



F@RMLETTER

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F

Fighting hunger has been central to FAO's mandate since its creation in 1945. Hunger's multi-dimensional nature has led FAO to tackle the challenge of global hunger from various angles including, to name a just few, natural resource management, sustainable intensification of agriculture, food markets and

trade, and the identification of promising crops for the future. In the 1990s, FAO identified quinoa as a promising crop to contribute to world food security in the twenty-first century. Twenty years later, the United Nations declared 2013 as the International Year of Quinoa (IYQ). In his opening remarks before the UN General Assembly, FAO's Director General, José Graziano da Silva, called quinoa an "ally" in the fight against hunger and food insecurity. Indeed, there are two compelling reasons why quinoa can play a key role in fighting against hunger: a) its high nutritional value, and b) its hardiness and versatility, which allow the crop to adapt to harsh conditions, such as low temperatures, drought, and salinity. Furthermore, some quinoa varieties can grow at sea level, while others can grow at 4 000 meters above sea level.

Another of quinoa's distinct characteristics is the fact that the crop is grown almost exclusively by small-scale family farmers, who for generations have been the guardians of this "golden grain of the Andes", its biodiversity and traditional knowledge on how to plant and process it. Although beneficiaries of the IYQ are multiple and diverse, family farmers are one of the key target groups, as they very often have limited access to protein sources. In addition, the market's great dynamism poses particular challenges to the small-farm sector.

Over the past ten years, quinoa exports have increased significantly, from a mere 2 423 tons in 2002 to 37 035 tons in 2012, driven mainly by a fast-growing demand in developed countries (the United States alone accounted for 56% of world quinoa imports during 2008-2013). However, this rapid increase is not risk-free. Indeed, in trying to meet growing quinoa demand, it is possible that production changes may occur. These could include, for example, the favouring of monoculture, lower land rest periods, loss of traditional

“IN THE 1990s, FAO IDENTIFIED QUINOA AS A PROMISING CROP TO CONTRIBUTE TO WORLD FOOD SECURITY IN THE TWENTY-FIRST CENTURY. TWENTY YEARS LATER, THE UNITED NATIONS DECLARED 2013 AS THE INTERNATIONAL YEAR OF QUINOA (IYQ)”

technology and local knowledge, and greater use of external inputs, as well as the resurgence of quinoa pests. In addition, other potential risks are that family farmers might find it more attractive to sell their quinoa production, thus reducing their family's consumption of the crop and, in turn, deteriorating their daily diet. Furthermore, the fast-growing demand for quinoa could affect biodiversity if market demand favours only a reduced number of varieties. Finally, because quinoa is not included in the International Treaty on Plant Genetic Resources, it is possible that there will be an increase in the movement of unregistered germplasm.

The IYQ seeks to address all of these issues. Specifically, and among other objectives, the IYQ is intended to "raise awareness about the need for more sustainable cultivation practices in quinoa and to recommend enabling policies for promoting sustainable conservation and use worldwide".



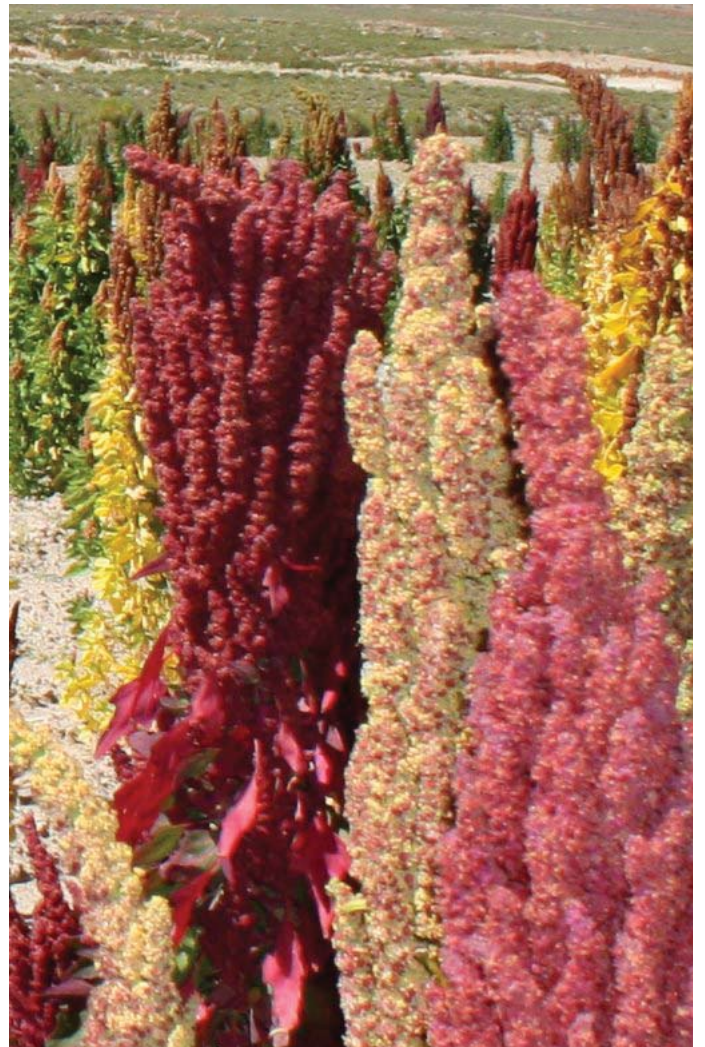
Quinoa

2013 International Year
A future sown thousands
of years ago

One of the forums in which quinoa specialists will gather to discuss these issues is the IV World Quinoa Congress, which will take place on July 8-12 in Ibarra, Ecuador. Over 600 participants from all over the world have registered, and they will discuss myriad topics including traditional knowledge, farmers associations, pest and diseases, biodiversity and quinoa genetic resources, food security, food uses, and several others.

Knowledge generation and exchange are also key objectives of the IYQ. Thus, after the IV World Quinoa Congress, other international symposiums will take place in the United States and Peru, organized respectively by Washington State University and Universidad La Molina, both leading institutions in the quinoa field.

