

# Four myths in global agrarian history

*Mats Widgren*

It is in the nature of global history to have to rely on secondary sources. An important role among those secondary sources is played by existing syntheses addressing individual countries or regions (cf. the discussion in Myrdal 2009 and in this volume). The author of global syntheses must therefore navigate through mountains of secondary literature and be able to separate the wheat from the chaff, or in this case, substantial, empirically based conclusions from shortcuts and sweeping generalizations lacking substance.

This chapter is based on observations made while reading secondary literature for the project *Mapping global agricultural history* (Widgren 2010b). The project aims to summarize the existing evidence for global agrarian systems in the last millennium. A central point has been to present current knowledge of global agrarian history using maps, in a format that can be easily compared with other datasets. In my reading of different types of secondary material it has struck me how often authors rely on commonly accepted assumptions rather than on empirically based generalizations. In this chapter, I will focus on four such assumptions that I claim take the form of myths. They especially creep into scholarly literature in regional and global syntheses, where scholars, for lack of empirical research, need them to help paint a broad picture. Often they are myths that once served particular interests. Although they may have been refuted a long time ago in the specialist literature, they are exceptionally resilient. They tend to resurface in new syntheses and in new guises, time and time again.

## Previous maps of global agricultural history

Previous work on mapping global agriculture can be found in scholarly works in two very different fields of research: climate modelling and global history. In our project we aim to present a synthesis in map form that communicates with these two different fields of research. Both these fields often suffer by replacing actual empirical evidence with assumptions that may seem to be based on common sense, but are in fact deeply problematic.

In climate research, it is a well-established fact that there is a close causal relationship between changes in land use and greenhouse gases. Forest vegetation sequesters carbon during its growth, while the clearing of forests leads to the emission of CO<sub>2</sub> into the atmosphere. It is thus increasingly recognized that early developments in land use had implications for the global climate system. Historical aspects of land use have come more and more into focus in climate research, especially following the seminal article by Ruddiman addressing the effect on climate of early human influences on land cover. Ruddiman proposed that the Neolithic revolution, as well as continued agricultural expansion well before the industrial revolution, impacted on the emissions of greenhouse gases and the global climate system (Ruddiman 2003; Ruddiman et al. 2011).

In the modelling of the relations between long-term carbon cycles and historical land use, different data aimed at reconstructing historical cropland change are used. The SAGE dataset was initially published in 1999, and covers the period 1700 to 1999 (Ramankutty & Foley 1999). At the same time the HYDE database was built up and initially also covered the last 300 years. Pongratz and co-authors in 2008 published a dataset covering 800 CE–2000 CE (Pongratz et al. 2008). All these datasets are based on recent global distribution of croplands, from which the cropland distribution in previous centuries is calculated, based on historical population estimates.

The most commonly used and quoted dataset now is probably HYDE and the most recent version of HYDE covers the last 12,000 years (Goldewijk et al. 2011). The basic assumption behind the HYDE dataset is that previous croplands only existed within the boundaries of the recent distribution of croplands and that these areas of cropland were successively filled up. Allocation of historical

cropland between recent state territories (and in some cases between regions within states) is made in relation to historical population estimates (mainly based on McEvedy & Jones 1978, with some recent updates) and an assumption on cropland per capita. The distribution within these geographical territories is based on algorithms and weighting maps which take into consideration such things as soil suitability for crops according to recent FAO maps of global agro-ecological zones. In addition, coastal areas and river plains are weighted positively and steep terrain is weighted negatively.

Historical data on agricultural history and cropland distribution cannot be entered into this weighting model. Only a few evident and well-known facts from agrarian history are taken into account in the underlying datasets and weighting procedures, and this is seldom stated explicitly. In sum: in the absence of an empirically-based, spatially-explicit history of agricultural land, a dataset based on hind-casting and environmentally deterministic algorithms is used here.

One would perhaps expect that in the fast-growing field of global history one would find a more evidence-based view of agricultural history. But that has so far not been the case. When agricultural systems are treated in works on global history, the overviews are often based on relatively dated and Eurocentric overviews. An alarming example is Malanima's recent work on the premodern European economy in which a global map of agriculture in the year 1500 shows only sparse occurrences of agriculture in America, and no agricultural lands in Sub-Saharan Africa (Malanima 2009: 99).

