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Barrier Analysis and Behavioral Change Strategy

Increased Ecological Stability of Dijo and Bilate Watersheds

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**Introduction**

The proposed project *“Increased Ecological Stability of Dijo and Bilate Watersheds”* aims to strengthen the community-based system of natural resources management in 14 kebeles of Alaba and Senkura Woredas in SNNP Region of Ethiopia. It responds to a high level of environmental degradation resulting in poor agricultural productivity and an increased vulnerability of people’s livelihoods. The proposed duration of the project is three years, starting from January 2016 until December 2018, and is funded 90% by the Czech Development Agency and 10% by PIN.

PIN identified among farmers living in the target kebeles a range of traditional soil management methods which are not compatible with the principles of sustainable land management (such as excessive tillage, ineffective sowing, etc.) and at the same times lead to unnecessarily low crop productivity. In PIN’s experience, changing farmers’ behaviours is difficult and has therefore decided to initially focus on 3 priority behaviours:

1. Farmers planting crops on the sloping lands establish permanent terraces covered by grasses, fodder grasses or trees on contours every 1m of fields of elevation (or at least every 15m of slope)
2. Farmers plant simultaneously (intercrop) maize with legumes (chickpea or beans) in rows
3. Farmers with livestock leave crop residue on their land until the next planting season

These behaviours were selected because of:

* their relatively low coverage of practice (which was determined in the baseline survey)
* their impact towards the objective of the project to reduce land degradation
* the ability of the project to address them (e.g. minimum tillage would be highly challenging to achieve in the project’s lifespan because the local government policy promotes maximum tillage)

The first behavior was studied in September 2016 (see Annex 1 for its completed DBC framework) and therefore this report focusses on the remaining 2 behaviours.

**TRAINING**

The training followed the “Practical Guide to Conducting a Barrier Analysis” and was also provided in soft-copy to the training participants. The “training of data collectors”, “coding and analyzing” was done by briefing the PIN staff beforehand, leading the session initially then handing over to the DBC training participants to the lead the session and providing feedback when necessary. The training schedule is available in Annex 2.

**METHODOLOGY**

Barrier Analysis (BA) study asks people a series of questions aiming to identify which barriers and motivators have the biggest influence on whether they (do not) practice the desired behaviour. The BA study uses the Doer/Non-Doer methodology that consists of interviewing 45 people who already do the behaviour (Doers) and 45 people who have not adopted the behaviour yet (Non-Doers). The differences between their answers are what matters most as they reveal the barriers and motivators to practicing the studied behaviour you studied.

**Questionnaire Development:** The intercropping questionnaire was developed by the Agriculture & NRM Advisor and the crop residue questionnaire was developed by the author and reviewed by the A&NRM Advisor. The questionnaires were then translated into the Amharic. During the training of the data collectors, each question, the translation was checked. The questionnaires were then piloted and the translated version was adjusted accordingly. English and Amharic versions of the questionnaires are available in Annex 3.

**Sampling:** Data was collected from 6 kebeles that were representative of the 14 kebeles of the project: Menzo Feten, Feten of Sankura Woreda and Woteta, Udana Choloksa of Halaba Woreda. 50 doers and 50 non-doers were interviewed with the crop residue questionnaire. 50 does and 49 non-doers were interviewed with the intercropping questionnaire. In total there were 10 data collectors and 5 were assigned to each Woreda. 2 data collectors were assigned to the larger kebeles. Each Woreda had at least one supervisor (PgM, M&E Officer or PjM) on all of the data collection days.

**Coding and Analyzing:** The questionnaires were coded and analyzed following the methodology of Lesson 12 / Step 6 of the BA Guide in order to compare significant differences between the responses of doers and non-doers of each behavior. A significant difference is defined as minimum of 15% difference between the responses of doers and non-doers. The completed Barrier Analysis tabulation sheets are available in Annex 4.

**Limitations & Lessons Learnt:** During the data analysis process with the data collectors, it became clear that the data collectors often misunderstood the meaning of certain questions, particularly the difference between a “difficulty” of doing a behavior and the “negative consequences” of doing that behavior. This required a lot of time taken to correct this. Therefore key lessons learnt are:

* The training of data collectors and pilot testing of the two questionnaires was done for one day. In the future, one full day should be reserved for each questionnaire. The extra time for training should be spent practicing the questionnaire in the classroom and in similar communities to the sampled communities, with supervisor reviewing and giving detailed feedback on all sections of the questionnaire.
* During actual data collection: At least the first two or three questionnaires of all the data collectors should be checked thoroughly by a supervisor and feedback given immediately.
* Therefore more time needs to be allocated to data collection. As well as the extra time allocated for the training and pilot testing, 2 days of data collection should be allocated for the first behaviour’s questionnaire (i.e. to complete 90 questionnaires). Once the data collectors are used to the questionnaire, 1 day for the remaining behaviours (i.e. each with 90 questionnaire) should be sufficient.