Markets will undoubtedly continue to influence the quinoa sector and may try to shape it in undesirable or unsustainable ways. However, greater knowledge, such as that being generated and exchanged under the different activities of the IYQ, should help all stakeholders in the quinoa value chain make better and more informed decisions, thus counteracting the unwanted signals of the global market's "invisible hand". During the 2013 FAO Conference that took place this June, member countries decided to increase the intensity of one of FAO's goals: from reducing to eradicating hunger. This poses greater challenges for governments and society, especially in light of high population growth projections, the adverse impacts of climate change, and soaring and more volatile food prices. Thus, we cannot afford to lose time in making quinoa a true ally in the eradication of hunger. As we strive towards this goal, let us ensure that quinoa remains an inclusive and family-farmed crop.





CULTIVATING QUINOA

(Chenopodium quinoa)

A PRODUCER'S PERSPECTIVE

Daniel Sfasciotti

In Argentina, this grain is increasingly taking center stage, for a decade, because of nutritional value and geographical and agro climatic adaptability, and the fact that it can grow in conditions not very conducive for the rest of most traditional crops (cereals and oilseeds). On that occasion it was presented together with Amaranth and Chia, as the “New Old Crops” thanks to its long history and production. Quinoa, like amaranth, has been classified as a “pseudo cereal”, having characteristics similar to cereal grains. It is also called a “super cereal”, thanks to its high protein, calcium, phosphorus, iron, magnesium and vitamin content compared to other cereals.

FAO and WHO qualify it as a unique food and culture recommended for the future. The very high nutritional value can replace animal protein, and it contains a balance of protein and other nutrients ideal for humans, compared with other foods. A special niche market for quinoa is among the gluten-free and diabetic foods.

The greatest anti-nutritional factor of the grain is the content of saponins, detergents which form aqueous solutions. Its concentration in the outer layers of the grain facilitates its removal through industrial abrasive or traditional bead wash. Depending on the content of the saponins, it is classified as sweet or bitter.

Its history indicates that it was cultivated for more than three thousand years by the Incas in the Andean areas of Peru, Bolivia, Ecuador, and northern

Argentina. It is one of the protagonists of the nutritional and economic livelihood of hundreds of small farmers and peasants and is one of the new products in demand from developed societies.

In the past, its production was marginalized by the introduction of cereals such as barley and wheat, and was replaced by these. The reduction in the area dedicated to quinoa cultivation in the Andean region is due to the following reasons:

- a) Techniques: for example the harvesting and threshing, in most cases is manual and therefore requires a high number of waged labor versus other crops. Furthermore, to get to the consumption stage, the grain must be washed clean of the saponins.
- b) Economic: The prices received

by small farmers in general is low compared to other grains.

The global area for quinoa cultivation extends approximately 100,000 planted hectares, with a production of 150,000 tons. It is an easy crop to produce thanks to its adaptability to various soils and can be cultivated from sea level up to 4,000 meters. This ancient grain requires farmers able to make it grow and produce it while respecting and preserving the environment.

Bolivia is the lead quinoa producer in the world (departments of La Paz, Oruro and Potosi), followed by Peru and the United States. The main advantage of the crop in Bolivia is its grain quality type: "Real" which is not found in other countries, and contains the highest genetic diversity of this crop. About 70,000 families produce more than 30,000 tons which are exported to America (40%), the Netherlands, France, Sweden, Germany, Australia, Belgium and Spain.

In Argentina, there are two distinct production areas: the NOA as the main crop and reference, and the Pampas that produces certain varieties, but is characterized by discontinuity in its production.

The first is the traditional area. The production is concentrated in: a) Quebrada de Humahuaca and Calchaquies Valleys. The crop cycle runs from early October / November to April. Harvesting and threshing is manual. b) Lerma Valley (Salta), irrigation systems, the cycle goes from May-June to October. In all these regions it is small producers who grow for their own consumption and in some cases there is a market surplus. The genetic materials are varieties such as CICA and some are improved varieties from Bolivia (Sajama: sweet variety of the central highlands and low percentage of saponin, while "Real" is bitter variety from the south of Bolivia). These varieties are adapted to temperate climates and short photoperiods.

In the southern region, there are two potential production centers: Choele Choele (Black River Province) and H. Ascasubi (southern province of Buenos Aires). These productions are

commercial and use improved varieties from the United States (NL6-FAROWANT) and central and southern Chile (Var. Regalona Baer), which are adapted to cold and long photoperiods. Under experimental conditions, they have achieved yields of up to 3 tons / ha. However, actual field cultivations have not exceeded 0.5 ton / ha.

Regarding technological aspects of cultivation, many details are collected based on personal observations of the producers, respecting the history of its cultivation how it can be implemented to increase its potential as a food.

The cultivation technology is relatively simple, with very similar stages and work processes in different places of production. The traditional technique of cultivation in the Andean region consists of planting under rainfed conditions, with rotation to potatoes, beans, or maize, with the preparation of the soil, using only organic fertilizers

“QUINOA HAS BEEN CLASSIFIED AS A “PSEUDO CEREAL”, HAVING CHARACTERISTICS SIMILAR TO CEREAL GRAINS. IT IS ALSO CALLED A “SUPER CEREAL”, THANKS TO ITS HIGH PROTEIN, CALCIUM, PHOSPHORUS, IRON, MAGNESIUM AND VITAMIN CONTENT COMPARED TO OTHER CEREALS.”





from the previous crop waste .

With reference to our country, and in particular to our experiences as producers, the precautions to be considered to achieve acceptable production go through choosing a plot of land of medium fertility, with no puddles, and according to the scale, consider the management regarding the control of weeds, application of fertilizer, and supplemental irrigation. The planting density ranges from 10-15 kg of unclassified seeds, down to 3 or 4 kg if using classified seeds. The row spacing varies from 0.40 to 0.70 cm. From the plant health perspective, it is a rustic crop, and its critical period is from germination to the 10 to 15 days post-emergence. Attacks from insects can be managed with low doses of insecticides. Often the crop is subject to ant attacks and the leaves are particularly susceptible. Planting season is November and December, and a ripe grain is ready in about 120 days.

