

Key impressions and conclusions of the International Conference on Agricultural Greenhouse Gas Emissions and Food Security, AgriGHG-2018 in Berlin (10.-13. 9. 2018) sponsored by the German Ministry of Food and Agriculture (<https://www.agrighg-2018.org/>) and organized by its special section, the Thünen Institute of Rural Studies, in charge of the Agricultural part of the National Greenhouse Gas Inventories in Germany.

Albrecht Glatzle, Paraguay

Participants

At the AgriGHG-2018 conference some 200 marvelous people came together, nice, friendly, and very competent in their respective fields (from fish breeding to agroforestry). It was a pleasure to talk to them. I estimated the average age of participants from all over the world at about 35 years (from graduate students to research department directors). In the 4 parallel sessions and poster presenters the typical speakers were post-doctoral fellows but of course also quite a number of professors.

There was a parallel conference of the Global Research Alliance. They were debating policies for the worldwide implementation of “climate smart agriculture” with some 100 high level delegates (with a higher average age, maybe 50 or even 55). This group, from dozens of countries, included leaders from several international organizations such as GRA (Global Research Alliance), FACCE (Program on Agriculture, Food Security and Climate Change), CCAFS (Climate Change Agriculture and Food Security), ICOS (Integrated Carbon Observation System), IFPRI (International Food Policy Research Institute), the vice president of FAO (Food Agriculture Organization), the president of WFO (World Farmers Organization), plenty of national institutions (e.g. New Zealand Agricultural Greenhouse Gas Research Centre), and (ex-)ministers from several countries. There were also joint plenary events and panel discussions. So as an attentive participant one could get a clear impression of the thought structures of the key players in policy and research for presumably mitigating manmade climate change and climate change impacts in agriculture.

Expressed and unexpressed positions and beliefs *[personal comments are in brackets in italics]*

The delegates represented tens of thousands of researchers from national and international institutions and organizations. These groups together move several hundred millions of world taxpayers' Euros every year. These activities provide tens of thousands of well-paid employment positions. Also, thousands of students get the opportunity and a topic for a thesis research. This is certainly good news, as long as all these activities are based in the solid ground of good science. May I, however, express some doubts in this respect?

- 1) **There was not one single opportunity during the whole conference that I was aware of that any of the widely proven beneficial impacts of (manmade) CO₂ emissions on nature, agriculture and global food security was even mentioned**, even though this is evident in literally hundreds of scientific publications (a very up-to-date summary: <https://www.heartland.org/publications-resources/publications/climate-change-reconsidered-ii-fossil-fuels---summary-for-policymakers>). I was not aware of one single participant who wouldn't have considered CO₂ as a pollutant that needs to be reduced. When I mentioned this point, the CO₂ is beneficial to agriculture, etc., to a modeler of GHG-impacts, he said that so far he had not yet considered this point in his models, but he

plans to do so in future. It was somehow irritating that a conference focusing on Agriculture totally ignored the most important nutrient of life, CO₂.

- 2) **There was a consensus at an apparent 100% level among all participants of the conference that the climate is predominantly controlled by manmade GHGs and that the future of the world's climates depends on the effective reduction of GHG emissions.** I could not hear the expression of the slightest doubt that this could not be true or that the IPCC-defined science could possibly not be settled. No one questioned this stance. Nobody among the participants felt the slightest need to resume any debate on the validity of the dogmatic view that human GHG-emissions are responsible for climate change and alleged climate disruptions.

Several high-level decision makers stressed that our efforts to mitigate Climate Change are not nearly ambitious enough. FAO-vice-president considered rich nations responsible for the climate distortions that we are supposedly witnessing. So, these nations should pay for the “damage caused”. Others (Werner Kutsch, ICOS) welcomed the fact that “we can feel climate change so clearly in this hot summer” (in part of Europe). “This will raise awareness among politicians and encourage them to do more” [*spend more money*], he added. The social scientists among the participants seemed to be the most convinced of the alleged scientific consensus and of the need to act urgently and even to exert pressure on the countries: “We have all legal and moral right to control the real mitigation efforts of the countries, including the least income ones, to see what they are really doing” (senior female bureaucrat from CCAFS). “70% of the agricultural mitigation potential is in developing countries.” (Castro Salazar, FAO)