**RESULTS**

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| **Behaviour** | **Priority and Influencing Groups** | **Determinants**  | **Bridges to Activities** | **Activities** |
| **Farmers plant simultaneously (intercrop) maize with legumes (chickpea or beans) in rows**  | **Priority Group:*** male and female smallholder farmers aged 18-65 years
* 37% of farmers practice intercropping
* 90% of households grow maize during the Belg season
* 66% of follower farmers do not know who their model farmer is
* Only 22% of farmers received any advice from a model farmer in the previous year
* Average landsize in target kebeles of Halaba is 1.5ha, average landsize of target kebeles in Sankura is 1.2ha
* Highly dependent on rain-fed agriculture, 98% do not use any irrigation
* 53% of farmers perceive that crop production is reducing year on year
* Households can on average produce sufficient food for all HH members for only 7 out of 12 months (9 out of 12 months for model farmers)
* Most frequent coping strategies were limiting portion size and reducing the number of meals per day (hence nutrition insecurity)
* The staff (DAs) of 13 out of 14 FTCs do not know the 3 principles of Conservation Agriculture

**Influencing Group**:* BA did not identify particular groups that influenced doers to do the behaviour as compared to non-doers.
 | 1. Self-Efficacy:
* Farmers do not know they can use the space between rows of maize
* Farmers are not able to access technical support from FTCs
* Farmers think that you need experience in order to do intercropping
* Farmers think that you need improved seed varieties to do intercropping
1. Positive Conseq.:
* Farmers do not know the benefits of intercropping
1. Negative Conseq.:
* Farmers believe that intercropping reduces maize yield
1. Access:
* Farmers believe it is very difficult to access the required tools to do intercropping
1. Cues for action:
* Farmers find it very difficult to remember to do intercropping
* Farmers don’t have the practical experience to be able to remember
* Farmers have no one reminding them to do intercropping
1. Action-efficacy:
* Farmers believe that soil quality will degrade if you practice intercropping
1. Policy:
* Farmers do not know that there are government policies in place that support intercropping
 | 1. Increase the perception that there is space between maize that can be used[[1]](#footnote-1)2. Increase the perception that intercropping is not difficult and can be done as a trial by farmers themselves (covers self-efficacy & policy)3. Decrease the perception that farmers need specific tools and improved seeds to do intercropping (covers self-efficacy & access)4. Increase the awareness of positive impacts: improved soil fertility, increased yield after 2-3 seasons, reduced risk due to 2 types of yield.5. Improve farmers ability to remember to do intercropping during soil preparation | Experience sharing visits on farmers’ plots - Community facilitators work with FTC staff to plan experience sharing amongst farmers in each kebele (and contribute to the target of 10,500 farmers with 250 farmers per kebele per year). This activity is done at least 1 month before the planting seasons of maize and haricot bean. The experience-sharing visits are organised under the model farmer structure i.e. each experience-sharing visit should be led by a model farmer (this will also help contribute to the target of activity 3.3).PIN staff use a HH list or other means to plan the schedule for the visits in order to ensure maximum coverage across the kebele and keep a record of who attended so there is no double-counting. Each visit, PIN staff facilitate the following topics to be discussed between the farmers (NOT PIN staff reading out this list):* there is space between maize that can be used to plant haricot bean
* farmers do not need specific tools or improved seeds to practice intercropping
* it improves soil fertility
* it increases yield after 2-3 years
* it reduces risk as it creates 2 types of yield
* farmers can ask DAs or model farmers for technical support during key stages.

In order to ensure active participation of farmers, the visit does not have more than 20 people in total.The project team should explore how to advertise and organise these visits – so that farmers actually want to attend and it is not “forced on them”:* visits do not take a long time and farmers do not have to travel far to attend
* they are at a convenient time of day
* not on a market day
* it is made clear that there are no material or financial benefits for attending these sessions
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| **Outcome Indicators**:* % of farmers that practice intercropping
 | **Process Indicators:*** total number of farmers that have attended an experience sharing visit on another farmers land on the subject of intercropping
* % of experience sharing visits that have a model farmer leading them
* % of experience sharing visits that have a DA leading them
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| **Behaviour** | **Priority and Influencing Groups** | **Determinants**  | **Bridges to Activities** | **Activities** |
| **Farmers with livestock leave crop residue on their land until the next planting season** | **Priority Group:*** male and female smallholder farmers aged 18-65 years
* 31% of farmers leave crop residue on land
* Permanent soil cover was one of the 3 agricultural training topics least received by households
* 21% of farmers grow fodder grasses
* Average land used for fodder grass production in FTCs is just 0.17ha
* 90% of households grow maize during the Belg season
* 66% of follower farmers do not know who their model farmer is
* Only 22% of farmers received any advice from a model farmer in the previous year
* Average landsize in target kebeles of Halaba is 1.5ha, average landsize of target kebeles in Sankura is 1.2ha
* Highly dependent on rain-fed agriculture, 98% do not use any irrigation
* 53% of farmers perceive that crop production is reducing year on year
* Households can on average produce sufficient food for all HH members for only 7 out of 12 months (9 out of 12 months for model farmers)
* Most frequent coping strategies were limiting portion size and reducing the number of meals per day (hence nutrition insecurity)
* The staff (DAs) of 13 out of 14 FTCs do not know the 3 principles of Conservation Agriculture

