Organic entrepreneurship and Moringa in Cambodia.

A case study: Baca Villa Co.

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Review article

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ABSTRACT

Moringa oleifera lam. is one of those multi-purpose vegetal species with exceptional nutritional and therapeutic properties, and could be considered as one of the potential food that can contribute to the eliminate malnutrition and increase the welfare of third world countries. Thanks to its exceptional nutrient composition it can be used to fight and prevent many diseases while improving the sources of antioxidants for humans. To promote its cultivation, a bibliographical review of different language sources was done in this paper. Following that there is the aim to show the commercial possibilities of this plant showing a case study of one organic entrepreneurship project in a developing country. This article shows how some entrepreneurs, belonging to the firm Baca Villa Co., in Siem Reap province are becoming pioneers in the creation of new jobs in agro-food sector and promoting the extension of this know-how to other farmers. This experience rewards to be shown and spread as a reference case of an agroecological lighthouse of sustainable and profitable green activities. The aim of this clause is that it can be useful to be involved as an object lesson on how to tackle and change the movement of the vicious circle of poverty and ignorance about food nutrients and the agronomic possibilities of novelty varieties, mixed with the virtues derived from certified respect to local environments.

Keywords: *Moringa oleifera lam*, agronomic characteristics, organic entrepreneurship, organic production, rural extension, poverty reduction, Cambodia.

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1. Introduction

In recent years there has been a flowering in organic markets and a "rediscovery" of the Moringa tree *(Moringa oleifera Lam.).* Due to its genetic plasticity, power of adaptation to different biotypes, outstanding nutritive virtues and abundant possibilities of use by humans. Since many centuries, this tree was mostly used to feed the countryside cattle in tropical, arid and semi-arid countries.

New demands from our societies, from both developing and developed countries are showing the pertinence on its more accurate knowledge, the opportunity of its agronomic extension and cultivation and the chances of opening new niches of markets that these kind of multipurpose varieties offer to new "green" entrepreneurs regarding to the demands of more exigent consumers to new habits on personal care and individual health.

Jahn (1986) noticed that M. *oleifera* belongs to a single genus, family of shrubs and trees cultivated in the whole area of the tropical belt (Makkar and Becker, 1997; Morton, 1991 in Muyibi and Evison, 1995). In many developing countries it is employed as a condiment to enrich the diets of mankind and cattle, as being practiced as a supplement in the diet of birds, hogs, fish (carp, tilapia and other herbivores) and other animals. It has been considered as a "miracle tree" because almost all its parts can be used (root, stem, bark, flowers, leaves, pods, seeds and gum, between other). In Northern Nigeria, Sani (1990) reported the use of the leaves as a vegetable for cattle and human consume and for medicinal purposes while the stem is used for demarcating properties (Carballo 2011).

Due to modern changes in our diets in most common occidental countries and thanks to the demand of the nutrients of this plant Moringa Olifera is progressively becoming more known as a multipurpose healthy source of vitamins, amino acids, antioxidants and other nutrients.

Hitherto, most of the studies have mostly focused on the agronomic characteristics and the adaptation of Moringa Olifera to different local biotypes. However, in this paper the objectives will depart by showing and promoting these agronomic issues, but continuing to develop a study on one local business initiative. The aim is to show the economic and social outcomes of one successful start-up firm based on a Moringa Olifera plantation and its commercialization to open new organic niches of markets.

2.Agronomic characteristics of Moringa olifera

Moringa belong to the family Moringaceae (García Roa, 2003 in Perez et al., 2010), which comprises 13 species of tropical and subtropical climates. The most popular specie is *Moringa oleifera* (Reyes, 2006). This tree is native to the southern Himalayas, which has spread to other parts of India, Bangladesh, Afghanistan, Pakistan, Sri Lanka, Southeast Asia, West Asia, Arabian Peninsula, East Africa and West, South Florida, Caribbean, Central America, much of South America and in much of the tropical ecosystems in the world (Foidl *et al.*, 1999). In general, we can say that is one of the most interesting vegetal species due to its high ecological plasticity, as it is located in different sorts of soils, and its capacity to adapt to moderate to dry precipitation and different ranges of temperature conditions (Perez et al., 2010). According to Reyes Sánchez N., (2006):

"The tree ranges in height from 7 to 12 m, has tuberous roots, soft and spongy wood, short trunk (25 cm thick), and slender, wide-spreading, drooping, fragile branches. The leaves are imparipinnate-reaches 3 to 6 cm long with 2 to 6 pairs of pinnules. Each pinnule has 3 to 5 elliptical leaflets that are 1 to 2 cm long and 0.3 to 0.6 cm wide. The terminal leaflet is oval and often slightly larger (Ramachandran et al., 1980; von Maydell, 1986). The flowers are borne profusely in axillary, drooping panicles 10 to 25 cm long. They are fragrant, white or creamy-white with yellow stamens and 2.5 cm in diameter (Morton, 1991). The pods, borne singly or in pairs, are pendulous, brown,

triangular, tapering at both ends, 25 to 45 cm long and 1.8 cm wide, and contain about 16 seeds embedded in the pith. The pods split lengthwise into three parts when dry. The seeds are round with a brownish semipermeable seed hull with three white papery wings, embedded in dry, white, tissue-like pith (Ramachandran et al., 1980; Morton, 1991). Moringa is propagated either by planting stem cuttings 1 to 2 m long or by seeding (Palada, 1996). Moringa is drought tolerant and is reported to tolerate an annual precipitation of 500 to 1500 mm and annual temperatures from 18.7 to 28.5 ª C. Moringa grows in a wide range of soil types (pH of 4.5 to 8.0) except heavy clays and prefers a neutral to slightly acidic soil. The tree grows well in altitudes from 0 to 1800 m.a.s.l. (Duke, 1978; F/FRED, 1992). Moringa is a fast-growing tree which also has fast regrowth after pruning (O'Donnell et al., 1994; Foidl et al., 2001) and the capacity to produce high quantities of fresh biomass per square meter, even at high planting densities. The dry matter (DM) yield is high, from 4.2 to 8.3 tons ha-1 when harvested every 40 days, and fresh leaves contain between 19.3% and 26.4% crude protein (CP) in DM (Makkar and Becker, 1996; Makkar and Becker, 1997; Foild et al., 1999; Aregheore, 2002). Moringa leaves have a negligible content of tannins, a saponin content similar to that of soybean meal and no trypsin and amylase inhibitors or cyanogenic glucosides (Makkar and Becker, 1996; Makkar and Becker, 1997)".

