

Food-Fuel-and-Income security through ‘Village Level Biodiesel’

Stimulating “*Oilseed and Pulses Villages*” to *bridge-the-yield-gap* in Odisha, India

A Grass-roots Initiative by CTx GREEN

Introduction

A strategic package of small-scale technologies and social engineering has been developed and fine-tuned over the past eight years by CTx GREEN, a Canadian not-for-profit organization. CTx GREEN works closely with grass-roots NGOs as well as universities in India and Canada (partnerships are emerging with NGOs in Ethiopia, Kenya and Sri Lanka). CTx GREEN’s package promotes sustainable agriculture within agro-forest communities to improve their self-sufficiency in *food-fuel-and-household-income*. Un-utilized and under-utilized local resources are harnessed to achieve a climate resilient, *local production for local use* model. The *local production* in this model refers not only to food but also to (bio)fuel produced from local agro-forest resources. “Feed yourself first before looking for a market for the surplus” is a key concept in maximizing local uses and benefits from the local production of fuel and food.

The use of oil cake as a local input to agriculture and the use of locally produced biodiesel fuel to increase agricultural mechanization are two important elements of the package. By increasing the level of mechanization of agriculture,¹ it is possible to bring more land under cultivation in rain-fed conditions by providing timely inputs of tilling, sowing and organic fertilizer (power tilling with local green fuel, good native seed varieties, and local oil cake, respectively). Overall food production, land productivity (tonnes/hectare) and soil health can thus be improved simultaneously. Relay cropping and mixed cropping of pulses, cereals and oil seeds are among agricultural practices that need to be adapted and customized to local agro-climatic conditions, to improve nutritional security as an integral part of food security. Trees grown as a part of agro-forestry packages will not only provide tree-borne oilseeds and fruit as raw material for making biofuels, but will also reduce soil erosion in the catchments of the watershed and enhance soil carbon. An increase in the green cover reduces vulnerability to climate change by sequestering carbon while supporting food-fuel-and-income security. Thus all of these elements, together and individually, build climate resilience. Technologies to facilitate the local availability of edible oil, oil cake and biodiesel include: small-scale oil presses and expellers; CTx GREEN’s pedal-powered biodiesel reactors, and village-scale refining of oil, biodiesel, glycerin and ethanol; biodiesel-fuelled multi-use power tillers, pump-sets, and a range of post-harvest value addition tools (threshers, rice mills, oil mills, and even gen-sets). The implementation of such small-scale technologies provides local jobs, training and economic opportunities to youth, and an incentive to reverse migration to urban centers.

The CTx GREEN definition of *food-fuel-and-income security* is more in tune with the Concept of Food Sovereignty, which goes farther than the UN Committee of Economic and Social and Cultural Rights (CECSR) definition of Food Security “... *when every man, woman and child, alone or in a community with others, has physical and economic access at all*

¹ Subsistence agriculture in much of Odisha state in eastern India is not mechanized.

times to adequate food or means for its procurement using a method that is in agreement with human dignity.” The concept of Food Sovereignty was first defined by the farmer’s organization La Via Campesina² in a manner that concerns all people’s right to food but also where this food comes from and how it is produced:

“Food Sovereignty is the right of peoples, communities and countries to define their own agricultural, fishing, food and land policies which are ecologically, socially, economically and culturally appropriate to their unique circumstances. Food Sovereignty places the people who produce, distribute and consume the food in the centre of the food system and its policies, instead of demands from markets and companies.”

By forging a link to increased local production of food through locally produced fuel and fertilizer, the local community is then in a stronger position to reduce the outflow of cash to purchase inputs to agriculture, and increase cash income from the sale of surplus food. Biofuel produced in this “*local production for local use*” model is far more likely to increase *food-fuel-and-income security* at the local level than large-scale centralized production of biofuels to substitute fossil fuels used in urban transportation, which may pose serious threats to food security by diverting land under food cultivation to cash-crops for fuel.

The CTx GREEN model of *local production for local use* that targets the strengthening of *food-fuel-and-income-security* is named **VLB** (as an abbreviated moniker for Village Level Biodiesel³) to differentiate it from other conventional biodiesel models based on mega-plantations and centralized production of fuel for urban transportation purposes. In the case of the latter models, not only is there a serious threat to local food security, but there is also little likelihood of the benefits trickling down to the producers of the feedstock.

The VLB model for strengthening food-fuel-and-income-security takes an approach that has three prongs, namely,

- creation of biodiesel-fuelled *green* livelihoods,
- delivery of value-added products and services, and
- practice of sustainable agriculture.

