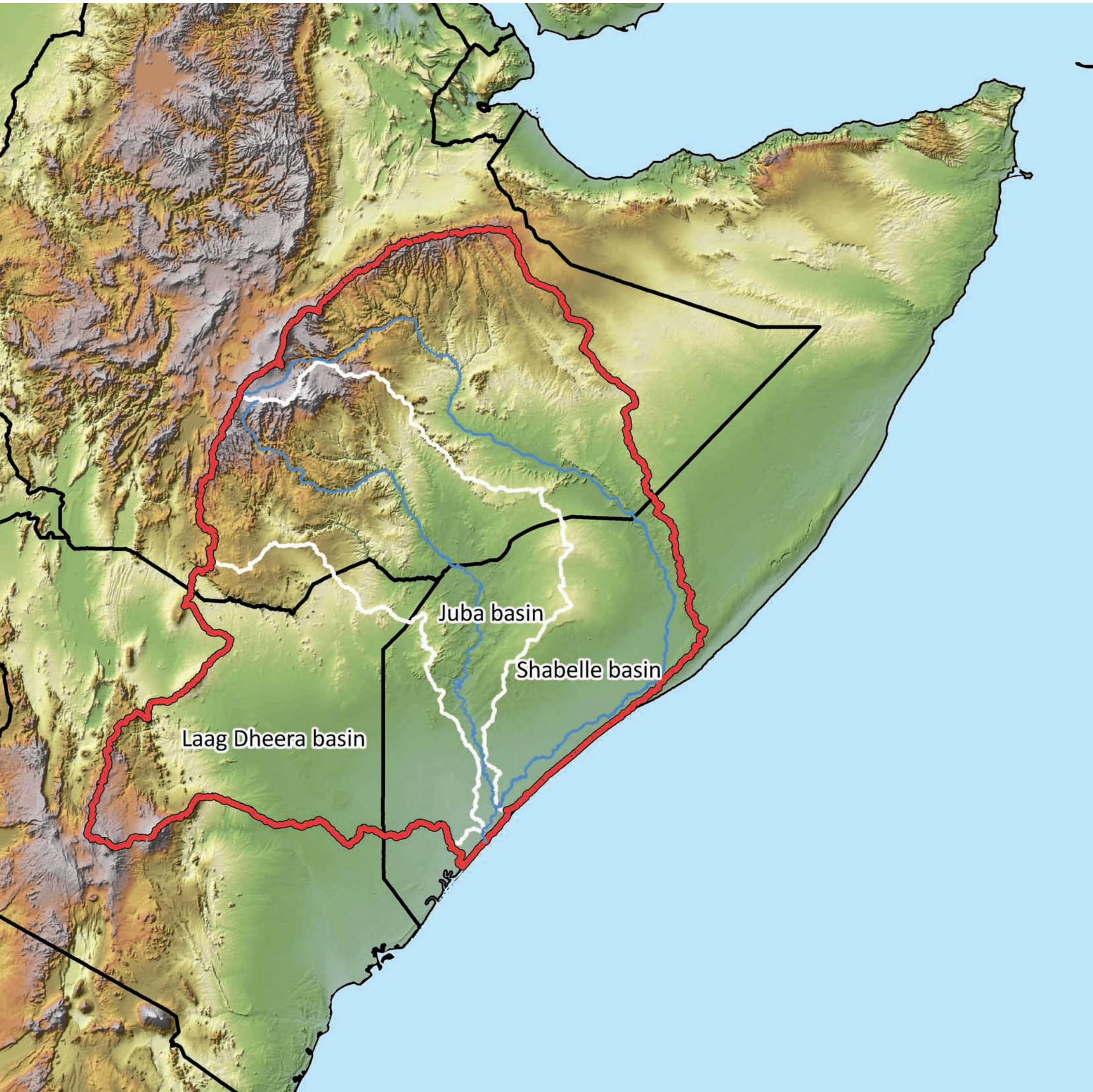


Part 1



The Juba - Shabelle transboundary river basin - General features

Galka isaga gudba xuduudaha ee wabiyada Juba iyo Shabeelle - Muuqallo guuda



River basins and drainage network

The Juba and Shabelle are the two major catchments contributing to perennial surface flow in southern Somalia. About two-thirds of these catchments lie outside Somalia, mostly in Ethiopia, and part of the Juba catchment lies in northern Kenya. The Laag Dheera catchment, about three-quarters of which lie in Kenya, joins the Juba catchment in the lower reaches through a natural depression.

