

**Is Quinoa a Solution for Food Security and Economic Growth in  
Bolivia?**

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## **ABSTRACT**

Bolivia is the world's largest producer of the superfood, quinoa. Quinoa is grown almost exclusively in the rural, mountainous parts of the country in relatively the same way for the last 5000 years. Since the 1970's, when quinoa was “discovered” by anthropologists and sociologists studying indigenous cultures, demand has increased throughout Western Countries. This demand has provided economic benefits to Bolivia there have been social and environmental costs that might outweigh allowing further industrial development of the quinoa industry. This paper discusses if granting intellectual property rights is a solution to ensure indigenous Bolivians benefit from their traditional knowledge of quinoa and if quinoa is actually aiding in Bolivia's economic growth.

## 1. INTRODUCTION

The explosion in the world's population requires a way to provide healthy, nutritional food to people. A possible answer to the question of food security may lie in a traditional Bolivian crop, quinoa. Bolivia is one of the world's poorest countries suffering from deep social divides.<sup>1</sup> The richer, urban, minority owns much of the land and wealth while indigenous groups make up the majority of Bolivia's population and live in poverty in the rural areas which is where most of Bolivia's quinoa production occurs.<sup>2</sup> The World Health Organization, using statistics from Bolivia's 2006 Census found that 63% of the population did not bring in enough income to support its basic needs and 35 percent of that group lived in extreme poverty.<sup>3</sup> Income disparities in Bolivia are large; the income of the wealthiest twenty percent of the population is thirteen times higher than that of the poorest twenty percent.<sup>4</sup> According to the Food and Agriculture Organization of the United Nations, "[t]he majority of [Bolivia's] population relies on the agriculture sector for their livelihoods; 85 percent of farmers can only produce at subsistence levels, and 40 percent of the population cannot earn enough money to meet their basic food needs."<sup>5</sup> Many proponents of indigenous rights argue that increasing production of traditional crops that are in demand, like quinoa, will economically enfranchise the poorer indigenous groups.<sup>6</sup>

Quinoa has been praised for allegedly ending hunger in Bolivia and fueling economic growth but some argue there is no connection between quinoa production, sale of quinoa and malnutrition in the country.<sup>7</sup> One of the more popular arguments is if indigenous Bolivians could patent quinoa it would further increase economic growth and

decrease malnutrition.<sup>8</sup> When compared to the repercussions of increased production, the benefits quickly disappear.<sup>9</sup> Currently, there exists too little evidence to make a definitive conclusion of whether increasing quinoa production would end Bolivia's food security concerns and solve malnutrition issues. Additionally, international law may not allow for a patent on quinoa and even if it did, there are a number of concerns about how it would be enforced and how profits from the patent would be distributed.

## **2. WHAT IS QUINOA?**

A pseudo grain, quinoa is more closely related to beets and tumbleweed than wheat. Id. An incredible hardy plant with various subspecies, quinoa is grown along the coastal regions of South America to 13,000 feet up in the Andes of Bolivia.<sup>10</sup> Quinoa is naturally tolerant to such a large number of abiotic stresses, or natural environmental factors<sup>11</sup>. Varieties of quinoa have been adapted to suffer through frost, drought, high heat, and nutrient-deficient soil.<sup>12</sup> There are many varieties of quinoa, only a few types are exported to the United States and most of them are of a similar genome.<sup>13</sup>

Indigenous Bolivians have adapted varieties of quinoa to survive on mountains with thin soil and high winds, but it can be modified and grown to live in most types of soil and weather conditions.<sup>14</sup> More importantly, quinoa grows best in low nutrient soil.<sup>15</sup> Developing countries could potentially use quinoa to provide sufficient nutrition to their populations as opposed to the inefficiencies of using large tracts of land to raise livestock. As the tables below indicate, quinoa is more nutritious than other types of grains and

provides nutrients animal-derived products do not. If a town or city needs to decide whether to plant quinoa or leave land fallow in order to graze animals, there is a good argument that the quinoa will provide more nutrients for the land used. There is less protein than in meat, quinoa also provides carbohydrates and far less fat; important for a country where many people work in the agricultural sector.16

