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## **Organic agriculture in Iran: Farmers' barriers to and factors influencing adoption**

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### **Abstract**

Organic agriculture is being promoted in Iran to address environmental problems resulted from the use of chemical materials in agriculture. Despite many advantages of organic agriculture, the results of several case studies show that its adoption rate is still very low among farmers. The purpose of this paper is to review previous studies that investigate the main factors influencing and challenges of adopting organic agriculture. The review included journal articles and conference papers from 2007 to 2012. The results showed that Iranian farmers have strong motives for the adoption, yet face challenges in certifying, marketing, access to reliable technical information, and credits. Given the review of factors that govern farmers' adoption of organic agriculture, key mechanisms for promoting farmers' adoption are discussed. Further research is needed to learn how to bring these mechanisms into play in Iran.

**Key Words:** organic agriculture, renewable agriculture, sustainable agriculture, farmers' attitude, small-scale farming

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## **Introduction**

Organic agriculture (OA) is a production system that sustains the health of agro-ecosystems and people<sup>1</sup>. Organic operation can contribute to a sustainable food production system<sup>2</sup>, improve the employment opportunities, especially for women<sup>3</sup>, improve household food security<sup>4</sup>, enhance biodiversity<sup>5</sup>, and contribute to agricultural development<sup>6</sup>.

Many countries promote OA to avoid facing larger problems with unsafe food supplies, health problems, unsustainable agri-rural development, environmental degradation, among others<sup>7</sup>. In Iran, the advantages of organic farming are widely appreciated by different stakeholders including policy makers, extension workers, and researchers<sup>8</sup>. However, despite the rapid growth of OA in much of the developed world<sup>6,9,10</sup>, the expansion of OA in developing countries, including Iran, has been much slower than the developed world<sup>7</sup>. Only one-third of the world's organic agricultural lands —12.5 million hectares— are located in these countries<sup>11</sup>. In such countries, certified organic food productions are generally limited<sup>12</sup>. Similarly in Iran, organic agriculture lands comprised 7,256 hectares in 2010. The key organic products in Iran consisted of pistachio (1,382 ha), wheat (1,156 ha), rose (900 ha), fig (780 ha), raisin (700 ha) and date (595 ha). In 2011, more than 95 percent of organic products in Iran were exported to European countries<sup>13</sup>.

The first Iranian national plan to promote sustainable agriculture was initiated in 1995, entitled Optimal Utilization of Fertilizers and Pesticides. The plan was a ten-year program aimed mainly at decreasing poisonous residuals in agricultural products. The plan could not achieve its goals after ten years, largely because of the low participation of farmers<sup>14</sup>. The process of the OA promotion is still in its early stages in Iran. IPM/FFS (Integrated Pest Management/Farmers Field School) are recognized as

extension approaches for promoting organic agriculture. High-level IPM (i.e., preventive practices to control pests) is considered a first step in promoting organic farming systems. The majority of farmers who are involved in the IPM/FFS projects in Iran are increasingly shifting to OA<sup>15,16</sup>. Consequently, the IPM/FFS sites have been established in pilot farms throughout the country in search for more participatory approaches for the dissemination of OA<sup>17</sup>.

Despite the important impact of the IPM/FFS initiatives, the results of case studies<sup>17-20</sup> show that farmers have not adopted sustainable and organic farming practices entirely. What makes it difficult for policy makers and practitioners to promote OA in Iran is that Iranian farmers' motives and challenges towards adopting OA are still unclear. Because the issue has only recently come to the researchers' attention, there are few qualified research studies<sup>19</sup>. In addition, these studies have mostly considered experts' attitudes towards the dissemination of OA, not those of farmers. Finally, the case studies on farmers' attitude reported from different areas lack methodological consistency.

The purpose of this review was to identify and summarize previous studies on Iranian farmers' attitudes towards OA, with the aim of drawing a comprehensive picture of the issue. Furthermore, this article aims to identify mechanisms that may stimulate the adoption of organic practices among farmers.

