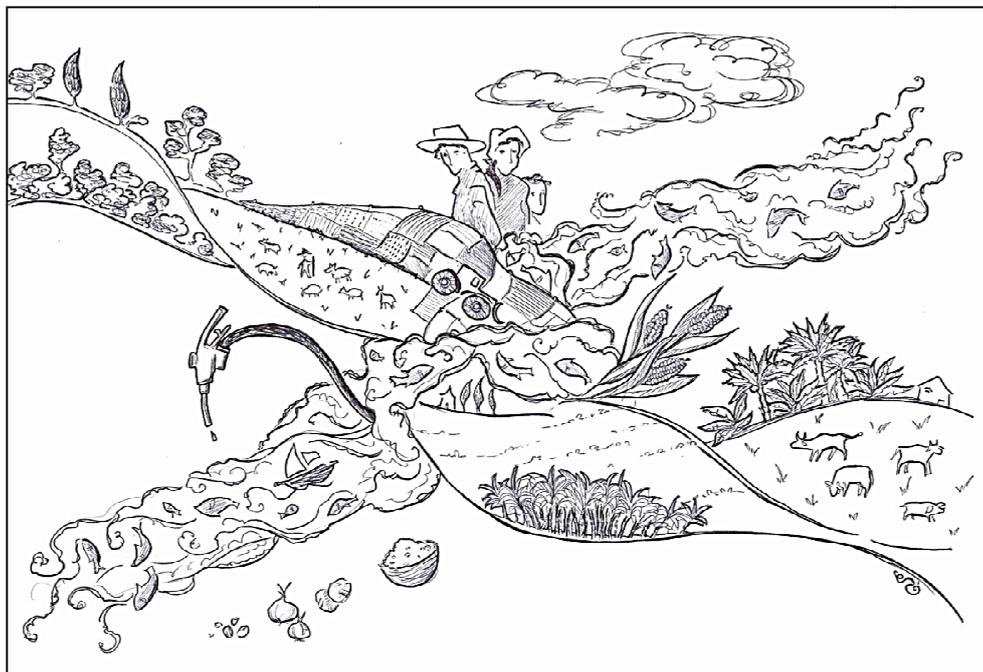


LAND AND WATER RIGHTS HOTSPOT



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Executive Summary

There are many different kinds of land and water rights, and many different kinds of rights holders. Land and water rights are social constructions that reflect existing power relationships and, as such, they sometimes lead to conflict. Today, social and technological change are occurring so quickly that societies are struggling to develop forms of social organization to cope with new challenges. Existing social structures cannot evolve and adapt quickly enough.

Pressures on land and water

The development of hotspots is frequently linked to constraints and/or limitations that put pressure on land and water use. These pressures affect two different aspects of land and water use: overall availability, and access rights. The average or overall availability of a given resource may hide individual disparities. In certain regions, a minority of individuals or corporations control most of the agricultural land, leaving the remaining majority with very little land access. Different areas of the world are distinguished by broad characteristics and trends. However, despite these broad characteristics, there is considerable variation within individual countries (for more detailed information about contrasts and distinct dynamics, consult the land tenure database at www.landportal.info). Because water resources are governed by cyclical dynamics, the equity, or inequity, of water access must be evaluated using specific methods. Fluctuating water resources (groundwater, rivers, canals, etc.) are shared by a large number of potential water users. It is not uncommon for different interest groups (whose access rights, while recognized, are regulated by a variety of different laws and institutions) to engage in conflict. Moreover, new conflicts arise when new interest groups with additional access claims emerge, complicating old conflicts and fueling territorial and social tensions. While the abundance of natural resources (or lack thereof) is in large part a natural physical feature, resource access is regulated differently by each society. Rights develop from the bottom up, over long periods of time, and that they are shaped by power relationships and ecological realities. However, they can also be imposed from the top-down, by national governments or outside powers, for example in the context of imperial expansion or colonial submission. Contradictions between imported legal concepts and local practices frequently lead to conflict.

Conflict over land tenure and water rights

- Conflict over land rights

One kind of conflict over land rights arises when rural populations are marginalized and excluded from land that has been appropriated by a minority of agricultural producers that rely on salaried employees. Another kind of land related conflict arises in contexts where feudalism (a system in which large land owners take advantage of sharecroppers or tenant farmers) persists. Still other conflicts involve indigenous populations who are attempting to re-appropriate land (sometimes very large amounts of land) that they have been using for generations. These populations often practice forest agriculture and leave land fallow for long periods of time as it regenerates. This makes them particularly vulnerable to land grabbing by foreign parties. In semi desert areas and steppes, conflict between herd people and farmers has increased due to population growth. Land and water related conflicts may also be between village communities, ethnicities, or even between countries. A large percentage of current and recent conflicts in central and West Africa are related (in one way or another) to land tenure and/or use. The map in figure 8 (in the text) uses specific examples to highlight the diverse nature of land related conflicts and hotspots everywhere in the world. It is not exhaustive and does not provide precise information about the location of hotspots.

- **Conflict over water rights**

Water related conflicts are varied as well. They include conflicts between different sovereign states over the management of transnational watersheds, conflict between different regions within the same country (over river water that has been re-routed by large scale water engineering works), conflicts between different water users for access, and conflict caused by changing public water policies.

If we are to improve water governance in areas affected by poor water management, territorial boundaries will have to be redefined to take watersheds and water distribution into account. Our governance style -and the choices we make to privilege certain sectors over others - must be guided by a coherent territorial approach.

Trends

- **Growing Pressure**

Land and water scarcity does not, in and of itself, inevitably lead to tension and conflict. Conflict occurs when change occurs so rapidly that societies are unable to develop forms of governance that will allow them to overcome crises. Currently, two major factors are accelerating change and putting enormous pressure on land and water resources: world population growth and climate change. The countries with the lowest number of available calories per person per day are the countries experiencing the most demographic growth. In some cases, they also have less and less water per inhabitant, per year. These trends will be exacerbated by urbanization, and the additional pressure it puts on natural resources (due to population growth and growing demand for energies other than oil) in the coming years. If governments create binding emissions reduction targets, it will be necessary to change farming methods if we want to avoid placing even more pressure on non-forested agricultural land. Climate imbalance is likely to influence both the quality and the quantity of agricultural resources.

- **Land Grabbing. A provocative question**

The less resource users' rights are protected, the easier it is for outside parties to take control of them. The systems that we currently use to regulate land and water access, and the transfer access and use rights, are inefficient and inadequate. Land grabbing will most likely accelerate, as countries continue to pursue food security, expand their use of bio-fuels (which are encouraged by public policy in many developed countries), and seek water resources needed for agro-industry. Without a binding legal framework that applies to land transactions at the international level, public and private investors can negotiate opaque contracts that are grossly advantageous to investors and which do not afford the possibility of formal judicial recourse in case of conflict with local populations or governments. Large scale land acquisition and concentration are already a source of political tension and conflict, and we have reason to believe that they will cause more and more violence in coming years. The mid and long-term consequences of these practices are very serious. If it continues, land grabbing will not only eradicate poor farmers, but it will accentuate environmental problems and threaten food security in host countries.

- **Are we headed for global crisis?**

The intensification of land-grabbing and, more globally, the deregulation of land and water resources, has led to the proliferation of land and water "hotspots." More particularly, it is now clear that the systems that we currently use to regulate land and water access, and the transfer access and use rights,

are inefficient and inadequate. Tension often arises when governance is out of step with territorial realities. In the coming years, conflicts will be increasingly international, challenging the legitimacy of national borders. Given the inherent complexity of the current context, land tenure policy must be governed by a culture of preventative negotiation that fully acknowledges the plurality of existing appropriation rights. In keeping with democratically determined, constitutionally protected economic, political, ethical, and social priorities, it must provide recognition for the structural interdependence of different land appropriation regimes. If there is a genuine risk that the current context, which is characterized by several hotspots, will transform into a full-blown global crisis - and if increasing global poverty and inequalities pose a legitimate threat to humanity - then it seems clear that international and civil society organizations have the ability to decisively influence the course of current trends.

Introduction

There are many different kinds of land and water rights. A wide variety of rights holders - including individuals, communities, institutions, etc., enjoy temporary and/or definitive rights to use, manage, and alienate (through inheritance, lease or sale) a wide variety of resources. The idea that private property is an exclusive, absolute right is a relatively new concept. It is not currently applied everywhere and cannot be, given that it will require at least 2/3rds of the world population to change their ways (which is easier for some than others). There are just as many different kinds of rights as there are different rights holders. These rights overlap within the same spaces and, depending on the time and place, are managed by different institutions.