Taking into account these characteristics and finding other sources, there are some relevant characteristics to be pointed out. In its natural habitat it grows up to 1400 m above sea level, and along the major rivers in sandy or gravelly alluvial soils (Troup, 1921). Ramachandran *et al.* (1980) stated that is very resistant to drought and grows in arid and semi-arid regions of India, Pakistan, Afghanistan, Saudi Arabia and East Africa, where rainfall is only 300 mm per year. According to Reyes (2006) Moringa is drought resistant and tolerates an annual rainfall of 500 mm 500-1. Furthermore, when growing in a soil its pH ranges between 4.5 and 8, except heavy clays, and it prefers neutral or slightly acidic soils (Croess and Villalobos, 2008). Therefore, it is a species adapted to a wide range and varieties of stains. In turn, Roa García (2003) explains that it is resistant to cold for a short time, but not to less than 2 to 3° C. At lower temperatures of 14º C it does not bloom and can simply be reproduced vegetatively (by cuttings). Falasca and Barnabas (2008) stated that in their natural habitat average annual temperatures have large fluctuations. During the cooler months it ranges between -1 and 3º C, while in the warmer months it can fluctuate from 38 ° C to 48 ° C (Troup, 1921). It is a perennial but a little long-lived tree, which at best can live 20 years, although there have obtained varieties in India that are annual. It provides a high amount of nutrients to the soil, in addition to protect from external factors such as erosion, desiccation and high temperatures (Jyothi *et al.*, 1990; Morton, 1991). It grows rapidly and reaches a height up to about 10-12 meters (Liñan, 2010), and does it between 1 to 2 meters in the first 4 years (Parrotta, 1993). It is farmed in many lands for food and feed for animals, as obtained good results in domestic fowl, swine, sheep, goats, production of meat, eggs and milk, and for the purpose as a medicament and for water purification. It delivers a high amount of proteins, vitamins and minerals and it provides an extensive mixture of foodstuffs since all parts of the plant are edible: the pods green, leaves, flowers, seeds and stems.

Falasca and Barnabas (2008) mention that the flowers are bisexual, with white petals and yellow stamens. In some regions it blooms just one time a year, but can bloom twice a year; such is the case of the Caribbean countries as Cuba. The blossoms are pollinated by bees, other worms and birds (Jyothi et al., 1990; Morton, 1991). FAO-WHO (2005) reported about their lobed fruits, dehiscent capsules, from 20 to 40 cm in length,. containing 12 to 25 seeds per fruit. The seeds are round in shape and dark brown color, with three whitish wings. Each tree can produce 15 000-25 000

seeds per year. According Roa García (2003), this species can be propagated by two ways: sexual and asexual. The most normally used for plantations is sexual, especially when the goal is the yield of fodder. Planting seeds are done manually, at a depth of 2 cm, and germinate between five and ten days after planting. The same source states that the number of seeds per kilogram ranges from 4 000-4 800. The seed does not require pre germinative products and has high germination rates, greater than 90%. Nevertheless, when stored for more than two months their viability decreases (Sharma and Rains, 1982). It may be reproduced by cuttings from 1 to 1.40 m. long, as in southern India (Ramachandran *et al.,* 1980), although to be transplanted in arid and semiarid regions should get the tree from seed, as it produces deeper foots. In the case of trees obtained from cuttings, seeds appear at six months after planting.

Trees grown for fodder are pruned to restrict crown development and promote growth of new branches (Ramachandran *et al.,* 1980). It is achieved after cutting the sprout vigorously and give four to eight shoots per stump (Nautiyal and Venhataraman, 1987). For small producers, it can be planted from cuttings or live fences harvest later flare-ups to be cut from 35 to 45 days, depending on the precipitation regime and fertilization. Planting should be executed in a phased manner at all times to provide fresh grass. According to the issues raised by Roa García (2003) the predominant pest planting Moringa are: defoliant worm (*Spodoptera* spp) weevil bulky *(Phantomorus femoratus)* and Zompopo *(Atta* spp). To control weevils defoliators manual removal methods are practiced, as populations use to be downcast. An association with natural pesticides, oil derived from the neem tree (Azadirachta indica) is frequently practiced in many countries of Asia and Latin America and it seems a perfect combination to impede the reproduction of pests in the orchard, preserving them under command.

3. Nutritional characteristics and other opportunities of Moringa olifera

Moringa could play an important role in solving most of the nutrition and general disease control problems of the world. Foidl *et al*. (1999) reported that Moringa olifera contains 10% of sugar and metabolizable energy in the leaves with an average proportion of 9.5 MJ / kg DM. Moreover, Garcia *et al*. (2006) evaluated that the content of crude protein in all plants was high. This species, individually, presented one of the highest contents of soluble carbohydrates (24.1%) and ash (25.8%). According to (Garavito, 2008) there are higher values of protein and metabolizable energy in the leaves and the lowest value are on its crude fiber.
The nutrient content of the species compared with other foods (per 100 grams of edible portion) are depicted in Annex I in the table 1. In all cases Moringa olifera has a higher content of vitamin A, vitamin C, calcium and potassium, regarding carrot, orange, cow's milk and bananas, respectively. Ndabigengesere et al. (1995) found that the shelled *Moringa oleifera* contains 36.7% proteins, 34.6% lipids, and 5% carbohydrates. The un-shelled *Moringa oleifera* contains 27.1% proteins, 21.1% lipids, and 5.5% carbohydrates (Folkard et al, 1989). These enormous sources of nutrients have been documented by many researchers (Fahey, 2005; Fahey, et al 2001; Rao, et al, 1999; Bharali, et al 2003).

It can have a great importance in the diet, as it has all amino acids, valuable vitamins and minerals. It contains high levels of carotene (vitamin A), vitamins B1, B2, B3, C, E, K, in addition to calcium, iron, potassium, copper, magnesium, zinc, all essential amino acids and antioxidants (ascorbic acid, flavenoids, phenols, carotenoids, including others). Moringa is also rich in *rhamnose,* a simple sugar, glucosinolates and isothiocyanates.

