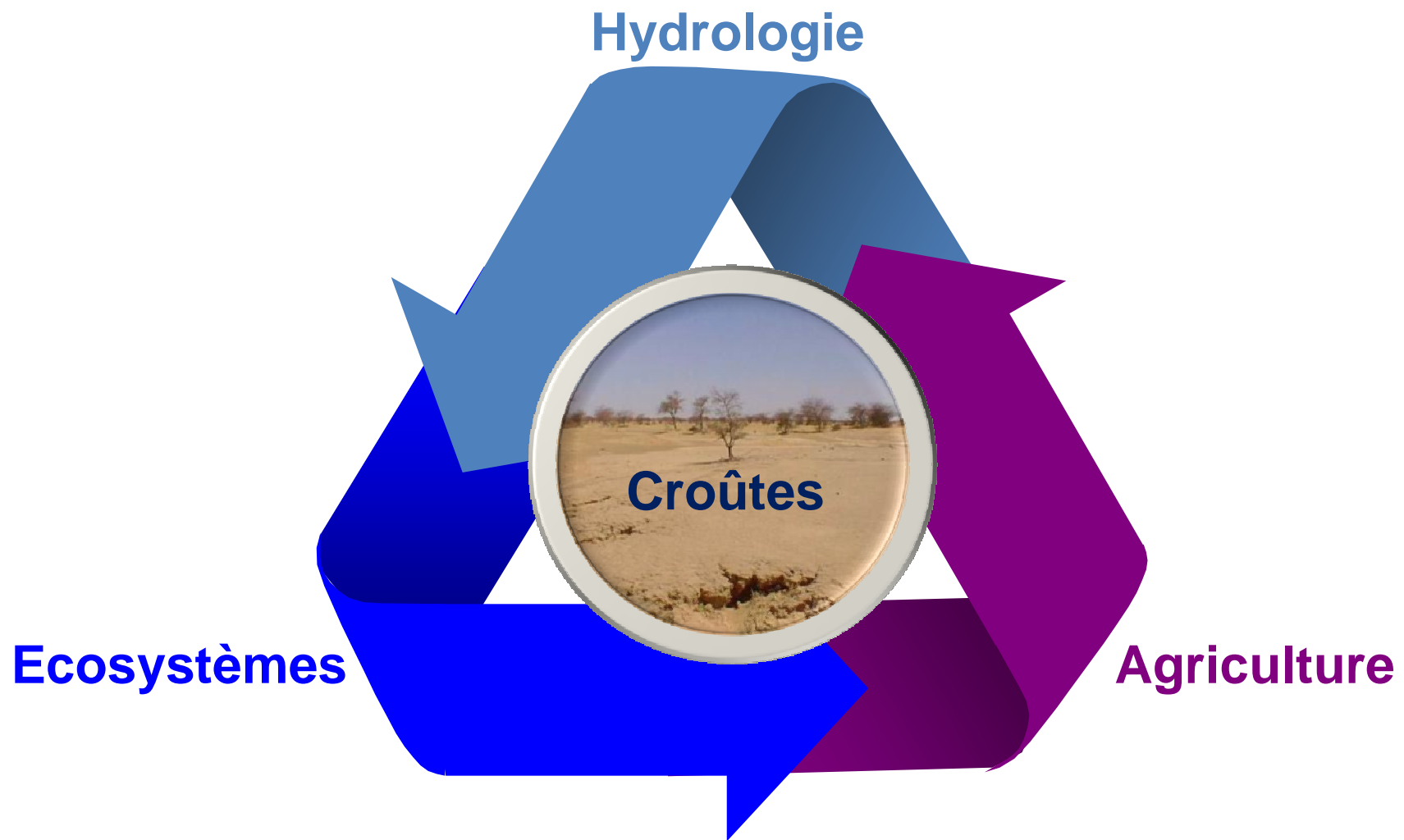




Effets des interactions entre les variations climatiques et les usages des sols sur la désertification et le reverdissement du Sahel