Land and water rights are therefore social constructions that reflect existing power relationships and, as such, they sometimes lead to conflict. This has always been the case, but the acceleration of the social and technological change is currently creating new challenges, and existing social structures are not evolving and adapting quickly enough to confront them. It is extremely difficult to develop new means of social organization in response to these changes, especially because they are no longer exclusively local in nature and they frequently have global dimensions as well. Moreover, the social and environmental aspects of these challenges are associated with different and sometimes conflicting objectives and limitations. In this essay, the word “hotspot” refers to areas where land related conflicts or limitations are worrisome, and, by their nature, may lead to crisis. These crises may result directly or indirectly from said limitations and/or conflicts. While hotspots may require individual attention, they also shed light on broader issues and trends that are less obvious elsewhere. It is challenging to think globally about resource-related problems for variety of reasons. Territorial realities, ecosystems, and human societies widely vary from one place to another. Moreover, these differences are not frozen in time and space, territorial evolutions and dynamics fluctuate well. Land and water rights must be addressed using an approach that takes both spatial and temporal dynamics into account. Moreover, it is essential to address land and water related phenomena using appropriate temporal and spatial scales:

- At the global level, we employ a general vision focused on macro differences. However, when we look more closely at different countries and regions, considerable differences appear within these broader categories. Generalizations that apply to entire continents may be inaccurate when applied to a specific region. We must avoid the trap of an excessively mechanical, simplistic approach by examining multiple levels of governance (from the local to the global). We would like to insist on the importance of sovereign states, insofar as they play a significant role in implementing laws and regulatory mechanisms. We will zoom in specific situations that speak to issues that are relevant at the national and/or global scale, without losing sight of sub continental similarities and/or trends.
- Similar issues arise when evaluating temporal scales. The situations that we have chosen to label as “hotspots” have developed over long periods. At the same time, conflict is frequently caused by recent changes, which also influence the ways it is dealt with. In addressing these situations, we must evaluate past, present, and (possible) future evolutions, with a particular focus on the factors that may lead to the conflicts in the future. In doing so, we will try to identify larger dynamics at play, and to differentiate between short and long term phenomena, between factors that facilitate progressive evolution and/or reform and factors associated with sudden shifts or departures from the past, and finally, between evolutions that are permanent/irreversible, and evolutions that are not. The latter will be evaluated using different temporal scales.

This process is difficult, and inevitably flawed, it should be repeated as often as possible to reach new information and perspectives. While we can start by looking at a certain number of factors that help us understand hotspots through the lens of land and water rights, this data alone does not provide all the information we need to evaluate the different ways in which specific situations are currently evolving. We must also evaluate how a variety of different human societies has dealt with changing pressures on land and water over time. These are questions of governance, not statistics. This is why we will use two different kinds of visual representation in this document: maps based on existing data, that illustrate (with varying degrees of precision) specific situations that reflect isolated pressures, and broader visual interpretations that gloss over local particularities in order to express a general idea and/or hypothesis. By using hotspots to illustrate broader trends and issues, this chapter invites readers to think globally. If we are to do so, we must recognize fully the world's environmental and social diversity. This will allow us to develop solutions for major 21st century challenges.

1. Growing pressure on land and water rights, growing conflict: A brief overview of the global context

1.1 Different pressures on land and water rights

The development of hotspots is frequently linked to constraints and/or limitations that put pressure on land and water use. These may lead directly to open (sometimes-recurrent) disputes, or simply lay the ground for future conflict.

Each macro-region is different, and can be classified according to key variables that reflect broad characteristics and trends. These variables structure our research. They are categorized according to two major themes:

- Resource availability
- Resource access (the distribution of access rights to water, land, and natural resources).

1.1.1 Availability of agricultural land and water throughout the world

The average utilized agricultural area per inhabitant varies considerably from region to region. In China, for example, the average farmer has 66 ha, whereas in Argentina the average farmer has 41 ha.

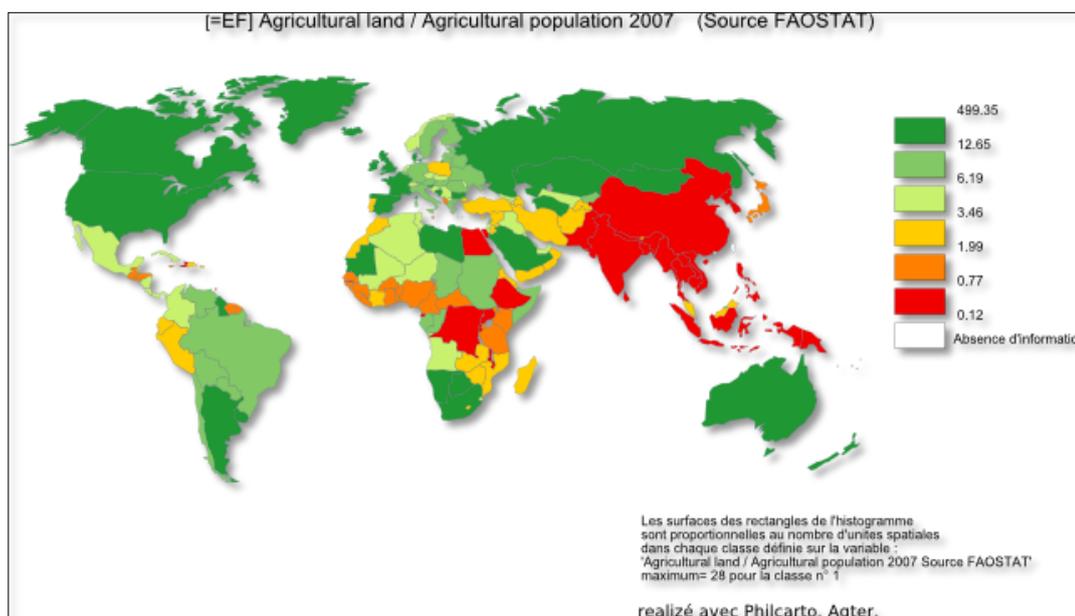


Figure 1. Agricultural area per farmer. There are significant disparities between different regions (hectares per individual)

However, country averages are often misleading. Not only available agricultural land (which include pastures) vary in quality, but also regional realities vary widely within any given country. For example, national averages make little sense in Bolivia, where lowlands coexist with an Andean region. The same can be said of China, where the vast majority of the population is concentrated within one third of the country's surface area. Moreover, land use depends on a population's ability to cultivate and maintain the land at their disposal, not to mention their capacity to valorize the fruit of their labor. These factors, which are influenced by economic development choices, have an impact on land availability. In western countries, the amount of land per farmer is high because most of the population has left the agricultural sector. The per capita availability of freshwater also varies from

region to region. Our focus is on the water that can be used for agricultural and pastoral activities, which makes up about 70 percent of the freshwater used globally (20 percent goes towards industrial use, and only 10 percent towards domestic use)². As with the utilized agricultural area, national averages are also very misleading. For example, the eastern Amazonian region of Ecuador is very rich in water, while there are water shortages on the western slopes of the Andes. The following map, which illustrates water stress in different regions throughout the world, is not misleading in this way.

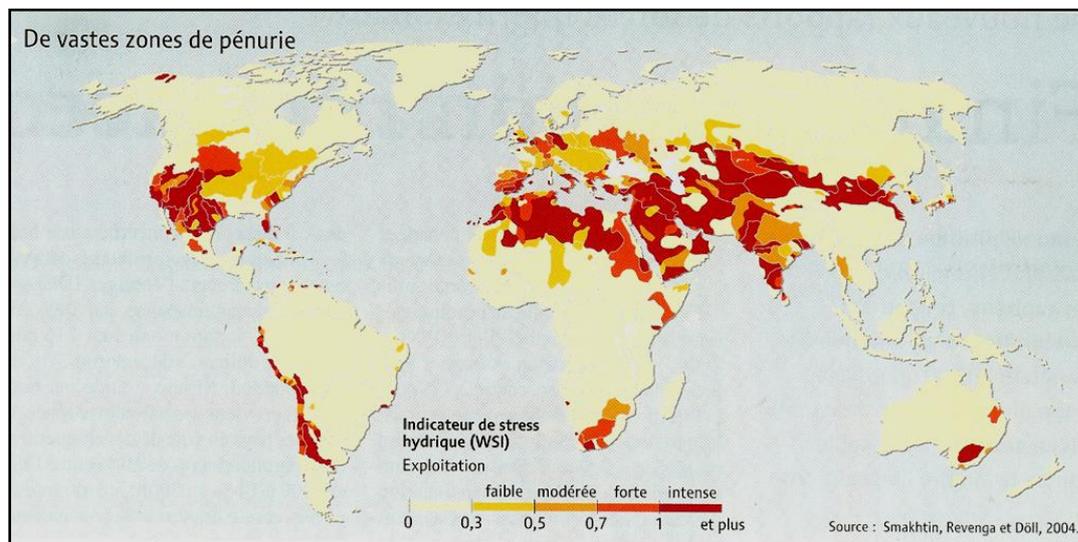


Figure 2. Water shortages throughout the world.
(Source: *Le Monde Diplomatique* 2010, 2009. *L'Atlas*. Armand Colin)

17 percent of the world's cultivated land is irrigated. Diverse forms of irrigation have developed in most areas where surface and ground water is accessible. It has required 73 percent of the world's water resources to stabilize yields and to modify agricultural calendars and crops. Mobilizing water and land in this way has tripled the productivity of pluvial agriculture, meeting 40 percent of the world's basic food needs as well as a series of complementary products (vegetables and forage crops)³. Soil quality, weather conditions, and water availability (with or without irrigation) have a significant impact on agro pastoral activities. In desert and semi-desert regions, land is not the only resource needed for agricultural production; water is essential as well. This map representing major forms of land use illustrates how varied land use is throughout the world. The extent of this diversity is visible at the global scale. It is particularly pronounced within forested areas.

