Moral panic about overpopulation: a distracting campaign?

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1. Introduction

The Optimum Population Trust (OPT), using the name Population Matters from 2011 describes itself as "the leading environmental charity and think tank in the UK concerned with the impact of population growth on the environment". It describes itself as an organisation that "campaigns for stabilisation and gradual population decrease globally and in the UK", based on the premise that the UK and the world are over-populated to the extent that the environment cannot sustain the current level of human population. The justification for these calculations is based on ecological footprint analysis, and is closely related to the notion of "carrying capacity": the idea that there exists a maximum number of organisms in an ecosystem that resources within that same ecosystem can sustain.

Claims that population has outpaced resources, or threatens to, have a long pedigree indicated by the usual tag of 'Malthusian', and have been expressed long before Malthus by Plato, Aristotle and Tertullian, and many times since. Today there are many organisations, mainly across the developed world, which promote population policies to their government that focus on reducing both fertility and immigration, and have recently stressed environmental concerns and claimed that population increase is a major cause of climate change.

That international network of independent organisations is acknowledged by its UK component the Optimum Population Trust (OPT)[1], whose working name since February 2011 is Population Matters. OPT is a registered charity describing itself as a think-tank and campaign with an overarching environmental aim: 'for a sustainable future'. It has attracted high-profile patrons including the naturalists and broadcasters David Attenborough and Chris Packham, environmental campaigner Jonathan Porritt, and senior academic and cultural figures.

Philosophically, there is a deeply negative dimension to many statements from senior OPT spokespeople. These two examples are from the chair of its trustees and from David Attenborough: "indefinite population growth dooms worthy efforts at achieving sustainability to long term failure"[2] and "there is no major problem facing our planet that would not be easier to solve if there were fewer people and no problem that does not become harder — and ultimately impossible to solve — with ever more."[3] The statements in themselves are trivially true; an indefinite growth of ever more people is reasonably a nightmare scenario.

However, current projections do not indicate indefinite growth but a maximum world population that remains between 10.0 and 10.5 billion from 2083[4]. In our reading of OPT material we encountered frequent overstatement, rhetoric and one-sided

assertion rather than evidence that population growth is the main cause of environmental threats. Apprehension at the size of global and UK population has led to the adoption of fertility and migration policies which are not justified in OPT material, including taxation of large families in the UK, a reduction of immigration to the UK, and a global reduction of international migration.

A substantial quote from an OPT briefing illustrates the assertion that current population growth is the 'indisputable' cause of pollution, climate change and danger of catastrophic collapse of the human race and other species:

"Sustainability has become an increasingly important issue over the last two or three decades. It has progressed from an esoteric subject within a few scientific and sociological communities to mainstream national and international political agendas and debates. Such interest has been triggered by:

i. the continuing rapid growth of populations during the 20th century and beyond;
ii. the increasing rate of pollution of the land and waters of the earth through excessive and ever-rapid exploitation of the world's biological and geological assets;
iii. the now-generally-accepted view that global warming — and thus climate change — is a direct result of human activity, and threatens the future of the human race and other species;
iv. the growing realisation that collective human consumption has:
    a. exceeded the renewable resources available to it and that the human race is, as a result, in danger of a catastrophic collapse;
    b. by its sheer magnitude caused irreversible damage to many ecosystems and other species.

Although not generally accepted, OPT considers that it is indisputable that ii, iii, iv are all a direct consequence of i." (Desvaux, 2008)

The gloomy outcomes of a scenario of continuous growth seem intended to stimulate support for the OPT's claims that the world's and the UK's population are both already too great, and require corrective action. These claims are not trivially true. In this article we will attempt to separate outlandish epithets and irrelevant allusions to nightmare scenarios that abound in OPT material, from evidence relevant to the main thrust of OPT's argument that 'The environmental damage resulting from population increase is already widespread and serious, ranging from climate change to shortages of basic resources such as food and water' (Guillebaud, 2007: p1).

For convenience we divide our treatment into three: overpopulation, fertility, and migration. There have been various recent reports on the relationship between population and the environment which tend to give a more positive view of the ability of human activity to reduce environmental threats, and assess population growth as an important factor but a lesser one than consumption and technology. We refer to these reports in the next section.

2. Overpopulation

"Overpopulation is a much used and much abused term," according to the OPT's chair of Trustees Roger Martin[5]. One of its academic writers John Guillebaud

explains overpopulation as over-use of resources: “population growth perpetuates poverty by increasing the number of individuals to share the resources – notably the basic resources of land and water – available to each family or country.” This definition of overpopulation, dependent on fixed resources, suggests that more population is always worse, less population is always better. It is the pervasive view in OPT material. It is wholly unconvincing; one can look back at any previous century and note a much lower global population in much greater poverty. It ignores the human experience of accessing resources in better ways, which has been a feature of history although never guaranteed for the future. It ignores the unequal distribution of resources that underpins both poverty and waste. It ignores societies’ changing view of what constitutes acceptable living standards.

2.1. Carbon footprinting

In recent years the OPT stresses a ‘sustainable population’, equated to the world’s ‘carrying capacity’, the number of people which planet earth can support. Its website home page carries the slogan “Campaigning for environmentally sustainable populations in the UK and worldwide”.

The OPT index of overpopulated countries constitutes the OPT empirical definition of overpopulation[6]. The index uses the Global Footprint Network’s ‘Ecological Footprint’ statistics including estimates of:

> (a) carbon emissions associated with each country’s consumption; carbon emissions associated with producing goods are allocated to the country they are consumed in;
>
> (b) each country’s ‘biocapacity’ – the carbon absorption of its biologically productive land; this is taken to represent the maximum consumption that would be consistent with self-sufficiency.