**Influencing Group**:* BA did not identify particular groups that influenced doers to do the behaviour as compared to non-doers.
 | 1. Self-Efficacy:
* Farmers think they do not have the adequate knowledge, skills or resources
* Farmers are not able to access technical support from FTCs
* Farmers do not know how to ensure sufficient livestock fooder if they do not use residues”
1. Positive Conseq.:
* Farmers do not know that leaving crop residue can increase crop yields
* Farmers do not know any benefits of leaving crop residue on land
1. Negative Conseq.:
* Farmers believe that leaving crop residue on land will result in a shortage of fodder for their livestock
1. Severity:
* Farmers believe it is very likely the soil will be too dry next season
 | 1. Increase the perception that farmers have adequate knowledge, skills and resources2. Increase the perception that FTC staff can provide technical support 3. Increase the ability of farmers to separately produce fodder4. Increase the perception that leaving crop residue on the land increases yields5. Decrease the perception that by leaving crop residue on land the farmers will have a shortage of fodder6. Reinforce the perception that the soil will be too dry in the next season if nothing is done about it | Experience sharing visits on farmers’ plots (contributes to activity 2.1, 2.3 and 3.3)Community facilitators work with FTC staff to plan experience sharing amongst farmers in each kebele (and contribute to the target of 10,500 farmers).This activity is done during the months of fodder grass distribution/planting and harvest The experience-sharing visits are organised under the model farmer structure i.e. each experience-sharing visit should be led by a model farmer (this will also help contribute to the target of activity 3.3).PIN staff use a HH list or other means to plan the schedule for the visits in order to ensure maximum coverage across the kebele and keep a record of who attended so there is no double-counting. Each visit, PIN staff facilitate the following topics to be discussed between the farmers (NOT PIN staff reading out this list):* The soil will be too dry next season if nothing is done about it
* Leaving crop residue on the land until the next harvest conserves soil moisture and structure
* Therefore, it also increases yields
* Experiences of fodder grass production, and the DA/model farmer provides technical advice on the stages of fodder grass production
* Farmers can ask DAs or model farmers for technical support during key stages
* Encourage farmers to try leaving residues in approx. 30m2 of their field and see the difference.

In order to ensure active participation of farmers, the visit does not have more than 20 people in total.The project team should explore how to advertise and organise these visits – so that farmers actually want to attend and it is not “forced on them”:* visits do not take a long time and farmers do not have to travel far to attend
* they are at a convenient time of day
* not on a market day
* it is made clear that there are no material or financial benefits for attending these sessions
 |
| **Outcome Indicators**:* % of farmers that leave crop residue on land until the next planting season
 | **Process Indicators:*** total number of farmers that have attended an experience sharing visit on another farmers land on the subject of crop residue and fodder production (per kebele, per year)
* % of experience sharing visits that have a model farmer leading them
* % of experience sharing visits that have a DA leading them
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**FOLLOW UP ACTIONS**

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| **What** | **Who** | **Deadline** |
| Decide on whether to provide fodder grass to those who attend experience sharing visits | HoP & PjM | ASAP |
| Create a facilitation guide for doing experience sharing visits including the topics mentioned in the DBC framework | NRM Advisor & PjM | Mid-April |
| Agree internally within PIN, how to advertise the visits in the community, the system of organising visits and how to ensure maximum attendance and maximum coverage. | PjM & FOs | Mid-April |
| PIN field staff to agree with FTC staff on the system for organising visits | PIN FOs/CFs | End of April |
| Revise activities 2.1, 2.3 and 3.3. in the workplan and submit to HoP for review | PjM  | End of April |
| Integrate the indicators of the DBC framework into the ITT of the project | M&E Officer | End of April |
| Monitoring of experience sharing visits: * Using the facilitation guide, the M&E Officer could adapt this into a quality standard checklist for monitoring visits.
* Field Officer should monitor the experience sharing visit at least four times per year in each of their kebeles and provide feedback to the Community Facilitator
* Project Manager should monitor the experience sharing visit at least twice per year in each of the kebeles and provide feedback to the Community Facilitator and their respective Field Officer
* M&E Officer should monitor the experience sharing visit at least once a year in randomly selected kebeles and provide feedback to the CF, FO and PjM.
 | FO, PjM, M&E Officer, NRM Advisor | Ongoing |