² FAO, 2009. *Aquastat*. Cited by Black, M. and King, J., *The Atlas of Water*. Earthscan. Myriad Ed. U.K.

³ According to Stephen Hodgson, Land and water the rights interface. Livelihood Support Programme. FAO, March 2004, and information from Thierry Ruf. For a careful calculation of arable land productivity potential comparability, see the FAO, 2009 interactive CD: Multilingual Thesaurus on Land Tenure, French version, at the term: *Productivité agricole per hectare*.

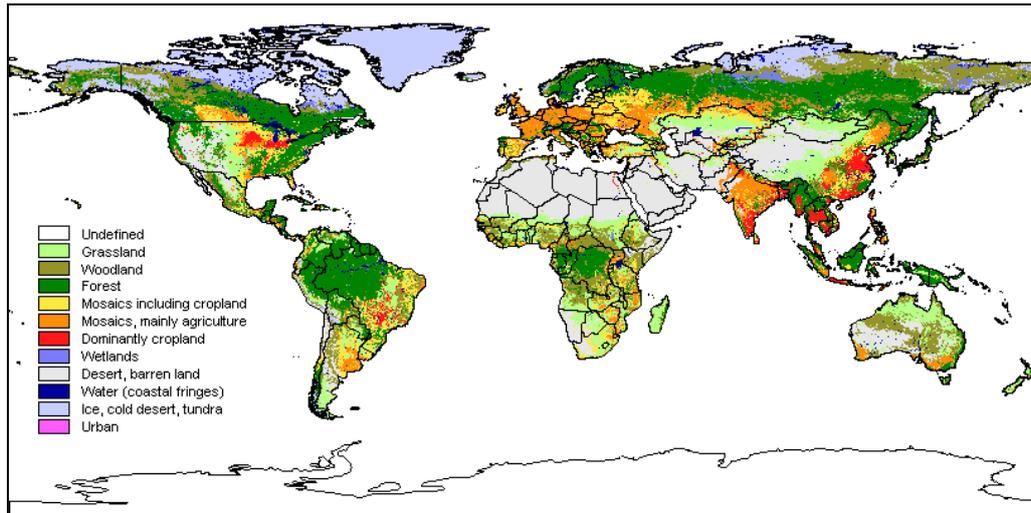


Figure 3. Ecosystems throughout the world.

Source: IIASA, GAEZ, 2002.

According to the IIASA, there is a significant amount of unused land that is suitable for non-irrigated agriculture. It is located throughout the world, in Africa, Latin America, North America, Europe, and Russia. The data that they used to develop the map in figure 4 includes land in protected areas. Moreover, certain forested areas are considered suitable for agriculture.

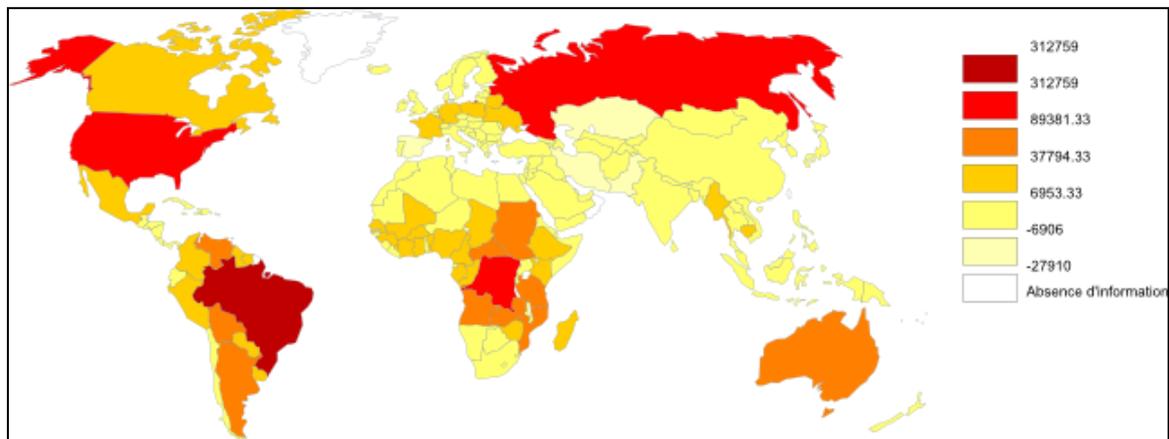


Figure 4. Areas with agricultural potential (very high, high, or medium) that are not currently used for farming. In thousands of ha/per country. Developed by AGTER, at GAEZ, IIASA-FAO, 2002. (Map elaborated with Philcarto)



Figure 5. Zones of the African Savannah where agriculture is not widely practiced.
Source: World Bank.

The IIASA data base reveals that 80 percent of this uncultivated, agriculturally suitable land is concentrated in 24 countries. In Africa, most of it (that is not covered by forest) is located in a strip (yellow on the map, figure 5) of savanna surrounding the Congo Basin. This said, these regions are not empty; they are inhabited by farmers (including livestock farmers). They often harbor cultivation systems that employ long rotations, and require vast areas of fallow, forested land. This land may be incorrectly identified as non cultivated by evaluation systems that rely on remote sensing. It is therefore important to take the assertion that this land is available for other uses with a grain of salt. Developed countries (the United States, Europe) also harbor significant amounts of unused land that is suitable for farming. This can be explained by evolving agrarian systems and agricultural policies, which have influenced the ways in which property owners choose to use their land.

1.1.2 The distribution of access rights

The average or overall availability of a given resource may hide individual disparities. Certain individuals or groups of individuals may have liberal access rights while others have none. It is important to keep this in mind when evaluating global land and water access. In certain regions, a minority of individuals or corporations control most of the agricultural land, leaving the remaining majority with very little land access. The GINI coefficient can be used to measure inequalities in resource distribution. The coefficient is 0 when this distribution is equitable, and 1 when one individual use has complete access to a given resource, (and the rest of the population none). Global data⁴ on this subject is incomplete, and has been gathered at different times using different methods; calculations of this kind are only valid when evaluating production units that control all of the resources within a given area⁵, and operate in relatively homogenous ecological

4 FAO and the World Bank, above all, and additional data collected from different sources on Eastern Europe.

5 Globally speaking, this is not how things work in Sub-Saharan Africa and in many areas of Asia, where multiple rights-holders enjoy different rights over the same land.

contexts⁶. Notwithstanding, this data can be used to identify broad characteristics and trends that distinguish different areas of the world, and within them to identify macro-regional contexts associated with the development of land access hotspots. The following map illustrates these broad characteristics.

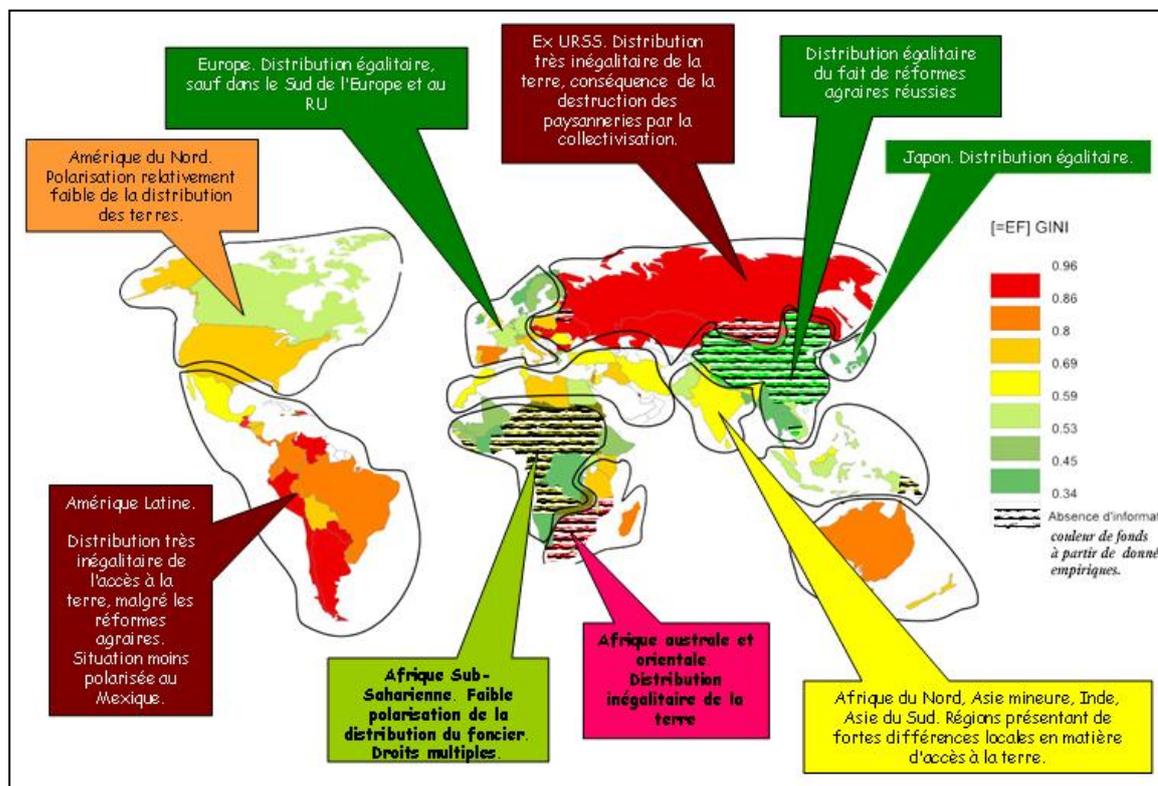


Figure 6. Characteristics of land distribution throughout the world.

