

# BLUE ECONOMY BHUTAN

*Review of Ongoing Projects June 2012*

## **Background**

After a series of field visits between 2009-2011 and the organization of the first GNH Fund meeting in June 2011 bringing together 150 local and international participants from government, business and academia, time was required to translated the project concepts into concrete proposals. While we proceeded with DHI to obtain the approvals for the GNH Fund and the Investment Management Company we continued carefully but resolutely with the most relevant initiatives that obtained a broad support and endorsement. The recent visit (May 3-8, 2012) takes stock of the local situation, secures advances of the existing portfolio while building trust amongst the partners.

## **Bhutan in the Spring of 2012**

The economic conditions of Bhutan have changed. The Rupee crunch deprives the Royal Government of Bhutan, the private sector and the citizens of foreign currency needed to import. In addition, the labor market deteriorates, waste and pollution due to unsustainable consumption patterns turn visible, and the full potential of all creative and renewable resources of Bhutan remains largely unexploited. This offers a background that urges all partners to move forward with innovations like the ones proposed by the Blue Economy. This situation adds to the relevance of the GNH Fund since it aims to make a positive contribution to the economy while maintaining GNH as a guiding principle.

The systemic approach to available and renewable resources would permit the Government to design policies that are conducive to the creation of a portfolio of competitive industries that also meet the most stringent parameters of GNH. The continued importation of animal feed from India weighs heavily on the balance of payments, while the strategy outlined below could revive buckwheat as an export product through the making of an extract, while generating quality feed locally. The tapping of the trees could reduce dependency on imported fuel, while generating jobs in a competitive environment. These two (and other) initiatives require policies to secure the shift. The Royal Government of Bhutan has proven in the past to be prepared to make such bold decisions.

Therefore this summary is aimed at reinforcing our commitment to implement the projects, and to secure both access to the technologies and expertise as well as marketing and financial resources. However, the key is to identify and reinforce the mutual benefits as these projects are undertaken in parallel to demonstrate a multiplier effect in the Bhutanese economy without weighing in on the limited financial resources of the government.

## **The Next Steps**

The projects that have clearly benefit from a broad financial and technical support are: (1) the GNH Centre in Bumthang, (2) the buckwheat project in Ura, (3) the organic buckwheat beer project, (4) the soapnut production, (5) the solar heat and power assembly plant, (6) tapping fuel from trees, (7) the waste transfer station and the recycling plants. In addition, consultations with GNH Commission and private local hotel owners lead to two additional initiatives (8) medicinal mushroom farming on agricultural waste in Ura, and (9) energy efficient hotel management.

### **1. The GNH Centre**

Thanks to an initial funding from John Raimondo, based on the business model that foreign participants pay 20 years in advance for the use of the GNH Centre, the team headed by Dr. Saamdu Chetri has now relocated to Bumthang, and started to operate the development which will prioritize the building of the walking bridge across the river, the community center and some meditation huts. In addition work has started on the program development for the GNH Centre. Beautifully located under the blessing skies that include a monastery, bordered for nearly fifty percent by a river, the site is exceptionally well situated for the purpose of GNH. Home stay with local villagers offers lodging in advance of the construction of its own facilities which will be invisible to the Monastery above. The housing will be built inside the ground, with a maximum use of the natural open space. Cars have to be left a few kilometers from the GNH Centre property, permitting everyone to make a meditative walk.

The walking of the land offered a better understanding of the opportunities. The site can provide for all its energy requirements with available local renewable energy resources. The installation of up to seven micro-hydro stations could generate baseload electricity. The installation of combined heat and power solar panels offer additional electric current, while offering hot water without burdening the electric power supply. The installation of the lighting system based on 12V DC and LED will be the standard.

This precious site - and the humble use of the land within the context of GNH requires special attention to waste water management. The facilities will only feature separation dry toilets, eliminating the need for septic tanks and black water treatment, securing the integrity of the river. The adjacent land will be farmed, and natural storage facilities will provide sufficient food reserves to provide healthy and abundant nutrition for both the body and the mind. Video images and interviews with Dr. Saamdu Chetri will introduce the GNH Centre to an international audience. This will facilitate further fundraising along the business model that now has been proven.

