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PRESERVING ENVIRONMENT THROUGH FARMLAND MANAGEMENT PRACTICES (FMP)? A REVIEW

By

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Preserving environment in agriculture: the importance of farmland management practices.

Cropping (farming) system design as the mainstream agronomic approach

- crop diversification
- optimization of agricultural practices
- extension of crop rotation
- Etc.

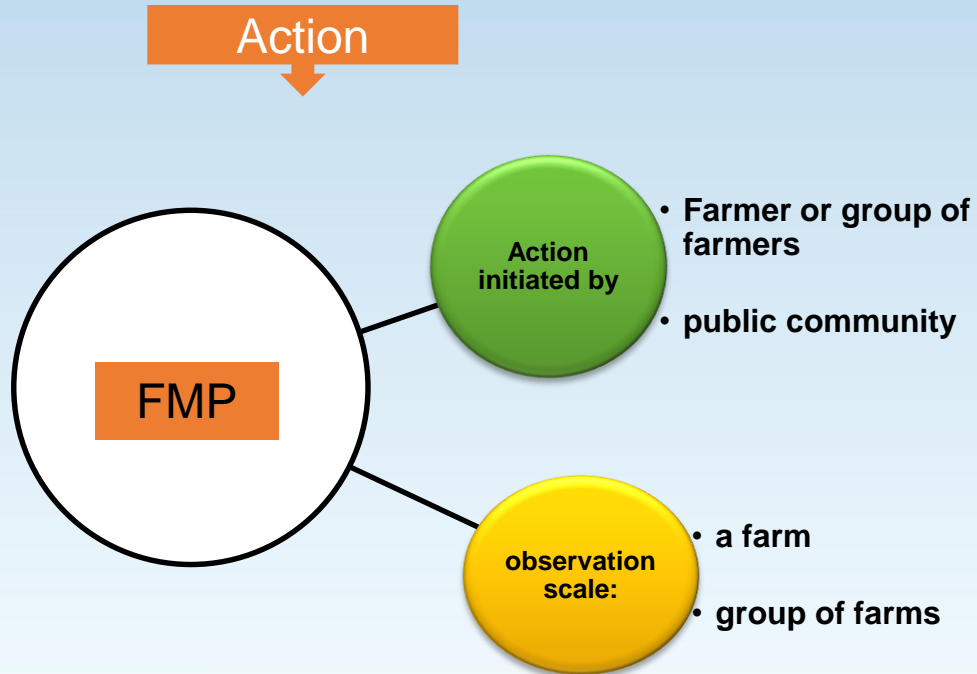
.... Under the assumption that farm territories are stable

But farm territory is moving constantly... (See: Marie et al. 2009; Grammatikopoulou et al. 2013; Bouty 2015; Wästfelt and Zhang 2018; Gueringer 2019)

We need a better understanding of how these changes occur to identify new levers for the preservation of environment in agricultural systems.

Farmland Management Practices (FMP): definition

Farmland Management Practices (FMP): **Actions implying changes in land use AND in use rights**



User rights

FMP	Not FMP
land temporary lease	Land abandonment: change in land use without a change in land use rights.
exchanges of plots	
Land purchase	
Land used in common	

Literature review for a typology of FMP: methodology

WOS and SCOPUS Data
bases

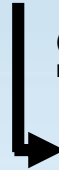


Query and key words: «*Farmland and environment OR Cropland tenure OR farmland tenure OR farm size and land consolidation*»

References found= 8,879 papers



(By snowball effect)



(selection factor: relevance by keywords in i) title (Papers selected after title reading = 820) and ii) abstract)