The Juba basin

The Juba basin lies roughly between 38° 1' and 46° 0' east of the Prime Meridian and between 0° 15' and 7° 28' north of the Equator. The altitude of the Juba basin ranges from a few meters above sea level (a.s.l.) at the Indian Ocean to over 3 000 m a.s.l. in the Ethiopian highlands. The total catchment area of the Juba basin at the mouth of the river, north of Kismaayo, is about 221 000 km² (based on catchment delineation from SRTM 30m DEM by USGS) 65% of which is in Ethiopia, 30% in Somalia and 5% in Kenya. Within Somalia the Juba basin covers the administrative regions of Gedo, Bay, Bakool, Middle Juba and Lower Juba.

The Juba River has three main tributaries in its upper catchment in Ethiopia: Weyb, Genale and Dawa all of which flow south-eastwards. Tributaries of the Genale River originate from the southern flanks of the Bale Mountains, and from the Sidamo Mountains in the north-west. The Dawa River originates in the Sidamo Mountains while Weyb River originates from the northern parts of the Bale Mountains.

The total length of the Juba River is about 1 808 km (measured on the longest tributary), of which 804 km lies in Ethiopia and 1 004 km lies in Somalia (based on SRTM 30m DEM derived streams by USGS). Rivers Genale and Dawa flow in deep valleys until they reach flatter and broader areas along their respective flood plains at elevations below 400 m a.s.l. However, the Weyb River flows mostly in a wide valley with intermitted deeply incised reaches along its course. The Weyb converges with Genale near the Somalia border at Doolow, before joining the Dawa shortly downstream. From this point the combined water course becomes the Juba River, which flows into Somalia. After entering Somalia, the river continues to flow south-easterly until it reaches the town of Luuq, from which point it flows gently southwards and into the Indian Ocean. In Somalia the Juba River has no major tributaries apart from the occasional confluence of Laag Dheera, during exceptional flood times, almost at the mouth of the river.

The Shabelle basin

The Shabelle basin lies roughly between 38° 40' and 46° 9' east of the Prime Meridian and between 0° 15' and 9° 38' north of the Equator. The Shabelle River does not have a proper mouth but it enters the Juba River during exceptionally high flows. The Shabelle originates from the Bale Mountains in the eastern Ethiopian highlands, at an altitude of about 4 230 m a.s.l. The total catchment area of the Shabelle River at its confluence with the Juba River is about 297 000 km², based on catchment delineation using SRTM 30 m DEM from USGS. Two-thirds of the catchment (188 700 km²) lies in Ethiopia and the rest (108 300 km²) lies in Somalia. Within Somalia the Shabelle basin covers the administrative regions of Hiran, Middle Shabelle, Lower Shabelle and parts of Bay, Bakool and Middle Juba.

The basin within Ethiopia is divided into three portions: the upper valley where the river is intermixed between steep slopes, plains and meanders in deep valleys; the middle valley where the river is suddenly deeply embedded in limestone plateaus; and a lower valley where the river flows in a vast alluvial plain with a very gentle slope of 0.25 to 0.35 m/km. Among the significant tributaries to the river within Ethiopia are the Maribo, Ulul, Hadida, Siyanan, Ungwata, Ramis, Errer and Daketa Rivers. The total length of the main course of the Shabelle River inside Ethiopia, from the source to the Somalia border is about 1 290 km.

Inside Somalia, the Shabelle River traverses additional distance of 1 236 km of gently sloping terrain. Near the coastal stretch of the Indian Ocean, the river runs into a series of swamps. Downstream of the swamps the river resumes

Galalka wabiyada iyo isku xirka biyomareennada

Juba iyo Shabelle waa labada biyoqabatinnada ugu muhiimsan oo keena biyaha joogtada u dul qulqula koofurta Soomaaliya. Qiyaastii saddex dalool laba ka mid ah labada biyoqabatin waxay dhacaan dibadda Soomaaliya, inta ugu badan gudaha Itoobiya, iyo qaar ka mid ah biyoqabatinada Juba oo dhaca Kenya. Biyoqabatinka Laag Dheera, oo qiyaastii afar dalool saddex ka mid ah ay ku taal Kenya, wuxuu kaga darsamaa biyoqabatinka Juba dhanka hoose oo uu sii dhexgalo dhasheeg dabiici ah.

Galka Juba

Galka Juba wuxuu ku yaal ku dhawaad inta dhaxaysa 38° 1' iyo 46° 0' bariga loolka koowaad iyo inta dhaxaysa 0° 15' iyo 7° 28' waqooyiga Dhulbaraha. Joogga sare ee galka Juba waxuu u dhaxeeyaa in dhawr mitir ka kor heerka badda badweynta Hindiya iyo wax ka saraysa 3 000m celceliska heerka badda xagga buuraleyda sare ee Itoobiya. Wadarta bedka biyoqabatinka galka Juba ilaa afka webiga, waqooyiga Kismaayo, qiyaastiisu waxay tahay 221 000 km² (oo ku salaysan wareegga xagga SRTM 30m ee USGS) oo ay 65% ku taal Itoobiya, 30% gudaha Soomaaliya iyo 5% gudaha Kenya. Gudaha Soomaliya galka Juba wuxuu ku fidsanyahay gobollada Gedo, Bay, Bakool, Jubada Dhexe iyo Jubada Hoose.

