Final Report

Feasibility of Scaling Up
Compost Production & Distribution
in Dinajpur

June, 2007

Waste Concern Consultants

EXECUTIVE SUMMARY

This study has been commissioned by KATALYST- a project of European Donors for Bangladesh with a goal to improve competitiveness of business in sectors having ample opportunities. One of the areas where KATALYST has been working for the last few years is to support compost producers in the rural areas to improve their technology and found that there is a growing demand for the compost amongst the farmers in the midst of few number of commercial compost producing companies. Field demonstration on maize and vegetable cultivation using compost has also shown encouraging results. Now it intends to expand up this activity to benefit larger number of farmers.

Against the backdrop of growing demand for compost among the farmers in the face of limited production capacity of existing compost producers, KATALYST intends to collaborate with private companies for increase the production and distribution of compost. Since developing a feasible model for increased compost production is a complex task and involves a number of value chain actors, a study is essential to assess technical and economic feasibility, as well as to identify effective business model for raw material collection as well as compost production and distribution.

In order to obtain in depth information about availability of raw material for composting and to develop a viable approach to meet the growing demand for compost in Dinajpur , this study was launched and contracted out to Waste Concern Consultants- a specialized research and consultancy firm working in waste, energy and environmental sector in Bangladesh for more than a decade.

This study is mainly based on primary data, as there was an acute lack of secondary data. The key findings of this study are as follows:

1. It has been found that 209,951 tons of compost is used in rural Dinajpur, out of which only 4635 tons which represents 2.2% of the total compost used is purchased from the market and rest 97.8% is produced by the farmers themselves within their backyards using traditional composting methods which has low efficiency.

2. The compost sold in the market is worth Tk. 4.4 crore. There are two types of compost sold in the market, one is raw compost and other one is enriched bio fertilizer/compost. In terms of percentage, 83% of the compost is raw compost, while the rest 17% is enriched compost. Marketing of enriched compost requires approval from the government.

3. It was also revealed from the field survey that there is an estimated demand of 487,928 tons of compost per year.

4. As such there is a shortfall of minimum 277,927 tons of compost per year in Dinajpur which in terms of percentage is 57%.

5. Biomass is generated from four sources in the rural areas, which are agricultural, animal, tree and household waste. Total available biomass in rural area is 8.96 tons/household/year of which 45% is used as fuel and 35% is used for composting.

6. Biomass in the urban areas is generated from animal sources, trees and household waste. Based on the field survey total generated biomass in the urban areas of Dinajpur is estimated at 4.98 tons/household per year. Almost all the biomass generated in the households is used as fuel and small portion as animal feed. At present without alternative fuel, only potential is to use household waste which amounts to 0.25 tons/household/year for composting.

7. In case alternate fuel is available for the households in urban areas at least 4.58 tons/household per year biomass can be made available for composting purpose, which can generate at least 123,660 tons of compost per year. However, this is not feasible at present moment.

8. Only 2.2% of the total compost used in Dinajpur is sold through markets, however, there is a well organized marketing channel existing in the district. There is a network of dealers and retailers marketing compost for different companies. It was found from the field survey that 70% of the dealers and 42% the retailers were selling compost.

9. Dealers and retailer came to know about the benefit of compost through the compost producing companies and feed back from farmers who had used it. Only 20% of the retailers and dealers reported that Department of Agriculture Extension (DAE) gave them information to promote compost. As such, government's agriculture extension services are not massively promoting use of compost amongst the farmers although there are several policies of the government promoting production of compost.

10. To promote compost, both the dealers and retailers have suggested that government's endorsement of the product being marketed is essential along with strict quality control of the product.

11. The compost producing farmers have identified shortage of biomass as a major barrier followed by the time taken to produce compost using traditional methods as well as lack of technical knowledge to produce good quality compost.

12. Main crop in Dinajpur is rice (Aman/IRRI) while the other crop varies between potato, wheat, maize, vegetable, mustard and tobacco. It has been also found from the survey that due to unpredictable weather condition and high cost of cultivation, farmers are shifting from paddy to maize.

13. Farmers have identified shortage of fertilizer which includes compost, problem with irrigation and declining soil fertility and crop yield as main barrier in the agricultural growth of Dinajpur.

14. Farmers spend Tk. 6753 to irrigate per bigha of land, which means per ha. cost of Tk. 51,070. 67% of the farmers reported that they are facing serious problem with irrigation due to high diesel price along with severe load shedding which is resulting in lower crop yield.

15. Use of compost can reduce the water requirement for irrigation by 20-30% depending upon the soil type which means there is a good potential to reduce the irrigation cost by Tk. 15,231 per year per ha. Alternatively, use of solar irrigation may be option to reduce fossil fuel based irrigation.

16. There are two major barriers to scale up compost production both at household level as well as commercial level. Availability of sufficient biomass is common for both the household and commercial level. However, at the commercial level the major barrier is permits/licenses required to start a compost business. To establish a compost plant to scale up the production of compost an entrepreneur has to get minimum six to maximum nine permits which are quite a hassle requiring at least one and a half years before one can start a project.