Created by AGTER, with Philcarto, using GINI coefficients taken from the World Bank and FAO databases, and other sources.

This chart does not include as much information on subtle variations as large scale maps. The land tenure database (which will become the International Land Portal), for example, provides more detailed information about the contrasts and the distinct dynamics that exist within individual countries, including Bolivia, Cambodia, Guatemala and Niger (amongst others)⁷. Because water resources are governed by cyclical dynamics (with the exception of fossil waters, which are very similar to non-renewable mineral resources), questions related to water access -and in particular to the equity, or inequity, of water access - must be evaluated using specific methods. However, land and water access are frequently linked, in particular regarding ground water access, but sometimes regarding surface water access as well⁸. Water access is constantly in flux. Changing ground water levels and/or river and canal flow are shared by a large number of potential water users. It is not uncommon for different interest groups (whose access rights, while recognized, are regulated by a variety of different laws and institutions) to engage in conflict. Moreover, new conflicts arise when new interest groups with additional access claims emerge, complicating old conflicts and fueling territorial and social tensions.

⁶ In Chile, a country with a vast array of climate zones, a high national GINI coefficient hides extreme regional variations in land concentration.

⁷ Additional information are available at www.landportal.info.

⁸ See Hodgson, S. March 2004. *Land and water – the rights interface*. Livelihood Support Programme. FAO. Rome.

When water resources are re-allocated from areas where they are abundant to areas where they are rare, they often become concentrated in the hands of a limited number of actors: Small farmers in Ecuador constitute 86 percent of the country's water users, but only possess 22 percent of the country's irrigated land, and are only responsible for 13 percent of overall water use; whereas large private farms, occupied by 1 percent of the country's farmers, use 67 percent of its irrigation water⁹.

1.1.3 Socio-economic, legal, and political variables

While the abundance of natural resources (or the lack thereof) in any given location is in large part a natural physical feature, resource access is defined by social norms, power relationships, and management rules. Historical factors can be used to distinguish a series of broader issues that have a decisive impact on the development of tensions, conflict, and hotspots. Different cultures view land and water rights differently. These rights also change over time. Because they are molded by history, they tend to be complex and heterogeneous. This said, globalization has homogenized administrative and legal systems, and while norms and practices governing land and water rights vary widely, certain systems benefit from more international recognition and support than others. Getting out of this maze is not easy. We must not forget that rights develop from the bottom up, over long periods, and that they are shaped by power relationships and ecological realities. However, they can also be imposed from the top-down, by national governments or outside powers, for example in the context of imperial expansion or colonial submission. Most countries in the world have experienced some form of colonial conquest (Latin America was colonized for several centuries, and Asia and Africa for shorter periods of time). Different kinds of colonization are associated with different land tenure systems:

- Trading post colonies (which took a variety of different forms),
- Colonies based on the domination of local populations, for example in the Mesoamerican and Andean regions of Latin America,
- Settlement colonies, for example in North America, Argentina, or Brazil, which almost always lead to the disappearance of local populations, and
- Plantation Economy Colonies, which frequently imported slaves. The different varieties of land rights that exist in each place are often directly related to its colonial history.

Different colonial powers used different legal systems in the colonies. These did not always correspond the systems used within the metropolis. Regardless, each was based on one of two broad legal systems structured by different basic principles: the Common law system, in which multiple rights and rights holders exist; and the Civil Law system, in which property is exclusive, but limited by laws and regulations. Over time, both of these systems and their various incarnations have gradually accorded some form of recognition to rights of use. During colonization, the metropolis granted rights within the colonies; then, after decolonization, this responsibility fell to newly independent states. Understanding the ways in which pre and post colonial rights have been combined and subsequently transformed by the populations of previous colonized countries is essential because this process has had a decisive influence on land governance almost everywhere in the world. Tensions and conflicts around land and water rights are often related to clashes between imported legal concepts and local practices – or between positive and customary law. Moreover, land and water rights are frequently denied to local indigenous populations because they lack legal and political recognition or representation. This is the case in several Southeast Asian countries, including India. It is therefore important to avoid broad generalizations and to examine the evolutions

⁹ Foro de los Recursos Hídricos. 2008. *El despojo del agua y la necesidad de una transformación urgente*. Quito, Equateur.

discussed above on a case-by-case basis. Everywhere in the world, land and water rights are influenced legal systems. In most systems, they have been historically interconnected (with the exception of public water rights, in particular rights related to navigable waterways). Increasingly, however, they are treated separately, as withdrawing large quantities of water in any given place may affect the water cycle within a much broader area¹⁰. It is important to note that accusations of excessive water usage should be evaluated with care, because this label is sometimes applied inaccurately by newly arrived downstream populations, attempting to modify the existing political balance by questioning the legitimacy of existing water rights.

Other historical factors unrelated to imperial or colonial processes, in particular broad agrarian reforms and/or forced land collectivization, also play a large role in the appearance of land and water related conflicts. Current forms of land access, whether equitable or inequitable, are the result of long-term evolutions and power struggles, but they are also affected by sweeping, radical transformations of varying shades. It is the case of the complete dispossession of small-holders in the Soviet Bloc. Or the one related to the equitable, efficient redistribution in Asia (a variety of reforms implemented by a variety of different regimes), or the creation of new property markets in Latin America, in connection with agrarian reforms that did not, in most cases, lead to legitimate land redistribution.

Resource access, and the legal contexts in which access rights evolve, are not the only factors to take into account when evaluating land and water availability and use. If resource users do not have access to technology and capital, and are unable to transform and/or market the fruit of their labor, resources will not be fully taken advantage of. Agricultural productivity varies widely from country to country and, increasingly, within each country. In wealth distribution systems that privilege those who are already wealthy, these differing levels of productivity have a huge impact on the ways in which land and water rights evolve. Average productivity levels are misleading as well. Net productivity differences sometimes surpass the 1-500 scale, even without subsidies, and significant differences exist within many countries. For example, Brazil's average productivity level is between that of developed, and developing, countries, but within the country itself, productivity levels vary dramatically.

¹⁰ Hodgson, S., op. cit. See also Ramazzotti, M. December 2008. *Customary Water Rights and contemporary Water Legislation*. FAO Legal Papers. Rome.

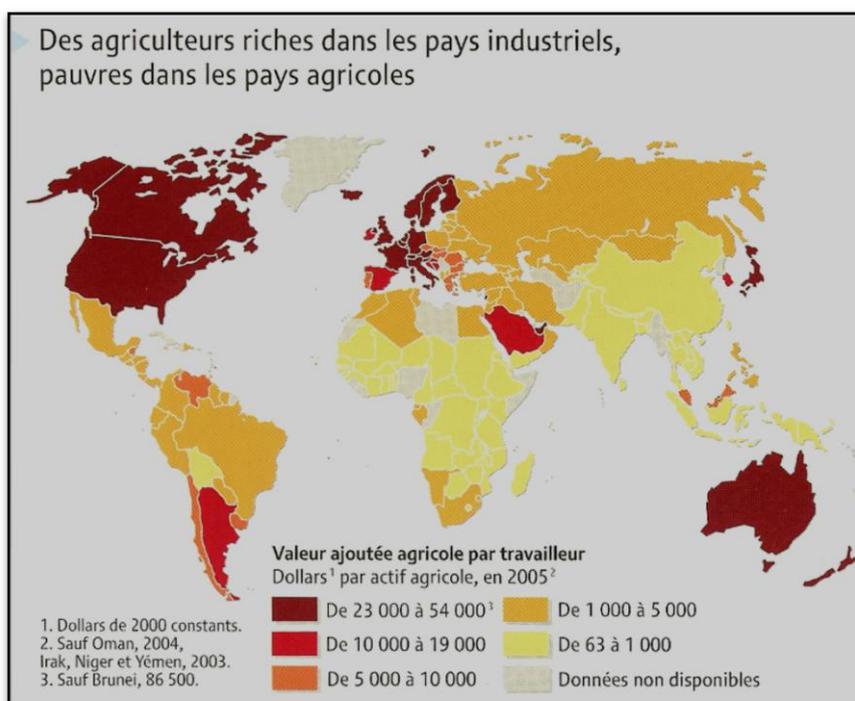


Figure 7. Differences in agricultural productivity. National Averages.

Source: L'Atlas du Monde Diplomatique, 2010. Armand Colin. (Based on data provided by the World Bank)

In a globalized market, what the best-equipped plantation produces in one day has the same value as what a smallholder produces in 500 days. This figure makes it easier to understand how the phenomenon of unequal exchange contributes directly to rural poverty.¹¹

1.2 Conflict over land tenure and water rights

While tensions and conflicts over land and water access (whether they are the direct, or indirect, result of access related issues) vary widely, almost all of them are affected by the factors that we have just discussed.

