

Social 'tipping points' under climate/environmental change

Pierre Ozer^{1,2}, Ouango Koala¹, Luc Clervil¹,
Gracia Joseph Gracius¹, François Gemenne^{2,3}, Tim Lenton⁴,
Richard Betts⁴ & Florence de Longueville^{2,5}



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Social 'tipping points' under
climate/environmental change
I could have talked about...

Social 'tipping points' under climate/environmental change

I could have talked about Nouakchott, Mauritania
where small rainfall perturbations can have big
effects including migration

3/6/2014

03-06-2014

100 m

An aerial photograph of a desert settlement, likely in the Negev region of Israel. The terrain is arid and sandy, with numerous small, rectangular buildings scattered across the landscape. A prominent road or path runs diagonally from the upper right towards the lower center. A red double-headed arrow in the bottom left corner indicates a scale of 100 meters. The image is overlaid with a date '03-06-2014' in red text in the top right corner and a date '3/6/2014' in white text in the top left corner. There are also some faint UI elements on the right side of the image, including a compass and zoom controls.

11/7/2014

11-07-2014

100 m

An aerial photograph of a desert settlement, likely in the Negev region of Israel. The terrain is sandy and brown, with numerous small, rectangular buildings scattered across the landscape. A prominent road or path runs diagonally from the top right towards the bottom center. A red double-headed arrow in the bottom left corner indicates a scale of 100 meters. The date '11-07-2014' is displayed in the top right corner in red text on a black background. A faint date '11/7/2014' is visible in the top left corner. The image shows a dense cluster of buildings in the lower-left quadrant, with more sparse structures and open areas towards the top and right.

22/7/2014

22-07-2014

100 m



10/8/2014

10-08-2014

100 m

An aerial photograph of a desert landscape, likely in the Middle East, showing a dense cluster of small, rectangular structures, possibly tents or small huts, arranged in a grid-like pattern. The terrain is sandy and brown. A prominent road or path runs diagonally across the center of the image. In the bottom left corner, there is a red double-headed arrow with the text "100 m" above it, indicating a scale. In the top left corner, the date "10/8/2014" is displayed in a white box. In the top right corner, the date "10-08-2014" is displayed in a black box with red text. The overall scene suggests a temporary settlement or a military encampment in an arid environment.

14/9/2014

14-09-2014

100 m

An aerial photograph showing a dense urban grid. The streets are arranged in a regular pattern, with buildings and other structures filling the spaces between them. A red double-headed arrow in the bottom left corner indicates a scale of 100 meters. The date '14-09-2014' is printed in red in the top right corner, and '14/9/2014' is printed in black in the top left corner.

3/10/2014

03-10-2014

100 m

An aerial photograph showing a dense urban grid. The streets are arranged in a regular pattern, with buildings and other structures filling the blocks. A red double-headed arrow in the bottom left corner indicates a scale of 100 meters. The date '03-10-2014' is printed in red in the top right corner, and '3/10/2014' is printed in black in the top left corner.

30/4/2016

30-04-2016

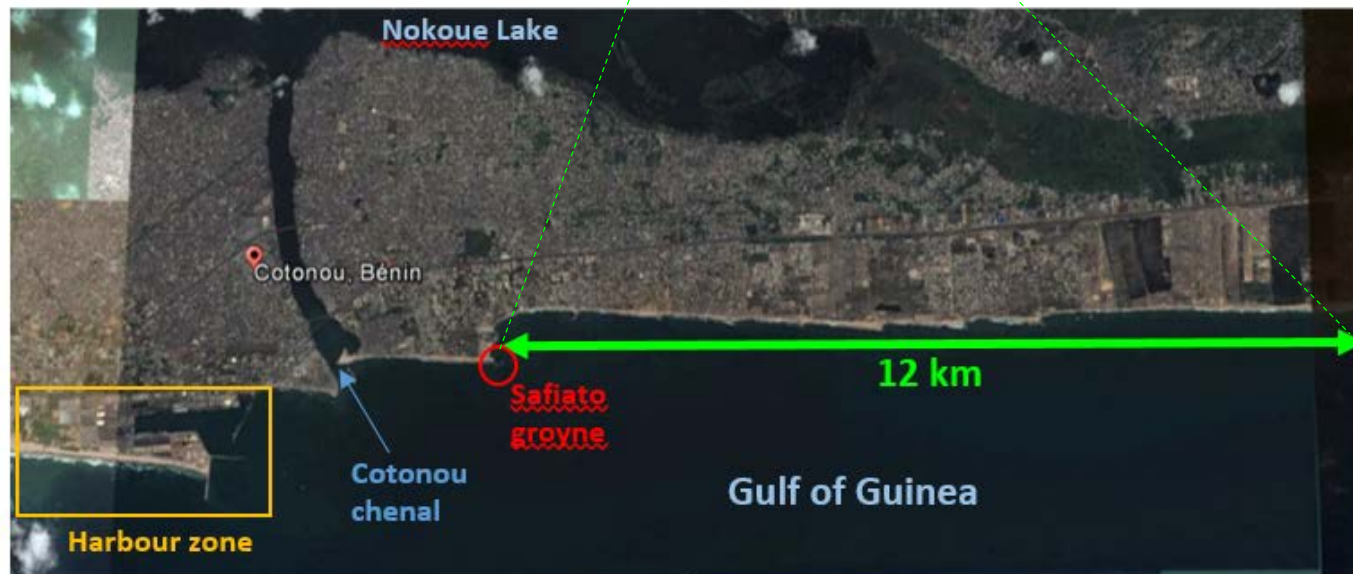
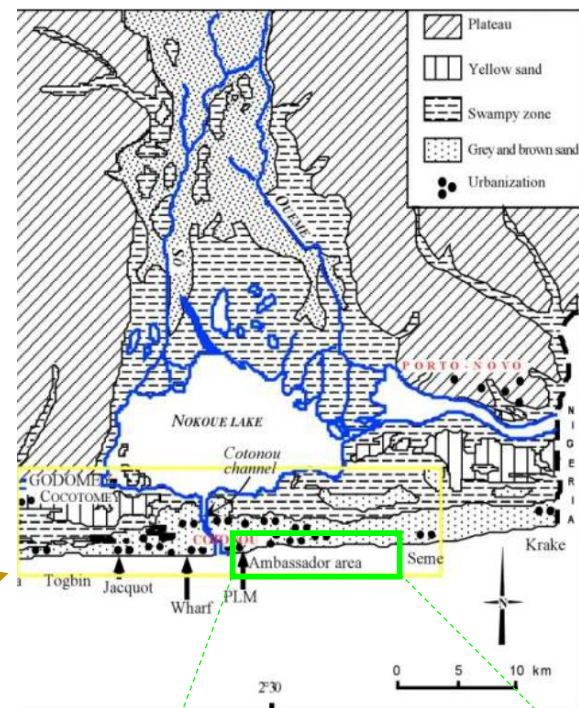
100 m

An aerial photograph showing a dense urban grid. The streets are light-colored and form a regular pattern of squares and rectangles. The buildings are small and dark, filling the spaces between the streets. A red double-headed arrow in the bottom left corner indicates a scale of 100 meters. The date '30-04-2016' is printed in the top left and top right corners.

Social 'tipping points' under climate/environmental change

I could have talked about Cotonou, Benin,
where 'immobility' of trapped population has a
huge impact on precarity

Study area



Two processes of habitats' loss

18/12/2002

25/03/2004

08/11/2011

26/11/2013



26/12/2016

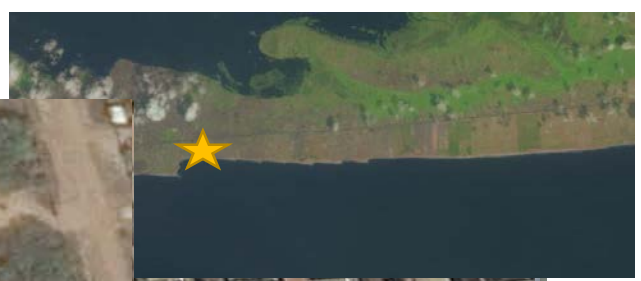
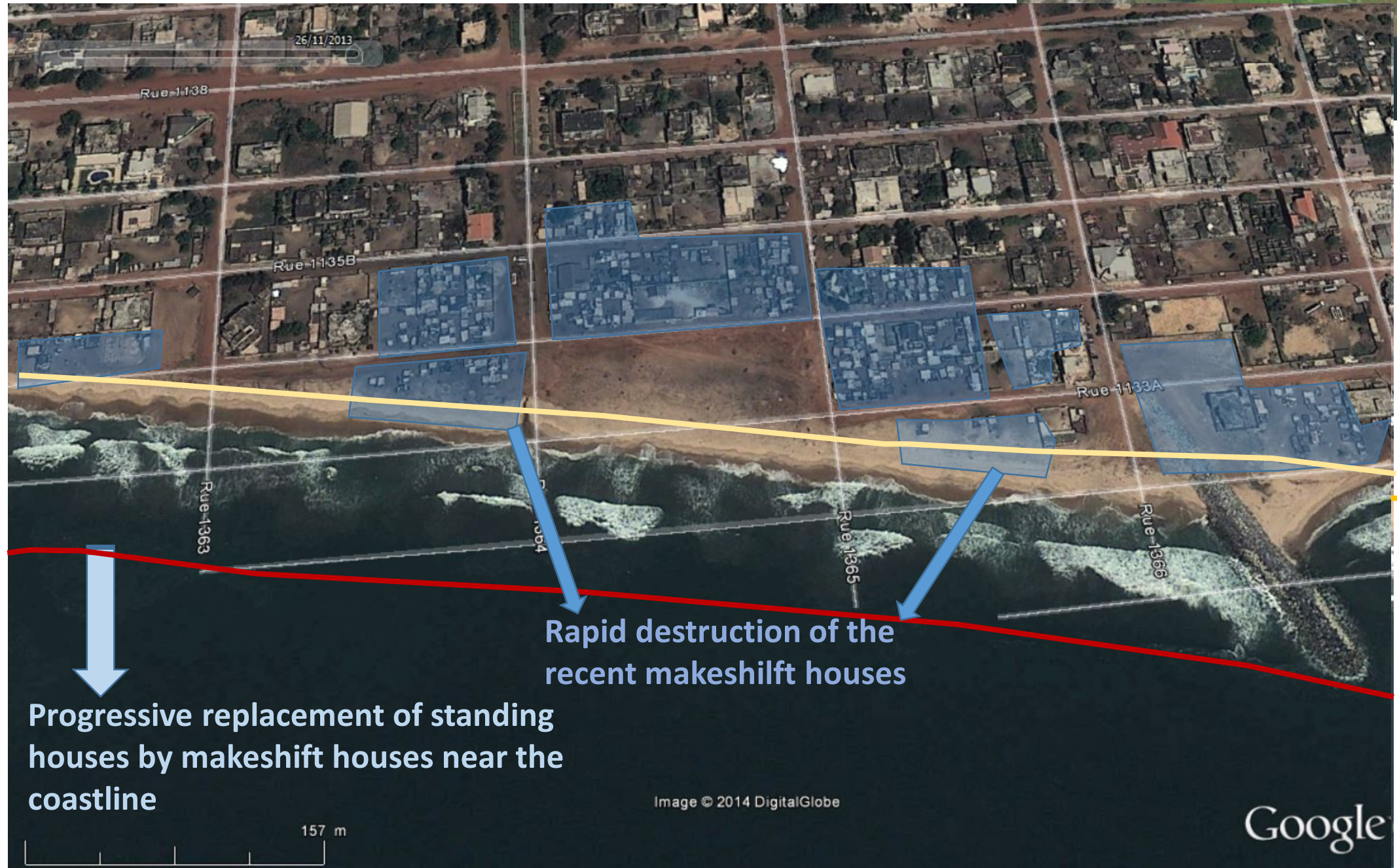


Image © 2014 DigitalGlobe

Google

99 m

Dynamic of settlements



18/12/2002

POINT 2

POINT 3

POINT 4

POINT 5

POINT 1

100 m

Rue 1451

Image © 2015 DigitalGlobe

Google earth

Date des images satellite : 18/12/2002

31 N 438615 75 m E 706658 04 m N élév. 4 m altitude 1.06 km



19/9/2014

POINT 2

POINT 3

POINT 4

POINT 5

POINT 1

130 m

108 m

100 m

Rue 1451

Image © 2015 DigitalGlobe

Google earth

2002

Date des images satellite : 10/0/2014 21 N 428615 75 m E 706658 04 m N. élév. 4 m altitude 1.06 km



19/9/2014

POINT 3

POINT 4

100 m

POINT 5

New habitat on the lake
is yearly exposed to
floods



dit SOMAZE

OKLUNDI ABASI

Social 'tipping points' under climate/environmental change

I also could have talked about Cap-Haïtien, Haiti, where a mix of social inhabitability lead to a long-term maladaptation mechanism to climate change