Dividing a country’s biocapacity by its total consumption indicates the extent of overpopulation. If the ratio is less than 1, then consumption exceeds biocapacity, and must, it is argued, have been supplemented by the biocapacity of other countries: “The proportion of consumption sourced from outside a country gives a dependency rating ranging from 0 to 100 per cent: the higher the dependency rating, the greater the overpopulation.”[7]

Tightly populated Singapore, with a biocapacity less than 1% of its consumption, is the most overpopulated country on the index. The UK is overpopulated by 45m according to the index. The implication is that the UK sustainable population is 45m less than the current population, or 17m, a quarter of its current total. OPT confirms this as its estimate of sustainable population for the UK and suggests a figure lower by 10%, ‘to allow for fluctuations’, as the UK’s optimum population[8]. It does not suggest this as a policy target, instead opting for constant fertility at its 2000 level, and zero net international migration, which at the time this proposal was first put in the early 2000s would have resulted in a decrease in population to 53m by 2050.

Clearly the world is inter-dependent, and each country need not be self-sufficient. The confusion in OPT’s discussion of country-specific and global phenomena is particularly apparent in its treatment of fertility and migration and is discussed below under those headings. According to the Global Footprint Network, the earth as a whole currently consumes more than it replaces, by about 50%. The calculation is based on strong assumptions about the *current* capacity of land. We have not

investigated these assumptions[9].

OPT's adoption of the carbon footprint perspective led to its promotion in 2010 of 'Population offsets', whereby individuals can donate to family planning projects in the UK, Madagascar and elsewhere in order to offset their high consumption patterns. The idea is that a reduction in children born will reduce global production of carbon dioxide. The initiative received rounding criticism from development agencies for its erroneous statistical justification and the implication that high consumers can finance their wasteful lifestyle by buying a reduction in other people's families. It is now offered with an emphasis that the decision to donate is one of "conscience not science", but the unscientific calculations that balance consumption with unborn children remain part of the donation process and are indeed at the heart of the OPT perspective.

2.2. Population, consumption, technology

The notion of overpopulation is closely related to that of the classical ecological concept of carrying capacity drawn from 19th century studies (Vandermeer, 1969; Vandermeer and Goldberg, 2003, Hui, 2006). When exceeding its maximum sustainable size in an environment of fixed resources, a population of organisms or animals is likely to crash for lack of food, then grow again, oscillating around an equilibrium as encapsulated in the Lotka-Volterra equations and explained in standard biology textbooks. Perhaps by analogy to this classical biological theory, some naturalists have easily adopted a concern that the human species is over-populated. However the concept is of limited use in the study of human populations because i) humans have regularly increased the capacity of the earth through their own endeavours to improve agricultural and industrial techniques and ii) human consumption is not driven by biological needs only, but is responsive to versatile cultural attitudes and adaptive to changing cultural contexts.

The nightmare predictions in John Erhlich[10]'s 'Population Bomb' of 1968 were far from confirmed (a substantial increase in the world death rate, Britain's population would collapse, India would be subject to devastating famines, all in the 20th century)[11]. Historical evidence of steadily increasing population fed by successive productive revolutions demonstrates that a fixed human carrying capacity for planet earth is nonsense. Debate with critics of Ehrlich in the 1970s gave rise to a more nuanced and widely used formula proposed by Holdren and Ehrlich (1974) to represent in shorthand the influence of three factors that affect the human impact on the environment (I), each of which changes over time: population (P), per capita affluence (A) and the impact of technology (T): $I = P*A*T$.

This formula is a self-evident tautology, as can be seen when written in full:

Impact = Population * (Consumption/Population) * (Impact/Consumption).

There have been no successful attempts to use the formula as a whole with real data, because it quickly becomes very complex. Different sub-populations have very different consumption patterns, and different types of consumption have very different impacts on the environment. Three examples: the production of pharmaceuticals, and their waste, have a substantial environmental impact, and are very much higher for older people; diet is a varying aspect of consumption that has major impact on the environment (Agrimonde 2010); family planning changes

population, and the reduction in consumption differs according to the location into which a child would have been born. A further complexity when investigating the impact on the environment in a region or a country is the effect of trade – the consumption of goods produced elsewhere.

The Royal Commission on Environmental Protection's final report in 2011 adopted the I=PAT formula as a useful framework to investigate the impact of demographic change on the environment in the UK. Its analysis showed that the impact on greenhouse gas emissions of growth in population, including the trend to smaller and therefore more households, was less than the impact of growing affluence in the UK during the period 1992-2004 (RCEP, 2011, Fig 3-I and its discussion). It showed that the environmental impact of waste in the UK 1992-2009 decreased – because recycling and consumption habits changed in the opposite direction and at a greater rate than population grew (p35). It concluded that "The environmental impact of the population depends not only on the number of people, but to a much greater extent on the amount they consume and on the impact associated with each unit of consumption. The amount of water used, the amount of waste generated and the amount people travel have a very significant effect on the environmental impact associated with each person" (p4).

A series of examples further undermines the primacy of the link between population size and environmental impact. The 1973 UK Government Panel on population reported that traffic pollution from emissions and noise had increased far more from growing car use than from population change. Satterthwaite (2009) finds a lack of association between population growth and carbon emissions at the national level and notes that trends towards urbanisation provide opportunities to reduce environmental impacts of population growth through efficiencies associated with clustering of population that enable further energy efficiencies and cleaner living.

