala kwamanzi kanye nekhono lamadolobha lokuhlinzeka ngezinsizakalo zamanzi ezithembekile nezilinganayo.



Umfanekiso 33. Izinto ezisemqoka ezicindezela izinhlelo zamanzi

Imiphumela Ebalulekile

Ezabantu: ukwanda kwesidingo sezinsizakalo zamanzi asemadolobheni.

Isimo sezulu nemvelo: ukuncipha kokutholakala kwamanzi nokwanda kobungozi bezikhukhula.

Ingqalasizinda: ukuphazamiseka kwezinsizakalo kanye nobungozi bezempilo yomphakathi.

Izinto zokuphatha nezenhlalo-mnotho: ukufinyelela okungalingani kanye nobuthakathaka besikhathi eside bohlelo.

Ukubhekana Nokushoda Kwamanzi, Izikhukhula, Nokunyuka Kwezinga Lolwandle Emadolobheni

Namuhla amadolobha abhekana nobungozi bamanzi obuhlukahlukene ngesikhathi esisodwa. Amanye abhekana nokushoda kwamanzi, amanye abhekana nezikhukhula, futhi amadolobha amaningi asogwini kufanele alungiselele ukunyuka kwezilwandle.



Umfanekiso 34. Izinhlelo zamanzi asemadolobheni ezibhekene nezingozini eziningi ezihlobene nesimo sezulu.

Amadolobha aba aqinile lapho ephatha lezi zinselele ngenkuthalo ngokuhlela, ukubandakanya, ukuklama, kanye nokutshalwa kwezimali kwesikhathi eside. Ukuqina kwamanzi akuhambi ngomugqa oqondile—kungumjikelezo wezenzo eziqinisana.

Isigaba esilandelayo sihlola ukuthi amadolobha angathatha ziphi izinyathelo ukunciphisa ukushoda kwamanzi, ukuphatha izikhukhula, nokuzivumelanisa nokunyuka kwezinga lolwandle, eqinisa ukuqina kwamanzi asemadolobheni ngokuhamba kwesikhathi.



Umfanekiso 35. Ukushoda kwamanzi kuthinta imiphakathi nokuhlinzekwa kwamanzi asemadolobheni.



Ukubhekana Nokushoda Kwamanzi Emadolobheni

Ukushoda kwamanzi kuyinselele ekhulayo ezindaweni eziningi zasemadolobheni. Amadolobha angakwazi ukuqinisa ukuqina ngokuhlanganisa ukuphathwa kwesidingo, ukuthuthukiswa kokusebenza kahle, ukusetshenziswa kabusha kwamanzi, kanye nokuvikelwa kwezinhlelo zamanzi zemvelo. Lezi zindlela ezilandelayo zikhombisa amasu abalulekile amadolobha angawasebenzisa.

Phatha isidingo. Amadolobha anganciphisa ukusetshenziswa kwamanzi ngemikhankaso yokushintsha ukuziphatha kanye nolwazi lomphakathi olucacile, esekelwa amathuluzi afana namamitha ahlakaniphile, izaziso zasemakhaya, kanye namadeshibhodi omphakathi. Amanani entela aklanywe kahle kanye nokubeka amanani ngokwezigaba “zokusebenzisa ngobuhlakani” nakho kunganciphisa ukusetshenziswa ngokweqile kuyilapho kuvikelwa izidingo eziyisisekelo.

Thuthukisa ukusebenza kahle futhi unciphise ukulahleka. Ingxenye enkulu yamanzi asemadolobheni ayifinyeleli kubasebenzisi. Ukuthuthukiswa kobunjiniyela—njengokuthola ukuvuza, ukulungisa ngokushesha, ukuphatha umfutho, kanye nokulungisa kangcono—kunganciphisa amanzi achithwayo futhi kwandise ukuthembeka ngaphandle kokudinga imithombo emisha.

Sebenzisa kabusha futhi uvuselele amanzi. Amanzi angcolile ahlanziwe angasetshenziswa kabusha ngezinhloso ezingezona zokuphuza ezifana nokunisela, izimboni, noma ukusetshenziswa okuhlobene namandla. Ukusetshenziswa kabusha kwamanzi kunciphisa ingcindezi emithonjeni yamanzi ahlanzekile futhi, kwezinye izimo, kungakha imithombo yemali engenayo esiza ukuxhasa ukuthuthukiswa kohlelo.

Khulisa ukugcina amanzi futhi uvikele amanzi angaphansi komhlaba. Amadolobha angaqoqa amanzi emvula namanzi eziphepho endaweni noma ngezinhlelo ezimaphakathi. Angakwazi futhi ukukhulisa ukuphepha kwesikhathi eside ngokugcwalisa kabusha ama-aquifer ngendlela elawulwayo, isibonelo ngokusebenzisa amachibi okufakelwa amanzi emhlabathini noma imithombo yokujova amanzi. Imithetho iyadingeka ukuvimbela ukukhipha amanzi angaphansi komhlaba ngendlela engasimeme.





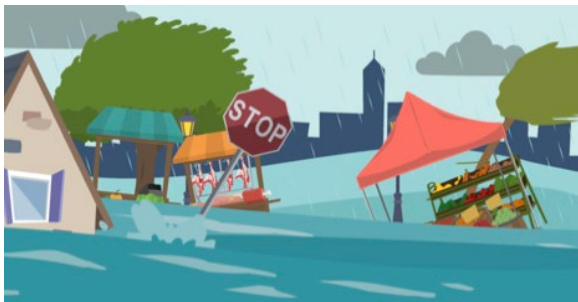
Vikela izindawo ezibamba amanzi futhi uthuthukise ikhwalithi yamanzi. Ukuhlelwa kokusetshenziswa komhlaba nokulawulwa kokungcola kusiza ukuvikela izindawo ezibamba amanzi ezihlinzeka izinhlelo zamanzi zasemadolobheni. Izixazululo ezisekelwe emvelweni, ezifana nokubuyisela amaxhaphozi noma ukuphatha izimila ezindaweni ezibamba amanzi, zingathuthukisa ukugcinwa kwamanzi nekhwalithi yawo.

Ukukhipha usawoti emanzini olwandle (lapho kufanele khona). Ukukhipha usawoti emanzini olwandle nobuchwepheshe bokuhlazwa obuthuthukile kungandisa ukunikezwa kwamanzi kusetshenziswa amanzi olwandle noma amanzi anosawoti omncane. Nokho, lezi zixazululo zivame ukudinga amandla amaningi futhi zibize kakhulu, ngakho zidinga ukuhlolwa ngokucophelela kokufaneleka kanye nokuqapha okuqinile kwekhwalithi yamanzi.



Ukubhekana Nobungozi Bezikhukhula Emadolobheni

Izikhukhula ziya ngokuya zivama emadolobheni amaningi. Ngakho-ke izindawo zasemadolobheni zidinga amasu ahlukahlukene ukunciphisa ubungozi bezikhukhula nokuvikela imiphakathi. Ukuphathwa kwezikhukhula okusebenzayo kuhlenganisa ukuhlolwa kobungozi, ingqalasizinda eqinile, imithetho yokuhlela, kanye nokusebenzisana phakathi kwezinhlelo zasemadolobheni nezesifunda.



Umfanekiso 36. Izikhukhula zasemadolobheni zithinta imigwaqo, izakhiwo nezimakethe zendawo.

Amasu Okubhekana Nobungozi Bezikhukhula

Amadolobha angaqinisa ukuqina kwezikhukhula ngokuhlenganisa ukuhlolwa kobungozi, ukuthuthukiswa kwengqalasizinda, izinyathelo zokuhlela, kanye nokuphathwa kwamanzi okuhlelekile.

Hlola futhi ulungiselele. Amadolobha kufanele aqale aqonde ubungozi bawo bezikhukhula. Lokhu kuhlenganisa ukwenza amamephu ezehlakalo zezikhukhula zangaphambilini, ukuhlolwa izindawo ezisengozini nengqalasizinda ebalulekile, kanye nokumodela imithelela yesimo sezulu yesikhathi esizayo. Izinqubo zezimo eziphuthumayo nezinhlelo zokuxwayisa kusenesikhathi zivumela isenzo esihlelekile kanye nempendulo esheshayo lapho izikhukhula zenzeka.



Yakha ingqalasizinda empunga-eluhlaza. Ukuqina kwezikhukhula kuvame ukuhlenganisa izinhlelo zokukhipha





amanzi ezakhiwe ngobunjiniyela nezixazululo ezisekelwe emvelweni. Ingqalasizinda empunga ihlanganisa ama-culvert, amachibi okubamba amanzi, namanethiwekhi amanzi eziphepho. Ingqalasizinda eluhlaza ihlanganisa amaxhaphozi, ukubuyiselwa kwemifudlana, kanye nokutshala nokuluhlaza emadolobheni okumunca futhi kubambezele amanzi amaningi.