Papers selected for further reading = 75

Google Scholar



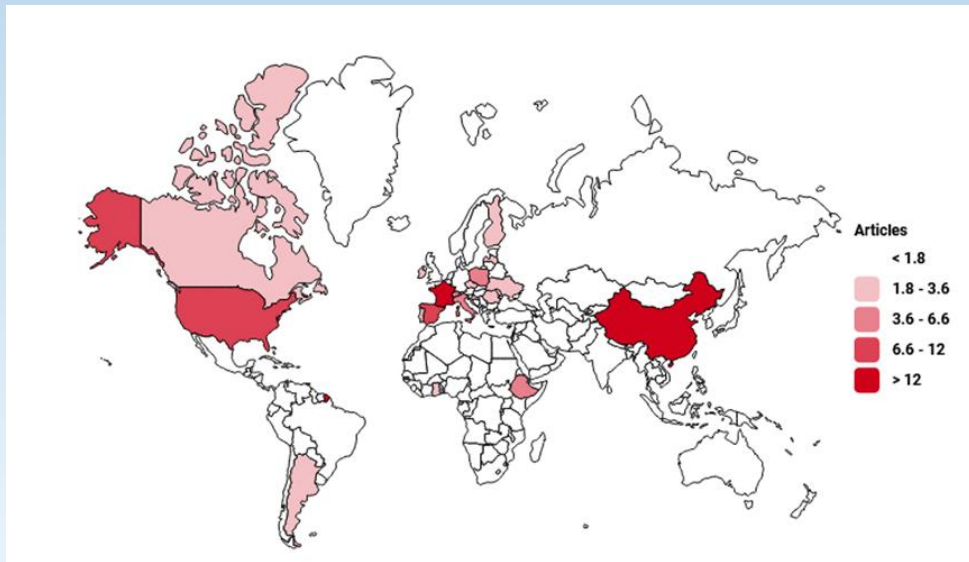
Additional papers = 20



95 papers selected

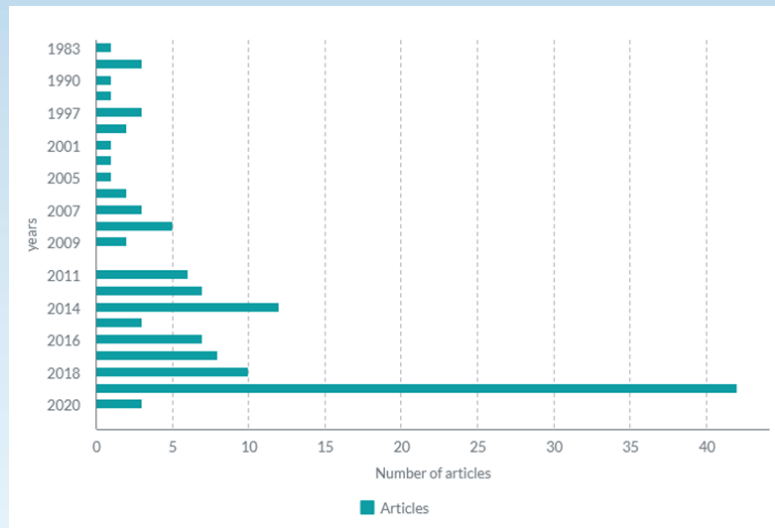
Overview of the 95 selected papers: worldwide and in extension issue

a) Geographical distribution of paper



The papers consulted are spread over about 40 countries on all continents. China ranges first (30 papers), followed by France (26 papers), Spain (11 papers), the United States (9 papers), Poland (4 papers), Czech Republic and Canada (3 papers each), etc.

b) Publication of papers sorted by date



About 60% of the papers are less than 5 years old.

Results



Four main issues /groups of papers

- **FMP based on farmers' initiatives** (22 papers)
- **FMP implemented by public policies** (39 papers)
- **Agri-environmental impact of FMP** (13 papers)
- **Other aspects of FMP** e.i: farmland tenure, land reform, etc. (21 papers)



Towards a characterization of FMP: a first typology

Based on the distinction between:

- (i) bottom-up strategies linked to local farmers' initiatives in search of adaptive solutions to adjust the overall functioning of their farms**
- (ii) policy implementation strategies from public administrations or private companies.**

I- Bottom-up strategies based on local farmers' initiatives in search of adaptive solutions to adjust the overall functioning of their farms (1/2)

1. FMP under farmers' strategies without explicit or apparent collective coordination

FMP under farmers' strategies without explicit or apparent collective coordination