In the stage of harvest, there are 2 modalities. One is the traditional or manual, which is still used in the Andean region, and NOA Argentino, with some interventions by state agencies (INTA), in support of new technologies such as threshing equipment for fixed or stationary production sites (formed by a central body cylinder-concave two screens and fan, pocketing the threshed material).

The most current harvesting method is through the complete mechanization, with the use of an automated harvester. This cutting system comprises fixed

reel timber, an air blower system that are responsible for the first phase of crop cleaning. The second stage is the classification and ventilation of the grain.

Finally, if the aim is to sell everything produced, and at the best price, it is necessary to carry out the cleaning. For small production volumes, small producers go through several washes of the seed, guided by the declining amount of foam that is being generated in each wash, and proceeding with the sun drying of the grains. For larger volumes, there is the possibility of using machines with drying systems or mixed systems (wet and dry).

With regards to the crop's future: there is high production potential, and the possibility to expand to different countries. With adequate soil management practices and culture in general, it is possible to obtain yields of more than 2 tons / ha. In recent years, the international market price exceeded 4 U \$ S / kg. Besides agronomic factors, the key factors for the development of the cultivation in the country are technical assistance, organization of producers in the post-harvest stages and marketing campaigns on the benefits of the crop, among others.

The challenge is to introduce quinoa in the consumption of large urban populations, where the price is high and today only accessible by more affluent sectors or with a special interest in healthier eating, as well as in the industrial gourmet food industry.

Some aspects of research and development to be considered are:

- germplasm: characterization, evaluation and exchange of materials. Improving genebanks.
- Breeding and agronomic selection of varieties (% saponin, earliness, grain size, yield, resistance to frost, drought and salinity and management structure and culture).
- Postharvest and Transformation: Cleaning Technology and technologies to avoid losses in nutritional value. Encourage industrial processing.
- Nutrition improve nutritional chemical characteristics of saponin and its use in the pharmacopoeia. Disseminate nutrition and culinary versatility features.
- Marketing: assess domestic consumption, stimulate demand, incorporation into food assistance programs. To improve the actions of the chain links and the pricing and quality. Define protocols for export.

In conclusion, it is important to remember that FAO established 2013 as the International Year of Quinoa, an event that will include a number of international activities aimed at the dissemination of the qualities and benefits of this crop. This will be done through scientific research, international fairs, courses, technical and scientific conferences on the social, economic, cultural and environmental impacts of this strategic resource for the world population to promote this pseudo cereal's nutritional value, that contributes to food security, nutrition and poverty eradication.



A NEW PUBLICATION ON ANDEAN GRAINS IN THE OCCASION OF THE UN IYQ

Alessandra Giuliani,
*Bern University of Applied Sciences,
School of Agricultural, Forest and
Food Sciences (HAFL)*

In the occasion of the UN 2013 International Year of Quinoa, Bioersity International together with PROINPA and HAFL has just published a book entitled 'Biodiversity of Andean grains: Balancing market potential'.

Farmers have adapted and selected different varieties of the Andean grains (quinoa, cañahua and amaranth) in order to reduce their vulnerability to a range of environmental risks. These are strategic crops for the livelihood of millions of people in the Andes. Their

valuable nutritional content, their adaptability to harsh environments, their diversity of uses, and the food culture and traditions associated with these grains, are at the basis of their extensive use in the Andes over centuries. The traditional Andean crops offer many advantages: they can be cooked or consumed in many different manners; and they offer culinary diversity, great nutritional value due to high protein contents, and relatively low prices if compared with animal sources.

This publication addresses the use, nutritional values, market potential and contribution to local livelihoods of Andean grains. Some of the research gaps regarding knowledge of the use, market and non-market values

of these crops and their associated traditional knowledge are illustrated, considering local livelihood assets of people living in difficult environments. Moreover, the book looks at what effects the change from subsistence to market production has on farming communities and their environment.

Results of recent projects show the great importance of the Andean grains, as a means to improve both income and welfare of native farming communities, together with other individuals involved in the commercial chain of production, mainly transformation and consumption. There is recent interest in the great potential that the products derived from the Andean grains have for domestic and foreign commercialization. In the case of



quinoa, an increasing number of products are successfully sold in national and international markets. In Bolivia, the agribusiness of Andean grains, in particular for quinoa, is still small and family managed, with limited processing infrastructure. The most common activity is the transformation of grains into flour. Nevertheless, a growing number of products made of quinoa, but also of cañahua and amaranth, are sold throughout the country.

A study focusing on the economic potential of quinoa in Southern Bolivia shows, however, the opposite effects that the transition from subsistence farming to cash cropping has on the livelihoods of the farmers. The promotion of markets alone does not substantially improve the situation of poor farmers unless there are accompanying measures to expand markets.

“IN VIEW OF THE GROWING DEMAND IN EUROPE AND NORTH AMERICA FOR ORGANIC, HEALTHY AND TRADITIONAL PRODUCTS, THESE ANDEAN CROPS HAVE A LARGE MARKET POTENTIAL THAT CAN CONTRIBUTE TO THE LIVELIHOODS OF THE SMALL-SCALE FARMERS IN THE ANDES.”

“THE IMPACT OF THESE PRACTICES ON THE FRAGILE SOILS OF THE ANDEAN REGION NEEDS TO BE ASSESSED AND MORE SUSTAINABLE PRACTICES SHOULD BE IMPLEMENTED TO AVOID NEGATIVE REPERCUSSIONS BOTH NOW AND IN THE FUTURE ON THE LOCAL AGRO-ECOSYSTEMS.”



Results of a project on small-scale processing technology for quinoa, with a big potential to facilitate saponin removal illustrate that the introduction of quinoa micro-processing units can work towards the increase of consumption of quinoa in the Bolivia Southern Altiplano, addressing the traditional laborious and time-consuming process.