Webiga Juba wuxuu ku leeyahay saddex biyomareen (togag) oo muhiim ah oo isku soo shuba gudaha dhanka biyoqabatinkiisa sare ee Itoobiya: Weeb, Ganaane iyo Daawa oo dhammaantood u socda xagga koofur-bari. Togagga Wabi Ganaane waxay ka soo unkamaan dacallada koofureed ee Calaha Baale, iyo xagga waqooyi-galbeed ee Calaha Sidaamo. Wabi Daawa wuxuu ka soo unkamaa Calaha Sidaamo halka Wabi Weeb uu ka soo unkamo qaybaha waqooyi ee Calaha Baale.

Wadarta dhererka Wabiga Juba qiyaastii waa 1 808 km (oo laga cabiray togga ugu dheer), oo 804 km ay dhacdo gudaha Itoobiya (oo ku salaysan SRTM 30m cabirka togagga la xigtay USGS). Wabi Ganaane iyo Wabi Daawa waxay ku socdaan caloosha dooxyo mool ah ilaa ay gaaraan meelo yara siman oo ballaaran oo ku dherersan dhooxooyin mid waliba ka hooseeyo 400 m celceliska joogga heerka badda. Hase yeeshee, Wabi Weeb wuxuu badanaa ku socdaa calool doox ballaaran oo ay ku soo biiraan kuwo hoos u qodan inta uu socdo. Wabi Weeb wuxuu kaga soo darsamaa Wabi Ganaane meel xadka Soomaaliya u dhaw ee Doolow Adow, ka hor inta uusan kaga biirin Wabi Daawa xagga biyoshubka hoose. Halkaan laga bilaabo biyaha wabiyada isu yimid waxay sameeyaan Wabi Juba kaasoo ku qulqula gudaha guda=ha Soomaaliya. Ka marka uu Soomaaliya galo, wabigu wuxuu sii wadaa inuu u qulqulo dhinaca koofur-bari ilaa uu gaaro magaalada Luuq, halkaas oo uu u yara weecdo xagga koofureed ilaa uu gaaro Badweynta Hindiya. Gudaha Soomaaliya Wabi Juba kuma laha togag muhiim ah oo biyo ku biirsha marka laga reebo Laag Dheera oo mar-mar ku soo darsama, waqtiyo ay socdaan fatahaaduhu aan caadi ahayn, meel u dhaw afka webiga Juba.

Galka Shabeelle

Galka Shabeelle wuxuu dhacaa qiyaastii inta u dhaxaysa 38° 40' iyo 46° 9' bariga loolka koowaad iyo inta u dhaxaysa 0° 15' and 9° 38' waqooyiga Dhulbaraha. Wabiga Shabeelle mala af dhab ah, balse wuxuu ku darsamaa Wabi Juba marka uu jiro biyosocod sare oo aan caadi ahayn. Shabeelle wuxuu ka soo dhashaa Calaha Baale, ee bariga buuraleyda sare ee Itoobiya, oo joog sare qiyaastu tahay 4 230 m kakor celceliska heerka joogga badda. Wadarta bedka biyoqabatinka Wabiga Shabeelle ila la gaaro halka uu kaga darsamo Wabi Juba waxay qiyaastu tahay 297 000 km², (oo ku salaysan wareegga biyoqabatinka oo loo adeegsaday SRTM 30 m ee USGS). Saddex dalool laba biyoqabatinka (188 700 km²) wuxuu dhacaa gudaha Itoobiya, inta kalana (108 300 km²) waxay dhacdaa gudaha Soomaaliya. Gudaha Soomaaliya galka Shabeelle wuxuu ku fidsan yahay gobollada Hiiraan, Shabeellaha Dhexe, Shabeellaha Hoose iyo qaybo ka tirsan Bay, Bakool iyo Jubada Dhexe.

Galka intiisa gudaha Itoobiya waxay u qaybsantaa saddex qaybood: qaybta sare ee dooxada halkaasoo webiga ay iskugu dhexdarmaan jan-jeero hoobad ah, dhul siman iyo leexlexyo oo mara dooxooyin hoos ugodan; dhexbartamaha dooxada halka webigu si kedis u galo meel qotodheer oo oogo dhagax ah; iyo doox hoos jirta oo ah meel webigu ku dhexsocdo dooxo siman oo ballaran oo jan-jeer dabacsan oo 0.25 ilaa 0.35m/km ah.

a defined channel, but the flows are very much reduced and the Shabelle discharges into the Juba only in times of exceptional floods. The swamp areas (wetland) which are fed by the Shabelle may have a high ecological value in terms of habitat for flora and fauna as well as recharge areas of the groundwater aquifers lying in the area.

