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## **A shrinking population offers opportunities for a sustainable Japan**

Lans, Cheryl

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## A shrinking population offers opportunities for a sustainable Japan

Since gaining independence in the 1960s and 1970s, developing countries have focused on increasing productivity and less time debating the question of what constitutes the good society. There was a large disparity between the opportunities of people living in the Third World to sustain their vital needs and people living in Japan, the United States, Canada, and the European Union. Some developing countries have benefitted globalizing economy and the impact of free trade treaties such as NAFTA (and the WTO), while others have not (Mander<sup>1</sup> 1991).

Japan's Edo period may represent the good society more than modern day society; it was sustainable and self-reliant. Japan and other Asian countries now have a decreasing population. This reduction and those in Europe may help bring population levels back to the earth's carrying capacity. World population has increased from 2.5 billion in 1950 to over 7 billion today<sup>2</sup> and there are some who think the earth's carrying capacity has been exceeded. Japan's land area is slightly smaller than the state of California and its population density is 836 per square mile, far higher than Canada at 9, Sweden at 57, France at 289 and even Haiti at 781<sup>3</sup>. This high density is reflected in the need for order, *oshiyas* to push people into trains and the focus on miniaturization (*bonsai*, sushi, calculators, compact discs, cameras and compact cars).

The population during the Edo period was 30 million and Japan was self-sufficient during that time; very little was imported<sup>4</sup>. In the 1990s Japan only provided one-third of its needs and imported 27 million tons of grain<sup>5</sup>. Currently Japan imports 78% of its energy, 60% of its food<sup>6</sup> and 82% of its construction timber<sup>7</sup>. The Edo period included innovation such as the mechanized dolls<sup>8</sup> that became the robots of today. Therefore a large population is not needed for innovation.

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<sup>1</sup> Mander, Gerry. *In The Absence of the Sacred*. Sierra Club Books, San Francisco. 1991.

<sup>2</sup> U.S. Census Bureau, 2012. <http://www.census.gov/population/international/data/idb/worldpoptotal.php>.

<sup>3</sup> Source: U.S. Census Bureau, International Data Base.

<sup>4</sup> Ishikawa, E. *The Edo Period had a Recycling Society (O-Edo Recycle Jijo)*, published in 1994 by Kodansha Publishing Company).

<sup>5</sup> Murai, Shunji. *Global environment and population carrying capacity*. United Nations University. <http://archive.unu.edu/unupress/unupbooks/uu03pe/uu03pe0c.htm>

<sup>6</sup> Agri-food consumer profile Japan, May 2011. Available online at <http://www.ats-sea.agr.gc.ca/asi/4150-eng.htm>. Accessed August 26, 2012

<sup>7</sup> Associated Press. 2012. Japan reports \$6.5 billion trade deficit in July, as exports sink, fuel imports surge. *The Washington Post*, August 22, 2012. Accessed August 26, 2012. [http://www.washingtonpost.com/business/japan-reports-65-billion-trade-deficit-in-july-as-exports-sink-fuel-imports-surge/2012/08/21/884bc334-ebf1-11e1-866f-60a00f604425\\_story.html](http://www.washingtonpost.com/business/japan-reports-65-billion-trade-deficit-in-july-as-exports-sink-fuel-imports-surge/2012/08/21/884bc334-ebf1-11e1-866f-60a00f604425_story.html)

<sup>8</sup> Law, Jane Marie. 1997. *Puppets of Nostalgia: The Life, Death, and Rebirth of the Japanese Awaji Ningyo Tradition* Princeton University Press.

The population of Japan reached the replacement level in the 1970s and peaked at 127.79 million people in 2004. Japan then had the world's tenth largest population. Life expectancy has increased from 76.9 in 1980 to 82.6 currently (see Raines, 2007). One-fifth of Japanese people were over 65 in 2006 and this segment of the population is expected to increase to 28.7% in 2025 and to 35.7% by 2050<sup>9</sup>. The birthrate for Japanese women in 2005 was 1.26 children<sup>10</sup> this low birth rate has resulted in a decline of 0.2 percent in the population<sup>11</sup>. Unlike the environment, economic programs are human creations and can be changed to match the decline in the population. For example, the long-term employment and seniority-based compensation traditional to Japanese companies changed in the past decade<sup>12</sup> to match changes in the economy. This decrease in employer-employee loyalty resulted in a higher than traditional unemployment rate and increased poverty.