## **Methodology**

Case studies were reviewed to identify factors that influence farmers' decision to adopt OA practices (e.g., biological pest and weed control, composting, cover cropping, green manuring and green leaf manuring, intercropping, living fences, microbial bio-fertilisers, multi-cropping, and multipurpose trees). The main keywords used to obtain

the documents were “organic agriculture” and “organic farming” followed by a combination of “farmers’ attitude”, “farmers’ adoption”, “farmers’ challenges” and “IPM/organic”. IPM was included, because as mentioned previously, IPM/FFS have been the main mechanisms to foster OA through participatory tools in Iran. Among the articles, quantitative studies were selected which used questionnaires to determine farmers’ barriers to and motives for adopting IPM and organic practices. Some inclusion and exclusion criteria<sup>21</sup> were used to conduct a more focused search. Inclusion criteria included studies that contained information about the adoption of OA practices, and assessed farmers’ point of views. Abstracts or unpublished studies were excluded from the review. The date of released documents, which were either in English or Persian, was limited to the five years (2007-2012). The data were obtained from four possible databases: Scholarly journals in Persian (n=13), Scholarly journals in English (n=6), Iranian conferences in Persian (n=12), and International conferences in English (n=3). Key findings of each study considered were those statistically significant factors affecting farmers’ attitude. Most articles used case study or survey methodology.

## **Results**

Among the 34 reviewed studies, some discussed the farmers’ barriers of adoption, some addressed their motives for adoption, and others investigated both. The following presents our findings about the farmers’ barriers to and their motives for the adoption of OA.

### *Farmers’ Barriers*

Table 1 describes the most important barriers of Iranian farmers to the adoption of organic farming.

### **Table 1**

**Certification.** Some studies on the barriers of adopting OA in Iran found that certification is one of the main challenges for farmers<sup>19,22-25</sup>. This has been mentioned as a critical challenge for farmers in many other developing countries as well<sup>21</sup>. According to the international rules, each farmer has to be inspected annually. In Iran, there are no national certification bodies that may verify organic products officially<sup>25</sup> and farmers have to utilize international certification bodies. In Iran, where 80 percent of farmers are small-holders, such a certification system is realized extremely expensive<sup>26</sup>. Some authors proposed establishing a national institute for the certification of organic products<sup>25,27</sup>. Mahdavi-Damghani<sup>26</sup> proposes a group certification system as an alternative way, in which farmers' groups consisting of a hundred to several thousand small-scale producers will be co-certified as a unit. Despite the differences amongst experts, there is consensus that certification is a barrier for the adoption of OA among Iranian farmers.

**Market.** Despite the global expansion of the market for organic products, it is still expanding very slowly in Iran<sup>25,27-31</sup>, as in many developing countries. This is partly because organic products are more expensive than other products<sup>32</sup> and the majority of Iranian people cannot afford organic products<sup>25,33</sup>. Therefore, farmers are not sure whether they can sell their products in the national market<sup>28</sup>. Sari and colleagues<sup>32</sup> suggest that to overcome this challenge, the government should establish specific sites for selling organic products. This will decrease the costs of marketing for producers and therefore, the price of organic products. Furthermore, sufficient information about the

benefits and standards of organic products is not available to both producers and customers<sup>55</sup>. Lastly, certification systems are considered by some authors as the root of many challenges for marketing organic products<sup>23,24</sup>.

**Knowledge and information.** Lack of knowledge and information is reported by many researchers as a barrier to the adoption of OA in Iran<sup>17,24,25,27,31,15,34</sup>. Knowledge and information barriers relate specifically to market<sup>25</sup>, and technical and financial issues<sup>20</sup>. Bello<sup>26</sup> believes that farmers in many developing countries lack technical information about farming practices, production and marketing methods such as choosing products to grow, identifying different markets and distribution channels, competition strategies, and market access.

**Workload and costs.** Previous studies have shown that organic farmers have greater labour needs compared with conventional farms<sup>20,27</sup>. Since many activities, such as weeding, are done manually in OA, there is a need to recruit more workers<sup>20</sup>. Additionally, OA can require more facilities for transport and storage, which are quite costly for farmers<sup>25</sup>. Moreover, the transition period to OA might be costly. Wossink and Kuminoff<sup>36</sup> consider that a farm in transition from conventional to organic needs to keep rigorous records for three years before being fully certified an additional cost for farmers.

#### *Influences on Farmers' Adoption of OA*

Despite the barriers, there are factors that influence the adoption of OA practices by Iranian farmers. Findings are summarized in Table 2.