1.1 Land use rights purchase to improve the farming technical system or the land structure of farms

Temporary lease of plots by farmers to meet phytosanitary controls or to impede the growing cycle of weed species (see: Amblard and Colin 2009; Choumert and Phélinas 2015)

1.2 Purchase of land use and property rights to adapt to external constraints

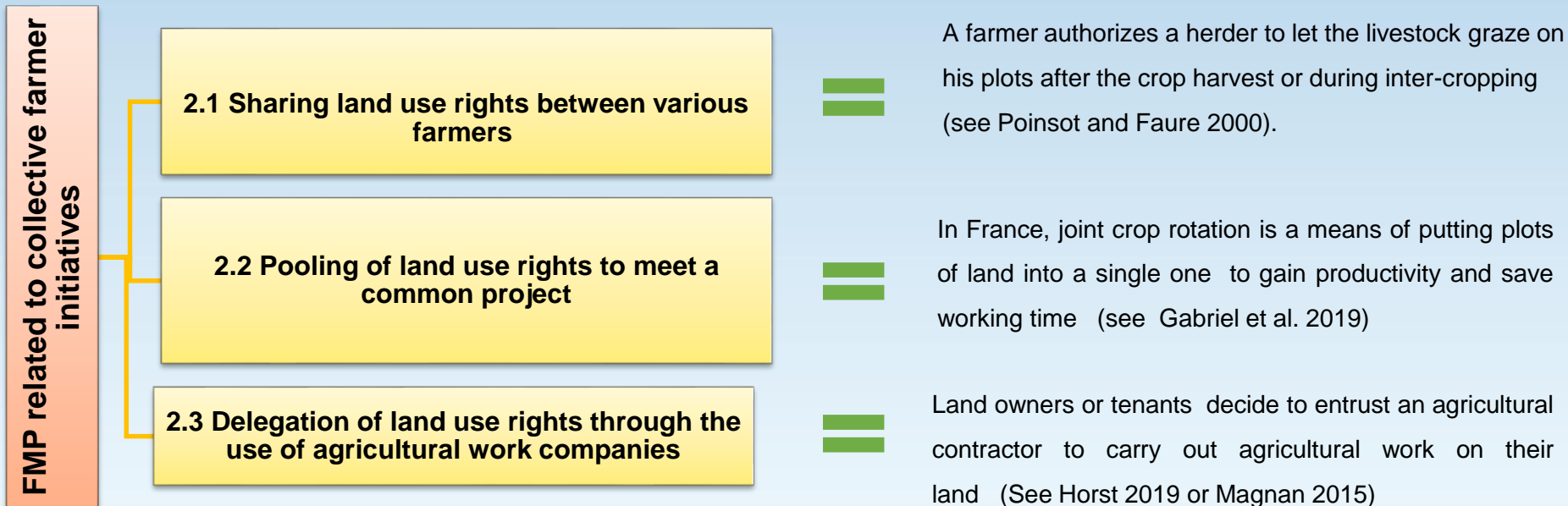
Purchase of scattered plots in different agro-ecological zones to avoid local drought (see Gedefaw et al. 2019)

1.3 Land use rights access through land conquest or land cleared

New farm plots created by forest clearing (see Lipscomb and Prabakaran 2020)

Bottom-up strategies based on local farmers' initiatives in search of adaptive solutions to adjust the overall functioning of their farms (2/2)

2. FMP related to collective farmer initiatives



II- Implementation of national or local public policies that impact the management of property or use rights

- ❑ **FMP related to "territorialized actions"**



FMP implemented within a defined perimeter where agri-environmental regulations are edicted.e.i: Natura 2000 network: (see: *Salsi et al. 2010*; *Zmihorski et al. 2016*; *Gałecka-Drozda et al. 2019*; *Santana et al. 2014* etc.)

- ❑ **FMP may be implemented without any specific delimitations**



These are instruments or agreements carried out by institutional actors which affect land use rights. e.i: Land tenure reform (see: *Hui Xu et al. 2014*; *Sallaku et al.2016*)

Environmental consequences of FMP possible, but in-depth studies required...