The primacy of the population-environment link is not substantiated by empirical evidence. Environmental damage may be the result of a small number of individuals exploiting resources without regard to the social consequences of their actions. Or it may be the result of a large number of farmers who lack the resources to properly manage the land (Furedi, 1997, who reviews the evidence for a link between population size and the environment and finds little empirical justification). Whether population growth at the levels experienced to date can be said to have any impact on the environment is debateable, given the potential for human organisation to control its relationship with the natural world. However, historical experience clearly shows that current population growth has not the prime driver of environmental degradation, and the next section's review suggests that the projected world population growth can be accommodated sustainably through attainable changes in consumption and production.

2.3. Recent research reports

Five major research reports have considered alternative public policies to reduce the environmental impact of a given population or a growing population. Each has taken forecasts of increasing population by national governments and the UN as their context. The Royal Commission on Environmental Protection (2011) referred to above concludes that "A combination of better technology, of planning and other policies which seek to minimise and manage environmental impacts, as well as

changes in consumption patterns, offer a greater scope to achieve sustainability than policies directed at influencing the size of the UK population." (p86).

The Food Ethics Council (2008) argues that changing the distribution of food would significantly affect the environmental impact of consumption, quoting UK Government estimates of £9bn social and environmental costs of food transport, over half resulting from congestion. Its solutions are not simply fewer 'food-miles', but also appropriate production, including less transport of perishable goods over very long distances (for example by air); support for consumers' preference for less animal discomfort, more seasonal local produce, local retailers; and changes to diet, eating less meat and dairy, more fruit and vegetables, also benefitting public health.

Changing diet is also an element of the scenarios explored by the Agrimonde (2010) study by France's national agricultural economics research institutions. It calculates that the global area of cultivated land has changed little while food calories per cultivated hectare have doubled between 1961 and 2003, and are highest in Asia, Latin America and OECD (twice that in Sub-Saharan Africa and ex-USSR). Africa increasingly imports food. It identifies that there is great scope for increasing food production. The report poses two scenarios: AG0 continuing current trends and responses (expansion with crisis management, high energy expansion including biomass-energy, environmentally threatening); and AG1 with planned sustainability (planned convergence of calorific intake, environmentally-friendly, more land in use). Both scenarios respond to the population forecast by the UN in 2050, with different environmental outcomes and different policy challenges to address now.

The Foresight Report on Food and Farming Futures (2011), commissioned by UK government, also advises a need to change policy to ensure food production. Published by the Government Office for Science, it reports options for increasing yields, recommends that these need not and should not come at the expense of sustainability, and calls for measures to hold governments and food producers to account for implementing these aims.

The UK Institution of Mechanical Engineers' global study (2011) identifies means of reducing environmental impact and increasing consumption, addressing each of food, water, urbanisation (including housing), and finance. Like other reports it points to the potential of established technology to increase water conservation and reduce food waste. It reports estimates that in the South (developing nations) half of all food is wasted before it reaches the consumer while in the North (industrialised regions and nations) 25% of food is wasted after it reaches the consumer. It concludes that "Even though there are likely to be no insurmountable technical issues in meeting the basic needs of nine billion people and improving their world through engineering, there is much urgent work to be done in preparing to meet this mid-century peak in a sustainable way. It is evident that many of the potential barriers to developing these solutions and ensuring a successful outcome are not technological, but lie in the areas of politics, social ethics, funding mechanisms, regulation and international relations." It recommends five engineering development goals and further targets for finance and knowledge transfer.

OPT acknowledges that population is not the only factor in human impact on the environment: "Population Matters believes that population needs to be addressed alongside consumption and technology to ensure a sustainable future." As a campaign one would expect OPT to stress the need for population policies. But its unbalanced view of other contributions goes far beyond this, dismissing the report by

the Royal Commission of Environmental Protection as ‘absurd’, ‘a mouse’, and ‘a whimper’ because it found population size to be not an important factor for the *UK* environment[12].

2.4. Overpopulation: conclusion:

While appealing by its apparent simplicity, the application of the carrying-capacity and population equilibrium concepts to the human population is not appropriate in that i) the concepts ignore the specific capacity of humans to develop new technology that increases carrying capacity and ii) they do not capture the complex processes linking humans and the environment.

The major environmental pressure of the developed world is not due to its population size but to its production and consumption patterns. Although differences in living standards and their environmental impact and technological aptitude to enhance the carrying capacity of an environment have been acknowledged by defendants of the optimum population thesis, their focus is invariably on controlling current population growth, which reports has shown to have limited impact on the environment.

Resources are finite but not limited in a known and fixed way. Achievement of the undisputed aim of environmental sustainability needs to address population, production and consumption patterns. Population will stabilise on current trends if continued effort is put to ensure reducing fertility, through women’s empowerment, in countries where it is still well above replacement. On the other hand technology and consumption patterns require faster change than currently experienced.

3. Fertility

The UN projects a rising population for the next few decades due to the momentum for growth in the existing relatively young global population, whatever happens to fertility rates. The UN prospect of a levelling population later this century and a consequent reduction is entirely dependent on the continuation of the trend towards lower fertility among currently high-fertility countries. The fall of fertility well below replacement level, especially in South-East Asia (including Japan, South Korea and now China) has significantly accelerated the global fertility decline and may contribute to reach world population stabilisation earlier than current UN projections suggest. The UN medium scenario presupposes that the strong decline in fertility that has been achieved (in all regions) will continue and will eventually stabilise at replacement fertility across the whole world, creating a population of about 10 billion, compared to the current 7 billion. Should fertility decrease further, and remain under replacement level as it already is in many developed nations, the maximum population would be lower and would be reached earlier than projected. Should fertility not decrease as it has in the past, population would continue increasing, feasibly to 14 billion by 2100.