| <b>Components of quinoa compared with other major foods and products</b>               |        |       |       |        |            |            |
|--|--------|-------|-------|--------|------------|------------|
| <b>Comparative table of components of quinoa with those of other major foods (kgs)</b> |        |       |       |        |            |            |
| Components (%)   | Quinoa | Meat  | Eggs  | Cheese | Cows' milk | Human milk |
| Proteins   |        |       |       |        |            |            |
| Fats   | 13.0   | 30.0  | 14.0  | 18.0   | 3.5        | 1.8        |
| Carbohydrates  | 6.1    | 50.0  | 3.2   | -      | 3.5        | 3.5        |
| Sugar  | 71.0   | -     | -     | -      | -          | -          |
| Iron   | -      | -     | -     | -      | 4.7        | 7.5        |
| Calories   | 5.2    | 2.2   | 3.2   | -      | 2.5        | -          |
| 100 grs  | 370.0  | 431.0 | 200.0 | 24.0   | 66.0       | 88.0       |
| <b>Table comparing components of quinoa with those of other products (kgs)</b>         |        |       |       |        |            |            |
| Components (%)   | Quinoa | Wheat | Maize | Rice   | Oats       |            |
| Proteins   | 13.0   | 11.43 | 12.28 | 10.25  | 12.30      |            |
| Fats   | 6.70   | 2.08  | 4.30  | 0.16   | 5.60       |            |
| Fiber  | 3.45   | 3.65  | 1.68  | -      | 8.70       |            |
| Ash  | 3.06   | 1.46  | 1.49  | 0.60   | 2.60       |            |
| Calcium  | 0.12   | 0.05  | 0.01  | -      | -          |            |
| Phosphorus   | 0.36   | 0.42  | 0.30  | 0.10   | -          |            |
| Carbohydrates  | 71.0   | 71.0  | 70.0  | 78.0   | 60.0       |            |

Source: Castiñeria and Lozano.

| Composition of quinoa grain in relation to wheat and oats<br><b>Components</b> | <b>Royal Quinoa</b> | <b>Wheat</b> | <b>Oats</b> |
|--|---------------------|--------------|-------------|
| Calories   | 336.0               | 330.0        | 405.0       |
| Water  | 10.8                | 16.5         | 9.3         |
| Proteins   | 12.1                | 9.2          | 10.6        |
| Fats   | 6.1                 | 1.5          | 10.2        |
| Carbohydrates  | 68.3                | 71.6         | 68.5        |
| Fiber  | 6.8                 | 3.0          | 2.7         |
| Ash  | 2.7                 | 1.1          | 1.5         |
| Calcium  | 107.0               | 36.0         | 100.0       |
| Phosphorus   | 302.0               | 224.0        | 321.0       |
| Iron   | 5.2                 | 4.6          | 2.5         |
| Thiamine   | 1.5                 | 0.2          | 0.0         |
| Riboflavin   | 0.3                 | 0.8          | 0.0         |
| Niacin   | 1.2                 | 2.8          | 0.0         |
| Ascorbic acid  | 1.1                 | 0.0          | 0.0         |

Source: PROCISUR-ICCA, 1997

### **A. BOLIVIA'S HISTORY WITH QUINOA**

Not only does quinoa provide a similar amount of energy, in calories, as other grains, but it provides more nutrients and, as a native species to Bolivia, grows much better than other grains. The issue of food security in developing countries is not a new one. Bolivia has suffered since it was first colonized in the early 1500's and traditional foods were repressed as part of native culture.<sup>17</sup> In attempting to erase native culture and cuisine, the colonists sowed the seeds of Bolivia's food security issues; native crops grow much better than European grains in the country's sandy soils. In the mid-1980s, scientists and anthropologists studying indigenous crops in Bolivia became interested in the potential of quinoa.<sup>18</sup> Used for thousands of years by the Inca, varieties of quinoa survived the European colonization and continued to be grown by natives across Bolivia.<sup>19</sup> When mixed with legumes and simple vegetables, quinoa provides the human body with amino

acids and proteins that normally require animal products to obtain.<sup>20</sup>

Royal quinoa is the most popular quinoa exported to the United States and Europe.