Population reduction was planned since the 1950s by men such as John D. Rockefeller who set up the Population Council and met with or shared the views of the International Planned Parenthood Federation (IPPF), William Vogt of the Planned Parenthood Federation of America (PPFA), Paul Ehrlich, Julian Huxley of UNESCO, the UN, the World Bank, pharmaceutical firms, and the Ford Foundation<sup>13</sup>. These international agencies discussed food supplies, development, depletion of natural resources and potential political instability from unchecked population growth<sup>14</sup>. Even if they were not motivated by concerns for the welfare of childbearing women<sup>15</sup> and they may have wanted to control the natural resources of other countries, the underlying fact that natural resources are limited remains unchanged.

Forgetting that population decline was in fact planned for, this decline in combination with an aging society has been linked by some researchers to inappropriate gender norms<sup>16</sup>. Kim (2009) writes that conservative Confucian society of some Asian countries was one of the factors

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<sup>9</sup> Horioka C.Y., Suzuki W., Hatta T. 2007. Aging, savings, and public pensions in Japan. *Asian Economic Policy Review* 2 (2), 303 – 319. Accessed August 26, 2012. Available at [www.nber.org/papers/w13273](http://www.nber.org/papers/w13273)

<sup>10</sup> Raines, David. 2007. The Evolution of Japanese Employer-Sponsored Retirement Plans. *Social Security Bulletin*, Vol. 67, No. 3, pp. 89-104, 2007. Accessed August 26, 2012. Available at SSRN: <http://ssrn.com/abstract=1154007><http://www.ssa.gov/policy/docs/ssb/v67n3/v67n3p89.html>

<sup>11</sup> Sharp, Andy. 2012. Japan's population declines by record in challenge for growth. *Bloomberg* April 17, 2012. Accessed August 26, 2012.

<sup>12</sup> Usuki, Masaharu. Recent Changes to Retirement Benefits in Japan and Relevant Public Policy Issues. Working Paper, NLI Research Institute, Tokyo, February 2003. Accessed August 26, 2012. Available at [hermes-ir.lib.hit-u.ac.jp/rs/bitstream/10086/14440/1/pie\\_dp135.pdf](http://hermes-ir.lib.hit-u.ac.jp/rs/bitstream/10086/14440/1/pie_dp135.pdf)

<sup>13</sup> Connelly, Matthew. 2008. *Fatal Misconception: The Struggle to Control World Population*. Harvard University Press (Belknap).

<sup>14</sup> Dunlop J. 2000. John D. Rockefeller 3rd, statesman and founder of the Population Council. *Popul Today*. Aug-Sep;28(6):3.

<sup>15</sup> Gardiner, A.B. 2010. Global population control: Not dead yet. *New Oxford Book Reviews* April 2012. Accessed on August 28, 2012. Available at <http://www.newoxfordreview.org/reviews.jsp?did=0410-gardiner>.

<sup>16</sup> Kim, Anna M. 2009. Book review. *The Political Economy of Japan's Low Fertility* Frances McCall Rosenbluth (edited) Stanford University Press, 2007 xii+222 ISBN: 978-0-8047-5486-6 (hardback). *Population Review* 48 (1): 138-142.

influencing gender inequality. In 1972 a large majority of women believed in traditional gender norms<sup>17</sup>. In 2002, only 43.2 % of women agreed with traditional gender roles in which only the husband worked. If a woman leaves the workforce before age 30 and does not return until age 42 or older, her career options are limited and this can become a problem if the population is shrinking. Flexible workplaces could allow women to either work for a few hours a day; or it may be more convenient for women to work for eight hours, two or three days a week (Yoshimura and Anderson, 1997).

Apparently Japan has already existing, but underused public buildings, museums and concert halls that could be used for childcare (Hay, 2009). Childcare could also be combined with eldercare<sup>18</sup>. Having an economic focus on people rather than infrastructure<sup>19</sup> would benefit the economy (Fackler, 2009). Japan spent \$2.1 trillion on public works from 1991 to 1995 and is said to spend \$208 billion a year on public work projects or 40% of the national budget<sup>20</sup>. Many of the construction projects undertaken since the 1990s governments did not stimulate the economy in a self-sustaining way (Inagaki and Fukase 2012)<sup>22</sup>.