The French historical geographer and geohistorian Christian Grataloup (2007) discusses why Western Europe and the United States became the main axis of control. In that argument, he bases his understanding of the material background, sixteenth-century global agricultural systems, on a map originally published in 1954. Grataloup quotes Braudel, but Braudel in his turn based his map on the works of the American ethnologist Gordon Hewes, who in 1954 published a map of world cultures in 1500 CE (Hewes 1954). In a critical article on Braudel's work, Samuel Kinser pointed out how Braudel's interpretation of Hewes' work emphasized a hierarchical interpretation of the relations between different agricultural systems and thus gave support to a Eurocentric view. This was, according

to Kinser, an aspect that was much less pronounced in Hewes' own categories and Hewes in fact argued against such simplifications and against a Eurocentric world-view (Kinser 1981: note 20). But Grataloup chose to use Braudel's interpretation rather than Hewes' and thus supports the idea of modernity emerging in Western Europe and later spreading throughout the world. With its foundation in a timeless ethnographic perspective it replaces time with space, and assumes that the agricultural systems recorded by ethnographers can be ordered along an evolutionistic timeline.

As can be seen from the above, both quantitative modellers and global historians thus easily fall into the trap of replacing empirical knowledge with assumptions. The quantitative modellers use environmentally deterministic assumptions that are clearly at odds with what we actually know about where and when different agricultural systems developed and decayed historically. In global history on the other hand, there is a tendency for assumptions about a hierarchically ordered historical sequence of agrarian systems to replace the empirical evidence.

### Mapping global agricultural history

It is thus clear that there is a need to develop methods for reconstructing land use, methods that accord the established empirical facts of agrarian development greater importance than hindcasting models or evolutionistic assumptions can ever do. For many regions of the world, historians, archaeologists and historical geographers have, after all, fairly good documentation on the timing and location of expansions, the abandonments of agricultural settlements and lands, and also of technological changes in farming. A project has therefore been set up with the aim to produce a series of maps covering the last millennium, in which the known agricultural history is made spatially explicit. Three cross-sections in time have been chosen:

- 1800 – before the second wave of globalization that drew large parts of the global south into commercial agriculture
- 1500 – or more precisely 1491, on the eve of European oceanic expansion and before the Columbian exchange

- 1000 – a period when African and American polities and landscapes were distinctly different from those of the late fifteenth century

The design of the project was inspired by the work done by historical geographers in the United States on pre-Columbian agriculture in North and South America. The perspectives outlined in the works by Bill Turner and Karl Butzer (Turner & Butzer 1992; Butzer 1992; Turner et al. 1995) and in three syntheses on the cultivated landscapes of different regions of the Americas (Doolittle 2000; Denevan 2001; Whitmore & Turner 2001) formed a model for our work. In the dissemination of that work to a broader audience, Charles Mann also later showed that it was possible to summarize such knowledge in map form (Mann 2005).<sup>1</sup>

Syntheses like these, expressed in map form or readily converted to map form, are not yet available when it comes to the rest of the world. In a few cases, archaeological and historical research has provided overviews that are spatially and chronologically explicit and can be directly used in the mapping. This is the case, for example, with regard to the archaeologically documented irrigation structures in the Angkor Wat settlement in Cambodia. Here recent analyses based on a combination of ground surveys and remote sensing make possible a detailed mapping of the distribution of irrigated fields in that period (Evans et al. 2007). In a number of other instances, the spatial detail of current and abandoned irrigation and terracing can be accurately mapped based on later maps and aerial surveys, but the chronological issues remain vague. This is the case for many of the instances of terraced agriculture in Western Africa and the Sahel. There are strong arguments that many of these areas were in existence in 1800 CE, but their exact distribution at that time cannot be accurately mapped (see the map in Widgren 2010a).

Scholars in China have taken a leading role globally in spatially explicit reconstructions of croplands, based on historical sources. This reflects a strong tradition of Chinese historical geography based on the rich material of early written sources. Also, comparatively strong state funding has been decisive for climate-related research, including a specific focus on the role of land cover history. This

research is also fuelled by geopolitics concerning climate change. Conflicting results have been presented by American and Chinese scholars on the role of earlier land conversions regarding the historical debt of emissions. Ge and co-authors (Ge et al. 2008) claimed that a detailed study based on Chinese historical records for the past 300 years showed significantly lower emissions caused by land use conversion than that previously established by Houghton and Hackler (2003). According to Chinese researchers, these discrepancies are due to an underestimation of early agriculture and deforestation in China. By assuming that present croplands were cleared during the last 300 years and not earlier, a larger part of the burden of historical emissions is transferred to recent times. A larger share will thus be attributed to the period after the mid-1800s, which is usually the starting point for calculating historical emissions.

