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Schweizerisches Tropen- und Public Health-Institut
Institut Tropical et de Santé Publique Suisse

Associated Institute of the University of Basel

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Household survey: hygiene and sanitation behavior as well as willingness to pay in rural Senegal

Support to the Direction de l'Assainissement

Final report

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The views and ideas expressed herein are those of the authors and do not necessarily imply or reflect the opinion of the Institute, WSP or any other institution involved in the study.

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Abreviations

ANSD	Agence Nationale de la Statistique et de la Démographie
CD	Census District
CI	Confidence interval
CLTS/ATPC	Community-Led Total Sanitation / Assainissement Total Piloté par la Communauté
DHS/EDS	Demographic and Health Survey / Enquête Démographique et de Santé
EAA	Eau et Assainissement pour l'Afrique
EKNZ	Ethikkommission Northwest- und Zentralschweiz
GSF	Global Sanitation Fund
GTS	Groupe Technique de Suivi
ISED	Institut de Santé et Développement
JICA	Japan International Cooperation Agency
JMP	Joint Monitoring Program
MDG/OMD	Millennium Development Goal / Objectifs du Millénaire pour le Développement
NGO/ONG	Non-Governmental Organization / Organisation Non Gouvernementale
OD	Open defecation
ODF	Open defecation free
OR	Odds ratio
PEPAM	Programme d'Eau Potable et d'Assainissement du Millénaire
RC	Rural community
RGPH	Recensement Général de la Population et de l'Habitat
SCIH	Swiss Center for International Health
SRA	Service Régional de l'Assainissement
Swiss TPH	Swiss Tropical and Public Health Institute / Institut Tropical Suisse et de Santé Publique
ToR	Terms of Reference
UCAD	Université Cheikh Anta Diop
UNICEF	United Nations Children's Fund
VIP	Ventilated Improved Pit
WHEPSA	Women's Health Education and Prevention Strategies Alliance
WSP	Water and Sanitation Program

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Résumé

Contexte

Les indicateurs en lien avec l'approvisionnement en eau de boisson indiquent que 32% de la population rurale sénégalaise s'approvisionnent à l'eau courante à domicile et 35% s'approvisionnent à une autre source d'eau améliorée. Par contre, 33% de la population rurale s'approvisionnent toujours à une source en eau non améliorée, dont 1% à l'eau de surface (WHO/UNICEF, JMP, 2015). L'accès à l'eau est également fondamental en termes d'hygiène, notamment pour le lavage des mains. Or, en milieu rural, un endroit spécifique pour se laver les mains a été observé dans moins de 24,8% des ménages. Parmi ces derniers, seuls 44.6% se lavaient les mains avec de l'eau et du savon; 18.7% avec de l'eau seulement et 35.2% n'avaient ni eau, ni savon ou autre détergent pour se laver les mains (EDS, 2014). En termes d'assainissement, des efforts importants restent à faire au Sénégal puisqu'en milieu rural, 34% de la population a accès à des latrines améliorées; 42% utilisent des latrines non améliorées (dont 8% utilisent des latrines partagées) et 24% pratiquent la défécation à l'air libre (DAL; WHO/UNICEF, JMP, 2015).

L'hygiène et l'assainissement sont donc des priorités du gouvernement sénégalais, notamment avec la mise en place du Programme d'Eau Potable et d'Assainissement du Millénaire (PEPAM). Cependant, 7 ans après son lancement, les progrès dans l'accès à l'assainissement en zone rurale restent insuffisants, l'accès à l'assainissement améliorée passant de 26.2% en 2005 à 35.2% en 2012 (Rapport Annuel, PEPAM, 2013). La DAL reste importante malgré l'augmentation des initiatives d'Assainissement Total Piloté par la Communauté (ATPC) depuis 2009. Il apparaît donc que le pays n'atteindra pas les Objectifs du Millénaire pour le Développement (OMD) fixés à 65% pour ce qui est de la part de la population utilisant des latrines améliorées en 2015.

Le Ministère de l'Eau et de l'Assainissement a donc sollicité le Programme Eau et Assainissement (PEA) de la Banque Mondiale pour qu'il apporte son appui technique au gouvernement sénégalais, afin de soutenir le renforcement de l'assainissement en milieu rural, notamment en engageant davantage les gouvernements locaux et de mieux cibler les communautés.

Dans le cadre de l'appui à son programme se rapportant à l'amélioration de l'offre et la demande en matière d'hygiène et d'assainissement au Sénégal, le PEA a alors mandaté l'Institut Tropical et de Santé Publique Suisse (Swiss TPH) pour conduire une enquête ménage au niveau national. Cette enquête a été complétée par une approche qualitative incluant des entretiens avec des informateurs privilégiés et des focus groupes.

Objectifs

Ce mandat vise à conduire une "enquête auprès des ménages pour évaluer les comportements d'hygiène et d'assainissement ainsi que la volonté de payer en milieu rural au Sénégal".

Les résultats de cette étude devront aider le PEA et ses partenaires à développer des outils de changement de comportements et de communication à partir d'éléments probants, avec un accent mis sur l'amélioration des pratiques d'assainissement et d'hygiène. Le but est de susciter durablement la demande des communautés rurales et de développer l'offre correspondante en services améliorés d'hygiène et d'assainissement à l'échelle du pays.

Plus spécifiquement, les objectifs de cette recherche sont les suivants:

- Estimer la disponibilité des latrines améliorées au niveau des ménages, leur utilisation, leur entretien, le lavage des mains ainsi que les pratiques d'évacuation des selles (incluant celles des jeunes enfants).

- Identifier et comprendre les principaux facteurs qui influencent, négativement ou positivement les pratiques d'hygiène, d'acquisition et d'utilisation des services d'assainissement.
- Déterminer les principaux bénéfices résultant de l'utilisation des structures d'hygiène et d'assainissement.
- Déterminer la capacité et la volonté des ménages à acquérir des structures d'assainissement sans déprendre de subvention.
- Déterminer les préférences des ménages en termes de latrines mais aussi leur satisfaction.
- Déterminer les différents canaux d'information des ménages comme les radios communautaires, TV, etc.

Méthodologie

La présente enquête a été mise en œuvre par le Swiss TPH et l'ISED en 2015. Des données aussi bien quantitatives que qualitatives ont été recueillies, d'une part à travers une enquête ménages portant sur plus de 2'000 ménages; d'autre part avec 40 focus groupes et 40 entretiens avec des informateurs clés.

L'**enquête ménage** a couvert 2'029 répondants et était représentative au niveau national. Le questionnaire ménage a suivi le cadre SaniFOAM mis au point par le PEA et abordait les thèmes suivants relatifs à l'assainissement rural: les caractéristiques socio-démographiques des répondants; la possession et l'utilisation des latrines, le lavage des mains, les pratiques de défécation et l'élimination des selles d'enfants; les caractéristiques des latrines parmi les ménages disposant de latrines; les opportunités, aptitudes et motivations à acquérir des latrines; les canaux d'information. La collecte des données a eu lieu du 16 mai au 7 juin et s'est faite à l'aide de tablettes électroniques. Après le nettoyage de la base de données, une analyse principalement descriptive reprenant les différentes variables clés collectées a été faite selon la zone géographique, le type de latrines (améliorées, non améliorées et DAL) et le score socio-économique du ménage.

La collecte de **données qualitatives** a porté sur 10 communes rurales représentatives de l'ensemble des 14 régions du Sénégal, avec une sélection des communes faite d'après un choix raisonné, tenant compte de la situation de l'assainissement rural et des interventions, passées ou en cours, sur l'assainissement. Les focus groupes ont ciblé d'une part les femmes et les hommes et d'autre part, les détenteurs et les non-détenteurs de latrines. Les sujets abordés ont concernés l'opinion sur le marché de l'assainissement, les préférences en matière d'ouvrage d'assainissement, les opportunités et contraintes de l'acquisition de services d'assainissement, la volonté de payer, l'utilisation des services d'assainissement et les motivations. L'accent a notamment été mis sur l'appréciation des projets de sensibilisation et de subvention de l'assainissement, l'enquête qualitative ayant spécifiquement ciblé des zones ayant bénéficié de tels projets. Les informateurs clés avec qui des entretiens ont été menés étaient des représentants des autorités locales (chefs de village, élus local chargé d'assainissement), des chefs religieux ou traditionnels, des représentants d' Organisations Non Gouvernementales (ONG), des relais ou acteurs impliqués dans les interventions d'assainissement, des enseignants et des membres du personnel médical ou paramédical. Après la retranscription des entretiens et focus groupes, les données ont été analysées selon les techniques de l'analyse de contenu.

Principaux résultats

- **35.8%** des répondants ont des **latrines améliorés** et **35.5%** n'ont aucune latrine et pratiquent donc la **DAL**. Ces chiffres sont proches de ceux fournis par d'autres sources, dont l' Enquête Démographique et de Santé (EDS) de 2014 et le JMP. Parmi les détenteurs de latrines, les latrines traditionnelles représentent 44.0% des latrines observées, les pour-flush toilet représentent 23.9%; enfin, les simple and double VIP représentent respectivement 12.4% et 8.2% des latrines. 27.2% des répondants mettent plus de 10 minutes pour se rendre à leur lieu de défécation.
- Le fait de disposer de latrines améliorées est très lié aux **conditions socio-économiques**, les ménages les plus riches ayant beaucoup plus de chances d'avoir des latrines améliorées que les ménages les plus pauvres. Par exemple, 39.9% des ménages les plus riches ont des pour-flush toilet contre respectivement 5.7% et 18.1% des ménages les plus pauvres et ceux appartenant à la catégorie imtermediate. Les fortes **inégalités** que l'on retrouve au niveau **géographique** concernant l'accès aux latrines améliorées traduisent largement ces inégalités socio-économiques. Ainsi, la disponibilité en latrines nettement plus favorable dans la région Ouest est à mettre en lien avec une population appartenant massivement à la catégorie la plus riche.
- Les **principaux facteurs associés à la possession de latrines améliorées** sont le score socio-économique, la zone géographique, le fait que le ménage dispose d'un dispositif de lavage des mains à proximité des latrines et dans une moindre mesure, le niveau d'éducation du chef de ménage.
- Pour ce qui est des édicules publics, l'enquête qualitative a montré qu'ils étaient insuffisants au niveau des marchés alors même que les marchés constituent des lieux de rencontre importants. Cela peut pousser les gens à déféquer à l'air libre. De plus, lorsque des **édicules** sont disponibles, beaucoup ne sont **pas fonctionnels en raison de difficultés d'entretien.**
- 78.3**%** des répondants ont déclaré **utiliser leur latrine de façon systématique**, et ceci est d'autant plus marqué que les répondants ont des latrines améliorées. Néanmoins, on retrouve des variations géographiques avec une utilisation systématique allant de 90.4% à l'Ouest et à 65.4% dans le Nord. Les principaux facteurs associés à l'utilisation systématique des latrines sont le **score socio-économique, la taille du ménage** (plus le ménage est grand, plus l'utilisation est systématique), **la zone géographique, la fréquence d'écoute de la radio** (plus l'écoute est importante, meilleurs est l'utilisation des latrines) et **la présence d'un dispositif de lavage des mains à proximité des latrines**. A noter que ni le fait de disposer de latrines améliorées, ni le niveau de satisfaction des répondants ne sont significativement liés à l'utilisation des latrines. Par ailleurs, **12%** des répondants ont déclaré n'avoir utilisé **que des latrines traditionnelles et/ou la DAL** au cours de leur vie ce qui suggère que l'exposition à des latrines améliorées n'est pas systématique, d'autant qu'on note également de fortes variations régionales (19.7% dans le Sud-Est contre 4.3% dans l'Ouest).
- L'enquête qualitative a révélé que pour les zones sélectionnées, la fonctionnalité des latrines ainsi que la configuration des latrines pouvaient influencer leur utilisation. En particulier, **l'emplacement** du lieu de la latrine peut être un facteur rédhibitoire s'il ne permet pas d'assurer **l'intimité** des usagers, ceci aussi bien pour ce qui est des latrines individuelles que des latrines publiques.
- La **DAL reste une pratique répandue** en milieu rural même si on retrouve de fortes variations régionales avec 78% de répondants qui ont déclaré pratiquer la DAL occasionnellement ou régulièrement dans le Nord contre 22.5% dans l'Ouest. Les

facteurs associés à la pratique de la DAL sont **le score socio-économique, le fait de partager ses latrines, la zone géographique et le fait d'écouter la radio tous les jours**. A noter que le fait d'avoir des latrines améliorées n'influence pas significativement la pratique de la DAL ce qui suggère que l'ensemble de la population est concerné par cette pratique.

