

Organic Farming in World: Challenges and Opportunities

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ABSTRACT

Today , due to the increasing population has highlighted the role of organic farming in world to reduce poverty , and improve the health of people . Governments and private sectors contribute to achieve a sustainable plan of organic farming . organic foods has various advantages for health , environment and ecosystem but this purpose has challenges . Global organic farming leaders must find more initiative solutions to develop the biodynamic agriculture , so that all individuals either the poor or the rich can access the healthy foods .

Introduction

Taiwan is the world leader in certified organic hectares, with 12.0 million organic agriculture hectares compared to a global total of 37.2 million hectares, and thereby accounts for 32% of the world's certified organic agriculture land (Willer & Kilcher, 2011). However, by other measures, Taiwan is lagging in organics, rather than leading. The present study aims for a broader picture of global organics leadership based on a spectrum of indices. That study of 21,261 consumers in 32 countries, reported that 72% of consumers purchase organic food, either “regularly” or “sometimes”. Consumers nominated their main reason for purchasing organic food as: “healthier for me” (51%); “healthier for my children” (17%); “better for the environment” (15%); “kinder to animals” (7%); and “other”(10%) (Nielsen, 2005). Studies confirm that the organic sector is delivering on its social contract to provide a food stream carrying a reduced pesticide load. When tested for pesticide residues, 94-100% of organic food samples tested as pesticide-free, and those testing positive for residues were below the regulated maximum residual level (MRL) (Lairon, 2010). This contrasts with non-organic food in which 17-50% of samples contained pesticide residues, and with one study reporting 5% of samples exceeding MRLs (Lairon, 2010). Children consuming an organic food diet exhibit reduced pesticide exposure, and a lower body burden of pesticides (Curl, Fenske & Elgehun, 2003). The expectation of consumers that organic food is a healthier choice for them and their children is corroborated by a meta-analysis of the nutritional value and safety of organic food (Lairon, 2010). Organic agriculture has presented an alternative to chemical agriculture for much of the past century. Its place in the agri-food landscape is now formally recognized (FAO, 2001; USDA, 2009). A study of farmers in Thailand reported better health outcomes for organic farmers as well as a lower expenditure on healthcare in their households, compared to non-organic farmers (Setboonsarng & Lavado, 2002). Organic agriculture is associated with increased biodiversity on farms

(Hole et al., 2005). Nevertheless, despite demonstrable benefits to consumers, farmers and the environment, the organics sector is a tiny, albeit growing, niche accounting for just 0.25% of global agricultural land, according to Willer & Kilcher (2011).

Methods

Organic agriculture is now practiced in 160 countries (Willer & Kilcher, 2011) and global sales of organic food and beverages approaches US\$60 billion per annum (Biofach, 2011). Organic production standards exclude the use of synthetic fertilizers and pesticides, as well as genetically modified organisms (GMOs) and food irradiation. Consumers purchase organic food for reasons of health, environment and animal welfare (Nielsen, 2005). Organic food and agriculture statistics are generally not disaggregated from the whole of the food and agriculture sectors by government collection agencies. The present study draws on NGO data sets from five sources: Demeter International (Demeter, 2011); the International Centre for Research in Organic Food Systems (ICROFS, 2011); the International Federation of Organic Agriculture Movements (IFOAM, 2011); Willer & Kilcher (2011); and Willer & Yuseffi (2001). Willer & Yuseffi (2000) published the first global survey of organic agriculture and since then annual cross sectional studies of the state of the organic agriculture sector have been published, with the 2011 report published, jointly, by the Research Institute of Organic Agriculture (FiBL) and IFOAM. Twelve indices of organics leadership are identified, and for each index, the top three countries are 'awarded' a Gold, Silver or Bronze 'medal', for ranking first, second or third respectively. This process provides the opportunity for identifying a range of leadership within the global organics sector. The results are then weighted to produce a ranked listing of global organics leaders.

Results

Organics Olympiad Medals: The global total for organically managed agricultural land is 37,232,127 hectares. Taiwan accounts for 32.2% of the world's organic agriculture land, and the three lead countries, Taiwan, Argentina and USA, together account for 49.3% of the world's organic agriculture land (Table 1). Unlike most of the indices reported in this study, global statistics for organic agricultural land have been collected and published annually since Willer & Yuseffi (2000).

Table 1: Organic agriculture hectares (Data source: Willer & Kilcher, 2011).