In the Odisha context, particularly in hilly forested regions inhabited by tribal people (*adivasis*, or indigenous people), the first value chain addressed by CTx GREEN’s VLB model is that of the abundantly available yet under-utilized and un-utilized oil seeds. (Typically the pre-VLB value chain comprises the collection and sale of these seeds, often at low prices to outside traders, who often double as money lenders in times of need). **The engagement of local actors in the expanded value chain is critical to maximize the benefits to the local economy.** Farmers drive the demand side as consumers of oil cake and biodiesel in sustainable agriculture. Youth are trained to operate the oil mill, biodiesel production centres and biodiesel-fuelled agro-service tools such as power tillers, rice hullers, *etc.*, in a profitable manner. Women’s self-help groups are engaged in securing the raw materials (procured

² The quote is reproduced from page 7 of “The betrayal of the poorest – on the agriculture aid that disappeared,” The Swedish Cooperative Centre (SCC), Facts from SCC, Nr. 7, June 2008, www.utangranser.se

³ VLB could also stand for Village Level Bio-ethanol or in general Village Level Biofuel

from collectors and cultivators) and marketing of products, by-products and services within the local community. Appropriate financing packages and training for all three groups of actors (youth, women and farmers) are critical supports that need to be extended to empower the actors in their roles as successful entrepreneurs. *A producers cooperative is also envisaged as an overarching need to streamline the production and sale of surplus goods and services emerging from the activities – every family in the cluster would be eligible for membership and full voting rights in the producers cooperative which becomes a fourth local group to train and support.*

Over time, as the individual as well as collective capacities of the various actors increase with experience, the range and scope of value-added products and services can be expected to expand. For example, a soap making unit could be added to add further value to surplus oil. Value addition to surplus food could begin and so on. The scales of local production and use of various products and services can also be expected to grow over time. The knowledge and experience gained in expanding the oil seed value chain can be expected to auto-catalyze the expansion of the value chains of other forest produce as well (ranging from fruits and ingredients used in medicinal preparation to raw materials that are converted into household consumer goods)

Our **VLB** model is designed to **catalyze** and strengthen community-government initiatives aimed at (1) appropriate development and management of the watershed, (2) regeneration of land and water through plantation of trees, and (3) agricultural extension activities to improve food production and land productivity. Government programs are typically premised on the power and ability of the market to compensate producers. The market often fails to reward the poorest of the poor producers, with middlemen ready and eager to skim off much of the fat. By providing small-scale tools for local value addition, the VLB model strives to provide an important link that not only helps local producers in maximizing their returns, but also generates local jobs and entrepreneurial training, all of which are beneficial to the mandates of additional Government departments such as Human Resources Development, and Rural Development. A conscious integration of the VLB model into the watershed and reforestation programs will steer the reforestation efforts towards mixed plantations that include native species of tree-borne oil seeds and fruit bearing trees and shrubs. Bolstered by tools to maximize the benefits from forest produce, residents of these agro-forest eco-systems are better equipped to understand and appreciate the importance of biodiversity protection and conservation, which will have a direct impact on the long term sustainability of their food, fuel and income systems. An even more dramatic impact can be expected from the synergistic integration of the VLB model into agricultural extension programs such as the creation of “60,000 oil seeds and pulses villages in Eastern India” and “Bridge the yield gap.”⁴ These Government programs currently provide input subsidies (for seeds, fertilizer and cultivation labour) and promotional materials in the drive to increase the production of

⁴ Both of these programs were first announced as part of the Government of India’s budget for 2010-11. Both continue to have priority and financial allocation in the 2012-13 budget with an additional mandate to integrate them within the National Livelihood Mission.

edible oil seeds, pulses and grains. The introduction of a technology package from the VLB model, including small-scale oil expellers, biodiesel production units and other small farm implements, into village communities will go a long way in improving the returns to the farmers and ensure self-sufficiency in edible oil, food, fuel and fertilizer.

Before wrapping up this introduction to our VLB model, it will be useful to trace its philosophical moorings. Our VLB model is very much rooted in E.F.Schumacher's proposal⁵ that "development outcomes could be maximized, or speeded-up, with technologies that are intermediate in scale and labour-intensive enough to create local jobs and capacity, much more so than with technologies deployed in bigger fully-automated mega-factories." Schumacher based much of his theses on Mahatma Gandhi's teachings on the importance of self-reliance and the utility of simple technologies that not only add value to local resources but also empower *gram swaraj* or village independence (and self-sufficiency). More importantly, we draw inspiration from Ivan Illich's differentiation⁶ between (mega)technologies that enslave humans and convivial technologies that liberate them, thus empowering and elevating the human spirit. On a contemporary level, we also subscribe to the principles embedded in The Working Centre's concept of providing access to *Community Tools*,⁷ where the idea is to nurture learning environments for those interested in picking-up skills and experiences that could be of collective and individual benefit. VLB technologies and processes have thus been designed to be simple to learn, operate and manage, and more importantly, to grow in step with local needs and capabilities.

⁵ E.F.Schumacher, "Small is Beautiful",.... Citation to be completed

⁶ Ivan Illich. "Tools for Conviviality," Citation to be completed

⁷ For more details on The Working Centre's Community Tools, go to www.theworkingcentre.org