<sup>21</sup> Compared to other grains, quinoa is more nutrient dense and due to its bitter shell that is removed during the industrial agronomic process before export, quinoa is protected against

pests that can destroy other grains.<sup>22</sup> The roughly 2mm quinoa seed is packed with essential amino acids and proteins which can be cooked when separated from the rest of the plant. Bolivians have been living off quinoa for thousands of years because the limited

availability of open land makes sustaining livestock and grains difficult.<sup>23</sup> It can be toasted, used as flour, made into drinks or soups, and if dried, can be stored up to ten years.

<sup>24</sup> Despite its known benefits and rising value in international markets, quinoa remains the least produced crop in Bolivia:

| <b>The most important crops in Bolivia (1998-1999) CROP</b> | <b>SURFACE AREA (ha) [hectare]</b> | <b>PRODUCTION (MT)</b> |
|---|------------------------------------|------------------------|
| Soya  | 632,255                            | 762,200                |
| Corn in grain form  | 282,306                            | 613,161                |
| Wheat   | 166,795                            | 140,594                |
| Rice  | 127,740                            | 189,388                |
| Potatoes  | 119,757                            | 783,323                |
| Sugar cane  | 89,629                             | 4,159,869              |
| Barley in grain form  | 87,265                             | 56,180                 |
| Quinoa  | 34,168                             | 22,027                 |

Source: Ministry of Agriculture and Rural Development, Statistics Department 2000.

In “1997 the gross production value of quinoa represented \$14.6 million, equivalent to 1.6% of the gross value of agricultural production as a whole.”<sup>25</sup> Additionally, “the prices paid per metric tonne (MT) of organic quinoa in European and US markets are high

(US\$ 18.9 per quintal (1 quintal = 46 kg), up to five times higher than the international price for soya per metric tonne (Crespo et al. 2001), which provides a very favourable economic advantage compared with many other crops, thus opening up considerable opportunities for being a very competitive and efficient chain of production.”<sup>26</sup> Currently, “Bolivia is the biggest producer of quinoa, with 46% of world production, followed by Peru with 42% and the United States with 6.3%.”<sup>27</sup> If Bolivia's government implements policies to expand quinoa production in a sustainable manner, it could create a niche in the global market for quinoa production and allow the Bolivian economy to grow drastically.<sup>28</sup>

### **3. ECONOMICS AND THE ENVIRONMENTAL IMPACT OF INCREASED QUINOA DEMAND**

It is unlikely that a patent on quinoa would be enforceable globally but there is the potential that Bolivia can still fuel its economy by increasing production of quinoa. Without an appropriate management plan to market and sell quinoa, the possibilities of environmental damage drastically increase.<sup>29</sup> The issue of economics and environmental impact are so closely related in Bolivia that one can hardly be discussed without the other. With an increased demand for quinoa, the need to increase production causes increased pressure on the environment.<sup>30</sup> To prevent the negative impact that increased production will likely cause, the Bolivian government needs to pass legislation to sustain the land resources that are available. Instead of allowing myopic policies like the use of pesticides, slash and burn agriculture and heavy machinery to maximize short term profits, traditional sustainable methods should be utilized.<sup>31</sup>

Prior to the 1970s, the goal of agriculture in Bolivian society was not to maximize

yield but to manage, conserve, and improve the land for future generations.<sup>32</sup> Pesticides were not known and therefore not used by farmers, although, “[s]ome farmers used natural extracts based on muña, tholas, etc.<sup>33</sup> In addition, the form of use of the soil and of the crop did not favour the proliferation and multiplication of pests”.<sup>34</sup> Farmers planted different varieties of quinoa on the same plot at different times in the season so that losses due to abiotic factors stayed to a minimum.<sup>35</sup> Soil management was traditionally a major focus as well “such as minimal or no ploughing, manual work using proper tools for the different areas, work in restricted areas, the construction of terraces, management of river courses for the formation of alluvial soils, the rotation of plots with resting periods of 4 to 6 years, and grazing on the stubble of previous crops.”<sup>36</sup> Environmental damage was kept to a minimum but production was mainly for the community with only a little being used to trade for other essential goods.

