Imprints of Ecological Footprints ...
A compilation of Ecologically Sensible Good Practices

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Aug 2016

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Acknowledgements

I am very happy to present "Imprints of Ecological Footprints .... A compilation of Ecologically Sensible Good Practices".

I take this opportunity to thank all organizations and individuals who contributed to the process of documenting these good practices. They were kind to frankly share with us their experiences, thoughts, challenges and achievements. They also shared relevant data to substantiate any critical point from their experiences. Some of them even prepared the first drafts of these case studies. They also revised them, based on our feedback. All the organizations/individuals happily gave consent for publishing these case studies and using them for learning purposes under "Leaders for Nature" program of IFHD, IUCN, CII, Hivos and Wild Life Trust of India. The entire process of producing this compilation was an enriching and fruitful experience. It is also a humbling experience for us to learn several lessons from these interactions and visits to several villages/sites. We genuinely believe that this compilation truly enriches the learning processes of "Leaders for Nature" program.

The Writeshop was one of the important events of this process. We got guidance and feedback on the '0' drafts from the participants of the writeshop. This was useful in refining the initial drafts. The participants of writeshop also made important suggestions on the presentation and utility of these case studies. From their busy schedules, they spared few days for refining these case studies, which is a very kind gesture. I thank everyone who participated in the writeshop. Their inputs are invaluable.

I thank Ms. Aruna Rangachar Pohl, IFHD for having faith in WASSAN and entrusting us the responsibility of compiling these case studies. She is an active team member at all critical stages of the project and guided us on choice of case studies, structure/framework, presentation, etc. The partnership with IFHD is really cherished by all of us, at WASSAN.
I also thank the family of artists of Cheriyal - Shri D Vaikuntam, Mrs D Vanaja, Mr D Vinay and D Rakesh, who visualized these experiences in their own unique style.

My team - MB Vali, Anitha Vustela, Waseem Mohammad, Benita Mahanta, Radhashree who spent considerable time on this agenda. I also thank K Suresh for providing editorial inputs and support at various stages of this process.

MV Rama Chandrudu

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Aug 2016
Foreword

It is almost three decades back, the threats to "Our Common Future" were formally identified and deliberations started gaining more steam and support from governments too... (Our Common Future, Gro Harlem Brundtland, 1987). Climate Change and its implications were also slowly getting recognized during this period. The need for "producing more with less" was also part of this thinking process, as a means to address the challenges of the future. Over a period of time, the world witnessed more economic distress, unemployment, political turmoil and ecological disasters across different countries and regions of world. Those early predictions seemed to be less threatening than the current reality. The global gloom got predictable companions - unscrupulous industrial growth, irresponsible urbanization, careless global politics, dishonest governments, self-centric citizenship, which tried to glorify the current trends as achievements and inevitable solutions.

In the middle of such despair and misery, there is a hope. "Imprints of Ecological Footprints - A Compilation of Ecologically Sensible Good Practices" is a compendium of good practices that brings the efforts made by relentless civil society organizations, citizens and community based organizations, to change the direction of this trend. These experiences bring cheer and hope in the lives of thousands of rural, tribal and urban citizens in India, who are part of these experiences. They were able to take a different path that is less travelled and troublesome. There were several challenges, at each step and milestone. But they continued their journey and proved that "producing more with less" is possible. They also ensured that the ecological and environmentally sustainable processes are feasible for improving economic standards and quality of life of poor communities.

These case studies give a hope and confidence that we can face the cruel world and transform the same into a comfortable place for all - including endangered species, poor and marginalized communities. While Corporate Social Responsibility is gaining more support
from governments, corporate agencies and development agencies, these experiences provide guidance and help them to think about alternatives. These experiences help the willing and discerning development agencies and investors in social change, to transcend the mundane "photo stories" of majority of current CSR interventions. They provide an array of options, strategies and ideas that proved themselves in different parts of the country.

I thank all the organizations and agencies who shared their stories - highs and lows of it, with us frankly and completely. I thank them for providing leadership on the chosen theme - promoting biodiversity; conservation and governance of natural resources; promoting ecologically sensitive production processes; enhancing livelihoods by developing environmentally harmonious economic models and several others. These experiences are invaluable and are certainly useful for provoking thoughts in the minds of participants of "Leaders for Nature" programs, which are jointly organized by IFHD, IUCN, CII, Wild Life Trust of India, HIVOS and other like-minded organizations. I thank WASSAN for producing this compilation of case studies and supporting us in this endeavor.