Hlela ukuthuthukiswa kwamadolobha okuphephile. Ukuhlelwa kwamadolobha kudlala indima ebalulekile ekunciphiseni ukuchayeka ezikhukhuleni. Amadolobha kufanele agweme ukwakha emaxhaphozini nasezindaweni zezikhukhula lapho kungenzeka khona. Imithetho yokuklama izindawo nezindinganiso zokwakha zinganciphisa ubungozi bezikhukhula, kuyilapho izakhiwo zingafaka izinyathelo zokuqina ezifana namathangi amanzi emvula, uphahla oluhlaza, amazanga aphantsi aphakanyisiwe, kanye nokuklama okumelana nezikhukhula.



Phatha imfucuza nokugeleza kwamanzi esifunda. Izinhlelo zokukhipha amanzi ezivalekile zandisa ubungozi bezikhukhula. Ukuqoqwa nokuphathwa kwemfucuza okusebenzayo kuvimbela udoti ekuvaleni imifula nemigudu yokukhipha amanzi. Amadolobha nawo adinga ukusebenzisana nezifunda ezingomakhelwane ukuphatha ukugeleza kwamanzi okuvela phezulu, okuhlanganisa ukubuyiselwa kwamaxhaphozi nokuphathwa kwemifula.

Ukubhekana Nokunyuka Kwezinga Lolwandle Emadolobheni

Ukunyuka kwezinga lolwandle kwandisa ubungozi bezikhukhula zasogwini emadolobheni amaningi. Lezi yizinselele zesikhathi eside ezidinga ukuxhumanisa okuqinile, ukuhlela, nokuphatha. Amadolobha adinga inhlenganisela yezinyathelo ezisekelwe ezinhlelweni zemvelo, ezesakhiwo, ezendawo, nezenhlalo ukuze anciphise ukuchayeka futhi avikele imiphakathi ngokuhamba kwesikhathi.

Amasu Okubhekana Nokunyuka Kwezinga Lolwandle

Amadolobha angaphendula ekunyukeni kwezinga lolwandle ngokuhlanganisa ukubuyiselwa kwezinhlelo zemvelo, ukuvikelwa ngokomzimba, ukuzivumelanisa kwamadolobha, kanye nokuhlela kwesikhathi eside.

Buyisela izinhlelo zemvelo zasogwini. Amaxhaphozi namahlathi e-mangrove anganciphisa amagagasi eziphepho nokuguguleka kogu ngokwemvelo. Ukuvikela lezi





Umfanekiso 37. Izindawo zasogwini zibhekene nokukhuphuka kwezinga lolwandle nokwanda kobungozi

zinhlelo zemvelo kunciphisa amandla amagagasi futhi kunikeza ukuvikelwa kwesikhathi eside okungabizi kakhulu. Ngale ndlela, imvelo ivikela ugu.

Yakha izivikelo zomzimba. Izindonga zolwandle nezithiyo zezikhukhula zingavimba amanzi anyukayo. Lezi zinyathelo zingasebenza, kodwa futhi ziyabiza futhi zivame ukusebenza kahle kakhulu lapho zihlanganiswe nezinhlelo

zemvelo. Ngamanye amazwi, ubunjiniyela busekela ukuvikelwa.

Vumelanisa amadolobha namanzi. Amadolobha anganciphisa ubungozi ngokukhawulela ukwakha ezindaweni ezinobungozi obuphezulu, ukuphakamisa izakhiwo, nokuklama amapaki nezindawo zomphakathi ezimunca amanzi ezikhukhula. Lapha, umqondo obalulekile ukuthi ukuklama kunciphisa ubungozi.

Hlela ukuhoxa okulawulwayo. Ezinye izindawo azikwazi ukuvikelwa unomphele. Kulezi zimo, ukuhlela kusenesikhathi kokuthuthwa kwabantu kungavikela imiphakathi futhi kugweme ukufuduswa okubangelwa yizinhlekelele. Lokhu kugcizelela ukuthi ukuhoxa kungase kudingeke kwezinye izimo.

Ucwaningo Lwesibonelo: Ukusetshenziswa Kabusha Kwamanzi Nokuqina Esomisweni eWindhoek, Namibia

IWindhoek, inhlokodolobha yaseNamibia, itholakala ethafeni elomile eliphakathi nezwe lapho imvula ilinganiselwe kakhulu futhi isomiso siyingxenye ehlala njalo yesimo sezulu.

Njengoba ingenayo imifula egeleza

unyaka wonke futhi ukugcwaliswa kabusha kwama-aquifer kuncane kakhulu, idolobha selibhekane nokushoda kwamanzi okuqhubekayo isikhathi eside. Njengoba idolobha likhulile, lezi zingcindezi ziye zaqina. Ukukhula okusheshayo kwabantu kanye nokwanda kwezindawo zokuhlala ezingahlelekile kukhuphule isidingo samanzi, kuyilapho izomiso eziphindaphindiwe zehlise amazinga ezinqolobane zamanzi aba sengozini enkulu. Phakathi kuka-2013 no-2019, isomiso esinzima sehlisa amazinga ezinqolobane zamanzi aba ngaphansi kwamaphesenti angu-20, sathinta ukuphepha kwamanzi kulo lonke idolobha. Imiphakathi engenayo imali eningi yayisengozini



Umfanekiso 38. Izingubo zokwelapha amanzi ezithuthukisiwe ezisetshenziswa ekusetshenzisweni





kakhulu, ibhekene nokuphazamiseka kwezinsizakalo, amanzi angaphephile, kanye nezindleko ezikhuphukayo.

Ukuze kubhekwane nalezi zinselele, iWindhoek yathuthukisa enye yezindlela ezintsha kakhulu emhlabeni zokuphatha amanzi asemadolobheni. Ngo-1968, idolobha laba elokuqala emhlabeni ukusungula ukusetshenziswa kabusha kwamanzi okuphuza ngokuqondile, ngokuvuselela amanzi angcolile ahlanziwe abe amanzi okuphuza aphephile. Esikhundleni sokuthembela kuphela ezinqolobaneni zamanzi ezikude, idolobha latshala imali engqalasizindenini yokuhlanza ethuthukile ekwazi ukuguqula amanzi angcolile abe amanzi okuphuza asezingeni eliphezulu. Isikhungo i-**Goreangab Direct Potable Reuse Plant** sisebenzisa uhlelo lokuhlanza olunezithiyo eziningi oluhlangabezana nezindinganiso ze-**World Health Organization**, futhi manje sihlizeka kuze kufike kumaphesenti angu-30 wamanzi edolobha.

Ukusetshenziswa kabusha kwamanzi kwakungeyona kuphela indlela eyamukelwa. IWindhoek iphinde yahlukanisa imithombo yayo yokunikezwa kwamanzi ngokusebenzisa ukugcwalisa kabusha ama-aquifer ngendlela elawulwayo, ukuqoqwa kwamanzi emvula, kanye nokuvuselelwa kwamanzi angaphansi komhlaba. Ngokugcina amanzi ngaphansi komhlaba ngezikhathi ezinemvula eningi nokuthuthukisa ukuphathwa kwamanzi angaphansi komhlaba, idolobha laqinisa ikhono lalo lokubhekana nezomiso ezinde. Lezi zinyathelo ezihlanganisiwe zasiza ukunciphisa ukuthembela emthonjeni owodwa wamanzi futhi zakha uhlelo lwamanzi asemadolobheni oluqinile noluhlukahlukeni.

Ukuphatha kwezezimali nakho kwadlala indima ebalulekile. Izinhlelo zamanani entela ezikhuphukayo zethulwa ukuze kuvikelwe imindenini engenayo imali eningi kuyilapho kudikibalisa ukusetshenziswa kwamanzi ngokweqile. Ukuphathwa kwezimali okusobala kwaqinisekisa ukuthi imali engenayo ibekelwa ngokukhethekile ukulungiswa kwengqalasizinda nokuthuthukiswa kohlelo, kwavimbela ukuphambukiswa kwezinsiza futhi kwasekela ukusimama kwesikhathi eside.

Izinhlelo zezikhungo nazo zazibaluleke ngokulinganayo. Izinkontileka zokuthenga izinsizakalo zazidinga izindinganiso eziqinile zokuphepha nokuqina, futhi idolobha lasebenzisana nabaqhubi abazimele ekudluliselweni kobuchwepheshe nasekuphathweni kwesikhungo kuyilapho kugcinwa ukuqapha okuqinile komphakathi



Umfanekiso 39. Imikhankaso yokuqwashisa umphakathi ekhuthaza ukongiwa kwamanzi eWindhoek.

nokuziphendulela. Lezi zindlela zokuphatha zasiza ukuqinisekisa ukuthi uhlelo lusebenza ngokuphepha nangokuthembeka.