Christian Valentin
Institut de Recherche pour le Développement





C. Valentin

Croûte de tamisage

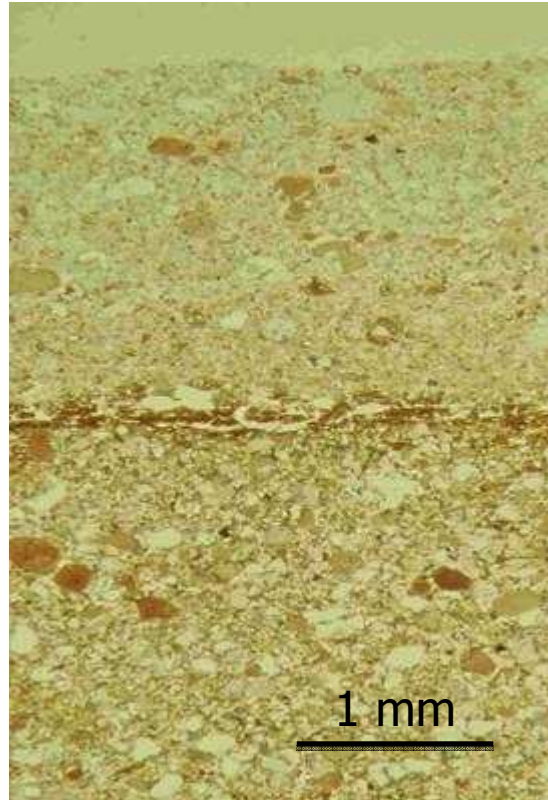


Surface



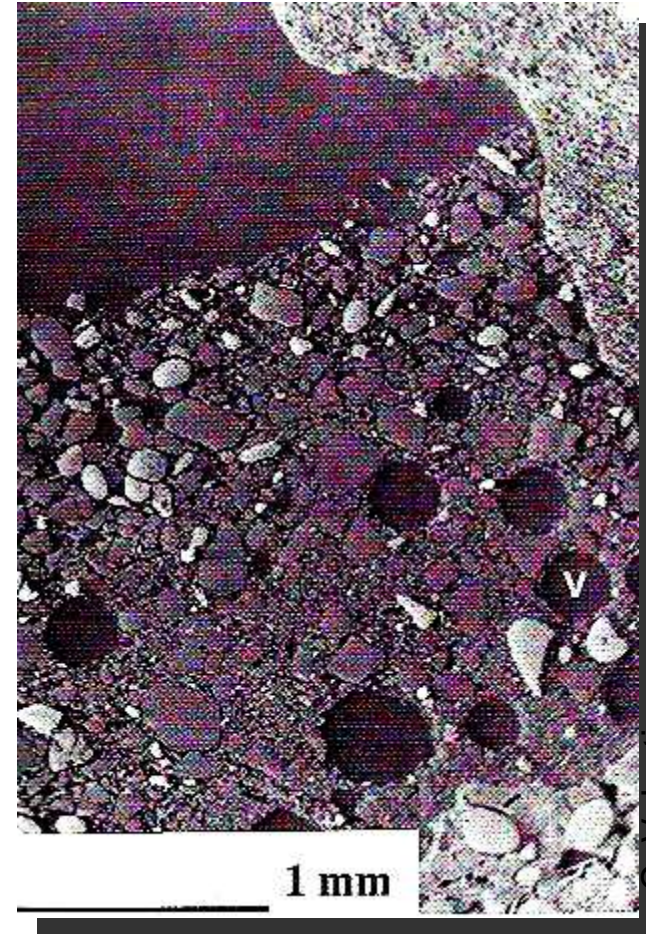
C. Valentin

En coupe



C. Valentin

En coupe



C. Valentin

Croûte grossière



C. Valentin

Surface



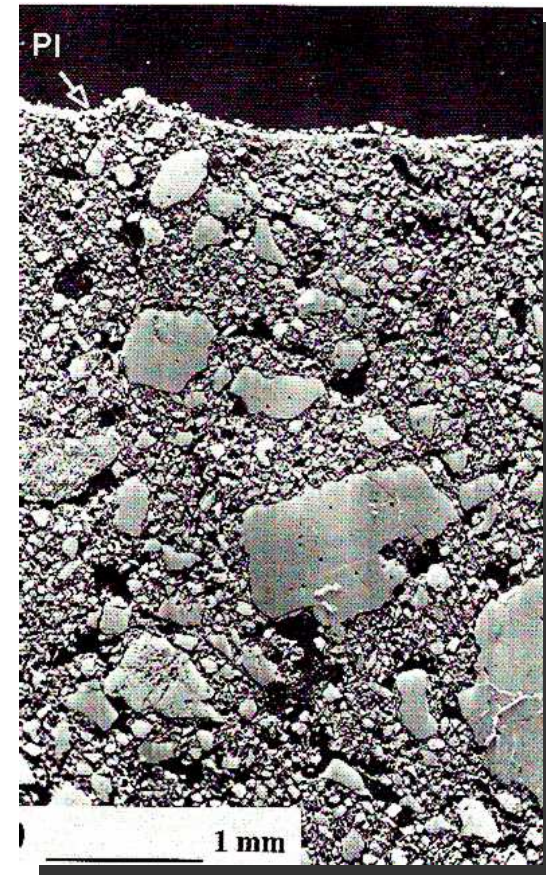
C. Valentin

En coupe

Croûte d'érosion



C. Valentin



C. Valentin

Croûtes de ruissellement et de dépôt

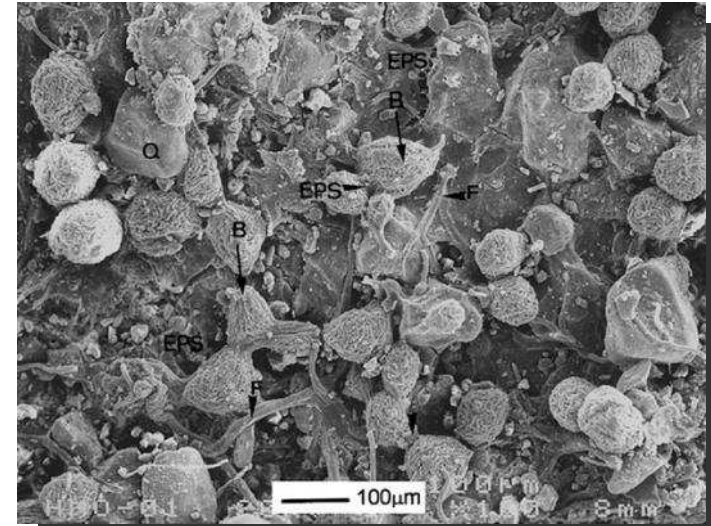
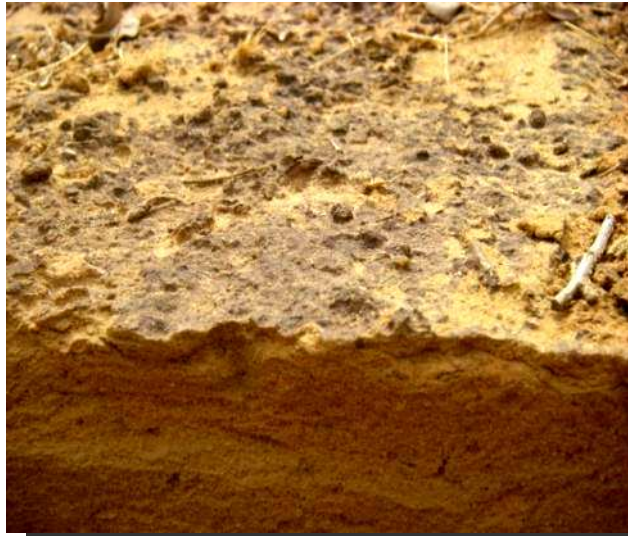


C. Valentin

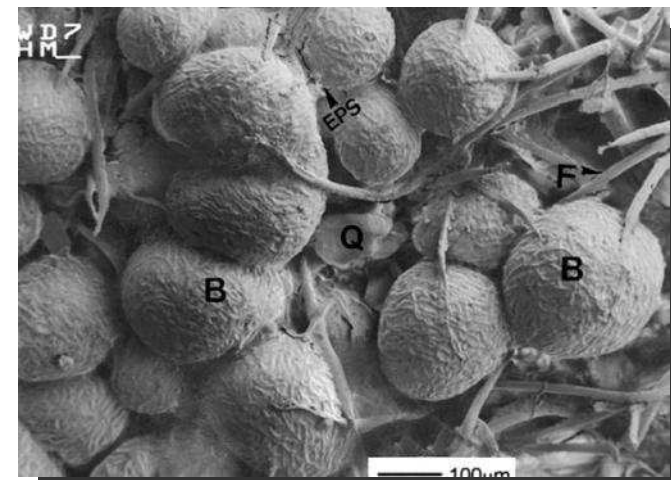
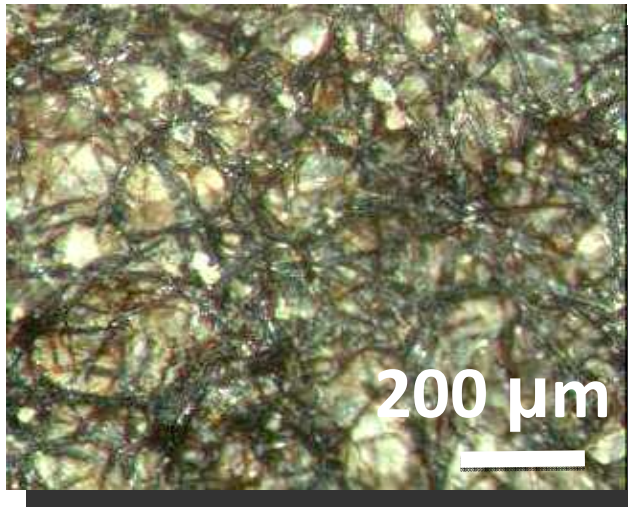