Many constraints hamper the ability of small-scale farmers to participate in high-value markets, an opportunity that now arises for Andean Grain products. These barriers are being addressed by value-chain-oriented research, looking at the importance of re-governing markets to improve efficiency and small-scale farmer accessibility. To address this issue, Bioversity International has recently implemented collaborative, multi-disciplinary platforms in the Andes with stakeholders involved in the

value chain, looking at channelling the benefits to the small-scale farmers.

In view of the growing demand in Europe and North America for organic, healthy and traditional products, these Andean crops have a large market potential that can contribute to the livelihoods of the small-scale farmers in the Andes. However, production increase, particularly in the Southern Altiplano of Bolivia, is often made without crop rotation, following very unsustainable production systems. The impact of these practices on the fragile soils of the Andean region needs to be assessed and more sustainable practices should be implemented to avoid negative repercussions both now and in the future on the local agro-ecosystems.

More sustainable cultivation practices are therefore needed. Moreover, in the poor areas of the Andean Region, the

case study in southern Bolivia shows that the mere increase of production of quinoa for the market might not necessarily improve the livelihoods of the farmers if not coupled with activities for developing partnerships, focusing on nutrition and basic services for isolated communities.

It is hoped that this book will be helpful in providing food for thought on the occasion of the UN 2013 International Year of Quinoa, and serve at the same time, as guidance for the future promotion of other currently underutilized crops, and how they will be maintained through sustainable production and utilization for the benefit of current and future generations.

http://www.bioversityinternational.org/index.php?id=4703&page_uid=user_bioversitypublications_data:7304



PERUVIAN COOPERATIVE HELPS SMALL QUINOA PRODUCERS TO ACCESS GLOBAL MARKET

Ilaria Perlini

The District of Cabana, in southern Peru, is a predominantly rural territory located at over 3,900m. of altitude. In these high plateaus, mainly inhabited by **small producers'** households, the cooperative of quinoa farmers COOPAIN-Cabana is regarded as a successful example of sustainable development, which could be replicated in other regions and countries of the world. Made up of 15 associations that directly benefit 500 families of quinoa producers – from the onset – COOPAIN Cabana has been committed to providing decent working conditions and better deals for its farmers, as well as promoting awareness and **respect for the environment**. Over the last ten years, the economic benefits of pooling resources and sharing investments have proven effective and yielded impressive results for the cooperative. Besides being able to guarantee producers a stable price – thanks to the technical support of various organizations, members of COOPAIN Cabana have also successfully increased productivity and quality of crops through the introduction of improved seed varieties and natural fertilizers. It is estimated

that **production trebled** from 2009 to 2011 and, in 2010, the cooperative received the prestigious “*Aji de Plata*” (Silver Pepper) prize for the best Peruvian quinoa, awarded at the Mistura food fair in Lima, where top chefs from all over the world attended. Also known as the “*golden grain of the Incas*”, quinoa has received growing attention in the media of developed countries thanks to its superior nutritional characteristics. It is a plant found in the Andean highlands, it is gluten free and in high demand amongst health food enthusiasts thanks to its high protein value.

To meet this growing international demand for quinoa, and especially organic quinoa, COOPAIN-Cabana has been working hard to enter the global market and export directly, without intermediaries. Today, the cooperative has its own processing plant for organic white, red and black quinoa and is the largest producer of organic quinoa in Peru. It prides itself for harvesting chemical-free produce and has achieved Kosher, HACCP and GMP certifications. The Organization of American States (OAS), with funding from the Canadian

International Development Agency (CIDA) and in coordination with the Ministry of Foreign Commerce and Tourism of Peru have helped COOPAIN-Cabana to meet the challenge of entering the global market. The initiative came as part of the *Economic Empowerment Program* of the OAS, which aimed to promote trade for micro, small, and medium enterprises (MSMEs), placing particular emphasis on women, small farmers, indigenous people and other vulnerable groups.

In 2009, the cooperative participated in local and regional fairs and in 2010 it was present at Food Taipei 2010, one of the most important global food shows. Through workshops and direct technical assistance, COOPAIN-Cabana is also preparing to fulfill requirements that will allow it to export to the Canadian market. With the launch of its new corporate brand named *Qhawuana* – meaning “guardians of the heights” in Quechua – COOPAIN-Cabana has proven that it is possible to give life to a fruitful cooperative business model based on transparency, social responsibility and good environmental practices – something that is certainly worth emulating.

ECOLOGICAL MANAGEMENT OF PESTS IN QUINOA

Miguel Angel Crespo,
director-PROBIOMA

Quinoa is a product of exceptional nutritional qualities, whose cultivation can be adapted easily to the demands of the organic food market thanks to its nutrients.

Quinoa (*Chenopodium quinoa*), is grown in the Andean regions of Bolivia, Peru, Colombia, Chile and the Argentinean Andes. Recently, expectations for increased production have emerged among farmers due to increasing demand in the local and international markets.

In Bolivia, quinoa production, occurs in the highlands areas in the north, center and southern regions which includes the departments of Potosí, Oruro and La Paz. Organic practices allow for the production of quality beans, i.e. high nutritional value, free of chemical contamination (no pesticides or harmful elements), physical appearance and flavor, making it more commercially valued at prices between 15 and 30% higher than the conventional product.

However, high global demand, have made the quinoa into a monoculture that is displacing other activities such as livestock and planting of other crops such as the Andean tubers.

This situation is exacerbated because, being a monoculture, it has generated an increase in pests that attack the crop causing serious damage to the quality and quantity of the final product. This situation is creating an impact on highland soils, especially in areas where the Andean grain is cultivated, of which over 90% is in the process of desertification, due to the use of agrochemicals and inadequate soil management.

For these reasons PROBIOMA, in partnership with businesses, producer or-

ganizations such as the Chamber of Quinoa Producers of Oruro (CADEPQUIOR), FAUTAPO and distribution companies, began field testing and validation of biological controls based on micro-organisms, organic foliar fertilizers and mineral wines that are internationally certified and supported organic and environmentally-friendly products.

Thus began a program that helped strengthen the offer aimed at facilitating biotechnology tools and pest management techniques in the field of environmental management. For the past three years, PROBIOMA has developed actions to validate and transfer alternatives of biological pest control. It is the case of bio, organic foliar fertilizers and mineral broths for pest insect control and ecological adaptation high on the Bolivian Altiplano.

