



Strategy to overcome barriers to bio-slurry / BEC use – Report (Inc3)

African Biodigester Component

Organic Fertiliser Valorisation Implementer

SEE – Clean Cooking

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Acronyms

| | |
|---------|---|
| AB-AOC | Alliance de Biodigester de l’Afrique de l’Ouest et du Centre |
| ABC | African Biodigester Component |
| ABPL | Africa Bioenergy Programs Limited |
| ABPP | Africa Biogas Partnership Programme |
| AD | Anaerobic Digestion |
| AfDB | African Development Bank |
| BC | Business Case |
| BDS | Business Development Services |
| BEC | Bio-slurry Enriched Compost |
| BNP-BF | National Biodigester Programme – Burkina Faso |
| BR | Biomass Research |
| BSUL | Biogas Solutions Uganda Limited |
| CSR | Corporate Social Responsibility |
| DC | DIBcoop |
| EAMD | Energy Access Market Development |
| EIB | European Investment Bank |
| ENDEV | Energising Development Partnership Programme (working with RVO) |
| ENERGIA | Gender and Energy Innovation Facility |
| f,m | female, male (often indicating that data should be gender-disaggregated) |
| FAO | Food and Agriculture Organisation (UN) |
| FI | Financial Institution |
| FTS | FarmTree Services |
| FTT | FarmTreeTool |
| FYM | Farm Yard Manure |
| GAP | Good Agricultural Practices |
| GIZ | German Development Cooperation (<i>Deutsche Gesellschaft für Internationale Zusammenarbeit</i>) |
| hh | households |
| IEA | International Energy Agency |

| | |
|------|--|
| IP | Inoculum Platform |
| IGM | Implementer Gender Mainstreaming |
| ILO | International Labour Organisation (UN) |
| IP | Implementing partner |
| IRR | Internal Rate of Return |
| IVA | Independent Verification Agent (of RBP) |
| LI | Lead Implementer |
| M | Milestone |
| MDB | Multilateral Development Banks |
| MDG | Millennium Development Goal |
| M&E | Monitoring and Evaluation |
| MEA | Ministry of Economic Affairs (Netherlands) |
| MEL | Monitoring, Evaluation & Learning |
| MFA | Ministry of Foreign Affairs (Netherlands) |
| NGO | Non-Governmental Organisation |
| NP | National Partner (in the project plan: Local Implementing Partner) |
| NPK | Nitrogen, Phosphorus and Potassium (K) |
| NPV | Net Present Value |
| OECD | Organisation for Economic Co-operation and Development |
| OFVI | Organic Fertiliser Valorisation Implementer (<i>Volet Engrais Organique</i>) |
| OLR | Organic Loading Rate |
| PPP | Public Private Partnerships |
| RBF | Result Based Finance |
| RD | Role Description |
| RVO | Netherlands Enterprise Agency (Rijksdienst voor Ondernemend Nederland) |
| SNV | SNV Netherlands Development Organisation |
| SOP | Standard Operational Procedures |
| TTDT | The Tree Domestic Team |
| ToC | Theory of Change |
| ToR | Terms of Reference |
| ToT | Training of Trainers |
| UN | United Nations |
| VSLA | Village Saving & Loan Associations |
| WCA | West and Central Africa |
| WUR | Wageningen University & Research |

Terminology

The consortium adopts the following organic fertiliser terminology:

- **Bio-slurry** is the product from bio-digesters, generated through anaerobic digestion of organic materials (often animal manure)
- **Compost** consists of composted biomass, this may or may not include bio-slurry. Under ABC, only Bio-slurry Enriched Compost (BEC) will be considered
- **Bio-slurry Enriched Compost** (BEC) is compost that has been generated using (amongst other inputs) bio-slurry
- **Organic fertiliser** is any bio-based fertiliser which may include both bio-slurry and compost, but also other organic fertilisers such as biochar and bokashi.
- **Other biomass** used in agriculture such as mulching with woodchips, straw etc is not included here as organic fertiliser, this is only indirect organic fertiliser once decay of this biomass starts.
- **End user:** person applying the bio-slurry and/or compost (BEC) on his or her own land

1 Introduction

This report presents a strategy to overcome the most important barriers for successful application of bio-slurry and BEC; this puts the focus on biodigester farmers and other farmers (potentially) using bio-slurry or BEC for crop production, in some cases a distinction will be made between male and female farmers.

The barriers relate to these farmers capacities (knowledge, skills and resources) to:

- produce quality bio-slurry and/or BEC, and assess the quality (and standards)
- buy bio-slurry and BEC (availability, markets, transport)
- understand the value (crop response) and use bio-slurry or BEC (cropping systems and farm practices)

Thus, the need for information and training re-appears in this strategy.