As previously cited fresh Moringa leaves have great nutritional qualities: more vitamin A than carrots, more vitamin C than oranges, more calcium than milk, more potassium than

bananas, more iron than spinach and more protein than any other vegetable. They are also highly prized, with them can be prepared teas, salads, pastes snacks, sauces, soups, creams, stews, fried rice, fried, and dressings in general. They can be mixed with fruit juices or cocktails with different egg dishes and mashed children, among other variants, enriching remarkably the nutritional value in terms of protein, vitamins and minerals. These leaves can be dried in the shade and kept whole or ground. In this latest variant, the dust stays on for months without losing its properties, in addition to it is useful to be used as a condiment or added to soups, broths and juices, among others. The flowers are rich in calcium and potassium and can be eaten raw or cooked, with salads, soups, and other dishes as infusions. Its oil is similar to olive oil, very good for salads and as a dressing oil. Its seeds, tender and boiled in water, are similar to chickpeas; dry roasted, remember peanut. The fruit is a pod or capsule triangular widely consumed as stews, is famous for its aphrodisiac properties, rich in protein, essential amino acids and multivitamins (Mathur, 2005).

Some authors also reported medicinal uses, such as antiepileptic, antipyretic and antispasmodic. Furthermore, some authors indicate that currently in many regions of Africa, Moringa is used in a self-medicated to treat patients with diabetes mellitus, hypertension and immunodeficiency.

In a review of several experimental studies conducted in animals, they found that Moringa have beneficial effects on the nervous system, central power sleep and reduces the incidence of cerebrovascular disease; further relates increases in the elderly and vitality reducing night cramps.

In the instance of the cardiovascular system, it has diuretic, antihypertensive effects, increasing the high density lipoprotein, decreasing body weight, serum cholesterol, phospholipids, lipoproteins and low and very low density; it stimulates healing of gastric ulcers, improves liver function (Low dose) and prevents hepatotoxicity; It is useful for improving renal function and dissolve the stones; it too has an antifungal effect (at the foot of athlete and skin infections by Staphylococcus aureus).

Also, regarding to osteomioarticular system, it brings down inflammation and reversal rheumatoid arthritis; it improves glucose tolerance and decreases free fatty acids; it functions as an immunostimulant, inhibits Burkitt lymphoma and skin papillomas. It induces a protective effect against ovarian cancer.

Various clinical tests conducted in the final five years show the properties of medicinal Moringa as an antioxidant, in respiratory diseases, cardiovascular, gastrointestinal, endocrine, central nervous system, on the immune system and as an antibacterial factor.

Moreover, at present the results of a project on the intensive cultivation of *M. oleifera*, Pérez et al. (2010) suggested that its cultivation is an alternative for the production of high protein fodder for feeding sheep. It also presents 70.5% of apparent digestibility of dry matter and 65.5% of apparent digestibility of protein.

Garavito (2008) attaches great importance to *M. oleifera* in animal feed, since the contents of protein and vitamins can be an important supplement in dairy farming and fattening, as well as in the diet of birds, fish and pigs. Price (2000) reported that milk production was 10 kg / cow / day with the use of 40-50% Moringa in the diet (no Moringa was 7 kg / animal / day). The daily weight gain in feedlot cattle was 1200 g / day (900 g / day without the economic consumption of Moringa). Foidl *et al*. (1999) advocate the use of Moringa as fresh grass for livestock, cutting intervals between 35 and 45 days, depending on driving conditions of culture, which can attain a height of 1.2-1.5 m.

It can be practiced as a living fence or windbreak. It prevents soil erosion in areas with intense periods of drought and high winds. Enables interleaving because it gives little shade and has little lateral roots (Becker and Nair, 2004). According Bosh (2009), Moringa is a useful contribution to increase

the use of live posts livestock. This research proposed to examine the feasibility of planting in small regions of the dairies own, tries (Gliricidia sepium) and linden (M. *Oleifera), in order to get the necessary low-cost poles, fencing in pastures of each entity.*

Fugliee (2000) reported on the use of Moringa as a green manure, which significantly enriched agricultural soils. In this process the soil is plowed first, then the seed at a depth of 1-2 cm and a spacing of 10 x 10 cm (a density of one million seeds per hectare) is sown. After 25 days the seedlings are planted with the plow in the ground at a depth of 15 cm. The land is once again set to the desired crop. Meléndez (2000) observed that the Moringa could be applied to support banana plants; Also falling leaves serve as green manure, because they can offer substantial quantities of N. The system developed uses *M. Oleifera established at a spacing of 6 x 2 m, with a dual row of bananas to 0.5 m lines of trees and spacing of 1 x 1.5 m (2222 plants / ha).*

Regarding to the extraordinary effects of Moringa seeds on clarification of waters several authors (Fahey, et al 2001, 2002; Jahn, 1986, Muyibi, et al 2003) have identified the active ingredient in the M. oleifera seed to be a Polyelectrolyte. According to Jahn (1988), the Moringa flocculants are basic polypeptides with molecular weights ranging *from* 6,000 to 16,000 daltons. Six polypeptides were identified with their amino acids being mainly glutamic acid, proline, methionine, and arginine. Bina (1991) identified the active ingredient as a polypeptide acting as cationic polymers; and Ndabigengesere et al (1995) reported that the active factors in an aqueous Moringa extract are dimeric cationic proteins with molecular weights of about 13 000 Daltons and ISO-electric point of between 10 and 11.

Foidl *et al.* (1999) recommend the use of Moringa as a natural flocculant, energy, raw material source of cellulose and plant growth regulating hormones. Moreover, it is important to point out the importance of the innovation of natural coagulants in the process of clarification of water for human consumption (García Fayos, 2007). These authors reported the outcomes received in the laboratory, using the seed cotyledon M. *oleifera* in clarifying drinking water. Many other researchers (Muyibi, et al 1995a, b; Suarez, et al 2005; Bichi, et al 2012) have described its use in surface water treatment. In the first two hours of treatment, the percentage of bacterial reduction *Bacillus cereus*, *E. coli* y *Salmonella typhi* (Oluduro, et al. 2010) using the gummy exudate from *Samanea saman* was similar to that obtained with the seeds of *M. oleifera* (90 to 99.9%). Studies reported by Rodriguez *et al.* (2006) show high levels of microorganism removal (99%) with the use of *M. oleifera* as a natural coagulant. The seed powder can also be utilized for harvesting algae from wastewater, currently an expensive process due to the use of centrifuges.