As a result of this process, only between 2010 and 2012, more than 40,000 biological doses have been transferred, and this means more than 10,000 hectares coverage under biological control and replacement of more than 8,000 liters of agrochemicals.

The validation of the proposed ecological pest management, with emphasis on biological control, and the results have demonstrated the feasibility of this scientific alternative developed in our country and it is expanding to more than 250,000 hectares for over 60 crops throughout Bolivia and Paraguay.

These results, expressed in figures, are a contribution to the sustainable management of quinoa cultivation, conservation of soil and human health.

Much remains to be done, but what has been achieved with biological control, demonstrates that technological innovation of biodiversity is a concrete fact and that is the basis of true sustainable development of the country.





COOPERATIVA CAMPESINA LAS NIEVES: A QUINOA COOPERATIVE IN CHILE

Weidmann, G., Kilcher, L., Garibay, S.: *“Training Manual for Organic Agriculture in the Arid and Semi-arid Tropics”, International Foundation for Organic Agriculture (IFOAM), compiled by Research Institute of Organic Agriculture (FiBL), pages 61-67.*

http://shop.ifoam.org/bookstore/index.php?cPath=64_68_72

Description of the initiative

Customs and traditions are important in the life of Chilean farmers. Farmers in the Paredones area in Chile’s region VI have traditionally cultivated quinoa,

a kind of cereal grown in the area since pre-colonial times. Quinoa used to provide the main protein base in the people’s diet in that region.

The Paredones area, where this organic initiative is situated, is a dry coastal area between the Pacific Ocean and the Andes mountain range. With an elevation of up to 1000 meters it has a nearly flat topography and very poor soils. Historically, the area has been dedicated to wheat production and has therefore developed its economy based on wheat over the centuries.

The Cooperativa Campesina (farmer

cooperative) Las Nieves is a non-profit organization which promotes the development of small-scale farmers. The cooperative offers technical support through an advisory team and provides management services such as organizing production, crop monitoring, documentation, quality management and further education, as well as explaining which practices are allowed by organic standards. The cooperative also organizes certification and looks for good marketing opportunities for the harvested quinoa.

The quinoa initiative started in



2000/2001 and was supported by Chilean institutions such as INDAP (for agricultural development) and ProChile (for export promotion). After four years of development, the initiative is in a phase of consolidation and careful extension towards other farmers and agricultural companies.

The Cooperative's main body is the General Assembly, where all the farmers meet. The Assembly elects the Board of Directors, which meets once a month to define the general policy. The General Manager, who is responsible for the quinoa project, is assisted by technical and administrative staff comprising dedicated local people. There is a project team of three people – a Stock and Warehouse Manager, a Secretary, and an Agronomist, who is responsible for ensuring that quality is high at each stage of production and processing.

The technical support and continuous monitoring provided by the cooperative's Advisory Team ensures that it conforms to the demands of the official certification body.

Origins

The Cooperativa Campesina Las Nieves was founded in 1969 with syndicates already established in the area. The cooperative worked well until the 1980s, when prices for conventionally grown agricultural goods dropped and the local economy experienced a recession. The agricultural production methods of the time proved too costly and lacked a guarantee of returns. The Board of Directors of the Cooperativa Las Nieves looked for an economically and ecologically viable alternative. This was the origin of the quinoa project.

In 1993, the Cooperative was reorganized out of Paredones town. Little by little, interest in developing the project's export potential grew. At that time, a new national cooperative law was introduced, which reduced income taxes for non-profit organizations. Cultivating quinoa appeared to be the most interesting of various options available, particularly as quinoa had been cultivated in the area for centuries

and because worldwide consumption was increasing.

Quinoa has excellent nutritional properties: it contains 18% protein and enough amino acids for a balanced diet, has a high mineral and vitamin content, and it supplies, on average, 350 calories per 100 grams. Its nutritional properties alone make it an excellent dietary supplement for people in general, and for vegetarians in particular. Due to its low sugar level, quinoa is also recognized as a good food for diabetics. Furthermore quinoa can be grown organically without using any pesticides. The varieties that are grown in the Paredones area are well adapted to the region's arid climate. Until the 1990s, quinoa had been grown only for home consumption (processed into flour) and had practically disappeared from the region.

As one of the first steps in the new project, the cooperative members decided to reintroduce quinoa. The organic quinoa project started with a



few farmers, using office space in a warehouse. The first sales were good, but delayed payment was an obstacle: the majority of the farmers in the cooperative were too poor to await late payments.

On the other hand, the guaranteed market, the easy availability of organic matter inputs and especially the free and ample support of the initiative's advisory service all encouraged farmers to participate.

The ease of cultivating quinoa gave the farmers confidence. However, soil fertility started to become a critical issue when the availability of farmyard manure decreased. It thus became clear that improving soil fertility should be of highest priority.

Milestones of the Cooperativa Campesina Las Nieves

1969: The Cooperative of Las Nieves is founded with regional syndicates to enhance development in the area.

1975: Due to the persecution of socially minded initiatives by the ruling government, and a national economic crisis, the Cooperative stops

its activities and many farmers leave the area to live in town.

1993: The new democratic government encourages the efforts of rural development initiatives. The Cooperative is reactivated in the Paredones municipality.

2000: The first organic cultivation of quinoa is finally launched in Paredones. The Cooperative staff begin the certification process in order to access foreign markets.

2002: The quinoa project generates its first income with the export of the first container (22 tons) of organic quinoa to Canada.

Some Bolivian quinoa varieties are tested, but no satisfactory results are obtained.

2003: The Cooperative studies the French market to find new prospects. A second container is sent to Canada.

2004: The third container of quinoa is exported. The sale price is increased thanks to better marketing and improved quality. The Cooperative finds new market partners in Italy with an international company and the Slow Food Foundation. From the year 2000 to

2004, the number of farmers involved in the project has slowly but surely increased.