## **2. Buckwheat**

### 2.1. Farming Buckwheat in Ura

The experience of the destruction of a buckwheat sample by Japanese authorities demonstrated the need for a stringent quality control. Karma Jurmin Tenzin from Ura, who was involved in the “buckwheat evening” at the GNH Fund event took it upon him to work directly with the Ministry of Agriculture and Forestry to design a quality control system that removes all sand, dust, stones and insects from the produce. The result after 9 months of work is an international standard of sweet buckwheat available for sale directly from the farmers. The progress led to the conversion of potato to buckwheat fields. A packaging design finetuned by Karma complements the quality controls, eliminates all intermediaries and offers a commercial package that meets local needs at local prices with international standards. Karma commits to buy from the farmers, and with the support of the Ministry they jointly undertake the controls. However he takes the financial responsibility.

### 2.2. Organic Buckwheat Beer

As proposed by the Prime Minister, the team coordinated by Sy Chen (Japan) of Creative Intelligence Associates, a network of branding and marketing specialists designed a strategy to earn higher revenues from buckwheat, than the mere sale of a commodity. The team of Sy developed the “PAWO” brand with a licensing concept. In addition to the design and licensing strategy, the company registered and protected the trademark in Japan. A successful implementation of the “buckwheat beer” strategy would generate more revenue for Bhutan from the royalties on the beer sold, than on the buckwheat exported as a commodity. The credibility of the license however hinges with the set-up of a buckwheat beer brewery in Bhutan in addition to the licensing of buckwheat beer for overseas consumption.

In a typical Blue Economy fashion, this strategy generates multiple benefits. First of all, the proposal is to produce malt extract from buckwheat in Bhutan. This represents an estimated eight percent of the biomass of the harvested buckwheat. After extraction, the remaining 92 percent can be fed to chickens. This reduces the need for import of fish meal from India which has been one of the doubtful practices of domestic chicken farming. Whereas buckwheat is too expensive as an animal feed - and too high quality, the spent buckwheat grains are an ideal nutrient for poultry farming.

The buckwheat extract allows a simplified brewing process both in Bhutan and overseas. Instead of a bulky transport of buckwheat, the extract - with a much higher value - saves space in the traditional brewery, and reduces the waste on site. However, in addition to the malt extract, the “Bhutanese” brand will be reinforced by the harvesting of wild yeast. Yeast is required to ferment the malt and produce beer. In traditional beer brewing fashion, wild yeasts could be harvested and domesticated to provide a distinct taste. The third ingredient are hops. Bhutanese farmland is also very well suited for the planting of hops for local use, and along the same strategy, Bhutan could produce a hop extract. One of the trials that a brew master should undertake is to study the use of bitter and sweet buckwheat in order to define a portfolio of beer options.

Jim Lueders, the US-based master brewer trained in Germany who over the years has created and consulted with a two dozen craft and micro-breweries, is prepared to come to Bhutan and undertake the beer brewing venture based on malt extracts. He has just inaugurated his most advanced concept known as “Wildwood Brewery” based in Stephenville, Montana. His newly created beer was immediately awarded the title “Best of the State”.

In addition, Mr. Kinley Tshering working at the Ministry of Agriculture and Forestry learned how to brew beer while studying forestry at Missoula, and has assembled a team to set-up a local brewery. Mr. Tshering and his colleagues also have land and financial resources to move this process forward. Whereas their original concepts was a simple brewery, the team is open to proceed with the local brewing and the international licensing.

When it comes to the non-alcoholic organic buckwheat beer, the original proposal of HE the Prime Minister, it may be appropriate to point out that beer is first produced with naturally occurring alcohol which is afterwards removed using one of the two standard methods. In view of the above, time is appropriate to develop a full-fledged business plan and accompany this with a technical development to review all the components (available and missing) ranging from potential volume of malt extract, harvesting and propagating of wild yeast, local farming of hops and the production of hop extracts, the test brewing with buckwheat both bitter and sweet.

### **3. Heat and Power Solar**

One of the proposals from the GNH Fund meeting was the creation of a local assembly of solar systems based on the double side use of photovoltaics with the purpose to generate both heat and power. The provider of the technology is the Swedish company Solarus AB. DHI demonstrated interest in pursuing the opportunity to locally assemble the units and an MOU has been signed in order to proceed with a feasibility study. Two local investors have confirmed their interest to join DHI. Mr. Passang Dorji (DHI) is coordinating this project and is studying the ramifications keeping in mind the recent decision of a local assembly of BATEC, a Danish solar water heating company with an assembly in Phuentsholing. Whereas DHI and the investors appreciate the better performance of Solarus providing heat and power, the feasibility needs to demonstrate that an assembly meets the commercial, financial and technical criteria for Bhutan. One of the key questions is how “blue” is the proposal.