- L'enquête qualitative confirme que si la pratique de la **DAL** est en régression, elle reste **présente** y compris dans les zones déclarées FDAL.
- **40%** des répondants n'ont **pas suffisamment d'eau pour satisfaire les besoins** du ménage, la région du Sud-Est étant particulièrement défavorisée. Les **puits non protégés** sont la principale source d'approvisionnement en eau de boisson mais l'approvisionnement en eau de boisson est fortement lié au statut socio-économique: plus le ménage est riche, plus il s'approvisionne à une source d'eau sûre, à savoir l'eau courante. Inversement, plus les ménages sont pauvres, plus ils s'approvisionnent à une source peu sûre que sont les puits non protégés. D'une façon générale, on retient qu'un **meilleur approvisionnement à l'eau de boisson va de pair avec l'amélioration des latrines et un meilleur score socio-économique**. Le temps moyen pour aller chercher de l'eau et revenir est de plus de 25 minutes. L'enquête qualitative a révélé que l'accès à l'eau est un problème récurrent dans la plupart des villages.
- Respectivement **32.9% et 34.8%** des répondants ont déclaré se **laver les mains avec du savon systématiquement** après avoir fait ses besoins et avant le manger. Ces faibles pourcentages peuvent être mis en relation avec le **faible pourcentage** de ménages dans lesquels un **endroit pour se laver les mains** a été observé à proximité des latrines (24.6%). La majorité des ménages disposent d'eau et de savon pour se laver les mains (63.3%) mais de fortes inégalités subsistent entre les régions, notamment dans le Centre où seuls 20.9% des répondants ont de l'eau et du savon. Les principaux **facteurs** associés au lavage systématique des mains sont la **présence d'un point de lavage des mains à proximité des latrines, le score socio-économique, le niveau d'instruction du chef de ménage et la zone géographique**. D'après l'enquête qualitative, les participants ont une **bonne connaissance de l'importance du lavage des mains** mais la pratique dominante est le lavage des mains à l'eau, notamment en raison de l'absence de savon. Il semble que dans les villages visités, les activités d'hygiène axées sur le lavage des mains sont courantes dans les écoles.
- Respectivement **67.9% et 64.5% des latrines traditionnelles n'ont ni toit ni porte**. La superstructure des latrines est meilleure lorsque l'infrastructure des latrines s'améliore et elle a son importance pour ce qui est de l'utilisation des latrines. Ainsi, des latrines avec un sol en dur sont davantage utilisées de façon systématique.
- Les **chefs de ménage ont participé à la construction de leur latrine dans 51.7%** des cas (mais ils ont pu être aidé par un maçon, la famille, un programme de construction), davantage lorsqu'ils ont des latrines traditionnelles (64.4%) et lorsqu'ils font partie des plus pauvres (65.6%). Un maçon qualifié est intervenu dans 35% des cas et un programme de construction de latrines dans 12.8% des cas. Les maçons interviennent majoritairement lorsque le ménage veut acquérir des latrines améliorées. Les programmes de subvention ont construit (partiellement ou intégralement) 20% des latrines améliorées contre moins de 4% de latrines traditionnelles, pour ces dernières, essentiellement dans le cadre de l'ATPC.
- D'une façon générale, il ressort que le **nettoyage est meilleur dans les ménages les plus riches** et qui ont des **latrines améliorées** et donc sans doute aussi plus faciles à nettoyer: l'utilisation des produits de nettoyage ainsi que le nombre moyen de nettoyage hebdomadaire augmentent avec le score socio-économique et lorsque les latrines sont

améliorées. Les répondants déclarent plus souvent que personne n'est responsable du nettoyage lorsqu'ils ont des latrines traditionnelles. L'enquête qualitative confirme que les **pratiques de vidange et de gestion des boues de vidange sont rarement observables** dans le milieu rural.

- La **dépense moyenne** pour l'acquisition de latrines est de 60'000 FCFA, plus précisément de **97'000 FCFA pour des latrines améliorées et de 24'000 FCFA pour des latrines traditionnelles**. Plus le score socio-économique augmente, plus la dépense est importante. Les latrines traditionnelles sont souvent gratuites (23.3%) dans la mesure où elles sont construites par le chef de ménage avec des produits trouvés localement. **La principale source de financement des latrines** est **le revenu du ménage**, suivi loin derrière par les subventions des ONG ou du gouvernement: 21% des répondants qui ont des latrines améliorées ont bénéficié de subventions. Les tontines, caisses de solidarité ou crédits restent des sources de financement marginales. On note que les subventions sont plus fréquentes à l'Ouest et au Nord, là où la population est aussi plus riche. L'enquête qualitative souligne qu'en absence de financement, les ménages optent pour la construction de latrines traditionnelles, et préfèrent **attendre la mise en place d'un programme de subvention pour acquérir des latrines**. Lors de co-paiement, le chef de ménage assure le plus souvent le montant de la contribution mais cela ne doit pas occulter la dimension collective du financement.

- Les focus groupes et les entretiens individuels ont confirmé que le secteur bancaire, notamment par l'octroi de prêts, est faiblement impliqué dans le financement du secteur de l'assainissement. Ils ont cependant permis d'identifier **plusieurs exemples réussis de financement des latrines**, que ce soit par le biais tontines (GSF/Sénégal), de caisse de solidarité ou de nouvelles méthodes de commercialisation de latrines (ACCRA).

- **Plus les latrines sont améliorées, plus la satisfaction des usagers augmentent** et ceux qui pratiquent la DAL sont majoritairement insatisfaits (92.9%): ces derniers sont 56.7% à déclarer qu'il n'y a aucun avantage à pratiquer la DAL. Les **odeurs, la saleté, l'inconfort** mais aussi le **manque d'intimité** ressortent largement comme étant des **points faibles** des latrines existantes, y compris des latrines améliorées pour lesquelles 14% des détenteurs ne sont pas très satisfaits ou pas satisfaits du tout. Les **caractéristiques préférées** que les répondants ont déclarées concernant leur latrine sont la **propreté, l'intimité et l'accessibilité**. On retrouve la propreté et l'intimité comme avantages de la DAL, ce qui suggère d'une part, que les latrines ne permettent pas systématiquement d'assurer à la fois l'intimité et la propreté; d'autre part, cela suggère aussi que ces répondants préfèrent ne pas avoir de latrines plutôt que de «mauvaises» latrines. Le fait que la **DAL soit perçue comme un choix par défaut** en l'absence de latrines est appuyé par l'enquête qualitative.

- L'enquête qualitative a révélé que pour certains villages visités, les latrines proposées par les **programmes de subvention ne répondent pas forcément aux attentes et aux besoins exprimés par la population**, notamment en termes de spécificités techniques (modèles de latrines proposées, profondeur de la fosse, coude en S, etc.) mais aussi concernant le choix du lieu d'emplacement des latrines qui n'assure pas systématiquement l'intimité des usagers. Des récriminations ont également été faites concernant la qualité de ses latrines pour lesquelles des problèmes ont été signalés, notamment par rapport à l'infrastructure. Néanmoins, les programmes de subvention restent très bien perçus et demandés par la population.

- Finalement, d'après l'enquête ménage, il ressort que les **latrines idéales** sont surtout les **Double VIP** (38.6%), les pour-flush toilet (19.8%) et les simple VIPs (19.6%) avec cependant des variations selon les zones géographiques. Concernant la superstructure, les principaux attributs attendus sont un **mur d'au moins 1.5 mètres (83%), une porte**

(84.5%) et un toit (67.5%). Les répondants dont les latrines ont un toit sont 1.57 fois plus satisfaits ou très satisfaits de leur latrine que ceux qui ont des latrines sans toit. L'enquête qualitative confirme que les **pour-flush toilet sont appréciées**, particulièrement des femmes car cela permet le nettoyage à grandes eaux. Les pour-flush toilet dégagent aussi moins d'odeur et présente plus de sécurité.

- La **capacité à payer** pour des latrines semble **limitée**: 18.6% des répondants ont affirmé ne rien pouvoir payer du prix des latrines de leur choix et la **contribution moyenne en cas d'échelonnement du paiement des latrines est de 25'500 FCFA,** soit l'équivalent du coût d'une latrine traditionnelle. On note peu de différence dans la contribution déclarée selon le score socio-économique, y compris concernant les montants mensuels moyens envisagés en cas de paiement échelonné (entre 4'789 et 6'338 FCFA). Près de **47% des répondants empruntent régulièrement ou occasionnellement pour faire face aux besoins élémentaires** du ménage et plus de 43% des ménages avaient une dette au moment de l'enquête. A peine 15.6% des répondants déclarent ne pas avoir besoin d'emprunter pour construire ou rénover les latrines. Les focus groupes et les entretiens confirment que les capacités de financement sont faibles, mais qu'elles existent. La population est d'ailleurs **favorable au co-paiement** ce qui montre bien qu'elle peut et veut participer au financement des latrines mais cette participation doit rester limitée: la population aurait développé une **attitude attentiste** vis-à-vis des programmes de subvention qui fait qu'elle est peu encline à investir dans les latrines spontanément et préfère attendre la mise en place d'un programme de subvention.
- Les **principaux freins** à la construction / rénovation de latrines sont en lien avec les faibles capacités de paiement déclarées: il s'agit d'une part du **coût des latrines** (59.3%) et d'autre part d'une **épargne insuffisante et/ou d'une difficulté à obtenir un crédit** (34.1%). Il semble par ailleurs que la perception du coût des latrines soit correcte: d'une part, les chiffres évoqués lors de l'enquête qualitative étaient tout à fait pertinent; d'autre part, les participants ont clairement fait la différence entre les coûts liés à l'infrastructure d'un côté et ceux liés à la superstructure de l'autre. La faible capacité de paiement qui est sous-entendue plus haut est à relativiser dans la mesure où pour 24.3% des répondants, la construction/rénovation de latrines n'est **pas une priorité**. Cela est confirmé par les focus groupes qui précisent que bien que les besoins en latrines soient clairement exprimés, **d'autres besoins élémentaires sont prioritaires.**
- Les principales motivations à avoir des latrines sont **l'intimité** que cela procure (74% des déclarations) et le **meilleur accueil des invités** que cela permet (35.1%). L'importance de l'accueil réserver aux invités et le fait d'éviter la honte ou la gêne de devoir les envoyer dans la brousse ressort également de l'enquête qualitative. Le fait que le ménage reçoive une **rentrée d'argent** ressort comme l'un des événements principaux susceptibles de les motiver chez 58.6% des ménages; **l'appui d'un projet de construction de latrines** est cité chez 40% des répondants ce qui tend à confirmer leur attente vis-à-vis des programmes de subvention. Enfin, les focus groupes ont signalé que le recul de la forêt avec des distances de plus en plus longues pour trouver un lieu de défécation pouvait inciter la population à acquérir des latrines.
- Les répondants sans latrines sont plus souvent d'accord avec certaines **normes validant la DAL**, à savoir que la plupart des personnes de leur connaissance font leur besoin en plein air et qu'il est naturel de faire ses besoins en plein air. Cependant, pour la plupart des autres affirmations stipulant que la DAL peut être source de problème, la grande majorité des répondants répondent par l'affirmative ce qui suggère que tous sont **conscients des limites occasionnées par la DAL**. Par ailleurs, la grande majorité des répondants sont d'accord avec les affirmations **valorisant la possession de latrines**. On note cependant que les répondants qui n'utilisent pas systématiquement leur latrine et

ceux qui n'ont pas de latrines à la maison sont plus nombreux à penser qu'ils ne peuvent **rien faire pour améliorer les conditions sanitaires à la maison**, ce qui suggère a une certaine fatalité. Ce **fatalisme** est également associé aux facteurs suivants: la zone géographique, la préférence en termes de latrines, le fait de posséder des latrines, le fait d'avoir contracté une dette au moment de l'enquête, le fait d'avoir déjà participé à un projet communautaire et la personne qui prend les décisions.

- La **radio, les rassemblements communautaires et les agents de santé communautaires** ressortent comme étant des canaux d'information à privilégier pour diffuser de l'information relative à l'assainissement, alors que les supports préférés sont les **affiches, les caravanes de sensibilisation et les discussions**.

Discussion

Au final, on retient que le facteur socio-économique est sans doute le facteur le plus important pour expliquer les inégalités observées dans l'accès à l'assainissement. La répartition de ces inégalités au niveau régional se matérialise par de fortes inégalités géographiques dans l'accès à l'assainissement et dans les pratiques sanitaires.

Les caractéristiques des latrines sont fondamentales, d'une part pour assurer la satisfaction de la population; d'autre part, pour favoriser leur utilisation, et enfin pour améliorer plus généralement les conditions d'hygiène en permettant un meilleur entretien des latrines.

La prise d'initiative de la population dans l'acquisition de latrines reste limitée, celle-ci attendant fréquemment que se mettent en place des programmes de subvention pour acquérir des latrines. Bien que les capacités de payer de la population rurale soient réduites, leur participation peut être envisagée d'autant que leur contribution moyenne envisagée pour l'acquisition de latrines en cas de co-paiement est proche du coût d'une latrine traditionnelle.

Il ressort enfin que les pistes d'action, en lien avec les stratégies de communication, devront intégrer plusieurs points importants qui ressortent de cette étude afin d'atteindre un maximum de personnes: d'une part, les zones où apparaissent des poches de pauvreté devront être particulièrement ciblées, notamment par des campagnes de sensibilisation adaptées. D'autre part, les stratégies de communication devront être adaptées aux situations locales et dans ce sens, les préférences et les habitudes en termes de communication qui ne sont pas les mêmes selon les régions, devront être prises en compte.

Summary

Context

The indicators for access to drinking water in Senegal suggest that 32% of the rural population have a piped connection on their premises while 35% cover their needs from other improved sources. This means that 33% of the population still satisfies their needs from unimproved sources, including 1% from surface water (WHO/UNICEF, JMP, 2015). Access to water is also fundamental to good hygiene behavior, notably for washing hands. However, in rural areas, dedicated hand washing stations have been observed in 24.8% of all households. Among the members of these households, only 44.6% used water and soap for hand washing; 18.7% used water only and 35.2% had neither water nor soap or any other detergent to wash their hands (EDS, 2014). With regard to sanitation, important efforts need to be made in Senegal as in the rural area, 34% of the population have access to improved sanitation; 42% use unimproved latrines (including 8% who share latrines) and 24% practice open defecation (OD; WHO/UNICEF, JMP, 2015).

Hygiene and sanitation are thus priorities for the government of Senegal, as demonstrated by the inauguration of the Programme d'Eau Potable et d'Assainissement du Millénaire (PEPAM, Millennium Drinking Water and Sanitation Program). However, 7 years after its start, progress in terms of access to sanitation in rural areas remains insufficient: access to improved sanitation increased from 26.2% in 2005 to 35.2% in 2012 (Annual Report, PEPAM, 2013). OD remains common despite the multiplication of Community-Led Total Sanitation (CLTS) initiatives since 2009. It thus appears likely that the country will miss the Millennium Development Goal objective of 65% of the population utilizing improved sanitation in 2015.

The Ministry of Water and Sanitation thus appealed to the Water and Sanitation Program (WSP) of the World Bank to lend technical support to the government of Senegal to reinforce sanitation in rural areas, most notably by better engaging with local governments and better targeting communities.

In the frame of its support to the program that aims to increase the availability and demand for hygiene and sanitation in Senegal, the WSP mandated the Swiss Tropical and Public Health Institute (Swiss TPH) to conduct a national household survey. The survey was complemented by a qualitative approach including key informant interviews and focus group discussions.

Objectives

The mandate was to conduct a “Household survey to evaluate hygiene and sanitation behavior and the willingness to pay in rural Senegal”.

The findings of this study will help WSP and its partners develop tools for behavior change communication based on relevant facts, with an accent on the improvement of sanitation and hygiene practices. The aim is to sustainably increase demand in rural communities nationwide, and to develop improved hygiene and sanitation services offers that answer to this demand.

More specifically, the objectives of this study are as follows:

- Estimate the availability of improved latrines at household level, their use and maintenance, hand washing behavior and the management of fecal matters (including those from young children).
- Identify and understand the main factors that negatively or positively influence hygiene practices and the acquisition and use of sanitation services.
- Determine the principal benefits resulting from the use of hygiene and sanitation infrastructure.