It was of course admitted by all leading speakers that it is not easy to achieve the reduction targets agreed on in the Paris agreement. “There is no way to get mitigation running unless we achieve win-win situations” (Andy Reisinger, NZ Agric.-GHG Research Centre). [*However, win-win-situations in costly mitigation projects can only be achieved within certain limits (e.g. in the case of higher energy efficiency or by beneficial soil fertility impacts of Carbon sequestration within Soil Organic Matter). So, what could be more obvious than increasing the opportunity costs for “business as usual”, in order to make mitigation efforts more attractive? The higher the assumed damages caused by an uncontrolled “wild” climate, the higher the acceptable costs for damage containment. Once the potential damages caused by climate extremes are assumed to be very high and once the feasibility of forcing the climate to a desirable behavior by GHG-mitigation have been accepted, the costs of mitigation can be fairly high and are still pretending to produce a profit.*

The most recent IPCC report SR1.5 (<http://www.ipcc.ch/report/sr15/>) is a prime example of an attempt not only to make efforts to reduce GHG emissions more attractive, but also to declare them overdue and to be virtually essential to survival. Without presenting a profit and loss account, the IPCC takes it for granted that, in order to avoid catastrophic damage, practically every conceivable effort is worthwhile to reduce global warming to 1.5° instead of 2°C, whereby it is stubbornly assumed that the mean global temperature is directly dependent on the greenhouse gas concentration in the air (without taking into account the numerous scientific publications of recent years that massively question this).

But what happens, if dangerous climate extremes have not been increasing (as even admitted by the IPCC) and there is no discernible influence of human GHG emissions on the climate? All mitigation efforts become pointless! This was, by the way, the central message of the around 100 scientists from all over the world who gathered at the international conference on “Basic Science of a Changing Climate” at Porto University just a week before the Berlin conference (<https://www.portoconference2018.org/>). Contrary to Berlin, in Porto the diverse drivers of climate change were in the focus of discussion. Nobody agreed with the IPCC hypothesis that CO₂

and other manmade GHGs could be the dominant cause of eternal climate change (as it was accepted unopposed by all participants in Berlin).]

Back in Berlin, an example of a mitigation success story was presented by Heather McKhann from FACCE who celebrated this formula $LD_{50} + N_0 = +SOC$ and $-N_2O$ as a kind of breakthrough. *[However, isn't it sort of banality that halving livestock density (LD_{50}) can stimulate carbon sequestration through the built up of soil organic carbon (SOC), and that the renunciation of Nitrogen fertilizer (N_0) will reduce Nitrous Oxide emissions? There was no comment on how these measures affected yields and profitability and the audience obviously did not miss it!]*

I had the pleasure of meeting in Berlin for the fourth time (the first time in his new position) the very sympathetic president of the World Farmers' Organization WFO, the South African Theo de Jager. He presented a slightly different mitigation strategy: Knowing that humanity needs to eat and depends on farming for the foreseeable future, he suggested that his member organizations will prepare a plan how to reduce GHG-emissions from Agriculture and Livestock husbandry at a world-wide scale. With this message he then wants to address national and international politicians telling them how much it will cost to achieve the planned reduction targets. So he expects high subsidies and good business for the farmers who will implement the mitigation efforts agreed on *[of course at taxpayers' and consumers' costs]*. *[This however also includes some risks for the global food security: With unhealthy incentives there will be an increasing competition for arable lands between food crops and afforestation or energy crops, which inevitably will increase food prices.]*

Yet the FAO Vice president Castro Salazar was confident that agricultural GHG-emissions can be brought to zero by 2100 through emission reduction (20%) and compensation (80%). *[However, as shown in Germany, bioenergy farmers (trying to offset carbon emissions) depend entirely on subsidies and purchase guaranties. They are unable to compete on a free energy market. Once the price guaranties expire, all farmers specialized on bioenergy will have a very hard time to reorganize their farms back towards a conventional agricultural business without subsidies.]*

Theo de Jager, president of the World Farmers' Organization told the audience at a panel discussion his unique experience when he met with a regionally well-known nomad in the Sahel zone: This elderly man owns more than 3000 head of cattle, beautiful animals, wonderfully tame. One can walk into the herd and touch the animals. Around 70% of the herd is male (but only 5% are needed for mating!). Only 30% are female animals capable of calving. Jager suggested to the owner of the herd that he should sell most of the surplus male animals every year and thus become a rich man with fewer animals but much higher reproduction rate, and less grazing pressure on the land. "Are you selling your children?" asked the nomad. "No, but the animals are not your children." "But they are like my children!" "How many have you slaughtered lately?" "Six in the past two years: 2 for a funeral and 4 for a wedding." "And how many animals died?" "Around 600!" (which is a significant part of the calving rate). When saying goodbye, Jager was asked for his telephone number and WhatsApp address! Jager expects a fundamental change of commercial attitude with the next generation growing up in Africa.