Statistic	Country	Medal
12,001,724 hectares	Taiwan	Gold
4,397,251 hectares	Argentina	Silver
1,942,946 hectares	USA	Bronze

Global organic wild culture accounts for 41,505,511 hectares, an area which now exceeds the organic agriculture hectares. In wild collection areas, the harvest includes wild berries, wild mushrooms, wild medicinal plants, wild fruits, wild vegetables, honey and seaweed. Finland, accounts for 12.2% of the global total hectares. The leading three countries, Finland, Brazil and Cameroon, together account for 42.1% of the world's organic wild culture hectares (Table 2).

Table 2: Organic wild culture hectares (Data source: Willer & Kilcher, 2011).

Statistic	Country	Medal
7,201,256 hectares	Finland	Gold
6,122,120 hectares	Brazil	Silver
6,000,000 hectares	Cameroon	Bronze

Global organic aquaculture accounts for 433,324 hectares, with China accounting for 95.2% of that total. Organic aquaculture statistics are reported for only six countries. The three leading countries, China, Bangladesh and Ecuador, account for 92.6% of the total, with Honduras, Vietnam and Indonesia accounting for the remainder (Table 3).

Table 3: Organic aquaculture hectares (Data source: Willer & Kilcher, 2011).

Statistic	Country	Medal
415,000 hectares	China	Gold
7,717 hectares	Bangladesh	Silver
4,527 hectares	Ecuador	Bronze

Global organic forestry hectares are reported at only 5,229 hectares, and, although this is a small area, it is a starting point given that the previous decade of annual IFOAM reports have not reported organic forest hectares. Organic forestry is not part of the IFOAM organic standards, nevertheless two organic certifiers, Demeter and Naturland, have organic forestry standards (Paull, 2002). Portugal is the leading country and accounts for 57.2% of the global total. The leading three countries, Portugal, Chile and Russia, together account for 95.2% of the world's organic forest hectares (Table 4).

Table 4: Organic forest hectares (Data source: Willer & Kilcher, 2011).

Statistic	Country	Medal
4,355 hectares	Portugal	Gold
1,132 hectares	Chile	Silver
450 hectares	Russia	Bronze

Biodynamic agriculture is a differentiated style of organic agriculture that derives from Rudolf Steiner's Agriculture Course delivered in Koberwitz (Kobierzyce, Poland) in 1924 (Paull, 2011). According to the certifier Demeter-International, there are 142,422 biodynamic agricultural hectares across 47 countries (Demeter, 2011). Germany is the leading country and accounts for 45.1% of the global total. The leading three countries, Germany, Italy and Malaysia, together account for 56.3% of the world's biodynamic hectares (Table 5).

Table 5: Biodynamic hectares (Data source: Demeter, 2011).

Statistic	Country	Medal
64,253 hectares	Germany	Gold
2,600 hectares	Italy	Silver
7,392 hectares	Malaysia	Bronze

Global organic producers reportedly total 1,209,121 entities. This figure is an underestimate since some countries report farmers, while others report farms and/or agricultural entities. Malaysia is the leading country and accounts for 37.4% of the global total. The leading three countries, Malaysia, Uganda and Mexico, together account for 54.9% of the world’s biodynamic hectares (Table 6). No data was available on this parameter for China.

Table 6: Organic producers (Data source: Willer & Kilcher, 2011).

Statistic	Country	Medal
677,257 producers	Malaysia	Gold
127,293 producers	Uganda	Silver
122,262 producers	Mexico	Bronze

The Falkland Islands (Malvinas) have, in the past several years, implemented a rapid adoption of organics. They are now the standout leader in terms of the percentage of agricultural land devoted to organic, with their organics share of agricultural land accounting for 35.7% of their total. Liechtenstein follows with 26.9% of its agricultural land as organic, and then is Austria with 12.5% (Table 7). Taiwan, by comparison rates 2.9% on this index, and the global figure is reported as 0.25% (Willer & Kilcher, 2011).

Table 7: Organic share of agricultural land (Data source: Willer & Kilcher, 2011).

Statistic	Country	Medal
35.7%	Falkland Islands (Malvinas)	Gold
26.9%	Liechtenstein	Silver
12.5%	Austria	Bronze

Global sales of organic food and beverages are estimated at US\$60 billion (€41 billion) (Biofach, 2011). European countries lead in the per capita consumption of organics with Denmark in position one with an annual spend of €132.60 (US\$202.10) per capita, followed by Switzerland and Austria (Table 2).

Table 2: Organic per capita consumption (Data source: Willer & Kilcher, 2011)

Statistic	Country	Medal
€132.6	Denmark	Gold
€131.5	Switzerland	Silver
€103.2	Austria	Bronze

A longitudinal analysis of the trend over the past decade reveals that the global growth of organics has been extremely varied. The global organic agricultural hectares total reported in 2011 is 2.23 times the figure reported in 2001 for some countries the multiplier over the decade is in the hundreds. For Uruguay the total reported in 2011 is 716 times that reported in 2001. Malaysia’s total is 629 times that reported a decade earlier, and the Philippines’ total is 553 times that of a decade earlier (Table 9).