Aruna Rangachar Pohl
IFHD, Bengaluru
Aug 2016
Towards Better Cotton...

“When I got better price for my cotton in the market, I knew that my reputation has increased. Now traders recognize that the cotton produced by our group is of high quality and they are willing to pay up to 48-50 Rs/ kg. Earlier I was getting only 45-48 Rs/ kg. Thanks to package of practices that we are all following, apart from getting higher profit, I am able to reduce cost of cultivation also... We are not just moving towards better cotton, but also towards better life and environment..." - Narsibhai Patel, Kansa village, Visnagar, Mehsana district, Gujarat.

There are 1075 farmers like Narsibhai Patel, who are determined to improve their incomes from crops (cotton, castor, mustard, wheat, green fodder and groundnut) and reduce environmental hazards associated with chemical agriculture. These farmers established a company KrishiDhan Producer Company Ltd, Gujarat in 2004. This company initially focused on agriculture in Dhari taluka, Amreli district where Development Support Centre implemented watershed projects. Since 2011, the operations spread to state level. This company is serving about 5000 farmers in the state now. The main purpose of this company is to make agriculture not only more profitable, but also environmentally friendly. The business secret
seems to be "Better Management Practices (BMP)" that these farmers are following...

**Let us unpack these secrets...**

Cotton is one of the important commercial crops of India and it has helped farmers to maintain their farm incomes in conducive weather and market situation. It takes about 7000 lts of water for producing one kilogram of cotton. Conventional production process of cotton involves usage of high doses of chemical fertilizers, pesticides and expensive BT Cotton seeds. Though, there are several local varieties of cotton seeds (that are environmentally more suitable to Indian conditions), the BT Cotton took over since 2000 onwards and pushed out the traditional varieties. As a result, the cost of cultivation of cotton increased substantially. The fortunes of cotton producing farmers are dependent on the vagaries of rainfall, availability of water resources and the market prices... There are also environmental hazards such as deteriorating soil conditions, damage to local agro-ecology, depleting water tables, etc.

Development Support Center (DSC), Ahmedabad decided to change this situation. DSC promoted farmers institutions around watershed management and participatory irrigation management in the blocks of Dhari, Visnagar, Modasa, Himmatnagar and Meghraj blocks. Most of the farmers in these blocks cultivate cotton. DSC joined hands with like-minded partners, which included donors (IKEA), Government Departments/agencies, agencies that promote micro irrigation (Gujarat Green Revolution Company Ltd, International Development Enterprise), agriculture research institutions (Dantiwada Agriculture University, Junagadh Agriculture...
University, Randheja Krishi Vignan Kendra), traders, ginning industries and others.

This journey for improving cotton production began in 2008-09 and continues... During this process, vibrant farmer's institutions were established that are able to deal with markets and induce new ethics of business in the cotton markets...

A typical village like Kansa in Visnagar block, Mehsana district, Gujarat would have about 40% of agriculture land under cotton. The cost of cultivation of cotton is one of the major concerns of these farmers. During 2013, DSC started interacting with Kansa Irrigation Cooperative on the issues related to cost of cultivation and sustainable practices of agriculture. DSC proposed Better Management Practices - BMP, which could reduce the cost of cultivation significantly. As high external inputs based destructive agricultural practices are already entrenched into the farming practices, it is difficult for farmers to appreciate the potential contribution of bio-pesticides prepared with local materials; improved composting methods that rejuvenate soils and other agronomical practices. Initially, few progressive farmers agreed to experiment with these practices. Narsibhai is one such progressive farmer who agreed to use his 0.18 hect land for experiment and demonstration. These practices also aimed at improving the quality of soils and cotton. The following strategies were followed: 1. Increase the usage of bio-pesticides and bio-fertilizers that are environmental friendly; 2. Improve efficiency of water application (reduce wastage of water used for irrigation). 3. Reduce external and expensive inputs such as chemical fertilizers and pesticides. This process also demonstrated how child labour could be completely eliminated.
As part of this demonstration, Narsibhai Patel divided his plot into two parts A & B. In plot A, he followed conventional package of practices and in plot B he followed BMP. The DSC's agriculture expert provided guidance to Narsibhai Patel. This demonstration plot became a learning centre for the cotton growers in the village. They were keenly watching these two plots. Along with Narsibhai, other farmers in the village found several differences between these plots and benefits of BMP were convincing:

