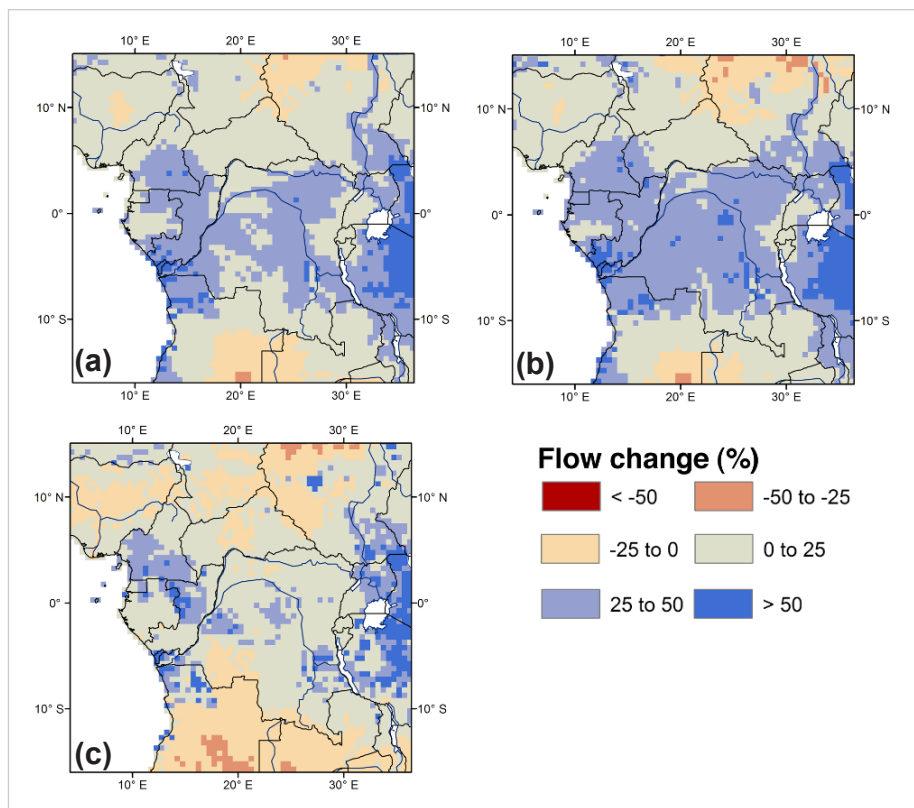
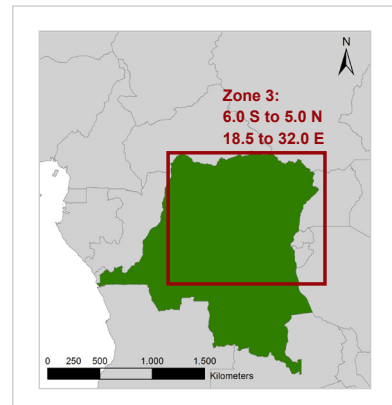


# Fact-Sheet - Hydrology and Energy - Democratic Republic of the Congo (DRC)- Zone 3

**Maps of projected changes** - Maps show the projection of changes in mean flow (a), high flow (Q95) (b) and low flow (Q10) (c) for 2071-2100 relative to 1971-2000 for the "High" emission scenario. Flows are calculated using the VIC model in combination with three different climate models.



**Definition of Zone 3** - The map below indicates the position of Zone 3 (red rectangle), representing the central regions with the mainly tropical rainforest climates and mainly a bimodal rain-regime. All values presented in this fact-sheet are changes spatially averaged over the whole zone. As the northern and central parts of DRC fall within Zone 3, projected changes for this zone are assumed to be representative for these parts of the country.



**Data and method** - Climate change impacts on the hydrology of the Congo basin were assessed using the VIC macroscale hydrological model. For this analyses we used climate change projections from three different global climate models and for two different greenhouse gas emission scenarios: the "Low" scenario based upon the SRES B1 (IPCC-AR4) scenario; the "High" scenario based upon the SRES A2 (IPCC-AR4) scenario. Here we present the results in terms of changes in run-off and river flows. First the relative changes in average flow are presented. If the average flow is decreasing it indicates that in the future less water is available for different users. Then we present the change in high flows. For this we use the Q95 indicator (flow is only this high 5% of the time). If Q95 is increasing, it indicates that your flood risks are increasing. For low flow we used the Q10 indicator (flow is only this low 10% of the time). If Q10 is reducing it indicates that drought risks are increasing.