- Determine the capacity and willingness of households to acquire sanitation infrastructure without reliance on subsidies.
- Determine the preferences and satisfaction of the households with regard to latrines.
- Determine the different information channels of households such as community radio, TV etc.

Methods

The survey was implemented by Swiss TPH and ISED in 2015. Both quantitative and qualitative data were collected through a household survey including over 2'000 families and through 40 focus group discussions and 40 key informant interviews.

The **household survey** covered 2'029 respondents and was representative at national level. The household questionnaire followed the SaniFOAM framework elaborated by WSP and covered the following topics related to rural sanitation: socio-demographic characteristics of respondents; availability and use of latrines, hand washing, defecation and child feces elimination practices; characteristics of latrines in households with latrines; opportunities, abilities and motivations to acquire latrines; information channels. Data were collected from 16 Mai to 7 June, facilitated by electronic tablets. Following the cleaning of the database, a primarily descriptive analysis was conducted that focused on the key variables that were collected, and was stratified by geographical zone, latrine type (improved, not improved, OD) and socio-economic status of the household.

Qualitative data were collected in 10 rural communities that were representative of the 14 regions of Senegal, with communities selected based on the rural sanitation situation and the local implementation of past or current sanitation interventions. Focus group discussions were held with women and men, either having latrines or not. The discussed topics included their opinion on the market for sanitation products, preferences for sanitation infrastructure, opportunities and barriers to acquire sanitation services, willingness to pay, the use of sanitation services and motivations to acquire sanitation infrastructure. A special emphasis was placed on their appreciation of sensitization campaigns and sanitation subsidy programs as the qualitative survey specifically focused also on zones that had profited from such projects. The key informants with whom interviews were conducted were representatives of the local authorities (village leaders, local politicians responsible for sanitation), religious and traditional leaders, representatives of Non-Governmental Organizations (NGO), local agents and actors of sanitation interventions, teachers and medical or paramedical personnel. Following the transcription of the interviews and discussions, the data were analyzed with content analysis techniques.

Main findings

- **35.8%** of the respondents have access to **improved latrines** and **35.5%** have no access to a latrine and thus **practice OD**. These figures are similar to those from the DHS 2014 and from the JMP. Among all surveyed latrines, unimproved latrines represent 44% of the total whereas pour-flush toilets represent 23.9%. Simple and double Ventilated Improved Pit (VIP) latrines make up respectively 12.4% and 8.2%. 27.2% of the respondents need more than 10 minutes to reach their place for defecation.
- The ownership of improved latrines is closely correlated with the **socio-economic status**, with better-off households having a much higher chance of having improved latrines than worse-off households: 39.9% of the better-off households have pour-flush toilets against 5.7% for the worse-off and 18.1% for the intermediate group. The marked **geographic differences** in access to improved latrines closely follow these socio-economic inequalities. Thus, the better availability of latrines in the Western region must be seen in the context of the much larger proportion of better-off people in this region.

- **The main factors associated with ownership of improved latrines** are the socio-economic status, the geographic area, the presence of a hand washing facility close to the latrines and, to a lesser extent, the level of education of the household head.
- Concerning public toilets, the qualitative survey shows that there are not enough of them at local markets albeit markets are an important place where people gather. This can force people to practice OD. Moreover, when **public toilets** are available, they often do **not work as they are not well maintained**.
- 78.3**%** of the respondents declare that they **systematically use their latrine**, and this rate is even higher among those who have improved latrines. However, there are geographic variations and the rate varies between 90.4% for the respondents in the West and 65.4% for those in the North. The main factors associated with systematic latrine use are the **socio-economic status**, the **household size** (the bigger a household is, the more systematically latrines are used) and the **presence of a hand washing facility close to the latrines**. Of note, neither the ownership of improved latrines, nor the respondents' satisfaction is significantly associated with latrine use. Also, **12%** of the respondents declare they have **only used traditional latrines or practiced OD** in their life. This suggests that exposure to improved latrines is not systematic. Regarding this indicator, there are also important differences between regions (19.7% in the South East against 4.3% in the West).
- The qualitative survey revealed that in the selected areas, latrine functionality and configuration influence their use. Of particular importance is the **location** which limits latrine use if it does not allow users to maintain **privacy,** this factor was important for both household and public latrines.
- **OD remains common** in rural areas, even if there are important geographic differences: 78% of the respondents report practicing OD in the North against 22.5% in the West. Factors associated with OD are the **socio-economic status, sharing latrines, the geographic area and listening to the radio every day.** Importantly, having improved latrines does not influence significantly OD which suggests that this practice remains common for all.
- The qualitative survey confirmed that **OD** decreased but **remains common**, even in zones declared "open defecation free".
- **40%** of the respondents have **not enough water to satisfy the needs** of the household, the South-East being particularly disadvantaged. **Unprotected wells** are the main source for drinking water, but this is highly related to the socio-economic status. The better-off a household is, the more likely it is to use water from a safe source, namely piped water. Conversely, the poorer a household is, the more likely it is to use an unimproved source, mainly unprotected wells. More generally, **a better water supply goes hand in hand with improved latrines and a better socio-economic status**. The mean time to fetch water and return is over 25 minutes. The qualitative survey revealed that access to water is a key issue in most of the villages.
- **Respectively 32.9% and 34.8%** of the respondents declare that they **systematically wash their hands with soap** after defecating and before eating. These figures are reflected in the low percentage of **hand washing stations** in proximity to the place for defecation (24.6%). Most people have water and soap to wash their hands (63.3%) but important inequities remain between regions: in the Centre, only 20.9% of the respondents have water and soap. The main **factors** associated with systematic hand washing are a **hand washing facility close to the latrine, the socio-economic status, the level of education of the household head and the geographic area.** According to the qualitative study, the participants have a **good knowledge of the need to wash their hands** but the most common practice remains hand washing with water, mainly because of a lack of soap. In the visited villages, hygiene activities focusing on hand washing are common in the schools.

- Respectively **67.9% and 64.5% of unimproved latrines have no door and no roof**. The superstructure of the latrines improves along with the infrastructure, and is an important determinant of latrine use. For example, latrines with a cement floor are used more systematically.
- **51.7% of the heads of the household contributed to the construction of their latrine** (but they may have received help by their family, a mason, or a construction programme), especially if they have unimproved latrines (64.4%) or belong to the most poor households (65.6%). A skilled mason or a construction programme had been involved in respectively 35% and 12.8% of the latrines. Masons were mainly involved in the construction of improved latrines whereas subsidy programs built 20% of the improved latrines and 4% of the unimproved latrines (mainly in the frame of CLTS).
- **Cleaning was better organized in better-off households** and those with **improved latrines**, the latter undoubtedly also being easier to clean. The use of cleaning products and the average number of weekly cleaning cycles increased with the socio-economic status and latrine quality. The respondents with unimproved latrines declare more often that nobody is responsible for cleaning. The qualitative survey confirmed that **emptying pits and disposing of pit contents remain rare** in rural areas.
- The **mean reported cost** to acquire latrines is 60'000 FCFA, more precisely **97'000 FCFA for improved latrines and 24'000 FCFA for traditional latrines**. The higher the socio-economic status, the higher is this expense. Unimproved latrines often come for free (23.3%) as they are built by the head of the household, using locally available products. **The main funding source is the household income** and to a much lesser extent, subsidies from the government or from NGOs which had supported the construction of 21% of the improved latrines. Tontines, village solidarity funds or credit represent minor sources of funding. Subsidies are more frequent in the Western and the Northern regions where the population is also richer. The qualitative study underlined that, in the absence of subsidies, the households build unimproved latrines and **prefer to wait for a subsidy program until they build a latrine**. With regard to co-payments, it is most often the head of the household who formally pays the contribution but the collective dimension of any funding should not be neglected.
- The focus group discussions and the key informant interviews confirm that the financial sector, especially through the granting of loans, is not involved in important ways in the sanitation sector in rural Senegal. However, **several successful examples of latrines funding** can be identified, including tontines (GSF/Senegal), solidarity funds or new marketing approaches for latrines (ACCRA).
- **The satisfaction of the users increases with the status of the latrines**, and most of those practicing OD are not satisfied (92.9%). For 56.7% of those **not owning a latrine,** OD has no advantage. The **smell, the dirtiness, the lack of comfort** but also the **lack of privacy** are often cited as **disadvantages** of the existing latrines, including improved latrines: 14% of the owners of such latrines are not very satisfied or not satisfied at all. The **preferred characteristics** of latrines are **cleanliness, privacy and accessibility**. Cleanliness and privacy are also cited as advantages by those having no latrines and practicing OD. This suggests that latrines are not always able to offer privacy and cleanliness. Moreover, it also means that respondents prefer having no latrines rather than "bad" latrines. The finding that **OD is a default choice** when no latrines are available is confirmed by the qualitative study.
- The qualitative survey revealed that for some villages, the **latrines promoted by subsidy programs do not necessarily fit the expectations and needs of the population**, especially regarding technical aspects (type of latrines proposed, depth of the pit, etc.) but also with regard to the location of the latrines which does not always offer sufficient privacy. The respondents are not always satisfied with the quality of the latrines which reportedly suffer from infrastructure issues. However, subsidy programs remain well appreciated and demanded by the population.

- Finally, according to the household survey, **ideal latrines** are **double VIP** latrines (38.6%), pour-flush toilets (19.8%) and simple VIP latrines (19.6%), with difference between regions. Regarding the superstructure, the most important characteristics are a **wall of at least 1.5 meter height (83%), a door (84.5%) and a roof (67.5%).** Respondents having a latrine with a roof are 1.57 times more likely to be satisfied than respondents whose latrine has no roof. The qualitative survey confirmed that **pour-flush toilets are preferred**, especially by women as they can be washed with lots of water. Moreover, they are less smelly and safer.
- The **capacity to pay** for latrines appears **limited**: 18.6% of the respondents confirmed that they could not pay anything for the latrine they desired, and the **mean contribution in case payments for latrines could be made in instalments was 25'500 FCFA**, i.e. the cost of an unimproved latrine. There are few differences between households of different socio-economic status with regard to the possible average contribution or monthly payment in case of instalments (between 4'789 and 6'338 FCFA). Almost **47% of the respondents borrow money regularly or occasionally to cover basic needs** of the household and over 43% of the households were in debt at the time of the survey. Only 15.6% of the respondents declared they have no need to borrow in order to build or renovate a latrine. The focus groups discussion and interviews confirm that the financial capacity is weak but exists. Further, the population has a **favorable view of co-payments** which shows that the people can and want to contribute to the funding of latrines but that this contribution must remain limited. It seems that the population has developed an **expectant attitude** with regard to subsidy programs which means they have little appetite to spontaneously invest in latrines and prefer to wait for the arrival of a subsidy program.
- The **main constraints** to construct / renovate latrines are related to the declared weak capacity to pay: it is the **costs of latrines** (59.3%) and **insufficient savings and/or the difficulties to obtain a credit** (34.1%). It also appears that the perceived cost of a latrine is correct as the figures mentioned during the focus group discussions reflect reality and the respondents made a clear distinction between the costs for infrastructure and those for the superstructure. The weak capacity to pays is also reflected in the 24.3% of the respondents who declare that construction/renovation of latrines has **no priority**. This is confirmed by the focus group discussions which specified that albeit the need for latrines exists, other basic needs have a higher priority.
- Main motivations to acquire latrines are related to **privacy** (74% of the answers) and a **better reception of guests** (35.1%). The importance of receiving guests without experiencing shame due to sending them to the bush is confirmed by the qualitative survey. Receiving **unexpected money** is another source of motivation for 58.6% of the respondents, as is the **support by a subsidy program** (40%), confirming their expectation that such programs exist. At last, the focus group discussions revealed that the loss of forest, entailing ever-longer distances to be walked before finding a place to defecate, might also encourage the population to acquire latrines.
- Respondents without latrines agree more often with certain **norms validating OD**, most importantly that most people they know practice OD and that it is natural to practice OD. However, the majority of the respondents agree with most other statements regarding potential issues with OD, suggesting that **they are aware of the problems associated with OD**. Most of the respondents also **agree with the benefits of having latrines**. However, respondents not using systematically their latrine and those who have no latrine think more often that they can **do nothing to improve the sanitation conditions at home**, suggesting a certain fatalism. This **fatalism** is also associated with the following factors: the geographic area, the preference in terms of latrines, latrine ownership, having a debt at the time of the survey, having already participated in a community-based project and the decision-maker in the household.

- **Radio, community meetings and community health staff** are identified as the preferred channels for sanitation-related information, and the preferred tools are **posters, sensitization caravans and discussions**.

Discussion

In conclusion, the socio-economic condition undoubtedly is the most important factor to explain the present inequalities with regard to access to sanitation. The regional variability of this inequality can be seen in the strong geographic differences in access to sanitation and sanitation practices.

The characteristics of the latrines are decisive, both to ensure the satisfaction of the population and to promote their use, and last to improve more generally the hygiene conditions by facilitating the maintenance of the latrines.

The engagement of the population in the acquisition of latrines remains limited as the people often wait with the construction of latrines until a subsidy program is implemented. Albeit the capacity to pay of the rural population is limited, their contribution must be considered, not least because the mean proposed contribution to the acquisition of a latrine in case of co-payments is close to the costs of a traditional latrine.

Last, it appears that strategic activities, together with the communication strategy, will need to address several important points that were identified through this study in order to reach the maximal audience: the zones where pockets of poverty exist need to be prioritized, especially by tailored sensitization campaigns. More generally, the communication strategies need to be adapted to the local context, and the communication preferences and habits, which differ between regions, need to be considered.

1 Introduction and Objectives

1.1 Background

Senegal is divided into 14 regions and 45 departments that are again subdivided into districts, municipalities, rural communities and villages. Senegal's population has increased significantly from 5.3 million in 1975 to 11.1 million in 2003, a growth rate of 2.9% per year. The population could reach 14.5 million in 2015 with an annual population growth rate of 2.5% (period 1999-2015). More than 80% of the population is concentrated along a coastal strip less than 200 km wide. The average density is 50 inhabitants / km2 and decreases from West to East. Half of the population lives in the “bassin arachidier” which is dominated by the agglomeration of Dakar which, itself, is where more than one in four Senegalese live.

Figure 1. Map of Senegal.

