# **Appendix B**

# **Questionnaire**

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|  | General |  | | |
|  | Name of the farmer |  | | |
|  | Gender | * Male * Female | | |
|  | Age | (\*exact) | * 15-25 * 25-35 * 35-45 | * 45-55 * >55 |
|  | Village |  | | |
|  | District |  | | |
|  | Phone number |  | | |
|  | Total Land Area own by you (in hac) |  | | |
|  | How much area do you farm out of total land area (in hac) |  | | |

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|  | For Sugarcane | | | | | | | | | | | | | |
|  | Before planting | | | | | | | | | | | | | |
|  | How do you plough your field | | | * Using Animals * By Tractors * Other (please specify\_\_\_\_\_\_\_\_\_\_\_\_\_) | | | | | | | | | | |
|  | When do you start to plough | | | * Within 5 days of preceding crop is harvested * 5-10 days after preceding crop is harvested * 10-15 days after preceding crop is harvested * 15-20 days after preceding crop is harvested * Just after a good shower received irrespective of time | | | | | | | | | | |
|  | Depth of ploughing | | | * 20-30cm * 30-40cm * 40-50cm * 50-60cm | | | | | | | | | | |
|  | Frequency of ploughing | | | * 2-3 times * 4-5 times * 5-6 times * 6-7 times * >7 times | | | | | | | | | | |
|  | How long do you expose your field to atmosphere after first ploughing | | | * 10-15 Days * 15-20 Days * 20-25 Days * 25-30 Days * More than a month | | | | | | | | | | |
|  | Frequency of harrowing(after ploughing for breaking up and smoothing out the surface of the soil) | | | * 1-2 times * 3-4 times * 4-5 times * >5 times | | | | | | | | | | |
|  | What is the type of soil | | | * Heavy soils * Medium soils * Light soils | | | | | | | | | | |
|  | What technique do you used for planting | | | * Planting on flat beds * Ridge and furrow method * Trench method * Furrow Irrigated Raised Bed (FIRB) technique * Ring Pit planting | | | | | | | | | | |
|  | Ridges And Furrows | | | Spacing | | | Length | | | | | Height | | |
| * 60 cm * 70cm * 80cm * 90cm * 100 cm * 120 cm | | | * 6m * 8m * 9m * 10m * 12m * 14m | | | | | * 8 cm * 10cm * 15cm * 20cm * 25cm * 30cm | | |
|  | Do you use any fertilization technique before deep ploughing | | | * Chemical fertilising * Liquid manure/slurry spreading * Dry manure spreading * Other fertilising work (please specify) | | | | | | | | | | |
|  | Fertilizers before planting | | | * Nitrogen in \_\_\_\_\_kg * Phosphorous in \_\_\_\_\_kg * Potassium in \_\_\_\_\_kg | | | | | | | | | | |
|  | Frequency of fertilizers | | | * 1-2 times before planting day * 3 times before planting day * 4 times before planting day * 5 times before planting day | | | | | | | | | | |
|  | **Planting day** | | | | | | | | | | | | | |
|  | What is the month of planting | | | * Autumn (October/November) * Spring (Feb/March) * Summer (April/May) | | | | | | | | | | |
|  | Which equipment do you use for planting | | | * Ridger- type sugarcane cutter-planter * Three-row multipurpose sugarcane cutter- planter * Paired row sugarcane cutter-planter * Zero-till sugarcane cutter-planter * Two row pit digger * Raised bed seeder * Raised bed seeder-cum-sugarcane cutter planter | | | | | | | | | | |
|  | What do you use for planting fresh crops? | | | * Setts * Seedings | | | | | | | | | | |
|  | What kind of setts do you use? | | | * Single bud setts * Two bud setts * Three bud setts | | | | | | | | | | |
|  | No of setts per hectare | | | * \_\_\_\_\_ | | | | | | | | | | |
|  | What was the age of setts | | | * 5-6 Months * 7-8 Months * 8-9 Months * 10-11 Months | | | | | | | | | | |
|  | What is the depth of planting setts | | | * 1-2 cm * 3 cm * 4 cm * 5 cm | | | | | | | | | | |