Future milestones:

Four years after the first cultivation of organic quinoa, the initiative has successfully developed this crop as an economically viable alternative to wheat. The main aim of the initiative is however, to improve the incomes of as many farmers as possible. Thus increasing the number of farmers involved in the Cooperative would be an important future milestone.

This would mean that more members would be available to participate in the project, thereby increasing the production volumes of organic quinoa. However, the initiative also faces some problems, which must be addressed:

- The Cooperative's production of its own seeds must be improved.
- Financial stress caused by delayed payment must be reduced. A capital fund to pay the farmers in advance could encourage participation.

Strengths (and weaknesses) of the



initiative

The following factors have contributed to the success of the initiative: Familiar farming system. Quinoa is an indigenous crop, which is traditionally grown without any chemical inputs, as pest and disease pressure is low. Therefore, conversion to organic cultivation does not present any additional difficulty. However, the farmers are confronted with some organizational changes related to certification.

Partnership. The fact that the farmers are owners of the Cooperative is one of the distinguishing factors of the initiative. A culture of dialogue and cooperation within the Cooperative has been one of the driving motivational aspects. It has proved important that the farmers know that they are the Cooperative's motor, and that the administrative and technical staff are their employees. The Cooperative's management has spent time meeting individuals and groups of farmers to discuss their needs and concerns. Farmers' participation in the General Assemblies is crucial, because these meetings define the Cooperative's policy as well as setting priorities based

on the farmers' needs.

Short supply chain. The cooperative is the starting point of an integrated supply chain covering raw material (harvested grains), processing (cleaning of the grains) and retail to the customers. Potentially, the involvement of producers at each production stage ensures that high quality is maintained. The Cooperative is considering organizing a 'Quinoa Day' to bring the buyers into contact with the producers, and to promote the consumption of quinoa at both the local and national level.

Quality control system. To create trust and marketability, as well as to meet extremely high quality standards, the Cooperative has established a rigorous quality control system, which is further developed every year. Strict production criteria and controls also apply to the processing of the quinoa grains.

Competent advice. The commitment to offering farmers competent advice free of charge has proved to be of major importance for the development of the project. The quality training and advice give the farmers confidence, help them

in difficult times and enable them to increase their yields. Training of the advisors by international experts and transferring technology and knowledge has also proved to be extremely valuable.

Better price. The Cooperative manages to sell the entire quinoa production every year, thanks to a marketing and production plan which is set up with the growers. The price obtained for the quinoa is much better than the one for wheat. This is a decisive factor which attracts new farmers to organic farming. **Social concern.** Organic farming is seen by the Cooperative partners as a measure to solve many of the area's socio-economic problems, as it raises members' incomes, improves soil fertility, etc. The main purpose of the initiative is thus to make farmers stronger and to enhance social development in the area.

Challenges

The initiative still faces some major challenges, including: **Seed production.** At present, farmers use their own seeds for the following season. The positive



side of this system is that it ensures independence of the individual farmer. Unfortunately, these seeds are not homogeneous. It has proven important to get the technical team involved to ensure the same quality of seeds for all the farmers. As a result, a plot for seed production was sown for the first time in 2004. The field is managed by the technical team, in association with the farmers, in order to get the best seed for all producers in the initiative. Previously, tests were carried out with Bolivian cultivars, but as these did not satisfy the needs of the Cooperative, the decision was made to establish a well defined local cultivar.

Soil fertility. Soil fertility is very fragile in this region. The lack of nitrogen

is the greatest obstacle for farming. In the beginning, it was possible to obtain organic material from a public organization thanks to a public program to rehabilitate degraded soils. Now, however, the availability of cow dung or organic fertilizer has become critical for the farmers.

At present, farmers work within a convenient rotation framework, which includes wheat (*Avena sativa*) and a *Vicia* bean, a nitrogen-fixing green manure crop. Possible future approaches include increasing the availability of farmyard manure by introducing animals to the farms and developing proper composting practices.

Drought. The region constantly faces drought. The combination of drought and the overexploitation of groundwater leads to a drastic reduction of water availability. This again leads to reduced yields and to an economic crisis amongst the farmers.

Organic farmers say that organic farming makes the soil softer and increases its waterholding capacity. To reduce water consumption and bring production costs down, the Cooperative farmers increasingly use drip irrigation systems. Marketing. So far only 20% of the total sales have gone to the national market. Quinoa is still a relatively unknown food. New markets must therefore be opened in order to allow an expansion of production. To develop the domestic organic market for quinoa, major efforts are necessary. One attempt will focus on improving the quality of the product to increase its marketability in supermarkets and specialized shops. An interesting alternative is to link the quinoa farmers to the fair trade market, which will ensure good prices.

In addition, the farmers are eager to market their rotation crops at an organic premium price. Finding new organic markets for the other crops would make full farm conversion easier. This is an enormous job, however, and at present the project does not have sufficient resources to invest in it.

Quality improvement. Quality improvements are still possible and are necessary to reach new markets. The timing of harvest, for example, needs to be improved to ensure the best quality grains.

Farmers' constraints. It is possible to increase yields and surfaces by involving more farmers in quinoa production, but it must be done in accordance with the market. Commercially, the most problematic issue is delayed payment. The Cooperative receives just 50% of the product's value before the container is exported, and does not have the resources to pay immediately for the farmers' entire production. The farmers must wait for the importer to complete the payment before receiving their full share of money. To make quinoa cultivation sustainable, especially for the weaker farmers, the Cooperative must find a way to pay the farmers in advance.

HAS QUINOA OPENED UP WIDE OPPORTUNITIES FOR YOUNG FARMERS?

Sridhar Gutam,

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“Quinoa holds hopes for dry Anantapur”

quoted one of the English newspapers based in India in one of its city editions last month (June 2013). This made me look at what are the opportunities the quinoa has for the dry lands and young farmers!