Few papers explicitly address the environmental consequences of FMP (only 12 papers out of 95)

FMP type

Environmental consequences

1.1 Purchase of land use rights to improve the farming technical system or structural farmland organization



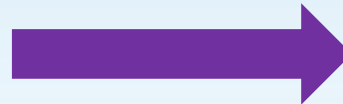
Land lease: Reduction of chemical inputs (Liu et al. 2019);

1.3 Land use rights access through land conquest



Land clearing: destruction of forests; Increased urbanization (Lipscomb et Prabakaran 2020; King et Balogh 2001)

FMP related to "territorialized actions"



Natura 2000 network: Contributes to improving biodiversity (Zmihorski et al. 2016; Santana et al 2013)

Discussion and Conclusion

A typology of FMP is an important output of our study, as far as it seems to be relevant in many contexts (example: Type 1.1: land temporary renting found in Canada, France, USA, China, etc.)

FMP could be a real help for a better design of farming systems

There is still a need of a methodology to assess the environmental consequences of FMP

In perspective, towards an assessment of FMP?



Thanks for your attention

Any question?



Summaries of FMP identified in the literature

Determinants of FMP	Type of FMP	Examples OF FMP	Bibliographic reference
Agronomic constraints	Land use rights acquisition to improve technical system or structural farmland organisation	grouping of plots with levelling of hedges or purchase of neighbouring plots	Marie et al. (2009); Francart and Pivot (1998); Janovska et al. (2017); Barbottin et al. (2018); Saint-Cyr et al. (2019); Puech et al. (2020)
		Temporary exchanges of plots	(Marie et al. (2009); Teijeiro et al. (2020)
Environmental constraints + Constraints linked to the farm topology	Land use rights acquisition to adapt to external constraints (climatic, urban pressure with competition on land)	plot leasing	Amblard and Colin 2009; Jarrige et al. (2003); Rotz, Fraser and Martin 2019; Wästfelt and Zhang 2018)
		Plot fragmentation (acquisition of dispersed plots)	Sklenicka (2016a); Latruffe and Piet (2014); Gedefaw et al. (2019)
		Purchase or sale of plots	Latruffe et Piet (2014)
Environmental constraints	Land use rights access through land conquest or land cleared	Dynamics of occupation of still vacant land (pioneer front in Africa and the Amazon)	Valette et al. (2013); Dounias (1998); Lipscomb and Prabakaran (2020); Choumert and Phélinas (2015); Tayeb (2019)
	Sharing land use rights between multiple farmers	The vain pasture	Sabourin et al. (1995)
Socio-institutional constraints		Community land use rights (communal property)	Hu (1997); Binot and Karsenty (2007)
		Land use agreements between landowners and farmers	Horst (2019); Poinot and Faure 2000; Clément et al. (2019)
Environmental constraints + Constraints linked to the farm topology	Pooling of land use rights to meet a common project	Voluntary pooling of land use (collective land use)	Gabriel et al. (2019)
Environmental constraints	Delegation of land use rights through the use of agricultural work companies	Use of agricultural contractors	Horst (2019); Amblard and Colin (2009); Anzalone and Purseigle (2014)
FMP induced by national or local public policies that impact the management of property or use rights	National or local public policies implementation	Natura 2000 Network	Salsi et al. (2010); Zmihorski et al. (2016); Galecka-Drozda et al. (2019); Santana et al. (2014)
		Environmental fallow land	Toivonen et al. (2013); Xie and Jin (2019)
		Long terms exchanges of plots	Pauchard et al.(2016); Teijeiro et al. (2020)
		Rural Environmental Leases / land trust)	Léger-Bosch (2019); Wästfelt and Zhang (2018); Xie and Jin (2019); Bodiguel (2015)
		Ecological compensation through supply	Etrillard and Pech (2015)
		Land consolidation	Nilsson (2019); Djanibekov and Finger (2018); Asiama et al. (2019); Grammatikopoulou et al. (2013); Yaslioglu et al. (2009); Wang et al. (2002)