Therefore it is important to place this initiative in the broader context of Bhutan. Up to 30 percent of the electric consumption in a residential area is for water heating. While the cost of electricity is low by international standards, the load on the grid in the winter forces Bhutan to import electricity from India at high rates. Having the opportunity to generate both electricity and heat relieves the pressure on the grid, while it also offers the chance - at first in the hospitality sector and then in the new housing projects - to offer floor heating. During this May visit several hotels managers have expressed a clear interest to eliminate the electric heaters and replace these with floor heating. Hotels that have already installed floor heating can substitute the boiler with solar heated water that functions even when extended cloud cover blocks direct sun.

When the Solarus was first discussed, the assembly emerged as an attractive option, not only since the knock-down versions are cheaper to transport than the ready to install. In addition, the assembly is a rather easy six step process, from the beginning there was a commitment to supply local content. While everything must meet the stringent quality and performance standards of Solarus, the outer casing could be made - according to the founder and inventor Stefan Larsson - from recycled plastics. This reinforces the need to establish a transfer and separation station for the city of Thimphu as is being implemented in cooperation between Greener Way with the support of DHI and the Royal Government, in order to give value to the plastic component. It is this potential additional value that generates multiple benefits (hot water, floor heating, power, plastics recycling, jobs) that could turn this initiative into a showcase of the GNH and the Blue Economy.

It should be pointed out that traditional solar water heaters rely on absorbers made from copper, and selective surface treatments made from nickel. Solarus uses recycled aluminum. The anticorrosion hydraulic channels in the Solarus absorber is produced from a cellulose polymer ceramic composite, which lowers the manufacturing costs, decreases the environmental impact, increases the life expectancy, and improves performance. This renders the Solarus option more competitive, and opens further long term opportunities for recycling.

With the visit to Sweden and the proposed mission by the feasibility team it is expected that a concrete investment proposal and business plan will be developed in the months following the data gathering which would lead to the negotiations on a licensing contract.

#### **4. Waste Transfer Station**

During the GNH Fund meeting, a commitment was made by the Royal Government of Bhutan to facilitate the business development of Greener Way, the pioneering recycling company in Thimphu. DHI has been supportive to Greener Way and secured additional loans in order to grow the business. The first step as suggested by the expert group was to set up a transfer station. Whereas the land was allotted, unfortunately the deed was annulled and a new land has been assigned. Regretfully, Karma Yonten, the CEO of Greener Way already invested in the design and the engineering of the transfer station, which now has to be repeated. Frank Raimondo, a participant of the GNH Fund meeting provided the investment to acquire the baling machine. The machine has been ready for delivery for a while but will only be received once the new location for the transfer station has been accommodated to receive the equipment.

Private investors - separate from Greener Way - have stepped forward and invested in a paper recycling facility which relies on the paper separation and baling from Greener Way. Whereas originally this would have been an initiative by Greener Way, adding value to the transfer station, Karma Yonten is prepared to work with this new investor and focus on the other high volume components that need recycling. The priority would be egg cartons, and in the light of the above case for the solar heat and power generation - the plastics. The critical factor today, is just like in June 2011, the readying of land for the transfer station.

## **5. Tapping Trees**

The ever increasing importation of fuel continues to stress the foreign exchange reserves. The “Las Gaviotas” project, initiated and directed by Paolo Lugari in Colombia, has continued to expand its successful tapping of the trees. Prof. Carlos Bernal had demonstrated the tapping techniques during his visit in June 2011. Based on the available information Mr. Kinley Tshering, the Chief Forestry Officer at the Ministry of Agriculture and Forestry, in cooperation with the National Resources Development Corporation, coordinates a nationwide study to assess the potential for both blue and Chir pine which precedes the undertaking of the proposed pilot project.

The Government realizes the strategic interest for the nation. Therefore, in order to speed up the development of the project by suggestion of Mr. Karma Tshiteem, the Hon. Secretary of the GNH Commission, the Minister of Agriculture and Forestry will visit Las Gaviotas (Colombia) in conjunction with the RIO+20 conference held in Rio de Janeiro, permitting to study on site the scope of the project implemented. The ZERI Foundation’s officials in Colombia will coordinate the visit and arrange visa with the 24th of June confirmed as date.