Despite its geographical position centered on the Sudan-Sahel region, Senegal has sufficient water resources to feed its people. The renewable water resources availability is currently estimated at approximately 4'747 m3 / capita / year, well above the reference value of 1’000 m3 / capita / year that defines water shortage (Country Report, 2009). However, sufficient water remains elusive for areas facing quality (fluoride, water pollution) and quantity (overexploitation of aquifers) issues and because of the very high mobilization costs of the resource. Climate change is likely to impose additional constraints on the availability (drought) and access to water (salinification and water pollution). All sectors relying on the availability of water as a resource, already suffer from reduced rainfall and its impact on water availability. The Senegal River runoff has decreased for 25 years. The climatic deterioration over recent years combined with overexploitation (in the West of the country) has resulted in locally falling water tables (20 to 25 m in 25 years in the horst de Ndiass) and saline water intrusion.

Indicators related to the supply with drinking water show that 32% of the rural population have access to running water at home, and 35% have access to another improved water source (eg protected wells , bottled water, rain water), which means that 67% of the rural population have an Improved source of drinking water. This means that 33% of the rural population have only access to non-improved water sources, including 1% who rely on surface water (WHO / UNICEF JMP, 2015).

Also for hygiene, access to water is fundamental: washing hands with soap, especially at critical times (after defecation, before preparing food or feeding children) is an important component of it which requires access to water. The place where this washing takes place is also crucial. But in rural areas, a specific place just for handwashing exists in less than 30% of all households. Among their inhabitants, 44.6% washed their hands with soap and water; 18.7% with only water and 35.2% had no water nor soap or detergent to wash hands (EDS, 2014).

In terms of sanitation, major efforts are still needed since in rural areas, less than **34% of the population has access to Improved latrines; 42% use unimproved latrines** (including 8% using shared latrines) and **24% practice open defecation** (WHO / UNICEF JMP, 2015).

The estimated coverage with improved latrines and the rate of open defecation (OD) in rural areas for 25 years, however, show a continuous improvement with a decrease in OD and increased coverage of improved latrines although it overall remains insufficient (WHO / UNICEF JMP, 2015)[1].

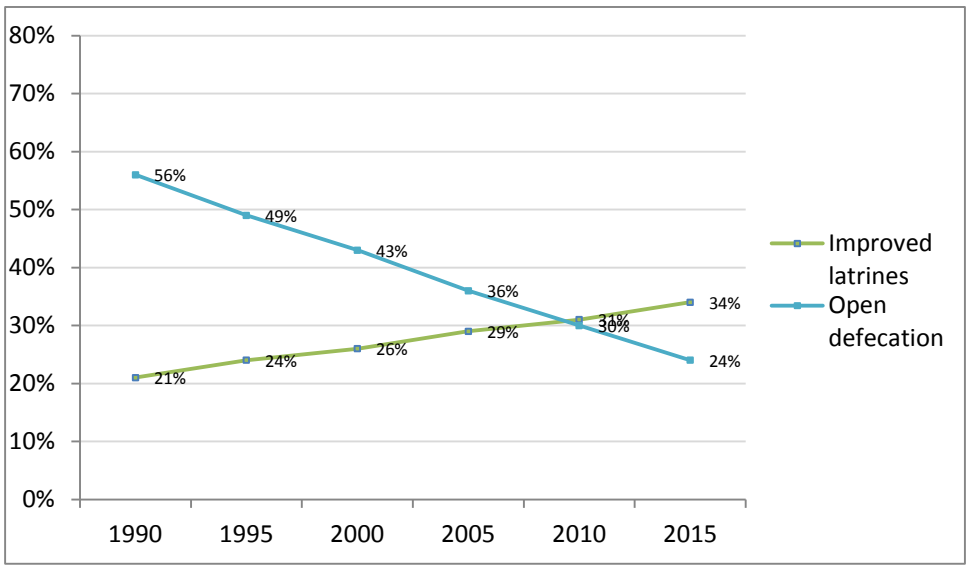

Figure 2. Estimated improved latrine coverage and rate of open defecation (% of the rural population), 1990-2015, Senegal (JMP).

Hygiene and sanitation have thus become the Senegalese government's priorities, particularly with the implementation of the Programme d'Eau Potable et d'Assainissement du Millénaire (PEPAM). However, seven years after its launch, progress in access to rural sanitation remains inadequate, access to sanitation increased from 26.2% in 2005 to 35.2% in 2012 (Annual Report, PEPAM 2013). OD rates remain high despite the increase in Community-led Total Sanitation campaigns (CLTS) since 2009. It therefore appears that the country will not reach the Millennium Development Goals (MDGs) that have been set at 65% regarding the part of the population using improved latrines in 2015.

The Ministère de l'Eau et de l'Assainissement (Ministry of Water and Sanitation) has thus asked the Water and Sanitation Program (WSP) of the World Bank to provide technical support to the Senegalese government in the area of strengthening of rural sanitation through increased involvement of local government, and better community targeting.

[1] www.wssinfo.org/fileadmin/user_upload/resources/**Senegal**.xls *(last checked 14.09.2015)*

In the frame of its support to a program to improve the supply of and demand for hygiene and sanitation products in Senegal, the WSP then commissioned the Swiss Tropical and Public Health Institute (Swiss TPH) to conduct a household survey at national level. The household survey was supplemented by a qualitative approach involving interviews with key informants and focus groups. The objectives of the study are outlined below.

1.2 Objectives

The mandate was to conduct a “Household survey on hygiene and sanitation behavior as well as willingness to pay in rural Senegal”.

To meet the objectives set out in the Terms of Reference (TOR) specified by WSP, namely to evaluate hygiene and sanitation behaviors as well as the willingness to pay, we conducted a survey of rural households and a series interviews with key informants and focus groups. The results of this study will help WSP and its partners to develop behavior change and communication tools based on evidence, with an emphasis on improving sanitation and hygiene practices. The aim is to sustainably increase demand in rural communities and develop corresponding offers of improved hygiene and sanitation services across the country.

More specifically, the objectives of this study were as follows:

- Estimate the availability of improved latrines in households as well as heir use and maintenance, as well as hand washing and feces disposal practices (including those of young children)
- Identify and understand key factors negatively or positively influencing hygiene practices, and the acquisition and use of sanitation infrastructure and services
- Identify the main benefits resulting from the use of hygiene and sanitation structures
- Determine the capacity and willingness of households to purchase sanitation facilities without subsidies
- Identify household preferences in terms of latrines but also their satisfaction
- Identify different information channels used by households including as community radio, TV, etc.

2 Literature review

2.1 Methods

The idea is not to present an exhaustive and systematic review of the literature but to select items helping to develop the most appropriate data collection tools as well as to ultimately perform a more detailed and insightful analysis of the collected data.

For that, we performed a search of articles and information related to our objectives on Pubmed, Google, Google Scholar and specific sites dedicated to hygiene and sanitation in Senegal, such as PEPAM, JMP, DHS, ANSD.

Only articles focusing on rural areas were selected. The following terms were used to search in French and English, both for articles on Senegal and more general ones, to cover as many aspects addressed by the study as possible:

*"*latrines */ latrines", "*défécation à l'air libre */ open defecation", "*hygiène et assainissement */ hygiene and sanitation", "*comportements assainissement */ sanitation behaviors",* "lavage des mains */ hand washing", "*participation communautaire */ community participation", "*assainissement total piloté par la communauté */ community-led total sanitation", "*volonté de payer */ willingness to pay", "*satisfaction latrines */ satisfaction latrines", "*intervention hygiène assainissement */ intervention hygiene and sanitation", "*croyance latrines */ latrines beliefs".*

The articles were selected based on their titles and abstracts. The references listed at the end of the articles were studied and additional articles have been selected according to the "snowball" method. The selected articles were either in French or in English, and published after 2000.

Overall, more than 40 articles were selected and were the subject of a comprehensive study (see bibliography). Many topics related to the SaniFOAM[2] conceptual framework developed by WSP emerged from these articles and are summarized below.

It goes without saying that the review of the literature presented here is neither comprehensive nor systematic. In addition, the articles written in a language other than French or English were excluded, thus implying a bias. Nevertheless, it appears that the selected items have yielded a lot of information that proved very useful for the development of questionnaires and subsequently for the analysis of our results.

2.2 Availability and use of latrines, management of child feces and hand washing

- Access to sanitation

In Senegal, the fraction of the population that has access to sanitation varies widely between regions but also between rural communities (Livret bleu, 2009). According to Backiny-Yetna et al (2010), the number of households with flush toilets, covered latrines or improved latrines decreased from 57.2% in 2005 to 53.8% in 2008. This decline could be attributed to a substantial number of newly formed households with unimproved latrines.

A study by Faye et al (2011) in the rural district of Ngohé (district of Diourbel) reveals that latrines are absent in 76% of the concessions and where they exist, they are reserved for adults. In the surveyed households, 61% of all children defecate in the open while 51% of them have latrines; in general, children practice OD more frequently than adults.

[2] "Introduction SaniFOAM: A framework to analyse sanitation behaviors to design effective sanitation programs" (WSP working paper), WSP, 2009

The study of Sow, Vlas et al (2003) conducted in northern Senegal with 59 children in the context of the fight against schistosomiasis has also revealed that even if the villages were relatively well equipped with latrines (90% of the concessions had latrines), their use nevertheless remained insufficient. Many of the children do not use them on the one hand because they are dirty – which means, a significant number of people use them – on the other hand because of security concerns, so that some children are afraid of using them. So there is a natural propensity for them to release themselves in the open where anonymity is almost certain but which is not without risks since 20% of the children said they defecated directly at water points.

Even though access to sanitation and more specifically to quality latrines is an important factor in terms of health and diarrheal diseases, the link is not systematic; this seems to indicate that one must not only focus on the rate of access to sanitation but also on the use of latrines and the reduction of exposure to feces (Clasen et al, 2014).

- Latrine use

A study in villages in rural India that benefited from total sanitation campaigns reported latrine coverage of 72% (against 10% in villages without sanitation campaign). However, among households with latrines, 37% of all latrines were not used by any member; 39% of the adults and 52% of the household children continued OD. Less than half of these households reported use of the latrine every time somebody relieved itself (Barnard et al, 2013). The main reasons were that they preferred OD (29%), that latrines were not completely finished (28%) or they felt that using latrines was not practical (20%). In addition, 23% of respondents considered that latrines lacked privacy, 22% reported that the latrines were used for storage, 17% indicated that the latrines were broken or blocked (9%). Only 4% justified the ongoing use of OD by the difficulty of emptying the pit. It therefore appears that even if large sanitation campaigns are launched to ensure broad latrine coverage, this does not guarantee their use as there are also behavioural changes that are needed which depend on cultural norms.

In a rural district in northern Ethiopia, the rate of latrine use was estimated at 8%, but 13.2% of the latrines were never used (Tadesse-Yimam et al, 2014). The majority of the respondents using latrines declared doing so because of the dangers of feces for health (94%), to keep the environment clean (27.5%) and for reasons of privacy. The reasons for non-utilization of latrines were related to the respondent's habit of practicing OD (60.4%) and that it was more comfortable (18.6%). Furthermore, the use of latrines was influenced by their cleanliness and the frequency of latrine cleaning, households with clean latrines were4.3 times more likely to use them (CI: 2.05 - 9.134).

Given the often large size of households, latrine use by all members of the household is far from systematic. Thus, in Tanzania, where 50% of the households have improved latrines, barely 40% of the household members use them even if they are improved latrines (Sara and Graham, 2014).

Nevertheless, it turns out that community programs with strong mobilization and awareness raising power can lead to significant levels of latrine use: for example, a study in the Amhara district in Ethiopia (O'Loughlin, 2006) reports a utilization rate of 90% of latrines constructed under the program by the community itself.

- Management of child feces

The way children's faeces are managed depends on their age. Young children are often dependent on the guardian who takes care of their waste. Thus, in Senegal, the nappies of young children are washed most frequently at home (53%) and in backwaters (27%) and river banks (20% Sow, Vlas et al, 2003). In Zinder in Niger, half of the households surveyed said they throw the feces of their young children into latrines and 28% on a rubbish heap outside the concession (Diallo et al, 2007).

When children are older and therefore more autonomous to go and relief themselves, it appears that, overall, they use latrines less frequently than adults. The assessment in rural

areas in Zinder on the establishment of latrine promotion program has revealed that children under 10 use latrines less frequently than adults (92.5% vs. 55%; Diallo et al, 2007).

In Ethiopia, the study by Tadesse-Yimam et al (2014) indicates that among the 226 households with children aged 3 to 5 years; only 8.8% of them used latrines. 31.7% of households indiscriminately dispose of the waste of their children around the house, in the yard or in the bush. The reasons for non-use of latrines by children were that the pit is too large (54.4%); and that they were only children (26.2%), which would tend to indicate that children have a separate status and that their feces are considered less harmful; finally, the latrines were seen as not stable enough for them to crouch on (19.4%). One can draw the lesson that it is necessary to disaggregate data on the determinants of access and use of sanitation services depending on the category under consideration: children / adults; men women.

- Maintaining cleanliness of latrines

For cleaning the latrines, not surprisingly, it appears that it is women who are responsible. A study in Niger (Diallo et al, 2007) mentions that they wash their latrines on average 2.7 times per week. For this purpose, they use water and soap (24.5%), only water (57%) or limited themselves to drying wet surfaces (13.5%). The quality of the cleaning is better when the latrine superstructure is in good condition and at least 150 cm high. 70% of the latrines were clean when investigators came one year after the launch of the project.

In Ethiopia, the study by Tadesse-Yimam et al (2014) reports that 79.5% of the households clean their latrines when they are "dirty", which obviously depends on each household's own criteria; only 1.7% washes them daily.

- Hand washing

In general, connection to a drinking water distribution system is still rare for villages in Senegal, only 21.3% of the households have access to a tap, and for rural areas in the regions of Kolda, Tambacounda and Ziguinchor, less than one in ten villages are connected (respectively 3.6%, 6.8% and 9.3%) (Livret bleu, 2009). In rural areas, despite the progress made between 2005 and 2008, universal access to safe water remains an elusive goal since two out of five households still use surface water (Backiny-Yetna et al, 2010).

This obviously has a negative impact on hand washing as the lack of water impedes the practice. The study of Faye et al (2011) conducted at Ngohé reveals that 94% of people do not practice hand washing. This is even worse when considering that washing hands with soap and detergents significantly affects child mortality (Bampoky et al, 2013). There still is good news for policy makers since making soap and / or detergents available for the most vulnerable households remains inexpensive.