Garavito (2008), belonging to the Ecological Corporation Agroganadera SA of Colombia, recommended to *M. oleifera* for the production of ethanol and biodiesel. Falasca and Barnabas (2008) consider it an attractive crop for the production of biodiesel, mainly because its seeds contain 31-47% oil. The high content of oleic acid in the oil indicates that is suitable for biodiesel production. Ayerza (2008) showed some of the results of Argentina on biofuels and highlighted the yield of oil from the seeds of M. *oleifera*; also found significant differences ($p < 0.05$) in the oil content in genotype named PKM-1 relating to African genotypes.

According to Foidl *et al.* (2001), Moringa wood pulp is excellent as well as poplar (*Populus* sp). The leaves are suitable for the production of biogas. However, Roa García (2003) considered that Moringa have not the physical-mechanical qualities to be counted as a timber, but it is rich in nectar and pollen, and is a honey plant par excellence.

4. Organic entrepreneurship in Asia

Most of the existing literature on green, small and medium-sized enterprises (SMEs), concentrates on existing businesses (Hillary, 2000; Walley and Stubbs, 2000), but little has been written on green (organic) entrepreneurs. Going away from the concept linked with the economist Joseph Schumpeter (1950) it can be rendered as the cognitive operation of creative destruction and innovation leading to step changes in economic development. Then, in the 1960s and 1970s, much research focused on them as determined by a function of personality-determined characteristics like their 'need for achievement' (McClelland, 1961). Current approaches tie to incorporate models of the room that people react to change, nor exclusively in terms of souls, but also near the organizational social systems that surround them (Walley and Stubbs, 2000).

Entrepreneurship is also by and large understood to entail a growth orientation, but also other values, meanings and interactions that can influence to different ranges of these actions like in the event of the greening of organizations (Walley and Stubbs, 2000) and of society in general.

The term 'greening' is used as a kind of shorthand for 'moving towards environmental or ecological sustainability'. Following to Isaak's (1998) it is possible to see a definition of "ecopreneurs" as individuals who establish or set up green-green jobs. It is recognized that green, ethical and social motives can be difficult to be distinguished. A profit orientation and some sort of environmental orientation are the minimum attributes. But considering further complexity the definition of green entrepreneurs should be broad, embracing not only "ecopreneurs" but also opportunistic entrepreneurs who happen to have found a green corner on the market.

Green agriculture product can be defined minimally as those that arise naturally without synthetic chemical fertilizer. A rising need of organic product worldwide, rapidly advances and is predicted to be yet more rapidly in the future.Therefore, organic crops emerge as the origin of market niches´ opportunities for farmer household and new pioneers on income and activities diversified improvements.

Organic farming achieves higher biodiversity than conventional agriculture, minor dependence on external inputs, higher habitat heterogeneity and most extensive land use in overall. Furthermore, organic farming generally decreases soil erosion, and conserves soil fertility and soil system stability to a higher degree than conventional farming (Gliessman, 2003).

Growing entrepreneurial venture typically comprehends the value of the expansion and depends on the willingness of individual conventional farmers to change to organic farming practices. In this case they are also embedded within institutions that promote or not the development of organic farming venture factors.

Organic agriculture might be capable to increase food production by shutting down part of the yield gap that still is haunting in many developing nations if it can increase yields in low-input smallholder farming systems. But organic agriculture seems to be unlikely to achieve as high yields as are attainable in high-input conventional agriculture when all the conditions of technological packs are ideally working on *ceteris paribus*. In case that there are droughts and climate change effects many test show that organic agriculture keep steady productions in those unexpected circumstances (Altieri, 2010). The impact of organic agriculture on yields and thus on food output will therefore strongly depend on what type of farming system it is likened to.

In developing countries, where three out of four poor people survive in rural regions and where more than 80% of rural people live in households that are involved in husbandry, improving poor farmers' livelihoods is central to addressing rural development (World Bank, 2007). Many studies have suggested that 'organic' agriculture could contribute substantially to farmers' food security and improve farmers' livelihoods. Nevertheless, they do not use to distinguish between chemical-free, organic and other

'agroecological' or 'sustainable' forms of farming.

The demand for organic food in Asia has been growing at 15 to 20 percent every year over the last decade (FiBL and IFOAM, 2009 in Cadilhon, 2009). This sustained growth can be viewed as remarkable in a region where agriculture has to compete fiercely for land and other resources with the industrial and building sectors. However, this spectacular level of growth cannot hide the fact that the market share of organic products in the region remains tiny. The Asian marketplace is characterized by this import of big amounts of processed organic products. The major retail markets for organic foods are relatively more industrialized countries from the region. However, a growing minority of urban consumers in emerging Asian countries is starting to develop in countries like the Philippines, Thailand, India, China, Cambodia and Malaysia.

Throughout the region, retail prices for organic food products stay expensive because of their scarcity and high import costs. Organic products can be as much as five times more expensive than conventional products in Asian markets. This is contradictory considering that three of the top-ten organic producing countries are located in Asia and the Pacific. Australia remains the largest producer of organic products in the world with over 12 million hectares under organic management in 2007 (FiBL and IFOAM, 2009). One should note though that a large proportion of this land is a natural prairie used as forage for livestock.

About Cambodia, the organic farming movement is still very new although in neighboring Southeast Asian countries it has already reached the take-off stage. As conventional farm production is geared mainly towards cash-crop production with heavy reliance on agrochemicals small-scale farmers are exposed to market instability and health hazards. Cambodian consumers are mostly unfamiliar with organic products and they are mostly worried about the uncontrolled usage of agricultural chemical inputs (Jensen, 2010).

Under contract farming schemes, farmers become increasingly dependent on production factors which are extraneous to the community, and on distant markets that are not bound to accept the needs of farmers. For some manufacturers, contract farming systems worked well in the short term, but in many cases the production and market risks were high, and many farmers became indebted.

In reality, in Cambodia there are many farming operations which can be classed as traditional or agroecological; many Cambodian farmers have never used any chemical fertilizers or pesticides, and therefore they are organic by default, using compost, botanical pesticides, etc. Nevertheless, it is difficult to measure their extent as they operate outside the certification logic and conventional markets. Therefore, organic products are commonly eaten and sold locally at the same prices as their formal counterparts.

Some provinces specialize in specific products, where geographical indicators may be appropriate to be linked to their territory. In the case of rice one interesting movement comes along with the System of Rice Intensification (SRI). It tries to increase rice production through improved practices for plant, water, soil and food management. This advance is expected to help farmers not merely to increase yields and maintain economic benefits, but also to preserve the local environmental sustainability.