C. Valentin

Croûtes biologiques



O. Malam Issa

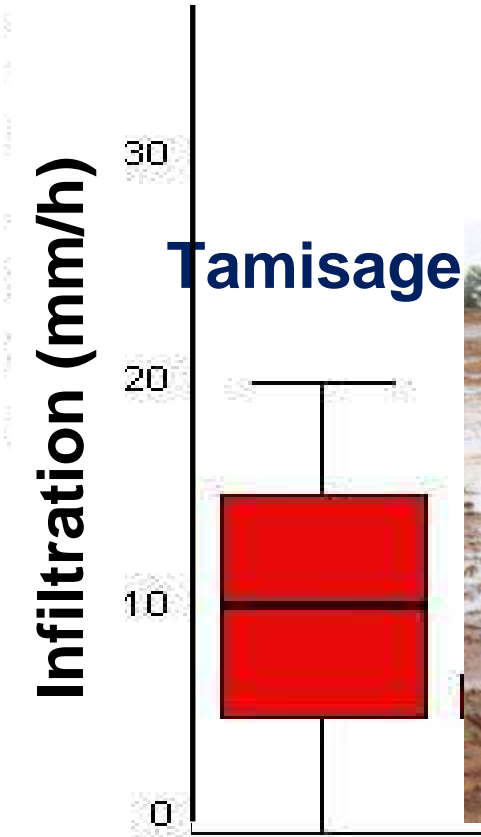


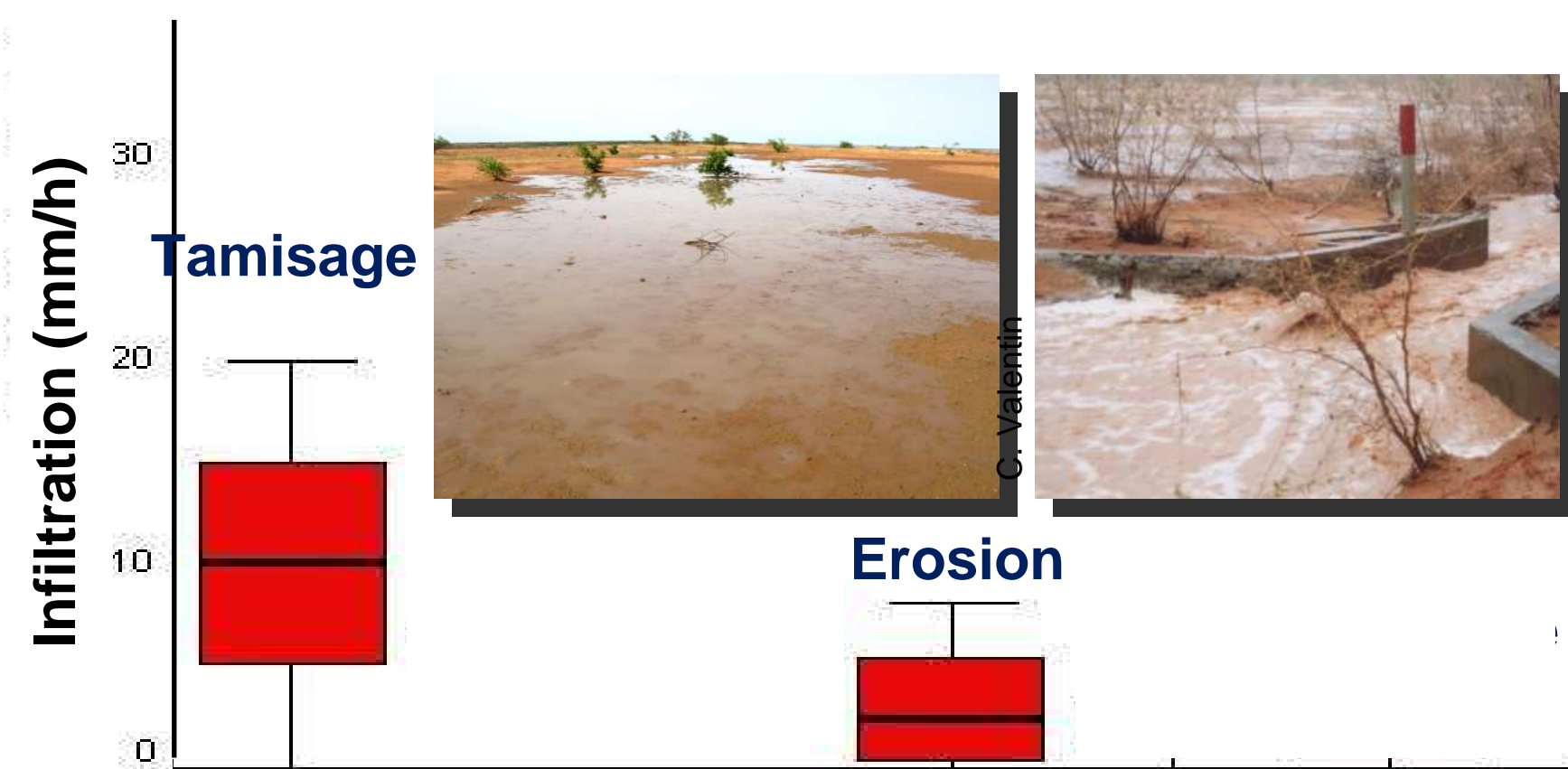
O. Malam Issa

Hydrologie



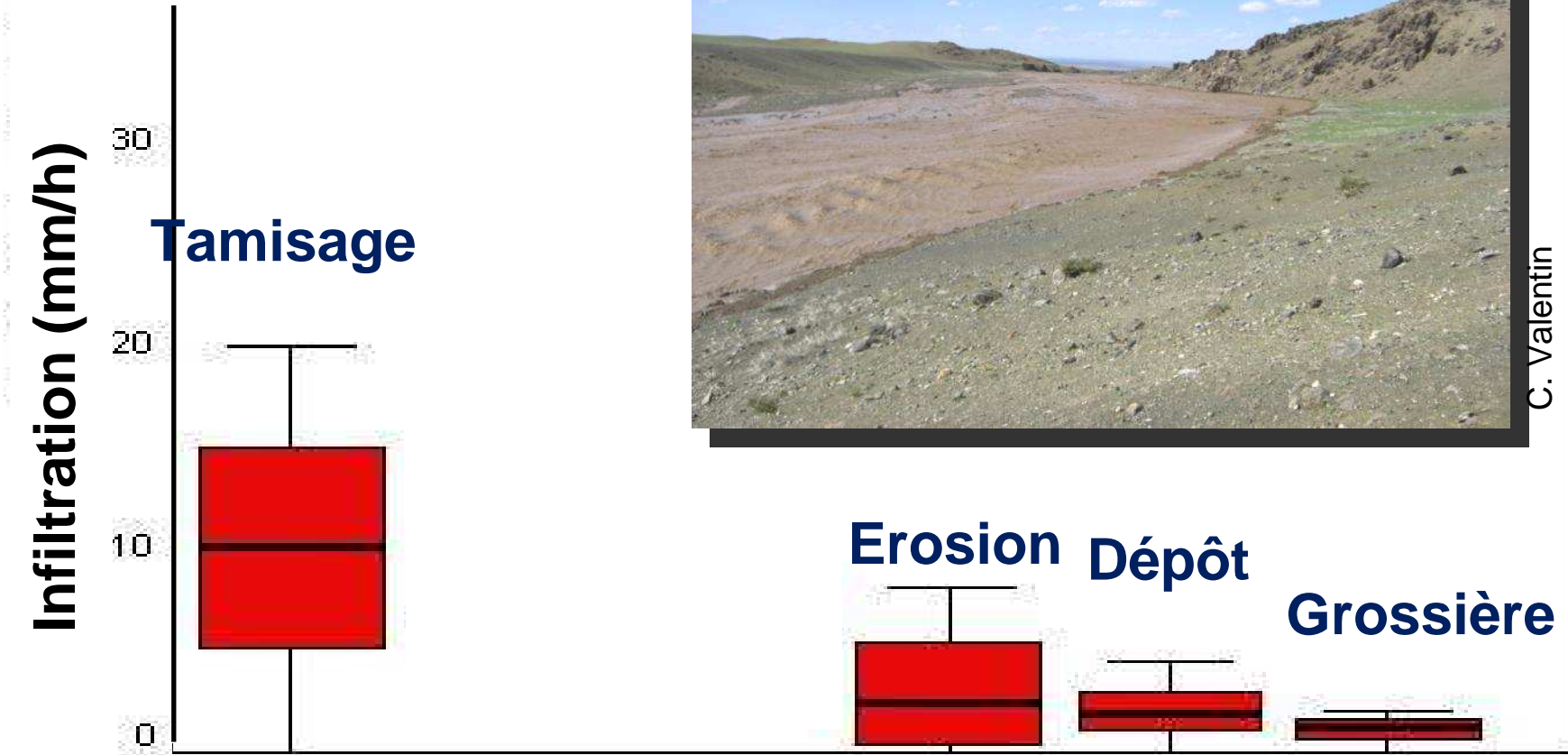
Croûtes





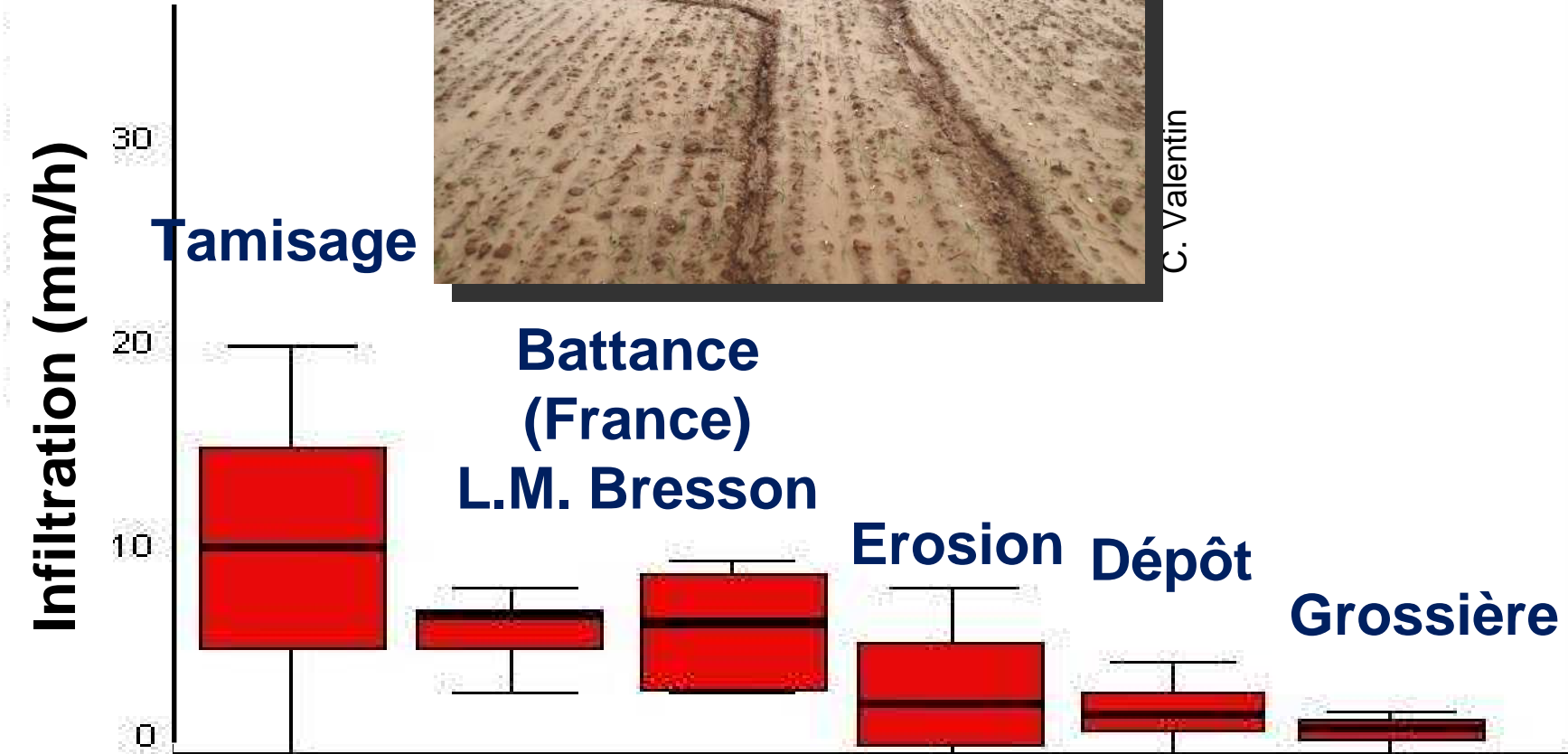


C. Valentin