Professor Toshihiro Ihori of the University of Tokyo told the New York Times that the US was correct in spending more money on energy and information-technology infrastructure and implied that Japan should do the same. Japan currently imports 78% of its energy. Alternative energy contributes less than 1.5% of Japan's current electricity supply<sup>23</sup>. Having 35% of Japan's energy needs being met by renewable sources could be achieved before 2030 if government approvals are speeded up. Much of the necessary environmental information such as bird

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<sup>17</sup> Hirouki, Ida. 2004. Japanese Women in Their 30's: Changes and Traditional Values. "DAWN" Newsletter of the DAWN CENTER. December 2004. Accessed August 26, 2012.

<http://www.dawncenter.or.jp/english/publication/edawn/0412/01.html>

<sup>18</sup> Roark, Anne. 2009. Day care for all ages. New York Times. Accessed August 26, 2012.

<http://newoldage.blogs.nytimes.com/2009/06/17/day-care-for-all-ages/>

<sup>19</sup> Peng, Ito. 2002. Gender and welfare state restructuring in Japan. In C. Aspalter (ed.). Discovering the welfare state in East Asia. Westport, CT. Praeger Publishers, pp. 39=62..

<sup>20</sup> Hay, J. 2009. Infrastructure and public works in Japan. Accessed August 28, 2012. Available online at

<http://factsanddetails.com/japan.php?itemid=842&catid=23&subcatid=152>

<sup>21</sup> Fackler, M. 2009. Japan's big-works stimulus is lesson. The New York Times February 5, 2009. Accessed August 28, 2012. Available online at: <http://www.nytimes.com/2009/02/06/world/asia/06japan.html?pagewanted=all>.

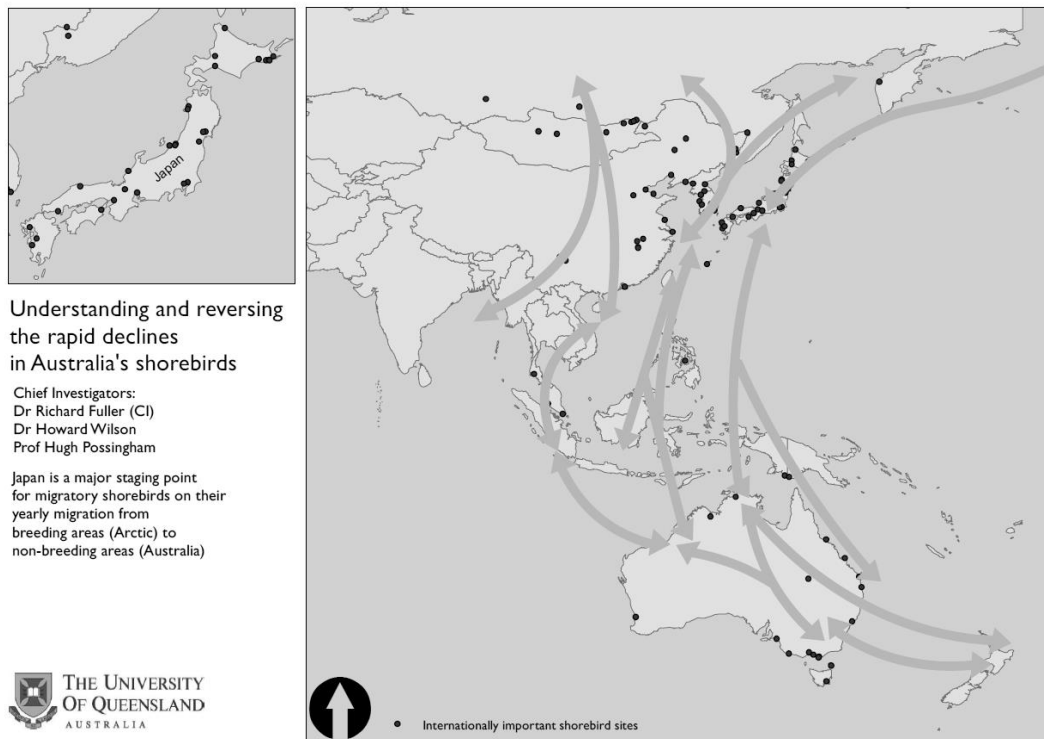
<sup>22</sup> Inagaki, K., and Fukase, A. 2012. Cash-rich Japanese firms go on global buying spree. The Wall Street Journal May 29, 2012. Accessed August 26, 2012. Available online at

<http://online.wsj.com/article/SB10001424052702303505504577403743150818820.html>.