As demand increased internationally, farmers began to produce more quinoa and using traditional techniques were insufficient to grow the amount necessary. Increasingly, farmers turned to the use of heavy machinery, like rototillers to quickly create rows and sow seeds.<sup>37</sup> Producing as much as possible has become more important than sustainability; the use of heavy equipment causes roughly 70 metric tons/hectare/a year of lost soil in Bolivia.<sup>38</sup> Fields that were traditionally rested for 4-6 years are now overworked until nothing can grow and then abandoned creating desertification and sand dunes in once arable land.<sup>39</sup> Inability to farm the land forces Bolivians to migrate, hurts the long term economic strength of the area and adds to the instability of the food security in the area.<sup>40</sup> “According to the Ministry of Sustainable Development and Planning

(MDSMA), out of the country's 1,500,000 hectares of agricultural land, some 1,800,000 MT of soil are lost annually due to erosion, meaning that the productive capacity is gradually reducing.”<sup>41</sup> As more land is lost, the less arable land is available to ensure that Bolivians can produce enough food to feed themselves let alone export a sufficient amount to continue to grow their economy. The Bolivian government needs to take a greater role in ensuring that land is not overtaxed and overuse does not destroy future production.

Increased output can also lead to the standardization of quinoa in an attempt to maximize profits by selling one type of sought after grain.<sup>42</sup> Nearly 2950 varieties of quinoa seed have been found in Bolivia.<sup>43</sup> The types planted have dwindled to the extent that “96% of farmers cultivate between 1 and 4 ecotypes of Royal Quinoa per family and that the remaining 4% of the population of producers sow between 5 and 7 ecotypes per family.” This loss in diversity means that quinoa plants will be more susceptible to disease and the potential for entire crops to be lost is much higher. Where farmers used to mix up the types of quinoa grown the focus on one or two types in a crop can result in famine if a quinoa disease or bad harvest occurs.<sup>44</sup> As mentioned above, quinoa represents only 1.6% of the total sales of grains in Bolivia, an insignificant amount and it cannot be conclusively said that quinoa is fueling economic growth. <sup>45</sup>

The use of new technology needs to be incorporated with traditional methods in order to prevent desertification and ensure long term growth. Traditional methods were more sustainable because someone digging with their hands or shovels can't cause as much damage as quickly as a tractor. It is essential that technology be used to make life easier for Bolivian farmers but equally important that it be used wisely to maintain the land for the

future.

### **A. TRYING TO ANSWER THE ORGANIC QUESTION**

In the United States and Europe organic quinoa receives a much higher price than inorganic quinoa.<sup>46</sup> International standards for an organic rating make producing, manufacturing and exporting quinoa much more expensive.<sup>47</sup> Non-organic quinoa gets a price of \$.73 a kilogram while organic quinoa is around \$.93 a kilogram.<sup>48</sup> The organic label increases the sale price of quinoa, it also increases the costs of labor and input.<sup>49</sup> When mass producing organic quinoa “the prices paid per metric tonne (MT) of organic quinoa in European and US markets are high (US\$ 18.9 per quintal (1 quintal = 46 kg), up to five times higher than the international price for soya per metric tonne.<sup>50</sup> Quinoa is traditionally organic but meeting international standards and ensuring that output is large enough to make it worthwhile to export organic quinoa is difficult. Growing organic in sufficiently large quantities for export, based on the data, will result in greater costs for Bolivian farmers than exporting inorganic quinoa in similar quantities. Organic quinoa does fetch a greater price in international markets but Bolivia lacks the infrastructure to adequately capitalize and streamline the venture to make it profitable.

Part of the organic question is promotion of the crop domestically and abroad. As more quinoa is exported the more expensive it becomes and the less access Bolivians have to quinoa in their diet. Studies show that quinoa is making up fewer calories in Bolivians' diets over the past few decades. Quinoa has gone from contributing around 238 calories a day in 1988 to as little as 22 calories a day in 1998 in some areas.<sup>51</sup> The nature of the communities make the figures highly variable and there is the potential for inaccuracy.