The handwashing frequency also varies according to the context and it is clear that some situations more than others are associated with hand washing; thus, a study in Bangladesh found that washing hands with soap after relieving oneself is more frequent than before taking a meal (Akter, 2014).

In general, it seems that hand washing is not yet a systematic practice everywhere and it is difficult to transform this practice into a habit as a number of obstacles remain, including a lack of interest in the issue, poverty and the lack of knowledge. In addition, there often appears to be a gap between the knowledge in terms of hygiene and hand washing and the reported practices: in another study conducted in Bangladesh (Rabbi et al, 2013), it was for example shown that 95% of the respondents reported that washing hands before meals were essential but only 22% of them actually washed their hands with soap.

A study among schools in England (Chittleborough et al, 2012) also shows that a lack of time, an unsatisfactory parental model for handwashing and unattractive washing facilities are significant barriers to regular hand washing. Even if reminders and explanations about the importance of hand washing have a positive impact on hand washing, this is not sufficient to initiate and maintain good practices. Structural factors like having time to wash hands,

access to clean and high-quality hand washing stations, and seeing hand washing as a societal norm also influence the attitude to handwashing.

Finally, it must be noted that the promotion of latrines does not necessarily entail adopting handwashing. Thus, a program in Ethiopia has been successful in promoting latrines but the majority of them did not offer water to wash hands near the latrines and there was no soap. The promotion of hand washing was not part of the construction of latrines.

2.3 Opportunities

- Latrine characteristics

As already mentioned above, for latrines to be used, they must not only be available and accessible; they must also have a level of quality and desired characteristics fitting the population expectations. A study in rural India (Barnard et al, 2013) showed that a latrine with a wall of more than 1.5 meters height, with unbroken panels and covered latrines were significantly more often used than others. The probability of using a latrine was even more important when it possessed a door (OR = 43.74, 95% CI = 4.44, 430.7). The fact that latrines have a door is also an important attribute in Ethiopia and this significantly increases the use of latrines (Tadesse-Yimam et al, 2014). In general, it appears that when the latrines are functional, that is to say they have satisfactorily high walls, a roof, undamaged panels, a door, a covered pit and all other features ensuring privacy, they are used in 95% of the cases. It is only under those conditions that households see an interest to use their latrines and stop OD. This is also confirmed by the study done by O'Connell (2014) for whom access to functional latrines is a major problem when we consider all the reasons for the persistence of OD.

This seems to be confirmed by the results of a study in rural Tanzania that shows a significant association between the use of improved latrines and satisfaction (Sara, 2014): the majority of the respondents practicing OD were not satisfied with this practice (85%) and those reporting the use of latrines were 2.05 times more often satisfied with the defecation place than respondents in favour of OD (CI: 2.95 - 11.85). The main reasons for dissatisfaction among the latrine users were linked to the superstructure and problems with the floor as well as safety and cleanliness issues. The last two reasons were also mentioned by respondents practicing OD.

The satisfaction that households have from the use of latrines also seems to depend on the type of latrines and in the case of shared toilets or public toilets, dissatisfaction is often high because of the problems of cleanliness and the large number of families who use them (Tumwebaze et al, 2013). In fact, more than the type of latrine, it seems that cleanliness determines the level of satisfaction and, according to a study by Nelson et al. (2014) conducted in East Java, 82.4% of all households with private improved latrines were satisfied with their place of defecation against 68.3% of households that use shared latrines. Households reporting to own clean latrines were satisfied in 79.5% of the cases but those with dirty ones were satisfied in only 38.9% of the cases. The distinction between improved latrines and unimproved latrines is not sufficient when considering the user's satisfaction; Cleanliness appears to be a very important criterion.

In terms of benefits derived from the use of latrines, according to the study by Barnard et al (2013), 66% of respondents suggested that there was a link between the use of latrines and better health, 39% evoked the improved security for women and girls and 27% think it gives them privacy; However, there was no significant relation between the use of latrines and the clearly felt benefits in having latrines. In Ngondi's study in Ethiopia (2010), there are slightly different advantages for respondents, mainly due to the fact that the environment is kept clean (55.8%), the reduction of flies (41.1%), and the prevention of diseases (35.8%).

Other studies finally put more emphasis on the improved intimacy, comfort, proximity or social status as the main advantage drawn from latrines (Diallo et al, 2007; Jenkins, 2004).

- Social norms

According to a study by Sara et al (2014) in rural Tanzania, the majority of the respondents practicing OD think that this practice is normal within their community. However, they largely agree with the fact that this may make them and their children sick. According to Barnard et al (2013), in India, it seems that OD does not stigmatize those who practice it and in terms of hygiene, it is preferable over the use latrines because the waste is not accumulated nearby the house.

Social norms vary across categories of persons and for some of them, OD appears as a practice more "natural": Sara et al. (2014) shows that OD was significantly more common among farmers who spend much of their day outdoors; it would be more convenient for farmers to relief themselves outside instead of having to find latrines that are away from their workplaces.

- Sanctions

Few articles mention sanctions in the event that a household would not want to build or improve their latrines. In a rural district in Ethiopia, Tadesse-Yimam et al (2014) reported that most respondents who have latrines (88.6%) were advised by health workers or community health workers to build latrines but a small part (5.2%) complained that this was imposed on them by the local administration, and they built them for fear of being punished. This could be related to a more generalized fear of the local administration.

2.4 Factors influencing capacity

- Education

The level of education is an important factor determining the use of latrines, firstly because it influences the socioeconomic level of the household – the level of education and the average monthly income are important factors in the fact of having latrines or not (Faye et al, 2011) – secondly because it modifies the knowledge and perceptions of beneficiaries.

A study in rural Tanzania (Sara et al, 2014) reveals that respondents who attended school were 5.26 times more likely (CI 3.16 - 8.75) to use latrines compared to those who have never been to school. In Ethiopia, Tadesse-Yimam et al (2014) found that the presence in the household of a child attending school increases the likelihood of the household to use latrines by 3.74 times compared to households without children in secondary school (CI: 1032-5756).

Nevertheless, the link between education and hygienic practices is not systematic (Grimason et al, 2014): a study in rural Malawi has shown that although hygiene problems were identified satisfactorily by students, their hands revealed a significant prevalence of *E. coli* (71%) and there were many traces of OD around the school, showing that the knowledge was not implemented, probably because the sanitation structures in place were not easy to use.

Another study in the North of Vietnam among kindergartens tends to confirm that poor living conditions with a lack of basic infrastructure are major barriers to the implementation of hygiene among children. Moreover, the living conditions in villages with parents often working outside the home makes it that there is little control over hygiene practices from adults (Rheinländer et al, 2014).

According to Ndiaye and al. (2010), the population is willing to change its behavior when it is aware of the links between diarrhea and latrines. A latrine construction project in the municipality of Ngohé has experienced an increase in demand following a cholera epidemic at the end of the project.

- Competencies of masons and companies offering relevant services

Jenkins and Scott (2007) studied the barriers to latrines access in Ghana and found that the main constraints to the construction of latrines, besides the limited space in houses, high costs, problems with credit and competing priorities, also included the lack of skilled builders.

In Tanzania (Sara and al, 2014), most households mentioned that it was difficult to access information about how to build latrines and that the community was not able to assist them in latrine building.

A study in Ethiopia (O'Loughlin et al, 2006) finds that the main reasons why households in the survey that do not have latrines have not built any despite the advice of the local administration is the lack of workers (41%), being too busy (15%) and the lack of awareness (11%).

The capacity to build latrines is thus often hampered by a lack of local expertise that would allow the population to learn to build latrines or at least to access information how to carry out the construction. Lack of equipment is not a barrier that emerges strongly, which also seems to confirm the study by Ngondi and al (2010) in Ethiopia that has found that the majority of household latrines had been built at least two years before the survey and that most of them had been completely built from local materials without the need for equipment donated by outside agencies. Latrines require maintenance of roofs, superstructure and floor, especially during the rainy season, but the fact that latrines are made by the owners, using local materials and without the need for additional hardware or technical support suggests that increasing the participation of households with latrines is durable.

- Financial accessibility

In general, both holders of latrines and those who practice OD identify the costs as a barrier to build or improve their latrines. The latter note strongly the lack of funding, the lack of money, the fact that the latrines are too expensive or they do not have money. Latrines are said to be expensive to build, especially when involving cement structures or when the pit is deep (O'Connell, 2014).

- Decision taking

Decision making is often the outcome of a long process in which several steps are required (Jenkins and Scott, 2007).

First, a **preference** for the improvement of the sanitation situation must emerge. This involves identifying the advantages and benefits that the household plans to draw from these improvements. Motivation to improve latrines comes from dissatisfaction with the current defecation practices and the increased awareness of the benefits of using new options. At that stage, households have not yet started planning the change.

Then, when households **intend** to plan the change, insights and motivations are established. Nevertheless, particularly in the context of the construction of latrines, there must also become available materials, knowledge and skills that are not necessarily found within the household. So it depends on the **opportunities** and **capacities** of the household but also on the **priorities** it has set. If it perceives its capabilities and opportunities as limited, there is little chance that the intention to adopt a change in the sanitation situation is realized.

Finally, the **choice** is the final step leading to the adoption of changes in the sanitation situation, with a higher probability that the household adopts this change in a limited period of time (often less than 12 months). This implies concrete actions to achieve it (e.g. save money or request information).

More specifically, a study in Ghana (Jenkins and Scott, 2007) reveals that in 56.2% of the cases, it is the owner of the compound who decided the construction of latrines in the house and the head of household was the person who made the decision in 25% of all cases. In case it is the male household head who decides the understanding as to who owns the latrines is quite wide: in nearly one third of cases, the women reported that latrines belonged to the entire household.

A study in rural Niger also notes that it is overwhelmingly the male head of the household who makes decisions related to latrines, partly because it is he who is involved in the construction work (Diallo and al, 2007). Nevertheless, the dynamics within households for decision making can be complex though it is predominantly the male household head that makes the final decision. In fact, the role of women or the wives of the household head may be more informal, which does not mean that they do not participate in decision making (Jenkins and Scott, 2007). This makes it difficult to analyze access, use, and willingness to pay without considering the complexity of decision making and the nature of those involved directly or indirectly in the decision.

- Community participation

Many latrine construction programs are conducted as part of the fight against diseases for which the lack of hygiene, including the proximity of human feces, is important; this is the case of schistosomiasis and trachoma (Ngondi, 2010). In Niger, the Programme National de Lutte contre le Trachome has launched a project to promote rural latrines in Zinder where water sources and sanitation facilities are limited. An emphasis was laid on hygiene education and community mobilization, promotion of latrines and a plea for water supply. All possible information channels have been used, including political leaders, religious or traditional ones within the community. In general, the program was a success because it has been able to rely on the community and has received continuous support. Thus, volunteers have been trained and have formed a committee to promote hygiene and sanitation practices; masons were also trained in the villages.

Another study in rural Tanzania shows that households benefiting from awareness in the field of hygiene and sanitation were nearly 9 times more likely to have improved latrines than others (CI: 4.39 - 20.1 ; Kema et al, 2012). Similarly, in Ethiopia (Awoke et al, 2013), households that received at least 3 visits from health professionals in the month were more than 2 times more likely to have latrines than households that have received no visit. Monitoring and awareness of households therefore seem to be important factors. There is also a higher chance for households to have latrines if they are located within 30 minutes' walk from a health center, which tends to confirm the important role of information and promotion of health programs and community mobilization in explaining the importance to build latrines.

Moreover, with the introduction of approaches based on community-led total sanitation (CLTS), it turns out that sustainable ways to improved hygiene and sanitation, especially the end of OD, are possible (Sigler et al, 2014). This approach aims to make communities share and analyze their living conditions and their practices and find solutions to their problems through a process of participation in a group; it particularly stresses the disgust and shame to initiate behavior change within the community. In Senegal, community participation is a fundamental pillar of action to see people take ownership of sustainable health programs and CLTS has developed since 2009. But again, depending on community involvement, results are variable.

Thus, in the rural community of Ngohé (in Diourbel, Senegal), a latrine construction project lasting for a period of 3 years has had a very poor result and the analysis of community participation in the project showed that it had been generally hampered by an inadequate participation strategy, in particular during the implementation; because of a promotion not always suitable to a rural population mostly illiterate and less aware of hygiene promotion; by the identification process of the activities to be implemented or by the control or management of resources. In general, the community has not been able to become sufficiently involved in the project (Ndiaye et al, 2010).

In contrast, the District of Touba has had a good experience with health and safety committees in health promotion activities (Diedhiou et al, 2006). The involvement of women was very strong, they themselves being supported by the local authority represented by the marabouts. The committees have particularly promoted the installation of latrines in the concessions, but also health promotion activities via talks, impregnated bed net distributions, sanitation sessions, etc. The socio-religious environment in Touba was very supportive,

Touba is a great religious center where free plots and water are available, and there have been many meetings with the marabouts which allowed the involvement of village leaders, districts and sub-districts that mobilized the population. More generally, the district encouraged self-management and community leadership to strengthen the dynamics of participation. In addition, the financial autonomy of most committees, strengthened by many sources of funding ensures the sustainability of committees in the district health system.

Another program to promote low-cost latrines in Ethiopia resulted in the building of latrines by 87% of the targeted households, with nearly 90% using them (O'Loughlin et al, 2006). The intervention was based on a CLTS approach where community members have built their latrines without external support at low costs and using local materials. Demand for latrines has been created through the community mobilization program that included education and awareness by including community leaders and health workers. Latrine demonstrations were organized so that the villagers know how to build latrines. The goal was to make OD less acceptable by increasing social pressure.

2.5 Motivations

- Belief

A study in Ghana (Jenkins and Scott, 2007) reveals that public latrines such as those that are common in communities tend to be dirty and decrepit, which affects their use. There is indeed a belief that the pit emits heat, gases and noxious odors, causing diseases. To be used, latrines must thus be clean, otherwise individuals risk their health. In addition to this, there is the idea that clean latrines, more than reflecting a picture of physical "purity", would also reflect mental and moral purity.

In Senegal, in the town of Ngohé, the study by Faye et al (2011) refers to the belief that water has a "natural purity" that could lead to an increased use of contaminated water sources; adding chlorine can distort this "purity".