1.2.1 Conflicts over land rights

One kind of conflict over land rights arises when rural populations are marginalized and excluded from land that has been appropriated by a minority of agricultural producers that rely on salaried employees. Historically, this situation has been widespread in Latin America; it has also occurred in Austral and North Africa. In Brazil, Zimbabwe, South Africa, and in the Philippines, conflicts of this kind have taken the form of agrarian struggles, and resulted in the repression of farmer's organizations. In certain countries, like Brazil, farmers' movements have gained national and international political significance. In Latin America, the expansion of large farms is closely linked to the development of pioneer fronts, and clashes between smallholders and large agricultural producers are intense and frequently violent. In North Africa, mobilizations of this kind are less common, but conflict and resistance to land grabbing sometimes occur on a local scale.

Another kind of land related conflict arises in contexts where feudalism (a system in which large land owners take advantage of sharecroppers or tenant farmers) persists. This is the case, for example, in the southern provinces of Nepal, in many regions of India, and in the Philippines. In several

¹¹ See Mazoyer, M. 2001. *Protéger la paysannerie pauvre dans un contexte de mondialisation*. FAO.Rome.

countries, agrarian reform has modified these systems, but in countries where it has not, conflict is continuing and often intensifying. Several Indian states have implemented policies intended to protect tenant and sharecropper rights, but most have been unsuccessful¹². In India and Nepal, land rights are the subject of acute political and social tensions. Nepal's Maoist uprising demonstrates the magnitude of these tensions, which sometimes decisively influence national politics. In India, hundreds of thousands of people participate in small farmer's movements such as Ekta Parishad. Still other conflicts involve indigenous populations who are attempting to re-appropriate land (sometimes very large amounts of land) that they have been using for generations. These populations often practice forest agriculture and leave land fallow for long periods as it regenerates. This makes them particularly vulnerable to land grabbing by foreign parties. In China, rapid industrialization and urbanization have provoked intense conflict by evicting farmers with rights of use from their land.¹³ In semi desert areas and steppes, conflict between herd's people and farmers has increased due to population growth. This is not new in the Sahel. However, conflict between different populations -in particular, between traditional rights-holders and newly arrived migrants- has also increased in the agricultural regions of sub Saharan Africa (in spite of the fact that migrants obtain permission to settle from the local population before doing so). Conflict often occurs in valleys, irrigated (or irrigable) perimeters, and forests used for fuel wood, as well. The conflicts discussed above are relatively local disputes between specific groups of resource users. However, land and water related conflicts might be also between village communities, ethnicities, or even between countries. A large percentage of current and recent conflicts in central and West Africa are related (in one way or another) to land tenure and/or use. The independence movement in Bolivia's eastern provinces is directly related to widespread conflict over land and mineral resources. The following map (figure 8) uses specific examples to highlight the diverse nature of land related conflicts and hotspots everywhere in the world. It is not exhaustive and does not provide precise information about the location of hotspots. It includes information about the following kinds of conflict and/or conflict area: armed civil conflicts that are largely fueled by disagreement over land tenure and/or use; land disputes that are directly related to mining, industrial, or touristic projects; areas where there is conflict between nomadic herd people and sedentary farmers; areas where indigenous people have been stripped of their ancestral lands; areas experiencing tension and/or open conflict due to inequitable land distribution; tensions and/or open conflicts caused by expanding pioneer fronts; conflicts related to the Chinese governments' massive land requisitions, which marginalize millions of farmers; and land conflicts related to water access. In North Africa, there are also numerous conflicts of ethnic and/or linguistic nature. These disputes are heavily influenced by the region's complex past: colonial conquest, the subsequent nationalization of natural resources, and the current vogue for liberalization and privatization. Analogous historical factors have created tensions in the Balkans, in Eastern Europe, and in Central Asia (although not all of them are included in the map below).

¹² Hanstad, T., Nielsen, R. and Brown, J. 2004. *Land and livelihoods. Making land rights real for India's rural poor*. LSP Working Paper 12. FAO. Rome.

¹³ See *Etudes Rurales* No. 179 (2007), dossier on Contemporary Rural China pp. 170-191.

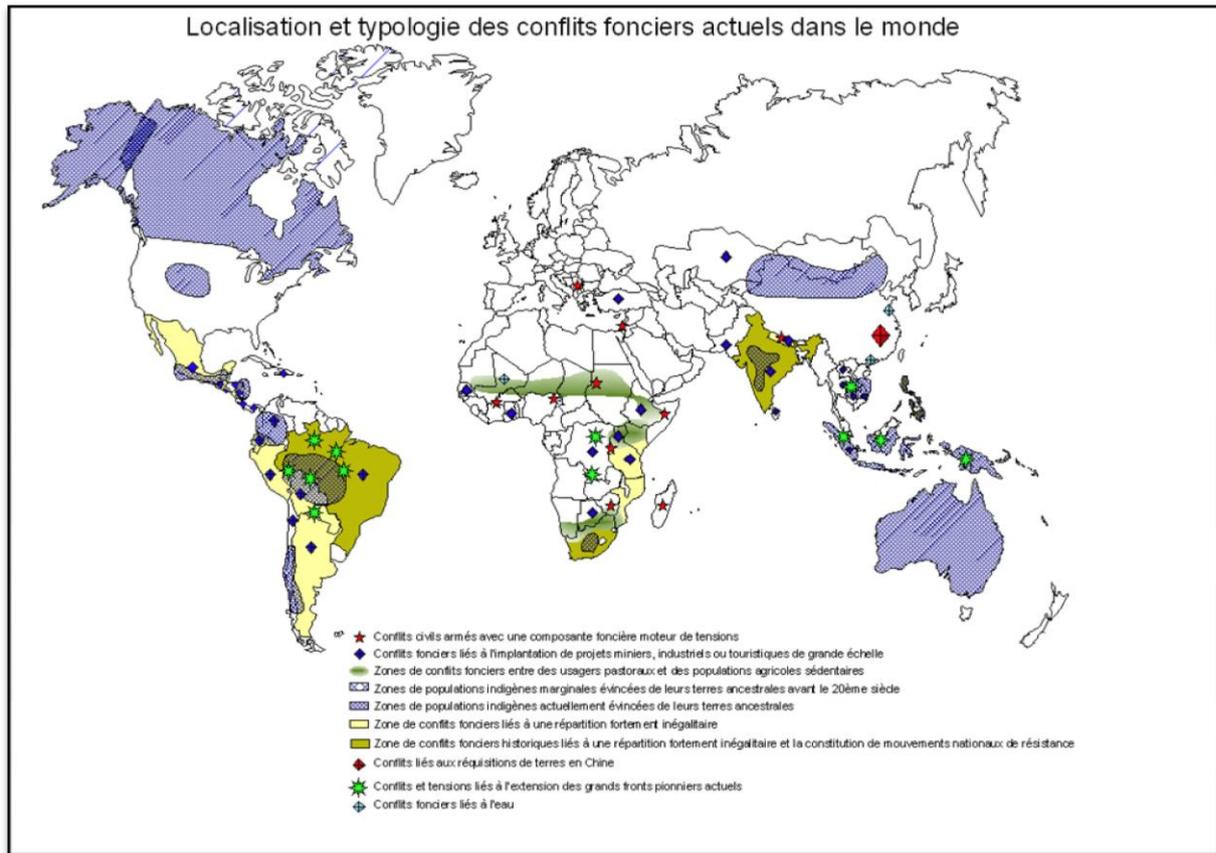


Figure 8. Examples of different kinds of land conflict throughout the world.
Source: AGTER.

1.2.2 Conflict over water rights

Water related conflicts vary as well. They include:

- Conflict between different sovereign states over the management of transnational watersheds.¹⁴
- Conflict between different regions within the same country, over river water that has been re-routed by large-scale water engineering works.
- Spain provides a well-known example of the above. In general, decisions of this kind are driven by technological choices that favor certain forms of agriculture over others.
- Conflicts between different water users for access.
- Conflict of this kind has occurred in Ecuador, where a variety of different users is competing for water resources from rivers and streams, from shared water sources, and water towers. These conflicts are more intense than land related conflicts.
- An entire category of water related conflicts are the direct result of changing public water policies.

Entities responsible for water management are often in charge of administrative and/or geographic areas that it make it impossible to manage water sustainably. Moreover, most projects that aim to “modernize” irrigation are designed to optimize water use within individual parcels. There is

¹⁴ For more information on this topic, consult the databases developed by the Institute for Water and Watersheds (University of Oregon). The Program in Water Conflict Management and Transformation (PWCMT), <http://www.transboundarywaters.orst.edu/>.

widespread ignorance concerning intermediary water management units, perimeter networks and *quartiers hydrauliques*, and management techniques that take temporal factors into account (seasons, appropriate times for watering, frequency, and the ways in which these factors interact with water availability and access). This ignorance has a negative impact on territorial water management and, over time, may lead to conflict.