- Higher production of cotton (600 kg/ acre)
- Quality of cotton is better which fetched additional 3 Rs/ Kg
- 50% reduction in the cost of seeds
- No major difference in expenditure on inputs (fertilizer and pesticide)

Apart from higher incomes, there are host of other environmental benefits such as healthy soils, low pollution of water/ air, better and revived ecology in villages, etc. These farmers are now believers and practitioners of low external inputs based agriculture, particularly cotton.

They also learned to grade the cotton and followed various methods to reduce contamination of cotton. While grading and packaging the cotton, these farmers use cotton cloths for placing the heaps of cotton (instead of plastic/ polythene sheets, which are usually fertilizer bags); don’t smoke tobacco, etc. As a result, the traders and ginners found that the cotton from Kansa village was of high quality and paid higher price.
<table>
<thead>
<tr>
<th>Theme</th>
<th>Conventional Cotton practices</th>
<th>Better Management Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ploughing and Land Preparation</td>
<td>Pre-sowing cultivation</td>
<td>Deep ploughing of land in summer</td>
</tr>
<tr>
<td>Seeds/hill</td>
<td>Two seeds</td>
<td>Single seed</td>
</tr>
<tr>
<td>Soil Testing</td>
<td>Not done</td>
<td>Done</td>
</tr>
<tr>
<td>Fertilizer Application</td>
<td>Excessive usage of chemical fertilizers</td>
<td>Reduced chemical fertilizers and increased bio-fertilizers such as vermi compost</td>
</tr>
<tr>
<td>Pesticide Application</td>
<td>Used chemical pesticides for sucking pests</td>
<td>Used variety of practices that reduce pest attack. Share of chemical pesticides is drastically reduced.</td>
</tr>
<tr>
<td>Wilt Control</td>
<td>Used M-45 and bavistin fungicide.</td>
<td>Used trichoderma.</td>
</tr>
</tbody>
</table>
Table 2: Kansa Cotton Demo Plot 2013-14 Cost Benefit Analysis Rs/ Acre

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Land preparation</td>
<td>1750</td>
<td>1750</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Seed</td>
<td>930</td>
<td>1860</td>
<td>-930</td>
</tr>
<tr>
<td>3</td>
<td>Sowing</td>
<td>420</td>
<td>480</td>
<td>-60</td>
</tr>
<tr>
<td>4</td>
<td>Fertilizers</td>
<td>7150</td>
<td>7740</td>
<td>-590</td>
</tr>
<tr>
<td>5</td>
<td>Irrigation</td>
<td>1680</td>
<td>1920</td>
<td>-240</td>
</tr>
<tr>
<td>6</td>
<td>Weeding</td>
<td>1250</td>
<td>1250</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>Labour for Pesticide, fertilizer and irrigation</td>
<td>1500</td>
<td>1500</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>Pest control</td>
<td>2460</td>
<td>3000</td>
<td>-540</td>
</tr>
<tr>
<td>9</td>
<td>Cotton Picking</td>
<td>7500</td>
<td>5250</td>
<td>2250</td>
</tr>
<tr>
<td>10</td>
<td>Transportation</td>
<td>900</td>
<td>600</td>
<td>300</td>
</tr>
<tr>
<td>11</td>
<td>Cotton uprooting</td>
<td>500</td>
<td>500</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total, Rs/ Acre</strong></td>
<td></td>
<td><strong>26040</strong></td>
<td><strong>25850</strong></td>
<td><strong>190</strong></td>
</tr>
<tr>
<td>Total Production, Kg</td>
<td></td>
<td>1800</td>
<td>1200</td>
<td>600</td>
</tr>
<tr>
<td>Rate, Rs/ Kg</td>
<td></td>
<td>51</td>
<td>48</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total income, Rs</strong></td>
<td></td>
<td><strong>91800</strong></td>
<td><strong>57600</strong></td>
<td><strong>34200</strong></td>
</tr>
<tr>
<td>Net profit, Rs</td>
<td></td>
<td><strong>65760</strong></td>
<td><strong>31750</strong></td>
<td><strong>34010</strong></td>
</tr>
</tbody>
</table>