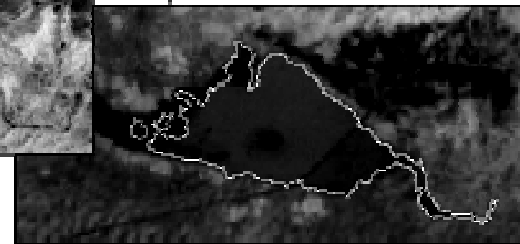
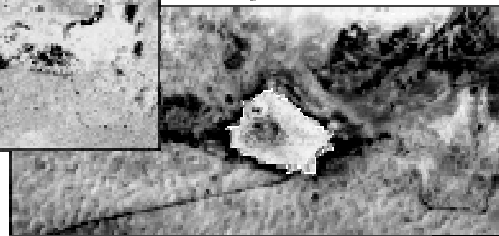
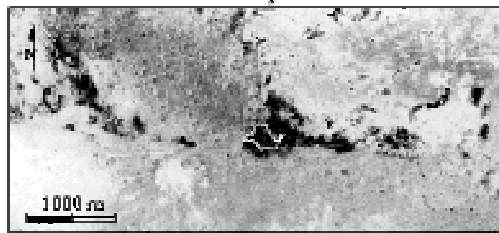
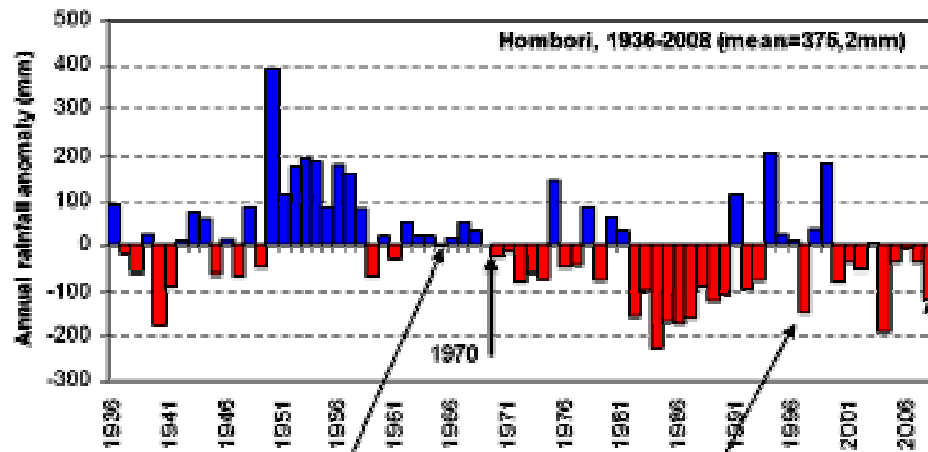




C. Valentin

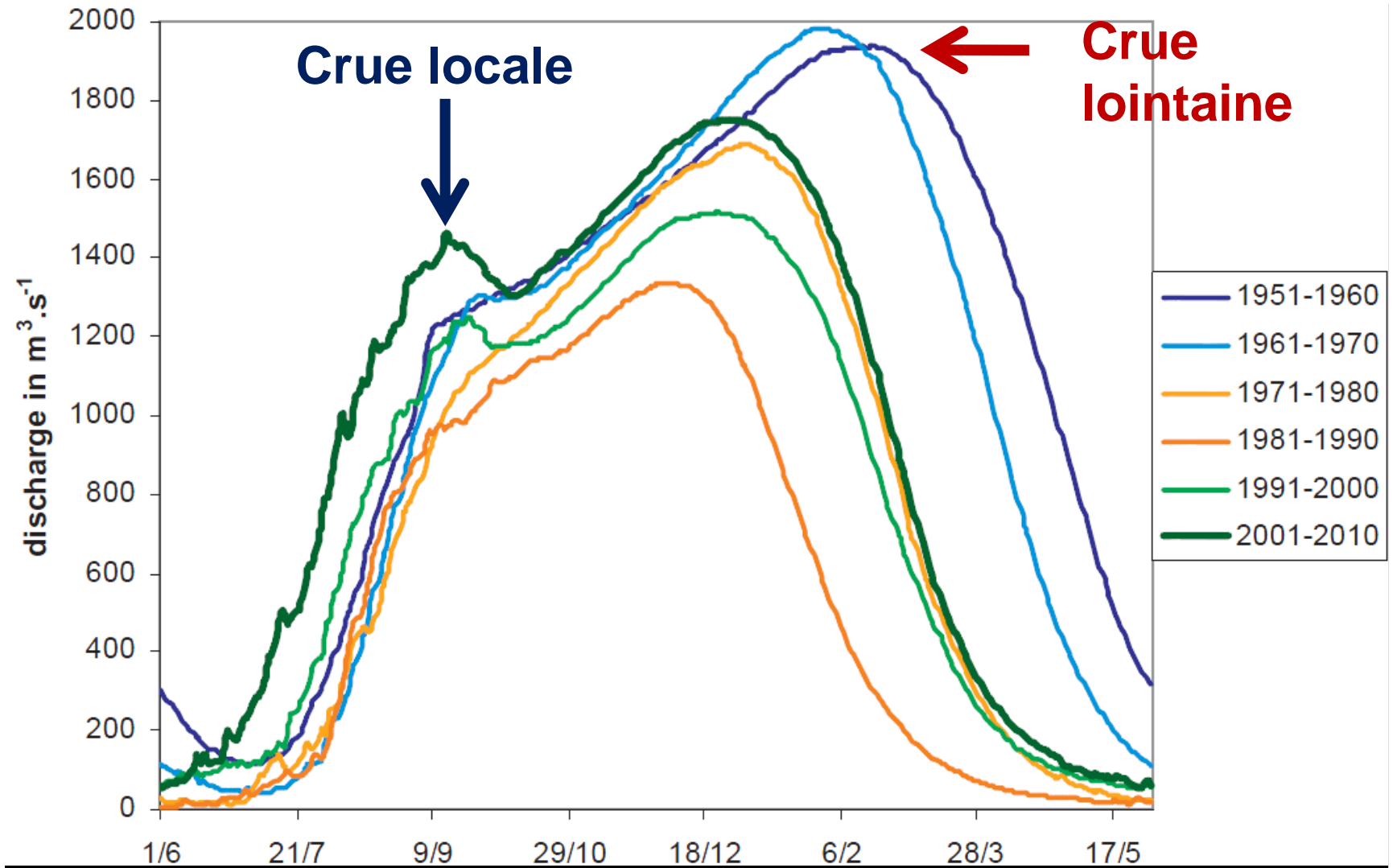


Extension des mares



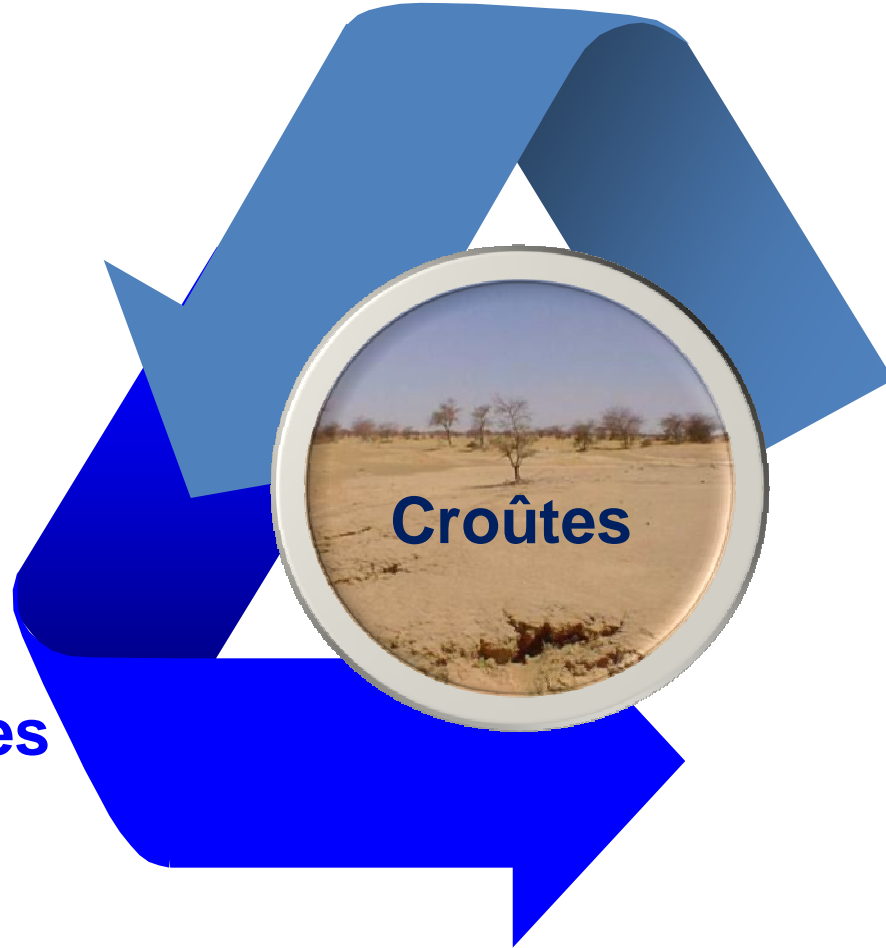
Gardelle et al. (2010)