2 Methodology

The strategy will be developed in several steps:

Step 1: Identify the barriers

This is mostly done in the activities baseline study (Inception 2) although additional knowledge on barriers will also be picked up from other activities. The barriers identified in the 5 countries will be grouped in two regions, East and West Africa.

Step 2: Link barriers to stakeholders that can address barriers - This is by checking key actors identified for the implementation phase are visualised in Figure 1.

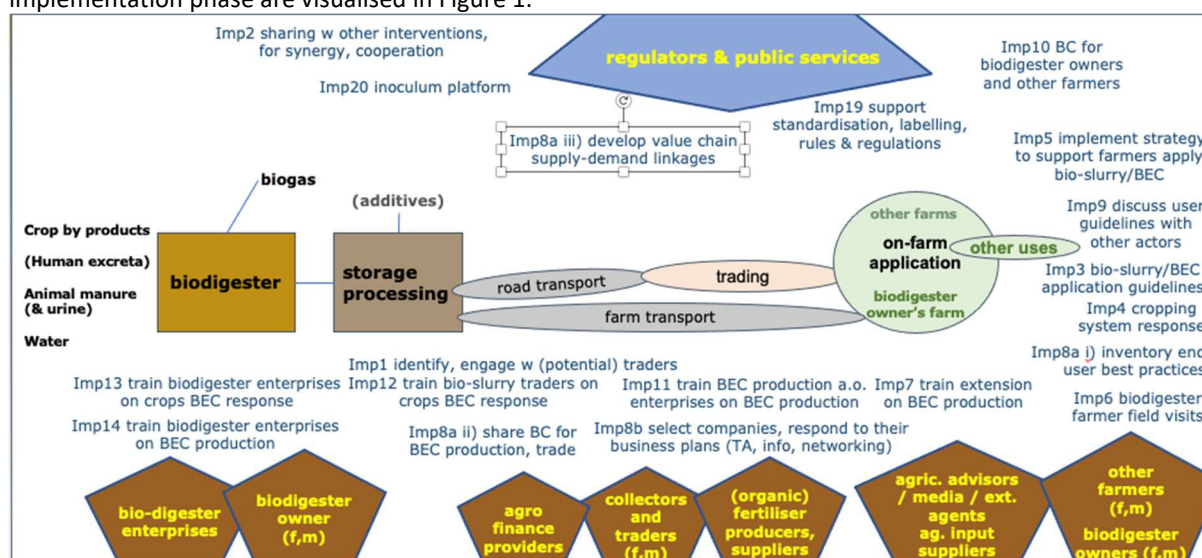


Figure 1: The bio-slurry value chain, stakeholders and OFVI activities

In addition to these, partners also indicate the need to work with agronomic research institutes to define a yield improvement methodology for different crops (at least maize, napier grass, tomato, banana, coffee and tea). This is somewhat captured in Imp2 where there will be a reach out to other interventions (that should include research institutes) and Imp9 where application guidelines are discussed with other actors. However, the project has no funds to do research itself.

Step 3: Draft the strategic options - Options for different stakeholders are formulated.

Step 4: Link to already formulated OFVI activities - The links are to show which activities will contribute to the strategy; these links automatically include the gender strategy attached to the activities.

Step 5: Consultations (online validation workshop) - All partners (NP, LI, IGM and other ABC partners) will be consulted for validation.

Step 6: Final strategy - This takes in the recommendations from the validation workshop.

3 Results

Results of steps 1 to 4 are presented in tables, by region.

3.1 East Africa: Kenya and Uganda

Table 1 presents the barriers, stakeholders and main strategy elements for East Africa. The highlights are areas insufficiently explored in the strategic options.