In this research, tax records and other information are transformed into gridded data in the format used by climate modellers. This has been done for the nineteenth and twentieth century expansions of croplands in the Northeast of China (Ye et al. 2011) and for central China in 1820 (Lin et al. 2009), but more remarkably also for the Song Dynasty (1004–1085 CE) (He et al. 2012). Of course, the usual source-critical caveats commonly applied to agricultural statistics based on tax records also raise questions in this case. Nevertheless, the chronological and spatial detail is far greater than what is usually possible for such early periods.

For most areas of the world, such detailed data on historical agricultural systems and land use is not available. For some regions of Eurasia, however, general works on economic and agrarian history are sometimes precise enough in their verbal characterization of agricultural systems in different periods and in different regions to permit a mapping of changes in agriculture over time. Examples of such works are the grand synthesis of China by Joseph Needham, with a contribution by Francesca Bray on agriculture (Bray 1984). Similarly, Irfan Habib's atlas work mapping surplus products from different parts of the Moghul Empire permits conclusions to be drawn about the types of agriculture in different parts of present-day India and Pakistan in about 1500 CE (Habib 1982). Although not as detailed in its evidence, James Scott's history of upland Southeast

Asia makes possible a mapping of the contrasts between intensive rice-producing and stratified areas and more extensively used areas with shifting cultivation (Scott 2009). These are just a few examples of scholarly work that can fairly easily be transferred to regions with different agricultural systems with a reasonable chronological specification.

Only a few regions of the world, however, can boast such syntheses of agrarian history. We are thus dependent on general works of history. This is the case for most regions of Africa and for many regions in Asia, apart from India and China. Many regional histories include an introductory chapter on land, people or subsistence, and often take the early nineteenth century situation as their starting point. The qualities of such overviews vary considerably. A few are based on actual agricultural history, while others substitute assumptions of different kinds for knowledge. The reflections in this chapter are based on a substantial trawling through such works for facts on agricultural development. Then, a sharp eye has to be used to weed out the shortcuts, so common in syntheses, from the genuine facts. It is in such situations that the checklist of four myths discussed in the remaining part of this chapter is important to bear in mind.

Similar myths or assumptions on agriculture of the past also flourish in much work on rural and agricultural development. As Daryl Stump has shown, these references to past agriculture may go in one of two directions. They either emphasize the inefficiency and inertia of traditional agriculture or they hail indigenous knowledge and the sustainability of previous farming systems (Stump 2010).

## The four myths

### *Myth 1: Empty or under-utilized land*

Narratives of empty or under-utilized land are common in descriptions of areas that were in fact populated by foragers, pastoralists or shifting cultivators. This is the myth that has most clearly been connected to political and economic interests, especially in the power relations of colonization. Historically, arguments about empty land have served to legitimate colonial interests in many parts of the world. The notion has also often gone hand in hand with

the notion of under-utilized land, and with the idea that itinerant hunter-gatherers and pastoralists have weaker rights to the land than permanent farmers.

One of the clearest cases of this myth is the contested settlement history of South Africa. The idea that European and African farmers entered South Africa at about the same time was disseminated as part of apartheid history writing, but the notion was not at all confined to the direct political interest of the apartheid regime. Much scholarly work outside South Africa was also based on this understanding. One does not have to search for long to find it in historical works and atlases, both in South Africa and in the rest of the world. In his history of Africa south of the Sahara, Donald Wiedner gives a vivid illustration of this idea in a map showing the "Occupation of South Africa 1652–1775" (Wiedner 1964: 123). Black and white arrows indicate "Bantu migration" and "European migration" respectively. While Europeans advanced eastwards and northwards from Cape Town, black African settlement was assumed to have advanced southwards at the same time. According to this map, these two migrations arrived at the Fish River in the Eastern Cape in 1775. "Conflict inevitably ensued when the Caucasian Boers and the Negro Xhosa met on the Fish River in 1775" writes Wiedner (1964: 125). A similar myth of empty land was also put forward for a later period in South African history, when it was claimed that most parts of the Highveld in the eastern parts of present-day South Africa were "depopulated by the Zulu wars before 1834" (see map from Theal 1891 reproduced in Davenport & Hunt 1974).