Débit du Niger à Niamey



Descroix et al. 2012

Hydrologie



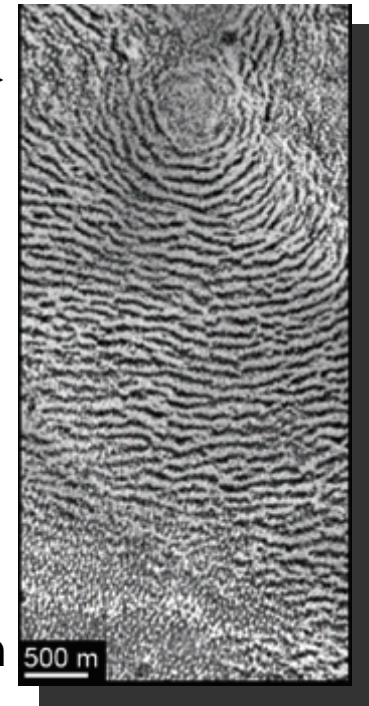
Croûtes

Ecosystèmes

Brousse tigrée



C. Valentin



Soudan



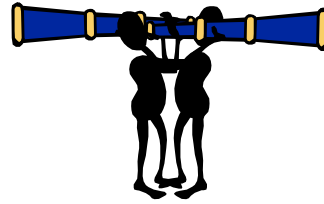
Basse Californie

Deblauwe et al., 2008,

Fourré aval



**Bande
nue**



Fourré amont



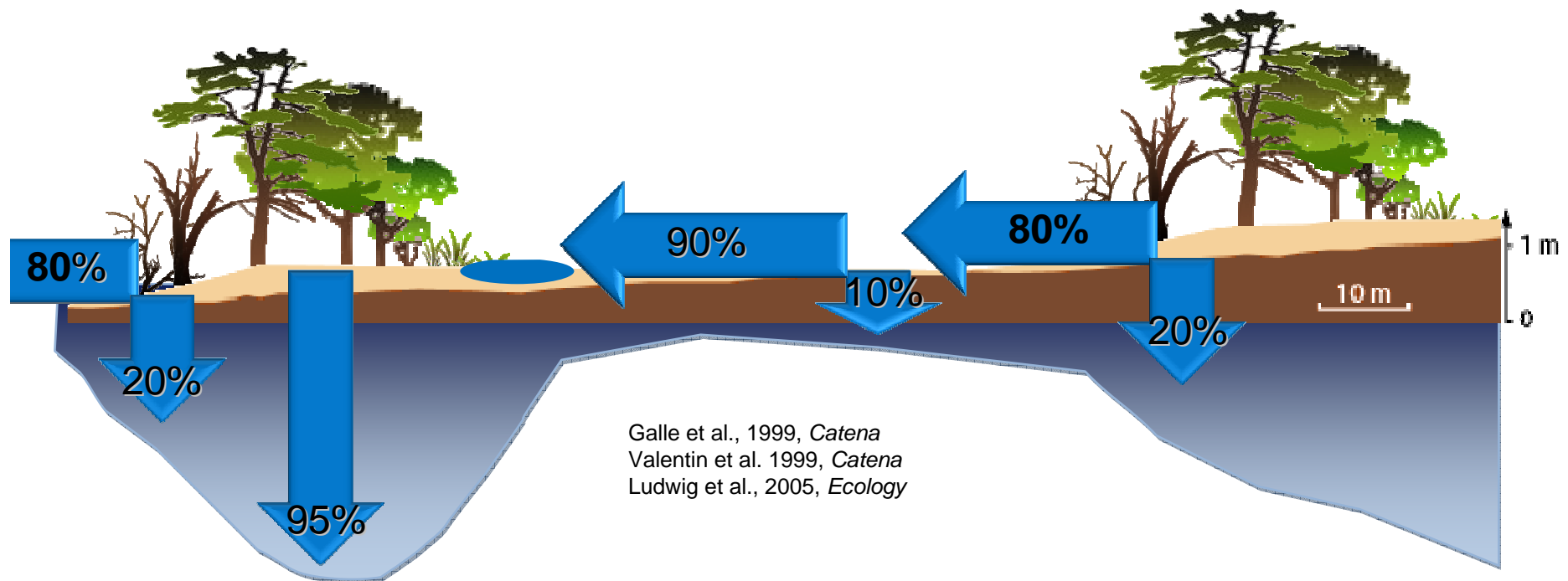
Fourré aval



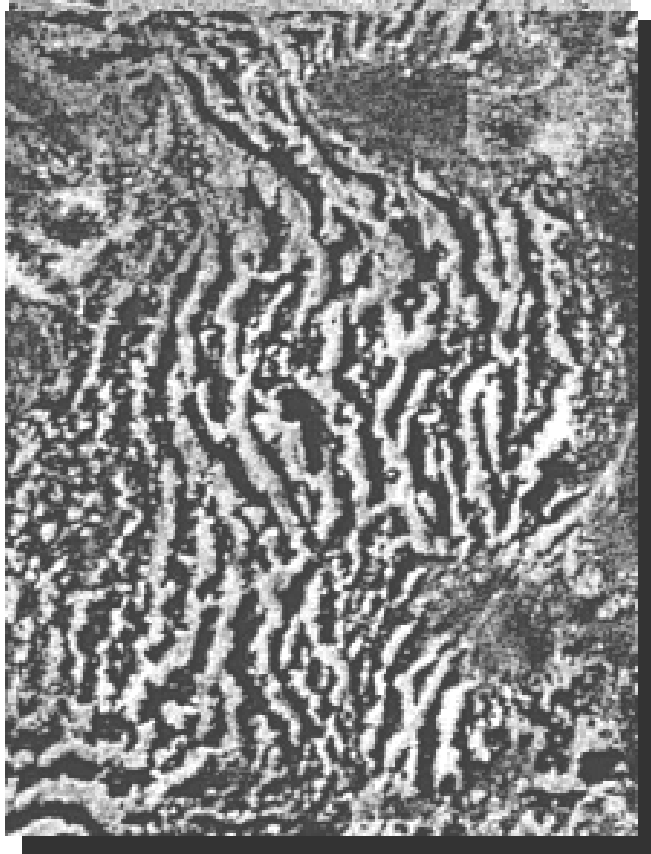
Bande nue



Fourré amont



Résilience



Pluie -26%

Bande nue/
Végétation

de 1,1 à 2,3

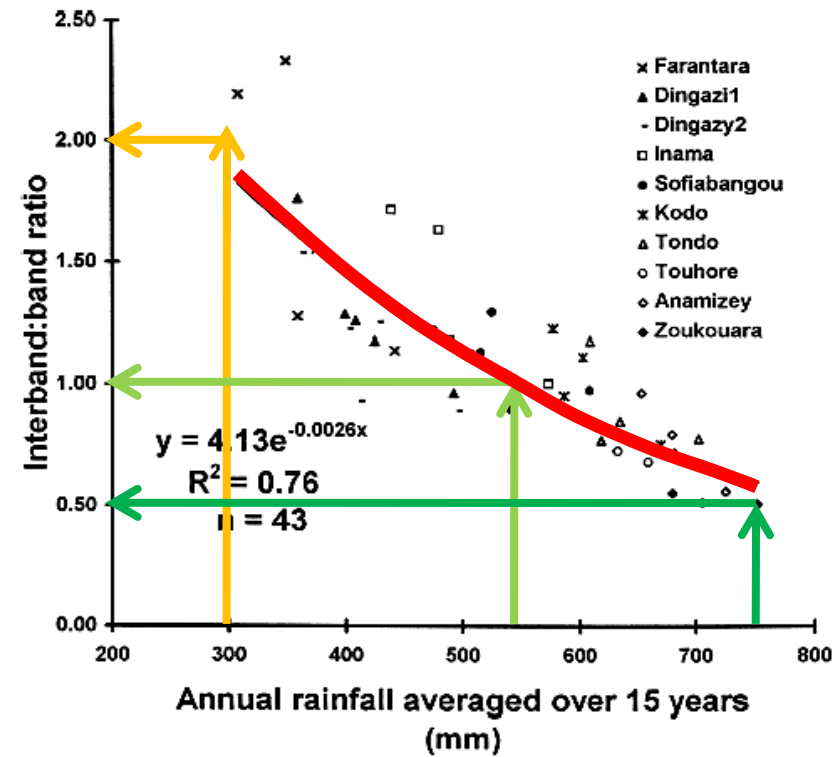
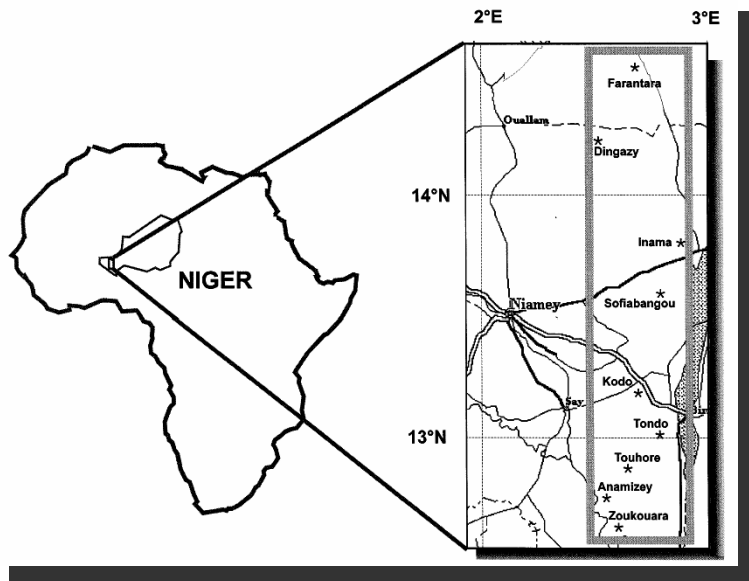
200 m