<sup>23</sup> Yamamoto, E. 2007. Status of hydropower in Japan. Accessed August 26, 2012.

[www.nef.or.jp/topics/pdf/2007\\_workshop\\_canada\\_presen.pdf](http://www.nef.or.jp/topics/pdf/2007_workshop_canada_presen.pdf)

migration routes<sup>24</sup>, is available and should be used as a guide to prevent windmills from being located in certain areas<sup>25</sup> (see Figure 1).



**Figure 1. Migratory bird route over Japan. Source: R. Fuller School of Biological Sciences, University of Queensland, St Lucia, Qld 4072, Australia**

Japan can be a pioneer in creating sound technology like acoustic cues that would prevent birds from flying too close to windmills. Sounds in the range of 2 – 4 kHz would not annoy humans but might help birds avoid the blades<sup>26</sup>. Hodos tested various visual deterrents<sup>27</sup> but they were not fail-safe. Japanese kite technology could be used to develop airborne wind turbines. Scientists from Delft University of Technology in the Netherlands used a 10-sq metre high-altitude kite tethered to a generator, to produce 10 kilowatts of power, or enough for ten

<sup>24</sup> Fuller, R. 2011. [Meeting with the Ambassador Designate to Japan](#) School of Biological Sciences, University of Queensland, St Lucia, Qld 4072, Australia. Accessed August 28, 2012.

<sup>25</sup> Iwata, M. 2012. Japanese solar power outlook looks bright but wind may not fly. Wall Street Journal August 6 21, 2012. Accessed August 28, 2012. Available online at <http://online.wsj.com/article/SB10000872396390443855804577602612914224228.html>.

<sup>26</sup> Dooling, R. 2002. Avian hearing and the avoidance of wind turbines. National Renewable Energy Laboratory, NREL/TP-500-30844. Accessed on August 28, 2012. Available at [www.nrel.gov/wind/pdfs/30844.pdf](http://www.nrel.gov/wind/pdfs/30844.pdf)

<sup>27</sup> [Hodos, W. 2003. Minimization of motion smear: reducing avian collisions with wind turbines. Period of performance: 12 July 1999 to 31 August 2002. United States Department of Energy, National Renewable Energy Laboratory Technical Report NREL/SR-500-33249, Golden, Colorado, USA.](#)

homes<sup>28</sup>. The project, called Laddermill, was headed by Professor Wubbo Ockels. Softbank a mobile phone company has announced plans to build both a wind farm and a solar farm on Hokkaido island.<sup>29</sup>

Hydropower is the leading source of renewable energy In Japan, producing about 22 GW at approximately 1,859 sites<sup>30</sup> with 26 sites under construction and 2,714 untapped. There are small hydropower projects in Yamanashi prefecture and large projects in Kanagawa prefecture. Hydropower is suited to Japan and there are many utility companies, firms, and government agencies involved such as Hitachi Limited (NYSE:HIT) (Tokyo), Mitsubishi Electric Corporation (TYO:6503) (Tokyo), and Mitsubishi Heavy Industries Limited (MHI) (TYO:7011) (Tokyo). Japan's feed-in tariff system obliges Japan's 10 regional power utilities to buy electricity generated by solar and wind projects, paying about ¥40 (50 cents) per kilowatt-hour and ¥23 per kilowatt-hour, respectively. Solar tariff payments are set for 20 years, wind tariff payments for 15 (Iwata, 2012).

Japan in the future can have a smaller population, with more land area, more space for wild animals and for livestock rearing. A smaller global population means more fish in the sea. The total catch of ocean fish increased from 18.5 million metric tonnes in 1950 to 73.5 million metric tonnes in 1996 (400%)<sup>31</sup>. The fish catch began to level off in the 70's and the catch per capita peaked at 14.4 kg per person per year. Many scientists consider that 69% of fish species are either fully exploited or over exploited and declining. Only 9% of species have potential for increased fishing. The Atlantic Cod and high value groundfish have declined dramatically.