**List of projected changes** - The table shows the projection of changes in mean run-off (rounded values). Note that current land use is used in this study for all assessed time periods. Consequently all changes are caused by climate change alone.

Run-off in mm/year or mm/season		Today	Projected changes			
			Low emission scenario		High emission scenario	
		2000	till 2050	till 2100	till 2050	till 2100
Mean run-off	YEAR	766	+72	+124	+94	+309
	DJF	146	+9	+18	-4	+43
	MAM	193	+4	+20	+3	+52
	JJA	156	+11	+20	+19	+60
	SON	270	+49	+67	+66	+145

### Key findings for Zone 3:

- The hydrological cycle will intensify resulting in more frequent floods and maybe more droughts.
- Especially peak flows will increase in this zone probably resulting in more frequent and more severe floods.
- On average hydropower potential will probably increase but due to more variable run-off patterns hydropower production could become less reliable.
- Hydropower facilities should be aware of more frequent high flow events which could possible cause severe damages.

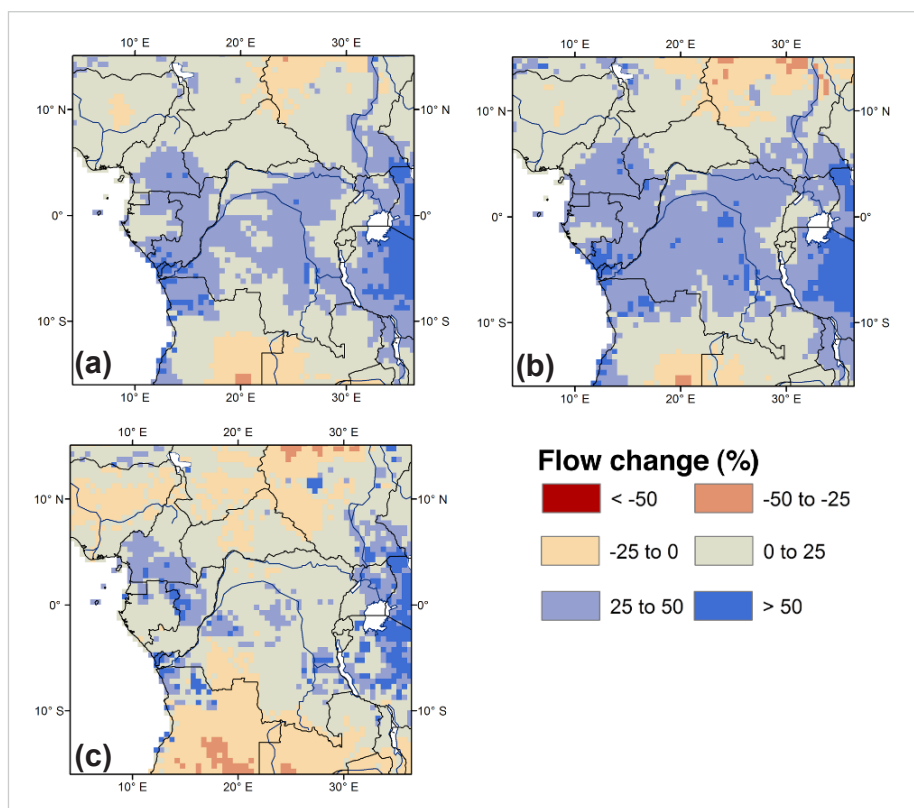
### Key adaptation options:

- Improving preparedness for extreme weather events and floods through for example (improved) early warning systems.
- Development of additional (micro)hydropower facilities where possible.
- Diversifying energy supply to prevent dependence on a single energy source.
- Existing and future hydropower facilities should be developed and managed in such a way that they can cope with more variable flow patterns including more frequent and severe extremes.

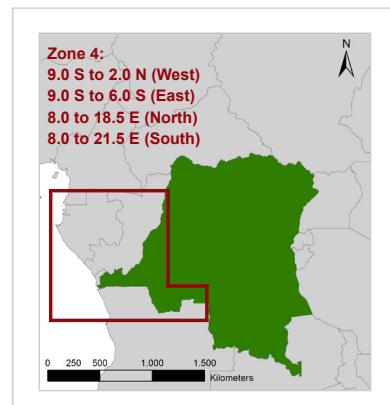
Further details can be found in the "Impacts Report" and the "Adaptation Report" in the report section of the final project document - also available online under [www.giz.de](http://www.giz.de) and [www.comifac.org](http://www.comifac.org)

## Fact-Sheet - Hydrology and Energy - Democratic Republic of the Congo (DRC)- Zone 4

**Maps of projected changes** - Maps show the projection of changes in mean flow (a), high flow (Q95) (b) and low flow (Q10) (c) for 2071-2100 relative to 1971-2000 for the “High” emission scenario. Flows are calculated using the VIC model in combination with three different climate models.