In the 1970s, archaeologists in South Africa moved to a position from which they were able to challenge this view with empirical facts. With the help of radiocarbon dating they had gathered enough evidence to revise some of the previously accepted chronologies based on pottery only. In the early 1980s, Tim Maggs presented the detailed evidence that once and for all refuted the idea of parallel black and white colonization. He compiled detailed maps of the spread of archeologically known African farming settlements north and east of the Fish River. In the era of apartheid, the need for meticulous work on indisputable empirical evidence of this process was important. From these maps it is clear that the expan-

sion of African farming communities along the coast had already reached the Fish River more than 500 years before Europeans even set foot in the Cape. Two grains of truth contained in the myth were first, that African farming expansion towards the south was indeed a continuing process that had not yet ceased when the first European explorers arrived in the area. Second, the Fish River did coincide with an important climatic boundary, and African farmers were not able to expand into the winter rainfall region in the southwestern area beyond the Fish River, where African grains (sorghum and millet) would not grow. It was only with the introduction of European grains that the Western Cape could become a farming region (Maggs 1980; Maggs 1984).

The South African case might seem to be an extreme version of politicized settlement history, and one might perhaps expect the idea of empty land to be an obsolete myth, but the idea of a sparsely populated Southern Africa survives in recently published historical land cover reconstructions (Goldewijk 2011). Such reconstructions use as their main input what is known today about historical populations. Unfortunately, the work on historical population reconstructions for early periods in Africa has advanced very slowly. It has not taken into account to any great degree the last thirty to forty years of archaeological work in Southern Africa. The atlas of world population history from 1978 still forms the basis of much work on African historical populations (McEvedy & Jones 1978). Nobody has yet seriously used the new archaeological evidence to reconstruct populations in Sub-Saharan Africa.

As noted above, the notion of empty land is also closely connected to the idea of under-utilized land. The idea that land is used below its full capacity has in history and in the present often been formulated as a motivation for state-led colonizations or for large investments in agribusiness to the detriment of the existing users of the land. In the context of recent large land acquisitions, Olivier De Schutter has pointed out the problematic use of the term under-utilized for occupied lands whose existing use is not perceived by governments as productive (De Schutter 2011: 260).

*Myth 2: Historical sequences of agrarian systems*

The notion of a historical sequence of land use intensity (foraging – pastoralism – shifting cultivation – permanent cultivation) is part and parcel of much work on regional and global syntheses in a long-term perspective. In a long-term perspective, human use of the environment has indeed progressed towards more intensive forms. The sequence from foraging to cultivation and from there to more intensive forms of cultivation is unquestionable. However, in the light of the most recent research, there are two question marks in the sequence presented above. One concerns the role of specialized pastoralism in such a sequence, and the other concerns the role of shifting cultivation. I will show how the idea of a historical sequence must be used with caution. Its predictive value across space and time is weak. In two broader fields, where an assumed historical sequence is often used, it can be considered a myth.

The first field of dubious usage is the idea that the resource utilization systems and the social organisation of ethnographically documented foragers, pastoralists and shifting cultivators, truly reflect previous stages in the evolution of technology and social organization. As has been shown in many recent studies, this is indeed a problematic assumption. It does not take into account the history of these people and their changing use of the land. At the same time, this interpretation most often ignores the wider political economy under which these extensive systems of land use exist today. With regard to the San-speaking peoples (bushmen) of Southern Africa, Wilmsen has argued that their present situation as foragers in the peripheral drylands of Southern Africa is a recent development that must be seen in relation to their subordination to incoming Tswana farming communities. It is not their isolation from the outer world that explains their lifestyle, but rather their contacts and interactions with politically and economically stronger groups (Wilmsen 1989). Similarly, it has been shown in Eastern Africa that specialized pastoralism developed during the last 200–400 years among groups who previously had much more diverse economic strategies based on small-scale dryland agriculture and foraging. This is, among other things, based on meticulous research in oral history to assess the time depth of age-sets in these pastoral groups

(Bollig et al. 2013). Specialized pastoralism reflects developments in exchange and political economies rather than being a stage in a historical sequence (Håkansson 2012).