1962

Valentin et al. 1999

1992

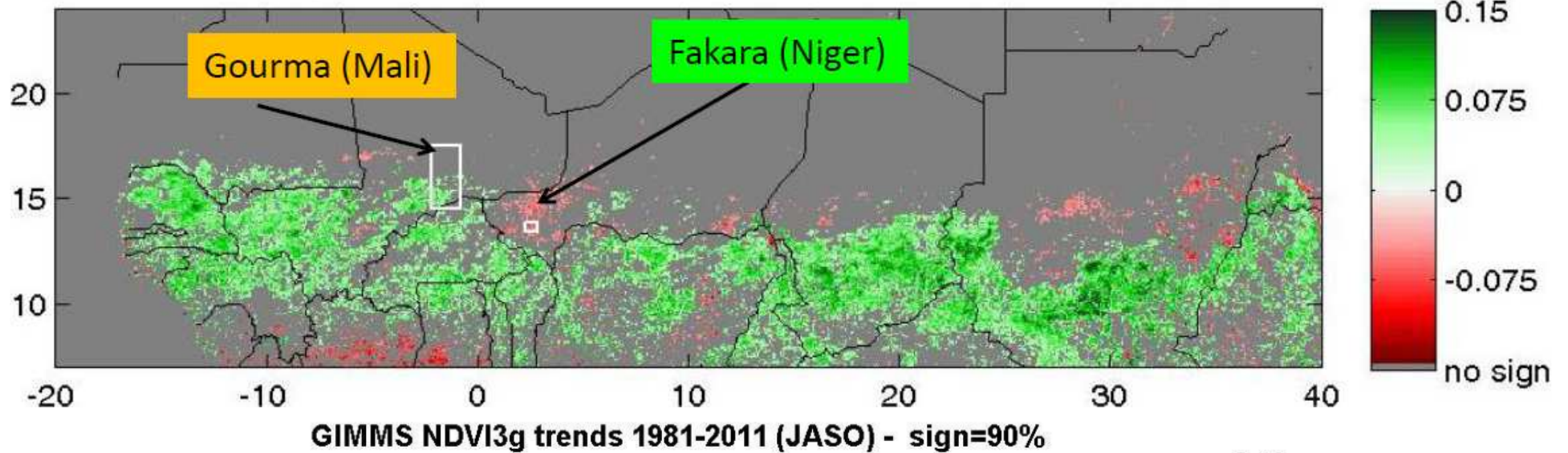
Résilience



Valentin et al. 1999,

Désertification ou Reverdissement ?

1981-2011



Dardel et al., 2014

Plateaux



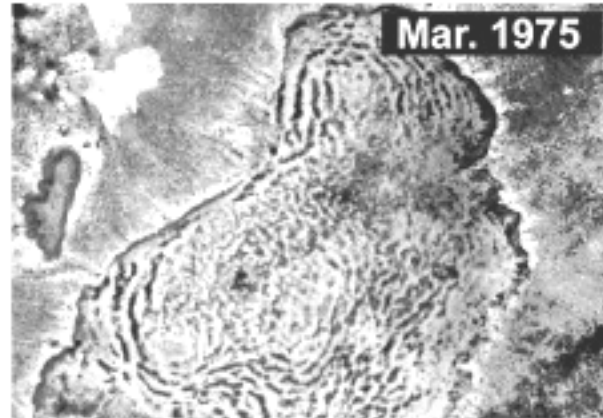
Versants



Bas-fonds



Déforestation

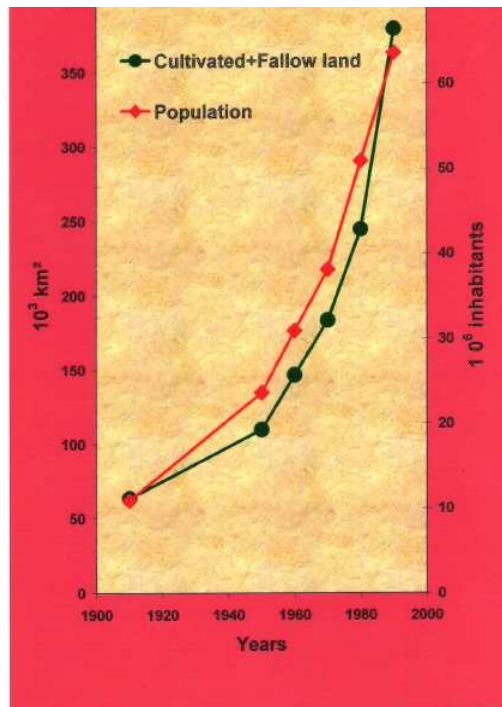
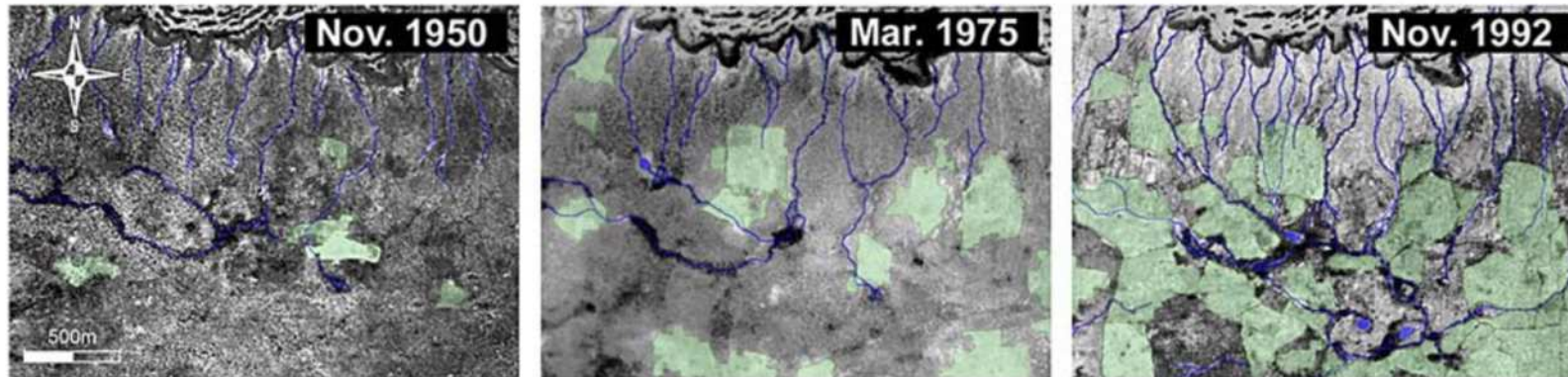


Leblanc et al., 2008.