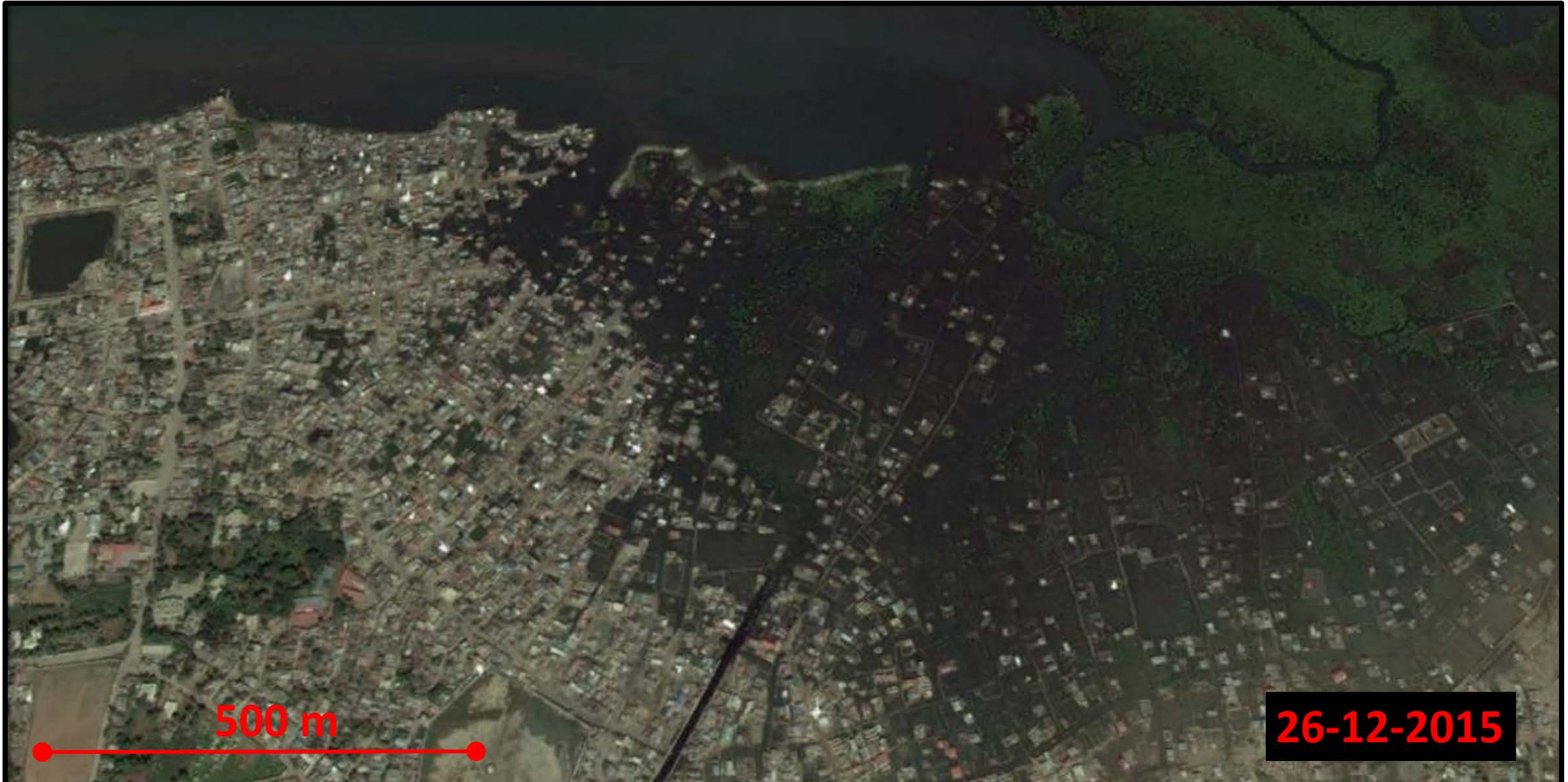
Cap-Haïtien, Haïti



500 m

30-05-2004

Cap-Haïtien, Haïti











29-10-2004

200 m

An aerial photograph showing a coastal town with a grid-like street pattern. A large, dark, irregularly shaped area, possibly a bay or a large shadow, is on the left side. The town is densely packed with buildings. In the bottom left corner, there is a red scale bar with two dots at its ends, labeled "200 m". In the top right corner, there is a black rectangular box with the date "29-10-2004" written in red. The overall image has a slightly grainy texture, typical of satellite or aerial photography from that era.

25-01-2010

200 m



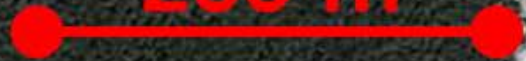
26-02-2013

200 m



24-11-2013

200 m



15-11-2014

200 m

An aerial photograph showing a dense urban grid. A dark, winding waterway or canal runs through the center-left of the image. The buildings are tightly packed, with some larger structures and blue-roofed buildings visible on the right side. A red scale bar with two circular endpoints is located in the bottom-left corner, labeled '200 m'. A black rectangular box in the top-right corner contains the date '15-11-2014' in red text.

01-01-2016

200 m



01-01-2016

200 m



Social 'tipping points' under climate/environmental change

I will talk about Niger, to question the immunity of
the 'system'

Perception of climate change (rainfall)

Climate	Arid Sahel		
Mean annual rainfall	300-500 mm		
Perception of change	-	NC	+
Source / Indicator	Yearly total rainfall		
Akponikpè et al. (2010)	91	2	2
Nielsen & Reenberg (2010)	62	6	32
Mertz et al. (2012)	83	4	13
Diessner (2012)	90	6	3
This study (Niger)	81	3	14

Adaptation to climate change (rainfall)

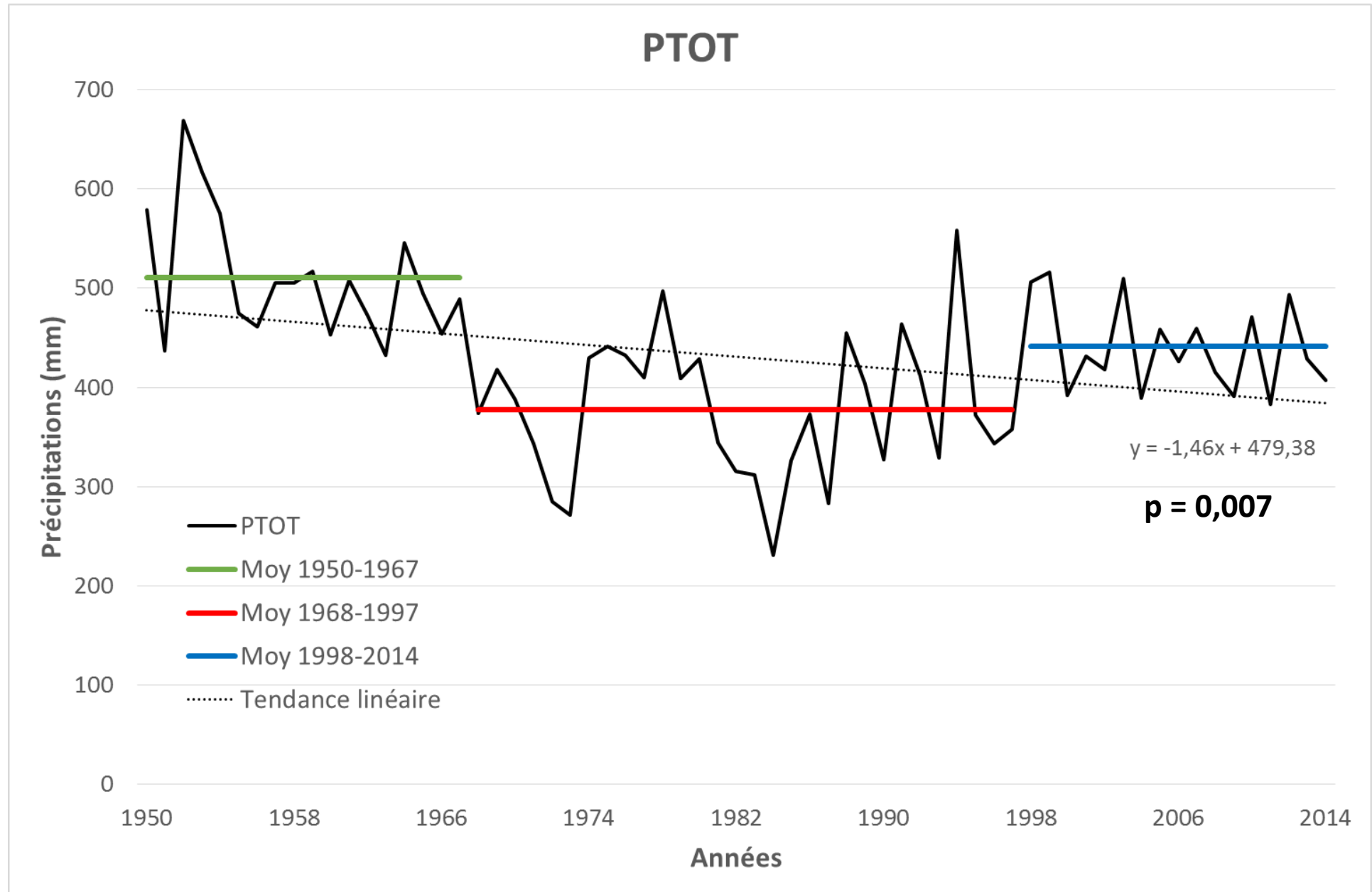
Temporal migration in response to a drier climate: 4.4%

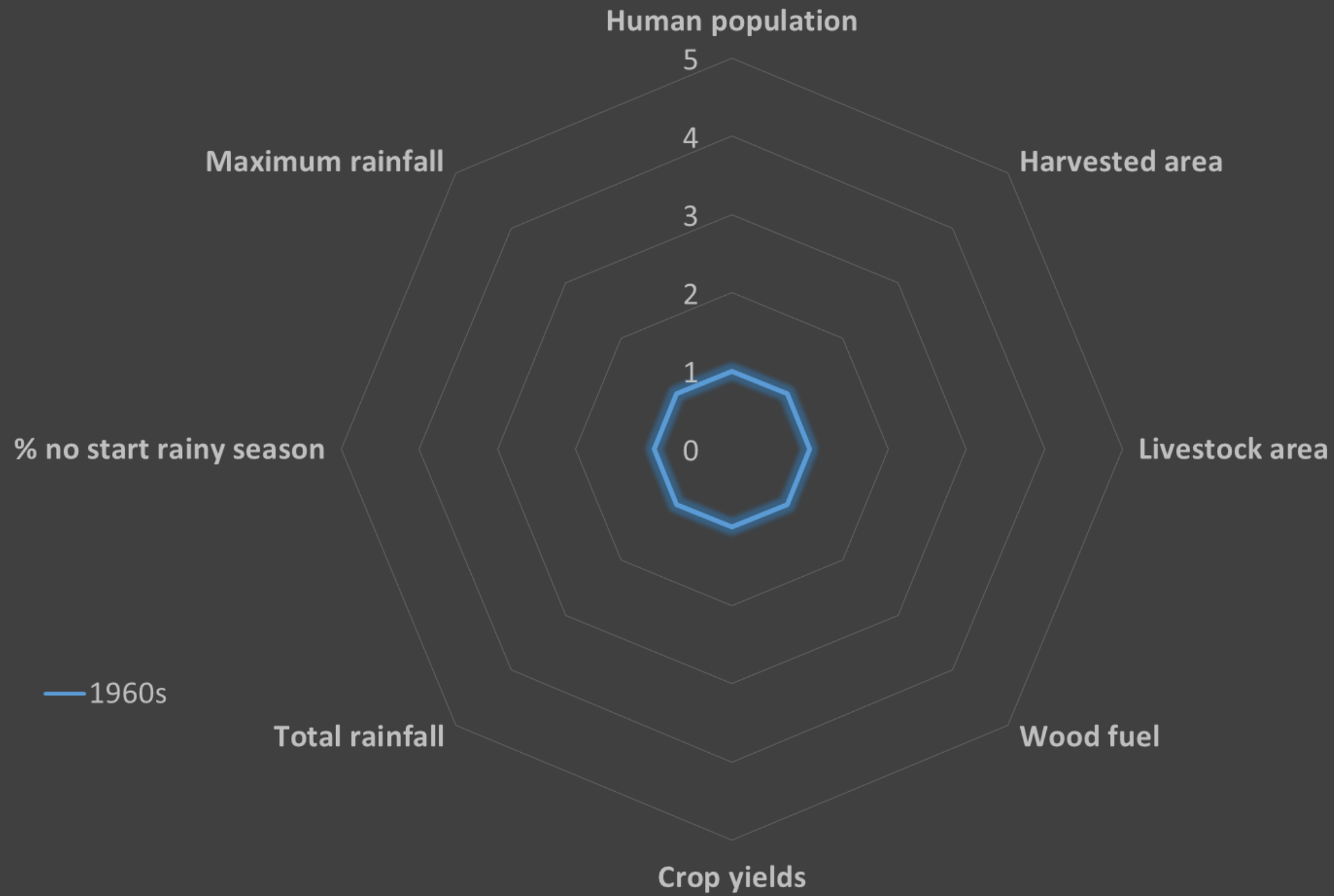
Permanent migration in response to a drier climate: 29.8%