**Definition of Zone 4** - The map below indicates the position of Zone 4 (red rectangle), representing the regions north of the equator with predominantly tropical wet and dry climates with a dedicated rainy season. All values presented in this fact-sheet are changes spatially averaged over the whole zone. As the western part of DRC falls within Zone 4, projected changes for this zone are assumed to be representative for this part of the country.



**List of projected changes** - The table shows the projection of changes in mean run-off (rounded values). Note that current land use is used in this study for all assessed time periods. Consequently all changes are caused by climate change alone.

Run-off in mm/year or mm/season		Today	Projected changes			
			Low emission scenario		High emission scenario	
		2000	till 2050	till 2100	till 2050	till 2100
Mean run-off	YEAR	1233	45	256	180	386
	DJF	325	-3	76	32	115
	MAM	433	7	75	56	102
	JJA	45	3	8	14	22
	SON	429	39	98	79	148

**Data and method** - Climate change impacts on the hydrology of the Congo basin were assessed using the VIC macroscale hydrological model. For this analyses we used climate change projections from three different global climate models and for two different greenhouse gas emission scenarios: the “Low” scenario based upon the SRES B1 (IPCC-AR4) scenario; the “High” scenario based upon the SRES A2 (IPCC-AR4) scenario. Here we present the results in terms of changes in run-off and river flows. First the relative changes in average flow are presented. If the average flow is decreasing it indicates that in the future less water is available for different users. Then we present the change in high flows. For this we use the Q95 indicator (flow is only this high 5% of the time). If Q95 is increasing, it indicates that your flood risks are increasing. For low flow we used the Q10 indicator (flow is only this low 10% of the time). If Q10 is reducing it indicates that drought risks are increasing.

### Key adaptation options:

- Improving preparedness for extreme weather events and floods through for example (improved) early warning systems.
- Development of additional (micro)hydropower facilities where possible.
- Adaptation of river systems so they can manage much higher flows and more extremes.
- Diversifying energy supply to prevent dependence on a single energy source.

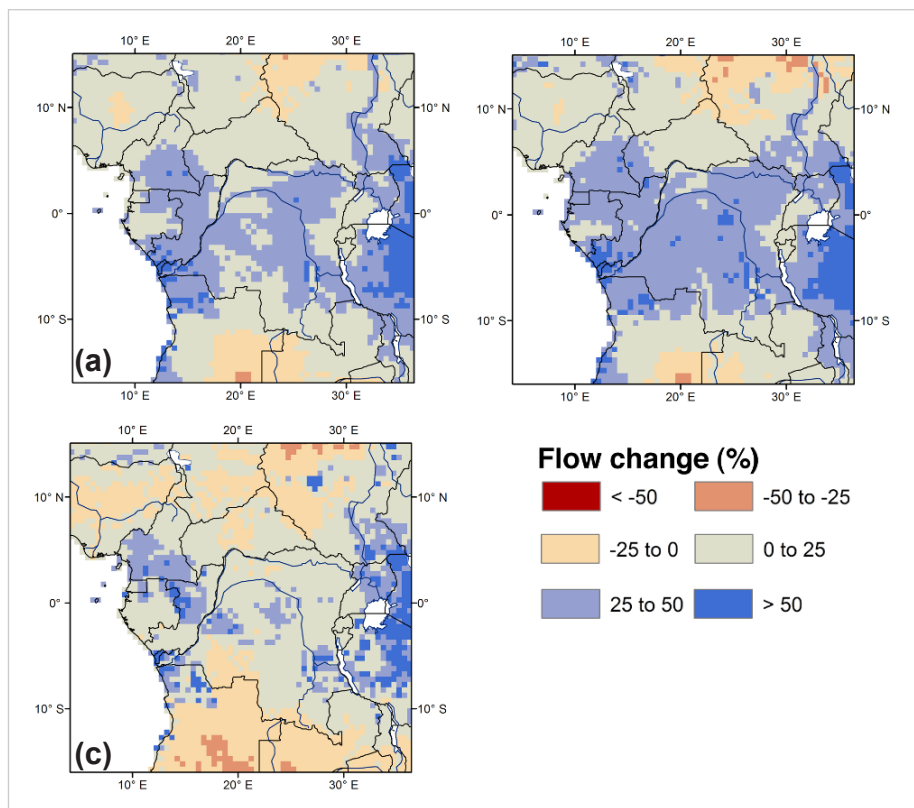
### Key findings for Zone 4:

- The hydrological cycle will intensify resulting in more frequent floods and possibly more droughts.
- Both average and peak flows could severely increase in this zone probably resulting in more frequent and more severe floods.
- Hydropower potential will probably increase but due to more variable run-off patterns hydropower production could become less reliable.
- In the future, hydropower facilities will be faced with more frequent and more severe high flow events this could potentially cause severe damages.