In a parallel argument concerning inland South East Asia, Scott shows that crops and agricultural systems do not reflect stages in a historical sequence. Shifting cultivation was instead a political choice to stay away from rice-based hierarchical societies. Scott classifies farming systems and crops, not along an evolutionary ladder, but according to their political significance as means to escape the hierarchical state: escape agriculture and escape crops. The post-Columbian introduction of American crops into Asia strengthened shifting cultivation and escape agriculture. Cassava and sweet potatoes in particular were not only perfect escape crops but also made shifting cultivation more productive than before (Scott 2009). To summarize, we are now in a position to avoid seeing today's foragers, pastoralists and swidden cultivators as "Stone-Age survivors" in the midst of modernity, and rather to see their present subsistence strategies as defined by a wider political economy.

The second field where ideas about a historical sequence of agricultural systems erroneously influence broader synthetic work in history is the assumption that the early stages of farming must always have involved some form of shifting cultivation. If farming is proved in the archaeological record (e.g. from macrofossil finds of grain), or in the historical record as areas with a surplus of agricultural produce, it is often assumed that it must have been based on shifting cultivation whenever there is no definite evidence of permanent agriculture. In many of these cases it is only the assumption of a historical sequence that supports the idea that shifting cultivation must have been the first stage of cultivation in a specific region. Strangely enough, for all other forms of agriculture (permanent, irrigated etc.) the burden of proof seems to be heavier than for shifting cultivation. A source-critical view of shifting cultivation would say that we need proof to show that slash-and-burn was actually practised as a rotation system, not just that burning was used to clear fields. There is also much evidence to support the idea that intensive permanent agriculture in many contexts may predate shifting cultivation (see for example Davies 2015). It might also be useful to be reminded of

one of the earlier classifications of stages in agricultural development that emphasize horticulture versus agriculture rather than shifting versus permanent (Lenski 1966: 91ff.).

Concerning the Eastern Woodlands in North America, there was, for example, for a long time a consensus that Native Americans practised slash-and-burn or a swidden-type of shifting agriculture before Europeans arrived. This idea is still represented in many general works on the history of Native Americans (see e.g. Stoltman 2000: 571). However, a detailed investigation of the evidence by William Doolittle leads to the opposite conclusion. Doolittle scrutinizes all available sources by early European writers in the area, many of which had previously been taken as evidence for slash-and-burn systems. He convincingly argues that Native Americans practised a form of permanent agriculture on large fields where stumps were removed. As has previously been argued by Denevan concerning the Amazon, there is thus strong evidence that shifting cultivation was also a post-European phenomenon in the Eastern Woodlands of North America, to a large degree made possible by the arrival of iron tools (Doolittle 2004).

### *Myth 3: Agrarian inertia*

Assumptions about agrarian inertia have often substituted for real historical studies of agrarian change in periods and regions where sources are deficient. Such ideas have also played a political role, and have gone hand-in-hand with pleas for agrarian modernization. This was true for eighteenth-century agrarian reformers in Europe as well as in the mid twentieth-century colonial sphere, but such assumptions also form a part of many uninformed development agendas of the twenty-first century. They are also present in the debate concerning European landscapes, where the idea of “traditional landscapes” conveys a vision of unchanging landscapes (see Antrop 2005 and for a critique Widgren 2012). Many scholarly overviews of African history take their point of departure from a timeless description of precolonial agriculture, as if it had not changed since its beginning. Agriculture is then often described on the basis of late nineteenth and early twentieth-century ethnographic observations and it is com-

mon to assume an almost essentialist connection between ethnical groups and their types of agriculture. As was pointed out by Paul Richards in 1983, many Marxist scholars have also fallen into this trap in their discussion of a “natural economy” as a starting point when discussing capitalist penetration in African agriculture. He argued that

the demographic and ecological processes subsumed under the category “natural economy” (or alternatively “precapitalist subsistence production”) are more plausibly viewed as products of capitalism (Richards 1983: 1).

Many such assumptions emphasize the primitive nature of agriculture and the lack of technological change over time. There is however often no basis for such assumptions. For example, overviews of African agricultural technology are sparse but the recent very informative overview by Blench of the diversity of agrarian implements gives an indication of a long period of innovation and change (Blench 2013).