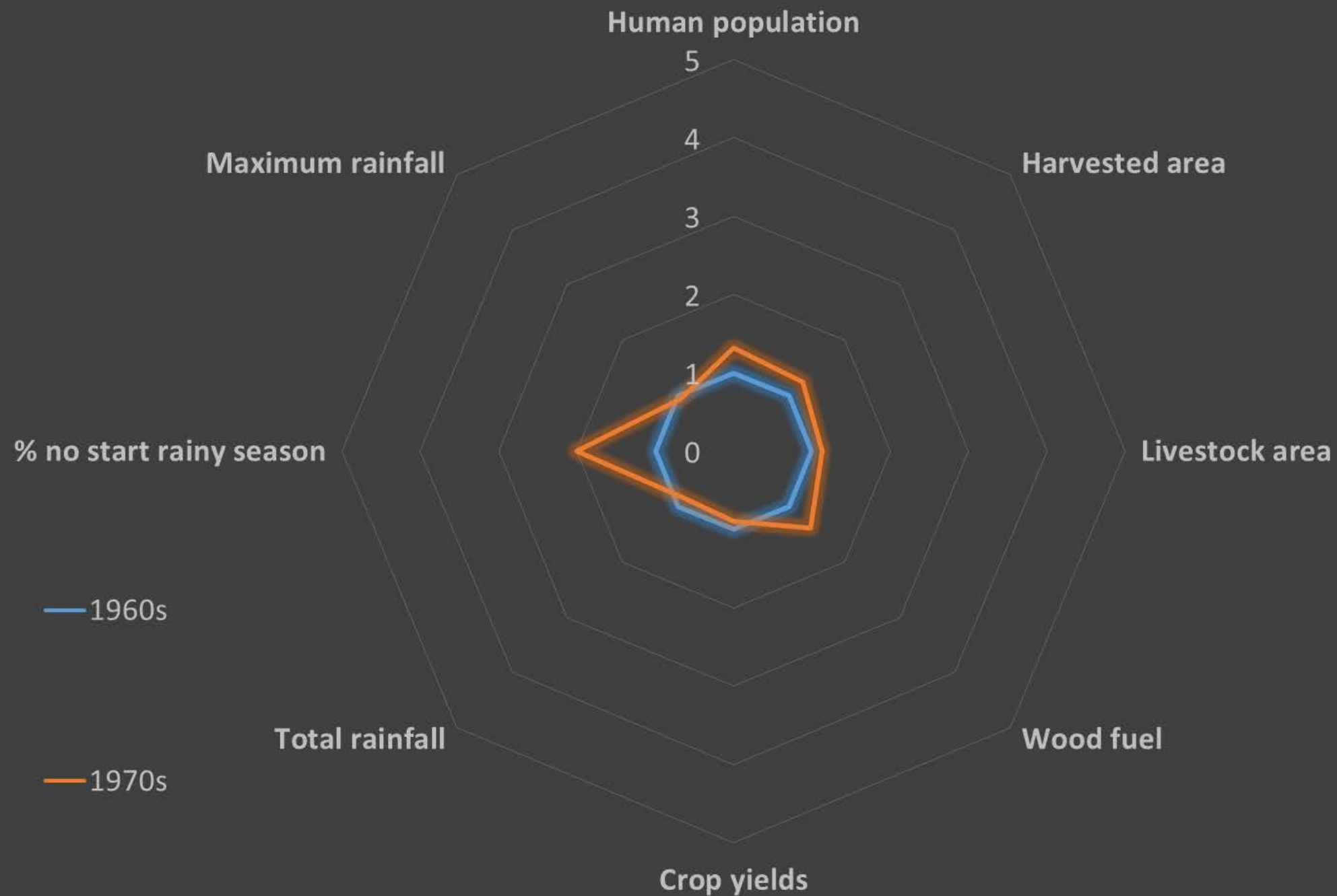
Temporal migration in response to a drought: 35.9%

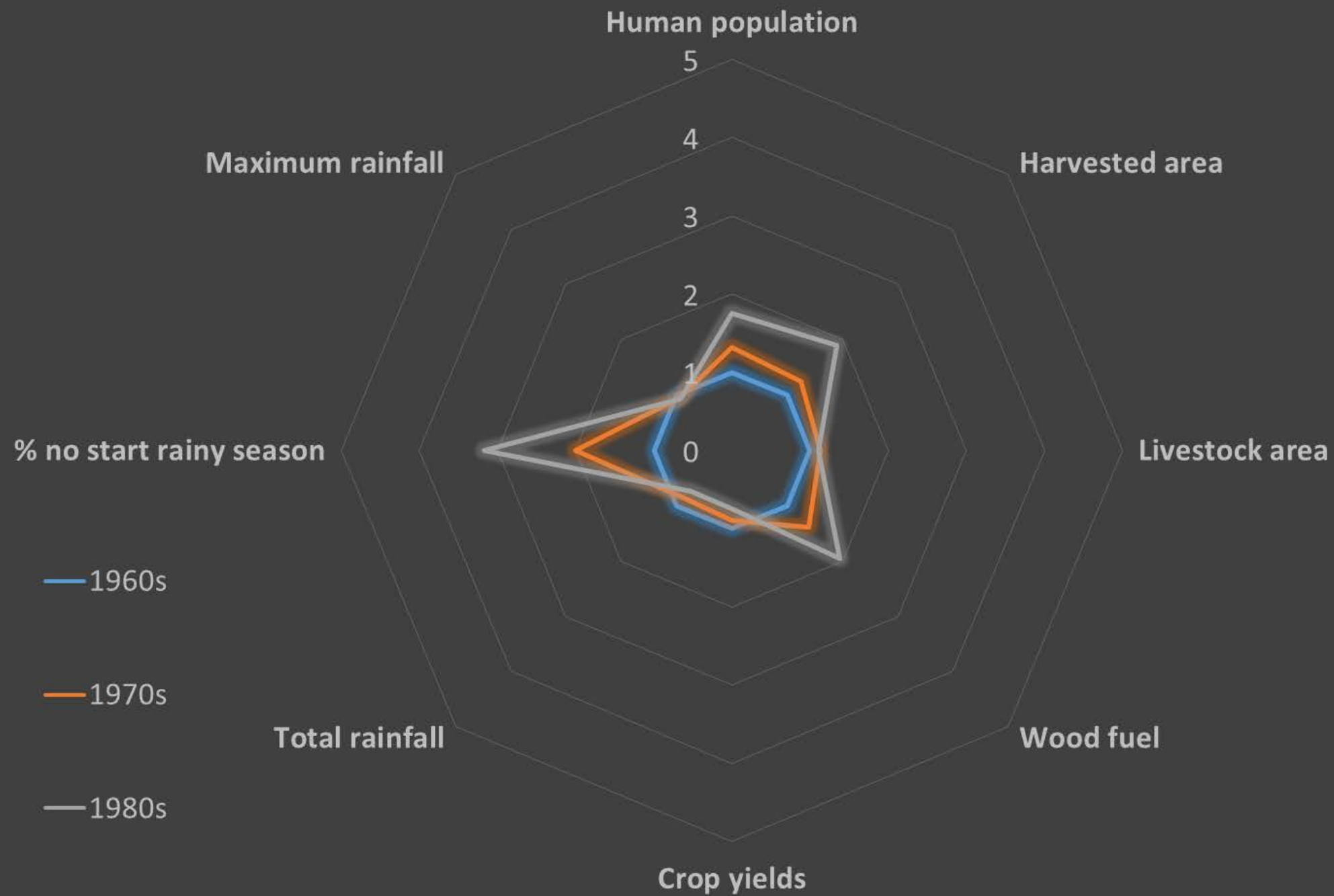
Migration in the 'top 3' adaptation strategies to climate change: 54%