Imprints of Ecological Footprints ...
While the demonstration was in progress, DSC conducted soil tests for a large number of farmers and started advising them on appropriate dose of fertilizers. As the soils are already saturated with nitrogen, they could focus on phosphorus and potassium. It was also found that the soils are deficient in micro nutrients. This resulted in reducing excessive and indiscriminate application of chemical fertilizers.

Similarly, DSC was also instrumental in promoting drip and sprinkler systems to irrigate cotton by developing partnerships with International Development Enterprise, a private company that supplies low cost and cost effective drip systems. This support included linking farmers with ongoing government schemes.

It is obvious that a good demonstration inspires the villagers to change their practices. As large numbers of farmers agree to follow these new practices, supporting them could be a challenge to DSC.

When few thousands of farmers agree to apply vermi compost, use Trichoderma (a bio-pesticide that is locally prepared) and other inputs. DSC made couple of experiments on this supply chain and finally narrowed down to women self-help groups in the villages. They motivated 33 women SHGs to produce/manufacture vermi compost. Under this enterprise empty plots in the village were converted into vermi-compost manufacturing units. The SHGs collected garbage, cow dung and converted

Fact Sheet of KrishiDhan Producers Company

- Number of shareholders - 2000 (1700 men and 300 women)
- Share capital - Rs. 10 lakhs
- Turnover during 2014-15 - Rs 3.10 Crores (Rs 1.51 crores of input supply and Rs 1.50 crores of aggregation business)
them into high quality vermi compost. DSC supplied earthworms to them free of cost and rest of the investment was made by the members. The production cost was about 3 to 3.5 Rs/ kg and they sold the vermi compost at 6 to 10 Rs/ Kg. Since 2013, women entrepreneurs sold about 180 tons of vermi compost.

Some of these women also started manufacturing bio-pesticides using local material like cow urine, wheat flour, jaggery, local herbs/ tree leaves, etc. DSC conducted several training/ demonstration programs on the manufacturing of these bio-pesticides. DSC also conducted tests on the quality and veracity of these bio-pesticides in one of the reputed and independent science labs of Gujarat - Bhishma Labs. These tests indicated that as the bio-pesticides aged they were more effective in pest control. These products are among the top selling items in the 6 outlets that KrushiDhan Producers Company Ltd established.

After production, farmers need support in marketing their products also. Soon DSC realized the need for establishing a proper institutional platform for this. DSC already facilitated the process of establishing a company KrushiDhan Producer Company Ltd, Gujarat in 2004 (later re-constituted in 2013). This farmer owned company has 1000+ shareholders at the time of establishment and the number is increasing steadily. From the day one, DSC ensured that the agenda of reducing cost of cotton cultivation and improving profits is taken care by this farmers company.

At the village level, informal farmers groups (Kisan Clubs) are the functional basic units. These were informally converted into an apex body at district level. KrushiDhan Producers Company Ltd was established at state level with interested farmers as stakeholders and shareholders. DSC supports this company by deploying a three member professional team -
marketing expert; technology and agriculture expert and finance expert. The company established 6 outlets at suitable locations to supply 50 types of products/ inputs to the farmers (both members and non-members). These products/ inputs include seeds, vermi compost; bio-pesticides; agriculture equipment; chemical fertilizers and pesticides and others. A sales person is employed at each outlet. During agriculture season, these shops are busy with farmers...

The company also procures cotton (and other products) from farmers and helps them to get better price in the market. DSC supported the company in getting access to traders, ginning factories and other buyers. The team of professionals is constantly engaged in finding out better buyers and markets for the farmers. As the markets are volatile, farmers need professional inputs on this issue every season/ year. This support costs Rs 10 lakhs per year to DSC. It is expected that the profits of the company would grow in due course of time and this cost would be internalized by the company itself.

As the facts and impacts of KrishiDhan Producer Company Ltd are impressive (Refer Box in page 144), it intends to expand its membership and shareholder base to 30,000 farmers. DSC intends to bring in resources from SFAC and other sensitive banks/ financial institutions, so that the financial muscle of this farmers company is really strong.