The Laag Dheera basin

The Laag Dheera basin lies roughly between 36° 12' and 42° 35' east of the Prime Meridian and between 0° 20' south and 4° 35' north of the Equator. The basin covers three administrative regions, Gedo, Middle Juba and Lower Juba within Somalia.

The total catchment area of the Laag Dheera River at its confluence with Juba is about 231 000 km² (based on SRTM 30 m DEM derived catchment delineation from USGS), out of which 80% is in Kenya. The Laag Dheera basin includes the Ewaso Nyiro River in Kenya and all the drainage from the north-eastern flanks of Mt Kenya which lies in Kenya. Its elevation ranges from almost sea level to the 5 195 m a.s.l in Mount Kenya. Within Somalia, the catchment area is all below 700 m a.s.l Slopes vary from steep to very steep in the mountains in the south-west and along the western boundary.

Much of the drainage network is not well defined. It consists of seasonal water courses of different lengths and carries runoff only after heavy rainfall. The larger parts of the seasonal streams are Lagh Kutulo in the north-east and Lagh Bor and Lagh Bogal in the centre of the basin. Much of the rainfall evaporates or infiltrates in the flat lands and the broad shallow valleys. The flows from Laag Dheera rarely reach the Juba as most water disappears in swamps in the south of the basin.

Note: For more detailed analysis and reference list, consult the SWALIM water reports series.

Togagga ugu muhiimsan oo biyeeya Wabiga Shabeelle oo ku yaal gudaha Itoobiya waxay kala yihiin wabiyada Mariibo, Ulul, Hadida, Siyanan, Ungwata, Ramis, Errer iyo Daketa. Wadarta dhererka socodka dooxa Wabi Shabeelle gudaha Itoobiya, laga soo bilaabo halka uu ka soo unkamo ilaa xadka Soomaaliya waxay qiyaastu tahay 1 290 km.

Gudaha Soomaaliya, Wabi Shabeelle wuxuu dhexmara dhul kala fogaan dhererku yahay 1 236 km oo leh geyi jan-jeer dabacsan. Meel u dhaw jiidada xeebta Badweynta Hindiya, wabigu wuxuu dhexqaadaa meelo biyofariisino isdabayaal ah. Dhanka biyoshubka hoos ka jira biyofariisinnada isdabayaal wabigu wuxuu dib u yeelanaya marin-caloolood u gaar ah, laakiin biyo socodka ayaa aad u yaraada, markaa ka dib Shabeelle wuxuu ku darsamaa Wabi Juba waqtiyada ay jiraan fatahaado aan caadi ahayn. Meelaha biyofariisiga ah (dhulka qoyanaha ah) oo uu Wabi Shabeelle biyeeyo waxay lahaan karaa qiime degaameed sare marka laga eego xagga rug dhireed ahaanta iyo xayawaanka, sidaas oo kale waa meelaha maax biyoodka siisa dhulka hoose ee biyahu fadhiyaan.

Galka Laag Dheera

Galka Laag Dheera wuxuu ku taal qiyaastii inta u dhaxaysa 36° 12' and 42° 35' bariga loolka koowaad iyo 0° 20' koonfur iyo 4° 35' waqooyiga Dhulbaraha. Galku wuxuu ku fidsan yahay saddex maamul goboleed, Gedo iyo Jubada Dhexe iyo Jubada Hoose oo guadaha Soomaaliya ah.

Wadarta bedka biyoqabatinka Wabiga Laag Dheera ilaa halka uu kaga darmo Wabi Juba qiyaasteedu waxay tahay 231 000 Km² (oo ku salaysan SRTM 30m lagana xigtay USGS), oo ay 80% ku taal Kenya. Galka Laag Dheera wuxuu ka kooban yahay Wabi Ewaso Nyiro oo ka yimaada Kenya iyo dhammaan togag ka yimaada dhanka waqooyi-bari ee buurta Mt Kenya. Joogeeda sare wuxuu u dhexeeyaa wax ku dhaw 5 195 m kakor celceliska joogga heerka badda ee buurta Mt Kenya gudaha Kenya. Soomaaliya gudaheeda, dhulka biyoqabatinka jooggiisu dhammaan waa ka hooseeyaa 700 m. Janjeerradu waxay isugu jiraan hoobad iyo kuwo aad hoobad u ah xagga calaha koonfur-galbeed iyo aagga xadka galbeed.