A reduction in fertility from above replacement to below replacement is associated with greater choice and control by women over reproduction, which itself is often associated with education, economic prosperity and availability of contraceptive aids and advice. This is a major plank of OPT global policy, which is in tune with many international declarations and publicly funded initiatives. However, to target further

reductions in average family size in countries where fertility is already below replacement is not generally supported outside OPT.

In 'Youthquake', OPT patron John Guillebaud (2007) aims to deal with the environmental impact of natural human population growth: it is a plea for family planning above all. Voluntary family planning that would tackle unwanted pregnancy is favoured. However, in some extreme cases coercive measures to avoid wanted pregnancies can be acceptable to OPT until population stabilises: 'one-child population policies should be the last resort, limited to emergencies such as so-called "demographic entrapment" where the environment of a region is so damaged as to approach being uninhabitable.' (p19).

The entire report is based on the assumption that population growth leads to environmental pressure. Repeatedly pivoting on this assumption, the only proposed policy intervention to reduce environmental pressure is to reduce population and fertility. Alternative solutions are not addressed. The report explains in length methods of family planning and its benefit for economic and social development. The promotion of family planning programs to address unwanted pregnancies, reproductive health (including preventing HIV/AIDS), maternal and child survival and women empowerment constitute important aspects of development policies concerned with social progress which may be sufficient justification for them. However, this does not provide evidence for the OPT statement that 'The environmental damage resulting from population increase is already widespread and serious, ranging from climate change to shortages of basic resources such as food and water' (p1). Reviews of evidence (see above in section 2.2) do not show a such a link.

The report acknowledges the need for the economically developed world to contribute to reduce demographic pressure on the environment. 'Each new UK birth, through the inevitable resource consumption and pollution that UK affluence generates throughout a lifetime, is responsible for on average about 160 times as much climate-related environmental damage as a new birth in Ethiopia or 35 times as much as a new birth in Bangladesh.' (p15). Why is UK resource consumption and pollution inevitable? Cannot we envisage changing life-style for instance to decrease the current per capita environmental footprint in affluent societies? For example, the Beddington Zero Energy Development shows how it is possible to combine high living standards with very low greenhouse gas emissions within the home (Chance, 2009).

Instead, the solution proposed for the UK is family planning to tackle teenage pregnancy[13]. This is justified by the assumption that 'educating' teenagers would help convince them to avoid early pregnancy, thereby increasing their chances to escape associated poverty. However arguable this simple conception of the link between teenage pregnancy and poverty might be, it does not constitute an adequate answer to climate change and other environmental issues.

Delayed childbearing has become widespread in the UK and most of the developed world, linked to women's enrolment in higher education and professional careers. Delaying the replacement of generations will contribute to curb future population growth. Delaying teenage pregnancies will add little to this trend. Teenage births (i.e. births to women below age 20) represent only 7% of all births (Bradshaw, 2006; ONS, 2011, Table B) and births to young women below 18 are relatively rare (2.3% of all births in 2008; calculated from ONS, 2011: Conception statistics in England and

Wales, 2009 (provisional), Table B). But totally eradicating births to young women below 18 would not necessarily reduce the number of all births even by 2.3%. The reduction is likely to be less because delaying childbearing of very young women may not reduce the total number of children a woman may have in her life, especially if other social determinants of fertility behaviour remain unchanged. Its impact on environmental pressure would be negligible at best.

It could be argued that poorer families in developed countries consume less energy and have a lower environmental footprint (smaller houses to heat, fewer cars and travel) compared to their wealthy compatriots. If so, it is unclear why the former are the target of a supposedly environmental policy and not the latter. If a population policy response to environmental threat as to be formulated, encouraging those who are polluting most to have a smaller family would be more efficient to protect the environment.

4. Migration

Here, we examine OPT's migration policy, paying particular attention to the empirical data and logical reasoning underpinning their arguments. The migration policy, as with the fertility policy, is divided into two subsections: Earth and UK. We refer to a copy of the latest Optimum Population Trust document on migration, not on the PM website but obtained through email correspondence (OPT, 2009).

Globally, population growth is the result of natural increase and is currently driven largely by still high fertility rates and, to a much lesser extent, falling mortality rates from countries engaged at various stages in the demographic transition. At a sub-global level, however, in several continental regions (such as Western Europe or North America) and in individual countries (such as the UK, the country in which OPT is based), population continues to rise despite fertility rates at or below replacement level, and natural increase being close to zero or negative. This country-specific population increase is driven partly by net in-migration from other parts of the world to these regions and countries.

The main thrust of the OPT's migration policies focuses on migration within the United Kingdom rather than the global phenomenon of migration worldwide. Sixteen pages have been devoted to OPT's UK migration policy; four to addressing issues of global migration flows. Migration cannot of itself be a driver of global population growth, though, as we will see later, the OPT does argue that global migration flows of themselves have an effect on climate change and should be reduced.

The policy places emphasis on the desire to reduce the population size of the UK by preventing migrants from entering. It is not adequately explained how this links to global climate change given that those people are already alive.

The most likely future population of the UK is in doubt. Official projections continue recent levels of net in-migration. Recent alternative projections of the UK population disaggregated by ethnic group (Rees et al, 2011) favour continuing international migration *rates* rather than flows. This has the consequence of increasing the forecast of emigration and halving the forecast of population growth officially forecast for England between 2010 and 2050. One could characterise rates as representative of demographic choice and flows as representative of some kind of quota and

therefore an international migration policy. If slowing population growth in the UK was the aim, leaving individuals to decide where they locate rather than setting numerical targets might be more successful.

