Earth System
Dynamics

Discussions

EGU

Interactive comment on "On deeper human dimensions in Earth system analysis and modelling" *by* Dieter Gerten et al.

J. Finnigan (Editor)

john.finnigan@csiro.au

This paper argues persuasively for the inclusion of important socio-cultural factors in earth system models, particularly in the IAMs used to design and test human policy responses to climate change mitigation and adaptation. It focusses on religion(s) as the primary shapers of human decision making at population/voting bloc level and teases apart the attitudes of different religions and sub sects to environmental protection and the use of earth's resources. The aims of the paper are threefold:

1. To explain how religion(s) can serve as markers for modern culture so that their inclusion can add a deeper human dimension to earth system modelling.

2. To propose environmental 'value sets' to capture aspects of religion in modelling the

whole earth system (understood here as the intersection of the social and biophysical worlds)

3. To provide some initial research primers for quantifying the required steps.

I think the paper succeeds quite well in approaching all three aims but leaves open a serious gap between the influence of religion on human attitudes and the way these attitudes come to be expressed in decision and policy making. I'll expand on this view below.

1. religion(s) as markers for modern culture

It makes sense to adopt the 3rd widest definition of religion, that is, as a belief in the sacred but I wonder if the definition of 'sacred' also needs to be wider? Communism was effectively a set of beliefs about the optimal way of organising social interaction and 'the means of production', which were received and largely unquestioned by generations in the eastern block post 1917. Capitalism and the primacy of the individual has held the same position in the USA through most of the 20th century and today. Economic and cultural nationalism (autarky) had a powerful and ultimately disastrous airing between the 2 world wars and seems to have reappeared on the world stage today.

More recently, a sub sect of capitalism, neo-liberal economics, has held sway in most Anglophone polities for the last 45 years. A feature of both neo-liberalism and communism has been the unquestioned adherence of its proponents to ideas for which there is no empirical evidence or which are contradicted by historical and current data (eg. trickle down economics). More important for the arguments in this paper is that these 'secular religions' directly shape policy whereas more traditional religious beliefs have to be filtered through a further step of electing representatives who profess those beliefs, at least in democracies.

Communism, at least in its soviet interpretation of Engel's dialectic materialism, had

disastrous environmental impacts. The untrammelled application of neo liberal economics today seems to be producing the same results but based on a totally different philosophy

2. environmental value sets

this is a useful survey of the attitudes of different major sacred (as opposed to secular) religions to the environment and to humanity's use of natural resources. However, I wonder if the authors' assessment of the role of religion is not more positive than is justified. For example, the papal encyclical 'Laudato Si' certainly said all the right things but it came from a Pope whose liberal views are strongly opposed by many powerful conservatives in the church hierarchy. The liberal-conservative battle in the catholic church is playing out on several fronts with cover ups of child sexual abuse and the role of women being major battle grounds but conservation and climate change is also far from accepted by conservative Catholics. The 'number two' in the Vatican hierarchy, Cardinal George Pell is a prominent climate denier and many other examples of powerful conservative figures who oppose Laudato Si can be found.

Hence, I do not wholly agree that the catholic church forms one pole of the Christian spectrum with regard to environmental and climate attitudes, evangelical Protestantism being the other. Rather it seems to me that conservatives in both catholic and protestant churches might have more in common with each other than with liberals in their own churches. Similarly, conservative Islam has many attitudes in common with catholic and protestant conservatives in areas like birth control and creationism so it is questionable quite how well the major religious divisions used in the paper map onto value sets.

There are a few other statement in this section of the ms that could be challenged. For example, that religion fosters social connectivity and so has the potential to create empathy for people in distant places and future generations. Religions are also powerful ways to define and exclude 'the other' so that adherents don't have to feel empathy.

There are of course ample examples from history but the demonization of the poor by US evangelical Prosperity Theology is a good current example of how a religion can be used to avoid empathy with the disadvantaged.

In summary, I found this section a good first attempt at identifying religions and value sets but the objections I raise above suggest that a subtler multi-factorial classification might be needed to operationalise this concept in any model.

3. Modelling avenues

Three possible pathways are considered: a) extensions of existing models; b) design of new model types; c) Distillation of deeper humanitarian questions from religious viewpoints that can inform and guide modelling. The authors suggest that religion can be considered a social technology in an IPAT formulation of environmental impact of society. This is unarguable but simply displaces the question of how to operationalise this in models.

a. extensions of existing models

The suggestion here is to adjust human impact on the environment using empirical data on the correlation between the religious value set and observed impact on the environment and also environmental feedback on human behaviour. Examples posited of the forward impact were the religious shaping of agro-forestry, pastoralism and land management practices; dietary preferences and population growth. The first four of these have certainly been important in the past but it might be argued that, in the future, satisfying the demand for food and living space will swamp religious traditions. Collective choices on reproduction, for example through cultural expectations for large families, clearly affect affect the population and thence impact through IPAT but government funded education or support for fertility control and simple per capita wealth probably has more ultimate influence on population.

Also, I found the idea that climate catastrophes would be blamed on supernatural dis-

pleasure and would also promote solidarity to be in the first instance unlikely and in the second optimistic. US evangelists tried to blame Hurricane Katrina on homosexuality without notably convincing many and at the same time Katrina apparently led to societal breakdown rather than solidarity. The main problem with this approach is that for the largest factors shaping human impact on the earth, religious values are mediated through political and economic processes.

Unfortunately, when we come to pathway b, there are no concrete examples of the kind of model the authors have in mind, other than a suggestion that attributes of agents in agent based models should include religious value sets that affect land use. As a result, it is difficult to see precisely what is envisaged here.

Pathway c is illustrated rather by sets of research questions that bring religion and ethics into questions of what future scenarios we might as a species or as separate populations find acceptable. This approach might fit quiet well with the development of the SSP framework for IPCC IAMs.

Summary

This paper casts a refreshingly unconventional eye on modelling earth system dynamics by including socio-cultural factors as embodied in religious beliefs and practices. It advances a series of assertions about the influence of religious value sets on human impact on the planet, many of which can be challenged, or at least to which significant exceptions can be found. I believe its main weaknesses are threefold. First, the religious value sets are not as clear cut as the authors suggest and a more multi factorial approach may be needed.

Second, when it comes to model pathway b, the construction of new models, the paper needs to suggest some concrete examples of the way the authors think this would work. There is a disconnect between some high level statements about how land use is land use shaped by religious practice, which may have been relevant once but are probably increasingly irrelevant as we head towards feeding and housing 10-11Bn

humans. More specificity here would allow readers to grapple better with the paper.

Third, one can make a strong argument that the principal way that religious value sets are implemented is via the medium of governments as they respond to their polities. The paper makes this point well early on but when it comes to describing new modelling paths, this seems to be lost. In other words, a more general formulation is required of how institutions and norms affect collective behaviour. These institutions and norms include religious (sacred and secular) value sets and thereby govern impact on the biosphere and collective reaction to biospheric changes. Trying to shortcut this level of understanding as suggested in modelling path a seems to invite false correlations and parameterisations.

Finally, I wonder if the authors want to comment on how religious value sets affect the way society reacts to other factors that operate outside its conscious understanding. I'm thinking of factors such as those described by Tainter in his many treatises on the collapse of Complex Societies (eg. Tainter, 2006 and refs therein) once the returns to complexity start to diminish. Past societies found various explanations for what must have seemed like inexorable negative forces out of their control. Would current religious value sets help or hinder our early appreciation of the fact we are on an unsustainable path?

Tainter, J. A. (2006) Social Complexity and Sustainability. Ecological Complexity. 3. 91-103