Ukubandakanywa komphakathi kwaqhubeka nokuqinisa uhlelo. Imikhankaso yokuqwashisa efana nethi “**Save Water,**





Save Windhoek”, kanye namamitha ahlakaniphile nezinhlelo ezikoleni, yakhuthaza izakhamuzi ukuthi zinciphise ukusetshenziswa kwamanzi futhi zibambe iqhaza ngenkuthalo ekongiweni kwamanzi. Ngokuhamba kwesikhathi, le mizamo yasiza ukwakha ukwethemba komphakathi ekusetshenzisweni kabusha kwamanzi futhi yakhuthaza isiko lokusebenzisa amanzi ngokuzibophezela.

Namuhla, iWindhoek igcine ukunikezwa kwamanzi okuqhubekayo naphezu kwezomiso eziphindaphindiwe, futhi amazinga ayo amanzi angangenisi mali aphakathi kwaphansi kakhulu esifundeni. Ngemva kweminyaka engaphezu kwamashumi amahlanu yokusebenza, idolobha selaziwa kabanzi njengesibonelo somhlaba wonke sokusetshenziswa kabusha kwamanzi asemadolobheni nokuqina esomisweni. Okuhlangenwe nakho kweWindhoek kukhombisa ukuthi ngisho namadolobha ome kakhulu angakha ukuqina kwamanzi okuhlala isikhathi eside ngokusungula izinto ezintsha, ukuphatha okuqinile, kanye nokuhlela kwesikhathi eside.

Ukuqinisa Ukuphatha Kwezinhlelo Zamanzi Eziqinile

Amadolobha anamathuluzi amaningi ezobuchwepheshe okulawula ubungozi bamanzi, kodwa la mathuluzi asebenza kuphela lapho izikhungo zihleleke ukuwasekela. Njengoba amamodyuli angaphambilini egqamisile, ingqalasizinda iyodwa ayanele. Izibopho ezicacile, ukuxhumanisa okuqinile phakathi kwemikhakha, kanye nekhono lokuhlela, ukuxhasa ngezimali, nokulawula ngendlela esebenzayo kubalulekile ezinhlelweni zamanzi eziqinile.

Emadolobheni amaningi ase-Afrika, ukuphatha kusehlukene futhi akuhambisani. Iminyango nama-ejensi amaningi avame ukwabelana ngezindima ezigqagqene emanzini, ezokuthuthwa kwendle, imvelo, ukulawulwa kobungozi, kanye nokuthuthukiswa kwamadolobha, ngaphandle kombono owabiwe noma uhlaka lokuziphendulela. Lokhu kwehlukana kungaholela ekuphindaphindeni imisebenzi, ukungasebenzi kahle, kanye nokuncipha kokwethemba komphakathi. Ngakho-ke, ukuphatha amanzi okusebenzayo kuncike ezisekelweni ezine: **izibopho ezihambisanayo, ukuxhumanisa okuqinile kwezikhungo, ukuphatha okusobala okusekelwe ekusebenzeni, kanye nobuholi obubandakanyayo obukwazi ukuqhuba ushintsho lwesikhathi eside.**





Imephu Yendlela Yokuqina Kwamanzi Asemadolobheni

Ukwakha ukuqina kwamanzi akwenzeki ngobusuku obubodwa. Amadolobha ngokuvamile adlula ezigabeni—kusukela ekuqondeni ubungozi, kuya ekuhleleni izixazululo, kuya ekwandiseni lokho okusebenzayo. Le mephu yendlela ichaza indlela esebenzayo amadolobha angayilandela ukuze aqinise izinhlelo zamanzi asemadolobheni eziqinile ngokuhamba kwesikhathi.

Ukubandakanywa Kwababambiqhaza Ezinhlweleni Zamanzi Eziqinile

Ukuqina kwamanzi kuncike esenzweni esihlelelekile phakathi kwababambiqhaza abahlukene, ngamunye enezindima nezibopho ezithile. Iziphathimandla zomasipala zidlala indima esemqoka ekuxhumaniseni imikhakha ehlukene nasekuhleleni, kuyilapho izinkampani ezihlizeka ngamanzi zibophezelekile ekusebenzeni nasekuletheni izinsizakalo. Iminyango yezinsiza zamanzi isiza ukuphatha nokuvikela imithombo yamanzi futhi iqondise ukwabiwa kwawo.

Ngesikhathi esifanayo, izinhlangano zomphakathi nama-NGO afaka isandla ekulungeleni nasekubandakanyeni abantu bendawo. Iminyango yezezimali isekela ukuhlelwa kwesabelomali noxhaso lwesikhathi eside, kuyilapho amayunithi okuphendula ezimweni eziphuthumayo eqinisekisa ukusabela okusheshayo nosizo ngesikhathi sezinkinga ezihlobene namanzi. Ngokuhlanganyela, laba babambiqhaza bakha inethiwekhi yezikhungo edingekayo ukusekela izinhlelo zamanzi eziqinile.

Ukutshala Imali Ezinhlweleni Ezimelana Nobungozi Bamanzi

Amadolobha angatshala imali emazingeni ahlukahlukene esabelomali. Ezinye izenzo zokuqina zidinga ukutshalwa kwezimali okuncane uma kuqhathaniswa, kuyilapho ezinye zidinga uxhaso olukhulu nolwesikhathi eside lwengqalasizinda. Izinqwaba zemali zikhombisa ukuthi amazanga okutshalwa kwezimali angakhula kanjani kuye ngohlobo lokungenelela.



Umfanekiso 40. Umgwaqo wokusebenza wokuqinisa ukumelana kwamanzi asemadolobheni, obonisa izigaba ezisemqoka kusukela ekuhleleni kuya ekuqapheni nasekwandiseni.





Ezingeni lokuqala lokutshalwa kwezimali, amadolobha angavikela izinhlelo zamanzi ezingozini zesimo sezulu. **Izinga lesibili lokutshalwa kwezimali** lihlanganisa izenzo ezifana nokuthuthukisa ukuthuthwa kwamanzi, ukuqinisa ukuhlelwa kwedolobha ngokwendawo mayelana namanzi, kanye nokubuyisela izinhlelo zemvelo. **Ezingeni lesithathu lokutshalwa kwezimali**, amadolobha angathuthukisa ukufinyelela emanzini, akhuphule ukunikezwa kwamanzi, futhi athuthukise izinsiza zamanzi ezifana namanzi angaphansi komhlaba. **Ezingeni lesine lokutshalwa kwezimali**, ukutshalwa kwezimali kugxila ekwandiseni ukugcinwa kwamanzi.

Ukuhlola Uxhaso Lwezimali Lokuqina Kwamanzi

Amadolobha kufanele ahlole ukuthi izindlela zoxhaso lwezimali ziyakusekela yini ukuqina ngaphandle kokwandisa ukungalingani. Imibuzo ebalulekile ihlanganisa:

- Ingabe izinhlelo zingakwazi ukubuyisa izindleko ngaphandle kokukhipha ngaphandle abasebenzisi abasengozini?
- Ingabe akhona amathuba ochungechunge lwenani lwamanzi lwendawo kanye nama-**MSMEs**?
- Ingabe ukusetshenziswa kwamanzi ezindaweni ezingenhla kunikezwe amalayisensi futhi kulawulwa?
- Ingabe amazanga okukhipha amanzi ayasimama?
- Ingabe imithetho yokukhipha amanzi ibuyekwezwa njalo ukuze kuvikelwe imithombo?



Umfanekiso 41. Amazanga ahlukeni okutshalwa kwezimali ekuqiniseni ukumelana

Ukuhlola Amandla Ezobuchwepheshe

Izinhlelo eziqinile zidinga amandla aqinile ezobuchwepheshe nezikhungo. Amadolobha kudingeka ahlole ukuthi anabo yini abasebenzi abanamakhono ekuphathweni kwamanzi, imishini eyanele namathuluzi ezobuchwepheshe, kanye nezinhlelo zokuqapha ikhwalithi yamanzi namazinga okunikezwa kwamanzi. Amandla ezobuchwepheshe nawo ancike ekhonweni lokuphoqelela ukuhambisana nokusetshenziswa komhlaba kanye nokutholakala kwezinsiza zezimali zokugcina ingqalasizinda ngokuhamba kwesikhathi.

Amaphuzu Abalulekile: Ukuqina Kwamanzi Emadolobheni

Le modiyuli igqamisa ukuthi ukuqina kwamanzi akusona isenzo esenziwa kanye kuphela, kodwa kuyinqubo eqhubekayo yokuhlela, ukutshalwa kwezimali,





ukuxhumanisa, nokuzivumelanisa nezimo. Ukwakha izinhlelo zamanzi eziqinile kudinga ukuthi amadolobha aqonde ukuthi amanzi avela kuphi, ukuthi ubungozi buguquka kanjani, nokuthi yimaphi amandla ezikhungo, ezezimali, nezobuchwepheshe adingekayo ukuze kusatshalaliswe izimpendulo ezisebenzayo.