The quinoa (*Chenopodium quinoa* Willd.) is a pseudocereal crop belonging to the Amaranthaceae family and originated in the Andean region of Ecuador, Bolivia, Colombia and Peru. The Anantapur is a drought-prone district of the state of Andhra Pradesh in India. Under the pilot project 'Project Ananta' aimed at the development of the drought-prone districts, now the quinoa would be cultivated on a pilot scale. The results of the work carried out at the AMR Andhra Pradesh Academy of Rural Development in Andhra Pradesh had showed that the quinoa as a good alternative to the groundnut crop whose cultivation is not any more fascinating due to drought conditions in the Anantapur district.

The quinoa is tolerant to several abiotic factors, viz., soil salinity, drought, frost and it can be grown in wide agro-ecological regions having relative humidity range of 40% to 88% and temperature range of -4 °C to 38 °C. It is a highly water efficient plant producing acceptable yields even with rainfall of 100 to 200 mm. The study carried out during the winters of 2008-09 and 2009-10 for analysing the prospects of quinoa introduction in Pakistan proved that quinoa is a potential drought and salinity tolerant crop for the Punjab province. In an earlier study during 2002-2003 and 2003-2004 in India, it

is reported that the quinoa seed yield was about 9.83 t/ha with the 21.02% of seed protein and the crop matures in 569 days when sown as a rabi crop in mid November. The quinoa seeds have a very good nutrient composition having essential amino acids and calcium, phosphorus, and iron. It has also got high unsaturated fat content, vitamins, rich dietary fibre and antioxidants.

As per the recent estimates, 12.5% of the world's population are undernourished. To improve the access to the nutritive food is now a top global priority and quinoa stands a suitable candidate for mitigating malnutrition globally. Seeing the importance and potential of the quinoa, The United Nations General Assembly declared this year 2013 as the 'International Year of Quinoa' with an objective of the to draw the world's attention to towards the quinoa and its importance in meeting the food and nutritional security. This indeed is a great recognition of the Andean peoples' efforts in the conservation of quinoa for the present and future generations.

Quinoa for Young Farmers?

Approximately one billion (18%) of the global population are youth and the majority (~85%) of the them are in the developing countries, with approximately 60% in Asia and the projections for India is that by 2020, India would become the youngest country in the world. However, the youth has limited access to opportunities and so are unemployed. The 60% of the world's rural population are youth but they are migrating to cities in search for opportunities as it is felt that there are better chances of acquiring skills and training in cities than in rural areas. In India, as per the latest data, there is a decrease in the number of farmers. At present there are 7.7 million less farmers when compared to 2001. This situation needs to be addressed as if this trend





continues, then how we would feed the global population which would reach 9.2 billion as projected by 2050?

The young farmers need investment in their capacity building in terms of entrepreneurship skills for creating self employment and substantial funding support for the initial establishment. Looking at the efforts for the conservation of the quinoa crop for the future for its prospects and the growth of the awareness among the people for quality and organically grown food, the quinoa proves as a promising crop for the rural youth to gain much by cultivation and marketing (exports). The recent trade trends show that the producer prices are touching up to \$1,300 per tonne and exports reaching to \$ 46 millions during 2010.

The young farmers as entrepreneurs and researchers have a wide scope of their intervention in the quinoa growth and development. There is an immediate need for the development of good agricultural practices and breeding of new improved varieties suitable for the establishment of quinoa based small scale industries for the development of food, cosmetics and pharmaceuticals.

Due to changes in the food habits of the population, the demand for ready to cook and eat foods is increasing. As

quinoa is of highly nutritive nature, it is being used in making flour, bakery, biscuits, soup and other breakfast items and also sold either as whole grain that is cooked as rice. Furthermore, in order to feed people with nutritious food during the emergency situations like natural calamities, processed quinoa food may be used. In India, the demand for quinoa based products is growing but they are now only available in select supermarkets and online e-commerce stores.

The quinoa has saponins in its seed coat ranging up to 11.3 g/kg dry matter which are anti-nutritional factors present and are removed before consumption on a commercial scale by abrasive de-hulling. These saponins have immense industrial importance and are used in the preparation of soaps, detergents, shampoos, beer, fire extinguishers and photography, cosmetic and pharmaceutical industries. They are also known to lower blood cholesterol levels. This character further gives scope for the establishment of processing units for processing quinoa. It is also reported that on a fresh weight basis quinoa showed an oil content ranging from 1.8 to 9.5% and has a diversity with 66 seed colours which would give an opportunity to extract oil and natural colours for the industrial application. The quinoa can be fermented to make beer, or used to

feed livestock.

The young agricultural researchers have also scope for their research viz., reduction in the drudgery in processing, value addition at farm level, development of good agricultural practices and development of improved varieties. As most of the times due to lack of access to current market prices, the young farmers would not get good remuneration for their produce. Now with the advent of new ICT tools, the youth has an opportunity to collate and disseminate the market prices. This has also a great potential role in the generation of knowledge with respect to quinoa nutritional benefits, industrial benefits and conservation of its biodiversity.

By addressing the problems faced by the young farmers and training them with good agricultural practices viz., setting up demonstration plots of quinoa, making available the necessary agricultural and business related information through youth forums, the young farmers and definitely they show enthusiasm to grow this high quality crop, quinoa and market it. This would make the rural youth to stay in their villages and take up farming as a livelihood instead of migrating to towns and cities due to the drought conditions in their villages.

QUINOA, AN EMERGING MARKET



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Agriculture has always been a top priority of most governments, as it depends on agriculture for foreign exchange, raw materials and for food.

“We have to make agriculture a gainful undertaking, an undertaking that people can depend on for their livelihoods” says Tanzanian President DR Jakaya Kikwete.

Quinoa, an agricultural crop dates back to 3 thousand or 4 thousand years ago when the Incas first realized it was good for human consumption. It is rich in protein and has all the 9 essential amino acids. It is hardy, drought and frost-resistant plant that thrives at high altitude- between 7,000 and 13,000 feet. It prefers sandy soils and short daylight cycles.

Bolivia, Peru and Ecuador account for 97% of global production. It is a food that has become so expensive that people who have been living off it for years can barely afford it anymore and has replaced it with cheap commodities like noodle, wheat etc.

The high production costs of the crop

(low production) and value chain (insufficient agronomic and post-harvest technologies, insufficient distribution chains, no subsidies) for the price hikes make it unaffordable for many people.