17. In order to reduce the existing demand-supply gap of compost and over come aforementioned barriers, there are four options which may be used to reduce it are:

Option 1: Change the Existing Composting Technology of Farmers to Increase Compost Production (this options considers no additional amount of waste to be composted from the baseline scenario, only improvement of composting technology);

Option 2: Provide Farmers with Improved Stove and Composting Technology to Increase Compost Production (this option considers 50% additional waste being available with the introduction of improved stove since it requires 50% less biomass for cooking purpose);

Option 3: Private Entrepreneur Investing in the Compost Plant as a Commercial Venture in Rural Areas; and

Option 4: Produce Compost in Urban and Peri Urban Areas Using Private Sector and CDM Based Investment.

18. Until regulatory barriers are not removed to ease commercial compost production, to meet the demand supply gap, the best way is to promote option 1 and 2 in partnership with micro credit organizations and composting technology providers.

19. Using option 1, the compost production can be improved to 61% from the baseline situation of 43%; while using option 2, 100% of shortfall can be met. Using option 3, 54% of demand can be met while with option 4 only 44% of the demand can be met compared to baseline condition of 43%.

20. Use of carbon financing using CDM mechanism can also be a very good vehicle to implement all the four options and to minimize the financial risks as well as promote more compost production in the country. It has been found that carbon credits increases composting projects benefit cost ratio significantly.

21. In order to promote compost production in the country using private sector investment, the first priority is to work with the Government to reduce the regulatory barriers associated with the implementation of commercial compost plants.

22. The second major step to promote compost is to maintain a good quality of the product, since both the local and international export market depends upon the quality. International certification such as ISO 22000 or organic certification should be promoted amongst the compost producers.

23. Some recommendations have been made as well as mode of implementation has been identified to promote compost production in Dinajpur so that it can be improved from baseline scenario of 43%, to reduce the demand-supply gap.

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GLOSSARY

Aerobic Composting: Environment characterized by bacteria active in the presence of oxygen.

Anaerobic Composting: Environment characterized by bacteria active in the absence of oxygen.

Biodegradable: Any material that can be reduced into finer particles (degraded or decomposed) by microbiological organisms. It may be referred as compostable material.

Biomass: Biomass is the name given to any material which is recently derived from plants that use sunlight to grow. That is plant and animal material such as wood from forests, material left over from agricultural and forestry processes, and organic industrial, human and animal wastes. It is sometimes classified as 'combustible renewables and waste'.

Clean Development Mechanism (CDM): Under the Kyoto Protocol, CDM is a mechanism that allows developed countries to achieve part of their green house gas emissions reduction obligations through investment in projects in developing countries that reduce green house gas or fix or sequester carbon dioxide from the atmosphere.

Certified Emission Reduction (CERs): Green House gas reduction of any CDM project is measured according to internationally agreed methods and are quantified in standard units called Certified Emission Reductions (CERs). These are expressed in tons of carbon dioxide (CO_2) equivalents.

Composting: The controlled biological decomposition of organic solid waste under aerobic conditions.

Compost: The relatively stable decomposed organic material resulting from the composting process. Also referred to as humus.

Decentralized Composting: Means composting of carefully segregated biodegradable local wastes in limited quantities at individual, neighborhood, or ward level with the cooperation of local residents, as close to the source of wastes as possible.

Green House Gas (GHG): Many gases present in the atmosphere are known as green house gases (GHG) because these prevent heat from escaping from the earth. The gases are: carbon dioxide, methane, nitrous oxide, hydroflurocarbons, perflurocarbons and sulphur hexafluoride. If the amount of these gases increases in the atmosphere, earth's temperature will increase. Scientists have named this phenomenon `Global Warming' and the associated changes to the atmosphere are known as `climate change'.

Inorganic Material: Materials, which are not degraded by microorganisms

Organic Material: Materials Waste material containing carbon. The organic fraction of municipal solid waste derived from animal or vegetable sources, and can generally be degraded by microorganisms

Pourashava*:* It is a local term for municipality.

Recyclable: Materials that still have useful physical or chemical properties after serving their original purpose and that can, therefore, be reused or remanufactured into additional products.

Source Separation: The segregation of specific materials at the point of generation for separate collection, Residences source separate recyclables as part of recycling program.

Small Scale Composting Plants: Generally labor intensive and involves less capital and produces compost less than 50 ton per day

Solid Waste Management: Systematic control of generation, storage, collection, transport, separation, processing, recycling, recovery and final disposal of solid waste

Urban Solid Waste: Means all solid waste generated in an urbanized area except industrial and agricultural waste

ABBREVIATIONS

BBS	Bangladesh Bureau of Statistics
BARC	Bangladesh Agricultural Research Council
CDM	Clean Development Mecahnism
CERS	Certified Emission Reduction
DAE	Department of Agricultural Extension
DOE	Department of Environment
FAO	Food and Agricultural Organization
GoB	Government of Bangladesh
Ha	Hectare
HH	Households
ISO	International Standardization Organization
PRSP	Poverty Reduction Strategy Paper
Tk.	Taka

CONVERSION EQUIVALENT

1 Hectare	10000 m2
1 Hectare	2.47 acre
1 Acre	43,560 sq.ft
1 Acre	0.4046856 Hectare
1 Bigha	14,400 square feet (20 Katha)
1 Katha	720 square feet
1 Lac	100,000
1 Crore	10,000,000

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF PLATES