Table 1: OFVI strategy main elements for East Africa

| Barriers | Stakeholders to address the barriers | Strategy options | Link to activities |
|---|---|--|--|
| Produce quality bio-slurry and/or BEC: 1. biodigester farmers have limited bio-slurry storage (space), lack tools and equipment to produce bio-slurry or BEC, uncertainty about hygiene, and how storage affects the quality of bio-slurry 2. sellers & buyers face an excessive/expensive regulatory system on fertilizer quality, -transport and -sales, and (excessive regulatory system notwithstanding) a lack of information on quality (standards) | 1. training colleges compost producers universities & research institutes extension policy makers / services | Compost produced following quality standards Compost provided with product information (on use) Universities & research institutes produced (or endorsed) and promote BEC production** & -use guidelines Training colleges adopt BEC production** & -use guidelines for soil management & crop production training programmes | Imp7: training materials on BEC production Imp11: train BEC production enterprises on BEC production (and use) |
| | 2. bureaus of standards | Regulations including standards are streamlined to be efficient (including considerations of indirect costs, and benefits for public health, safety) and actionable, to be clearly communicated, and effectively monitored | Imp19: support standardisation, labelling, rules Imp2, Imp9, Imp20: sharing with other interventions |
| Buy bio-slurry and BEC (availability, markets, transport): sellers & buyers face long distances, poor roads, lack of transport means, high cost, difficulties in packaging, and: lack of market info on organic fertilisers | biodigester companies | Upscaled smaller-scale, or multi-household on-farm biodigesters Local BEC markets stimulated | Imp14: training biodigester enterprises |
| | information media incl. private sector media extension and input service providers incl. suppliers of fertilisers bio-slurry/BEC collectors, traders, producers | Relevant stakeholders (providing market info, e.g. media, extension services) informed, stimulated to engage on the info need and abolish the bias in information favouring chemical fertiliser Market power for organic fertiliser trade and advice developed | Imp2, Imp9: sharing with other interventions Imp20: inoculum platform Imp8a ii: BEC production BC Imp8b companies' business plans |
| Understand the value (crop response) and use bio-slurry or BEC (cropping systems and farm practices): | end users: biodigester owners and other farmers suppliers of agricultural advice and inputs | Training materials tailored to specific cropping systems and farming approaches including organic farming, conservation agriculture | Imp4: cropping system response Imp3: bio-slurry, BEC application guidelines |

| Barriers | Stakeholders to address the barriers | Strategy options | Link to activities |
|---|---|--|---|
| farmers insufficient know how to use bio-slurry or BEC, especially application rates , to make production efficient, profitable and sustainable. Women farmers have less access to information/extension. | extension services training colleges | Agricultural (extension) service providers trained on bio-slurry, BEC use All relevant stakeholders informed about barriers to bio-slurry, BEC use and accessing guidelines (see previous row) Most of the work applying bio-slurry/BEC on the field is done by women (female adults, children, workers), and this should be reflected in the numbers of women to be trained on the use of bio-slurry or BEC. Training methods and materials should consider that it is mostly applying bio-slurry/BEC: check appropriateness of loads, tools, etc. and taking into account women's access to equipment (including pumps) input, means of work, and the conditions under which they carry out their agricultural activities. Consider the extra workload on transporting bio-slurry/BEC (heavier than chemical fertilizer): that may fall on women; look into ways to offset this. | Imp5: strategy to support farmers apply bio-slurry/BEC Imp9: discuss user guidelines with other actors Imp2, Imp9, Imp20: sharing with other interventions, platform Imp13: train biodigester enterprises on crop BEC response Imp12: train bio-slurry traders on crop BEC response Imp6: biodigester farmer field visits Imp10: BC |

3.2 West Africa: Burkina Faso, Mali and Niger

Table 2 presents the barriers, stakeholders and main strategy elements for West Africa. The highlights are areas insufficiently explored in the strategic options.

Table 2: OFVI strategy main elements for Burkina Faso, Mali and Niger

| Barriers | Stakeholders to address the barriers | Strategy main elements/goals | Link to activities |
|---|--|--|---|
| Poor quality bio-slurry and/or BEC due to: <ul style="list-style-type: none"> poor condition of compost pits (insufficiently protected against sun and/or water runoff) insufficient information on how to produce BEC | training colleges compost producers universities & research institutes extension policy makers / services | Compost produced following (informal) quality standards Compost provided with product information (on use) Universities & research institutes produced (or endorsed) and promote BEC production** & -use guidelines Training colleges adopt BEC production** & -use guidelines for soil management & crop production training programmes, <i>to keep women in</i> | Imp7: training materials on BEC production Imp11: train BEC production enterprises on BEC production (and use) |
| Insufficient bio-slurry production (less than potential) due to insufficient manure | | Support to increase fodder production, stabling, livestock techniques; with the project Access to Finance | |