4.1. OPT's UK migration policy

OPT calls for population to be brought to an "environmentally sustainable level" through a "balanced migration, where the number of immigrants is balanced by the number of emigrants". OPT expects to achieve this by reducing immigration into the UK - there is no consideration whatsoever of the alternative method: increasing emigration from the UK. While OPT does not specify its favoured means of achieving balanced migration, all the policies that it says should be considered are to reduce immigration[14].

The OPT paper's discussion of UK migration with the rest of the world is low on evidence and high on rhetoric, one-sided claims, and demolitions of straw men. "UK population policy doesn't have to turn its citizens into battery chickens, devastating the country's natural resources" is a typical example.

The bulk of the OPT discussion is against immigration. It draws on claims of detrimental economic consequences and claims that residents have prior rights over immigrants, rather than the environmental issues that predominate in the more accessible pages of the website. Some examples follow.

> "In the 1950s net natural change accounted for 98% of population change and net migration for only 2%. But with no confirmed policy intent by the government to curb migration, it is now projected, directly and indirectly due to its impact on the birth rate, to account for 70% of population growth from 2006 to 2031."

Several things may be challenged in this decomposition of past and projected population change into net natural change and net migration. Either of those net figures can and have been negative, making the other exceed 100%, showing that this approach to decomposition is not as straightforward to interpret as OPT implies. Each net figure is the balance of two flows of events, so it is not net migration that accounts for population change but four very large flows. For example, the steady reduction in mortality has contributed substantially to population growth as has net international migration. Most importantly, the gap between immigration and emigration fluctuates from year to year and over generations.

Fertility in the 1950s was unusually high (it being the post-war years). While the migration balance in the 2000s has been positive, more immigrants than emigrants, it is unlikely to continue. Economic difficulties are likely to shorten the stay of new immigrants as it has already of those from Eastern Europe[15]. Projections of current levels of migration are unlikely to prove accurate. Migration, like trade, tends to balance or have persistent causes not amenable to policy restraint except at the margins. Meanwhile fertility and natural change have increased since 1999, to more closely match the growth of the UK population arising from migration. Childbearing postponement is thought to have an important role in this recent trend (Tromans *et al.* 2009).

> Immigration is claimed by OPT as a cause of indirect population growth through the increased fertility rates of migrants.

Overall immigrant women have about 10% higher fertility than UK-born women

(Dubuc and Haskey, 2010). However, currently the population growth due to the fertility of immigrants is small, due to their modest proportion in the total UK population. It is the fertility of children of immigrants which increasingly dominates the fertility of ethnic minority populations. However, this indirect effect of immigration on population growth contributes to the natural increase of the UK population, not to its migration component, both in practice and in population projection models.

Fertility rates of minority ethnic groups in the UK (i.e. immigrants and their descendants) have decreased very significantly over the last 20 years (Coleman and Dubuc, 2010). This substantive decrease is primarily driven by falling fertility of the second generation (i.e. the children of earlier waves of immigrants now at childbearing age) and secondarily by the decreasing fertility of recent immigrants from traditionally high fertility countries, reflecting on the global demographic transition. Additionally fertility rates of immigrants are lower than the average in the sending countries (Dubuc, forthcoming), in part because immigrants are not like the 'average person' in their country of origin, and in part because their childbearing behaviour adapts to the receiving country.

> "The population of rural England (14.1 million) was increasing by 100,000 a year, and has since risen further".

No explanation for this trend is offered, other than the implicit notion, since it is written within a document on international migration, that migration from overseas was the cause. This is completely untrue as rural England has been increasing in population from the counter-urbanisation that has accompanied de-industrialisation since the 1950s.

> "Far from solving labour market requirements, excess immigration appears to have made them worse - by increasing the base population requiring services for which there may already be an inadequate supply of labour. If more people enter than leave, and the inflow is excessive, a perpetual spiral of demand for further immigration can be created. Population growth of about 250,000 a year from 2001-2004 has not solved the 'problems' of skills shortages. It has instead created additional demand for goods and services which employers claim they need to import yet more labour to satisfy."

The implication seems to be that immigrants, more so than an indigenous population, are a drain on resources and perpetuate a need for still more immigrants. No evidence is given, while research suggests the opposite[16]. The condition that "the inflow is excessive" makes the logic a trivial game, as there is no justification of what excessive immigration might be, but the implication is that the figures that follow are indeed excessive.

> "...cheap immigrant labour exploits both immigrants and the existing workforce by lowering wages to subsistence levels or below; that the existence of a pool of cheap labour creates new jobs; that Britons cannot do these jobs because population growth has exacerbated house price rises in regions where jobs are available - an unemployed worker from the North of England (who might be a Briton of Pakistani descent) cannot afford to live and work in London on minimum wages, or finds the jobs already taken by new immigrants (who might be Eastern Europeans)."

No evidence is given in this hotly disputed research area, where the main conclusions are that any economic impact of immigration on existing population is

very small, that the overall balance of remittances is towards Britain, and that illegal working conditions are best tackled by improving the conditions rather than making immigration harder[17].

The rhetoric becomes alarming when applied to citizenship and reveals deeper prejudices.