Amaphuzu abalulekile avela kule modyuli ahlanganisa:

- Ukuqina kwamanzi asemadolobheni kuyinqubo eqhubekayo, hhayi isenzo esenziwa kanye kuphela.
- Ukuqapha okuqhubekayo kwezinsiza zamanzi, ukungcola, amazinga okukhipha amanzi, kanye nokufinyelela okulinganayo kubalulekile ukuqondisa izinqumo nokuzivumelanisa nezimo ngokuhamba kwesikhathi.
- Ukwakha ukuqina kudinga ukubandakanywa okusebenzayo kwababambiqhaza abaningi, lapho imiphakathi nomasipala besekelwa izikhungo zomphakathi.



Imojuli 6: Izindlu Eziqinile

Inhloso yale Mojuli

Le mojuli ihlola ukuthi ukukhula okusheshayo kwamadolobha kanye nokuguquka kwesimo sezulu kwakha kanjani izinselelo zezindlu emadolobheni ase-Afrika. Yethula imigomo esemqoka yezindlu eziqinile esimweni sezulu futhi ichaza ukuthi ukuhlela, ukuphatha, uxhaso lwezimali, kanye nokubamba iqhaza komphakathi kungasekela kanjani izinhlelo zezindlu eziqinile. Ekupheleni kwale mojuli, abafundi bazothola ukuqonda okusebenzayo kokuthi amadolobha angathuthukisa kanjani izixazululo zezindlu eziphephile, ezingabizi, futhi eziqinile esimweni sezulu, kuyilapho ephendula ezingcindezini ezikhulayo zasemadolobheni.

Izindlu Eziqinile Emadolobheni Ase-Afrika

Kulo lonke elase-Afrika, amadolobha ayanda ngesivinini esingakaze sibonwe. Ukukhula okusheshayo kwabantu basemadolobheni kuguqula amaphethini okuhlala, izimakethe zomhlaba, kanye nesidingo sengqalasizinda kulo lonke izwekazi. Enhliziyweni yalolushintsho kunesidingo esiphuthumayo **sezindlu ezingabizi ezingamukela** abantu basemadolobheni abakhulayo.

Nokho, ingxenye enkulu yalokhu kwanda yenzeka ngokuthuthukiswa okungahlelekile **emaphethelweni amadolobha**, ngokuvamile ngaphandle kwengqalasizinda eyanele, ukuhlela, noma izinsizakalo.

Lezi zindawo zokuhlala zivame ukubhekana nokuvezwa okukhulu ezingozini zesimo sezulu, njengoba zitholakala ezindaweni ezisengozini yezikhukhula, ukushisa okukhulu, noma ukudilika komhlaba. Ngenxa yalokho, izinselelo zezindlu azigcini nje ngenani lezindlu, kodwa zihlanganisa **ingozi, ukuphepha, nokusimama kwesikhathi eside**.



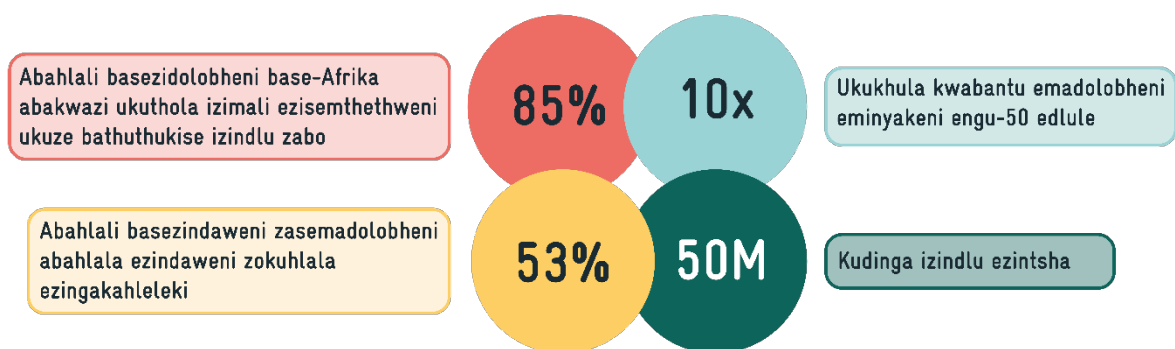
Umfanekiso 42. Ukukhula okusheshayo kwamadolobha nezindawo zokuhlala ezingahlelekile kwandisa ukuchayeka

Kulesi simo, amadolobha kufanele adlulele ngale kokwakha izindlu eziningi kuphela. Kudingeka athuthukise izinhlelo zezindlu ezingakwazi ukumelana nezingcindezi zesimo sezulu kuyilapho zihlala zifinyeleleka futhi zibandakanya wonke umuntu. Lokhu kusho ukuhlanganisa ukuqina ekuklameni izindlu, ekuhleleni, nasezinqumweni zokutshala imali.

Ngakho-ke, ukuqinisa ukuqina kwezindlu kubalulekile ekuqinisekiseni izimo zokuphila eziphephile, ukunciphisa ubungozi, kanye nokusekela intuthuko yasemadolobheni esimeme emadolobheni akhula ngokushesha.

Isidingo Sezindlu Zasemadolobheni e-Afrika

Amadolobha ase-Afrika akhula ngesivinini esimangalisayo. Abantu basemadolobheni bakhule izikhathi eziyishumi eminyakeni engamashumi amahlanu edlule, futhi kudingeka izigidi zezindlu ezintsha ukuze kuhambisane nalokhu kwanda. Kodwa-ke, ngaphezu kwengxenywe yezakhamuzi zasemadolobheni sezihlala ezindaweni zokuhlala ezingahlelekile, ngokuvamile ezindaweni ezivezwe ezingozini zesimo sezulu.



Umfanekiso 43. Izibalo ezisemqoka ezibonisa isidingo sezindlu zasemadolobheni nokwanda kwezindawo ezingahlelekile emadolobheni ase-Afrika.

Indlela Isimo Sezulu Esithinta Ngayo Izindlu

Ukuguquka kwesimo sezulu kuqinisa izingozi zezindlu emadolobheni ase-Afrika. Imvula enamandla nezikhukhula kungalimaza amakhaya nengqalasizinda, kuyilapho amaza ezivunguvungu nokukhuphuka kwezinga lolwandle kusongela izindawo zasogwini. Ngesikhathi esifanayo, ukushisa okukhulu kwenza izimo zokuphila zibe nzima kakhulu, ikakhulukazi ezindaweni eziminyene lapho izakhiwo zibamba ukushisa. Ngaphezu kwalokho, isomiso sinciphisa ukutholakala kwamanzi, sithinte imindeni nezinhlelo zasemadolobheni, futhi ukudilika komhlaba kungalimaza amakhaya ezindaweni ezingazinzile noma ezihlelwe kabi.

Lezi zingozi—**izivunguvungu nemimoya enamandla, izikhukhula, ukukhuphuka kwezinga lolwandle, ukushisa, isomiso, nokudilika komhlaba**—zivame ukwenzeka zihlangene, zikhulise ubungozi babantu basemadolobheni. Ukuqonda lezi zingozi kubalulekile ekuklameni izindlu ezingakwazi ukumelana kangcono nezingcindezi zamanje nezizayo zesimo sezulu.



Umfanekiso 44. Izingozi ezisemqoka zesimo sezulu ezithinta izindlu

Le mithethelela ivame ukuba mibi **kakhulu ezindaweni zokuhlala ezingahlelekile**, lapho ikhwalithi yezindlu nengqalasizinda kungalinganiselwe. Ngenxa yalokho, abantu abavezwe kakhulu ezingozini zesimo sezulu bavame ukuba yilabo abanezinsiza ezimbalwa kakhulu zokuphendula.

Ngakho-ke, amadolobha kufanele asuke ekuphenduleni izinhlekelele aye ekuhleleni izindlu eziqinile ezingozini zesimo sezulu zesikhathi esizayo. Kubalulekile ukuthi ukutshalwa kwezimali okwenziwa emkhakheni wezindlu namuhla kuklanyelwe ukumelana nezimo zamanje nezizayo zesimo sezulu kanye nezehlakalo zesimo sezulu esibi kakhulu.

Yini izindlu eziqinile?

Izindlu eziqinile zibhekisela ezindlini ezingakwazi ukumelana nezingozi zesimo sezulu, zilulame ngokushesha ngemva kwezinhlekelele, futhi zijwayele imithelela emibi yokuguquka kwesimo sezulu noma yezingozi zemvelo ezifana nezikhukhula noma ukushisa okukhulu. Nokho, ukuqina akugcini nje ngezakhiwo eziqinile—kuphathelene futhi nendlela izinhlelo zezindlu ezihlelwa, eziphathwa, futhi ezisekelwa ngayo.