The idea that agriculture has not changed over time is, paradoxically, not only applied to what are seen as backward and unsustainable forms such as shifting cultivation, but also to more intensive and seemingly sustainable forms involving, for example, terracing and irrigation. Such forms of agriculture are often assumed to be much older than they actually are.

The Balanta in present-day Guinea-Bissau were known from early records for being good paddy rice producers. The connection between the Balanta and paddy rice production is manifested in local proverbs and in creation myths. This would indicate a long history of paddy rice cultivation. However, in a detailed history of the relation between agricultural systems and the political economy of the area, Walter Hawthorne has shown that the expansion of rice production among the Balanta was a gradual process that occurred as a result of colonial penetration. Before the Portuguese arrived in the area, the Balanta cultivated other crops than rice, and in more extensive systems. Paddy rice production at that time in the sixteenth century, was restricted to Mandinge speakers in the Senegambia. Through their control of the trade in iron, they had also developed

a technologically advanced rice cultivation in which large iron tools played an important role. With the arrival of the Portuguese traders, other groups along the coast like the Balanta were able to get hold of iron. The Portuguese demand for rice made it possible for the politically decentralized Balanta to evade slave raiding by producing rice. Paddy rice cultivation spread southwards during the seventeenth and eighteenth centuries and came to form an integral part of the slave-trading network. The story of the labour-intensive paddy rice cultivation among the Balanta in Western Africa from the eleventh to the nineteenth centuries thus reflects an intricate interplay between the political economy of the slave trade, ethnic affiliations, and an advanced iron-using technology (Hawthorne 2003).

Another case of intensive agriculture thought to have had a long history is the area of rice terraces in the Philippine Cordilleras. Unesco, on their website, claim an early dating of these World Heritage areas:

For 2,000 years, the high rice fields of the Ifugao have followed the contours of the mountains. The fruit of knowledge handed down from one generation to the next, and the expression of sacred traditions and a delicate social balance, they have helped to create a landscape of great beauty that expresses the harmony between humankind and the environment (Unesco 2014).

However, recent archaeological excavations and radiocarbon dating in the area have shown that the expansion of these rice terraces occurred, not 2,000 years ago, but during the seventeenth and eighteenth centuries, and was related to movements of people in response to the Spanish colonization (Acabado 2012). Prior to that, taro would probably have been the most important crop in these areas. Moreover, Håkansson has shown how this expansion of investments in rice terraces was closely connected to regional economic networks, and thus is an expression of changes in world systems rather than a purely local development (Håkansson 2014).

*Myth 4: Environmental determinism*

The problem of environmental determinism would, like that of historical sequences, really need a longer treatment. Most geographers are strongly opposed to anything that has the slightest smell of environmental determinism. We are sometimes misunderstood by other scholars, who think that we oppose the idea that physical factors such as climate and soils have a profound influence on the type of agriculture developed in a particular environment. That is not the point. What the historical geography of agriculture tells us is that the major regional types of agriculture in the world cannot be explained on the basis of the environment alone. Areas with similar environments exhibit very different types of agriculture. Geographers have been aware of this for a long time (some examples: Whittlesey 1936: 209; Morgan 1988: 69).

Ideas based on environmental determinism have, however, continued to thrive in many other disciplines. For example, it is evident that the idea of Oriental despotism, as well as the notion of the Asian mode of production, were to large degree based on a misunderstanding by Marx and Engels of the determining factor that arid Asian environments supposedly had their own modes of production (Blaut 1993: 82–4).

In 1954, on the basis of her experience of archaeological work in South America, the American anthropologist Betty Meggers formulated what she called “the law of environmental limitation on culture”. She argued that

[d]ifferences in soil fertility, climate and other elements determine the productivity of agriculture, which, in turn, regulates population size and concentration and through this influences the sociopolitical and even the technological development of culture (Meggers 1954: 802).

and formulated her law as

the level to which a culture can develop is dependent on the agricultural potential of the environment it occupies (Meggers 1954: 815).

Her argument was to a large extent based on contemporary knowledge of archaeology in the South American Amazon rainforest, which she claimed could only support hunting and gathering or slash-and-burn agriculture. However, Hirschberg and Hirschberg criticized her arguments very early on, on theoretical grounds. They reformulated the law as follows:

The level to which a culture develops is dependent on the amount of food the people know how to raise (Hirschberg & Hirschberg 1957: 891).