[This is definitely the most striking example of inefficiency in a wholeheartedly practiced livestock production system. However, does this also mean that nomadism practiced since thousands of years is unsustainable? Certainly not! But how does this insight fit to the efficiency concept in our criteria for sustainability? Isn't the luxury of keeping thousands of horses just for pleasure particularly in the richest countries a modern example of "inefficiency"?)

Another wise comment made by Jager: “The food supply chain is a chain, which cannot be pushed but has to be pooled (by demand)”. This means translated: Try not to impose restrictions to production but rather listen to what the market is asking for. Farmers tend to produce demand-oriented. [*While this is a captivating argument, sometimes one might be **forced** to pool the (supply) chain: Recently I was searching in German supermarkets for charcoal without the WWF-label. I couldn't find it! Isn't it a very clever strategy practiced by the WWF to try to occupy sort of monopolist position in the commercialization of its “sustainability-blessings” for a variety of food and forestry products (perceived by the public to represent the highest standards of integrity, objectivity and scientific soundness)? On the other hand, the production sector has to decide to what extent he really shares common ground with WWF and whether or not he is prepared to give WWF a (paid) platform to spread its logotype with his products.*] This is really a fundamental question for agriculture considering the disturbing remarks made by Sonja Vermeulen (Global Lead Scientist for the Food Practice of WWF) in a panel in Berlin: “Food is the biggest driver for loss of nature.” [*Should we reduce humanity for the sake of nature?*] “Halving carbon footprint of food within the next 5 years is our target.” [*And what if carbon footprint is absolutely irrelevant for anything as evidence suggests?*] “Shift in diet is the most significant mitigation tool at lowest cost” [*reducing red meat consumption, just as The Guardian also called for recently: https://www.theguardian.com/environment/2018/oct/10/huge-reduction-in-meat-eating-essential-to-avoid-climate-breakdown?CMP=share_btn_tw*]. A carbon price of 150\$/t would double the price for beef. [*Will humanity let prescribe its food consumption habits by WWF, IPCC and FAO just because these organizations erroneously believe this could bring the climate to a desired behavior?*]

[*It is disturbing to what extent farmers' organizations and leading personalities from politics, science and economy are wrapping themselves in sackcloth and ashes, accepting without any resistance that agriculture is making a significant contribution to a potentially dangerous climate change, although the scientific justification for this allegation does not stand up to critical scrutiny. They are prepared to accept considerable restrictions and expenses in order to "save" the climate by reducing greenhouse gas emissions from agriculture, in the illusionary expectation to ultimately emerge as beneficiaries from the externally imposed codes of conduct, the costs of which are expected to be covered by taxpayers and consumers under the auspices of politics regulating everything.*

The alternative strategy would be to face up to the weakly substantiated allegations of the harmfulness of agriculture and livestock husbandry for the climate, and to prove the contrary with well-founded scientific counterarguments. This, however, only is possible when farmers accept the overwhelming evidence of CO₂ being their most important ally. As soon as farmers think it is meritorious to fight the most important nutrient of life, CO₂, as if it were a pollutant, they have lost. Then they are prisoners of the quasi-religious illusion of a dangerous, man-made climate change fed by distorted science.]

Personal impressions and experiences at the Berlin conference

Apparently, I was the only dissident participant at this conference. Maybe I was even the only participant travelling at his own expenses.

When I submitted my abstract (see attachment below, clearly documenting my critical position) I applied for a slot to give a presentation. Despite a promise to be informed about my admission to the conference by May, without further notice, only after my inquiry in June I was informed that I had been admitted for a poster presentation. When I arrived in Berlin and presented myself to the chief organizing lady she remembered my name very well among several hundred participants

(and I had the strong feeling that this was due to my dissident position, which drew her attention). I guess I was admitted to the conference, despite my undesired message, for two reasons:

- 1) As an alibi that even inconvenient contents will be allowed to the conference.
- 2) Being the only participant from Paraguay my participation meant one country more attending the conference.