In badan isku xirka biyomareennada ma aha mid aad u qeexan. Wuxuu ka kooban yahay togag biyo socodaan xilliyada qaar oo leh dherero kala duwan kuwasoo biyo qulqulaan ka dib marka roobabka mahiigaan ah ay da'aan oo keliya. Togagga ugu ballaaran ee qulqula xilli roobaadyada waxay yihiin Laag Kutula oo ku taal waqooyi-bari, Laag Boor iyo Laag Bogol oo ku yaal bartamaha galka. Roobku intiisa badan wuxuu u idlaadaa uumibax ama wuxuu hoos u galaa dhulka siman iyo dooxooyinka ballaara oo aan qoto dheerayn. Biyosocda Laag Dheera marar dhif ah ayuu gaaraa Wabi Juba, waayo biyaha intooda badan waxay ku libraan dhasheego ku yaal koonfurta galka.

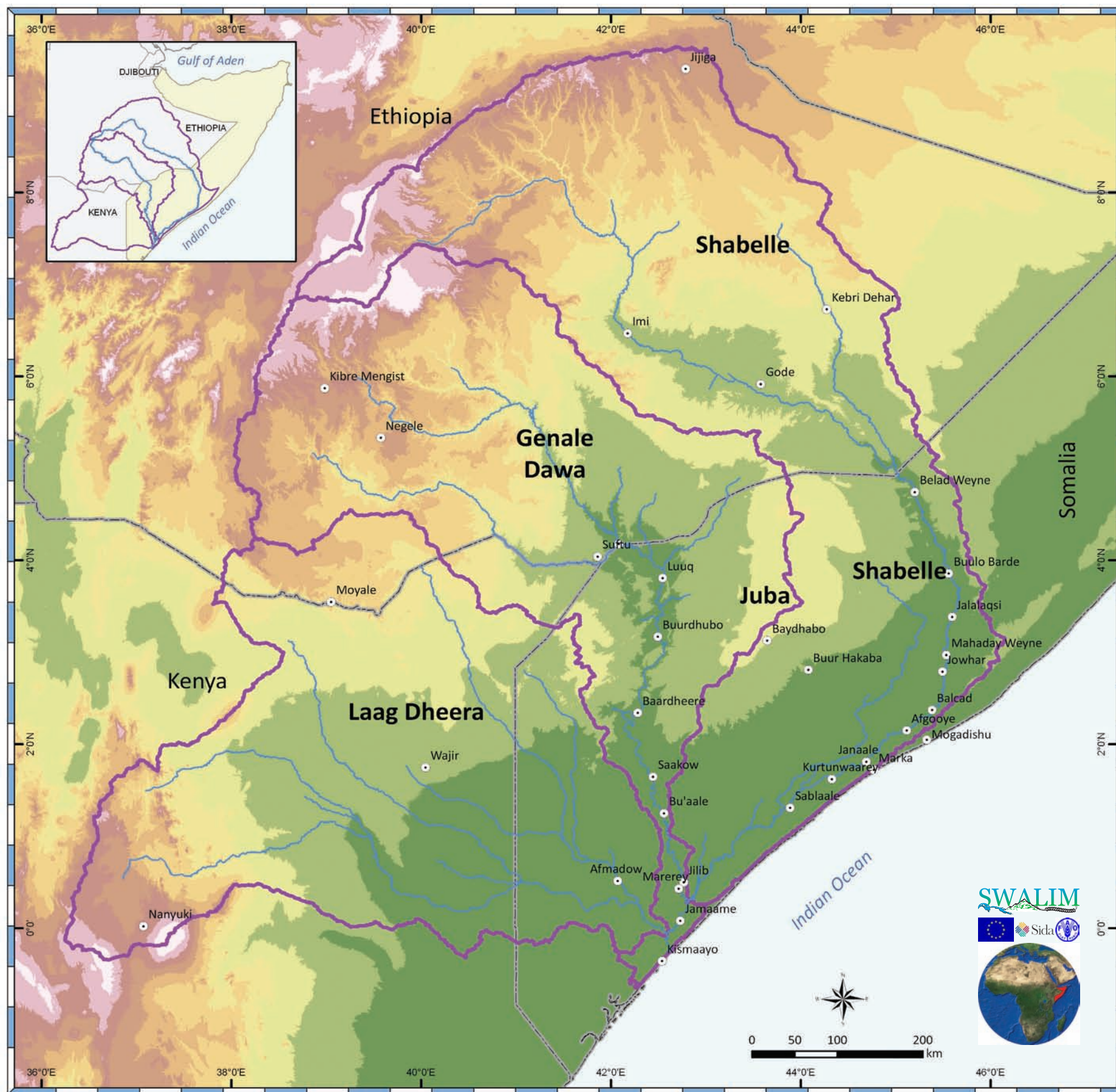
La socio: Faahfaahin baaris dheeraad ah iyo tixda buugag raad-raac, ka daalaco buugaagta warbinta taxanaha ah ee SWALIM.