Ngakho-ke, izindlu eziqinile kufanele ziqondwe njengomphumela wohlelo, owakhiwa izinhlelo zasemadolobheni nokuphatha. Zixhomeke ezintweni ezifana nokuhlelwa kokusetshenziswa komhlaba, ukuhlelwa nokunakekelwa kwengqalasizinda, kanye namazinga okwakha nokuphoqeelwa kwawo. Uma izibopho kulezi zindawo zihlukene kakhulu, izinqumo zingangqubuzana. Isibonelo, ukuthuthukiswa okwenziwa phezulu komfula kungandisa izikhukhula ezansi nomfula, noma izimvume zezindlu zingabambezeleka eminyangweni ehlukene.

Ukwakha ukuqina kudinga izindima ezicacile, ukuxhumana okuqinile, kanye nesibopho esabiwe phakathi kwabalingisi abahlukene ababandakanyeka ezinhlelweni zezindlu.

Lezi zindima zihlanganisa:

Ubani ohlelayo: Iminyango yokuhlela yedolobha noma iziphathimandla zentuthuko yasemadolobheni eziquma ukuthi izindlu zingakhiwa kuphi nokuthi umhlaba usetshenziswa kanjani. Ohulumeni kazwelonke nabo bangadlala indima ekubekeni amazinga okwakha.





Ubani onikeza izimvume: Iziphathimandla zokwakha zikamasipala ezibuyekeza imiklamo futhi zikhiphe izimvume zokwakha ngokuvumelana namakhodi okwakha nemithetho yokuhlelwa kokusetshenziswa komhlaba.

Ubani okhokhayo: Ingxube yabalingisi ehlanganisa izabelomali zomphakathi, okuwuhulumeni, abathuthukisi abazimele nabatshalizimali, amabhange, abanikazi bezindlu, izikhungo zezimali ezincane, futhi kwesinye isikhathi amaqembu okonga omphakathi.



Ubani onakekelayo: Abanikazi bezakhiwo, izinhlangano zezindlu, izinsizakalo zikamasipala, noma amaqembu omphakathi abhekele ukunakekela izakhiwo, izinhlelo zokukhipha amanzi, kanye nengqalasizinda eyabiwe.

Amadolobha avame ukudala amapulatifomu okuxhumana phakathi kweminyango axhumanisa izindlu, umhlaba, ezokuthutha, amanzi, nokuphathwa kwezinhlekelele ukuze kuqinisekise izinhlelo zezindlu ezihambisanayo futhi eziqinile.

Imigomo Yezindlu Eziqinile Esimweni Sezulu

Izindlu eziqinile esimweni sezulu zigxila endleleni amakhaya angaklanywa ngayo ukuze aphephe futhi alungele kangcono izingozi zesimo sezulu. Ziqondiswa isethi yemigomo esemqoka esiza ukunciphisa ubungozi, ukuthuthukisa izimo zokuphila, nokuqinisekisa ukuthi izindlu zingakwazi ukumelana nokuzivumelanisa nezimo zemvelo ezishintshayo.

Le migomo idlulela ngale kwezakhiwo ngazinye. Ibonisa indlela izindlu ezixhumana ngayo nendawo ezizungezile, izinhlelo zengqalasizinda, kanye nokutholakala kwezinsiza. Ngokuhlangene, le migomo inikeza uhlaka olusebenzayo lokuklama izindlu ezingagcini nje ngokuba namandla, kodwa futhi ezikwazi ukuzivumelanisa, ezisebenza kahle, futhi eziphendula ezinseleleni zesimo sezulu zendawo.

Le migomo emihlanu—ukukhetha indawo, ubuqotho besakhiwo obuqinile, umklamo ongasebenzisi amandla amaningi, ukuzimela, kanye nezixazululo ezisekelwe



emvelweni—ihlinzeka ngendlela ephelele yokwakha izindlu ezingakwazi ukumelana kangcono nezingcindezi zamanje nezizayo zesimo sezulu.

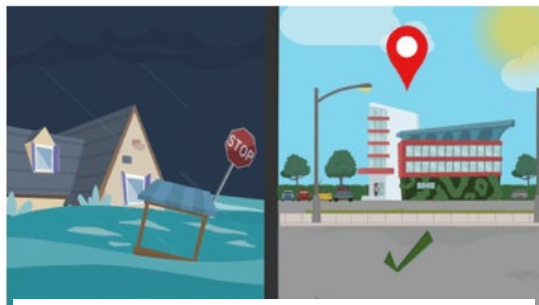


Umfanekiso 45. Izimiso ezisemqoka zezindlu ezimelana nesimo sezulu.

1. Ukukhetha indawo

Izindlu eziqinile ziqala ngokukhetha indawo efanele. Amadolobha kufanele asebenzise imephu yezingozi nokuhlela kwasemadolobheni ukuqondisa ukuthi izindlu zakhiwa kuphi futhi kanjani. Imephu yezingozi isiza ukugwema ukuthuthukiswa ezindaweni ezivezwe ezingozini ezinkulu, njengezindawo ezigcwala amanzi, izintaba ezingazinile, noma izindawo zasogwini eziphansi ezisengozini yokukhuphuka kwezinga lolwandle.

Amadolobha kufanele futhi acabangele ukuhambisa izinhlelo ezibalulekile ngaphezu kwamazinga ezikhukhula, ikakhulukazi ezikoleni, ezibhedlela, ezindaweni zokukhosela, nasezakhiweni zezinsizakalo eziphuthumayo, ezibalulekile ekuphenduleni izinhlekelele. Ngaphezu kwalokho, umklamo wedolobha ungasiza ukunciphisa izingozi zesimo sezulu. Isibonelo, amadolobha anganciphisa ukuvezwa ekushiseni ngokuthi:



Umfanekiso 46. Ukugwema izindawo ezinobungozi obukhulu kunciphisa kakhulu ukuchayeka ezikhukhuleni.

- Kucatshangelwe isici sokubonakala kwesibhakabhaka ekuklameni imigwaqo nezakhiwo
- Kwandiswe umthunzi ovela ezakhiweni ezingomakhelwane nasezihlahleni
- Kuklanywe ukuhlelwa kwemigwaqo okuthuthukisa ukuhamba komoya wemvelo

2. Ubuqotho Besakhiwo Obuqinile

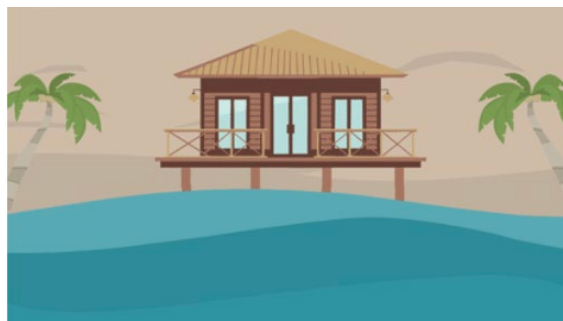
Izindlu eziqinile kufanele zakhiwe ukuze zimelane nezingozi zesimo sezulu. Isakhiwo—noma “igobolondo”—kufanele simelane nemimoya enamandla, izikhukhula, nokushisa



okukhulu. Amadolobha angathuthukisa ukuqina kwesakhiwo ngokuklama izakhiwo, ukukhetha izinto zokwakha, kanye namazinga okwakha.

Amakhaya kufanele afake ukuxhumana kwesakhiwo okuqinisiwe okuqinisa isixhumanisi phakathi kophahla, izindonga, nezisekelo. Isibonelo: ukusebenzisa ama-hurricane straps noma ama-anchor bolts kungavikela uphahla ezindongeni, kuyilapho ukuqinisa ukuxhumana phakathi kwezindonga nezisekelo kusiza ukuvimbela ukuwohloka kwesakhiwo ngesikhathi semimoya enamandla.

Ukusebenzisa izinto zokwakha eziqinile nezimelana nomswakama kusiza izakhiwo zigcine ubuqotho besakhiwo ngesikhathi sezikhukhula noma imvula enamandla. Izibonelo zihlanganisa amabhulokhi omhlaba, uqalo, nezinto zokwakha ezigaywe kabusha. Amazinga okwakha kufanele akhuthaze izinto eziqinile nezimelana nesimo sezulu ezivumelaniswe nezimo zendawo.



Umfanekiso 47. Ukuphakamisa izindlu ezakhiweni eziphakanyisiwe kusiza ukunciphisa umonakalo wezikhukhula.

Ezindaweni ezisengozini yezikhukhula, amakhaya angaphakanyiswa ezinkundleni eziphakeme noma ezinsikeni ukuze amanzi ezikhukhula adlule ngaphansi kwawo ngaphandle kokulimaza isakhiwo. Lokhu kungahlanganiswa nezinhlelo ezisebenzayo zokuphatha amanzi emvula, njengezimisele zokumunca amanzi, amachibi okugcina amanzi, noma ukuthuthukiswa kokukhipha amanzi.