Traditionally grown organically, the need to produce higher yields is resulting in less crop diversity and more use of agro-pesticides.<sup>52</sup> Going organic might demand a slightly higher price in international markets but the research shows that labor costs, land costs and production costs are too high to make it worthwhile to attempt to mass produce organic quinoa for export.<sup>53</sup>

## **B. STRUCTURAL DEFICIENCIES**

Domestically, the production and consumption of quinoa is not promoted or used by the state.<sup>54</sup> Also, “the necessary investments required to improve the technological aspects do not materialise because the current market conditions for financial services do not allow access to sources of finance.”<sup>55</sup> Bolivia, being such a poor country is having a difficult time finding capital to finance farmers because risks are usually high and profit, at least initially, is low.<sup>56</sup> A more basic problem is finding the basic needs for farming like irrigation, access roads and electricity.<sup>57</sup> Local governments are in charge of providing basic infrastructure but it currently costs twice as much to transport quinoa in the rural areas of the country than in the more developed areas.<sup>58</sup> Additionally, quinoa producers are for the most part individuals or communities producing what they can; “[a]round 70% of the quinoa producers... are independent producers.”<sup>59</sup>

Even if these independent producers form associations, the associations tend to act more like non-profits than business entities, limiting expansion.<sup>60</sup> Quinoa producers also are slow to change from their traditional methods of sale. Farmers continue to bring quinoa to the same markets and sell it at similar prices as they have for years.<sup>61</sup> This lack of business innovation is partly a result of tradition but largely due to a lack of knowledge of

international markets which is often enforced to ensure that prices are kept down in domestic markets.<sup>62</sup> Local and regional government need to become more actively involved in the process of growing and distributing quinoa

Processing quinoa is far more costly than other grains because of the need to remove the bitter, shell that surrounds each grain.<sup>63</sup> The industrial process is needed to remove the shells; it is too costly for a producer to do it on their own so costs for farmers are driven up further.<sup>64</sup> Since the quinoa needs to be “de-saponised” before it can be eaten, the cleaners have a monopoly over the process.<sup>65</sup> There are only five companies in Bolivia that have “de-saponization” plants and the quality of the finished product is well below the international standards needed for the mass sale of quinoa abroad.<sup>66</sup>

### **C. IS THERE A CONNECTION BETWEEN EXPORTING QUINOA AND MALNUTRITION IN BOLIVIA**

A New York Times article published March 19, 2011, declared that the export of quinoa was causing malnutrition rate<sup>67</sup>s in Bolivia to rise because Bolivians no longer could afford it. A few days later, an editorial letter demanding that Americans stop buying quinoa appeared on the editorial page.<sup>68</sup> Native rights groups and Bolivian quinoa organizations like PROPINA spoke out against the article and editorial on the grounds that not enough information existed to link the alleged social harm and the economic benefits.<sup>69</sup>

With the current information available it is nearly impossible to determine if increased production of quinoa is harming the Bolivian population. Evidence suggests that malnutrition is on the rise but there is no evidence that it is solely because of a decreased

consumption of quinoa.

## **5. DO INDIGENOUS BOLIVIANS HAVE PROPERTY RIGHTS IN QUINOA?**

Patenting and controlling quinoa exclusively would enable Bolivians to profit and ensure a food supply at affordable prices. On the other hand, companies argue that quinoa is the product of nature and so belongs to everyone.<sup>70</sup> Agro-Food giants, like Monsanto and similar companies are willing to invest millions of dollars into turning a profit on researching and selling quinoa.<sup>71</sup> If a company like Monsanto were able to patent quinoa in the United States, there is the possibility that the indigenous population of Bolivia could be enjoined from continuing to grow it. The United States Patent and Trade Office clearly expresses the concept: “The right conferred by the patent grant is: the right to exclude others from making, using, offering for sale, or selling the invention in the United States or importing the invention into the United States.”<sup>72</sup> The patent owner is granted a twenty year monopoly which is recognized internationally and included in Trade Related Aspects of Intellectual Property Rights (TRIPS), the governing World Trade Organization (WTO) international intellectual property agreement.<sup>73</sup> The inability to produce quinoa in Bolivia for twenty years would effectively destroy any attempts to use quinoa to build the economy.