> "Citizenship of the UK brings the right to permanent settlement for individuals and all their descendants in perpetuity, granting benefits that generations of Britons of all backgrounds have worked for, yet until recently citizenship has been given away (with few exceptions) as if it were worthless." "Applying a market forces policy to the granting of citizenships is the equivalent, in economic terms, of matching a 5-year asset against an obligation extending for thousands of years." "We thus recognise that achieving balanced migration is challenging: one step which might be taken is the breaking of the automatic link between economic migration and the right to permanent settlement or citizenship."[18]

Another straw-man which is set up is the idea that continuous immigration of young adults is required to maintain a constant dependency ratio, to balance the number of elderly. But this is not the case: population ageing is foreseen, but policies need to be enacted during "demographic dividend" periods in order to prepare for the post-demographic transition period of a stable but aged population. Immigration of a younger population is a method of extending that window of opportunity.[19]

The OPT document on migration and the UK population lists polls on immigration in recent years that show concern of British residents. The rhetorical question is asked: "Can everyone be wrong?" No attempt is made to critically appraise the validity of the polls, the content of the questions, or any other explanation for the findings. The main conclusion one can sensibly draw from the findings is that, assuming that the poll is representative of the UK population, a long-standing (irrational) fear of immigration seems to remain strong in Britain, and may be people can be a little racist sometimes, both potentially fed by anti-immigration campaigns.

The lack of argumentation in the OPT report linking immigration to *the environment* calls into question OPT's claim to address environmental concerns and suggests rather a motivation of anti-immigration views. The report's failure to provide evidence-based arguments and several misleading statements reinforce this impression.

The OPT discussion of immigration to Britain and opinion towards it is irrelevant to whether country-level population growth has environmental consequences, which ostensibly is the stated raison d'etre of OPT. The Royal Commission on the Protection of Environment (2011) specifically considered this issue, concluding that net immigration was positively related to UK economic performance, that there were already stringent controls in place, and that "We do not consider that there is a case for further controls to regulate non-EU migration on environmental grounds." (p80)

One wonders why OPT has adopted such a stance on immigration, and what would happen if it dropped that stance.

4.2. OPT global migration policy

The policy on global migration flows is shorter. Again, irrelevant assertions get in the way of evidence, and seem designed more to stir emotions than to make a case. OPT begins with "[in] 2005, an estimated 75% of all international migrants were concentrated in just 12% of the world's nations". But 74% of the entire population are concentrated in just 12% of the world's nations. The UN estimates that the number of international migrants has doubled between 1960 and 2001. This is mainly the result of trade, transport and other communication technologies development. The argument presented by OPT is that global migration flows contribute to environmental degradation through two pathways: firstly by exacerbating global population growth, and secondly by behavioural change in a way that increases a person's ecological footprint.

The first pathway is entirely unconvincing, a point that the OPT tacitly admits:

> "Most analysts hold that migration reduces population growth rates: migrant birth rates usually fall as migrants move from developing countries to settle in developed countries. This is usually true, but..."

The four arguments that follow the "but" are fallacious or irrelevant. The first two point out that international migration increases the population in the receiving countries, ignoring the balancing reduction in the sending countries. The third dismisses the fall in migrants' birth rates as slow. The fourth argument claims that contraception is a more effective method for reducing family size—which rather confirms that the whole notion of migration exacerbating population growth is irrelevant in the first place.

The second pathway, that international migration increases high-consumption behaviour may be true: that the ecological footprint of a migrant will on average be higher in their receiving country than in their sending country. But this effectively says that richer countries have higher per capita emissions than poorer ones. Whether the emitter is a migrant or not is a distraction from that point.

Despite the OPT document ostensibly being about global migration flows, national and regional migration issues are presented, muddying the waters further with references to brain-drain. To the question of whether global migration has a damaging effect on the environment, data for country-specific migration is meaningless.

A final piece of rhetoric in OPT's discussion of international migration:

> "When a ship is heading for the environmental rocks, the best policy is to steer it away - not to encourage everyone to escape to areas they perceive to be lifeboats, sink them and drown. If Calcutta were drowned by rising sea levels, for example, London and New York would be inundated soon after. If London's flood defences were breached, large parts of the city could then be six feet under water."

Notwithstanding the outdated nomenclature, quite how Kolkata and London's flood defences are representative of the nuances of India's internal and international migration flows is anybody's guess.

4.3. Migration conclusion

The general approach of OPT migration policy is scaremongering: offer a macro-level statistic as a problem, mention some buzzwords like “environmentally sustainable”, offer immigrants as the explanation without mitigating factors, possible biases or alternative explanations, repeat.

Overall, there is a self-defining case for ‘excessive’ global population growth being an environmental problem, but OPT does not provide evidence that migration from poor to rich countries has any effect on either global population growth or on the environment. The policies frequently conflate global population trends with those in individual countries. Statistics are frequently quoted but not adequately contextualised, with no attention paid to the consideration of alternative explanations for the trends presented by the data.

Stripping away the rhetoric, the UK migration policy document merely tells us (repeatedly) that there has been a lot of immigration into the UK, that the OPT believes that this is bad, and that some polls say that lots of people interviewed think this is bad too.

Very little evidence is provided even of UK environmental degradation, let alone how that is causally linked with migration. Before making policy recommendations, OPT should seek to address the following questions:

- How is country-specific immigration a cause of global environmental degradation?
- If international immigration to rich countries proved to increase environmental pressures globally (despite current evidences do not support this statement), on what environmental grounds should “zero net migration” be achieved solely through the reduction of immigration rather than by increasing emigration?
- If the question of migration is superfluous to OPT environmental concerns, why not drop it from the OPT policy recommendations?