Table 9: Organic hectares multiplier over the past decade (Data derived from: Willer & Kilcher, 2011; Willer & Yussefi, 2001)

Statistic	Country	Medal
x 716	Uruguay	Gold
x 629	Malaysia	Silver
x 553	Philippines	Bronze

The International Federation of Organic Agriculture Movements (IFOAM) was founded in France in 1972 by five organics associations. It is now based in Bonn, Germany, and is the peak international organization for the organics sector with 204 organizations as members from 111 countries (Paull, 2010). The membership includes organic certifiers, and research and other organizations participating in the organics sector. Germany leads with a membership (members plus associates) of 72, followed by Malaysia, and the USA (Table 10).

Table 10: Membership of IFOAM (Data source: IFOAM, 2011)

Statistic	Country	Medal
72 members & associates	Germany	Gold
44 members & associates	Malaysia	Silver
42 members & associates	USA	Bronze

The organic sector relies on certifiers to endorse that products are produced to an organic standard. Worldwide, there are now 532 organics

certifiers, with only 10 certifiers reporting that they started before 1925. Three countries, Japan, USA and South Korea account for 22.0% of the world's organics certifiers (Table 11). Many countries, especially small and developing countries do not have their own certifiers and instead rely on foreign certifiers.

Table 11: Organics certifiers (Data source: Willer & Kilcher, 2011)

Statistic	Country	Medal
59 certifiers	Japan	Gold
57 certifiers	USA	Silver
33 certifiers	South Korea	Bronze

Organic Eprints (www.orgprints.org) is an open access archive of organics research and it is the largest depository of research papers on organics with 10,964 entries currently available (ICROFS, 2011). This digital archive is a project of the International Centre for Research in Organic Food Systems (ICROFS; www.icrofs.org). Fifty four countries are associated with contributed research papers in this data base. The leading contributor to this archive, based on the country of research affiliations, is Germany with 2937 contributions and accounting for 26.2% of the total entries. The three lead countries, Germany, Denmark and Switzerland, dominate the orgprints resource, together accounting for 63.2% of the entries (Table 12).

Table 12. Organics research papers (Data source: ICROFS, 2011).

Statistic	Country	Medal
2937 entries	Germany	Gold
2442 entries	Denmark	Silver
1615 entries	Switzerland	Bronze

Organic Olympiad Medals Tally: The results of Tables 1 to 12 are presented as an aggregated medal tally in Table 13. Twenty six countries are identified as organics leaders, each scoring at least a single medal. In this Olympiad, 36 medals are in contention. No country scored more medals than Malaysia which achieved a total of four (Table 13). For each country appearing in the medal tally, a weighted score is presented, with the following weightings applied to medals: Gold = 3; Silver = 2; Bronze

= 1. Thus, for this Olympiad, there are a total of 72 points in contention. No country scored more than a weighted score of nine (Table 13). Three gold medals put Germany in the lead in the Organics 2011 results, and Malaysia with four medals secured the second place, followed by Denmark in third place with two medals (Table 13).

Table 13: Organics Olympiad 2011 medal tally: listing of organic lead countries, ranked by weighted total score (Based on 12 indicators; Tables1-12). *Countries with equal rankings are tabulated in alphabetical order.

Weighted Score	Medal Tally	Bronze	Silver	Gold	Country	Ranking*
9	3	0	0	3	Germany	1
2	4	1	2	1	Malaysia	2
5	2	0	1	1	Denmark	3
4	3	2	1	0	USA	4
3	1	0	0	1	Taiwan	5
3	1	0	0	1	China	5
3	1	0	0	1	Falkland Islands (Malvinas)	5
3	1	0	0	1	Finland	5
3	1	0	0	1	Japan	5
3	1	0	0	1	Portugal	5
3	1	0	0	1	Uruguay	5
3	2	1	1	0	Switzerland	12
2	1	0	1	0	Argentina	13
2	1	0	1	0	Bangladesh	13
2	1	0	1	0	Brazil	13
2	1	0	1	0	Chile	13
2	1	0	1	0	Italy	13
2	1	0	1	0	Liechtenstein	13
2	1	0	1	0	Uganda	13
2	2	2	0	0	Austria	20
1	1	1	0	0	Cameroon	21
1	1	1	0	0	Ecuador	21
1	1	1	0	0	Mexico	21
1	1	1	0	0	Philippines	21
1	1	1	0	0	Russia	21
1	1	1	0	0	South Korea	21
72	36	12	12	12	Totals	