Izakhiwo kufanele futhi zifake ukufakwa okuvikela ukushisa nokwakhiwa okuvala kahle umoya ukuze kuncishiswe ukuvezwa ekushiseni ngaphakathi. Lezi zinyathelo zisiza ukugcina ukunethezeka kwangaphakathi futhi zivikele izakhamuzi ngesikhathi sezehlakalo zokushisa okukhulu.

3. Umklamo Ongasebenzisi Amandla Amaningi

Umklamo ongasebenzisi amandla amaningi usiza izakhiwo ukulawula izinga lokushisa nokusebenzisa amanzi kahle ngaphandle kokuthembela kakhulu emandleni noma engqalasizindenini yangaphandle. Ngokuklama okuhlakaniphile nezinto zokwakha, amakhaya angahlala epholile, ekhululekile, futhi esebenzisa izinsiza kahle.

Izinto zokwakha ezinomthamo omkhulu wokugcina ukushisa zimunca ukushisa emini futhi zikukhiphe kancane ebusuku. Lokhu kusiza ukuzinzisa amazinga okushisa angaphakathi nokunciphisa ukushisa ngokweqile. Ukugwema ingilazi namafasitela





amakhulu nakho kungasiza, ngoba kuvame ukwenza izakhiwo zishise ngokushesha. Isibonelo, izinto ezifana namabhulokhi omhlaba, itshe, nezindonga zikakhonkolo zingathuthukisa ukusebenza kokushisa.

Izakhiwo zingaklanywa futhi ukuze zikhuthaze ukugeleza komoya okunqamula phakathi kwamakamelo, okuvumela umoya ukuhamba ngokwemvelo. Amasu ahlanganisa ukubeka amafasitela ezindongeni ezibhekene, ukusebenzisa ophahleni abaphakeme, nokufaka izimbobo zokungenisa umoya ezakha “umphumela we-chimney” ukuze kukhishwe umoya oshisayo.

Izakhiwo ezikhona zingathuthukisa ukunethezeka ngokulungiswa kabusha. Isibonelo, ukwengeza umthunzi wangaphandle njengezihlahla, ama-veranda, noma ama-shutter, ukuthuthukisa ukufakwa kophahla, ukuthuthukisa ukuhamba komoya, nokufaka amafasitela awonga amandla kungathuthukisa kakhulu izimo zangaphakathi.

Izakhiwo kufanele futhi zifake ukufakwa okuvikela ukushisa nokwakhiwa okuvala kahle umoya ukuze kuncishiswe ukuvezwa ekushiseni ngaphakathi. Lezi zinyathelo zisiza ukugcina ukunethezeka kwangaphakathi futhi zivikele izakhamuzi ngesikhathi sezehlakalo zokushisa okukhulu. Umklamo wezindlu unganciphisa futhi isidingo samanzi ngokufaka:



Umfanekiso 48. Amasu okuklama angenzi lutho asiza ukugcina izindlu zipholile futhi zikhululekile ezimweni zezulu ezishisayo.

- Izinto zokusebenzisa amanzi ngendlela eyonga amanzi
- Izinhlelo zokuqoqwa kwamanzi emvula
- Amathangi okugcina amanzi ukuze kusetshenziswe kabusha amanzi ampunga noma amanzi emvula

4. Ukuzimela Ngokwakho (Ukusebenza Ngaphandle Kwenethiwekhi)

Amakhaya aqinile kufanele aqhubeke esebenza ngisho nalapho ingqalasizinda yedolobha yehluleka. Ukuklama izinhlelo zezindlu ezingasebenza ngokuzimela kusiza imiphakathi igcine izinsizakalo ezibalulekile ngesikhathi sokuphazamiseka.





Amakhaya angahlanganisa izinhlelo zamandla avuselelekayo ukuze agcine ugesi ngesikhathi sokunqamuka kukagesi. Isibonelo, amaphaneli elanga ophahleni, izinhlelo zokugcina amandla ebhethrini, nezinhlelo zamandla ezincane ezisakazekile zingasekela imindeni nomakhelwane.

Izakhiwo zingathuthukisa futhi ukuphepha kwamanzi ngezinhlelo zokuqoqwa nokugcinwa kwamanzi emvula. Izibonelo zihlanganisa:

- Ukuqoqwa kwamanzi emvula ophahleni
- Amathangi okugcina amanzi



Umfanekiso 49. Amandla elanga aqinisekisa ukufinyelela kagesi.

- Ukusetshenziswa kabusha kwamanzi ampunga ekuniseleni noma ekuhlaleni

Amakhaya kufanele aklanyelwe ukugcina izimo zokuphila eziyisisekelo ngesikhathi sezimo ezinzima, njengokunqamuka kukagesi, ukusweleka kwamanzi, noma izehlakalo zesimo sezulu esibi kakhulu. Lokhu kuhlanganisa

izinhlelo zokusekela zokukhanyisa, ukufinyelela emanzini, nokungenisa umoya.

Ukuba nezinhlelo zokusekela nakho kubalulekile: ukuklama izinhlelo ezinezindlela zokubuyisela emuva kuqinisekisa ukuthi uma ingxenye eyodwa yehluleka, isibonelo iphampu, indlu ingaqhubeka nokusebenza.

5. Isixazululo Esisekelwe Emvelweni

Izindlu eziqinile esimweni sezulu kufanele zisebenze nemvelo kunokuba ziphikisane nayo. Ukuhlanganisa izinhlelo zemvelo ekuklameni izindawo zomakhelwane kunganciphisa izingozi zesimo sezulu kuyilapho kuthuthukisa izimo zokuphila.

Uhlaza lwasemadolobheni eduze kwezakhiwo lusiza ukunciphisa ingcindezi yokushisa ngokunikeza umthunzi nokupholisa ngokukhishwa komswakama ezitshalweni. Isibonelo, izihlahla zasemgwaqweni, amapaki, imigudu eluhlaza, nokulima emadolobheni kunganciphisa amazinga okushisa futhi kuthuthukise ukunethezeka ezindaweni zasemadolobheni eziminyene.

Uphahla oluluhlaza nezitshalo ezimile mpo zingasiza ukwehlisa amazinga okushisa angaphakathi, zithuthukise ukufakwa kokuvikela ukushisa, futhi ziphathe amanzi emvula. Zibuye zifake isandla ekuthuthukiseni ikhwalithi yomoya kanye nokuhlukahluka kwemvelo emadolobheni.





Ukukhipha amanzi okusekelwe emvelweni kungasiza amadolobha ukuphatha amanzi emvula nokunciphisa izingozi zezikhukhula ezakhiweni. Izibonelo zihlanganisa:

- Izindawo ezingenisa amanzi ezithatha indawo kakhonkolo ngezivande noma ngamatshe agandayiwe avumela amanzi emvula ukuthi angene emhlabathini
- Ama-bioswale
- Amachibi okugcina amanzi
- Amaxhaphozi abuyiselwe esimweni



Umfanekiso 50. Izindonga eziluhlaza zisiza ukupholisa izakhiwo ngokwemvelo.

Umklamo womakhelwane

ungahlanganisa futhi izivikelo zemvelo nengqalasizinda eluhlaza ukuze kuvikelwe izindlu ezingozini zesimo sezulu. Izibonelo zihlanganisa:

- Ama-mangrove asogwini
- Amabhange emifula abuyiselwe esimweni
- Izindawo eziluhlaza ezigcina izikhukhula

Lezi zindlela zibonisa ukuthi ukusebenza nezinhlelo zemvelo kungaqinisa ukuqina kuyilapho kuletha izinzuzo ezengeziwe zemvelo nezomphakathi.

Izindlu eziqhutshwa umphakathi kanye nokuqina komphakathi

Ukuqina kwezindlu kuyathuthuka lapho imiphakathi ibamba iqhaza ekwakheni izixazululo. Izindlela ezisemqoka zihlanganisa:

- **Ukuhlela ngokubamba iqhaza**, okubandakanya izakhamuzi ezinqumweni zezindlu nezomakhelwane.
- **Ukuthuthukiswa kwezindawo zokuhlala ezingahlelekile**, okugxile ekuthuthukiseni izindlu ezikhona esikhundleni sokususa imiphakathi.
- **Izindlu ezibandakanya ubulili**, okuqinisekisa ukuthi izindlu ziphendula ezidingweni zabetesifazane namaqembu asengozini.
- **Ukuhlenganiswa kwezindlela zokuziphilisa**, okuxhumanisa izindlu nokufinyelela emisebenzini nasezinsizakalweni.