However, my opinion should not attract too much attention. That's why I think I was only allowed a poster presentation.

Moreover, on the introductory plenary session it was noticeable that I was stubbornly overlooked by this very lady, moderating the discussion, in spite of my early and clearly visible requests to ask a question.

When it came to the poster presentation, I was the fourth who had three minutes to explain the essence of the poster. My performance was a bit faltering, but still coherent and clear. What really surprised me was the fact that I was the first one to receive applause for my explanations. This showed me that, in spite of the ostensible unanimity on the apparently manmade climate change, there was a dormant potential in the audience for doubting the official version, when plausible scientific arguments were presented. This was the essence of my three-minute poster presentation (see poster below):

We were looking for livestock influence on the climate and could not find any. Why is that?

- 1) IPCC claims are incompatible with reality. The irrefutable reality of extended warm periods in preindustrial times is witnessed by prominent tree trunks preserved in glaciers and moors well above the present-day tree lines.
On the other hand, the global warming forcing components as defined and quantified by the IPCC are very much dominated by manmade GHG-emissions. Natural climate influence has been reduced to a tiny effect of direct solar irradiance. There is no way whatsoever to explain any significant warming at preindustrial GHG-levels with these IPCC tools. There's clearly something wrong with the IPCC concept. Therefore, manmade GHG emissions cannot be the main driver of climate change.
- 2) There is a wealth of scientific evidence that manmade CO₂-emissions have been beneficial for Nature, agriculture and global food security. On the other hand, we can see, at best, only a tiny climate effect from the increase of CO₂ from 0.03 to 0.04% since the beginning of industrialization.
- 3) There is no discernible livestock fingerprint, neither in the geographical methane distribution...
- 4) ...nor in the historical evolution of average methane concentration in the air.
Livestock born methane emissions do not fit at all to the geographical pattern of methane concentration as measured by satellite.
Between 1990 and 2005 global methane concentration leveled off completely in spite of a significant increase of world cattle population by more than a 100 million head during this period.
We conclude that livestock emissions are insignificant for the global methane budget.
- 5) The IPCC guidelines for National GHG-inventories do contain methodological errors. These guidelines give instructions how to estimate total emissions from managed ecosystems. However, emissions from native ecosystems are explicitly not taken into account.
All agro-ecosystems replaced native ones at some stage in history. So, to determine the manmade part of methane and nitrous oxide emissions from agro-ecosystems, total emissions have to be corrected for the natural baseline emissions, which even occur

without any human influence. This correction is omitted in the IPCC guidelines. Therefore, the IPCC falsely considers all farm born methane and nitrous oxide emissions as manmade at a 100% level. The logical consequence is a systematic overestimation of manmade emissions from agro-ecosystems, an error which propagated undetected hundredfold through scientific literature.

In conclusion we cannot see any substantiated livestock influence on the climate.

Of course there were some critical questions:

- One lady said she was not a scientist herself, but what I explained is fundamentally contrary to current scientific views. She asked me if I was a climate scientist.
My answer: No, I am an agricultural scientist, but I have been intensively involved in the scientific debate on climate change for more than 10 years and have also contacted dozens of prominent climate scientists. I have come to the compelling conclusion that eternal climate change is not primarily man-made, not even the present one. Moreover, science has never been a question of presumed majority consensus. Last week I participated in a congress at Porto University, Portugal, where around 100 leading scientists from 4 continents debated “the Basic Science of a Changing Climate”. Although there were disagreements between participants in some details, the participants presented diverse scientific evidence of internal earthly drivers of climate change, and external solar and planetary drivers of climate change. Many of these are seen in visible evidence of cycles embedded in earth’s geology. This group of scientists sees that humanity is not the principal driver of climate change [<https://www.portoconference2018.org/>].
- A USDA scientist from Washington DC (US Department of Agriculture) accused me of giving biased information on CO₂. During the Milankovitch cycles, he said, CO₂ and temperature had been running parallel. So, CO₂ caused temperature change.
My answer: Not at all! Temperature change was always leading and CO₂ following. So, CO₂ could not be the cause for a changing temperature. The warming ocean gasses CO₂ out, the cooling ocean re-absorbs CO₂. Plenty of beneficial impacts of additional CO₂ have been documented. However, there is no convincing scientific evidence that this trace compound - CO₂ - could cause any dangerous warming.
”But CO₂ produced a feedback, i.e. the re-enforcement necessary to obtain the observed warming” he added.
My answer: There is no proof of any CO₂-reinforcement and no need for that to explain temperature change between ice ages and interglacial periods. To the contrary, CO₂ re-enforcement would eventually lead to a runaway effect of temperature which simply did not occur.
“What about sea-level rise and ocean acidification?”
My answer: Unadjusted data measured with hundreds of tide gauges along the coastlines all over the world do not show any acceleration of mean sea level rise since more than 60 years (Mörner; Parker; Wysmuller).
There is no ocean acidification; pH of sea water is alkaline and ranges from 7.8 to 8.3. The most “acid” sea waters are offshore Peru (pH 7.8), one of the richest fishing-grounds worldwide. Corals thrive at places where CO₂ is released from the ocean floor. So, CO₂ is not the cause for coral bleaching. Moreover, there is no convincing evidence of any detectable decline in average ocean water alkalinity.
“But you’re right in two points”, the USDA-scientist said: “We also realized that the release of methane from cattle is of minor importance globally. And we also found that the IPCC guidelines ignore natural baseline emissions from ecosystems, overstating the manmade emissions” he added. [*For me, this was the second time that a scientist admitted the erroneous omission of baseline emissions, committed by the IPCC. The first time it was*