However, for a relatively long period, the position that Meggers took on the agricultural potential of the Amazonian rainforest became part of a general assumption about what kind of prehistory one would expect there. Towards the end of the last millennium, archaeological research came to reverse that story fundamentally. Complex societies based on dense settlements and advanced agriculture from pre-Columbian times were discovered and this completely overthrew Meggers' ideas about the "the level to which a culture can develop" in a tropical rainforest environment (Heckenberger et al. 2003). It has also been shown that the type of agriculture that was fundamental for these settlements was to a large extent based on permanent agriculture rather than on the slash-and-burn agriculture known in the area from later times. Permanent agriculture was based on a form of soil improvement that had been unknown until these archaeological discoveries were made. Woody vegetation was charred and the charcoal incorporated into the soil, forming what is now known as a new type of anthropogenic soil – Amazonian Dark Earths (Glaser & Woods 2004). The discovery that the Amazonia rainforest was not virgin has also raised the issue of a new research agenda addressing the cultural history of other rainforest areas in the world (Willis et al. 2004).

The interpretative mistake that Meggers made was to assume that the type of agriculture that was practised in the area in later times was a good indication of the type of agriculture that was possible given the environmental conditions. This led her to conclude that similar adaptations might have existed in the past.

Recent findings from the Central African rainforests illustrate a similar case, where assumptions about what was possible in the past were erroneously based on recent agriculture. In the Central African rainforest, bananas and tubers play a decisive role in agriculture. It has been assumed that the earliest agriculture in this area must have been based on a similar repertoire of crops. It should, however, be noted that many of the crops important in the area in the present and in recent history, which form the basis of present forest vegetation systems are of American origin. Based on archaeobotanical evidence, Kahlheber and co-authors show that pearl millet and Bambara groundnuts were cultivated in the rainforests of South Cameroon in the period 400 BCE–400 CE. These crops have conventionally been seen as part of a savannah type of agriculture usually found much further north, and the environment of the African rainforest is generally considered to be too wet for them (Kahlheber et al. 2013). The new finds thus suggest that the more recent forest vegetation systems should be considered as a secondary phase of agricultural development in the area, and not the earliest and only possible adaptation to that environment (Fuller et. al 2013: 22).

## Conclusions

Common to the four myths discussed above is that they deny agriculture and farming communities a history, and replace empirical facts with assumptions. In broader syntheses there is always the risk that such assumptions will creep in. The global historian must therefore always read secondary literature with a critical eye, having these resilient myths in mind. When land is described as virgin, is it only because there is no data available on the inhabitants and their land use? When agriculture is proved to have been present in an area, but is not known in detail, the burden of proof for arguing that it was based on shifting cultivation should be as heavy as it would be for, for example, irrigation. Ideas about historical sequences cannot be substitutes for empirical data. When descriptions of early land use are based on the empirical documentation of more recent forms of agriculture, there is always the risk that the author has fallen into the trap of environmental determinism, believing that recent “traditional”

use of the land is the only possible option given environmental constraints, and that agriculture did not change in the past.

It is interesting to see how such myths have become part of a general discourse both in academic history and in applied fields such as development work. In many cases, the persistence of such myths must be understood within the relevant political (often colonial) contexts. They do indeed represent discourses, in the sense of ways of talking and writing that reflect existing power relations. However, in the cases I have referred to, when researchers have been able to debunk such myths, they have not based their critique on discourse analysis but on painstaking and detailed empirical work, often of an interdisciplinary nature, in the field and in the archives.

The results of recent research have also motivated us to be very humble when imagining past worlds. Most of the results disclosed by new research on agrarian systems of the past could not have been predicted from the environment, from population density, or from historical sequences of agricultural systems. When writing global history, one must be wary if syntheses and secondary literature use such assumptions about agriculture rather than referring to empirical investigations. The new results also illustrate, most clearly perhaps in the case of the Amazonian Dark Earths, that human ingenuity is immense, and that the variations of systems and techniques for producing food are many and indeed difficult to predict – let alone hindcast.

## Notes

- 1 For a cartographically clearer version of Mann's map see <http://www.utexas.edu/courses/wd/MannMap%202013.pdf>.

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