Le ndlela ibaluleke kakhulu ngoba, emadolobheni amaningi, imindeni engenayo ephansi yakha iningi lezakhamuzi zasemadolobheni, kodwa ngokuvamile ayikwazi ukufinyelela uxhaso lwezindlu olusemthethweni. Ngakho-ke, ukuqinisa ukuqina kwezindlu kudinga ukuhlenganisa izixazululo zezindlu ezisekelwe emakethe





nokutshalwa kwezimali komphakathi, izinqubomgomo zezindlu zomphakathi, kanye noxhaso olubandakanyayo.

Ukuvikela imiphakathi esengozini

Izakhamuzi ezisezindaweni zokuhlala ezingahlelekile zivame ukubhekana nezingozi ezimbili: izingozi zesimo sezulu kanye nengcindezi yokuxoshwa. Ngakho-ke, amasu ezindlu eziqinile kufanele agxile ekuvikeleni, ekuthuthukiseni, nasekusekeleni imiphakathi ekhona esikhundleni sokuyisusa.

Ukubamba iqhaza kudlala indima ebalulekile kule nqubo futhi kufanele kube okufinyeleleka kalula futhi okubandakanyayo. Lokhu kusho ukuthi izinqubo, izindawo, nolwazi kwakhiwa ngendlela yokuthi wonke umuntu akwazi ukubamba iqhaza, kungakhathaliseki amandla omzimba, ulimi, indawo, noma imikhawulo yesikhathi. Kubandakanya futhi ukususa izithiyo ezifana nezindawo ezingafinyeleleki kalula, ulimi oluyinkimbinkimbi, noma izikhathi zemihlangano ezingalungile. Ngesikhathi esifanayo, ukubamba iqhaza kufanele kuqinisekise ngokusebenzayo ukuthi amaqembu ahlukahlukene ayamelwa futhi abandakanywe ekuthathweni kwezinqumo, ikakhulukazi labo abavame ukukhishwa inyumbazane, njengabesifazane, intsha, abantu abakhubazekile, kanye nemiphakathi engenayo ephansi.

Ngokwenza, lokhu kungahlanganisa:

- Imihlangano ngezikhathi nasezindaweni ezifinyeleleka kalula
- Izinto zokufunda ngolimi olulula
- Ukusekelwa kokunakekelwa kwezingane
- Ukuhumusha ngolimi lwezandla
- Ukubandakanya ngokulinganayo abesifazane, intsha, abantu abadala, kanye nabantu abakhubazekile

Ngokuqinisekisa ukuthi ukubamba iqhaza kufinyeleleka kalula futhi kubandakanya wonke umuntu, amadolobha angaklama izixazululo zezindlu ezibonisa kangcono izidingo zomphakathi futhi ziqinise ukuqina kwesikhathi eside.

Inqubomgomo, uxhaso lwezimali kanye nokuphatha

Ukwakha izindlu eziqinile esimweni sezulu kudinga okungaphezu komklamo omuhle. Amadolobha adinga futhi izinqubomgomo ezifanele, izindlela zoxhaso lwezimali, kanye nezinhlelo zokuphatha ukuze asekele futhi andise izixazululo zezindlu eziqinile.

Ukuxhasa ngezimali izindlu eziqinile





Amasu oxhaso lwezimali kufanele abonise ukuhlukahluka kwabalingisi kanye namaqiniso ezimali emindeni engenayo ephansi. Imithombo ehlukahlukene yoxhaso ingasekela izindlu eziqinile:

- Ukutshalwa kwezimali komphakathi ezingqalasizindenini eziyinhloko, ezinhlelweni ezisekelwe emvelweni, nasezicini zokuklama okubandakanyayo
- Abathuthukisi abazimele nababolekisi abaxhasa ukwakhiwa kwezindlu lapho izingozi zibikezelwa
- Uxhaso lomphakathi, njengamaqembu okonga nama-cooperative ezindlu asekelwa ukuthuthukiswa kancane kancane

Izibonelo zamathuluzi oxhaso lwezimali zihlanganisa uxhaso oluluhlaza, izikweletu ezincane nezibonelelo, kanye nobambiswano phakathi komkhakha kahulumeni nowangasese.

Ukuphatha kanye nokulawulwa

Ukuphatha okuqinile kusiza amadolobha ukuklama, ukusebenzisa, nokuphoqelela izinqubomgomo zezindlu eziqinile. Izinyathelo ezisemqoka zihlanganisa:

- Izinqubomgomo zezindlu eziphendula esimweni sezulu
- Amakhodi okwakha nemithetho yokuhlelwa kokusetshenziswa komhlaba ebuyekeziwe
- Ukuxhumana okungcono phakathi kwezikhungo ezibhekele izindlu, umhlaba, nengqalasizinda

Lezi zinhloko zisiza ukuqinisekisa ukuthi amazinga okuqina asetshenziswa ngokungaguquki kuyo yonke intuthuko yasemadolobheni.

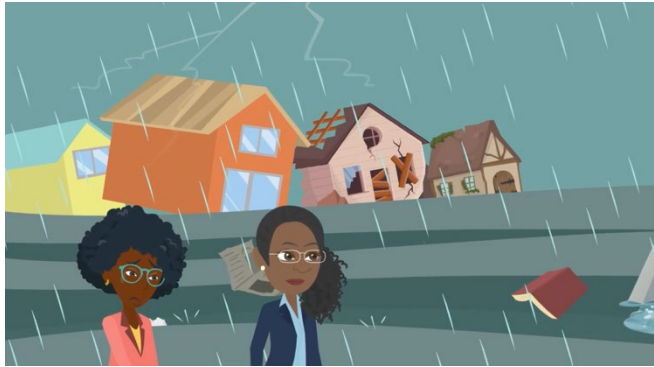
Indawo esebenzayo yokuqala ukugxila ezakhiweni zomphakathi. Amadolobha angaqala ngokulungisa kabusha izakhiwo zikamasipala, njengezikole noma izibhedlela, ezingasebenza imisebenzi eminingi, okuhlenganisa ukusebenza njengezikhungo zokupholisa ngesikhathi sokushisa okukhulu kanye njengezindawo zokukhosela eziphuthumayo ngesikhathi sezivunguvungu noma izinhlekelele. Amaphrojekthi okuhlola nawo angasiza amadolobha ukuvivinya izixazululo zokuklama eziqinile futhi abonise izindlela ezingasetshenziswa kamva ezindlini ngezina elikhulu.

Ucwaningo Lwesibonelo: Izindlu Eziqinile Esimweni Sezulu eLagos, eNigeria

ILagos, idolobha elikhulu kunawo wonke eNigeria, ingenye **yezindawo zasemadolobheni ezikhula ngokushesha kakhulu emhlabeni**, inabantu

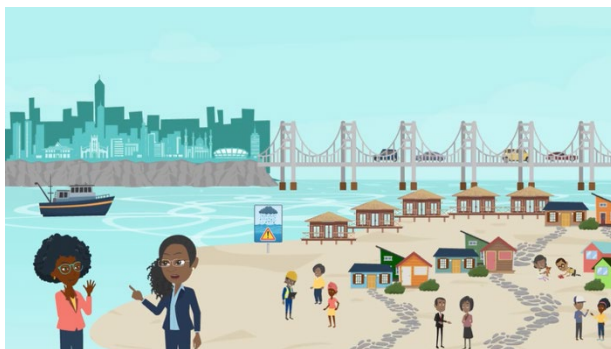


abangaphezu kwezigidi ezingama-20. Ukukhula okusheshayo kwabantu basemadolobheni kukhulise kakhulu isidingo sezindlu, kodwa ukuthuthukiswa kwezindlu kube nzima ukuhambisana naleso sidingo. Ngenxa yalokho, izakhamuzi eziningi zihlala ezindaweni zokuhlala ezingahlelekile lapho ikhwalithi yezindlu nengqalasizinda kungalinganiselwe.



Umfanekiso 51. Izikhukhula nemvula enamandla kwandisa ubuthakathaka bezindlu eLagos.

Isimo sendawo yedolobha siphinde sikhulise ubungozi balo. ILagos isendaweni yamachibi asogwini, kanti izindawo eziningi ziphakeme kancane kuphela ngaphezu kwezinga lolwandle. Kuhlangukane nemvula enamandla nezinhlelo zokukhipha amanzi ezinganele, lokhu kwenza idolobha livezwe kakhulu ezikhukhuleni. Ukuguquka kwesimo sezulu kuqinisa lezi zinselelo, ngemvula evame kakhulu futhi enamandla edlula amandla engqalasizinda, okwandisa izikhukhula zasogwini nokukhuphuka kwezinga lolwandle, futhi kufaka isandla ekuzikeni komhlaba nasekugugulekeni. Ngesikhathi esifanayo, izindawo zokuhlala ezakhiwe ngokuminyene zibhekene nokushisa okukhulu, okuphinde izimo zokuphila.