About the domestic market the organic production grown in Cambodia includes rice, cashew, palm-sugar, pepper, veggies. In the domestic market a range of product is available in supermarkets and also made directly to major hotels and restaurants. Indeed, there is increasing interest in the export market from an increasing number of overseas importers (Cadilhon, 2009).

5. Materials and methods

In order to test these assumptions, primary and secondary data were collected and processed. About primary data an in-depth

interview was developed on Baca Villa firm Siem Reap on 24th January 2015. In February 2015 a written testimony was sent to be incorporated into this document. Please find its content in the Annex II.

The outcomes of this consultation are used to elucidate the theoretical concepts and results of the analyses obtained from the secondary sources found in the academic literature. The in-depth interviews cannot be generalized, but deliver the capability to develop additional opinions that will be presented in the terminations.

Data Analysis. Data were analyzed using the NVIVO program for use of Qualitative data (version 10). The electronic entry for each questionnaire was sent and the answers were collected and validated using the free package Monkeysurvey for Windows 8.

6. The case of Baca Villa Organic Co.

Baca Villa projects started in 2005, departing from the ownership of a guest house in the toutistic town of Siem Riep, Cambodia. Different agents coming from the Netherlands decided to move to live and work in the charity and firm and ventures sector. Stitching Cambodia-Dutch organization was set up on June 6th, 2008. It is a Dutch non-profit organization that supports the local Cambodian population by means of various projects. Their efforts are aimed specifically at the rural population living below the poverty line. Its key aim is raising funds and bringing in new supporters in different projects about education, water and sanitary facilities, health care and employment. The ultimate long-term aim is to help the population to become self-supporting and no longer be entirely dependent on outside assistance. Their work in clear terms is divided as:

- Education: provide free English and basic health care classes, instructed by local teachers in collaboration with volunteers from the base. These volunteers also visit families in need of care and supply them with food and clothing, for example.
- Water and sanitary facilities: install water filtering systems, provide water filters, install water pumps, and build toilets.
- Health care: build a health care center, provide medical staff and medicines.
- Employment: provide work and help people become self-supporting through, for instance, a sewing machine project.
- Furthermore, the volunteers in the Netherlands collect aid supplies, such as clothes, tools, toys, etc. These are shipped to Cambodia in containers.

Since 2010 they have started growing Moringa olifera trees. After realizing that it could be a sustainable and profitable project they decided to focus on the organic market, obtaining the Cambodian Organic Agriculture Association (COrAA) certification in 2013 and manufacturing Moringa with this label different types of products and sub-products. They have centered on making Tea, powder, tablets, oil, Soap, etc. Their activities and products are accommodated to the demand and different cycles of Moringa production. In their factory, they employ from 20 to 30 people depending on the stock and the customers' requests. Instead of becoming a closed firm their aim is to extend the benefits of Moringa cultivation, commercialization and consume and they have organized training and consultancy in the field of agriculture, Food safety and Quality Management for new entrepreneurs and farmers, focusing on:

- Agricultural training.
- Theoretical and practical training: How to grow the Moringa tree and the benefits of the Moringa tree.
- Food hygiene and Quality Training
- Basic hygiene for kitchen staff and hotel management.
- Advanced hygiene training for kitchen staff and hotel management.
- Hygiene training for food producing staff.
- Internal audit training for ISO 9001 and Food safety management systems like HACCP, GMP and BRC

- How to develop a Food Safety Management system, based on HACCP, GMP or BRC.

By personal observation organic Moringa products are made with the highest quality and these are Organic certified by COrAA and certified by the Ministry of Industry in Cambodia on Microbiological and Chemically accredited by the National Association of Testing Authorities, Australia. This Moringa product information is available in English, Khmer, Korean, Chinese and Dutch languages. Their main products are:

- Organic Moringa Tea leaves,
- Tea 30 sachets in boxes,
- Moringa Powder available in all kinds of weights till 5 Kg,
- Tablet bottle's (100 and 200 tablets per bottle) and Moringa-Honey tablets,
- Moringa Seeds,
- Handmade Natural Moringa Soap.

These Moringa Products are sold in the Cambodia domestic market in shops, supermarkets, restaurants, hotels, massage and souvenir shops etc. The integrants of the firm are beginning to export these products to other neighboring countries, like China, India, Vietnam and Laos. One of their objectives is to extend the cultivation among farmers and to tie alliances with other firms to grow in terms of market niche and commercialization of other markets like the European Union, Japan and Australia.

Regarding to their organic production they show a pioneer experience linked to the positive attributes of plasticity and resistance of Moringa trees in their farm of 4 ha., joined with the help of other farms. In total, more than 25 ha. are cultivated in different places in order to diversify the production during the whole year and keep the production out of a possible risk of plagues and diseases.

Considering the data obtained by a personal interview and the testimony showed in the Annex II they do not show in-deep interest in organic or agroecological methods to keep the sustainability of the soils as crop rotations, use of organic or green manure, the introduction of animals or cattle to fertilize the fields or the use of interlined productions with other vegetables, technical fallow periods to enrich the soil and the alellopaty effects of combining different species.

Even thought that they show the observed case that cashew nuts as bad companions of Moringa trees are in interlined or Agroforestry cultivation. Thanks to the extraordinary capacity of adaptation of Moringa trees, the only method that they utilize to keep plagues under control is to spray every 3 weeks one solution compounded of neem oil extract. Some irrigation is delivered along the trees during the dry season to prevent severe drought consequences on trees. Even thought the poor composition of the sandy soils of their farms the trees have easily adapted to the local ecosystem and not many troubles have arisen in these 4 years of production.

Further inquiries should be managed in future periods to show the capability of these trees to adapt to the rough conditions under a scenario of longevity and to evaluate the plasticity capacity shown regarding the lack of further agroecological techniques to improve the biodiversity in the farm system. In other words, it is necessary to know whether the good conditions for growth rely on the youth of the trees and/or better results of production depend or not more on the ability to survive of Moringa trees than in treatments used or not used for their long term fertility and vegetal health.

7. Discussion

At the beginning, like every "new" incorporation into consumer culture this dissemination can create resistance and skepticism and many obstacles can stop or delay the innovative process of organic new firms considering social and regulatory reactions.