**Table 2**

**Experience.** Some studies show that more experienced farmers with a higher level of informal knowledge are keener to learn about sustainable farming practices<sup>18,15,37,38</sup>. The traditional agriculture of Iran is a great deal like OA in many ways<sup>8</sup>. Mahmoudi and colleagues<sup>5</sup> believe that almost all practices and processes in the traditional agro-ecosystems of Iran are compatible with organic agriculture<sup>5</sup>. Therefore, years of experience in traditional agriculture can support farmers to appreciate and more easily adopt OA practices. Moreover, such an experience provides them with increased knowledge about the environment in which decisions for adopting OA must be made<sup>39</sup>. This seems to be a rather unique finding among developing countries.

**Age.** Age is positively correlated with experience in some studies<sup>39</sup>. Evidence shows that in Iran, older and more experienced farmers have a more positive attitude towards OA and IPM<sup>18,38,40</sup>. Although few studies show that younger farmers are less risk adverse and may adopt organic practices sooner<sup>10</sup>, some research has found that both groups of experienced and younger farmers who participate in extension programs (especially IPM/FSS) are more likely to adopt organic practices<sup>38,40,16</sup>.

**Gender.** The term “feminization of agriculture” is becoming a cliché that refers to the significant role that women play in the agricultural sector<sup>41</sup>. Some studies show that women are generally more willing to adopt organic practices<sup>37,42</sup>. OA supports gender equality because it creates meaningful work, offers economic opportunities for women, encourages biodiversity and traditional knowledge, and ensures equitable work standards<sup>43</sup>. According to Kang<sup>44</sup>, women are the major stakeholders in OA because,



over decades, the socio-economic and health statuses of women in farming communities have been adversely affected by conventional farming technologies and policies.

**Education and knowledge.** Both scientific and indigenous knowledge influences farmers' attitude towards organic adoption. The positive impact of farmers' education on adoption was found by Omani and Chizari<sup>45</sup>, Razzaghi-Borkhani and colleagues<sup>40</sup>, also and Sadati and colleagues<sup>10</sup>. Generally, educated farmers can acquire technical information more easily<sup>39</sup>. Farmers' education is identified as an influencing factor on organic adoption in other developing countries as well<sup>46</sup>. Behrad-far and Farzania<sup>47</sup> believe that in OA, modern knowledge is not in contradiction with traditional knowledge, but is complementary to it. Sofia and colleagues<sup>48</sup> explain that organic farming has been practiced since ancient times. As such, the values and principles of OA, including the principle of health, ecology, fairness and care<sup>49</sup> are in line with the traditional beliefs and values of farmers.

**Income, yield, and land area.** Organic farmers can experience an increase in production costs because of the introduction of labour-intensive technologies. In addition, farmers face new costs related to certification and transportation<sup>50</sup>. Therefore, higher incomes might facilitate the adoption of OA by farmers. According to Kassie and colleagues<sup>41</sup>, wealth affects adoption decisions, since wealthier farmers have greater access to resources and may be better able to take risks. Similarly in Iran, some studies<sup>10,42,45</sup>, Ghorbani and colleagues<sup>51,52</sup> show that farmers with higher incomes and larger farms are more likely to adopt OA. Yield is associated with income and land area in many small farms, and influences the adoption of OA<sup>29,45</sup>. These factors seem to be common around the world in regard to the adoption of OA<sup>50,53</sup> and other innovations<sup>54</sup>.

**Extension services and communication.** Many studies<sup>19,15,16,42,51,55</sup> show that the Iranian farmers' participation in extension programs will enhance their tendency to adopt organic farming practices. However, Behrad-far and Farzania<sup>47</sup> found that extension workers in Iran are generally not sufficiently capable of providing assistance with organic methods. To overcome this deficiency, FFS programs have recently been launched and are considered as the best training methods for farmers interested in organic agriculture<sup>53</sup>.

Some studies<sup>10,15,40</sup> show that by increasing farmers' access to information and communication technologies, they are more likely to adopt organic practices. Organic farmers should develop their communication skills to increase their access to the information about the latest achievements in agriculture. Furthermore, technical assistance should take into account farmers' communication needs in Iran<sup>15,40</sup>.