If we are to improve water governance in areas affected by poor water management, territorial boundaries will have to be redefined to take watersheds and water distribution into account. This paper focuses exclusively on conflicts over agricultural water. This said, there are a vast array of water related conflicts in the world. If we are to prevent these conflicts, our governance style - and the choices we make to privilege certain sectors over others - must be guided by a coherent territorial approach. It is important to note that Figure 9 does not include information about a number of significant water related disputes in North America and Europe, between the United States and Canada, the United States and Mexico, within the Iberian Peninsula, in the south of France, or in Italy.

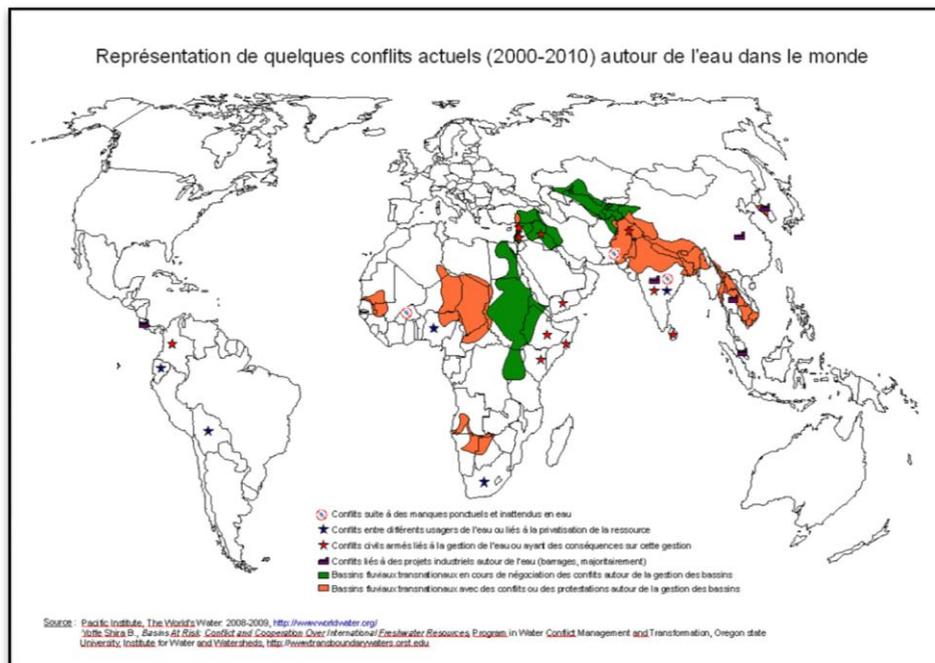


Figure 9. Examples of water related conflicts throughout the world.

1.2.3 Conflict related to changes in land and water management policy: some examples

Modifying land and water management, even on a local scale, has wide-ranging repercussions. The following examples illustrate this:

Cisterns in Ethiopia

In Ethiopia, seasonal rainwater has traditionally been stored in cisterns called *berkadros*. Development projects designed by donors from developed western countries have gradually replaced these with storage systems that permanently stock purchased water, which is then resold to local water users for human and animal consumption. This transformation has had serious environmental and social consequences. Livestock farmers have settled around storage areas, putting enormous pressure on land resources and damaging pastureland. Moreover, cistern owners have expanded their herds (normally composed of camels and small ruminants) to include animals that consume more significant quantities of water. Pressure on resources and overgrazing has increased. Poorer farmers without cisterns now travel larger and larger distances in search of the land and water resources they need to guarantee the survival of their herds.¹⁵

In pastoral areas of the Sahel, control over water access is a fundamental component of pastoral governance systems. Individuals and groups who grant or withhold access to a water source also control (de facto) surrounding pastures. Privatizing water points and making access rights exclusive will inevitably lead to the disappearance of pastoral communities. On the other hand, if unlimited water access is freely granted to everyone, herds will grow, exhausting pastures before the end of the dry season.

Pastoral Wells in Niger

Traditional water management systems manage pastures sustainably. For example, in eastern Niger, people who dig wells have priority, but not exclusive, access to well water. They grant rights to other herdsmen with the knowledge that they will be granted access to wells created by others during transhumance. These access rights, which are negotiated between both parties, include conditions relative to the herd's health, watering hours, and length of stay. Regulating the number of livestock around each source of water prevents overgrazing and protects the quality of the soil. In Niger, sustainable water and pasture management require both negotiation and reciprocity. Managing wells in this way is not only better for the environment, but it strengthens communities by reinforcing social ties.

This said, over the last 50 years, traditional governance in pastoral areas has been progressively destabilized by new forms of water access. The advent of modern infrastructure that provides unlimited water access has seriously undermined the sustainability water management, leading to conflict. Most of this infrastructure was constructed by development projects promulgated by western developed countries, which were intended to optimize pastoral water use by providing a consistent network of water points throughout the Sahel. Although local authorities were asked to supervise new wells to avoid overgrazing, they never implemented new management methods, which required near constant well surveillance.

After the independence, the state continued to strongly fund the construction of modern infrastructure. Freshly built wells were the private property of the new government, and unlimited access was granted free of charge to the entire population. State wells attracted larger herds, encouraging overgrazing and seriously damaging the surrounding environment. Negotiation and reciprocity were replaced by deregulation and force. As a result, a variety of different actors vied for access rights in pastoral areas.

The reestablishment of collective management systems in the 1980s and 1990s did not reverse this trend. Modern well management was already a major source of intercommunity conflict. In some places, like Niger, intercommunity disputes have erupted into armed conflict.¹⁶

¹⁵ Gomes, N. 2006. *Access to water, pastoral resource, management and pastoralists' livelihoods*. FAO LSP. Rome.

¹⁶ From Thébaud, B. 2006. *Land and Water Rights in the Sahel*, in Cotula, L. (Ed.). 2006. IIED, FAO LSP. Rome.

1.2.4 Tensions and conflicts indirectly related to changing land and water management policy

The conflicts discussed above are directly fueled by disagreements over land and water rights. However, limitations on land and water resources may indirectly lead to conflict by exacerbating rural poverty. Poverty related uprisings (frequently referred to as hunger strikes) and discord surrounding illegal immigration are examples of this kind of conflict. Conflict reflects poor governance. On the bright side, it may serve as a catalyst by encouraging stakeholders to address causes of dissent. It is extremely important to develop governance mechanisms capable of confronting and resolving current and future conflict. It is also important to note that national approaches will not suffice (see below); global forms of governance will be necessary.

2 Growing pressure on land tenure and water rights that leads to conflicts: causes and current trends

2.1 Growing Pressure

Scarcity is does not, in and of itself, inevitably lead to tension or conflict: human societies have always confronted resource shortages, and have often found ways to adapt to them. However, when change occurs too quickly, societies do not have the time that they need to develop new forms of governance. This leads to crisis. The current global context reinforces existing pressures on natural resources, in particular on land and water. Factors that exacerbate these pressures -hence increasing the probability of conflict- are organized into two broad categories: demographic factors and climate factors.

2.1.1 Demographic factors

The world population is growing. According to the United States Census Bureau, it was roughly 6.8 billion in January 2010; it was only 1.6 billion in 1900. If predictions are precise, it will reach 9 billion in 2050.

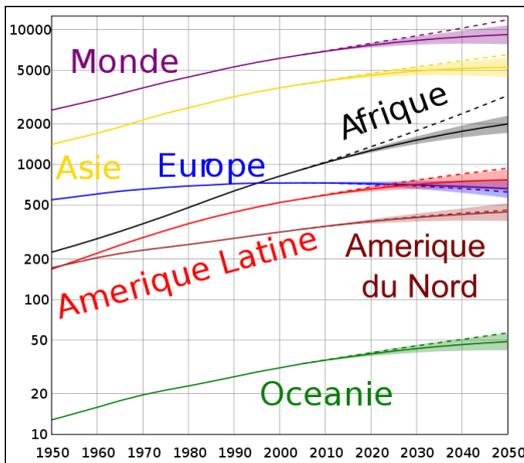
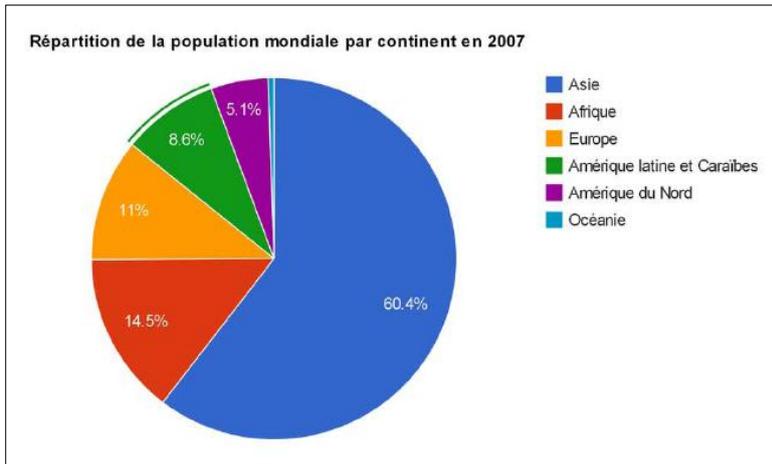


Figure 10. Population growth throughout the world.
 (Source: Population Mondiale and World Population Prospect, fr.wikipedia.org)

Population distribution and growth are not consistent throughout the world. These inconsistencies are portrayed in the above reported charts. The overall rate of population growth has gradually declined since the 1970s, but it is still positive. In 2006, it was estimated at 1.14 percent per year. With the exception of certain Eastern European Countries, Russia, and some southern African countries, population growth rates are positive everywhere in the world. They are particularly high in Africa, in the Gulf countries, and (although somewhat less so), in Latin America and Southeast Asia.