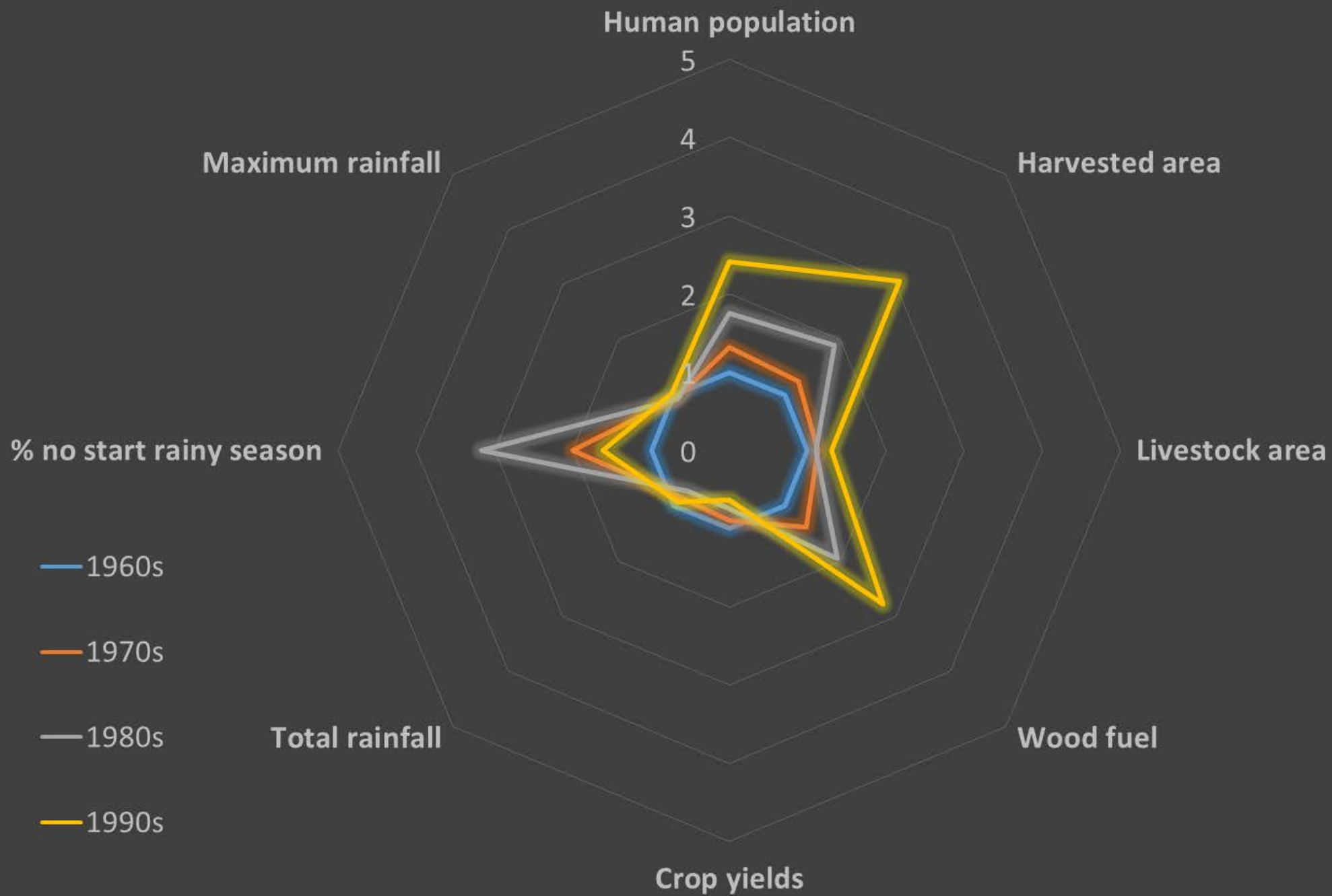
Measured rainfall

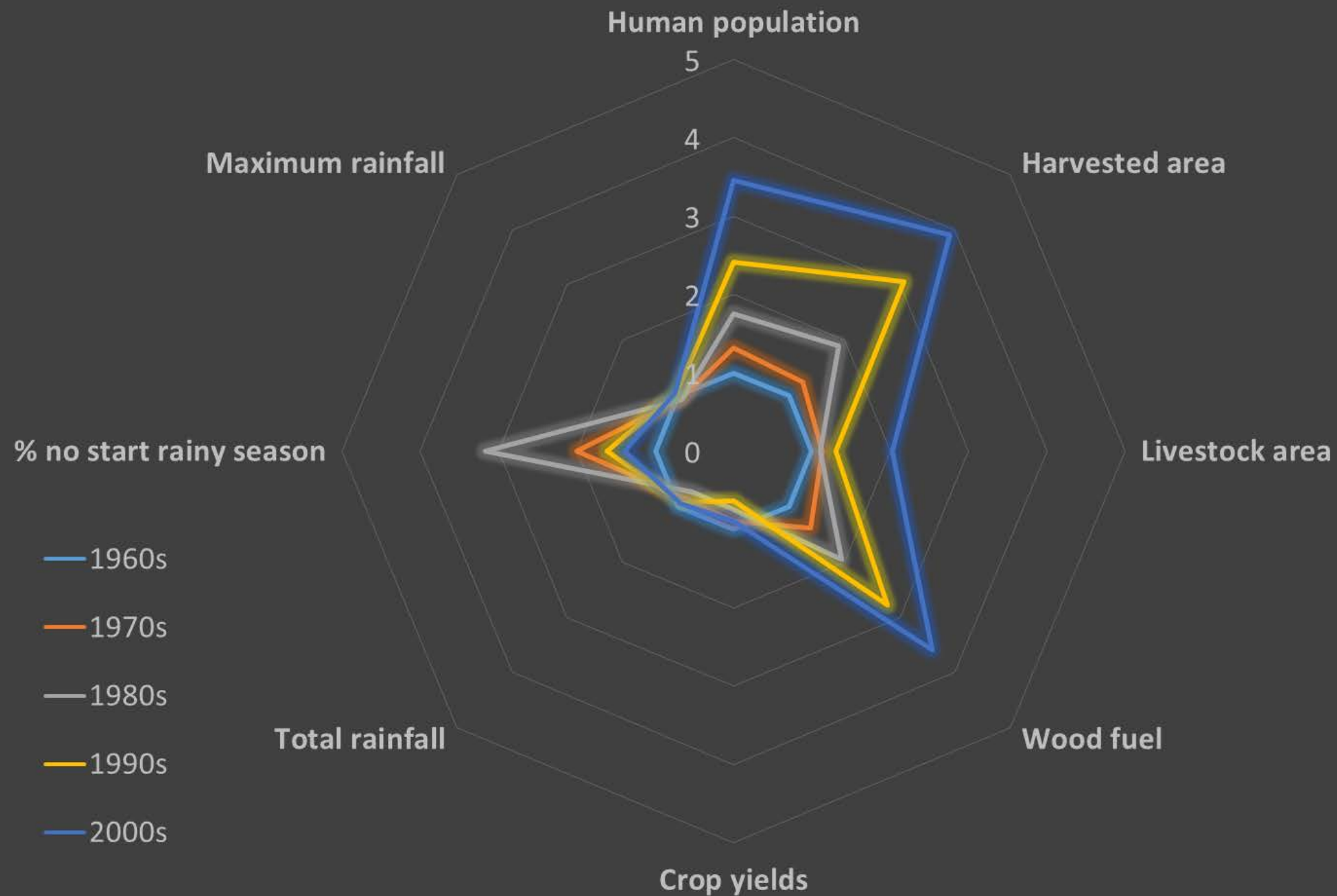


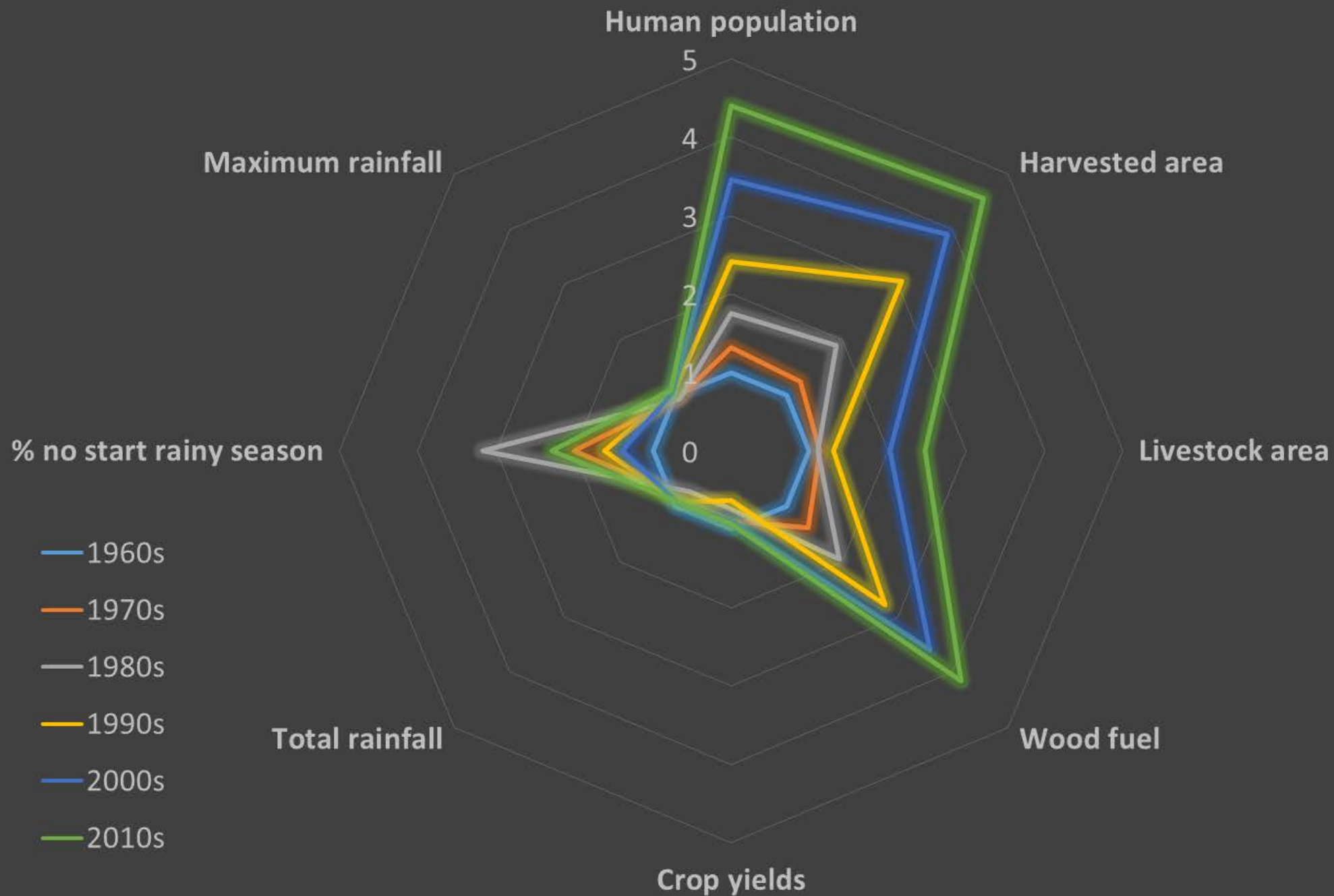




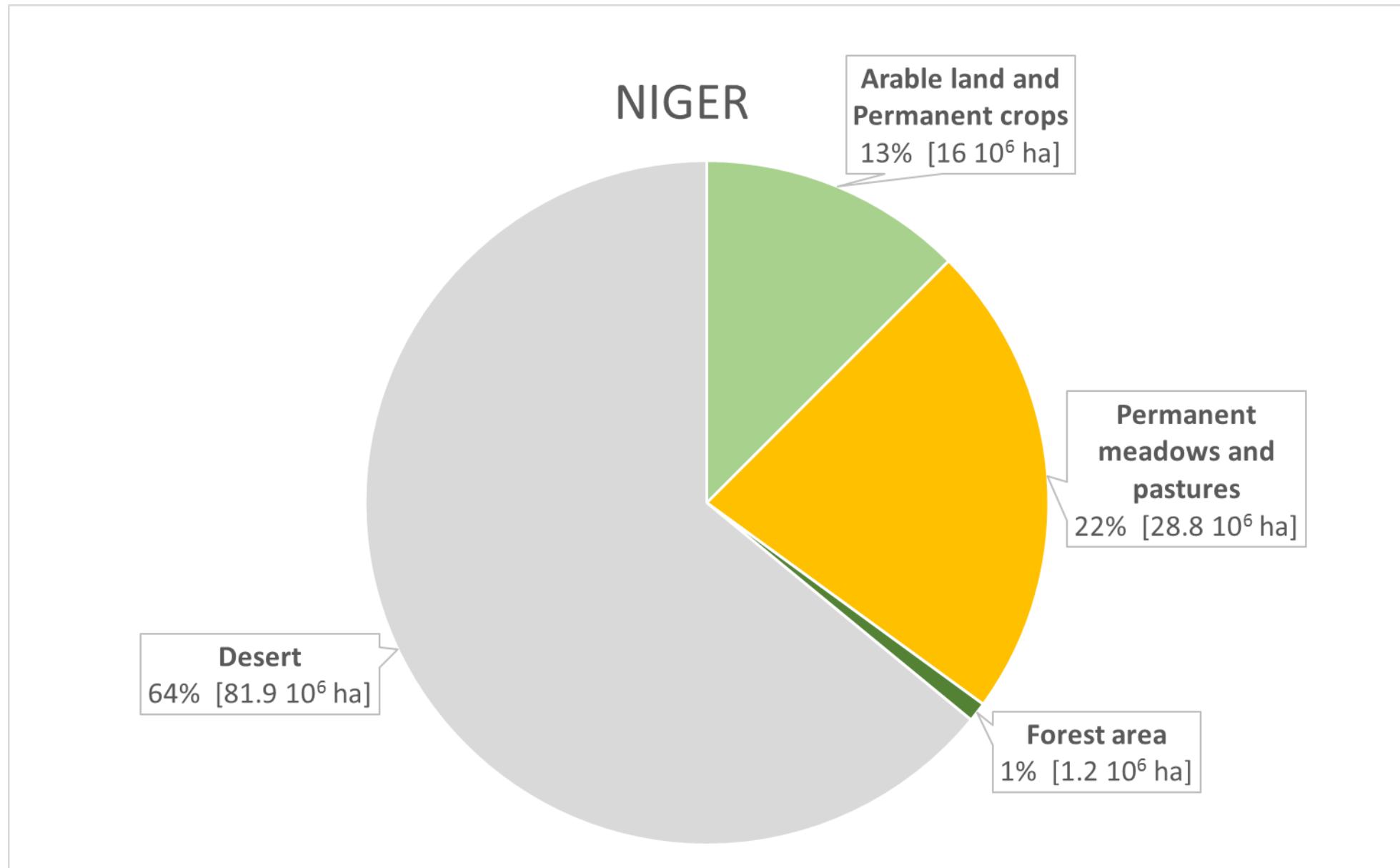




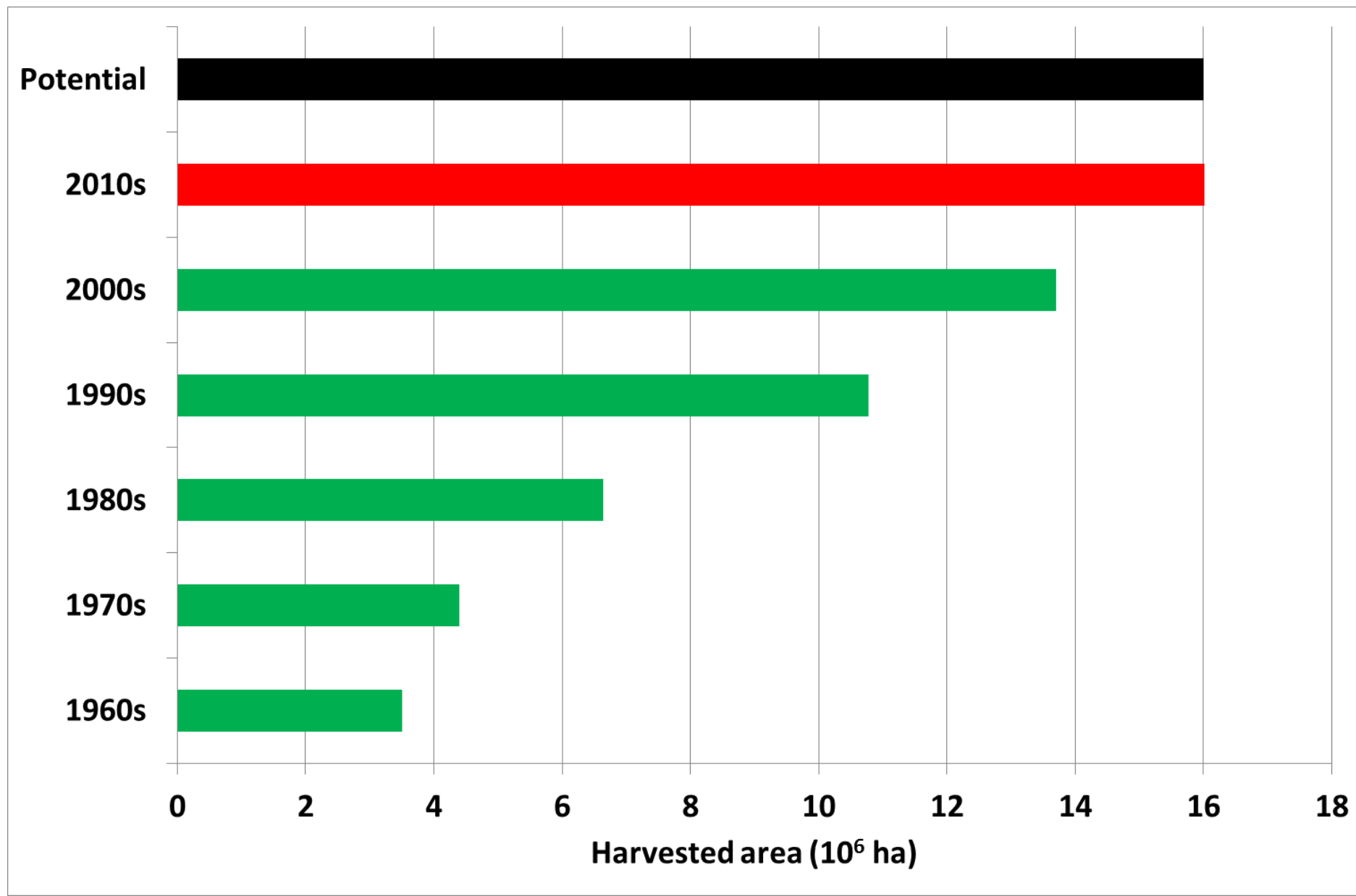




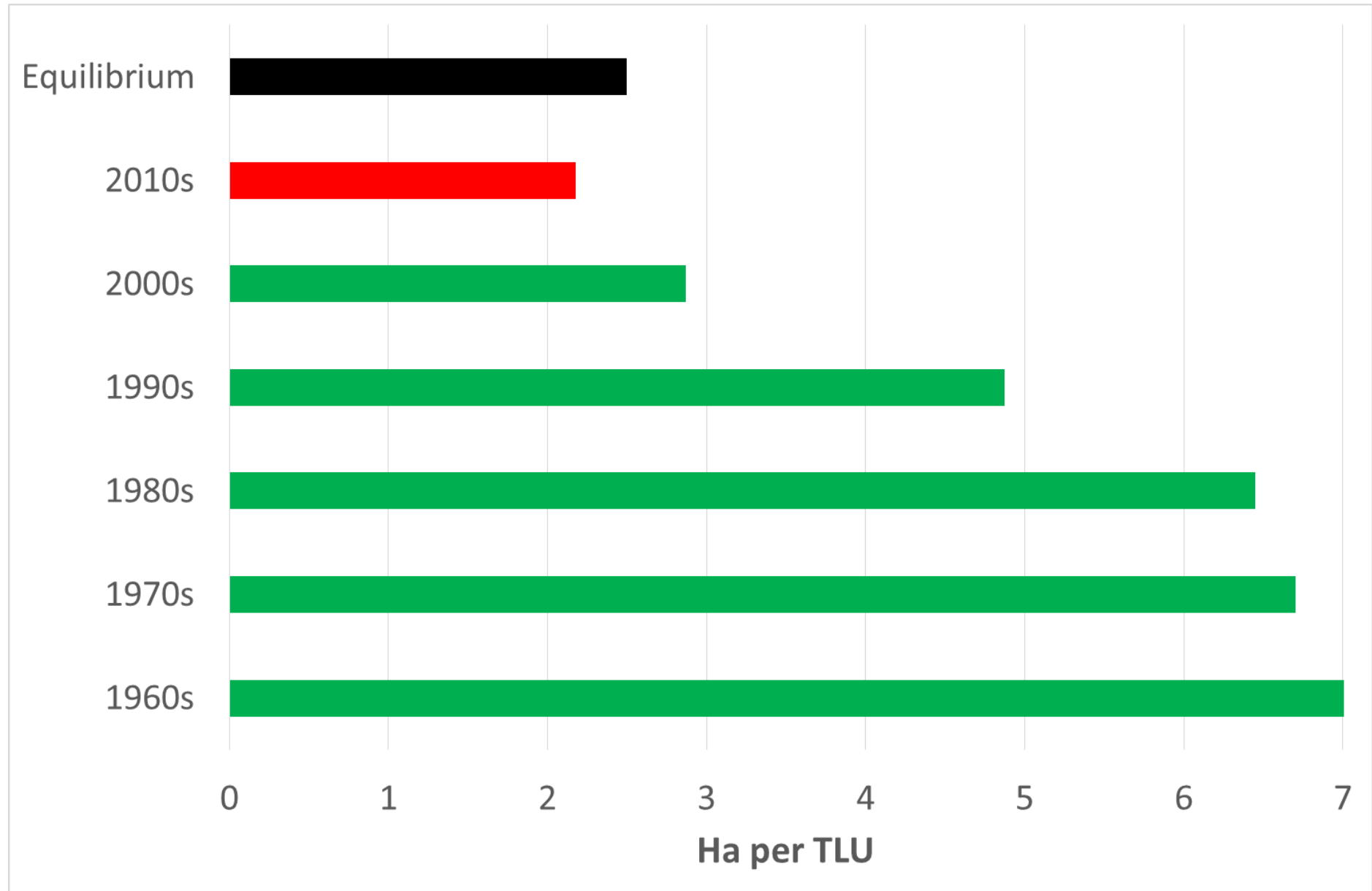
Potential land resources in Niger (FAO, 2015)