About the organic movement in Cambodia there are thousands of rice farmers who could easily qualify as organic growers if they could

be connected to consumers who appreciate organic rice. Regarding to other products this author has noted that many of the new organic ventures started thanks to the installation of foreing entrepreneurs and Non Governmental Organizations (NGOs) looking to reduce local poverty meanwhile investing into sustainable commercial enterprise in a very gifted country for tropical agriculture and facilities for young investors. Nevertheless, the content of the reduced existing market channels and the following impediments linked to the lack of knowledge about organic products by the local population, joined to a blocking corruption, have derived into the specialization of these producers to sell to medium high purchasing power clients, through schemes of marketing that cannot absorb the already existing products.

Consequently, in multiple scenarios of absence of incentives or the removal of cultural obstacles could make that many farmers might get out of the old ways of production. The success of the organic cashew, Moringa and pepper sub-sector might encourage similar endeavors in the rice sector.

The bureaucratic organic certification process has also been said to favor large producers and to thereby increase the social inequalities between small and large farmers. In addition, the need to conform to organic standards defined by Western nations and monitored by local certifiers constrains farmers and prevents them to enroll into this movement.

Consumers in Asia and the Pacific are increasingly worried about the safety of their food. Major business ventures have come along because the new opportunities derived from recurrent food crises involving pesticide residues on fresh produce, food contamination by chemicals in dairy and seafood products, and unregulated use of additives in processed foods. As a result, organic food is perceived as safer by medium and high consumers because it is chemical-free or at least guarantees lower levels of chemical residues than products from conventional agriculture.

While it is possible to provide data (although often only estimates) on the available quantities of organic products as well as the prospects for each sector, it is a great deal and more difficult to forecast the adaptation of potential markets for organic products.

Likewise, the results show that organic and chemical-free farming is feasible and helps to engage more people in the countryside and generate extra incomes. However, often, the productivity of the farms needs to be significantly enhanced to make economically viable operations. Unfortunately the scheme of organic certified agriculture still has not advanced or come back to the future enough to be considered as agroecological but mostly in terms of its chemical-free attributes.

8. Conclusions

Despite numerous investigations conducted worldwide in the last years on prophylactic, nutritional and curative properties of Moringa more rigorous in human clinical tests are required.

The promotion of *Moringa oleifera*, especially regarding its nutritional and medicinal properties, is in line with the guideline of enhancing new organic activities able to create different sources of incomes and jobs in countries that are naturally gifted to extend these tropical varieties.

Unfortunately, no many comprehensive surveys have been taken on what Cambodian and Asian urban consumers expect from food producers. Hence, it may be suitable to explore options about the perceptions and knowledge of consumers' worries and desires as well as the need for discrete classes of food could be endured.

In order to respond to the challenges of the years to come a different approach regarding to organic certified agriculture must be revised. Foremost, it is important to start diversifying the market exits of the region's organic producers. More demand could be stimulated within the region. This would be

achieved by raising the awareness of local consumers on the environmental, food safety and taste attributes of organic merchandise. As many industry stakeholders in the region are already involved in high-profit, export-led supply chains, it is possible for them to use these high profits and strong established circuits to invest in the development and adaptation of lower-cost local marketing channels for products, that are already certified and ready to be exported.

Finally, local, participatory communities and assemblies can show alternative guarantee systems of certification that can play a role in developing greater consumer trust in local markets, while cutting or reducing institutional verification costs. Such participatory guarantee schemes have been successful in Europe, Latin America, and in India and Japan.

Communication and knowledge sharing should be encouraged within the global organic community to establish organic and agroecological consumer groups in Cambodia and other countries in Asia, in order to learn from these success stories about strengthening relationships and promote alternative markets between local producers and consumers.

REFERENCES

Altieri, M. A. and Nicholls, C. I., (2013): The adaptation and mitigation potential of traditional agriculture in a changing climate. Climatic Change DOI 10.1007/s10584- 013-0909-y.

Ayerza, R. Jr. (2008): Seed protein and oil contents, fatty acid composition, and growing cycle length of a single genotype of chia (Salvia hispanica l.) as affected by environmental factors. New Crops & Bioproduct Development. The Association for the Advancement of Industrial Crops. College Station, Texas.

Aregheore, E.M. (2002): Intake and digestibility of *Moringa oleifera*-batiki grass mixtures for growing goats. *Small Rumin. Res.* 46: 23-28.

Becker, B. and Nair, P.K. (2004): Cultivation of medicinal plants in an alley cropping system with *Moringa oleifera* in the United States Virgin Islands. 1st World Congress of Agroforestry. Orlando, Florida, USA.

Bina, B. (1991): Investigations into the use of natural plant coagulants in the removal of bacteria and bacteriophage from turbid waters; *Ph.D thesis*, University of Newcastle Upon Tyne.

Bharali, R., Tabassum, J. & Azad M. R. H. (2003): Chemomodulatory effect of *Moringa oleifera*, Lam, on hepatic carcinogen metabolizing enzymes, antioxidant parameters and skin papillomagenesis in mice.; *Asian Pacific Journal of Cancer Prevention* 4: 131-139.

Bosch, H. (2009): Útil aporte para elevar uso de postes vivos en la ganadería. Periódico Granma. La Habana, miércoles 24 de junio de 2009. Año 13, No. 175.

Cadilhon, J. (2009): *The market for organic products in Asia-Pacific* Paper presented at the BioFach China 2009 Conference on International Organic Food Markets and Development, Shanghai China.

Carballo, N. (2011): *Moringa oleifera* Lam. Árbol de la vida. Folleto, CENPALAB, p. 12.

Croess, Rubelis & Villalobos, Nuris. (2008): Caracterización en cuanto a edad y altura de corte del moringo (*Moringa oleifera*) como uso potencial en la alimentación animal. Instituto Universitario de Tecnología de Maracaibo.

Duke, J.A. (1978): The quest for tolerant germplasm. In: G. Young (ed). Crop tolerance to suboptimal land conditions. Amer. Soc. Agron. Spec. Symp. 32. Madison, Wis. pp. 1-61.

Fahey, J. W; Zalcmann, A. T. & Talalay, P. (2001): The chemical diversity and distribution of glucosinolates and isothiocyanates among plants; *Phytochemistry* 56(1): 5-51.

Fahey, J.W. (2005): *Moringa oleifera*: A Review of the Medical Evidence for Its Nutritional, Therapeutic, and Prophylactic Properties. Part 1; *Trees for Life Journal*; 1(5).

Falasca, Silvia & Bernabé, María A. Potenciales usos y delimitación del área de cultivo de *Moringa oleifera* en Argentina (2005): *Revista Virtual de REDESMA*. p. 1 FAO-OMS. Normas alimentarias FAO/OMS. Comité del Codex sobre Residuos de Plaguicidas. Reunión 37.