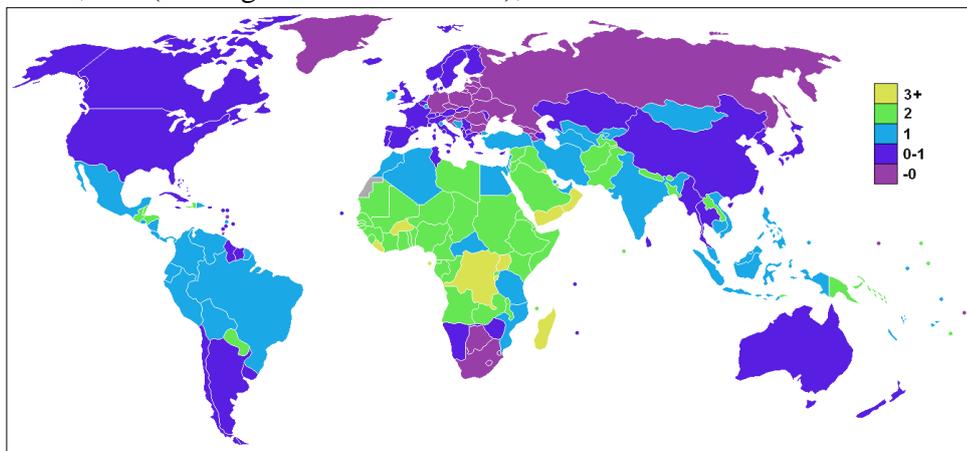


Figure 11. Population growth rates (percentages), according to the CIA Fact book (2006).

In 2050, it will be necessary to feed a world population of 9 billion. This means that pressure on land and water will increase. Even worse, the countries with the lowest number of available calories per person per day are the countries experiencing the demographic growth¹⁷. In some cases, they also have less and less water per inhabitant, per year¹⁸. If these countries (Sub-Saharan countries in particular) are struggling to feed their current population, how can we expect them to deal with the rapid population growth of the next 40 years?

Urbanization will also have an impact on land and water resources in the coming years.

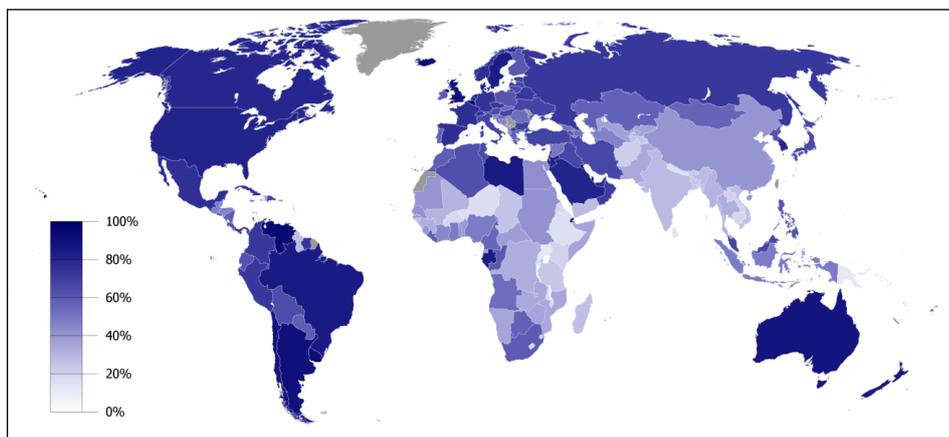


Figure 12. Urbanized population percentage by country as of 2006. Source. Wikipedia Commons. Source: UNICEF, *The State of the World's Children 2008* (p. 134).

Not only do cities take up many land (in alluvial or littoral areas, moreover, they often develop on fertile land), but they use many resources. Land and water suitable for agriculture are now increasingly being consumed by growing urban populations, which consume more meat than rural populations. According to predictions, global meat consumption will increase by 64 percent between 2006 and 2025. This means that more and more water will be used to produce less and less food; 15 500 liters of water are required to produce just one kilogram of bovine meat, whereas it takes only 625 liters to produce a kilogram of potatoes, or 1 300 liters for a kilogram of wheat¹⁹. Meat is generally produced in pastoral, rainy ecosystems composed of prairies and itineraries adapted to this task. By tripling the production of dry materials, irrigation makes it possible to combine cultivation and livestock farming. Fodder crops are an intrinsic component of this system because they allow farmers to produce dairy and meat products, manure for fertilization, and animal power. In addition to significantly increasing our global water use, therefore, the new lifestyles discussed above will also modify the way people farm. Finally, unless our consumption and production habits change, we will consume more and more energy as the population grows and urbanizes. Resources are required to access fossil fuels, to produce electricity, and to grow bio-fuels. This means that pressure on these resources will inevitably grow. Bio-fuels are particular, insofar as they compete with agricultural crops for land and resources. In France, replacing just 10 percent of conventional fuels with bio-fuels would require that 20 percent of the country's agricultural surface area, not to mention billions of cubic meters of irrigation water, be re-allocated. Developed countries that want to increasingly rely on bio-fuels without undermining food production are likely to import bio-fuels (ethanol and biodiesel) from developing countries that have a comparative advantage in terms of energy balance and production cost (cane sugar in Brazil, palm oil in Indonesia or Malaysia, for example). However, at what environmental cost? Putting even more pressure on land resources in developing countries will accelerate deforestation that is already underway in tropical forests in Asia, and in the Amazon.

¹⁷ Millstone, E., Lang, T. 2008. *The Atlas of Food*, Earthscan, maps pp.18-19.

¹⁸ Millstone, E., Lang, T. 2008. *The Atlas of Food*, Water Pressure, map p.25

¹⁹ Source: Black, M. and King, J. 2009. *The atlas of water*. Earthscan, maps pp.56-57.

Demographic and climate-related factors both put additional pressure on land and water resources. This said, we would like to look at climate-related factors individually.

2.1.2 Climate Factors

In 2010, agriculture was responsible for roughly one third of global greenhouse gas emissions. Not only do we need to find a way to feed a growing, increasingly urban world population, but also we need to do so without making climate change - and associated pressures on land and water resources - worse. What kind of agricultural system can sustainably provide food for 9 billion people?

Most climate experts agree that it is necessary to reduce greenhouse gas emissions everywhere in the world. According to the IPCC (Intergovernmental Panel on Climate Change), developed countries must reduce emissions by 25–40 percent before 2020 if we are to limit global temperature growth to 2 degrees; moreover, even if they succeed in doing so, we only have a 50 percent chance of meeting this goal. It is therefore necessary to adopt farming and development methods that pollute less. Deforestation is currently responsible for roughly 20 percent of the world's greenhouse gas emissions; if we want to address climate change, expanding farming fronts into forest areas or clearing trees for the benefit of extensive livestock farms is no longer an option. If governments create binding emissions reduction targets, it will be necessary to change farming methods if we want to avoid placing even more pressure on non-forested agricultural land.

Whether they do so or not, climate imbalance is already underway. This process has unavoidable consequences that influence both the quality and the quantity of agricultural resources. Certain areas of the world are already experiencing soil erosion due to disproportionately intense periods of rain or draught. Moreover, ice melts more quickly when summers are longer, which threatens agricultural activities (and food security) in vast, densely populated areas. For example, the Indus and Ganges basins in northern India are replenished (in large part) if these melt, Himalayan glaciers will affect 500 million people affected by severe water stress. The effects of climate imbalance are not systematically negative. For example, in temperate climates, temperature increases will extend cultivation time. In tropical and sub-tropical regions, however, increases of only a few degrees (or even a few tenths of degrees) will seriously affect agricultural activities by extending dry and wet seasons. World food production will therefore evolve differently in different areas of the world. In their "Atlas of Climate Change," Kirsten Dow and Thomas E. Downing examine how these changes will affect different countries between now and 2080²⁰. According to their research, food production should increase everywhere in Latin America, North Africa, and Southeast Asia, and decrease in the Indian sub-continent, in Western Europe, and in all of sub-Saharan Africa. In sub-Saharan Africa in particular, climate change will have extremely negative consequences. Given the fact that the population of this area is growing, and that available calories per person per day are more limited than anywhere else, these consequences will be highly destructive. How should we deal with this situation? The systems that we currently use to define, recognize, and protect land and water rights – and, consequently, the economic, political, and social regulations that apply to these resources on a variety of different scales (from the local to the global) are ill-adapted to the pressures described above. With a significant amount of political will, developed countries can use existing governance systems to address coming evolutions. However, developing countries with young and/or weak governments are not in a position to do so. Even in this respect, different areas of the world differ significantly. Land and resource grabbing- and associated political, economic, social, and environmental consequences- are accelerating. This proves that the systems that we currently use to manage land and water must be improved. Below, we look more closely at the phenomenon of land grabbing. We believe that this issue sheds light on the dangers of deregulating resource management in the context of global population growth and climate change.