**Farmers' membership in cooperatives.** A few studies<sup>15,56</sup> show that farmers' membership or relationship with cooperatives increases their likelihood to adopt organic practices because they have better access to resources such as credit and extension services<sup>57,58</sup>. Moreover, when a cooperative adopts OA, it attempts to generate information that allows contracting, production and marketing planning, communication, and monitoring, in order to keep organic production costs at a low level<sup>59</sup>. This is in line with findings from Ethiopia<sup>46</sup> where the household's membership in farmers' organizations increased the likelihood of practicing organic techniques.

**Government support.** Studies<sup>29,15,51,32,52,60,31</sup> also show that governmental support can be very critical in generating positive attitudes in farmers to adopt organic practices. According to Mahmoudi and colleagues<sup>61</sup>, it remains the responsibility of governments

to change the attitude of farmers toward OA and encourage them to produce organic products. Such support can be provided in five areas, including organic food production at the farm level, processing and marketing organic foods, out-of-home consumption, consumer information, and cross-cutting measures such as research and development<sup>62</sup>. The situation is the same in many developing Asian countries. According to Partap<sup>7</sup>, the governments in these countries are not providing minimum incentives to farmers, NGOs, small and medium-sized enterprises involved in OA. In Ethiopia, Kassie and colleagues<sup>46</sup> found that poverty limits OA adoption. This means those policies which aim at alleviating poverty can positively affect the adoption decisions.

**Farmers' attitude.** Some studies<sup>19,63</sup> confirm that farmers' attitudes towards organic farming influence their decision to adopt it. Iranian organic farmers strongly believe that organic production is harmless and healthier for both the environment and human<sup>38,64,60</sup>. Moreover, the long-standing values and beliefs of farmers are in line with the values of sustainable practices of organic farming<sup>37,63</sup>. However, traditional beliefs that are in line with OA practices are declining. It appears that Iranian farmers now have a mix of traditional and modern values that drive them to adopt some organic practices, and reject those which are not productive or diminish their income. For example, a study by Bagheri and Shahpasand<sup>64</sup> on potato farmers' attitude toward sustainable and organic agricultural practices shows that some farmers had a negative attitude towards using fewer fertilizers and pesticides, while their attitude towards some methods of securing sustainability such as soil and water conservation and crop rotation, for instance, was positive. These same attitudes can be found in other developing countries<sup>65</sup>.

## **Discussion and conclusion**

There is growing evidence that increased adoption of organic farming can offer numerous environmental, social and financial benefits, and lead to an alternative way to sustainability in agriculture<sup>2,66,67</sup>. The results of this study show that for Iranian farmers', there are some main challenges that slow down the process of adopting OA. These barriers include challenges in certification, market, access to knowledge and information, labour and costs. These barriers exist in many developing countries<sup>36</sup>. Among them, certification seems to be the most serious problem in Iran, in comparison to other developing countries, due to Iran's limited international communications and lack of national certification bodies.

In spite of these barriers, there are some factors that influence Iranian farmers' decision to adopt OA practices. Experience is one factor that influences farmers to adopt OA. Since most Iranian farmers are older and experienced<sup>15,56</sup>, such attributes can be regarded as an opportunity for the promotion of OA. Gender can also influence OA adoption, and studies found that women are better adopters of OA<sup>42,32</sup>. Knowledge from both types of formal (education) and informal (indigenous) sources also has a positive effect on the adoption of OA. Income, land area and productivity have positive impacts on farmers' adoption as well. Extension services are important in the promotion of OA, especially IPM/FFS programmes that apply participatory methods for disseminating OA. Findings show that those Iranian farmers more likely to adopt OA are those who have a more positive attitude towards OA; have access to communication technologies; are members of cooperatives; and are farmers supported by the government. Similar findings are reported in other developing countries<sup>26,46,68,69</sup>.

### *Implications for Current Practices on OA Adoption*

Taking the findings of the discussed case studies into consideration, we make four recommendations to increase the adoption of OA in Iran: (a) appreciating the Iranian farmers' role in the process of adoption, (b) rethinking extension programs, (c) realization of the women's facilitation role, and (d) appropriate governmental support.