|  | What do you use to save the setts from the attack of termites and ants | | | Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Quantity\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_kg/hac  Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Qunatity\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_kg/hac | | | | | | | | | | |
|  | To reduce the incidence of soil-borne diseases, how do you treat with fungicides | | | * Hot water treatment: temp\_\_\_\_\_, time duration\_\_\_\_\_\_\_ * Other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | | | | | | | |
|  | What additional treatment do you apply to increase germination | | |  | | | | | | | | | | |
|  | What is the variety of sugar cane you use? | | | * Co0238 * CoS767 * CoS8436 * CoJ64 * Other\_\_\_\_\_\_\_\_ | | | | | | | | | | |
|  | Any additional operation | | |  | | | | | | | | | | |
|  | **Irrigation** | | | | | | | | | | | | | |
|  | What kind of irrigation technique do you use | | | * Flood irrigation * Furrow irrigation * Sprinkler * Surface drip irrigation * Sub surface drip irrigation * Drip irrigation combined with fertigation * Other | | | | | | | | | | |
|  | If you use Flood/Furrow irrigation system | What is source of water | | | | | | Method | | | | | | |
| * Bore wells * Canal * Directly from river * Other | | | | | | * Electric pump * Diesel pump, * Gravity * Any other\_\_\_\_\_\_\_\_\_\_ | | | | | | |
|  |  | Since when (year) | | | How do you maintain and repair the system? | | | | Across what % of farm land do you use these practice | | | | % decrease in water use | |
|  | If you use Surface drip irrigation based on electricity |  | | | * I do not maintain * Hire labor * I do it myself * Practitioners does | | | | * ≤5% * >5% ≤ 25% * >25% ≤ 50% * >50% ≤ 75% * >75% ≤ 100% | | | |  | |
|  | If you use Sub surface drip irrigation based on electricity |  | | | * I do not maintain * Hire labor * I do it myself * Practitioners does | | | | * ≤5% * >5% ≤ 25% * >25% ≤ 50% * >50% ≤ 75% * >75% ≤ 100% | | | |  | |
|  | If you use Drip irrigation with fertigation |  | | | * I do not maintain * Hire labor * I do it myself * Practitioners does | | | | * ≤5% * >5% ≤ 25% * >25% ≤ 50% * >50% ≤ 75% * >75% ≤ 100% | | | |  | |
|  | How much water do you supply in one go/What is the irrigation water depth (in mm) | | | |  | | | | | | | | | |
|  | Irrigation time | | | | * Morning * Noon * Evening * Night | | | | | | | | | |
|  | How often do you irrigate | | | | * \_\_\_\_\_ times per cultivation season (if exact no is known) * 5-10 times per cultivation season * 10-15 times per cultivation season * 15-20 times per cultivation season * 20-25 times per cultivation season * 25-30 times per cultivation season | | | | | | | | | |
|  | Frequency of irrigation with days (e.g. 3rd day after planting) | | | |  | | | | |  | | | | |
|  | \*If exact days are not known to farmer or not able to clearly answer question (i) | | Germination Phase (1-35 days) | | | Tillering stage (36-100 days) | | | | Grand growth stages (101-270 days) | | | | Maturity phase (271days to harvest) |
| * Weekly intervals * 6 days intervals * 5 days * 4 days * 10 days | | | * 7 days intervals * 10 days * 12 days * 15 days | | | | * Weekly intervals * 3-4 days * 5-6 day * 8-9 days | | | | * 7 days intervals * 10 days * 12 days * 15 days |
|  | What is depth of ground water table | | | |  | | | | | | | | | |
|  | **Fertilizers** | | | | | | | | | | | | | |
|  | What do you apply as fertilizers | | | | * Animal Manures * Green Manures * Chemicals | | | | | | | | | |
|  | What do you add for nitrogenous fertilizers | | | | Name | | | | | Quantity (Kg/ha) | | | | |
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|  | What do you add for potassium fertilizers | | | | Name | | | | | Quantity | | | | |