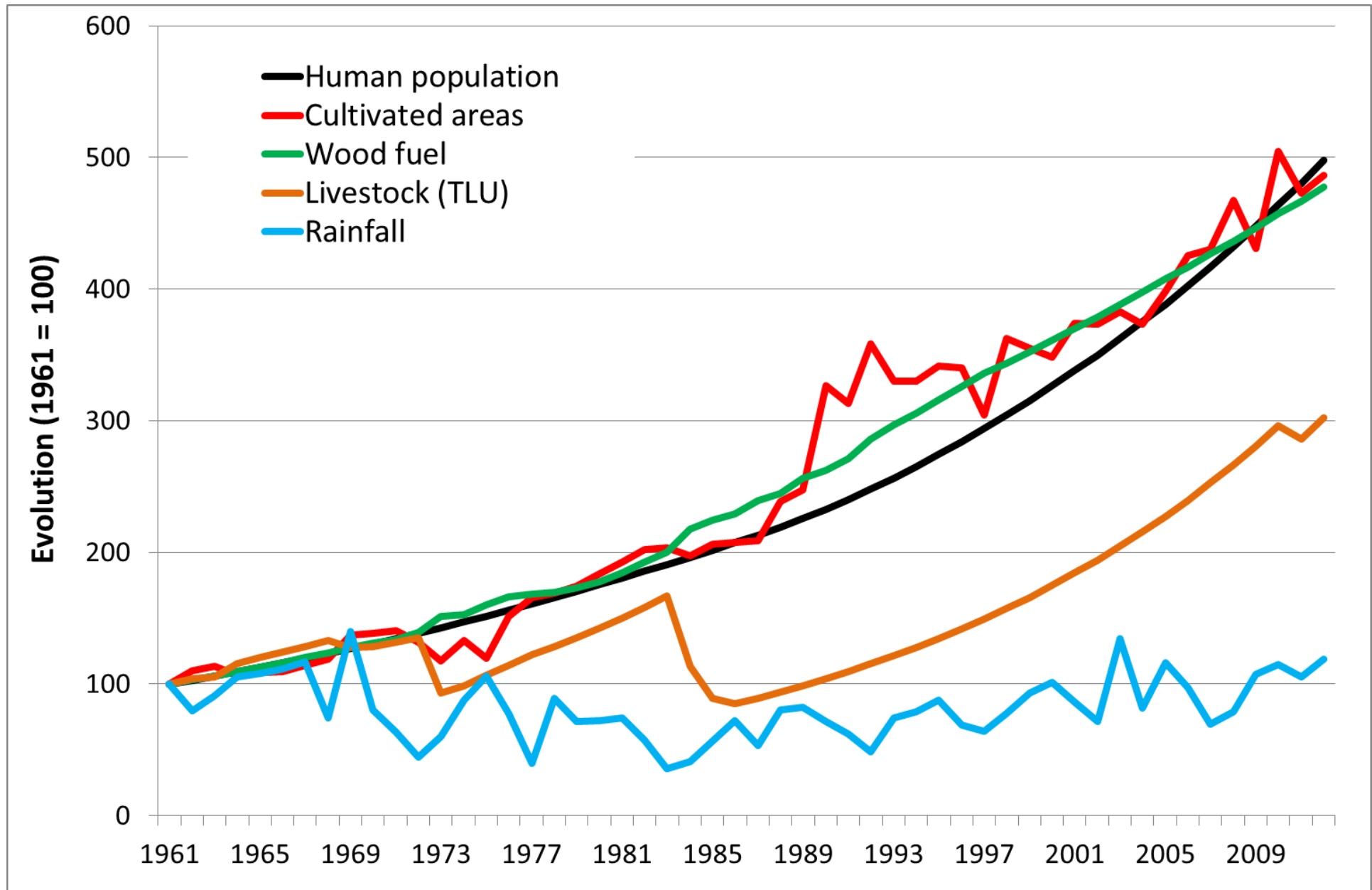
Harvested area Vs Arable land and permanent crops potential



Livestock area Vs Permanent meadows and pastures potential

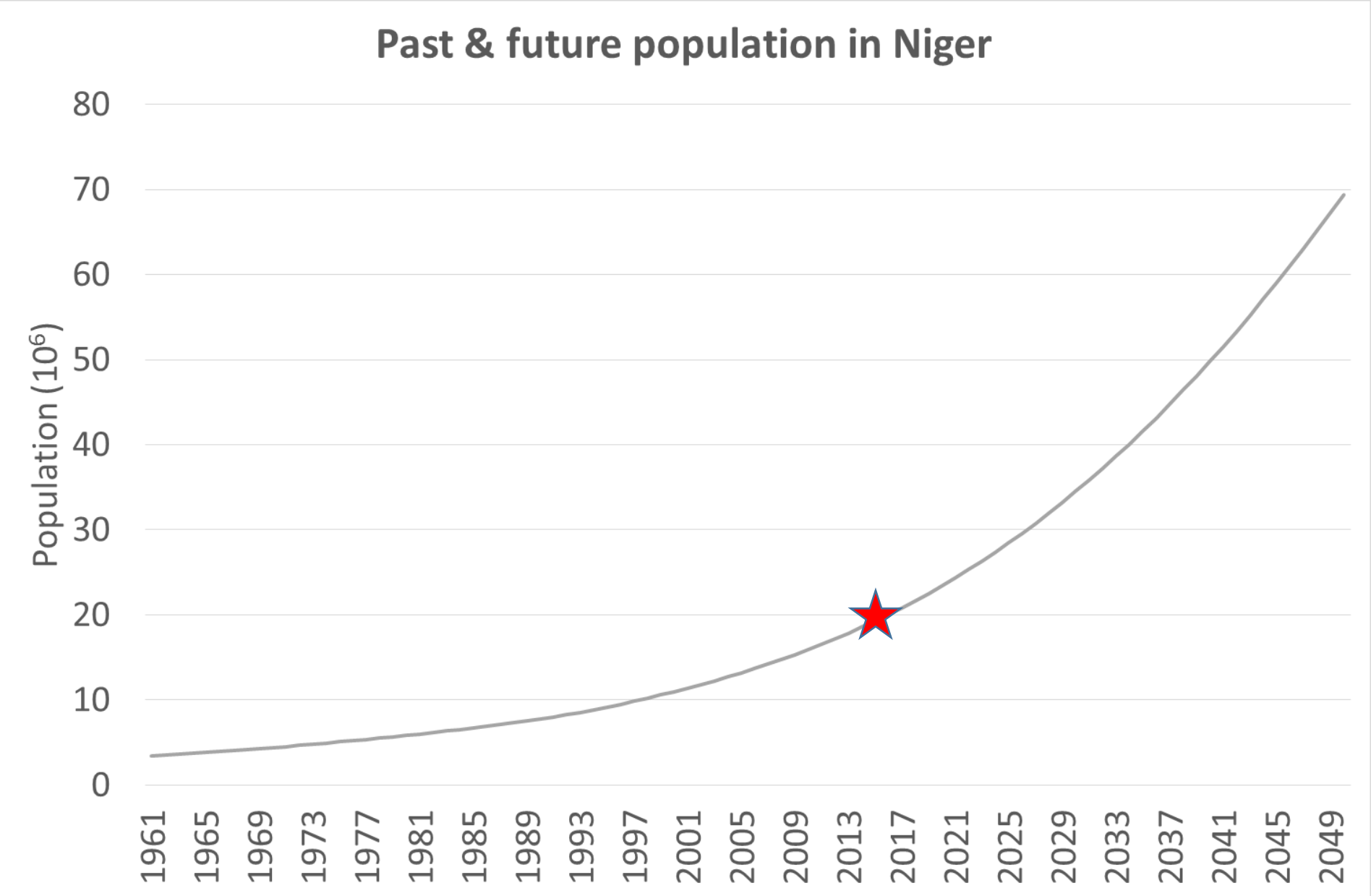


Evolution of some indices in Niger (1961-2013)



Data: FAO, 2014; Ozer *et al.*, 2015

What's next ?