F/FRED (1992): Forestry/Fuelwood Research and Development Project. Growing Multipurpose Trees on Snlall Farms. Bangkok, Thailand: Winrock International. 195 + ixpp (including 41 species fact cards).

FiBL and IFOAM (2009): *The World of Organic Agriculture. Statistics and Emerging Trends 2009*. FiBL (Frick, Switzerland) and IFOAM (Bonn).

Foidl, N., Mayorga, L. and Vásquez, W. (1999): Utilización del Marango (*Moringa oleifera*) como forraje fresco para el ganado. Conf. Electrónica de la FAO sobre Agrofor. para la Prod. Anim. en América Latina.

Folkard, G.K., Sutherland, J.P. & Grant, W.P. (1989): Optimization on the use of natural coagulants for water purification; *Technical report No.R4254*; Department of Engineering, University of Leicester.

Fugliee, L. (2000): Se estudian nuevos usos del marango en Nicaragua. *EDN 68* (Spanish) Septiembre.

García Fayos, B. (2007): *Metodología de extracción in situ de coagulantes naturales para la clarificación de agua superficial. Aplicación en países en vías de desarrollo* . Valencia.

Garavito, U. (2008): *Moringa oleifera*, alimento ecológico para ganado vacuno, porcino, equino, aves y peces, para alimentación humana, también para producción de etanol y biodiesel.

García Roa, M. (2003): Producción de semillas forestales de especies forrajeras enfatizados en sistemas silvopastoriles. INAFOR. 37 p.

Gliessman, S.R., ed. (2001): Agroecosystem sustainability: developing practical strategies. Book Series Adv. in Agroecology, CRC Press, Boca Raton, FL.

Hillary, R. (ed.) (2000): *Small and Medium-Sized Enterprises and the Environment: Business Imperatives* (Sheffield, UK: Greenleaf Publishing).

Isaak, R. (1998): *Green Logic: Ecopreneurship, Theory and Ethics* (Sheffield, UK: Greenleaf Publishing).

Jahn S. A. A. (1986): Proper use of African natural coagulants for rural water supplies – Research in the Sudan and a guide to new projects. GTZ Manual No. 191.

Jensen, H. K., Konradsen, F., Jørs, E., Petersen, J. H., & Dalsgaard, A. (2010): Pesticide use and self-reported symptoms of acute pesticide poisoning among aquatic farmers in Phnom Penh, Cambodia. *Journal of toxicology*, *2011*.

Jyothi, P.V. Atluri J.B & Reddi C.S. (1990): Pollination ecology of *Moringa oleifera* (Moringaceae). Proceedings of the Indian Academy of Sciences (Plant Sciences). 100:33.

Liñan, F. (2010): Moringa oleífera EL ÁRBOL DE LA NUTRICIÓN. Ciencia y Salud.

McClelland, D.C. (1961): The Achieving Society (Princeton, NJ: Van Nostrand).

Makkar, H.P.S and Becker, K. (1996): Nutritional value and antinutritional components of whole and ethanol extracted *Moringa oleifera* leaves. *Anim. Feed Sci. Techn.* 63: 211-228.

Makkar H.P.S. and Becker, K. (1997): Nutrients and antiquality factors in different morphological parts of the *Moringa oleifera* tree. *Journal of Agricultural Science,* 128:311-322.

Mathur, B. (2005): Trees for life. Recuperado el 4 de Enero de 2014, de Trees for life : http://www.treesforlife.org/sites/default/files/documents/Moringa_Book_Sp(screen).pdf

Meléndez, L. (2000): Ricardo Russo: Maestro de la agroforestería latinoamericana. *Agroforestería en las Américas.* 7 (28).

Morton J F (1991): The Horseradish tree, *Moringa pterygosperma (Moringaceae)*: A plant boon to arid lands? Economic Botany, 45: 318- 333

Muyibi SA and Evison LM. (1995): Moringa oleifera seeds for softening hard water. Water Res 29: 1099–1104.

Muyibi, S.A., Saad A. Abbas, Megat Johari Noor, M.M. & Fakrul Razi Ahmadon (2003): Enhanced coagulation efficiency of *Moringa oleifera* seeds through selective oil extraction. *IIUM Engineering Journal, 4* (1), 1-11.

Nautiyal, B.P and Venhataraman, K.G. (1987): Moringa an ideal tree for social forestry. 1: Growing conditions and uses. Myforest. 23 (1): 53-58.

Ndabigengesere, A., Narasiah, K.S. & Talbot B.G. (1995): Active agents and mechanism of coagulant of turbid waters using *Moringa oleifera*. *Water Research*, Vol. 29, No. 2, pp. 703-710.

O´Donnell, J.J., Palada, M.C., Crossman, S.M.A., Kowalski, J.A. and Bulbulla, A. (1994): Growth and biomass production from hedgerow species. *Agron. Abstr*. pp. 72.

Oluduro, O., Aderiye, B., Conolly, J., Akintayo, E., & Famurewa, O. (2010): Characterization and Antimicrobial Activity of 4-(-D-Glucopyranosyl-1→4--L-rhamnopyranosyloxy)- benzyl thiocarboxamide; a Novel Bioactive Compound from Moringa oleifera Seed Extract. Folia Microbiol , 55 (5), 422-426.

Palada, M.C., (1996): Moringa (*Moringa oleifera* Lam.): A versatile tree crop with horticultural potential in the subtropical United States. *HortScience*, 31(5): 794-797.

Parrotta, J. A., (1993): *Moringa oleifera* Lam. Reseda, horseradish tree. Res. Note SO-ITF-SM-61, South. For. Res. Sta., For. Serv., U.S. Dep. Agric., New Orleans, LA, USA.

Pérez, A.; Sánchez, Tania; Armengol, Nayda & Reyes, F. (2010): Características y potencialidades de *Moringa oleifera*, Lamark. Una alternativa para la alimentación animal. *Pastos y Forrajes*. 33:1. 2

Ramachandran, C., Peter, K.V. & Gopalakrishnan, P.K. (1980): Drumstick (*Moringa oleifera*): A multipurpose Indian vegetable. *Econ. Bot.* 34: 276-283.