| Barriers | Stakeholders to address the barriers | Strategy main elements/goals | Link to activities |
|---|---|--|---|
| (too much free grazing) → production is less than on-farm demand | | | |
| Insufficient quantity of BEC (less than on-farm demand) due to insufficient availability of plant material for composting | | What to do? | |
| Insufficient availability of bio-slurry and BEC, challenges on markets, transport: sellers & buyers face long distances, poor roads, lack of transport means, high cost, and insecurity; and there is little or no bio-slurry surplus from famers with biodigesters | Biodigester companies | Mobile biodigesters Local BEC markets stimulated | Imp14: training biodigester enterprises Imp8: develop local markets Imp2, Imp9: sharing with other interventions Imp20: inoculum platform |
| Limited understanding on the value (crop response) and use bio-slurry or BEC (cropping systems and farm practices): Farmers obtain their information from professionals not specialised on on-farm use of bio-slurry or BEC (e.g., from masons), and have questions e.g. on application rates , combining BEC with chemical fertiliser, the comparative advantage of BEC compared to FYM (or chemical fertiliser); they look for answers on making production more efficient, profitable and sustainable. The information provided on how to improve soil health and -fertility is biased, limited to chemicals fertiliser which is also subsidised. Women farmers have less access to information/extension; most trainers are men and in Niger women cannot be trained by men: a structural disadvantage for women. | end users: biodigester owners and other farmers suppliers of agricultural advice and inputs extension services training colleges | Training materials tailored to specific cropping systems and farming approaches including organic farming, conservation agriculture Agricultural (extension) service providers, with a focus on women trainers, trained on bio-slurry, BEC use All relevant stakeholders informed about barriers to bio-slurry, BEC use and accessing guidelines (see previous row) Most of the work applying bio-slurry/BEC on the field is done by women (female adults, children, workers), and this should be reflected in the numbers of women to be trained on the use of bio-slurry or BEC. Training methods and materials should consider that it is mostly applying bio-slurry/BEC: check appropriateness of loads, tools, etc. and taking into account women's access to equipment (including pumps) input, means of work, and the conditions under which they carry out their agricultural activities. Consider the extra workload on transporting bio-slurry/BEC (heavier than chemical fertilizer): that may fall on women; look into ways to offset this. | Imp4: cropping system response Imp3: bio-slurry, BEC application guidelines Imp5: strategy to support farmers apply bio-slurry/BEC Imp9: discuss user guidelines with other actors Imp2, Imp9, Imp20: sharing with other interventions, platform Imp13: train biodigester enterprises on crop BEC response Imp12: train bio-slurry traders on crop BEC response Imp6: biodigester farmer field visits Imp10: BC |

| Barriers | Stakeholders to address the barriers | Strategy main elements/goals | Link to activities |
|--|--------------------------------------|--|--------------------|
| Hard work to make sowing potholes at seeding | | | |
| Land tenure insecurity reducing the incentive for use of BEC | | Recommending BEC as part of a package of measures to keep women in a production system; particular attention to be given to women's land tenure insecurity | |

3.3 Gender considerations

Mainstreamed in this strategy is gender. That means that below points are *integrated in above table already*:

- most of the work *applying* BEC is done by women and this should be reflected in the numbers of farmers to be trained on the use of bio-slurry /BEC
- training methods and materials should consider user application friendliness for women (load, tools, etc), taking into account women's access to equipment/inputs/means of work, and the conditions under which they carry out their agricultural activities
- considering the extra workload for women when fertiliser is replaced by BEC, e.g. transport to irrigated vegetable farming site; women are already disadvantaged compared to men doing the same production: more men than women have the means to use a pump
- recommending BEC should be part of a package of measures to keep women in this production system (where currently - and sometimes with the help of other programmes - they tend to be pushed out by men-with-more-means; particular attention to be given to women's land tenure insecurity, which is a disincentive for investing in the use of BEC on their own fields.

4 Discussion

A strategy was presented to overcome major barriers for bio-slurry and BEC successful application in ABC target countries. The main focus is on biodigester farmers and other farmers (potentially) using bio-slurry or BEC for crop production, in some cases a distinction will be made between male and female farmers. Main barriers in farmers knowledge, skills and resources related to the production and quality of bio-slurry and/or BEC including standard values, as well as understanding of the added value of bio-slurry and BEC application will be covered in the activities of the Implementation phase.

An extensive training program of enterprises (building and/or selling prefabricated biodigesters, selling agro-input suppliers) and extension officers (ToT) has been defined for the implementation phase (Imp11 to Imp11). Information shared with enterprise staff and extension officers is indicated to be reaching farmers via their regular contacts.

Additionally, the following is planned to ensure end-users of bio-slurry and / or BEC are informed sufficiently:

- production or update of training materials and brochures used by National Partners (Imp3, Imp7)
- dedicated online and live meetings organised in the Inoculum Platform (Imp20)
- (online) discussions and workshops regarding organic fertiliser valorisation (Imp22)
- website and social media (Imp20)