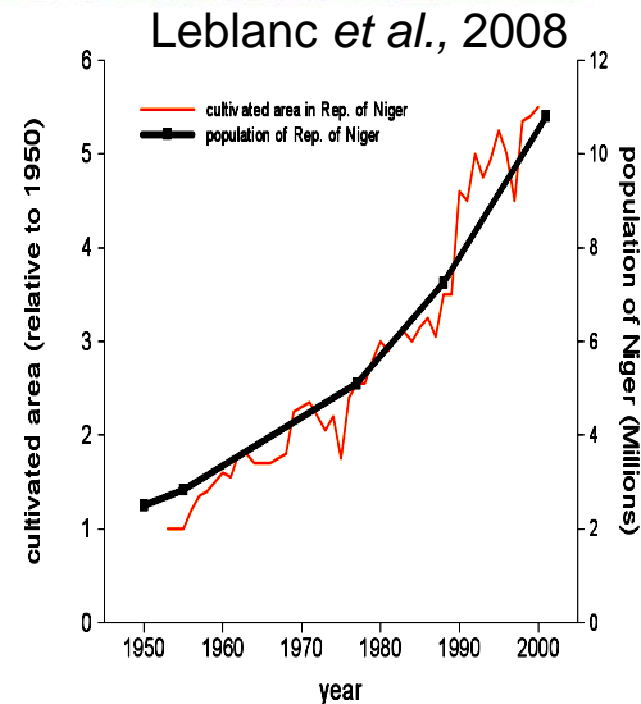
D. Tongway

Extension des cultures

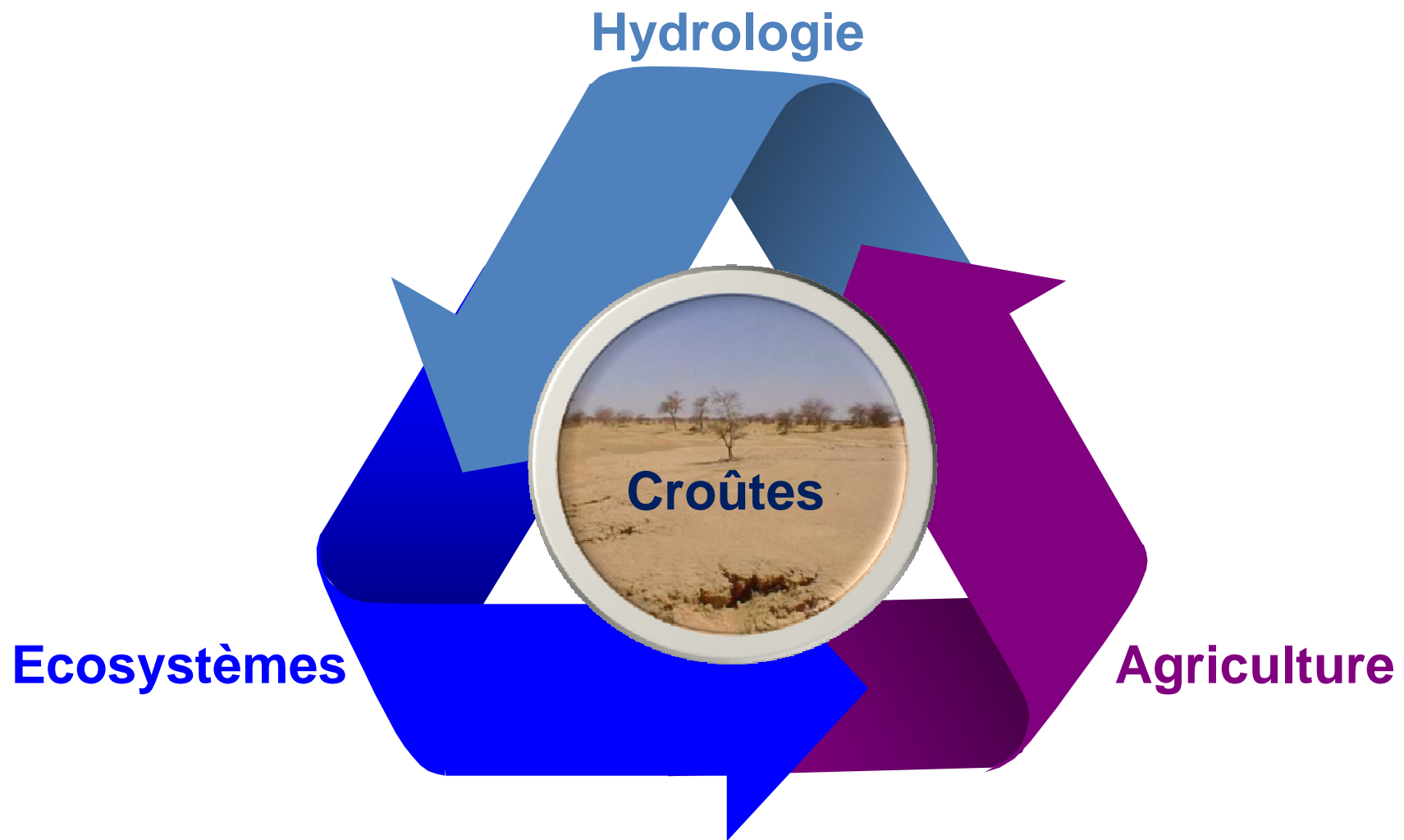


Le Houérou, 1993.

Sahel
Niger



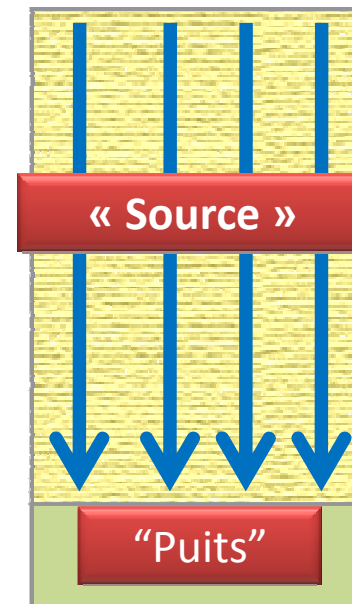
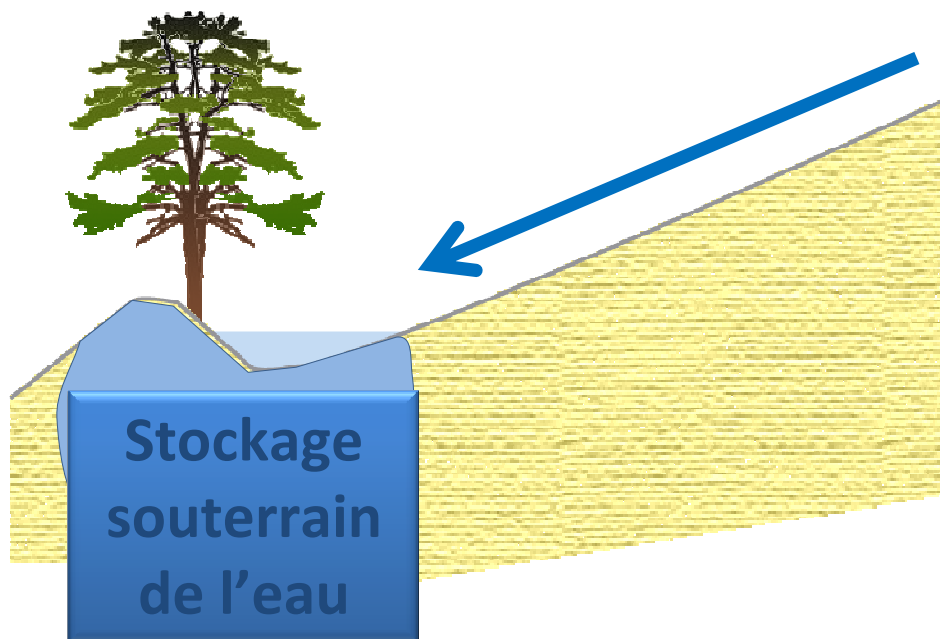
Boulain, 2009



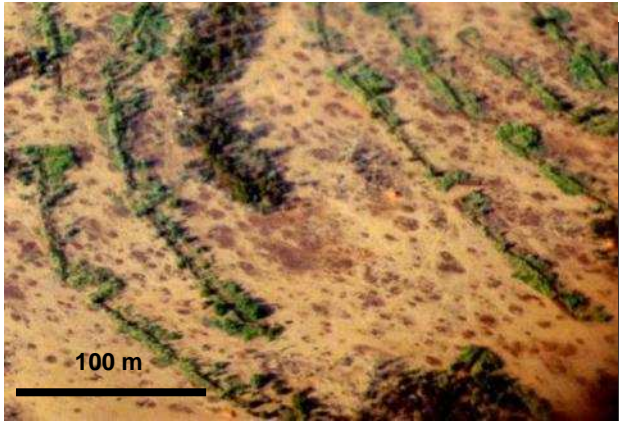
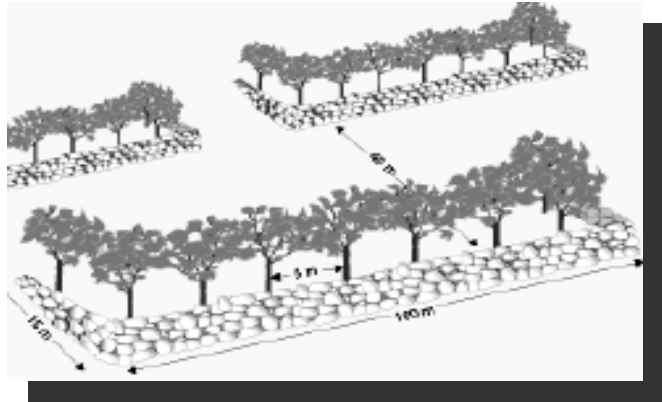
Source et puits

Zone de concentration perméable ("puits")

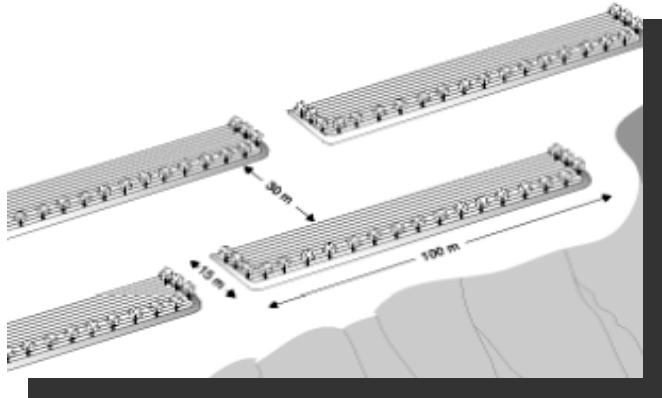
Impluvium peu perméable ("source")