5. Population, inequality and the environment

Malthus’s historical context of late 18th Century England was a new start in agriculture. Extensive farming methods were enclosing common land. The new methods created more food which wasn’t equally distributed. Many rural families were forced through lack of livelihood into the cities, where they were condemned as contributing to over-population. Even minimal support to those who suffered, through the Poor Laws, was considered a waste by some, including Malthus.

Similarly the green revolution of the 1970s introduced intensive cash crops to the developing world, making massive contributions to production which have mainly benefited the developed world and wealthy minority elites in the production country. Again those who had farmed the land before have been forced into cities where they are the focus of population concern.

In both cases ‘over-population’ focused illogically on those people who consume the least. We should be careful not to fall into the same pattern, that of high-polluters with the education to powerfully demand that low-polluters pay for our privilege.

It is true that millions of people are lacking basic resources such as food and water available locally. What is the impact of demographic pressure compared to other threats to the environment? What is the role of commercial plantations responsible for the deforestation of large parts of Asia, Africa and South America to provide the food industry, and now bio fuel, mainly for the developed world? What is the role of large industrial fishing practices in endangering species (and potentially the whole ecosystems) and stealing subsistence food from traditional fishing villages in the developing world? What is the role of other industrial and energy production companies in damaging the environment that poor people have to live with?

It would be helpful to clarify whether poverty is due to a lack of resources on earth to support the total number of humans (in which case population growth might be a serious threat for the environment) or whether there are enough resources on earth for all but resources are unequally distributed generating poverty, as the reports reviewed earlier suggest. The relationships between population growth, environmental depletion and food shortage include the coexistence of food shortages with areas of food-overproduction. How does the ongoing process of water privatization by large corporations improve water conservation and sustainable development?

Globally, according to the FAO, farmers produce more than the necessary nutrition requirement to feed the world population[20]. This supports views that not limited world resources but the unequal distribution of resources mainly explains the current poverty and hunger problems in the world (e.g. Ghersi 2005). Humanity could provide more food and use it more efficiently to ensure food security for all in an environmentally sustainable manner, using existing technology in a globally co-ordinated manner (Godfray et al, 2010).

Thinking about sustainable practices to satisfy the whole population will involve a science which takes very seriously the aim of reducing inequality.

OPT acknowledges that the environmental pressure per capita in the UK is 35 times higher than in Bangladesh and 160 times higher than in Ethiopia. This factor in the relationship between population and the environment is not explored by OPT. As reviewed earlier, the level of wasted food is alarming, with a one third of all food produced for human consumption each year being wasted according to the latest UNFAO report (2011) and a large part of the resources in the poor countries are exploited by international firms and consumed in the rich countries, and disproportionately by their wealthier social groups. Controlling population size will have little effect on the international organisation of production, trade and consumption. Addressing human pressure on the environment must involve reducing inequality, for example by making technological innovations widely available; enhancing equity in the share of resources internationally; changing consumption behaviour to reduce per capita footprint in rich countries and particularly among the wealthier.

Unwarranted focus on population often results in charging the local victims with the burden of environmental pressures which they are not responsible for. It would be difficult to address environmental sustainability without addressing the context of severe inequality, for three reasons. First, high resource users have the capacity to contribute the most to reducing environmentally harmful consumption. Second, raising the economic level of the currently poorest will help to reduce population growth. Third, raising economic levels demands that consumption and production be

changed to reduce environmental hazards.

6. Conclusion

Overpopulation has power as a folk myth (as Lisa Cliggett explores, 2001). It is a myth in that one has to appeal to extremes of ever-increasing numbers to make a convincing point that there is a definite limit to the human population. Overpopulation chimes with a certain sense that we all have, that our local world would be a more comfortable place without a few (often particular!) people. This is what the Optimum Population Trust's 2011 YouGov poll found, when only 4% of respondents felt that their local area would benefit from more people, but 47% felt that fewer people would be better (the rest felt the number was about right).

From the documentary evidence, we think that OPT policies on UK fertility (focused on teenage fertility) and migration (greater control on immigration) are a response to the folk-myth of overpopulation, rather than justified by concern for the environment. OPT's appeal to extremes of population growth, and the repeated focus on what would happen if nothing else changed except population increase, encourages responses based on an unbalanced vision of the future.

In a historical context, the OPT's determined focus on immigration and on population size rather than resource distribution, serves to protect the current privileges of the highest polluters.

Recent reports for Britain and globally identify patterns of production and consumption as having the potential to satisfy human needs in a sustainable way, given the current demographic projections of global population growth.

We find that the case made by OPT for global overpopulation is a crude simplification of the relationship between population and the environment, and ignores the impact of affluence and technology on that relationship. The interdependence of the UK and other countries means that an optimum population for the UK cannot be considered in isolation. OPT's support for improvement of women's educational and economic conditions, and non-coercive facilitation of family planning throughout the world, is in tune with international understanding embodied in the Millennium Development Goals. These social aims are known antecedents of the low fertility necessary for the continued reduction of population growth and reaching a maximum global population during this century as projected by the UN.

OPT's UK policies for reduction of teenage fertility, discouragement of third and further children, and a focus on reduced immigration from outside the EU are not justified by environmental concerns, are a distraction in efforts to address climate change and environmental degradation, and are insensitive to human rights and inequalities. A much stronger emphasis on reducing human activities associated with high energy consumption – through changing behaviour and technology – would be more effective in reducing human threats to environmental sustainability both in the UK and globally. For a sustainable human society, including low demographic equilibrium (i.e. low mortality and low fertility), governments have to address the inequality that gives rise to poverty, famine and waste.