Umfanekiso 52. Ukuhlelwa okuthuthukisiwe nengqalasizinda kusiza ukunciphisa izingozi zesimo sezulu eLagos.

Ukuphendula lezi zinselelo, uHulumeni Wesifunda saseLagos wethule izinhlelo eziningana zokuthuthukisa ukuhlinzekwa kwezindlu nokuqinisa ukuqina kwedolobha. Izinyathelo ezisemqoka zenqubomgomo zihlanganisa ukunweba izinhlelo zezindlu ezingabizi, ukuthuthukisa ukuhlelwa kwedolobha nokulawulwa kokusetshenziswa komhlaba, ukutshala imali ezingqalasizindeni zokukhipha amanzi

nokulawula izikhukhula, kanye nokuhlangukane izimo zesimo sezulu ekuhlelweni kwentuthuko yasemadolobheni.

Uxhaso lwezimali lusese yinselelo ebalulekile ekubhekaneni nezidingo zezindlu ngezinga elikhulu. ILagos ihlole izindlela eziningi zoxhaso lwezimali, okuhlangukane ubambiswano nabathuthukisi abazimele, izinhlelo zemalimboleko yezindlu nezinhlelo zoxhaso lwezindlu, ukutshalwa kwezimali komphakathi ezingqalasizindeni nasezindaweni zezindlu, kanye nokusebenzisana nabalingani bentuthuko. Le mizamo



ihlose ukuhlanganisa izinsiza zomphakathi nezangasese ukuze kusekelwe ukuthuthukiswa kwezindlu ngezina elikhulu.

Izindlu eziqinile eLagos nazo zigxile ekunciphiseni ukuvezwa ezingozini zesimo sezulu ngokuklama nokuhlela okuthuthukisiwe. Lokhu kuhlanganisa ukuqinisa izinhlelo zokukhipha amanzi emvula, ukuthuthukisa ukukhethwa kwezindawo nokuhlelwa kokusetshenziswa komhlaba, kanye nokwakha imiklamo yezindlu evumelana nezikhukhula nezimo zezulu ezimbi kakhulu.

Okuhlangenwe nakho kweLagos kugqamisa izifundo eziningana ezibalulekile. Ukwakha izindlu eziqinile esimweni sezulu kudinga isenzo esihambisanayo emikhakheni eminingi. Amadolobha kudingeka ahlunganise ingozi yesimo sezulu ekuhlelweni kwezindlu, aqinise ukuphatha kwedolobha nokuxhumana kwezikhungo, aqoqe izindlela ezahlukeneyo zoxhaso lwezimali, futhi athuthukise ingqalasizinda nokuhlelwa kokusetshenziswa komhlaba kanye nokuthuthukiswa kwezindlu.

Njengoba iLagos ibonisa, ukubhekana nezinselelo zezindlu emadolobheni akhula ngokushesha kudinga hhayi kuphela ukwandisa ukuhlinzekwa kwezindlu, kodwa futhi nokuqinisekisa ukuthi izindlu ziphephile, zibandakanya wonke umuntu, futhi ziqinile ezingozini zesimo sezulu.

Ukupholisa ngendlela yemvelo ukuze kuqiniseke ukumelana nokushisa

Emadolobheni afana neLagos, ukwanda kwamazinga okushisa nokufinyelela okulinganiselwe kugesi kwenza ukupholisa kube yinselelo ebalulekile ezindlini.

Inselelo: Ukushisa okukhulu: amazinga okushisa ngaphakathi ezindlini emadolobheni aseNigeria avame ukudlula ku-30°C ngaphandle kokupholisa ngomshini, okwenza amakhaya angakhululeki futhi kwesinye isikhathi angaphephile. Kulinganiselwa ukuthi abantu abayizigidi eziyi-114.9, okuyi-53% yabantu, basengozini enkulu yokushisa okukhulu. Ngesikhathi esifanayo, imindeni eminingi ayinawo ugesi othembekele wokusebenzisa ama-air conditioner, okunciphisa amandla ayo okubhekana nokukhuphuka kwamazinga okushisa. Ngenxa yalokho, izixazululo zokupholisa ezingabizi zibalulekile ekuthuthukiseni izimo zokuphila ezindlini zasemadolobheni.

Impendulo yenqubomgomo: ukuphendula lezi zinselelo, iNigeria yethule i-Building Energy Efficiency Code ngo-2017. Le khodi ikhuthaza ukwakhiwa kwezakhiwo ezisebenzisa umklamo wokupholisa ngokwemvelo, ikhuthaza ukwakha ngendlela eyonga amandla, futhi ihlose ukunciphisa ukuthembela ezinhlelweni zokupholisa ngomshini. Lezi zinyathelo zisekela izindlela ezisimeme nezifinyeleleka kalula zokulawula ukushisa ezindlini zasemadolobheni.





Izixazululo zokupholisa ngokwemvelo ezihlolwe eLagos: ucwaningo namaprojekthi okuhlola abonisa ukuthi amasu okungenzi lutho angathuthukisa kakhulu ukunethezeka kwangaphakathi. Izindlela ezisemqoka zihlanganisa:

- **Okungenisa umoya wemvelo** ngokuma kwesakhiwo nokubekwa kwamafasitela
- **Umklamu wokupholisa ngokwemvelo** kumaprojekthi ezindlu zomphakathi njenge-Jakande Housing Estate
- **Uphahla oluluhlaza** nezindonga eziluhlaza ezinciphisa ukumuncwa kokushisa

Ucwaningo luthole ukuthi izindonga eziluhlaza zinganciphisa amazinga okushisa angaphakathi cishe ngo-2.3°C, zithuthukise ukunethezeka futhi zinciphise isidingo samandla.

Ezinye izinsiza

Kulabo abanesifiso sokuhlola lesi sihloko ngokujulile, ucwaningo nezinsiza ezingana zinikeza ukuqonda okujulile ngokupholisa ngokwemvelo nezindlu eziqinile esimweni sezulu eLagos nakwamanye amadolobha ase-Afrika. Lokhu kuhlenganisa imibhalo ebalulekile yenqubomgomo, izifundo zocwaningo, nezibonelo ezisebenzayo.

Ezinye izinsiza ezinconywayo yilezi:

- Uhulumeni Wesifundazwe saseLagos [Uhlelo Lokuzivumelanisa Nesimo Sezulu Nokubekezela](#) (2024)
- [Amathemba Athusayo: Ukupholisa okusimeme ezakhiweni nasemadolobheni – isifundo secala saseNigeria \(Amandla Asimeme Kubo Bonke\)](#)
- [Ukuthuthukisa Induduzo Yokushisa Emafulethini Aphakeme Ngamasu Okuklama Angasebenzi eLagos, eNigeria \(IIETA\)](#)
- [Ukusetshenziswa Kwamasu Okungenisa Umoya Emvelo Okuthuthukisa Induduzo Yokushisa Nokusebenza Kahle Kwamandla Ezindlini Ezingabizi Kakhulu eLagos State, eNigeria \(I-ABUAD Journal of Social and Management Sciences\)](#)

Lezi zinsiza zinikeza **izibonelo ezisebenzayo, ukuqondisa kobuchwepheshe, kanye nemiphumela yocwaningo** engasekela ukuklanywa nokusetshenziswa kwezixazululo zezindlu eziqinile esimweni sezulu.

Amaphuzu asemqoka

Njengoba amadolobha eqhubeka nokukhula futhi izingozi zesimo sezulu ziba zimbi kakhulu, ukwakha izindlu eziqinile kuba yinto ebalulekile ekuvikeleni abantu, ukuthuthukisa izimo zokuphila, kanye nokuqinisekisa intuthuko yasemadolobheni





esimeme. Amaphuzu asemqoka alandelayo afinyeza ukuqonda okukhulu okuvela kule module:

- Ukukhula okusheshayo kwamadolobha e-Afrika kudala isidingo esiphuthumayo sezindlu ezingabizi. Ingxenye enkulu yalokhu kwanda yenzeka ezindaweni zokuhlala ezingahlelekile ezivame ukuntula izinsizakalo futhi ezivezwe ezingozini zesimo sezulu.
- Ukuze kuvikelwe imiphakathi, izindlu kufanele ziklanywe ukuze zimelane, zijwayele, futhi zilulame ezingozini zesimo sezulu ezifana nezikhukhula, ukushisa okukhulu, nezivunguvungu.
- Izindlu eziqinile azigcini nje ngezakhiwo. Zibuye zincike ekuhleleni kwedolobha, ingqalasizinda, ukuphathwa komhlaba, kanye namazinga okwakha.
- Izixazululo zezindlu eziphumelelayo zidinga ukuphatha okuqinile, izindlela zoxhaso lwezimali, kanye nokubamba iqhaza okusebenzayo okuvela emiphakathini.