at the Marrakech COP22, when I talked to a US-scientist working at CIAT, Colombia. Strangely, however, this gentleman defended the concept, that politics that provide funding for research do have the right to lay down the methodological rules of how to define manmade emissions. "When they tell us to ignore baseline emissions we have to do that." Of course, I strongly disagreed to this submissive concept as it clearly contradicts good logic and science.]

- At the end of the discussion a lady, also from USDA, advised me: "As you're not a climatologist yourself, you have to believe the experts! Your position shows me they've still got a lot of work to do making their message more logical for everyone to understand."

At the last day of the conference three participants, whom I did not know and with whom I had never spoken before, greeted me in a very friendly way as I passed by (independently from each other). One of them I had seen before, two or three times, watching closely my poster during the breaks. Had I delivered a new, convincing message to the three of them with my poster? But they didn't want to show too clearly that they sympathized with my position (that we are not yet on the brink of the end of the world, which only can be averted by mitigating GHG emissions)?

Conclusions

At the conference AgriGHG-2018 in Berlin leading policy makers and scientist from many countries came together representing thousands of professionals who deal with all imaginable topics related to the modern concept of "climate smart agriculture". The many programs (only a tiny portion of which could be presented at the conference) spend hundreds of millions of euros and create, directly and indirectly, tens of thousands of well-paid jobs worldwide. Every now and then these programs generate interesting amendments of basic scientific knowledge or other desirable side effects. Their intended additional value, however, can only be achieved under the (illusionary) assumption of very high opportunity costs for doing nothing, i.e. only with major mitigation efforts catastrophic climate change and its catastrophic consequences can presumably be avoided. But what if the climate was not controlled by manmade GHG emissions? The whole concept of "climate smart agriculture" would collapse and all the costly programs would lose their legitimacy.

Therefore, it is obvious that

- the concept of climate controllability through GHG emission avoidance
- and the idea that CO₂ is a "climate-killing" pollutant

must be cultivated by the beneficiaries of the programs as an inviolable scientific consensus, and any criticism of this dogma must be combated. Tens of thousands would lose their jobs as soon as a broader public was aware that the GHG-dominated IPCC models have been wrong. Therefore, all questioning of GHG driven Climate Change is considered a threat to business and to income by all those who have a vested and even existential interest in the idea that the climate can be controlled effectively in a desired way by human action. Under these conditions it is, of course, undesirable to cast doubt on the aforementioned beliefs or even to start a new debate about them. Skeptics are therefore ignored, excluded and even eventually discriminated against. Such behavior is all the easier to justify if one can decorate it with highly ethical arguments, such as saving the planet from catastrophic climate change.

Even farmers' associations seem to follow this strategy on the (erroneous) assumption that, although they can be affected by serious land use restrictions, they will ultimately (under the protection of politics) emerge as winners from this game, and the respective bill will finally be paid by others (i.e. the consumers).

Such a constellation, a complex mixture of interests, real and distorted science, quasi-religious beliefs, group pressure and herd instinct, is very unfavorable for maintaining an open debate, which has always been an essential feature of sound science.