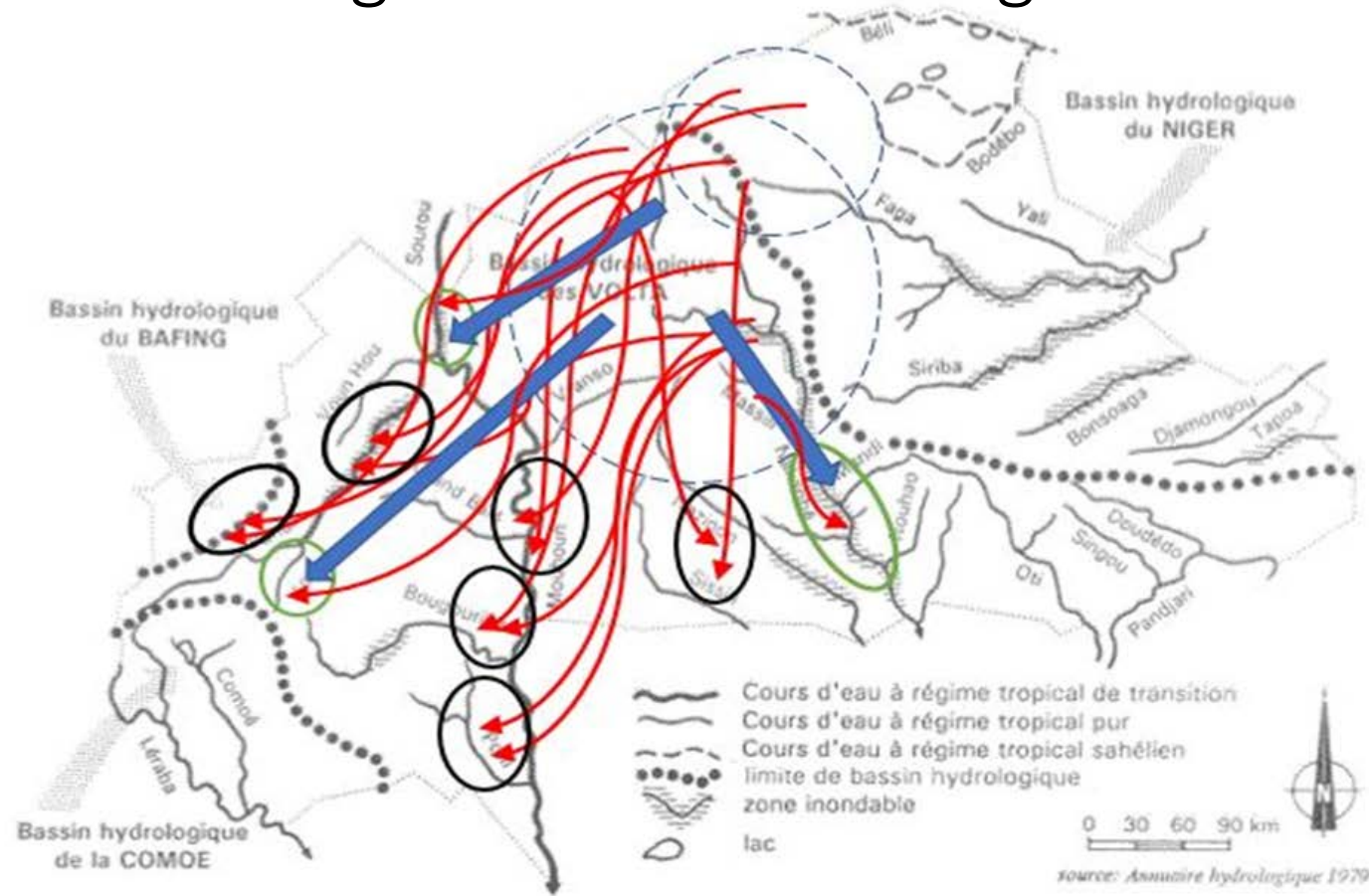


Social 'tipping points' under climate/environmental change

I will talk about Burkina Faso, where the application of Law 034/2009 on rural land tenure security may turn into a national conflict

Context

Large migration resulting from severe droughts of the 1970s and 1980s



- Zones d'accueil des migrations agricoles organisées par l'Etat
- Zones d'accueil des migrations agricoles volontaires sans intervention de l'Etat
- Zones de départ de la majorité des migrants agricoles
- ➡ Mouvements migratoires organisés
- ➡ Mouvements migratoires volontaires

Context

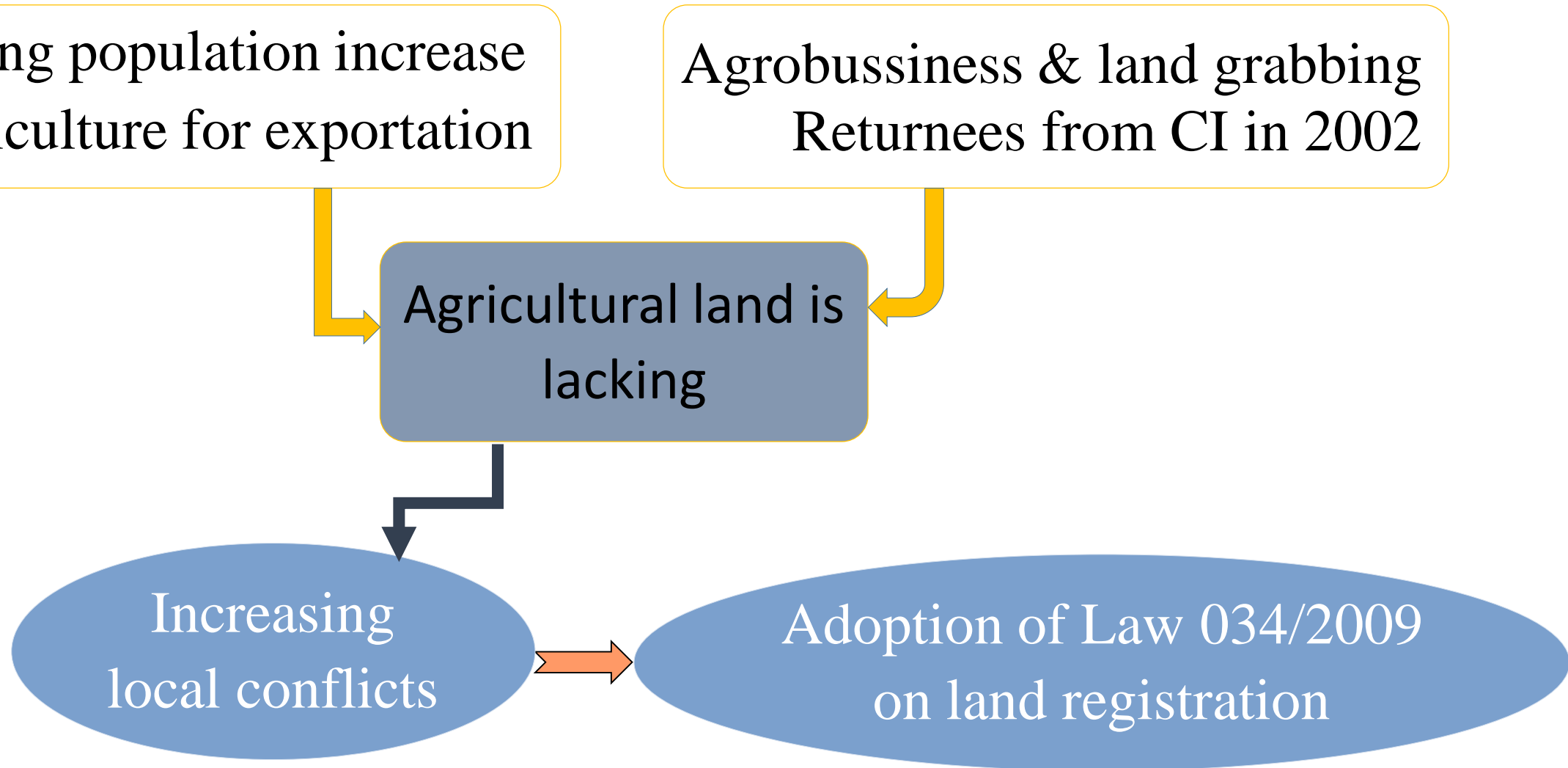
Strong population increase
Agriculture for exportation

Agrobusiness & land grabbing
Returnees from CI in 2002

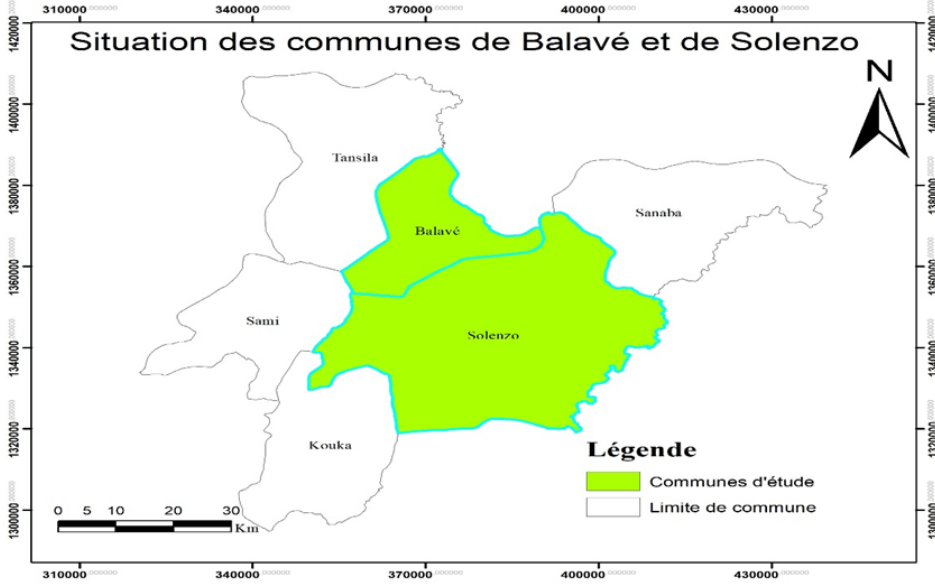
Agricultural land is
lacking

Increasing
local conflicts

Adoption of Law 034/2009
on land registration



Data & methods



Source: Données administratives (Divas Gis)