Further details can be found in the “Impacts Report” and the “Adaptation Report” in the report section of the final project document - also available online under [www.giz.de](http://www.giz.de) and [www.comifac.org](http://www.comifac.org)

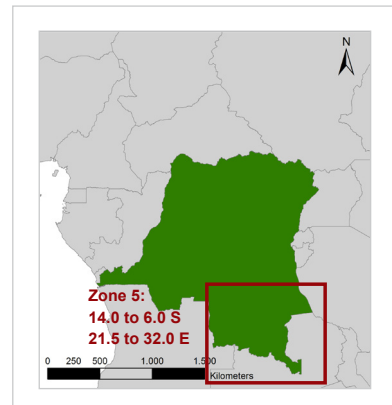
# Fact-Sheet - Hydrology and Energy - Democratic Republic of the Congo (DRC)- Zone 5

**Maps of projected changes** - Maps show the projection of changes in mean flow (a), high flow (Q95) (b) and low flow (Q10) (c) for 2071-2100 relative to 1971-2000 for the "High" emission scenario. Flows are calculated using the VIC model in combination with three different climate models.



**Definition of Zone 5** - The map below indicates the position of Zone 5 (red rectangle), representing the subtropical regions in the south of central Africa. All values presented in this fact-sheet are changes spatially averaged over the whole zone.

As the southern part of DRC falls within Zone 5, projected changes for this zone are assumed to be representative for this part of the country.



**Data and method** - Climate change impacts on the hydrology of the Congo basin were assessed using the VIC macroscale hydrological model. For this analyses we used climate change projections from three different global climate models and for two different greenhouse gas emission scenarios: the "Low" scenario based upon the SRES B1 (IPCC-AR4) scenario; the "High" scenario based upon the SRES A2 (IPCC-AR4) scenario. Here we present the results in terms of changes in run-off and river flows. First the relative changes in average flow are presented. If the average flow is decreasing it indicates that in the future less water is available for different users. Then we present the change in high flows. For this we use the Q95 indicator (flow is only this high 5% of the time). If Q95 is increasing, it indicates that your flood risks are increasing. For low flow we used the Q10 indicator (flow is only this low 10% of the time). If Q10 is reducing it indicates that drought risks are increasing.

**List of projected changes** - The table shows the projection of changes in mean run-off (rounded values). Note that current land use is used in this study for all assessed time periods. Consequently all changes are caused by climate change alone.

Run-off in mm/year or mm/season		Today	Projected changes			
			Low emission scenario		High emission scenario	
		2000	till 2050	till 2100	till 2050	till 2100
Mean run-off	YEAR	531	24	52	60	140
	DJF	327	15	29	32	84
	MAM	140	11	16	23	47
	JJA	1	0	0	0	0
	SON	64	-2	6	5	9

**Key adaptation options:**

- Improving preparedness for extreme weather events and floods through e.g. (improved) early warning systems.
- Development of additional (micro)hydropower facilities where possible.
- Diversifying energy supply to prevent dependence on a single energy source.
- Existing and future hydropower facilities should be developed and managed in such a way that they can cope with more variable flow patterns including more frequent and severe extremes.
- Adaptation of river systems to manage higher flows and more extremes.
- Improving water storage facilities to guarantee sufficient water supply during droughts.

**Key findings for Zone 5:**

- The hydrological cycle will intensify resulting in more frequent floods and maybe more droughts.
- Especially peak flows will increase in this zone probably resulting in more frequent and more severe floods.
- On average hydropower potential will probably increase but due to more variable run-off patterns hydropower production could become less reliable.
- Hydropower facilities should be aware of more frequent high flow events which might cause severe damages.

Further details can be found in the "Impacts Report" and the "Adaptation Report" in the report section of the final project document - also available online under [www.giz.de](http://www.giz.de) and [www.comifac.org](http://www.comifac.org)