I was pleased to see that this kind of open debate did happen, for example, at the conference on "The Basic Science of a Changing Climate" at the Faculty of Geography of the University of Porto in early September 2018 (<https://www.portoconference2018.org/>). This event was attended by many emeritus (and therefore independent) scientists (all of whom had travelled on their own expenses), and I had the honor to be among them. Opponents had tried to prevent this conference with an open letter to the dean's office but could not assert themselves. The right of free speech and exchange of scientific arguments has finally won in Porto. But what was it like in Berlin?



Livestock's Role in Climate Change: Do we need a shift of paradigm?

Albrecht Glatzle, INTTAS, Filadelfia, Paraguay albrecht.glatzle@gmail.com



We searched for livestock influence on the climate and found **NONE**

Why?

- 1) IPCC-defined GHG-dominated global warming forcing components incompatible with reality:



IPCC (2013): Radiative forcing components by far dominated by human GHG-emissions and solar influence on climate change kept tiny. → Impossible to explain the numerous irrefutable prominent preindustrial warm periods.

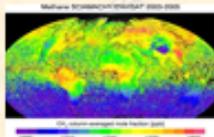


Reality: 65% of the Holocene was warmer than today, in spite of pre-industrial GHG-levels, as witnessed by tree trunks recovered well above the present day tree lines (Patzelt 2014, and Kullman 2017, supported by Alley 2000, Mangini 2005, Fudge et al 2016 and others).

- 2) CO₂-emissions shown to be beneficial for nature, agriculture and global food security:

> Leaf Area Index (Zhu et al. 2016), > Gross Primary Production (Campbell et al. 2017), > Agricultural yields (Goklany 2015).

- 3) No livestock fingerprint in global Methane distribution:



Geographical distribution... of Methane (ENVISAT 2003-2005)



of livestock-born Methane emissions (Wolf et al. 2017). → Livestock emissions insignificant for global Methane budget.

- 4) Historical rise of methane in the air not livestock-born:

It is instead predominantly fossil-fuel-born (Quirk 2010, Aydin et al. 2011, Schwietzke et al. 2016).

- 5) Severe methodological mistakes in IPCC guidelines:



IPCC (2006) provides meticulously instructions how to estimate total non-CO₂-GHG-emissions from managed ecosystems. Emissions from pristine ecosystems are explicitly not taken into account. However, all agro-ecosystems replaced native ones at some stage in history, which also were sources of considerable non-CO₂-GHG-emissions. Total emissions need to be corrected for these baseline emissions. However, the IPCC considers all farm born CH₄ and N₂O emissions as manmade at a 100% level. → Systematic overestimation of manmade emissions is the consequence.

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Livestock's Role in Climate Change: Do we need a shift of paradigm?

Albrecht Glatzle,

INTTAS (Initiative for Research and Extension of Sustainable Agrarian Technologies) Filadelfia, Paraguay, albrecht.glatzle@gmail.com

It is very old wisdom that climate dictates farm management strategies. In recent years, however, we are increasingly confronted with claims that agriculture, livestock husbandry and even food consumption habits are forcing the climate to change. We subjected this worrisome concern expressed by public institutions, the media, policy makers, and even scientists to a rigorous review, cross checking critically coherence and (in)compatibilities within and between published scientific papers. Our key conclusion is: There is no need for anthropogenic emissions of Greenhouse Gases (GHGs), and even less so for livestock-born emissions, to explain Climate Change. Climate has always been changing and even the present warming is most likely driven by natural factors. The warming potential of anthropogenic GHG emissions has been exaggerated and the beneficial impacts of manmade CO₂ emissions for nature, agriculture and global food security have been systematically suppressed, ignored or at least downplayed by the IPCC (Intergovernmental Panel on Climate Change) and other UN (United Nations) agencies. Furthermore, we expose important methodological deficiencies in IPCC and FAO (Food Agriculture Organization) instructions and applications for the quantification of the manmade part of non-CO₂-GHG emissions from Agro-Ecosystems. However, so far, these fatal errors inexorably propagated through scientific literature. Finally, we could not find a clear domestic livestock fingerprint, neither in the geographical Methane distribution nor in the historical evolution of mean atmospheric Methane concentration.

In conclusion, everybody is free to choose a vegetarian or vegan lifestyle but there is no scientific basis, whatsoever, for claiming this decision could contribute to save the planet's climate.

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