We consider two extensions of this review would be particularly useful in countering the moral panic encouraged by allusions to worrying but unrealistic scenarios. First, a study of the social, political and historical contexts of movements that claim

overpopulation could identify common origins and assumptions (drawing on Connelly, 2008, and others). Second, a lay guide to the environmental impacts of population, consumption and technology would help to encourage effective campaigning to reduce social inequality in a sustainable world.

At best, OPT's goals (long-term population stability and environmental sustainability) are laudable but its UK policies suggested to achieve its goals are misguided.

At worst, OPT's UK policies of reducing teenage conceptions and immigration while over-emphasising the role of population growth in a litany of ills are scapegoating, scaremongering, and promote a deeply conservative agenda, while diverting attention away from the real drivers of environmental degradation.

We suggest that its patrons consider the following:

- A campaign for stabilising global population need have little to say about the UK population, since the UK has fertility below replacement. UK fertility, UK immigration and global migration flows are red herrings with respect to the slowing of global population growth.
- The global population growth is slowing and predicted to stabilise at 10 billion, a number that could be fed with current worldwide production if better managed. While family planning policies in developing countries are beneficial for various reasons, it is of ethical concern to suggest that birth restrictions should be enforced in some cases.
- Growth of the UK population growth has little or no impact on global climate change, but its production and consumption patterns have great impact. To emphasise UK population policies is to allow UK climate culprits to continue unchallenged.
- A claim to be the leading charity on population matters in the UK, engaged in education and research, demands justification by engaging in considered research, and acceptance of research that already exists.

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[1] OPT’s external links are given at http://populationmatters.org/about/outside/ The same page gives a joint statement from 12 of these organisations that calls on the UN to recognise that “Current population growth is both undesirable and unsustainable.”

[2] Roger Martin, Chair of Population Matters, Environmental Ecology conference 2011, http://populationmatters.org/documents/esee_conference.pdf

[3] David Attenborough, Patron of Population Matters, speech to the Royal Society of the Arts, March 2011, http://populationmatters.org/attenboroughs-rsa-speech/

[4] UN Population Division (2011) World Population Prospects, the 2010 revision. http://esa.un.org/unpd/wpp/index.htm

[5] http://populationmatters.org/2010/press/index-highlights-overpopulated-countries/

[6] OPT (2010) New index highlights most overpopulated countries. http://populationmatters.org/2010/press/index-highlights-overpopulated-countries/ and its associated report at http://www.optimumpopulation.org/overpopulationindex.pdf. The footprint and biocapacity data refer to 2007, from the Global Footprint Network, which has since updated their figures though showing similar results: http://www.footprintnetwork.org/en/index.php/GFN/page/footprint_for_nations/.

[7] The ratio is more than 1 for countries whose consumption is less than its biocapacity and thus the ‘dependency’ is less than 0%. These countries include less densely populated countries like Sweden, Canada, Australia and many developing countries, and are not listed in the OPT index.

[8] http://www.optimumpopulation.org/opt.optimum.html. Elsewhere it mentions ‘lower than 20m’, and ranges of 17m-27m and 20m-29m which allow for reduction in carbon emissions.

[9] OPT ignores the Global Footprint Network’s emphasis that its estimates are of current not future carbon emissions. Based on a UN forecast of 9.2 billion by 2050, the OPT evaluates that ‘by 2050, humanity is likely to require the biological capacity of two Earths’.

[10] John Ehrlich still inspires many and is a patron of the OPT.

[11] In ‘Population Bomb’ Ehrlich advocated population control through compulsion, if voluntary measures failed within the USA, and either cutting off food aid to some countries or making provision of food aid dependent of use of contraception.

[12] Press Release Feb 17th 2011, http://populationmatters.org/2011/news/royal-commission-environmental-pollution-ends-bang-whimper/

[13] Fertility of immigrants is another ‘issue’ raised by OPT (in the immigration section of their report) and commented in the next section of this paper.

[14] For example, the list in http://www.optimumpopulation.org/opt.sub.briefing.whatpoppolicy.Nov06.pdf

[15] Netherlands recent research shows unemployment is associated with shorter duration of

immigrants, whose largest flow to that country is currently from Britain. http://www.cpc.ac.uk/resources/downloads/Does%20unemployment%20cause%20return%20migration.pdf.

[16] Reviewed by Finney and Simpson (2009, pp78-86)

[17] See for example Glover, S. Gott, C., Loizillon, A., Portes, J., Price, R., Spencer, S. Srinivasan, V. and Willis, C. (2001) 'Migration: an economic and social analysis' RDS Occasional Paper No. 67 London: Home Office; Dustmann, C., Fabbi, F., Preston, I. and Wadsworth, J. (2003) The Local Labour Market effects of Immigrations in the UK Home Office Online Report 06/03; Select Committee on Economic Affairs (2008) The Economic Impact of Immigration, 1st Report of Session 2007-08, HL Paper 80-I, House of Lords, London.

[18] http://populationmatters.org/analysis/sustainable-populations/sustainable-migration/. As it happens, migration to fill a job does not give the right to permanent settlement or citizenship in the UK.

[19] Ronald Lee and Andrew Mason have written about this for the International Monetary Fund: 2006, What Is the Demographic Dividend?, Finance and Development, 43(3) (http://www.imf.org/external/pubs/ ft/fandd/2006/09/basics.htm).

[20] Calories produced could be twice those necessary to provide the entire world population with the amount recommended by nutritionists according to a report on 'The 9 billion people question' by John Parker to *The Economist* 24 Feb 2011 http://www.economist.com/node/18200618, although FAO figures are more conservative.