- Social and emotional determinants

In Benin, the study by Jenkins and Curtis (2005) identified several categories of factors influencing the motivations related to latrines adoption:

1. Those linked to **prestige**: households that have latrines feel pride, particularly when they receive visits because it inspires respect and avoids being embarrassed of having to send visitors to defecate outside. Their social status and lifestyle are improved, especially because this suggests a proximity to the lifestyle of the urban environment. The fact that latrine ownership promotes social status is confirmed by O'Connell (2014) who concluded for the countries included in his study that latrine holders have more prestige, are respected and are considered more favorably by others.
2. Factors associated with **well-being** for themselves and their families: Having latrines protects from disease and brings security, especially at night. It is also more comfortable, cleaner and offers intimacy.
3. Factors related to a specific **context**, namely having an elderly or sick parent and voodoo practices confining people to the concession. In these situations, not having latrines becomes difficult. On another note, it is also clear that it is more profitable for owners to rent a concession with latrines than a concession without.

In Ghana, we find some of the above-mentioned motivations for the construction of latrines (Jenkins and Scott, 2007): the will to improve conditions for the sick or elderly (23.2%) which denotes a certain solidarity with the most vulnerable; security problems, especially at night (18.8%); the idea that having latrines close by is more convenient (12.5%).

Moreover, the concepts of embarrassment, shame and humiliation are also important to explain the motivation of latrine owners to acquire or improve their latrines. These feelings

are especially important in people who owned at some point latrines that are no longer functional (O'Connell, 2014). The concepts of shame and humiliation can be exploited for the promotion of latrines.

In contrast, there are significant barriers to the construction of latrines, among them bad smells: for example, in Niger and Malawi, 25% of latrine owners reported that the odors from the latrine located near the house constituted a major drawback (Rheinländer et al, 2013). Studies in Ghana showed that odors were an obstacle to the adoption of latrines (Rheinländer et al, 2013) and also in schools; this may discourage children from using the available latrines.

- Willingness / capacity to pay and financing

According to the study of Kema et al. (2012), households earning more than 50,000 Tanzanian shillings (about US $ 27) every month were 2 times more likely to have improved latrines than those that earn less, and the households headed by a woman were 60% less likely to own improved latrines. We find the effect of income in a study in rural Ethiopia (Awoke et al, 2013) where the chance to own latrines is 2 times higher in households with an annual income of 5,000 birr or more (nearly 244 US $).

A study conducted in a rural community in northern Vietnam revealed that 62.1% of the respondents who had no toilets were willing to pay for the construction of flush toilets, willingness to pay is significantly related to the economic status of the household (Van Minh et al, 2013). Generally, many studies show a link between the possession of latrines and economic status (Diallo et al, 2007, Jenkins, 2004). In Niger, it actually seems that the cost of latrines is a limiting factor for the poorest households (Diallo et al, 2007).

In Tanzania, Sara and Graham (2014) also note that financial barriers remain high for the adoption of latrines in households not declaring the intention to build latrines; half of them list the financial constraints as the main reasons. This includes the cost of latrines, lack of ability to save and lack of access to credit. Similar observations were made for Ghana (Jenkins and Scott, 2007).

Nevertheless, the construction of latrines does not necessarily require money. A study of a low-cost latrine promotion program in the Amhara district in Ethiopia indicates that 69% of the respondents who owned latrines had spent nothing, while those who had paid for latrines had on average spent 4 US $ (O'Loughlin et al, 2006). No money or material was provided by the program; it is the community members who provided the material and labor for their own latrines. The latrines required on average four days of work. Studies in Asia have also shown that self-financed household latrines were better maintained and of better quality than when a project financed them (Mukherjee, 2001).

This is in line with the comments made by Harvey (2011) explaining that strategies involving no subsidies have the potential to cause quicker increases in coverage of sanitation services. Moreover, these strategies are more sustainable than conventional approaches based on subsidies that are predominant in low-income countries.

- Intention to build latrines

A study in rural Tanzania (Sara, 2014) found that among households practicing OD, 85% are dissatisfied, 67% planned to build latrines and 17% have already started saving to do so. The reason given for the construction of latrines in households having already started saving is health (60%) although in general, the literature indicates that the benefits in terms of health are an afterthought only. The households that have not started saving yet referred to the need to avoid contamination of the environment as the main reason for building latrines.

The majority of the households that planned to build latrines wanted pit latrines without a slab (75%), with a slab (11%) or ventilated pits (7%) as they are affordable and easy to build. Among these households, the main benefits of latrines were privacy (57%), security (17%), respect from neighbours and raising the social status (14%), which is similar to what has been found in other studies (O'Loughlin et al, 2006). Interestingly, the answers differed from those to a similar question to which health and environmental protection were mentioned.

3 Methods

The details of the methods are described in the study protocol in annex A.

3.1 Study location

Senegal is subdivided into 14 regions which can be grouped into 5 geographical zones that were all covered by the household survey and the qualitative study.

- West: Dakar and Thiès
- Center: Diourbel, Fatick, Kaolack and Kaffrine
- North: Matam, Louga and Saint Louis
- South East: Tambacounda and Kédougou
- South West: Kolda, Sédhiou and Ziguinchor

Figure 3. Map of the 14 regions of Senegal.

3.2 Definition of improved latrines

The household questionnaire included two questions about the type of latrines available in the household. One was directed to the respondent (Q3.2) and the other was answered based on observations of the interviewer during the data collection (Q5.2). Because data collectors were agents of the Service National d'Hygiène with extensive experience in identifying latrine types, analyses incorporating the type of latrines available in the

households were made on the basis of the investigators observations.

Latrines were considered **improved** if they allowed the hygienic disposal of excreta and domestic wastewater and included a barrier against disease vectors (flies, insects...) [3]. These essentially were SanPlat latrines with a brick pit, double Ventilated Improved Pit (VIP) latrines, simple VIP latrines, pour-flush toilets and ecological toilets (Ecosan).

Note that only the **infrastructure** is taken into account in the definition of improved latrines, the superstructure does not form part of the classification. Nevertheless, the superstructure characteristics of latrines will be considered independently in the analysis.

3.3 Household survey

3.3.1 Study population and inclusion criteria

The household survey covers only the **rural population**. It is defined by default as the population living in areas outside of urban centers. It was agreed to define four categories of living environments including 3 that are in agreement with the definition of what is urban (ANSD, 2013):

- *Urban Dakar*: the separation of urban Dakar from all other areas is justified by the particular difficulty of finding households during the visits of statistical services.
- • *Big cities*: have a population greater or equal than 50,000 inhabitants, to which is added the rural community of Touba Mosquée.
- *Other cities***:** all other urban centers (<50'000 inhabitants).
- *Rural*: all administratively rural zones not integrated into urban areas.

A **household** is defined as a group of people, related or not, living together under the same roof and pooling all or part of their resources to meet their basic needs, particularly housing and food. The people called household members usually take their meals together and recognize the authority of a single person, the head of household (ANSD, 2013). Belonging to a household also depends on the length of residency: anyone who spent at least six months with the other household members or has the intention to do so, is considered as a household member.

Within the household, the **main respondent** is the person who takes decisions for the construction and improvement of latrines and more generally for questions related to sanitation. This is usually the head of household, who also must be more than 18 years of age. In cases where the head of household was absent or unavailable, the interviewer came back later in the day or during his stay in the village up to two times. If after the second visit, the household head was still not present, his wife was invited to answer the questions provided she was in a position to answer.

When an appropriate respondent of the selected household was not available during the stay of the interviewer, the household in the closest neighbouring compound was selected.

3.3.2 Sampling frame

The division of the national territory into Census Districts (CD) made in 2012 for the needs of the Recensement Général de la Population et de l'Habitat de l'Agriculture et de l'Elevage conducted in 2013 (RGPHAE-2013) provided the sampling frame to select CDs. This database contains 17'165 CDs. In the file, each CD is listed with all its identifiers (region, department, municipality / district, ID code), its size in terms of number of households and its

[3] République du Senegal, Ministère de l'Hydraulique et de l'Assainissement/Direction de l'Assainissement. *Elaboration de document de politique et stratégie opérationnelle de l'assainissement rural au Senegal. Vol 1: Etat des lieux dans les programmes majeurs d'assainissement, Rapport de mission 1*. Dakar, Mars 2013.

type of living conditions (urban or rural).

The sampling was carried out by the ANSD which is the structure responsible for preparing the sample for all surveys taking place in the country. The primary sampling units were the CDs within which households were selected. At the end of the sampling process, the ANSD provided a list of CDs with selected rural communities and a map of each CD indicating the location of each household and readily identifiable places such as mosques, dispensaries, water sources, etc.

3.3.3 Sample size and representativity

The calculated sample size included 2,000 rural households selected from a sample of 100 CDs distributed across the 14 regions, with probabilities proportional to the size of the DR, the size being here the number of households in the CD. A total of 20 households were randomly selected from every CD.

Of note, the sampling strategy of the ANSD was to select CDs independently in each region and therefore not specifically from DRs that have benefited from a program funded by the PEPAM. This means that when looking at access to latrines, there may be differences to estimates that have systematically integrated the CDs that have benefited from subsidy programs.

The sampling strategy of the ANSD allows reducing the relative error by increasing the precision of the estimates in the sense that the size of the CDs is variable; it also provides much more precise estimates than sampling with equal probabilities.

The table below summarizes the information related to the composition of the sample with regard to the number of rural households selected in each region. Note that during the random selection of CDs, the ANSD had selected Diourbel in which 11 rural communes were selected in Touba Mosquée. Since Touba Mosqée is considered a largely urban area, it was decided to remove these CDs from the selection and another 11 CDs were randomly selected.

The details of the sampling strategy are available in the study protocol attached as Appendix A. The list of selected CDs is attached in Appendix B.

Table 1. Distribution of CDs and number of households selected.

Region	Number of CD to draw	Number of households /CD	Total number of households to select
Dakar	2	20	40
Diourbel	7	20	140
Fatick	8	20	160
Kaffrine	7	20	140
Kaolack	8	20	160
Kédougou	2	20	40
Kolda	7	20	140
Louga	10	20	200
Matam	7	20	140
St-Louis	8	20	160
Sédhiou	5	20	100
Tambacounda	9	20	180
Thiès	15	20	300
Ziguinchor	5	20	100
Total	**100**	**20**	**2000**

3.3.4 Household questionnaire

The questionnaire structure followed the SaniFOAM[4] framework and addressed a maximum of the aspects outlined in the conceptual framework. The questionnaire is structured around six modules as presented in the document annexed to the ToR (*Sanitation marketing toolkit; Sample modules/prototypes for latrine ownership and acquisition surveys*). A module comprising the main channels of information to which the public has access was added in order to cover all aspects listed in the ToR.

The methods for completing the questionnaire and information about the variables of the different questionnaire modules have been detailed in the interviewer and team leader guides. Under each question, an instruction was given in brackets to guide the interviewer:

- Either the response categories are read, in which case the interviewer ticks the answers after the respondent has chosen his or her answer(s) among the proposed ones;
- Or the answers are spontaneous; the investigator therefore leaves the respondent to give her/his answers without interfering. Among the answers appearing in the tablet, the surveyor ticks the answers corresponding to the answers of the respondent.

An overview over the topics covered in the questionnaire and the type of information collected is presented in the table below. The household questionnaire is attached in Appendix C.

Table 2. Type of data collected in the course of the household survey.

Module	Information collected
1. Household identification	Name and ID of the surveyor, region, CD, household ID, outcome of the questionnaire, time of interview start, name of the head of household
2. Household socio-demographic characteristics	Gender, age, status in the household, composition of the household, level of education, marital status, ethnicity, main activity of the household, source of income, household savings, subsistence expenses, water supply, possession of property / land, phone expenses, housing characteristics
3. Latrine ownership and use, hand washing, defecation practices, disposal of children's stool	Characteristics of available latrines, distance of latrines, hand washing station and practice of hand washing, use of latrines, defecation practice, access to latrines outside the home, disposal of children stools
4. Latrines characteristics among household with latrines	Location of latrines, functioning of latrines, age of latrines, maintenance and cleaning of latrines, latrines construction and costs, financial or other assistance to build latrines, funding source, motivations to acquire a latrine, improvement and renovation
5. Latrine check	Type of latrines, latrine characteristics, presence of hand washing station
6. Opportunities, abilities and motivations to acquire latrines	Perceived availability of professional skills and materials for construction, types of materials and preferences, decision, intention, competing priorities, mutuelle de santé (village health insurance), willingness / ability to pay, brakes, social norms, values, belief
7. Information channels	Newspapers, radio, television, advice on sanitation, means and modes of information, participation in a community project

3.4 Focus group discussions and key informant interviews

3.4.1 Participants

Key informants for **individual interviews** were chosen by virtue of their position or their activity within the community or village. They were members of local authorities (village chief, local councilor in charge of sanitation); religious and traditional leaders; representatives of Non-Governmental Organizations (NGOs) related to hygiene and sanitation; community assistants; local staff or other actors involved in sanitation interventions; teachers; medical and paramedical staff. The selection and mobilization of informants was done with the help of a respected person in the village, mainly the village chief, who has a good knowledge of people who could provide relevant information.

[4] http://www.wsp.org/sites/wsp.org/files/publications/GSP_sanifoam.pdf

For the **focus groups**, the criterion for their compositon was first the **gender**: the separation man / woman was justified by the desire to constitute homogeneous groups and because women can provide more specific information than men e.g. about children; secondly, the **ownership or not of latrines** which is a key factor for the analysis. The focus groups were formed through a convenience sample insofar as the most suitable persons to provide information are retained. Each focus group consisted of 4 to 10 participants, at least a dozen participants were approached in advance to guarantee a minimum number of 4 participants.

3.4.2 Sampling

For reasons of coherence, the sample of the qualitative survey, selected on a principle of diversification, was based on the sample of rural communities selected for the quantitative survey. The choice of rural municipalities for interviews and focus groups was the same: each of the 5 zones was represented by two rural communities (RC) belonging to different departments and regions, thus ensuring diversity. These rural communities were selected directly, based on the characteristic of the department or the RC: areas covered by sanitation interventions of different actors or not; nature of sanitation interventions carried out in the area (with subsidies, without subsidies, combined approach, no intervention), OD free certification of some rural communities, etc. The following table describes the selected and visited rural communities in the different zones, along with the names of programs that have been carried out, if applicable.

Table 3. Rural municipalities selected as part of the qualitative approach.