²⁰ Based on information from: Dow K., Downing, T. E. 2007. *Atlas of Climate Change*. Earthscan.

2.2 Land grabbing. A burning question

When we use the term “resource grabbing,” we are referring either to the privatization of common resources, or to the hoarding of private resources for economic, or financial purposes (by public or private investors). This process has intensified over the last few years, revealing the inadequacy of the current regulatory environment. Generally speaking, land grabbing occurs in two contexts:

- In cases where land is already private, and is sold or leased (emphyteutic lease) to investors by individual property owners with formally recognized rights. Land concentration, in the form of large property domains or leased areas, can occur both quickly and easily. While rights holders sometimes relinquish their rights voluntarily, they may also be threatened or pressured (sometimes violently) into doing so.
- In the second case, the land that is sold or leased (emphyteutic lease) is already governed by customary law. This is frequently “national” land that was given back to newly independent states after colonization. While in most cases it has been lived on, and used, for generations, its inhabitants have no formally recognized rights. They may enjoy some rights of use, but these are poorly protected. Governments therefore feel that they can dispose of this land as they wish. Privatizing it through sale or long-term lease seriously modifies existing land tenure regimes, which privilege the common or collective nature of the resources found there²¹.

Whatever the situation, one thing is clear: the less resource users’ rights are protected, the easier it is for outside parties to take control of them. The systems that we currently use to regulate land and water access, and the transfer access and use rights, are inefficient and inadequate. They do not prevent land grabbing, which, in addition to destabilizing the economic, social, and environmental harmony of local communities, threatens food security. Furthermore, land grabbing weakens existing regulations. It creates a situation in which local populations have less and less control over land and water. Once a local farming system, and local farming populations, are destabilized and/or destroyed, they will never be the same again. This process is irreversible. Even with political will, it is impossible to re-create an entire society of small holders that has disappeared, taking their lifestyle, their knowledge, and their know-how with them. Moreover, given current trends, it seems likely that land grabbing - and, in its wake, the destruction of local farmers and farming systems-will intensify in coming years:

- Land is “grabbed” with the goal of producing food that investor countries (such as South Korea or Gulf countries) need to feed a growing, increasingly urban population. Lacking unused agricultural land within their own territory, in a context of rising commodity prices, they will continue to seek it abroad.
- Public policy in certain western countries encourages the use of biofuels. These countries may grab land for biofuels abroad, to avoid converting food crops at home.
- Investor countries are not only looking to grab hundreds of thousands of hectares of land. They also want to take control of water resources, which they need for intensive, agro-industrial crops. This water is appropriated at the expense of local, or even distant, residents that depend on it.
- There are no binding laws that apply to land transactions at the international level. This allows public and private investors to negotiate opaque contracts with host governments or local populations. The conditions in which they are negotiated are frequently very advantageous to

²¹ Merlet, M., Jamart, C. Avril 2009. *Pressions commerciales sur la terre dans le monde. Problématique et cadre conceptuel*. ILC AGTER, (available at http://www.agter.asso.fr/IMG/pdf/ILC_AGTER_Conceptual_framework_of_the_Scoping-Study-fr_def.pdf).

investors, and contracts rarely afford the possibility of formal judicial recourse in case of conflict.

Multiple studies have explored the dynamics described above. Since 2009, the IIED, with the support of the FAO and the FIDA, have focused on five countries in particular (Mali, Ethiopia, Madagascar, Mozambique, and Sudan)²². Transactions of this kind are primarily occurring in three broad geographical areas, which are depicted in the sketch below (figure 13). Pink countries are already experiencing land grabbing or in the midst of negotiations with outside investors. In the first two areas, the context has been heavily influenced by different colonial pasts. Hence Spain and Portugal's long-lasting colonization of Latin America, and the series of migratory waves that occurred after independence (zone 1), resulted in a context that diverges significantly from that of Africa and Asia (zones 2a and 2b). The final area differs from the first two completely; it has been heavily influenced by land collectivization in communist bloc countries.

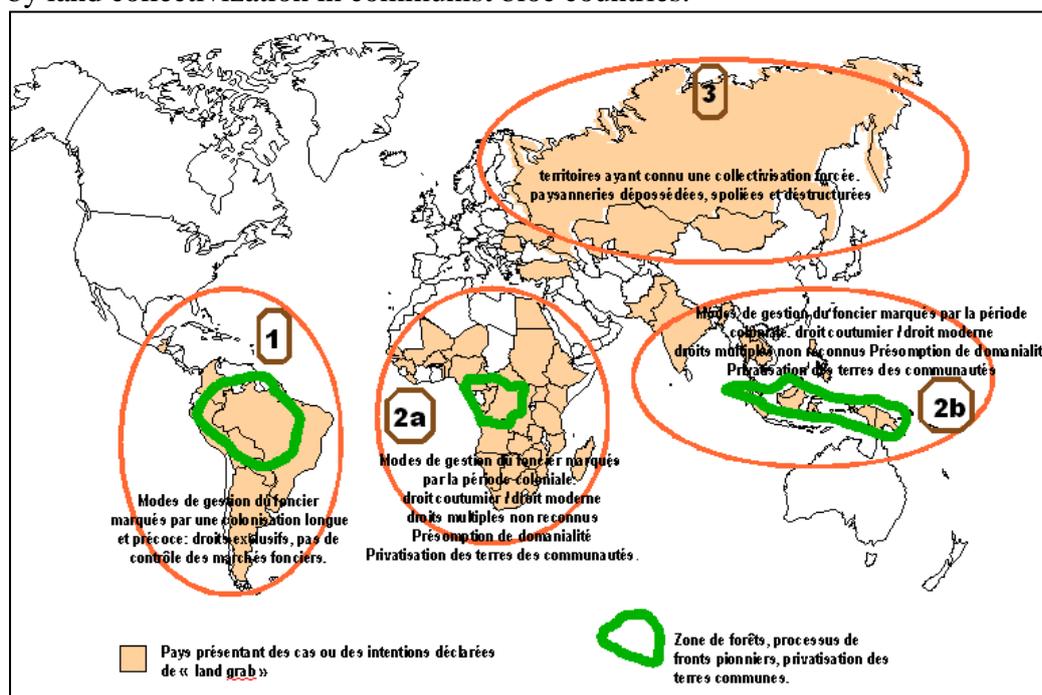


Figure 13. Principal areas in which foreign (or national) investors are engaging large scale land appropriation and concentration. (Elaboration AGTER).

It is important to note that there is significant variation within each area. For example, inter-tropical forest land that has already been cleared is “grabbed” very quickly (and in large quantity), regardless of location. Large scale land acquisition and concentration are already a source of political tension and conflict, and we have reason to believe that they will cause more and more violence in coming years. The mid and long-term consequences of these practices are very serious. If it continues, land grabbing will not only eradicate poor farmers, but it will accentuate environmental problems and threaten food security in host countries²³. These trends are caused by poor governance at both local and national levels. They might be solved with more regulatory mechanisms, and a more transparent legal and administrative environment, which would make it more difficult to implement projects that openly violate the rights of local populations. This said, local and national forms of social

²² Cotula, L., Vermeulen, S., Leonard, R. and Keeley, J. 2009. *Land grab or development opportunity? Agricultural investment and international land deals in Africa*. IIED, FAO, IFAD. Rome.

²³ Merlet, M. 2010. *Les grands enjeux de l'évolution du foncier agricole et forestier dans le monde. Des réponses globales sont nécessaires*. January-February 2010. *Revue Etudes Foncières*, 143:6.

organization and control change slowly. This is why it is necessary to begin by regulating land grabbing on an international, and not a national or local, scale.

2.3 Are we headed for global crisis?

Given the demographic, environmental, and regulatory challenges described above, it is clear that we must make significant changes if we want to guarantee the food and energy security of 9 billion people in 2050. In this context, what is the best way to move forward? How can we preserve the resources that we need to survive?

The proliferation of land and water “hotspots” is directly related to the intensification of land grabbing and, more globally, to the deregulation of land and water resources.

- Due to land grabbing and land concentration in areas where private property already exists, agricultural land and water is less and less available to smallholders, who make up most of the world’s rural population. Their land and water rights are subject to more and more limitations and constraints. Conflicts are getting worse and occurring more and more frequently.
- Indirect conflict related to growing rural (and urban) poverty, intensifying inequalities, and illegal immigration is becoming more widespread.
- Unless we develop alternatives, violence will continue to grow.

Tension often arises when governance is out of step with territorial realities. For example, as conflict becomes more and more international, national borders will become less relevant.

Given the inherent complexity of the current context, land tenure policy must be governed by a culture of preventative negotiation that fully acknowledges the plurality of existing appropriation rights. In keeping with democratically determined, constitutionally protected economic, political, ethical, and social priorities, it must provide recognition for the structural interdependence of different land appropriation regimes. If there is a genuine risk that the current context, which is characterized by several hotspots, will transform into a full-blown global crisis - and if increasing global poverty and inequalities pose a legitimate threat to humanity - then it seems clear that international and civil society organizations have the ability to decisively influence the course of current trends.

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