Currently, “the World Intellectual Property Organization (WIPO), the Convention on Biological Diversity (CBD), United Nations Educational, and the Scientific and Cultural Organization (UNESCO), and a multitude of other international bodies are proposing new measures for the protection of Indigenous peoples' cultural property.”<sup>74</sup> The United Nations, even created a Declaration on the Rights of Indigenous Peoples:

“the United Nations Declaration on the Rights of Indigenous Peoples, which is regarded as a minimum standard for the rights of Indigenous peoples, recognizes that Indigenous peoples have the right to maintain, control, protect, and develop their cultural heritage, traditional knowledge and traditional cultural expressions, as well as manifestations of their sciences, technologies, and cultures, including... seeds, medicines, knowledge of the properties of fauna and flora...”<sup>75</sup>

Regardless of the above listed organizations and good intentions, the “traditional knowledge” of indigenous groups is still exploited globally.<sup>76</sup> Bolivia's Gross Domestic Product in 2010 was roughly \$19.37 billion (USD).<sup>77</sup> In comparison, pharmaceutical companies made \$43 billion, only thirteen percent of worldwide profits, from pharmaceuticals derived from plants used by indigenous groups.<sup>78</sup>

## **6. ISSUES WITH ALLOWING INDIGENOUS GROUPS INTELLECTUAL PROPERTY RIGHTS TO QUINOA**

As stated above companies argue that naturally occurring plants, like quinoa, are should be available for anyone's use. The process of using Bolivians' traditional knowledge to make profits has already begun. Quinoa Gold, a company based in Rhode Island, patented a quinoa-based drink and markets it as the “gold of the Incas”.<sup>79</sup> Quinoa Gold's site pushes the fact that it uses a “5000 year old secret” created by the Inca but does not mention anywhere on the site that Bolivians have been making drinks out of quinoa for the same time.<sup>80</sup> In order to receive a patent for an existing process, the patented product needs to take an “inventive step”.<sup>81</sup> It is likely because of the indigenous Bolivians' lack of a visible “inventive step”, or something to distinguish it from the naturally occurring plant no patent will ever be granted<sup>82</sup>. Quinoa evolved along with the Bolivian communities that used it; therefore no recourse is available in a court of law.<sup>83</sup> Quinoa

Gold has potentially spent millions of dollars on marketing and development of a product that is doing well in the United States market, possible even more because it does not have a patent registered on the USPTO website.

Bolivians have been making a quinoa drink called Mocola for thousands of years.

84 Quinoa Gold is the first company to mass produce a quinoa based drink in the United States. Courts have held that inventors who take the “inventive step”, change something so that it is not like the original, are able to patent and market the drink.<sup>85</sup> There may be a case if Quinoa Gold does attempt to get a patent on its beverage, but to this date nothing has been filed. Even if Bolivian groups did have an intellectual property sharing arrangement with a company like Quinoa Gold, once the patent expires, the “recipe” would go into the public domain where anyone could use it.<sup>86</sup>

Another argument made by companies looking to use indigenous knowledge to create new products is that innovation will be stifled if they can't use that knowledge to potentially manufacture something new.<sup>87</sup> In 1996, Scientists at the University of Colorado attempted to patent a number of varieties of quinoa as well as a hybridized form after working on seeds with local organizations and indigenous groups.<sup>88</sup> The University eventually let the patent application expire but it is one example of an international partner about to exploit the traditional knowledge of an indigenous group.<sup>89</sup> If the patent process had been completed the food security and the economy for rural Bolivians would have been at risk.<sup>90</sup> This situation, and others like it, has hampered international efforts to continue collaborative research between foreign research institutes and natives on quinoa.<sup>91</sup> US patent law is enforced internationally through treaties like the Madrid Protocols and TRIPS,

disadvantaging indigenous peoples.

Determining who would own a quinoa patent is another difficulty. The Bolivian government could manage the funds but the money might not go directly to the people who need it most. It would simply be a tax as opposed to revenue for intellectual property. If each indigenous group patents their own brand of quinoa then marketing would become difficult as groups competed with one another to sell their type of quinoa. This internal struggle would keep prices low and prevent money from being made which defeats the purpose of patenting quinoa. Much of the land isn't even owned by the indigenous people who live on it and grow the crops.<sup>92</sup> Does the money go to the land owner or the subsistence farmers living on the land? There are so many "brands" of quinoa that many share characteristics that showing an inventive step would be nearly impossible. Massive companies can more easily patent a product than indigenous groups because of their access to expensive technologies. Traditional knowledge is often ignored when it is used during the making of a new product especially if technology is involved. A "use of technology" showing is considered an inventive step, and there is no need to mention the traditional knowledge used in the new product's creation.<sup>93</sup>