Drainage basins of the Juba and Shabelle Rivers

Isku xirka biyomareennada galalka Wabiyada Juba iyo Shabeelle

4



Elevation m (a.s.l)

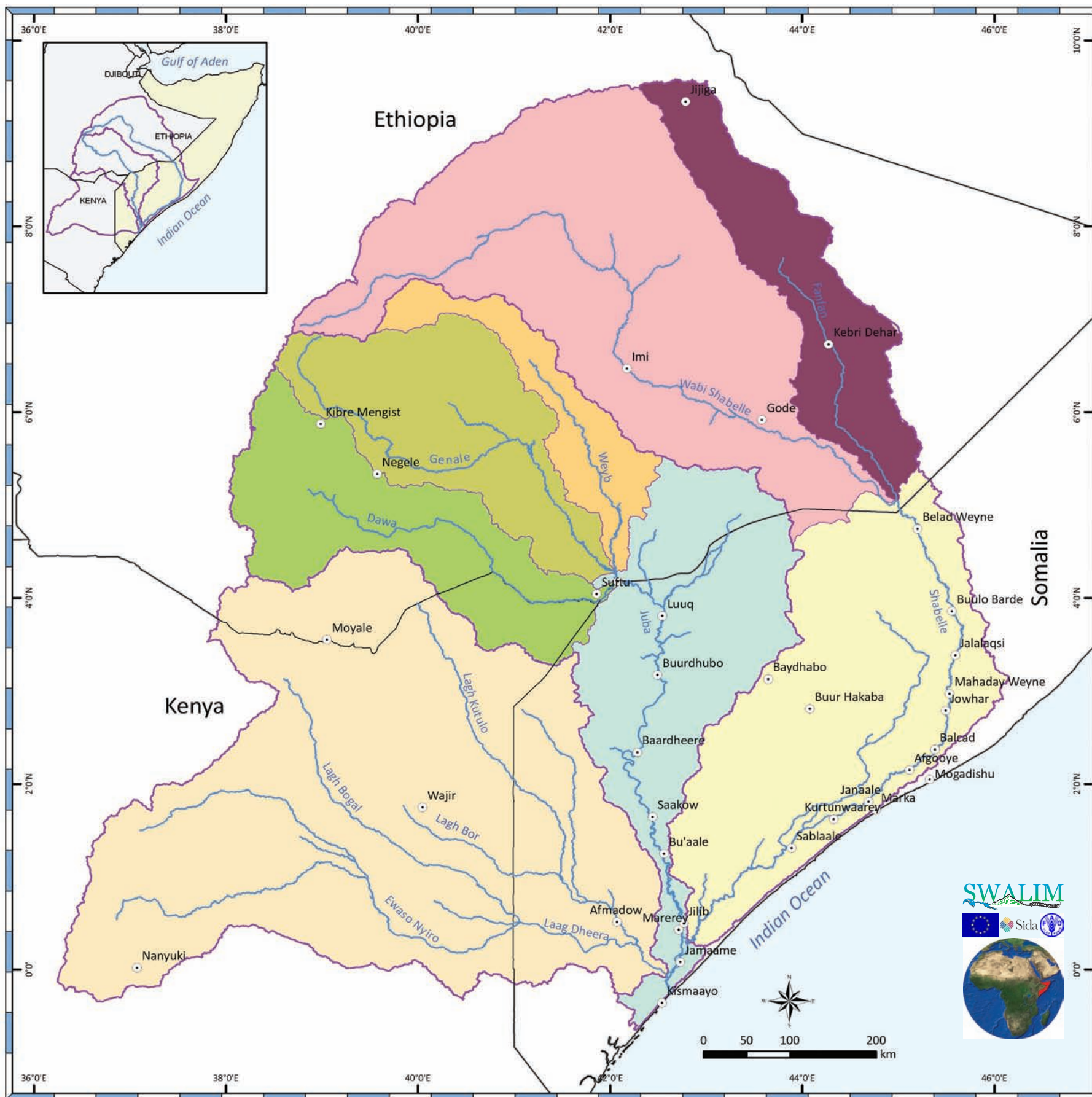
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220 - 444	1,502 - 1,833
445 - 671	1,834 - 2,245
672 - 924	2,246 - 2,810
925 - 1,201	2,811 - 5,880

- Major towns
- River
- - - National boundary
- ▬ Catchment boundary

Data source: Catchment boundaries and drainage network derived by USGS for SWALIM from NASA-SRTM 30m; administrative data from UNDP
 Map Reference: RIVAT-DRAINAGE BASIN BOUND-20100106-A3
 Produced by: FAO Somalia Water and Land Information Management –SWALIM-project. Contact: enquiries@faoswalim.org
 The boundaries and names on this map do not imply official endorsement or acceptance by the United Nations