As youths we need to discover and take advantage of the benefits of this crop and the economic value we stand to gain if we engage in it. YPARD as a platform can encourage and sensitize youths at all levels to get involved in the production and marketing of this crop considering the health benefits to the human body.

Because of the increase in demand, youths can bring in efficiency, ICT knowledge and with government support through capacity building, information and finance, this sector can be well explored.

The Bolivian government acknowledged that quinoa has an important role to play with regards to food security and public health.

In Africa for example, poverty reduction and food security are important keys to economic development. Today's youth is well positioned to capitalize on this crop with latest technology and innovation to

generate opportunities along agriculture value chains.

As youths we also need to raise the level of awareness of quinoa amongst youths and youth organizations on the need to advocate for increase investment and research of quinoa as a healthy crop for human consumption and a gainful undertaking especially if it is taken as a career path.

Youth engagement in agriculture, especially in a crop like Quinoa can and will create multiplier effect through job creation, reduced unemployment and eradicate rural poverty and poverty as a whole.

The Food and Agricultural Organization of the United Nations (FAO) has officially declared that the year 2013 be recognized as “The International Year of the Quinoa”.

Proposed by the government of Bolivia and receiving strong support from many central and south American countries, quinoa has now been singled out by the FAO as a food with “high nutritive value”, impressive biodiversity and an important role to play in the achievement of food security worldwide.



QUINOA CRAZE INSPIRES NORTH AMERICA TO START GROWING ITS OWN

The explosion in world popularity of quinoa in the past six years has caused prices to quadruple on retail markets. However, scientists who study the biology and economics of quinoa say that is about to change. As a matter of fact, it is proved that quinoa can flourish and produce high yields in many parts of North America such as the Rocky Mountains, much of Canada, and the Pacific Northwest. This initiative could be very lucrative for American Farmers. In Bolivia, for instance, second in production only to Peru, this particular culture has been granting prosperity to many indigenous farmers. All in all, There is tremendous potential for quinoa, the key is simply figuring out where it will grow!

[HTTP://WWW.NPR.ORG/BLOGS/THESALT/2012/11/29/166155875/QUINOA-CRAZE-INSPIRES-NORTH-AMERICA-TO-START-GROWING-ITS-OWN](http://www.npr.org/blogs/thesalt/2012/11/29/166155875/quinoa-craze-inspires-north-america-to-start-growing-its-own)



IT'S OK TO EAT QUINOA

“The appetite of countries such as ours for this grain has pushed up prices to such an extent that poorer people in Peru and Bolivia, for whom it was once a nourishing staple food, can no longer afford to eat it,” writes journalist Joanna Blythman.

This was one of several stories published in the last few years by the Associated Press, and the New York Times that draw attention to the negative aspects of the boom in world demand for quinoa.

Some, like the Guardian, went beyond by warning readers against buying it.

Edouard Rollet co-founder of the fair-trade import company Alter Eco is of a different opinion and says “The farmers are still eating quinoa.” As a matter of fact, over the years he has watched how the extra income from rising prices has allowed the families he works with to diversify their diets dramatically, adding foods like fresh vegetables.

Not all quinoa growers are fortunate enough to sell their product to fair-trade organizations, and many receive less for their product. However, it is hard to see how rising prices could be considered anything but good for these people.

http://www.slate.com/articles/life/food/2013/01/quinoa_bad_for_bolivian_and_peruvian_farmers_ignore_the_media_hand_wringing.html



MEMBER COUNTRIES OF THE LATIN AMERICAN INTEGRATION ASSOCIATION (LAIA) MEET TO DISCUSS QUINOA'S ROLE IN THE ERADICATION OF HUNGER

Within celebrations concerning the International Year of Quinoa 2013, Uruguay hosted an international seminar on this nutritious crop entitled, “Quinoa: an ally in the eradication of hunger”, the seminar took place in Montevideo on 27 June at the LAIA headquarters. Participants included experts from Bolivia, Ecuador, Peru, Uruguay and Argentina, among others.

Eradicating hunger is fundamental to the work of FAO and its member countries and represents the first of the internationally-agreed Millennium Development Goals. Quinoa is one of a number of forgotten crops that can, nevertheless, play a significant role in achieving the goal of eradicating hunger due to its excellent nutritional qualities and adaptability to diverse climatic conditions. As Salomón Salcedo, Technical Secretary of the International Year of Quinoa 2013 and Senior Policy Officer of FAO Regional Office for Latin

America and the Caribbean (RLC), said “quinoa can play an important role in the eradication of hunger, malnutrition and poverty due to its high nutritional value that can contribute to the food and nutritional security of our countries.”

The discussion aimed at promoting the potential that this ancient Andean crop has on regional and global food security. It also drew attention to the importance of partnerships in promoting this important crop and analyzing the commercial opportunities surrounding quinoa that are emerging in the context of LAIA and beyond.

<http://www.fao.org/quinoa-2013/press-room/news/laia-seminar-quinoa/en/>



PUNO TO LAUNCH 'QUINOA ROUTE' TO BOOST TOURISM

Javier Zaira, head of Puno's Quinoa project, promotes this initiative as a part of the activities surrounding FAO's International Year of Quinoa in 2013.

“We have planned several activities for this occasion, the most important is the implementation of the ‘Quinoa Route’ project which seeks to boost Puno's tourism potential by encouraging consumption of one of the Peruvian flagship products: Quinoa,” he told Andina new agency.

The route would include the Cabana district in San Roman province, the Llachon community in Capachica district and other communities living on the shores of Lake Titicaca.

Other Quinoa-related activities this year include the Sixteenth Festival of Quinoa and Cañihua in November and the publication of books on the benefits of this Andean grain.

The ‘Quinoa Route’ project is being developed by the Ministry of Agriculture, the Regional Office for Agriculture, the Technical Committee on Quinoa, and the regional Quinoa project of Puno's regional government.

<http://www.andina.com.pe/INgles/noticia-puno-to-launch-quinoa-route-to-boost-tourism-448123.aspx> ♦♦♦