**a) Appreciating the Iranian farmers' role in the process of adoption.** Most factors which drive farmers to adopt OA are directly related to personal attributes of "farmers" (e.g.: experience, age, gender, education, knowledge, and attitude). However, the development of organic farming is led by the Iranian government through top-down processes<sup>15</sup> that often disregard farmers' concerns and their characteristics. The critical issue is that in many extension programs at the rural level<sup>70</sup>, wealthy farmers are the focus of the programs, while poor and small farmers are often ignored.

**b) Rethinking extension programs.** Providing extension services to increase organic farmers' yield and supply natural inputs are necessary<sup>52</sup>. Among other extension initiatives, FFS programs have been reported as the most successful in facilitating the adoption of IPM technologies in Iran<sup>35</sup>. However, some studies show the unsatisfactory impacts of FFS programs, maintaining that they have been mainly successful in changing farmers' attitude and not their behaviour. Other studies show that it could not improve the farmers' collaboration over the long term. For example, a study by Etehad and colleagues<sup>15</sup> shows that, from farmers' point of view, FFS has been very effective in providing relevant information, but not linking farmers, researchers and extension agents to each other over the long term, because the farmers' collaboration and linkages

with research and extension are limited to the project duration, and collapse once the project ends<sup>14</sup>.

**c) Realization of rural women's facilitation role.** It is important to understand that women are not merely the adopters of OA, but can also be important facilitators and promoters of organic practices among farmers, processors of agricultural products, and their family. According to Partap<sup>7</sup>, all over Asia, women are taking a leading role in OA development—as farmers, as consumers, or as the organizers of the organic sector. For instance, in Thailand and Malaysia, many of the pioneer traders of organic products are women. In India, the organic movement receives much support and leadership from women self-help groups, NGOs, and individual entrepreneurs. Similarly in Iran, rural women are generally more willing to adopt organic practices and are the main customers of organic products<sup>32</sup>. However, support and extension services for rural women are very limited. Etehadi and colleagues<sup>15</sup> study on the effectiveness of IPM/FFS sites shows that only 11 percent of the participants were rural women. Men were also more satisfied by the IPM/FFS sites, which were originally planned for them. The main conclusion is that rural women's access to information and credit for organic production should be enhanced and an awareness of the importance of organic foods among rural women needs to be emphasized.

**d) Appropriate governmental support.** In the past, OA has been adopted without the support of governments and agricultural extension agencies in Iran. Especially in the early stages, farmers applied organic practices without any professional backup or infrastructure<sup>71</sup>. Today, the situation is different. Modern agriculture has resulted in the increased use of chemical inputs, causing adverse impacts on human health and the

environment<sup>15</sup>. Therefore, a critical role of the government is envisaged. According to Partap<sup>7</sup>, governments should consider providing direct incentives, rather than subsidies, to organic farmers. Moreover, there is a need to allocate resources and expertise to establish private institutions/agencies that can facilitate the adoption of OA. Such institutions can be managed by pioneer organic growers. Esmaili<sup>72</sup> proposes that organic farmers should receive specific insurance services as a support from the government. Such insurance should cover the first three years of transitional period, yield losses as a result of diseases, and market failure, among others.

Abdollahi<sup>73</sup> believes that government supports should include subsidies, long-term loans, the establishment of organic farmers' organizations, and facilitating farmers' access to information about technical issues of OA and marketing. Additionally, Yaghubi and Naseri<sup>74</sup> suggest that the government can ease the access of organic farmers to information through holding workshops and exhibitions on OA. The government can also support organic farmers in the domestic market by purchasing their products in advance before harvest. The policies for developing organic farming should be formulated in a way that allows a bottom-up approach<sup>75</sup>.

#### *Implications for Future Research*

The recommendations proposed in this article are expected to improve the rate of the OA adoption. Further research is needed to address how best to bring these mechanisms into practice. For instance, there is a need to assess the governmental supports for organic farming at the farm level. Moreover, the role of rural women, and their challenges and opportunities in adopting and promoting organic farming, should be studied. The effectiveness of existing extension methods for fostering OA should be

assessed on the bases of “region-case” and “crop-case”. Finally, future studies could address the weight of the different applied criteria in this study to come up with further insights into the decision making process, why farmers decide for or against the adoption of organic agriculture.

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