Rao, K. N. V., Gopalakrishnan, V., Loganathan, V. & Shanmuganathan, S. (1999): Antiinflammatory activity of *Moringa oleifera* Lam; *Ancient Science of Life* 18(3-4): 195-198

Reyes Sanchez, N. (2006): *Moringa oleifera* and *Cratylia argentea*: potential fodder species for ruminants in Nicaragua. Faculty of Veterinary Medicine and Animal Science Department of Animal Nutrition and Management Uppsala. Doctoral thesis, Swedish University of Agricultural Sciences Uppsala.

Sani M. A. (1990): The use of Zogale seeds for water treatment. B. Eng., Final year project report, Bayero University, Kano, Nigeria.

Sharma, G.K. and Rains; V. (1982): Propagation techniques of *Moringa oleifera* Lam, in Khosia, P.K, ed. Improvement of forest biomass: Proceedings of a Symposium. Solan, India. Indian Society of Tree Scientist: 175-181.

Schumpeter, J.A. (1950): *Capitalism, Socialism and Democracy* (New York: Harper & Row).

Thurber M.D. and Fahey, J.F. (2009): "Adoption of Moringa oleifera to combat under-nutrition viewed through the lens of the "Diffusion of innovations" theory," Ecology of Food and Nutrition, vol. 48, no. 3, pp. 212–225.

Troup, R.S. (1921): The silviculture of Indian trees. 3 vol. Clarendon Press. Oxford, UK. 1195 p.

von Maydell, H.J. (1986): Trees and shrubs of the Sahel, their characteristics and uses. Deutsche Gesellschaft fur Technische Zusammenarheit (GTZ). Federal Republic of Germany. pp. 334-337.

Walley, L., and Stubbs M. (2000): 'Termites and Champions: Case Comparisons by Metaphor', *Greener Management International* 29 (Spring 2000): 41-54.

World Bank (2007) World Development Indicators: Reducing Poverty and Hunger. http://devdata.worldbank.org/wdi2006/contents/ Section1_1_1.htm.

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ANNEX I

	Fresh leaves [a] (value/100g edible portion)	Dried leaves [b] (value/24g [≈3tbsp] edible portion)	RDA for healthy children age 1-8 years old [c]
Calories	92 cal	49 cal	
Macronutrients			
Protein	6.70 g	6.5 g	13-19g/day
Fat	1.70 g	0.55 g	30-40 g/day
Carbohydrates	12.5 g	9.2 g	130 g/day
Micronutrients			
Carotene (Vitamin A)	6.78 mg	4.54 mg	300-400 µg/day
Thiamin (B1)	0.06 mg	0.63 mg	.5-.6 mg/day
Riboflavin (B2)	0.05 mg	4.92 mg	.5-.6 mg/day
Niacin (B3)	0.8 mg	1.97 mg	6-8 mg/day
Vitamin C	220 mg	4.15 mg	15-25 mg/day
Calcium	440 mg	480.72 mg	500-800 mg/day**
Copper	0.07 mg	0.14 mg	340-440 mg/day
Fiber	0.90 g	4.61 g	19-25 g/day**
Iron	0.85 mg	6.77 mg	7-10 mg/day
Magnesium	42 mg	88.32 mg	80-130 mg/day
Phosphorus	70 mg	48.96 mg	460-500 mg/day
Potassium	.26 g	0.32 g	3.0-3.8 g/day**
Zinc	0.16 mg	.79 mg	3-5 mg/day
Essential Amino Acids [7]			
Histidine	149.8 mg	147.12 mg	8 mg/g protein
Isoleucine	299.6 mg	198 mg	25 mg/g protein
Leucine	492.2 mg	468 mg	55 mg/g protein
Lysine	342.4 mg	318 mg	51 mg/g protein
Methionine + Cysteine	117.7 mg	84 mg	25 mg/g protein
Phenylalanine Tyrosine	310.3 mg	333.12 mg	47 mg/g protein
Threonine	117.7 mg	285.12 mg	27 mg/g protein
Tryptophan	107 mg	102 mg	7 mg/g protein
Valine	374.5 mg	255.12 mg	32 mg/g protein

Table 1: Nutrients in Moringa olifera (Thurber & Fahey, (2009)

ANNEX II: Testimony by Baca Villa manager, Ing. Jan Camp

"It started with a few Moringa seeds which I received from Engineers without Borders US because I had many troubles with clean drinking water in the province of Takeo where we're also working. They did not know about these seeds also but heard you could make clean water of this.....I was interested, but scared to lose them so first I put them into my garden to make more seeds....

In 2010 I started with a few Moringa seeds in my garden at home and after buying >1 ha outside in the countryside I moved 2012 to my nursery from my garden to there, this empty land we had to clean from trees and weed.

I kept all administration from the land up to date because I would like to be Organic farming.From every harvest seeds I made more trees...after this I started to cut the leaves for making productions.

First, we start to wash and dry the leaves at the countryside place, but soon we saw many E. Coll in our products. People in the countryside are not used to washing their hands after toilet and it was too hard to teach them also when I was not at the place....

We move the production of washing and drying to Siem Reap, to my Baca Villa place to make sure and control the whole process.

We also had to learn a lot, washing and drying is one.... Packaging, style, design, size of powder customer asking, the machines we need which you couldn't buy at that time in Cambodia, etc. Explain the employees how to work with machines, packaging and western quality etc.

Step by step I translated more and more Moringa information into Khmer so that they could read and read it again, that was already a better way. I asked the University in my country about drying method and times of drying the leaves to keep nutrient value as much as possible etc. I sent Moringa leaves to them so they could check it on chemical and Microbiological analyses. This was a big step forward's how to work.

Step by step we learned to make dry Moringa leaves for Tea and powder and after we bought our first tablet machine customers were more and more interested in our products. We bought International food grade zip bags which were unique at that time, even the ministries were amazed where we bought this one....

In August 2013 we are Organic recognized Moringa farmers, the 1st one in Cambodia!

Customers found the way to our Baca Villa, buying more and more Moringa products and nowadays we are selling in almost every supermarket in Cambodia.More and more customers, companies from everywhere contacted us for export. Export is still not easy at Cambodia...

At this moment we have a huge Chinese company where we under contract making Moringa products in their packaging, in 40F containers, packing arrives frequently at Baca Villa... They are selling them in almost all countries in Asia.

Because our selling increases more and more we found a farmer's family willing to cooperate with us and they start farming in an area of 25Ha, every year they are growing around 1ha more Moringa trees. Its near the mountains, excellent land and easy growing fast without fertilizers. A third place of 4 Ha we start this season. Also the reason to grow in different places is to make sure we have always leaves from different place in case of diseases".