| K2O | | | | |  | | | | |
|  | | | | |  | | | | |
|  | | | | |  | | | | |
|  | What do you add for phosphorus fertilizers | | | | Name | | | | | Quantity | | | | |
| P2O5 | | | | |  | | | | |
|  | | | | |  | | | | |
|  | | | | |  | | | | |
|  | Composition of fertilizers in fertigation | | | |  | | | | | | | | | |
|  | Any additional fertilizers do you apply | | | |  | | | | | | | | | |
|  | How often do you apply fertilizers | | | | * 3-5 times per cultivation season * 5-7 times per cultivation season * 7-9 times per cultivation season * 9-12 times per cultivation season | | | | | | | | | |
|  | Fertilizers application with days (e.g. 3rd day after planting) | | | | | | | | | | | | | |
|  | \_\_\_ day after planting | | | | N\_\_\_\_kg, P\_\_\_kg, K\_\_\_kg | | | | | | | | | |
|  | \_\_\_ day after planting | | | | N\_\_\_\_kg, P\_\_\_kg, K\_\_\_kg | | | | | | | | | |
|  | \_\_\_ day after planting | | | | N\_\_\_\_kg, P\_\_\_kg, K\_\_\_kg | | | | | | | | | |
|  | \_\_\_ day after planting | | | | N\_\_\_\_kg, P\_\_\_kg, K\_\_\_kg | | | | | | | | | |
|  | \_\_\_ day after planting | | | | N\_\_\_\_kg, P\_\_\_kg, K\_\_\_kg | | | | | | | | | |
|  | \_\_\_ day after planting | | | | N\_\_\_\_kg, P\_\_\_kg, K\_\_\_kg | | | | | | | | | |
|  | \_\_\_ day after planting | | | | N\_\_\_\_kg, P\_\_\_kg, K\_\_\_kg | | | | | | | | | |
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|  | How do you manage pests and diseases | | | | * By Chemical measures: Application of chemical materials on plants, soils or seeds, fungicides, insecticides, herbicides, etc. * By Biological measures: Pathogens (viruses, bacteria, fungi), use of antagonists, resistant cultivars, organic fertilizers etc. * By Agronomic practices: Location and amelioration, cultivation, crop rotation, elimination of inoculums sources, proper seeding and planting, etc. * By Physical procedures: Mechanical, thermal, exclusions (nets, etc.), radiation. | | | | | | | | | |
|  | **Herbicides** | | | | | | | | | | | | | |
|  | How do you control weeds? | | | | * Mulching with organic/biodegradable material * Mulching with an inorganic material * Machine weeding * Manual weeding * Integrated weed management * Herbicides * Other (specify\_\_\_\_) | | | | | | | | | |
|  | If you use herbicides for weed control | | | | Name | | | | | Composition (e.g. 2.5 kg/hac in 500 liter water) | | | | |
| * Atrazine | | | | |  | | | | |
| * Metribuzin | | | | |  | | | | |
| * Ametryn | | | | |  | | | | |
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|  | How often do you apply herbicides | | | | * 3-5 times per cultivation season * 5-7 times per cultivation season * 7-9 times per cultivation season * 9-12 times per cultivation season | | | | | | | | | |
|  | Frequency of herbicides application with days (e.g. 3rd day after planting) | | | |  | | | | |  | | | | |
|  | **Insecticides** | | | | | | | | | | | | | |
|  | Insecticides Information | | | | Name of Insecticides | | | | | Composition (e.g. 2.5 kg/hac in 500 liter water) | | | | |
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|  | How often do you apply Insecticides | | | | * 3-5 times per cultivation season * 5-7 times per cultivation season * 7-9 times per cultivation season * 9-12 times per cultivation season | | | | | | | | | |
|  | Frequency of Insecticides application with days (e.g. 3rd day after planting) | | | |  | | | | |  | | | | |
|  | Common Insect-pests in sugarcane and their management approaches | | | | Name of Insect-pests | | | | | Management approaches | | | | |
| * Pyrilla * Wooly Aphid * Sugarcane stalk and internode bore * Top borer * White grub * Early shoot Root borer & borer * Termite * White fly * Mealy bug * Rodents | | | | |  | | | | |