Projection: UTM Zone 30N
Datum: WGS 1984
Coordonnées en mètres

Auteur: KOALA Ouango
Date d'édition: Juin 2017

Rainfall analysis
1950- 2013

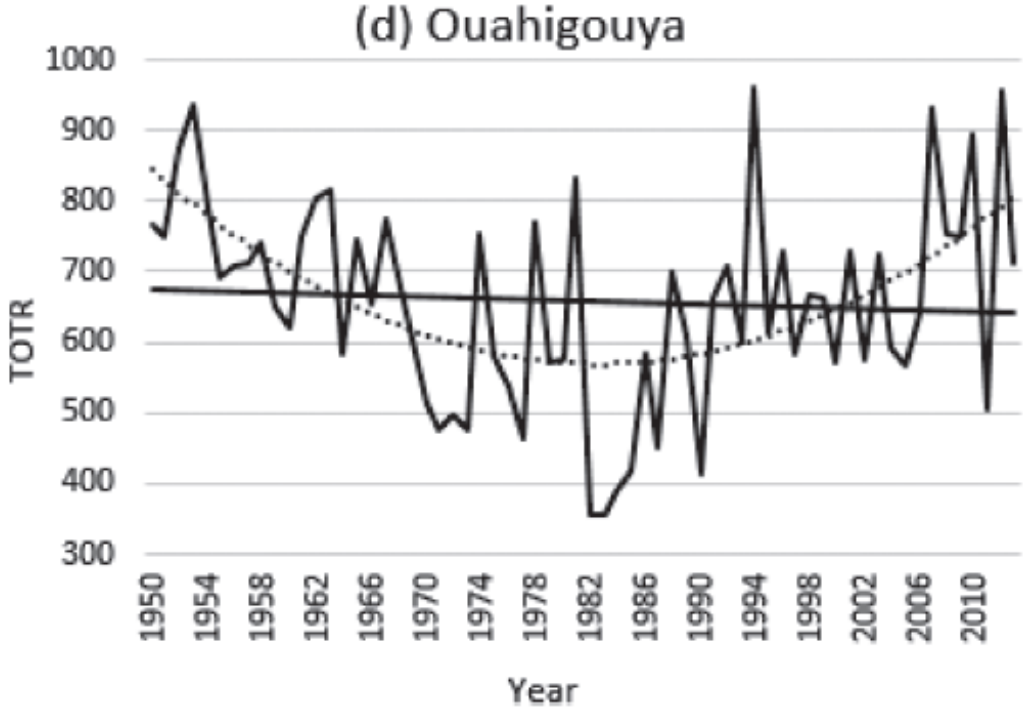
Data & methods

Interviews with
local & national
authorities

Interviews with
200 'migrant farmers'
& 100 future land owners

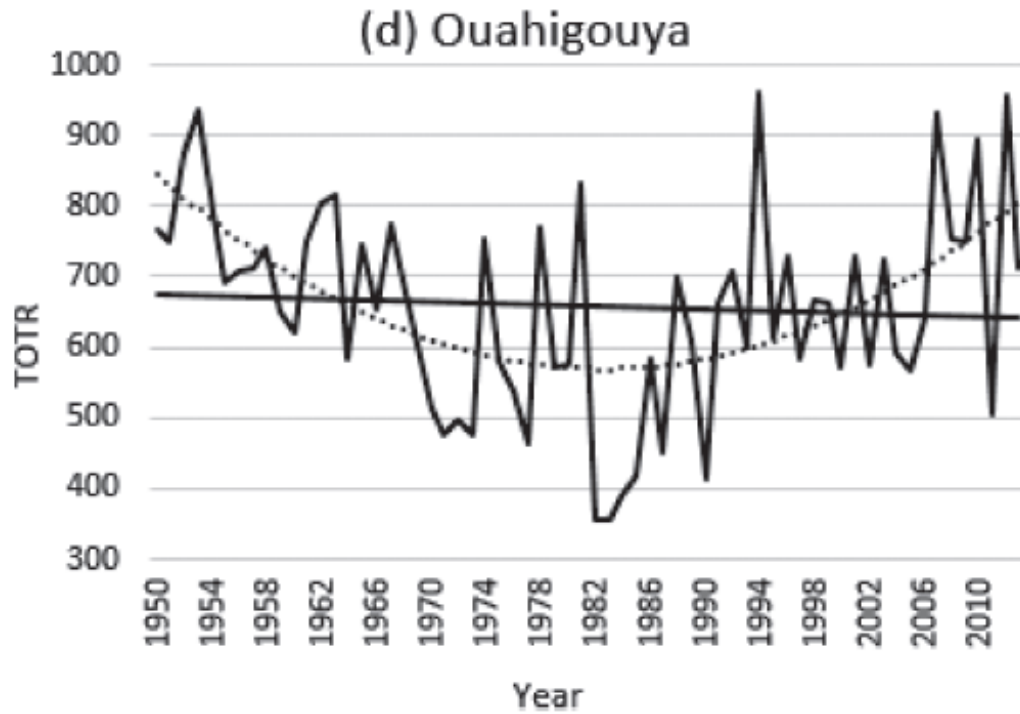
Results

Rainfall

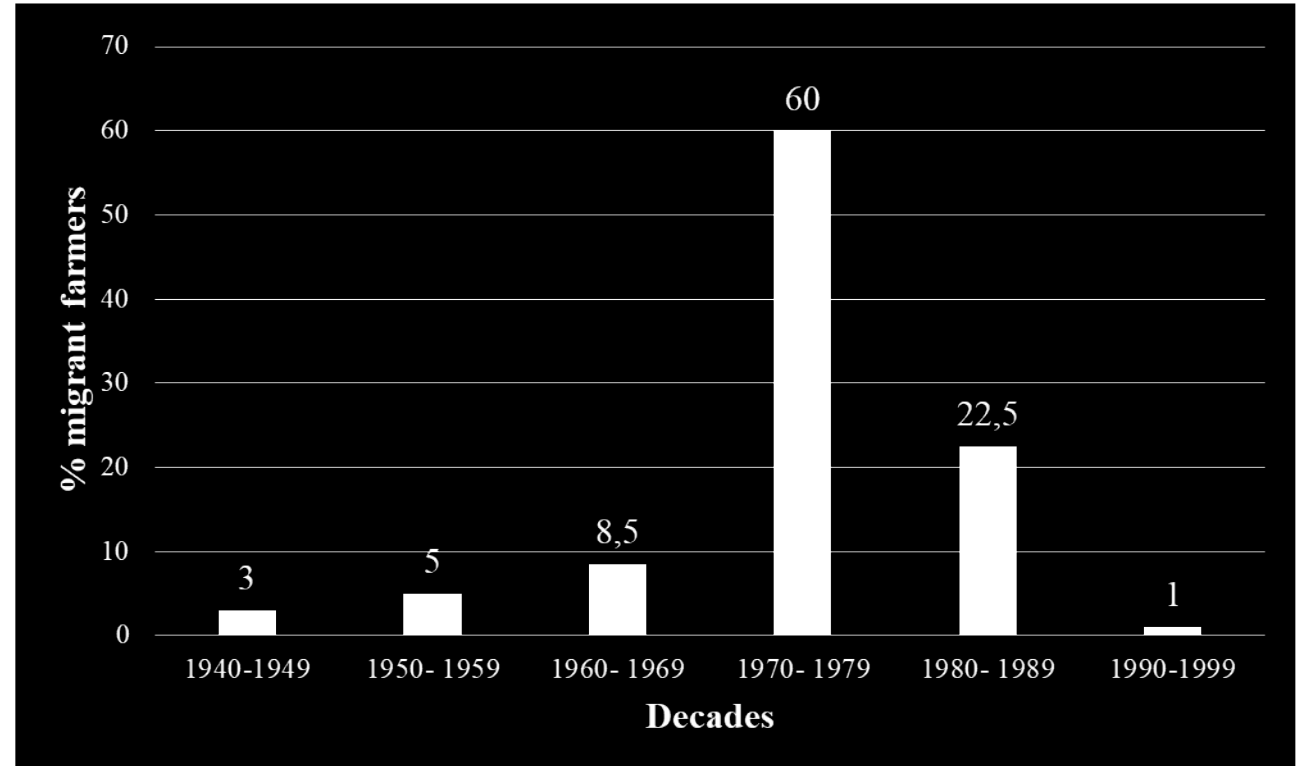


Results

Rainfall

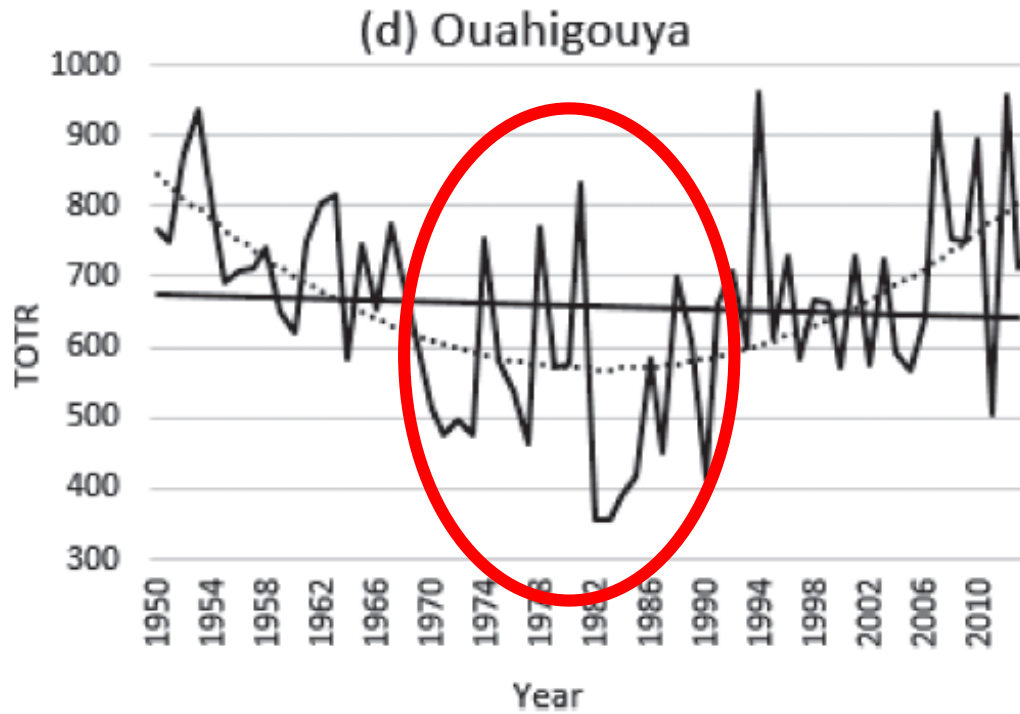


Period of migration

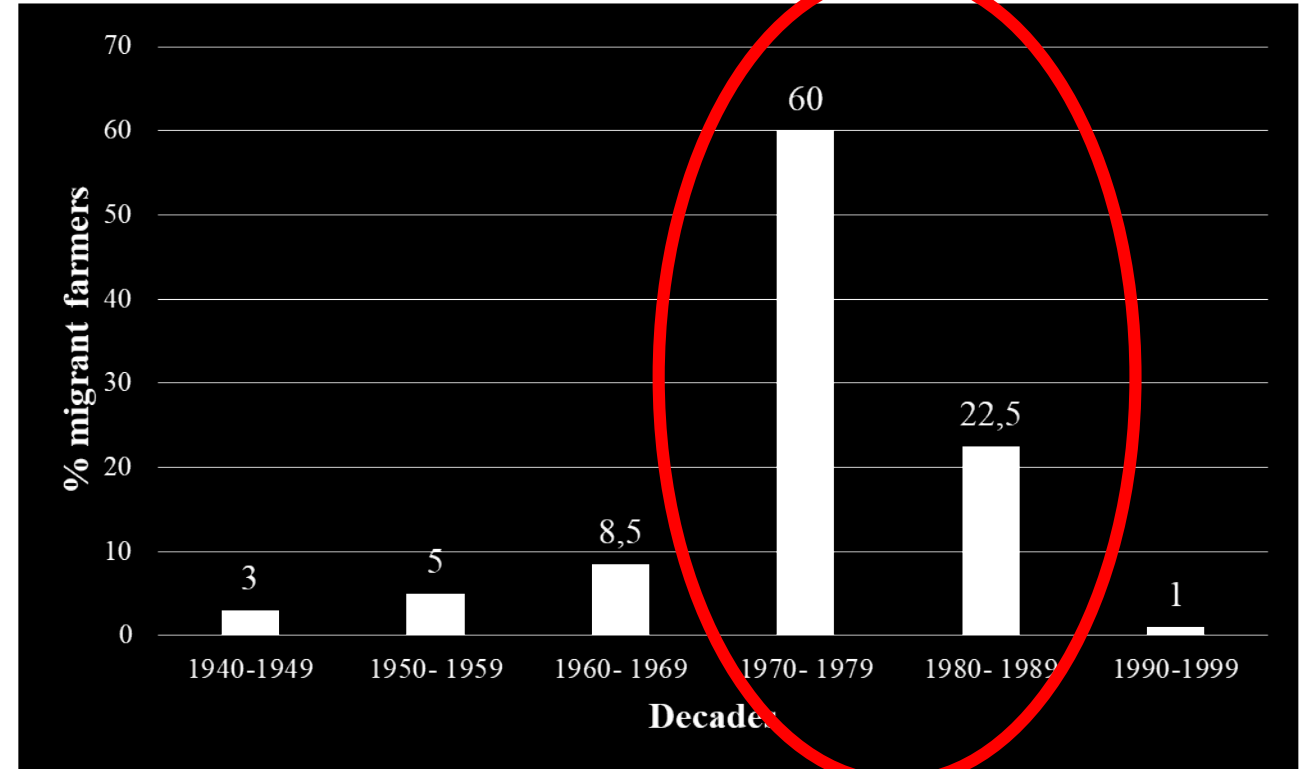


Results

Rainfall



Period of migration



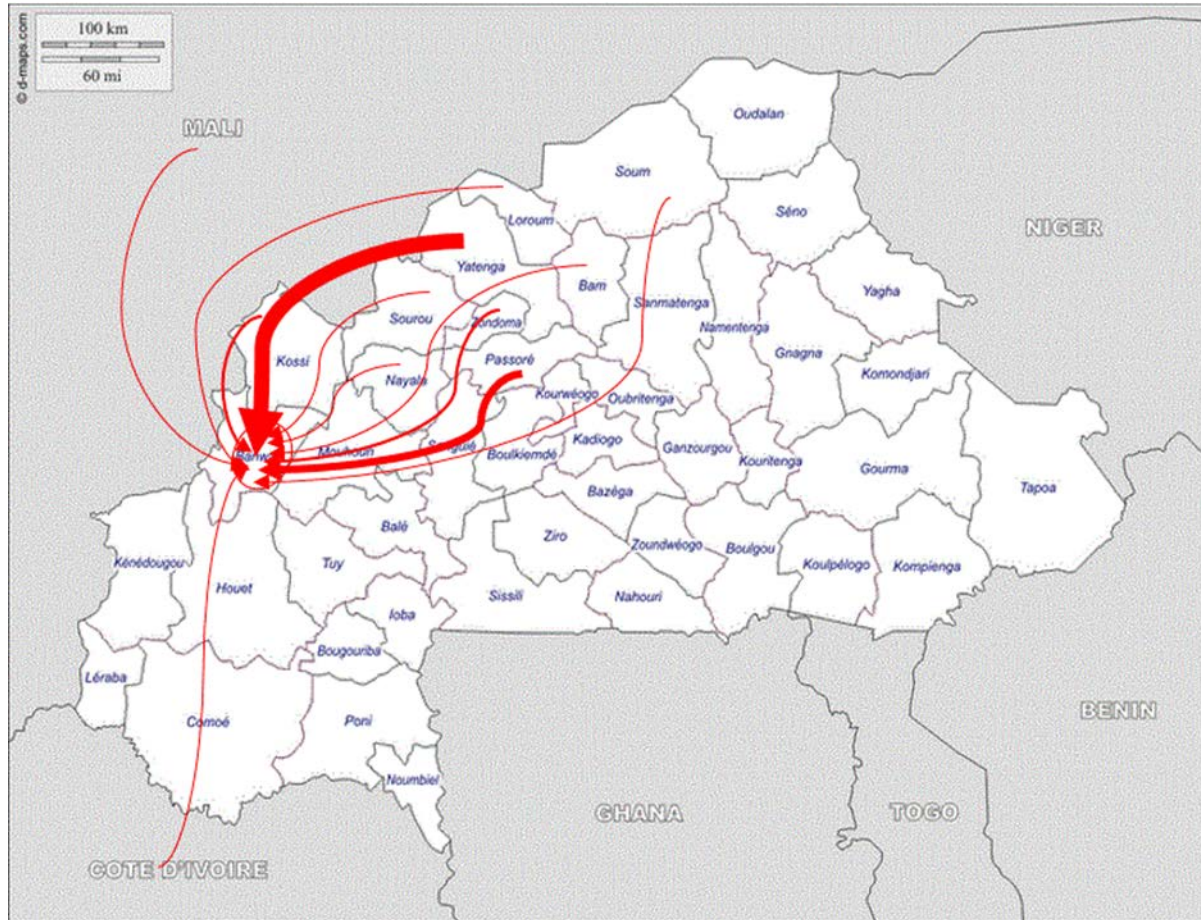
Main reasons of migration

Land degradation (46.5%), drought (28%),
lack of land (12%)

Results

Region of departure

Current access to the land for the 'migrant farmers'