## **7. CONSIDERATIONS AND COUNTERARGUMENTS**

The Patent Act, 35 U.S.C. § 101, defines patentable inventions as "[w]hoever invents or *discovers* any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title."<sup>94</sup> The United States Patent and Trade Office has found that "[t]he right conferred by the patent grant is: the right to exclude others

from making, using, offering for sale, or selling' the invention in the United States or 'importing' the invention into the United States."<sup>95</sup> It can be argued that Bolivians discovered quinoa and have since, over the past thousand years, made it new and more useful. The indigenous groups, by blending and domesticating quinoa so that the grains had a lower saponin<sup>96</sup> content have not "merely discovered quinoa but created something entirely new.<sup>97</sup> Legally, Bolivians are limited since traditional knowledge is not an individual property right and therefore, not patentable.<sup>98</sup>

A similar problem existed with the Neem tree in India. Pharmaceutical companies attempted to patent toothpaste, a traditional use of the tree, but were denied.<sup>99</sup> A patent was issued for pesticide derivatives to W.R. Grace & Co.<sup>100</sup> Indians became aware of the need to show that the knowledge for these products existed and so began translating ancient documents to prove to courts that these "new" products had been known for years and that the companies were coming in to profit from previously held knowledge.<sup>101</sup> Patent offices in India and most of the world, require that traditional knowledge be documented and published, not simply passed down by tradition.<sup>102</sup> The Bolivian government has already begun an effort to document every available type of quinoa produced in the country in an effort to protect indigenous rights.<sup>103</sup> The United States patent office has allowed patents to continue for Neem products, their European counterparts have terminated many of them on the grounds that the inventive step was not significant to distinguish the new product from the original.<sup>104</sup>

The Southern Hemisphere is disadvantaged by international intellectual property law regimes. Developed countries in the Northern Hemisphere create international trade

agreements that include the use of technology as a key indicator of a significant step towards patentability.<sup>105</sup> Southern Hemisphere countries are much less technologically developed and much of what they produced is based on traditional knowledge that is passed down, not in the technologies created.<sup>106</sup> Additionally, Bolivia and many third world countries lack funding to protect their intellectual property against international corporations. Legal disputes, filing patents internationally and creating a domestic structure to enforce patents takes time and costs money that poverty stricken countries do not have available.<sup>107</sup> Research and publication so that quinoa can be patented requires a massive amount of funding that simply does not exist in the Bolivian government's budget.<sup>108</sup>

## **8. CONCLUSION**

The international community, needs to better protect traditional knowledge so indigenous groups have an incentive to share. Indigenous groups rightly believe that if benefits are discovered from their traditional knowledge they will see none of the profits and be unable to afford and of the uses. A good example is medicines derived from traditional herbs. Hypothetically, if a company develops a drug from quinoa, the company will have a 20 year patent-derived monopoly and be entitled to all the profits. The Bolivians who had been farming the quinoa for thousands of years are not legally entitled to the profits or any bi-products derived from quinoa. If a medicine was developed, the Bolivians would be forced to purchase it even though it was their knowledge of quinoa that led to its use in the first place. Having any foreign group doing research on Bolivian quinoa sign a non-disclosure agreement might stifle business but it will benefit the country in the long run because the knowledge will remain Bolivia's. International law will not

protect a patent issued for quinoa so it is left up to the Bolivian government to ensure that indigenous groups are not exploited.

Quinoa is growing Bolivia's economy but obtaining property rights to quinoa is not a solution to ensure that this trend continues. The Bolivian government needs to pass and enforce laws that protect indigenous groups' traditional knowledge about quinoa from appropriated to their detriment. Policies to expand yield of quinoa needs to be sustainable and overseen from local government sources that can ensure national policies are being enforced at the local level. Quinoa can and will play an important part in building Bolivia's economy as long as the government plans ahead and does its best to ensure that profits go to farmers and land owners equally.

As for the issue of malnutrition, there is no simple solution. Maintaining lower prices from government subsidies in Bolivia and raising prices on the exports is a possibility. Something must be done to ensure that quinoa prices remain affordable in the country or people who need the nutrition that comes from quinoa will be unable to access it.

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