This journey of KrishiDhan Producers Company Ltd and Development Support Centre towards producing better cotton has demonstrated that environmental friendly production processes could also fetch good profits. The production and value chains of cotton also generate a variety of green business opportunities to local entrepreneurs.
Impact of Better Management Practices in Cotton

- Cotton Produced (Annual Average): 14830 Tonnes
- Number of Farmers who adopted BMP: 11000
- Area Covered: 11000 hect
- Farmers who are linked to ginners: 2635
- Farmers who are engaged in seed procurement: 2600
- The total benefit from BMP is estimated to be Rs 9.35 crores/ year:
  - Cost of Cultivation reduced from 24000 Rs/ Hect to 18000 Rs/ Hect; an annual saving of 6000 Rs/ hect. The total saving is Rs 6.6 Crores/ year.
  - About 20% farmers observed 10-15% increase in yield of cotton. The additional income from this will be Rs 2.5 Crores/ year.
  - About 2600 farmers participated in bulk purchase of seed cotton at village level and saved Rs. 24.50 lakhs each season, in transaction costs.

The cost for promoting BMP is 455 Rs/ hectare, while the benefits accrued are 8503 Rs/ hectare. This is an impressive 1:18 cost: benefit ratio.

1:18 cost benefit ratio is an impressive figure, for any company, more so for a farmer's owned company... When the environmental benefits are included, it would be better and invaluable... Green businesses are not only producing better cotton, but also better ecological setting, livelihoods and living conditions...

MV Rama Chandrudu, WASSAN

Based on interactions with: Mohan Sharma, Deepak Raval & Sachin Oza,

Development Support Centre, Ahmedabad, Gujarat.
About Cheriyal Paintings

Shri D Vaikuntam and his family members Mrs. D Vanaja (wife); D Vinay and D Rakesh (sons) are keeping the tradition of Cheriyal Paintings of Telangana state, for generations. All members of the family are engaged in protecting and conserving this rare art form, that is not likely to survive for long. This is the only family in the country that is still engaged in this traditional art form. The Cheriyal Art has a unique character - red color background; vivid presentation of figures (men, women, animals, flowers, plants and others) with unique strokes and style. This art form belongs to "nakashi" form of paintings in India. But Cheriyal paintings contextualized this nakashi format to local Telangana and improvised it, with their unique styles. Apart from paintings and scrolls, Cheriyal Masks are also very attractive and unique with their bright colors and large eyes. D Vaikuntam received several awards from Central/ State governments, for his unique contribution to Cheriyal Art.

D Vaikuntam and his family members agreed to present the key messages of these case studies. They spent time with us to understand the essence of each case study and presented it in their own style. These pictures further enriched the experiences, which are already exemplary in several ways. WASSAN thanks the family of artists of Cheriyal for their support in visualising these case studies.

Pictures of some of the paintings/ scrolls and masks could be seen on this blog:
http://vaikuntamnakash.blogspot.in/
".....In the middle of such despair and misery, there is a hope. "Imprints of Ecological Footprints - A Compilation of Ecologically Sensible Good Practices" is a compendium of good practices that brings the efforts made by relentless civil society organizations, citizens and community based organizations, to change the direction of the trend. These experiences brought cheer and hope in the lives of thousands of rural, tribal and urban citizens in India, who are part of these experiences. They took a different path that is less travelled and troublesome. There were several challenges, at each step and milestone. But they continued their journey and proved that "producing more with less" is possible. They also ensured that the ecological and environmentally sustainable processes are feasible for improving economic standards and quality of life of poor communities..."Aruna Rangachar Pohl, IFHD, Bangaluru.

"......these experiences are invaluable and are certainly useful for provoking thoughts in the minds of participants of "Leaders for Nature" programs, which is organized by IFHD, IUCN, CII, Wild Life Trust of India, HIVOS and other like-minded organizations. The entire process of producing this compilation was an enriching and fruitful experience. It is a humbling experience for us to learn lessons from the interactions and visits to their villages/ sites. We genuinely believe that this compilation truly enriches the learning processes of "Leaders for Nature" program" - MV Rama Chandrudu, WASSAN