Region	Municipalities / RC	Villages	Programme type
Thiès	Diender Guedj	Bayakh1	-
		Gollam	
	Niakheme	Keur Gallo	SEN 026
		Dere Mbaye	
Fatick	Nioro Alassane Tall	Thilla keur Momar Mbayang	-
		Ndiop Ndienguène	
Kaolack	Keur Maba Diakhou	Keur Maba	PEPAM BA
		Fass Keur Serigne Mbaye	
Ziguinchor	Sindian	Médiégue	PEPAM USAID
Sédhiou	Diambaty	Darou Salam Cissé	-
Louga	Coky	Ndiakhar	PEPAM BAD1
Matam	Oréfondé	Ouro Mollo	PEPAM IDA
		Thianguel	
Kédougou	Bandafassi	Sylla Counda Diakha	GSF/CLTS
		Indar	
Tamba	Ndoga Babacar	Kanappé Kotto	-
		Ndoga Babacar	

As for key informant interviews, four interviews were conducted in each RC including with community leaders, representatives of the departmental sanitation service, etc. In total, 40 individual interviews were conducted in ten rural communities covered by the study.

In each selected RC, four focus groups were conducted to better identify and analyze the barriers and motivations for the acquisition and use of latrines, the satisfaction and the preferences of potential latrine users. Thus, in each RC there was a discussion with women with latrines, one with women who do not have latrines, one with men with latrines and one with men who do not have latrines; a total of 40 focus group discussions conducted in 10 RC.

3.4.3 Topics and organizations targeted by focus group discussions and key informant interviews

The interviews and focus group discussions were conducted according to a previously elaborated interview grid that was provided to the interviewers; this grid included adjustments based on the categories of persons or groups of respondents.

These grids with an accompanying guide were provided and introduced to the interviewers before the start of field work during a training, along with a note book to allowing them to note down specific comments that were provided.

The table below shows the type of information collected during the interviews and focus group discussions as presented in the interview grids in Appendix D and E.

Table 4. Summary of the information collected during the qualitative approach.

Themes	Collected information
Individual interviews	
Socio-demographic information	Age; gender; position / status in the community
Key challenges in the community	Importance of hygiene and sanitation issues; opinion on the difficulties in acquiring latrines
Access and use of sanitation and hygiene	Hand washing and use of latrines; population with higher risk behaviors; social conflicts related to sanitation; sanitation situation of the community; use of latrines in schools; mobilizing students as community volunteers, school-based hygiene
Open defecation	Opinion on open defecation; opinion on the approaches to stop open defecation; mobilization of resource persons
Promoting sustainable sanitation as part of their activities	Decision making; sequence of actions; information; activity related to hygiene and sanitation in schools; requests by the population; using services related to hygiene and sanitation
Views on the existing awareness programs and subsidy[5]	Knowledge about the existence of subsidy programs; assessment of these programs; population satisfaction with these programs; constraints of the population to access these programs
Willingness to pay	Opinion on the guidelines of the Senegal Sanitation Policy; types of aid to offer to encourage the acquisition of latrines; main barriers to behavior change
Mobilization resource persons	Examples of successful activities; mobilization to encourage behavior change
Focus groups	
Men and women owning latrines	
Motivations	Reasons which led to the acquisition of latrines; type of latrines constructed; presence of a hand washing station Subsidies or grants received to build latrines and its role in choosing to acquire latrines
Level of satisfaction	Satisfaction with latrines acquired; emotions felt by the acquisition of latrines Continued practice of open defecation
Obstacles	Difficulties in the acquisition of latrines: access to materials and building professionals Aspects of latrines to improve and necessary means
Decision making process	Time before acquiring latrines Lead in the discussion on the acquisition of latrines; firm decision to acquire latrines Influence in decision making
Willingness to pay and determinants	Acquisition cost of latrines and financial effort Latrine funding sources Ability to cope with unexpected expenses for latrines
Appreciation for grant programs in the areas[6]	Opinion on the relevance of grant programs; opinion on co-payment; satisfaction with the grant programs; constraints to access the program's services
Men and women not owning latrines	
Practice of open defecation	Usual defecation location Satisfaction from practicing open defecation; advantages and disadvantages
Handling children excrement (for women only)	Usual defecation places of children Learning defecation Handling of children feces Opinion on the harmfulness of child feces
Social norms	Acceptance of open defecation in the community Maintaining open defecation under certain conditions

[5] This section has been added by the consultant for the economic analysis which took place in parallel to the qualitative study.

[6] This section has been rejected by the consultant for economic analysis which took place in parallel to the qualitative study.

Themes	Collected information
Emotional determinants	Image conveyed by open defecation Opinion on the holders of latrines Perceived implications of the absence of latrines for girls and women in the community
Intentions	Need to have latrines Perceived stress Encouraging factors; existing aid or external support to acquire latrines
Spending priorities	Spending priorities within the household and types of expenses related to sanitation
Appreciation of grant programs in the areas[7]	Opinion on the relevance of grant programs; opinion on co-payment; satisfaction with the grant programs; constraints to access the program's services

3.5 Data collection teams, training and pre-test

The **interviewers and team leaders selected for the household survey** were all experienced and belonged to the Service National d'Hygiène. 15 interviewers including 5 who were also cartographers (to help locate the households indicated on the maps of the ANSD) were grouped into 5 teams of 3 interviewers per zone, each team being supervised by a team leader.

Team leaders and investigators have all gone through a training in which the data collection tools and the media on which the data should be entered (digital tablets) were reviewed. Team leaders were made aware of the need to check that the selection of households was consistent with the methodology and was based on the CD maps provided by ANSD.

After training, a pre-test of the questionnaire including the use of the digital tablets was organized to identify any problems or inconsistencies in the tools, to estimate the daily workload and the duration of administering a questionnaire in a households, and finally to test the tablets and check the functioning of input masks.

After the pre-test, the tools have been revised on the basis of observations made during the pilot phase.

The 4 **qualitative investigators** were all accustomed to using qualitative survey techniques, and had a good level of academic training and practice of social sciences (sociology master and doctorate level) and had already participated in interviews and/or focus group discussions. Moreover, their experience in the field of water and sanitation, and wider health issues was a criterion for their selection. They have also been selected and assigned according to linguistic specificities of the visited areas.

The interviewers were supervised and monitored by a professor of social anthropology, teacher and researcher at the UCAD and expert social scientist who had already participated and led many surveys related to hygiene and sanitation. These interviewers also received training although they were already trained in the techniques of in-depth interviews and focus group discussions.

Finally, as in the case of the household survey, the questionnaire grids were pre-tested in order to detect potential problems or inconsistencies but also to check the applicability of the tools in terms of duration, together with the use of dictaphones for recording conversations.

Following this test phase, the instruments have been revised on the basis of observations made during the pilot phase.

[7] This section has been rejected by the consultant for economic analysis which took place in parallel to the qualitative study.

3.6 Data collection, entry and analysis

3.6.1 Management of data collection in the field

The collection of the **household survey data** was through the 5 teams of three interviewers, each supervised by a team leader and posted to a different zone. Data collection took place from 16 May to 17 June 2015 at the rate of 5 questionnaires per day per interviewer.

The collection of the **qualitative data** was through two teams of two interviewers who had divided among them the villages within the 5 zones. Each team was responsible for data collection in two zones as the South zone was shared between the two teams at the start of the data collection. The investigators worked in tandem during the focus group discussions which were led by a facilitator who asked questions, stimulated the discussion and managed the contributions; and one observer who was responsible for taking notes (on the issues of relaunching, the topics he considered as particularly significant, gestures ...) and recorded exchanges on a dictaphone. Discussions typically lasted nearly an hour.

3.6.2 Data entry and storage

Data collected during the **household survey** were instantly entered in digital tablets (Galaxy Tab 4G) that allowed the recording of data as and when questions were asked, with transmission to a central server set up by the Swiss TPH which also provided quality control. ISED also had access to that server. The data transmission took place in the same evening or the next day if there was no internet connection.

Every evening, each team leader copied all questionnaires completed by his team to his computer. No data loss due to mismanipulation or tablet malfunction has been noted.

For **focus group discussions and key informant interviews**, information was recorded on dictaphones and then transcribed and translated into French and entered directly in Word. Each individual interviews and focus group was saved as a separate document, faithfully reporting all the information exchanged during the interview and discussion. The transcripts were made at the end of the field phase by the investigators themselves; they respected the confidentiality as names / surnames of participants are not mentioned, only their status or position are specified.

At the end of the day or survey in a locality, the investigators saved the audio recordings as a separate electronic file for each individual interview or focus group discussion.

Every evening, teams conducted a debriefing to inform the proposed analysis plan and perform induction. This session yielded the first empirical analyzes and identify areas requiring deepening for further investigations.

In order to more easily manage the mass of qualitative data and prepare the deliverables (audio file and transcript), the different files with the conversations were awarded a label to identify more easily, based on the file name, the department, the rural community and the village as well as the category of respondents.

3.6.3 Data analysis

Household survey

The database has been cleaned and checked for internal consistency of data before running the analysis. The analysis is primarily descriptive and focuses on key results and related communication strategies that can be developed. Descriptive statistics made with the STATA/IC 14.0 software summarize the results as frequencies, that is percentages of the total number of respondents to the question (ie all respondents to the question, a sub group of respondents).

Stratification of data has consistently been made according to the following characteristics:

- Geographical zone (West: Dakar and Thiès; Center: Diourbel, Fatick, Kaolack and Kaffrine; North: Matam, Louga and Saint Louis; South East: Tambacounda and Kédougou; South West: Kolda, Sédhiou and Ziguinchor)
- Available latrines (Improved: SanPlat, DVL, simple and double VIP, pour-flush toilet, Ecosan; unimproved: traditional latrines; no latrine)
- Socio-economic score: grouped into 3 strata, the less poor group, the most poor group and an intermediate group

Additional stratifications have been made for relevant variables as warranted.

Of note, the socioeconomic status of the households was calculated as an index proposed by Filmer and Pritchett. The following variables were taken into account: whether or not the household has electricity, a radio, a TV, a fridge, a bicycle, a motorcycle, a cart , a car / truck and solar panel (goods and equipment); the main house building materials (surface materials for walls, floor and roof). While the variables related to the material and equipment were already collected as binary data (has, does not have a certain good/equipment), variables related to the housing characteristics were recoded according to whether they had to be bought (eg. cement, tiles) or were locally available (eg. mud, sand, branches).

Multivariate logistic regression models were also developed to identify the determinants of open defecation, possession of improved latrines, latrine use and hand washing practise after defecation. Several independent variables were tested and selected because of their relevance in explaining differences in health practices and because they are reference variables to explain many phenomena or events. The main ones are: education level (none, primary, secondary ...), socioeconomic status, access to sufficient water to cover the needs of the household or the existence of a handwashing station nearby the latrines.

Qualitative survey

Each interview was studied and analyzed on the basis of its transcription and translation to French. A thematic analysis was conducted according to the SaniFOAM conceptual framework and integrated opportunities (access to water, hand washing, availability of sanitation facilities, use of available latrines, open defecation, satisfaction with defecation places, social standards); capacity (obstacles, financing of latrines, ability / willingness to pay, decision making); and motivation.

The interviews were analyzed using the technique of software-supported content analysis. In this context, a first coding system based on the definition of a list of deductive codes (defined from the aims of the research) was used. This list was enriched subsequently by inductive codes, based on the development and identification of new themes emerging during data collection. The final list of concerted codes allowed to move to the data coding phase, processing and analysis.

Significant verbatim quotes were extracted from interviews and grouped according to the codes to which they correspond. This categorization allowed a synthesis by the technique of thematic content analysis.

3.7 Quality assurance and control procedures

Before the data collection phase, the use of the ODK application to collect data via tablets helped to limit inconsistencies in the answers in several ways:

- By selective blocking of numerical responses to avoid outliers: for example, if an investigator types an age of 220 years instead of 22, an error message appears and you can not go to the next question
- By incorporating jumps for questions that do not require a response based on an answer that was recorded previously; for example, if the question reads "is there a hand washing

station?", and the respondent said no, the interviewer has not to ask, "is there soap in that place?" and is directed to the next question

Some answers given for a household to a specific question are not necessarily compatible with a question later in the questionnaire. For example, if the person said that the household had no income from employment but responds to a question about his professional activity that he is employed, there clearly is an inconsistency. ODK will block these responses in the sense that it is no longer possible to advance in the questionnaire as the answer has not been changed. A warning message also is shown to the interviewer.

In addition, during the pre-testing phase, the data collection tools, the stability of the questionnaire installed in ODK and the feasibility in terms of time needs were tested, which allowed to make all necessary adjustments.

During data collection, the following quality control mechanisms were put in place:

At the end of each interview, the interviewer verified that all sections of the questionnaire were entered in the tablet before validating the questionnaire.

The teams on the ground were supervised by a team leader (household survey) who checked that the field work was going well and that the completion of the questionnaire was correct and complete.

A person in charge of quality control was in place and ensured the quality of data collection in the field by making surprise visits on the ground and supervision teams on site. He was a permanent member of the Swiss TPH based in Senegal.

For the key informant interviews and focus group discussions, the interviewers had daily contact with the social scientist and a debriefing was held at the end of each day.

To ensure the quality of the transcripts of key informant interviews, random quality controls on a dozen interviews (25%) were performed: a section of the interview was replayed and compared to the transcript.

3.8 Ethical considerations

The Swiss Tropical and Public Health Institute attaches great importance to ethical values during the implementation and field work of studies. A copy of the study protocol including the schedule for the data collection, the household questionnaire and the interview grid for interviews were transmitted to the competent authorities in Senegal and Switzerland:

In **Senegal**, the protocol has been submitted to the Comité National d'Ethique du Ministère de la Santé by ISED to ask for its consent to the implementation of the study. A presentation of the protocol by the investigators for the National Ethics Committee was held in order to accelerate the process.

In **Switzerland**, the protocol was submitted to the ethics committee responsible for the Basel region that oversees all research institutes in the Basel area, including the Swiss TPH (Ethikkommission Northwest und Zentralschweiz, EKNZ [8]) to obtain ethical approval. However, given that the data collected is limited to information on sanitation and hygiene (no health data or biological sample collection), a notification requiring the preparation of a simplified dossier was submitted which simplified the procedure.

During the data collection phase with households and key informants, respondents were provided with detailed information on the objectives of the study and their participation. Written consent was obtained from all respondents at the beginning of the interview. They also were informed that their participation was voluntary and that at any moment they could stop the interview, without consequences for themselves, their family or the community. Interviewees were majors, that is to say aged over 18 years.