With 36 awards in contention in this Olympiad, there are 26 ‘winners’ with the majority of these (N=20) scoring a single medal, and the remainder scoring two medals (N=3), three (N=2) or four (N=1) (Table 13). Countries ranging from big, such as Russia, China and Taiwan, to small, such as Liechtenstein and the Falkland Islands (Malvinas), are

represented. The countries identified in this Olympiad as organics leaders are broadly distributed across geo-regions: Europe (N=9, counting Russia); Asia (N=6); South America (N=6, counting the Falklands); Africa (N=2); North America (N=2), and Oceania (N=1).

Discussion and Conclusion

An Olympiad is, firstly, an opportunity to identify, recognize, credit and honor the reigning champions in a field of endeavor and, secondly, an opportunity to challenge and inspire aspirants to emulate and surpass the reigning leaders. The Organics Olympiad presents an overview of global organics leadership and demonstrates that organics leadership is broadly and diversely distributed, not just geographically but also culturally, linguistically, and with countries rich and poor, large and small, and developed and less developed all represented. Such diversity augurs well for the health and future of the ‘organics project’. Many countries and regions have set targets for conversion to organic agriculture, and such goals are generally configured in terms of the percentage of organic, versus total, agriculture (Table 7). France has set a goal to be 20% organic by 2020 (Lichfield, 2007). Brazil has set a goal of 20% organic by 2012 (IFOAM, 2005) which is now looking increasingly unlikely given that the current level is a mere 0.67% (Willer & Kilcher, 2011), although Brazilian organics exports have tripled in three years (Biofach, 2010). The Malaysian states of Kerala and Sikkim have both set the bar high with declared aims of achieving 100% organic (Chamling, 2010; Vijayan, 2007). For the UK, the Soil Association has proposed the goal of “Organic by 2050” (Soil Association, 2009) and that would certainly earn a place for the UK in a future Organics Olympiad. However, currently, the UK organics sector is in retreat in terms of the organics retail spend which shrank 13.6% in the past year (Soil Association, 2011), although the hectares under organic management continue to increase (Willer & Kilcher, 2010, 2011). Germany is the overall organics leader in this Olympiad, which suggests that it is a good and useful model

for aspiring countries and regions to consider. Germany presents a balance of research, production, consumption, market availability, and government support to be envied, and more importantly, emulated. Woody Allen is quoted as saying that “eighty percent of life is showing up” (Boedeker, 2002), sometimes varied as “eighty percent of success is just showing up”, and this certainly applies to an Olympiad. The present study relies on what data are available, as well as on their veracity, currency, and completeness, none of which can be guaranteed, although they can reasonably be taken as indicative. The collection of organics data relies on regional and national NGOs with limited resources and varying capabilities for data collection. The statistics for the global organics sector are evolving in sophistication, but they remain incomplete, there is some reliance on estimates, and there is a lag between collection and reportage. For the present Olympiad, for example, there is no statistic of organics producers in China in the data set used (Willer & Kilcher, 2011) although this figure can be expected to be considerable, and no statistic was available for biodynamic hectares in Taiwan in the data set used (Demeter, 2011) although there has been a biodynamic farming presence in Taiwan since 1922. Global organics leadership, based on the twelve indices here, is demonstrably diverse and distributed. In the set of 26 organics leaders, nation’s large and small, rich and poor, and representing a diversity of geographical regions, political regimes, economic systems, and ecological spaces are present. This is evidence of the successful diffusion of the organics meme and suggests that the organics sector has strong prospects for survival and continued growth. The successful global diffusion means that lessons can be available from a diversity of social, geographical, political, and ecological situations. There is a business maxim that advises: ‘Find out what the winners do, and do that’. Apart from informal sharing of information and experiences, as well as the formal sharing of information at conferences such as the triennial World Organic Congress, the research archive of the International Centre for Research in Organic

Food Systems (ICROFS), orgprints.com, serves as a depository of shared organics experiences, scholarship and learning (Table 12). Of the 10,964 entries in the orgprints.com database (ICROFS, 2011) most are open source and offer a free resource to all. The orgprints.org archive offers the opportunity to be profitably mined by those countries and regions aspiring to organics leadership, as well as by those seeking to maintain or enhance their own leadership positions as revealed in the present study, plus those setting and achieving their own goals. Underlying the results of the present study are 26 success stories, any of which might be usefully explored by those countries and regions aspiring to leadership.

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