Reforestation en bandes



C. Valentin



Gestion du ruissellement



C. Valentin

Rockström et Valentin, 1997



C. Valentin

Demi-lunes et Zai

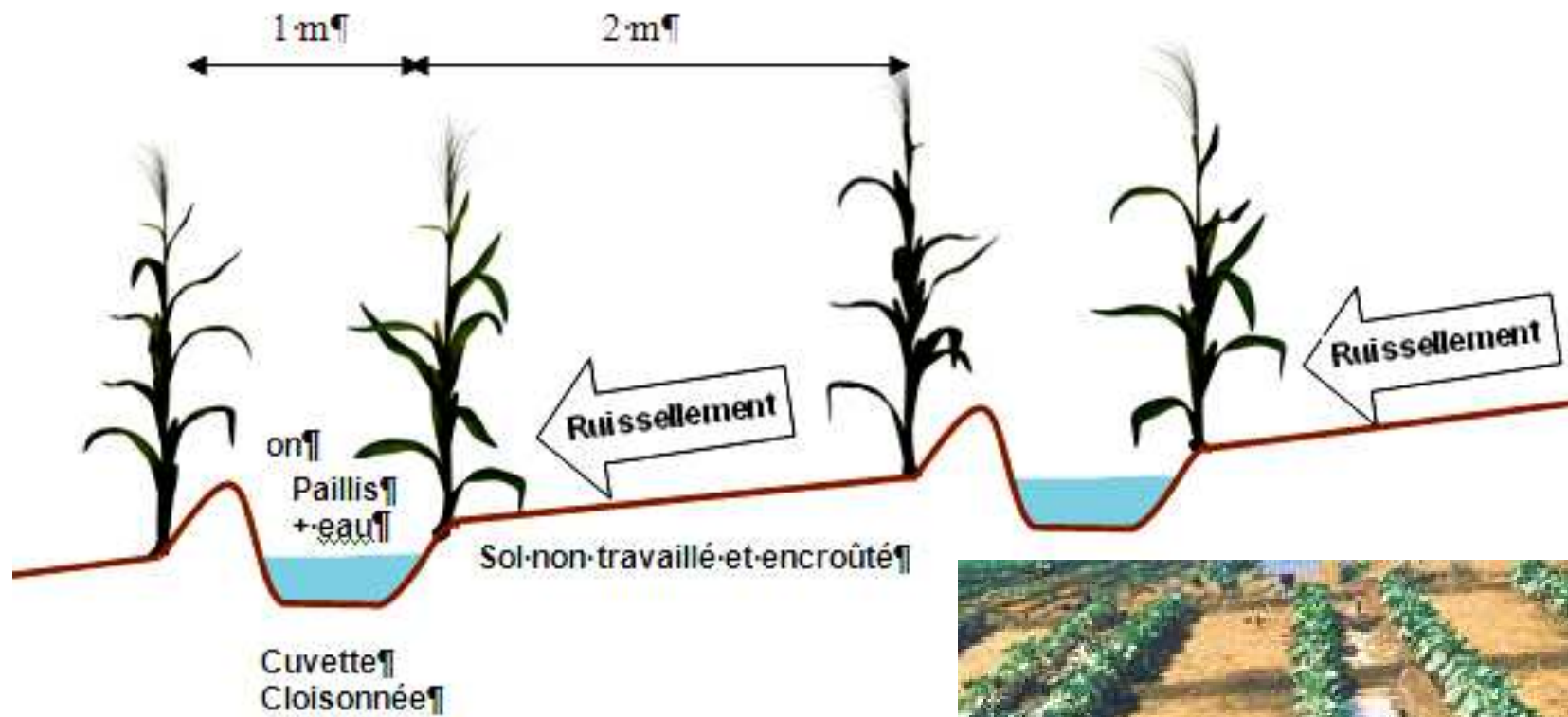


WRI, 2008



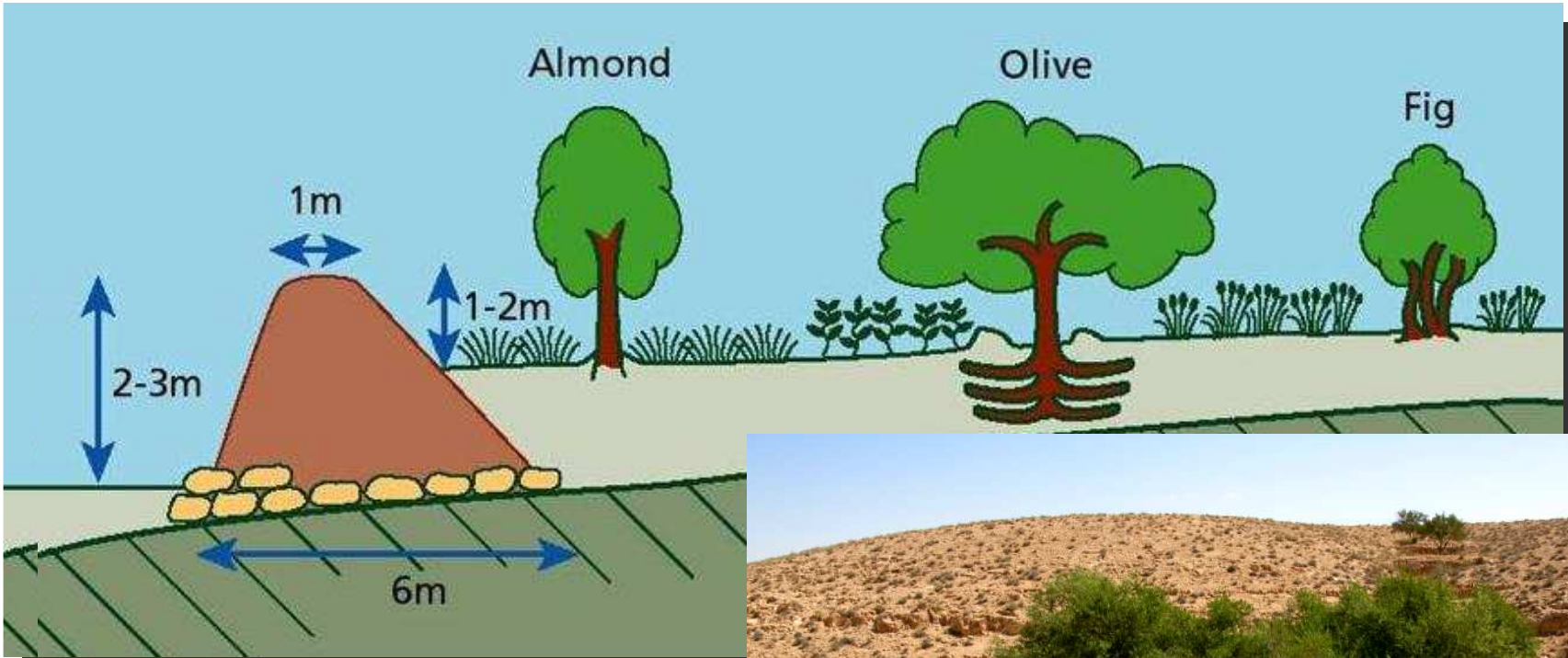
C. Valentin

Gestion du ruissellement



Hensley et al., 2000
Woyessa et al., 2006,

Jessour



Bonvallot, 1986

Hill and Woodland, 2003



Sarclage



C. Valentin

Résidus de culture

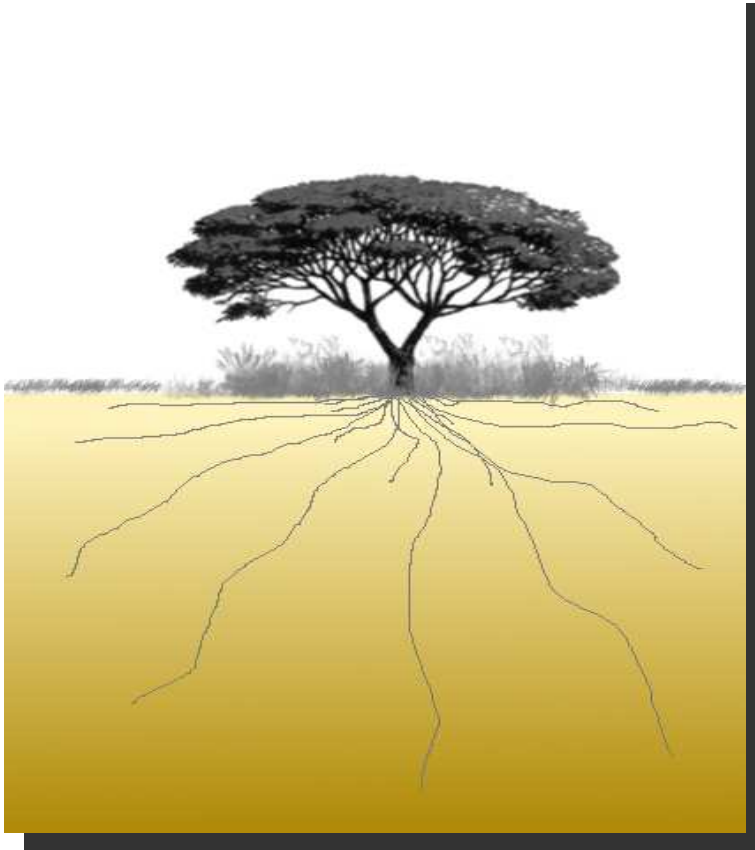


C. Valentin



C. Valentin

Agroforesterie



Ondo Okama

Conclusions