**ANNEX 1: DBC framework of the behaviour studied in September 2016 (led by PIN’s NRM Advisor)**

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| **Behaviours** | **Priority & Influencing group** | **Determinants** | **Bridges to Activities** | **Activities** |
| **Farmers planting crops on the sloping lands establish permanent terraces covered by grasses, fodder grasses or trees on contours every 1m of fields of elevation (or at least every 15m of slope)** | Priority group:Lead farmers and Follower farmersModel and Ordinary farmersFarmers cropping the fields on the sloping lands – both doers and non-doers*(During the BA, the behaviour had been relaxed, while respondents had been assessed as doers even when not applying the terrases in sufficient density*)Influencing group:Kebele AdministrationDevelopment armiesNeighboursAlso, please consider the influencing group in activities | Self efficacyBelive that the beneficiaries need to be supported with tools firstBelive they don’t have sufficient knowledgeBelive that tools maintenance is complicatedPositive consequencesBelive that the water, fertility and producion on the field will increaseBelive that the production of fodder plants will be higherSocial NormsBelive that kebele admins, Development armies, DAs and WaO experts will appreciate the effort along with the family membersAccessBelieve that the accessing tools or seeds or seedlings is very difficultPercieved riskBelive that beneficiaries are highly susceptible to severly affected by erosionBelive that the terraces have only limited anti-erosion effectPolicyBelive that the there is no policy on buliding terraces or any policy related to this topic | Increase the perception that no difficult knowledge is required, only basic skillsIncrease the perception that terraces primarilly increase the production on the field, through increased water and nutrient contentIncrease the perception that terraces are a good source of fodder grasses and plantsIncrease the awareness about the governmental campaigns and compliance of the terraces with the watershed campaignIncrease the perception that quality tools can be accessed and worth the investmentIncrease the percepetion that terraces covered by vegetation and sufficient density (every 1m of elevation) have good antierosion effect | Preliminary Suggestions:▪ Leaflets and posters explaining the basic steps for terrace establishment▪ Experience sharing among doers▪ Instructions to Lead farmers▪ Trainings in the NRM measures▪ Demoplots▪ Experience sharing among doers▪ Preparation of the list and uses of the grasses, plants and foddercrops which can be planted on terraces▪ Printing of the posters▪ Training in cattle feeding practices▪ Training of the DAs in extension methods.▪ Promotion of the Monitoring techniques▪ Presentation of terraces jointly in Watershed management, Belg and Meher campaigns▪ Collecting the experience of the Doers in maintenance▪ Experience sharing in how to recognise the quality tools▪ Comparing the increased production with price of tools – presenting the difference▪ Creation of the demoplot with sufficient slope and terrace density in each sloping kebele▪ Testing the difference between fields with appropriate density of terraces, vegetation cover and bare terraces▪ Experience sharing |

**ANNEX 2 : Training Schedule**

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| **Date / Location** | **Training Topic** | **Attendees** |
| 21st FebAwassa | Overview of the Designing for Behaviour Change FrameworkIntroduction to the Determinant of Behaviour ChangeIntroduction to the questionnaireStep 1: Defining the Behaviour for the Formative Research | HoP[[2]](#footnote-2), WASH PgM, EDU PgM, M&E Officer, NRM/FTC PjM |
| 22nd FebAwassa | Revision of day 1Step 2: Writing the Behaviour Screening QuestionsStep 3: Writing the Research QuestionsOrganizing the field work | WASH PgM, EDU PgM, M&E Officer, NRM/FTC PjM |
| 23rd FebHalaba | Training of data collectors on questionnairesLearning to Interview the Doer/Non-Doer Way - Do’s and Don’ts of InterviewingPre-testing questionnaire | HoP, WASH PgM, EDU PgM, M&E Officer, NRM/FTC PjM, NRM FO, NRM CFs |
| 24th Feb Halaba & Sankura | Data collection | WASH PgM, EDU PgM, M&E Officer, NRM/FTC PjM, NRM FO, NRM CFs |
| 28th FebHalaba & Sankura | Data collection | WASH PgM, EDU PgM, M&E Officer, NRM/FTC PjM, NRM FO, NRM CFs |
| 2nd MarchHalaba | Data coding, tabulating and analysing | WASH PgM, EDU PgM, M&E Officer, NRM/FTC PjM, NRM FO, NRM CFs |

**ANNEX 3 : Questionnaires**



**ANNEX 4: TABULATION SHEETS**



1. However, maize row spacing may need to be adjusted, recommended spacing is 40x40x40cm. [↑](#footnote-ref-1)
2. HoP = Head of Programs, PgM = Program Manager, PjM = Project Manager, FO = Field Officer, CF = Community Facilitator [↑](#footnote-ref-2)