## **6. Soap Nuts**

The study of the soapnuts as a commercial product has advanced to the next stage thanks to Yusuke Saraya. Whereas it was impossible to stabilize a liquid extract, a stable powder was produced at the Saraya’s research facilities in Osaka. The results were communicated to Sangay Rinchin who had visited the facilities in Japan last year and who had expressed an interest to pursue this business as a means to generate additional revenues for farmers who have soapnut trees. The question is how to convert the product that has the look, feel and smell of a modern soap could be commercialized? Saraya is prepared to share the know how of the extraction and stabilization as a powder, and Bhutanese partners have to decide how they wish to proceed with the conversion of this opportunity into a business plan. Thanks to the product development undertaken in Japan, it is confirmed that this can be a competitive product first and foremost on the local market, substituting the synthetic, over-packaged products laced with artificial fragrances imported from India. In a second stage, a niche market could be developed for export provided there is sufficient production to warrant a continuous supply.

## **7. Mushrooms**

The discussions with the Secretary of GNH Commission indicated a desire to embark on a broad initiative to farm exotic mushrooms in Bhutan. The ZERI Foundation has successfully introduced mushroom farming on agricultural and forestry waste for production in rural zones. In addition, the mushroom experts have also set up urban cultivation centers operating with selected organic components of solid municipal waste (like coffee and tea waste). This opportunity was deemed relevant to Bhutan especially in the context of the present Rupee crunch. If Bhutan is interested to pursue a rural and/or urban initiative, then the ZERI Foundation is ready to offer the hands-on expertise in order to turn this into a competitive and

productive business that could respond again first to the demands of the discerning hotels which are now importing all fresh and dried mushrooms. In the second phase this could also become an export product for the international market further building on the positive image of the Bhutan and the concept of GNH.

## **8. Hotels**

Meetings with the managers and owners of the hotels Aman, Taj and Ziwha Ling indicated that the hospitality sector is prepared to play a catalytic role in the successful implementation of several of the Blue Economy projects described above. The installation of solar heat and power systems, the purchase of local soaps, the use of buckwheat and mushrooms from local production would benefit from the original orders from hotels. Brent Hyde, the General Manager of the Ziwha Ling Hotel confirmed his preparedness to apply the principles to the hotels that work together on a collegial basis. The business models proposed would benefit from purchase commitments from the hotels which would trigger the implementation of several of the projects while reducing the risks of the early phase development.

## **9. GNH Fund and GNH Fund Management Company**

DHI has filed the applications with the Royal Monetary Authority through the Ministry of Economic Affairs. It is expected that the acceptance of the proposal, and the approval would take at least an additional 3 to 6 months. It was agreed that the roadshow for the raising of the capital could only be planned after the appropriate approvals have been obtained.

Whereas there are other developments related to the original list of 18 projects, we have come to the common understanding that these items reported on are the priority and most relevant on which we should focus at this point in time.

## **10. Beyond the GNH Fund**

At the outset of our collaboration we wished to contribute to the Tarayana Foundation which wishes to bring development to the periphery of the country, securing that basic needs are met in the remote villages. Shawn Frayne developed a stripped down solar cellphone charger, with the PV panel made from recovered waste material. The first 500 units were delivered to the Tarayana Foundation and are sold at \$6 a piece. The money so generated is used to buy the next 1,000, and the sales will then provide the cash for the next 2,000 until the market of an estimated 10,000 units would be reached. This project is to demonstrate the opportunity to apply “micro-investments” that through a rapid cash flow generation permit to take on challenges (securing communication in an environment without a grid) at low cost. The initial investment by the ZERI Foundation of \$2,000 (product plus shipment) can evolve into a \$40,000 contribution to the funding of the projects of the Tarayana Foundation.

## **BLUE ECONOMY BHUTAN**

**WITH THANKS TO ALL THOSE WHO CONTRIBUTED TO THE TRANSLATION OF THE PROJECTS IDEAS INTO CONCRETE INITIATIVES, AND THE ALWAYS EFFICIENT BACK-UP AND SUPPORT FROM THE TEAMS AT DHI, GNH COMMISSION AND ETHOMETHO.**

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