Japan's population density is one of the highest in the world and this can produce negative health effects, for example many Japanese people wear face masks to avoid spreading or catching diseases. This is not common outside of Asia.

A natural experiment on air quality and health was conducted during the Beijing Olympics in 2008. Over 300,000 polluting vehicles (about 10% of total) were barred from the Olympic area in order to decrease pollution for athletes and visitors. The number of vehicles was reduced by about 1.9 million or 60% of the total fleet during the Games. Emissions of black carbon, carbon monoxide and ultrafine particles were reduced by 33%, 47%, and 78% respectively compared

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<sup>28</sup> Jha, Alok. 2008. Giant kites to tap power of the high wind. The Guardian online. August 3, 2008. Accessed August 28, 2012. Available online at: <http://www.guardian.co.uk/environment/2008/aug/03/renewableenergy.energy>

<sup>29</sup> <http://www.bloomberg.com/news/2012-09-14/softbank-aims-to-be-japan-s-biggest-wind-producer-with-new-plant.html>

<sup>30</sup> Hydropower Could Become More Prevalent in Japan Following Nuclear Crisis, an Industrial Info News Alert. Accessed on August 28, 2012. Full report at <http://www.industrialinfo.com/showNews.jsp?newsitemID=178310>. News Alert available at.

<http://www.marketwire.com/press-release/hydropower-could-become-more-prevalent-japan-following-nuclear-crisis-industrial-info-1508440.htm>

<sup>31</sup> World Fisheries. <http://www.whole-systems.org/fisheries.html>

to the year before the Olympics. Frequency of respiratory illnesses during the 2008 games were reduced compared to previous years due to the reduction of vehicles on the road (Wang et al., 2009<sup>32</sup>; Jentes et al., 2010<sup>33</sup>). A future Japan can emulate the self-sufficiency of the Edo period. Japan's population at that time was 30 million. A reduction in population should alleviate environmental concerns and reduce the possible negative effects of climate change on Japan. These effects are said to include an increase in temperature of 1 to 3 degrees Celsius; a change in the growing season, reduced fresh water in some places and reduced rice yields<sup>34</sup>.

Japan's cherry blossom festivals have provided data on climate change, some of the data goes back to the 11<sup>th</sup> century. Academics Richard Primack<sup>35</sup> and Hiroyoshi Higuchi analyzed the data of the cherry (*Prunus serrulata* var. *spontanea*) blossom festivals and found that the mean air temperature in March has slowly risen since the industrial revolution beginning in 1830 (3.4°C in Kyoto), which means that trees are flowering a week or more earlier than previously. The increase in temperature is linked partly to increased urbanization (2.8°C) but 18% of the increase is attributed to climate change.

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<sup>32</sup> Wang, X., Westerdahl, D., Chen, L., Wu, Y., Hao, J., Pan, X., Guo, X., & Zhang, K. M. (2009). Evaluating the air quality impacts of the 2008 Beijing Olympic Games: On-road emission factors and black carbon profiles. *Atmospheric Environment*, 43, 4535–4543.

<sup>33</sup> Jentes ES, Davis XM, MacDonald S, Snyman PJ, Nelson H, Quarry D, Lai I, van Vliet EWN, Balaban V, Marano C, Mues K, Kozarsky P, Marano N. (2010). Health risks and travel preparation among foreign visitors and expatriates during the 2008 Beijing Olympic and Paralympic Games. *American Journal of Tropical Medical Hygiene*, 82, 466–472.

<sup>34</sup> WWF Global. Climate change impacts in Japan. Highlights of the IPCC 4th Assessment Report 2007. Accessed August 28, 2012. Available online at:

[http://wwf.panda.org/about\\_our\\_earth/aboutcc/problems/rising\\_temperatures/hotspot\\_map/japan.cfm](http://wwf.panda.org/about_our_earth/aboutcc/problems/rising_temperatures/hotspot_map/japan.cfm)

<sup>35</sup> Primack, R., Higuchi, H. 2006. Climate Change and Cherry Tree Blossom Festivals in Japan. Pp. 1-22 In: *Arnoldia* 65/2