Sub basins of the Juba and Shabelle Rivers

Qayb hoosaadyada galalka Wabiyada Juba iyo Shabeelle



Sub basins

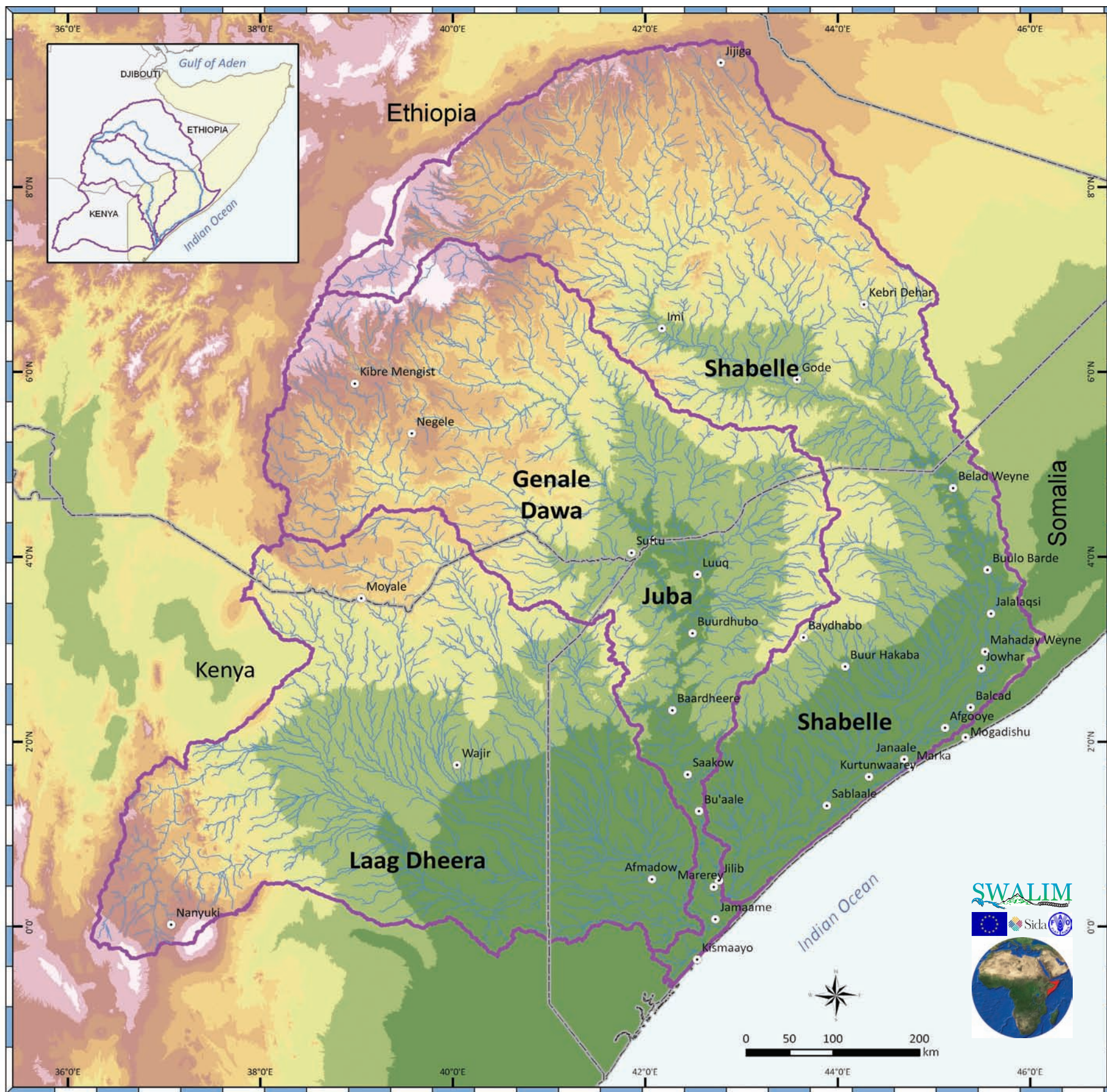
- Fanfan
- Wabi Shabelle
- Weyb
- Genale
- Dawa
- Juba
- Laag Dheera
- Shabelle

- Major towns
- River
- National boundary
- Sub basin boundary

Data source: Catchment boundaries and drainage network elaborated by USGS for SWALIM from SRTM 30m DEM; administrative data from UNDP
 Map Reference: RIVAT-SUBBASIN-20100106-A3-450dpi-01
 Produced by: FAO Somalia Water and Land Information Management
 –SWALIM- project contact: enquiries@faoswalim.org
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Drainage network of the Juba and Shabelle Rivers

Isku xirka biyomareennada Wabiyada Juba iyo Shabeelle



Elevation m (a.s.l)