|  | **Fungicides** | | | | | | | | | | | | | |
|  | Fungicides Information | | | | Name of fungicides | | | | | | Composition (e.g. 2.5 kg/hac in 500 liter water) | | | |
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|  | How often do you apply Fungicides | | | | * 3-5 times per cultivation season * 5-7 times per cultivation season * 7-9 times per cultivation season * 9-12 times per cultivation season | | | | | | | | | |
|  | Frequency of Fungicides application with days (e.g. 3rd day after planting) | | | |  | | | | | |  | | | |
|  | Do you perform Hoeing  (hoeing helps in breaking the hard crust at surface, which might create problems to the sprouting of seedlings) | | | | * Yes * No | | | | | | | | | |
| If yes, How often | | | | | | If exact time period is known  (e.g. 1 weeks after planting) | | | |
| * 3-4 times per cultivation season * 4-6 times per cultivation season * 6-8 times per cultivation season | | | | | |  | | | |
|  | Tying and Wrapping | | | | * Yes * No | | | | | | | | | |
| If Yes, In which month, do you start tying and wrapping | | | | | | Height of plant during tying and wrapping | | | |
|  | | | | | |  | | | |
|  | What is the common diseases in sugarcane and their management | | | | Name of Disease | | | | | | Management approaches | | | |
| * Red rot * Wilt * Smut * Yellow leaf * Grassy Shoot * Sugarcane rust * Pokkah Boeng * Red stripped * Other \_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | | |  | | | |
|  | What was the age of your sugarcane crop when you harvested it last year? | | | | * Less than 10 months * 11 months * 12 months * 13 months * More than 13 months | | | | | | | | | |
|  | Yield of sugarcane (t/ha) | | | |  | | | | | | | | | |
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|  | How many crops do you grow in an year? | * 1 * 2 * 3 * 4 | |
|  | Main Crop Name | 1. \_\_\_\_\_\_\_ and how much\_\_\_\_(%) 2. \_\_\_\_\_\_\_ and how much\_\_\_\_(%) 3. \_\_\_\_\_\_\_ and how much\_\_\_\_(%) 4. \_\_\_\_\_\_\_ and how much\_\_\_\_(%) 5. \_\_\_\_\_\_\_ and how much\_\_\_\_(%) | |
|  | What is your sugarcane base cropping system | Rotation in spring   * Rice (short duration)–Rabi fodder/Potato-Sugarcane ratoon I-ratoon II-Wheat * Rice/kharif fodder-Toria/Raya-Sugarcane-ratoon I-Wheat * Maize/Cotton-Senji-Sugarcane-ratoon I-ratoon II-Wheat * Arhar-Oat/Senji-fodder-Sugarcane-ratoon I-ratoon-II Wheat * Rice- Wheat- Green gram * Other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   Rotation in Autumn   * Sugarcane * Kharif fodder/Green manure/Maize/Rice (short duration) Moong-Sugarcane with intercrop (Raya/ Potato/Wheat/Winter Maize/Gobhi Sarson/cabbage) ratoon I-ratoon II-Wheat. * Rice – Sugarcane – Ratoon –Wheat – Urd / Moong * Sugarcane + Potato/Toria/Lentil/Urd/Moong– Ratoon–Wheat * Other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
|  | Do you perform intercropping with sugarcane | * Yes * No | |
| If Yes, Mark the name of intercrop | * Mustard * Groundnut * Soyabean * Water melon * Cucumber | * Potato * Gram * Cabbage * Cauliflower * Onion * Coriander |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| The tasks of the farmer | January | February | March | April | May | June | July | August | October | November | December |
| Prepare the field |  |  |  |  |  |  |  |  |  |  |  |
| Plough the field |  |  |  |  |  |  |  |  |  |  |  |
| Purchase seeds |  |  |  |  |  |  |  |  |  |  |  |
| Sow |  |  |  |  |  |  |  |  |  |  |  |
| Fertilizer application |  |  |  |  |  |  |  |  |  |  |  |
| Weeding |  |  |  |  |  |  |  |  |  |  |  |
| Apply insecticide |  |  |  |  |  |  |  |  |  |  |  |
| Harvest and store |  |  |  |  |  |  |  |  |  |  |  |