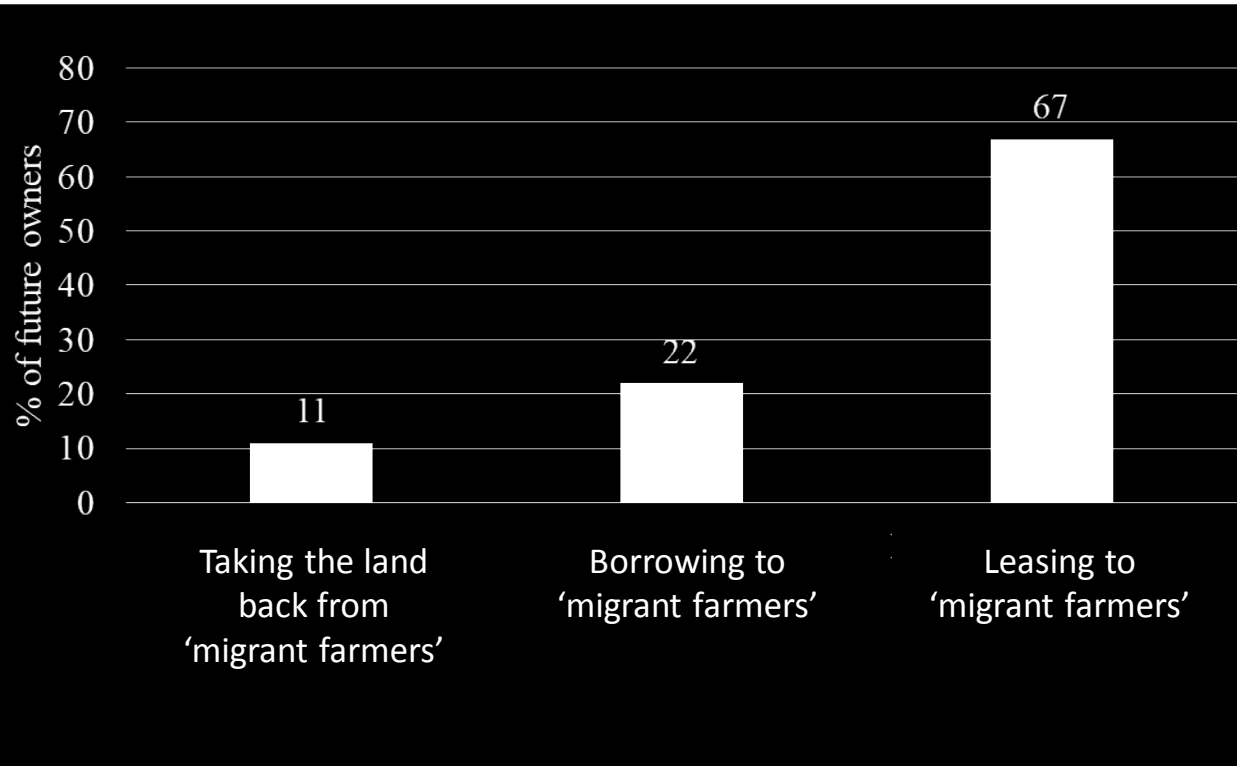


Borrowing	92%
Leasing	3%
Owner	5%

95% of the 'migrant farmers' will not have a 'free access' to the land after the application of Law 034/2009 on land registration

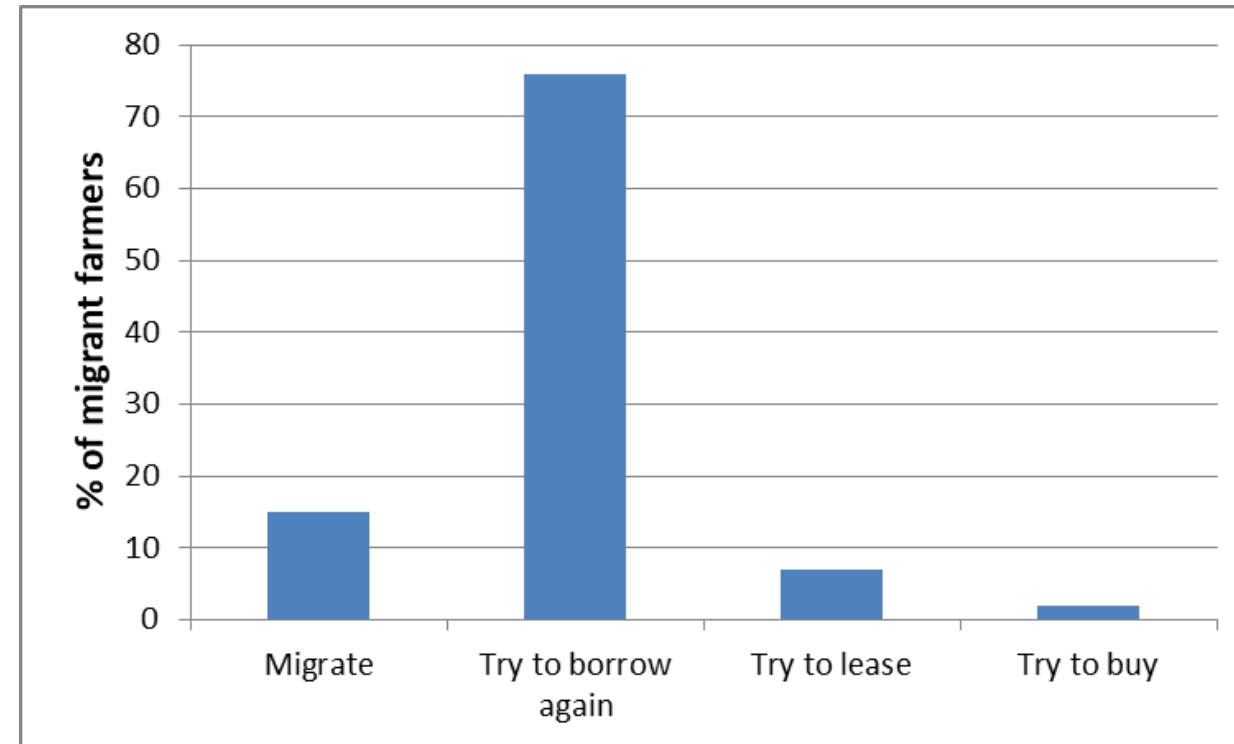
Results

What will the future owners do with their land ?



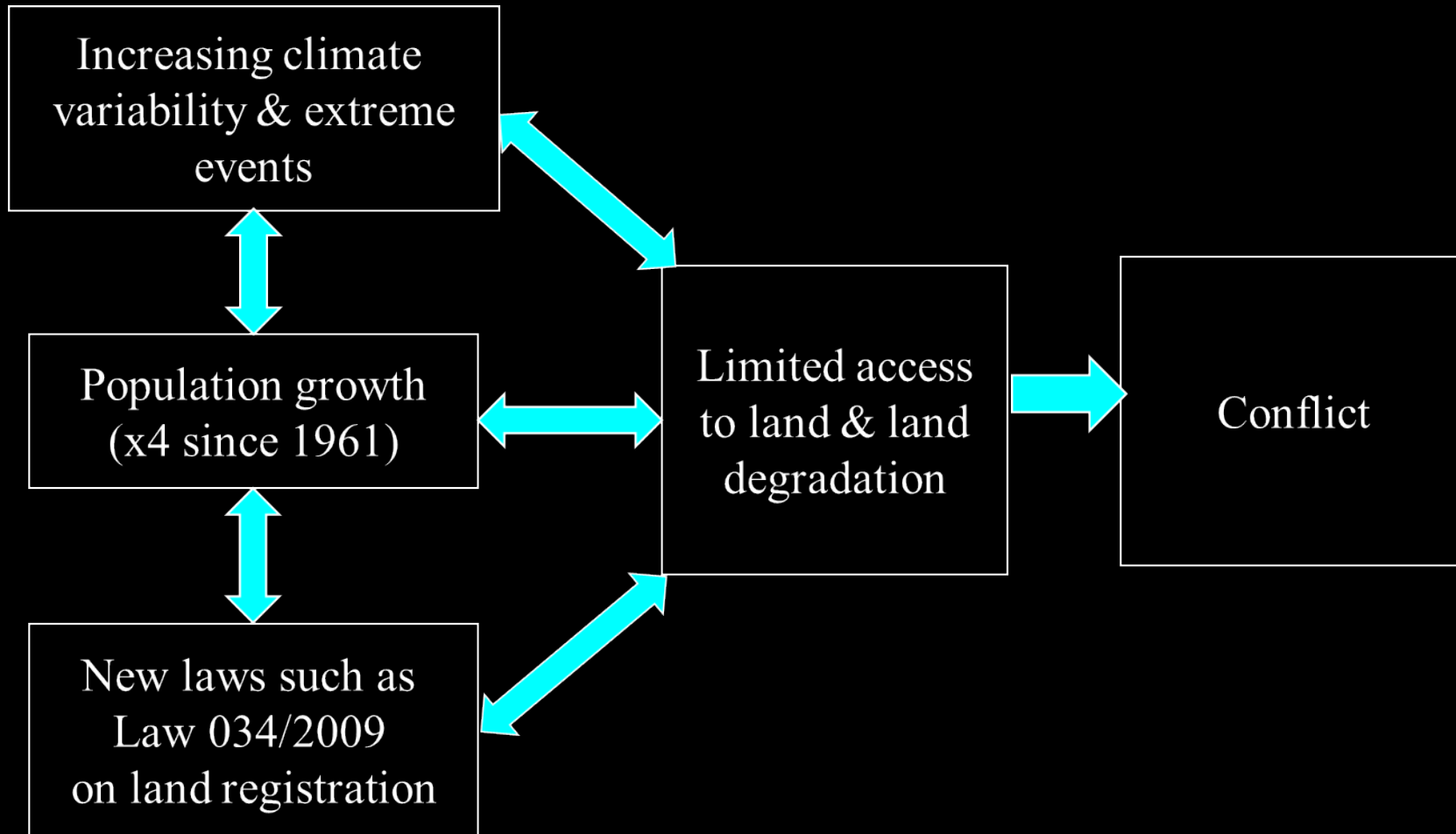
High risk of limited access to the land since 60% of the 'migrant farmers' live below the poverty line (INSD, 2016)

How will 'migrant farmers' adapt after the application of Law 034/2009

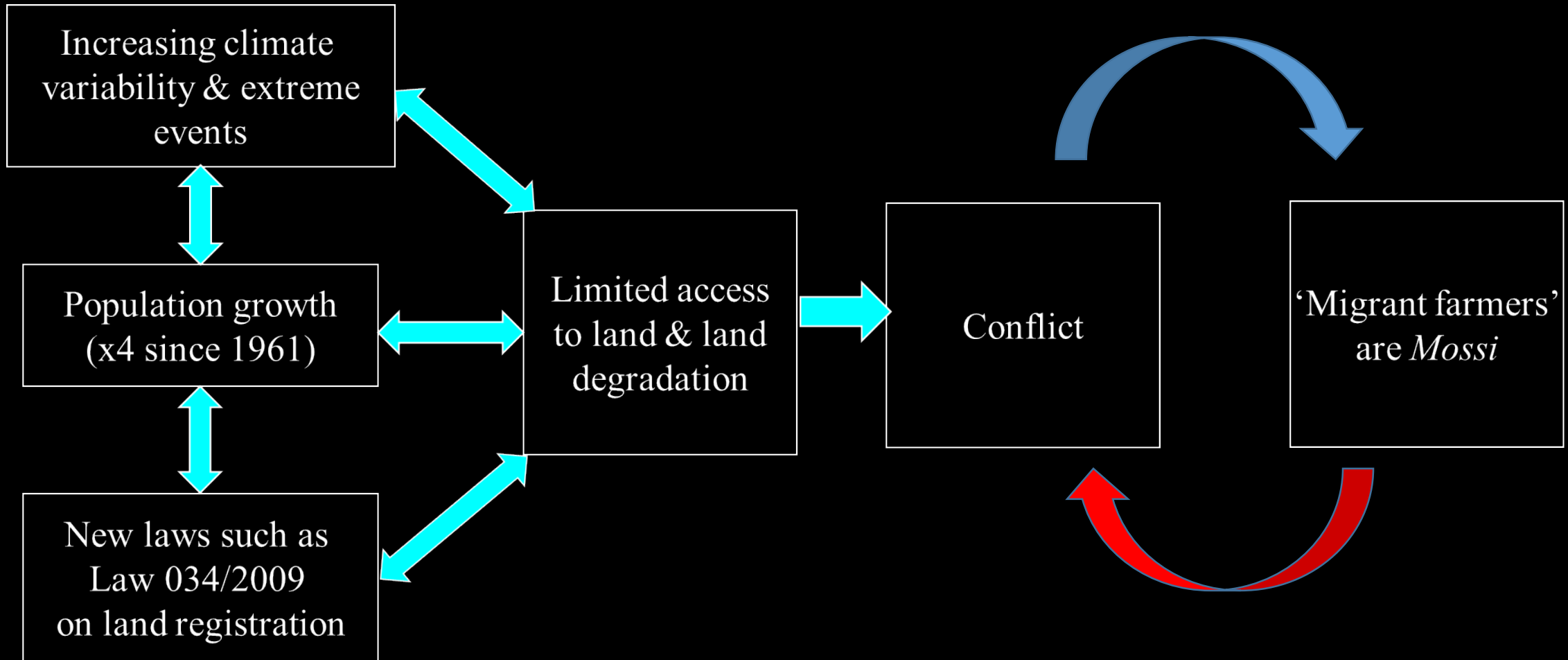


Many 'migrant farmers' will likely be 'trapped', especially the poorest. 86% of the 'migrant farmers' will not back to their region of origin.

Conclusion



Conclusion



Conclusion