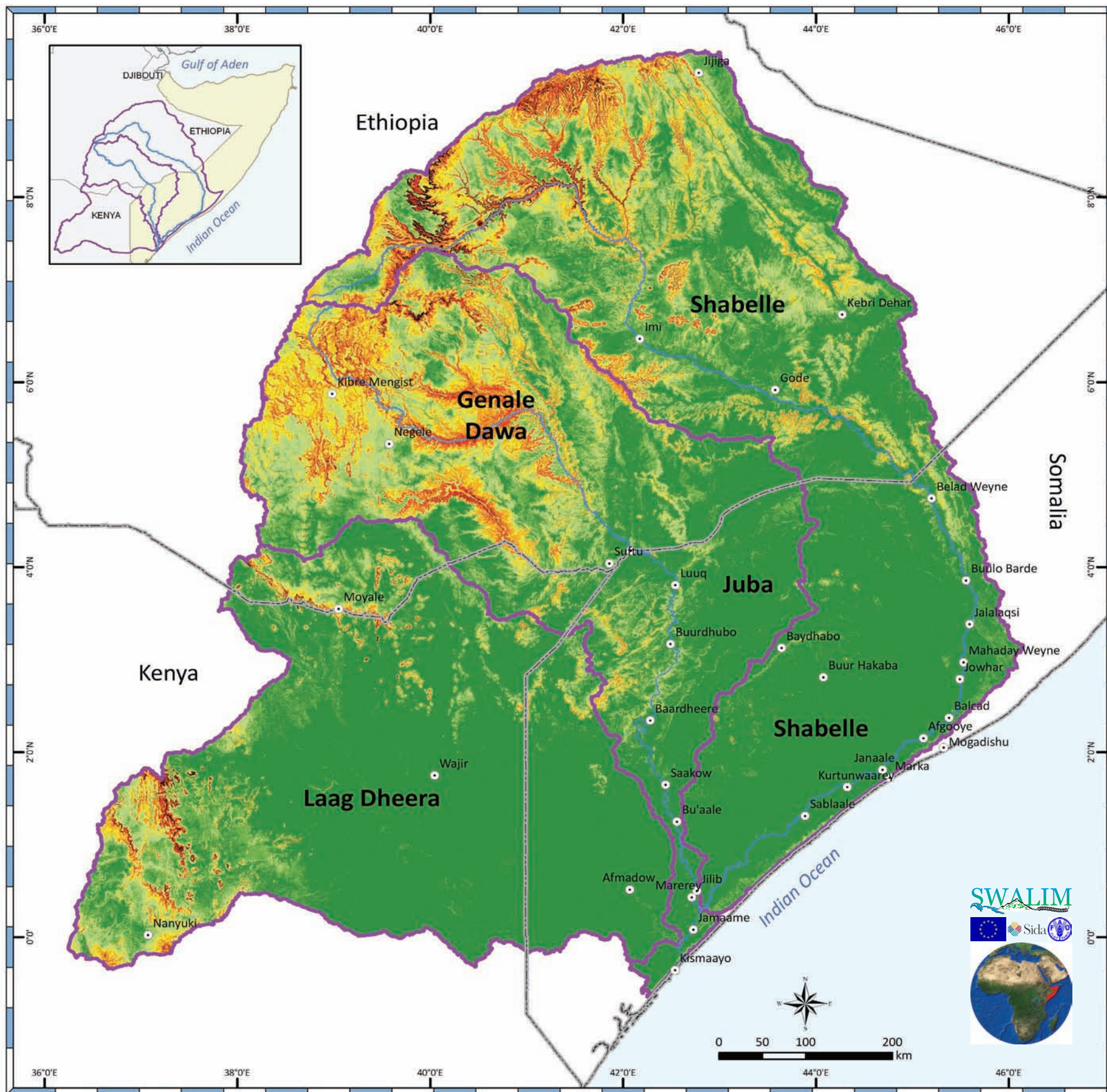
0 - 219	1,202 - 1,501
220 - 444	1,502 - 1,833
445 - 671	1,834 - 2,245
672 - 924	2,246 - 2,810
925 - 1,201	2,811 - 5,880

- Major towns
- Drainage network
- ▭ National boundary
- ▭ Catchment boundary

Data source: Catchment boundaries and drainage network elaborated by USGS for SWALIM from SRTM 30m DEM; administrative data from UNDP
 Map Reference: RIVAT-DRAINAGENETWORK-20100106-A3-450dpi-01
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Slopes of the Juba and Shabelle basins

Janjeerrada galalka Juba iyo Shabeelle



Slope (degrees)

- Flat (0 - 1)
- Very gently sloping (1 - 2)
- Gently sloping (2 - 5)
- Moderately sloping (5 - 9)
- Strongly sloping (9 - 16)
- Very steep (16 - 27)
- Extremely steep (27 - 90)

- Major towns
- River
- - - National boundary
- ▭ Catchment boundary

Data source: Slope in degrees derived from the SRTM 90 m dataset (NASA); catchment boundaries and drainage network elaborated by USGS for SWALIM from SRTM 30m; administrative data from UNDP,
Map Reference: RIVAT-SLOPE-20092226-A3-450dpi-01
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