[8] http://www.eknz.ch/

3.9 Study limitations and bias

3.9.1 Sampling

The sampling procedure was done on the frame used by ANSD for the last population census conducted in 2013. This updated frame is the basis for the preparation of samples for all surveys taking place in the country, including major national surveys such as Demographic and Health Surveys (DHS). It is thus the best available alternative for an up-to-date database. Our sample therefore suffers from the same limitations as the sampling frame of the ANSD; it depends on the quality of the determination of the census districts (ANSD, 2013), which a priori does not present a significant bias.

3.9.2 Possible bias

Selection bias: Due to the nature of the information collected, the study focuses on the lawfully present population, that is to say, the usually resident population of the selected household. This systematically excludes migrant and nomadic populations for which no information was collected.

Information bias: a bias linked to the investigator must be considered if he has already been involved in another study or national program and that his way of asking questions or to induce responses has thus been affected. To minimize this potential bias, a team of three interviewers conducted the interviews in any one village.

Response bias: the field of sanitation and even more so that of defecation may be a sensitive issues to the extent that they invade the individual privacy. The main bias can thus be in the gap between the responses of those surveyed and their actual practice. The attitude of the interviewer and how he put those surveyed at ease was therefore paramount. A response bias may also occur due to the "official" nature of the investigation team. Investigators therefore reassured respondents and put them at ease.

4 Results

4.1 Participation

The calculated size of the sample for the household survey was 2000 households, with the surveyed regions represented relative to the size of their rural population. The cleaned final database contains data from 2029 respondents in 14 regions of the country. The size of the intended sample was slightly exceeded in Matam, Saint Louis, Tambacounda and Thies while a slight underrepresentation of responses from Kaffrine was noted. However, these differences in the expected and effective representation of the regions being small, they do not affect the validity and representativeness of the results. Note that no investigator has registered a refusal to participate and no interview was stopped in progress; 100% of the questionnaires have therefore been completed.

Table 5. Number of households interviewed by CD.

Region	Total number of households selected	Number of households surveyed
Dakar	40	42
Diourbel	140	140
Fatick	160	159
Kaffrine	140	132
Kaolack	160	162
Kédougou	40	40
Kolda	140	140
Louga	200	203
Matam	140	147
St-Louis	160	167
Sédhiou	100	100
Tambacounda	180	185
Thiès	300	313
Ziguinchor	100	99
Total	**2000**	**2029**

Full participation in the focus group discussions and key informant interviews was recorded, with 40 focus groups discussions and 40 interviews with key informants conducted in accordance with the planned number.

4.2 Characteristics of households and respondents

The main characteristics of respondents and households participating in the household survey are summarized in the table below.

Table 6. Socio-demographic characteristics of respondents, stratified by region

	West	Central	North	Southeast	Southwest	Total
Participants (% of total)	355 (17.5%)	591 (29.1%)	517 (25.5%)	226 (11.1%)	340 (16.8)	2029
Average age (years; Q2.2)	52.6	47.0	47.4	46.5	48.5	48.3
% of women who responded to the survey (Q2.1)	29.3	27.2	25.1	11.9	20.3	24.2
No of household members (Q2.5)	12.2	13.3	12.2	14.6	14.5	13.2[9]

[9] The confidence interval is CI = [12.79-13.65] which does not cover the value of 10 found in previous surveys. The average household size in this investigation is therefore significantly greater.

	West	Central	North	Southeast	Southwest	Total
Average number of children under 5 years (Q2.6)	2.2	3.2	3.0	3.5	3.2	3.0
Level of education of household head (Q2.7)						
- None	28.1	49.9	34.8	41.4	28.2	37.7
- Primary	14.3	7.6	8.5	12.8	13.8	10.7
- Secondary and higher	9.6	3.4	5.4	7.1	8.5	6.3
- Madrasa	48.0	38.2	50.9	38.3	48.8	45.0
Main activities of the household head in the last six months (Q2.10)						
- Agriculture / Livestock / Fish	40.2	69.5	49.3	62.6	53.8	55.8
- Informal	22.5	15.7	25.2	19.4	19.4	20.4
- Any	17.9	3.2	14.0	7.1	14.4	10.7
- Manual work	10.7	5.1	1.8	3.5	3.8	4.5

For all 5 areas, the average **household profile** of the selected households is quite similar. This is a household with an average of 13.2 members (with a range between 12.2 on the Western axis to and 14.6 on the South Eastern axis), among them approximately 3 children below the age of 5 years. The household size estimated here is significantly bigger than that estimated in the DHS or other surveys conducted by the ANSD (10 members per household in rural areas) which has implications with respect to the capacity of sanitation facilities. We will get back to that.

Regarding the **socio-demographic characteristics of respondents**, the average age of the respondents was 48.3 years, respondents being slightly older in the West region (52.6 years). The highest proportion of female respondents was observed in the Western axis (29.3%) and lowest in the South East (11.9%). The ethnicity of the respondents varied greatly between regions: the Pulaar were mostly in the North and South; Wolof were dominant in the West, the North and the Center, and Sereers in the West and the Center.

The Madrasa (Quran school) remains the most common mode of education, 45% of the household heads had attended a Madrasa and had reached their highest level of education there. About 38% had not attended school at all, with significant variations between geographical areas (28.1% in the West and 49.9% in the Center).

The **main occupation** of the household head in the last six months prior to the survey was agriculture/farming/fishing (55.8%), the informal sector (20.4%) and no activity (10.7%). The share of agriculture/lifestock breeder/fisherman was particularly important in the Center (69.5%); the share of those who reported no activity was higher in the West (17.9%).

Note that among the households selected as rural households, a small number (n=76) belong to Ndomor, Darou Khoudoss and Bayakh (Thies region) and Tengory (department of Bignona) that are closer to **semi-urban** areas because of their more developed living conditions. Given the very small number of these households (3.7% of total), this does not impact the reported data.

For more information, the table below presents the characteristics of respondents by whether they have latrines (all types), have enough water to meet household needs and by socio-economic status.

It is apparent that the percentage of households with latrines varies between areas, which is in agreement with the Livret Bleu (2009) that reports that the rate of access to sanitation varies markedly between regions. This rate increased from 48.1% in the Center to 82.1% in the South West. The particularly low rates of households with latrines in the Center area is the topic of a subsequent special study (Box 3). Indeed, the factors that were analyzed throughout this report do not provide an explanation as to the low rate, the Center region not exhibiting atypical features compared to other regions.

The percentage of households with sufficient water to meet the household needs increases from 49.3% in the South East to 64% in the Center. The area considered here as semi-urban is significantly favored over the rural environment in terms of latrine ownership.

Table 7. Socio-demographic characteristics of the respondents, stratified by whether or not they have latrines, enough water and their socio-economic status.

	Possession of latrines (Q3.1)		Sufficient quantity of water (Q2.19)		Socio-economic status		
	Yes	No	Yes	No	Poorer	Intermediate	Less poor
Percentage (%)	64.4	35.6	59.0	41.0	33.4	36.8	29.8
Region (%)							
- West	77.8	22.2	60.1	39.9	4.5	32.7	62.9
- Center	48.1	52.0	64.0	36.0	39.3	39.7	21.0
- North	63.1	36.9	58.5	41.6	29.3	34.3	36.4
- South East	62.1	37.9	49.3	50.7	55.8	29.8	14.4
- South West	82.1	17.9	56.5	43.5	39.8	43.5	16.7
Semi-urban areas[10]	92.1	7.9	64.5	35.5	3.3	21.3	75.4
Average age (years)	49.6	45.9	48.9	47.5	46.6	48.6	49.5
Gender (%)							
- Female	66.6	33.4	59.3	40.7	28.5	36.7	34.8
- Male	63.7	36.4	58.9	41.1	31.9	36.9	28.2
Average number of household members	14.1	11.6	12.7	14.0	12.7	13.5	13.5
Average number of children under 5 years	3.1	2.8	2.9	3.2	3.2	3.1	2.8
Level of education of household head (%)							
- No	52.1	47.9	57.9	42.2	41.8	38.5	19.7
- Madrasa	70.1	29.9	58.7	41.3	30.9	36.1	32.9
- Primary	71.3	28.7	58.8	41.2	22.4	41.8	35.9
- Secondary and higher	86.6	13.4	70.9	29.1	12.1	20.2	67.7
Socio-economic score							
- Poorer	42.6	57.5	45.7	54.3	xxx	xxx	xxx
- Intermediate	63.1	36.9	57.6	42.4			
- Less poor	85.5	14.5	74.0	26.0			

It can also be seen that the higher the level of education of the household head is, the more likely the household becomes to have latrines and to a lesser extent to have enough water to meet all household needs. Households with latrines are of a larger size than those that do not have latrines, which could suggest that household size might encourage the acquisition of latrines (not shown in table). By contrast, households that have problems sourcing enough water are larger, suggesting that it is more difficult to ensure adequate water supply for all household members when it is bigger.

In terms of **socio-economic status**, the whole population is divided into three categories with about one third of the population belonging to the poorest class, a little over one third to the intermediate category and just under one-third to the richest segment of the population. In sharp constrast, very significant variations between region can be observed to the extent that the share of the population that belongs to the poorest population varies from 4.5% in the West to 55.8% in the Southast. Regional disparities in the socio-economic score thus appear very large, with a peak in the South East and to a lesser extent the South West and the Center that are particularly disadvantaged. The communities linked to semi-urban municipalities also have a significantly above-average share of the population belonging to the richest population class.

[10] This includes the following 5 areas: Ndomor, Darou Khoudoss and Bayakh (Thies) and Tengory. Given the small size of the population belonging to the semi-urban population compared to the rural population, the relevance of these results is limited when this variable is crossed with another variable with multiple response categories.

Main results

- The average size of households is 13.2 which is higher than the average size found in other investigations.
- Respondents mainly had education from Koranic schools (45%) or did not attend any school (37.7%).
- The main activity of the head of household is agriculture / livestock / fisheries (55.8%), followed by work in the informal sector (20.4%); 10.7% of household heads had no activity in the last six months.
- 64.4% of the surveyed households have latrines and 59% have enough water to meet the needs of all household members.
- The geographical inequalities are important; the western region has more households with latrines and household which belong to the share of the economically more favored population.
- The more educated the head of household, the higher the rate of possession of latrines and the more economically advantaged the household.
- In general, the less poor a household, the better its access to latrines and adequate water supply.

4.3 Ownership and use of latrines, hand washing, defecation practice and management of child feces

Box 1. Recall of the definition of improved /not improved latrines
The available sanitary infrastructure has been identified and categorized based on observations of the surveyors regarding the type of latrines present in the households.

- Improved Latrines: SanPlat, double ventilated latrines (DVL), VIP latrines with a single pit, VIP latrines with two pits, pour-flush toilet, ecological toilets (Ecosan)
- Unimproved latrines: traditional latrines
- No latrine: open defecation

The distinction between improved and unimproved latrines was made solely on the basis of the sanitation facilities available, and not on the presence or not of a superstructure.

4.3.1 Availability of sanitation infrastructure

Household survey results

The table below shows that nearly 35.8% of the households have improved latrines, against 28.7% for unmproved latrines. 35.5% have no toilet and it is therefore assumed that they practice OD. These figures are close to those provided by the DHS in 2014 accordng to which 32.3% of the households have latrines and 8.5% have access to shared improved latrines, 28.4% have unimproved latrines and 30.7% have no latrine. They are also similar to those provided by the JMP according to which 34% of the rural households have improved latrines in 2015[11].

[11] WHO / UNICEF. Joint Monitoring Programme for Water Supply and Sanitation. Estimates on the use of water sources and sanitation facilities. Updated June 2015, Senegal.

Table 8. Availability of sanitation infrastructure in households, stratified by region and socio-economic status.

	Region					Socio-economic score			Total [IC]
	West (n=271)	Center (n=283)	North (n=315)	South East (n=137)	South West (n=279)	Poorer (n=604)	Intermediate (n=666)	Less poor (n=529)	
% of households with access to: (Q5.2)									
- Improved Latrines	64.5	27.5	47.5	16.6	15.1	10.3	28.2	65.6	35.8 [33.7 – 38.0]
- Unimproved Latrines	12.9	20.5	14.9	44.9	70.8	33.0	34.8	19.7	28.7 [26.7 – 30.7]
- No Latrines	22.6	**52.0**	37.6	38.6	14.1	56.8	36.9	14.7	35.5 [33.5 – 37.7]
% of the main types of latrines found among holders of latrines (Q5.2)									
- Traditional	16.6	42.8	23.8	73.0	78.5	75.1	54.0	23.1	44.0 [41.3 – 46.6]
- Simple VIP	20.7	5.3	24.1	2.9	3.4	5.3	8.4	16.0	12.4 [10.7 – 14.3]
- Double VIP	10.7	5.3	17.8	2.2	1.4	3.8	7.0	8.9	8.2 [6.9 – 9.8]
- Pour-flush	42.7	37.8	21.6	8.8	3.4	5.7	18.1	39.9	23.9 [21.7 – 26.3]
% of households with latrines shared with other households (Q3.3)	7.8	24.7	23.8	21.9	23.9	27.9	20.9	16.9	20.4 [18.3 – 22.7]
% of household with a travel time to the site of defecation of > 10 min (Q3.5)	14.6	39.7	29.7	31.4	8.6	40.9	28.4	13.0	27.2 [25.2 – 29.2]

The type of latrine however varies between **geographical areas**, with significant inequalities in the possession of improved latrines. Thus, it is in the West zone, certainly influenced by the proximity to Dakar[12], that households are most likely to have improved latrines (64.5%) while in the South East and South West, 16.6% respectively 15.1% of households have them.

In villages belonging to the semi-urban area, 80.3% of the households have improved latrines, 11.8% have traditional latrines and 7.9% do not have latrines, and it is therefore assumed that they practice OD. The characteristics of this zone are thus different from those in typical rural areas in the sense that they are becoming more and more similar to those in urban areas.

In the Center, more than half of the surveyed households have no latrine which implies that the practice of OD is very common in these areas, unlike the South West region where 14.1% have no latrines; that region had a very large number of unimproved latrines.

In connection with the availability of unimproved latrines, we see that the most frequently observed latrine type in the South East and South West is the traditional latrine. In the North, improved latrines are more common, including VIP and to a lesser extent against pour-flush toilets which are very common in the West where access to improved latrines is above the average.

It is also in the West where there are relatively few **shared latrines** (7.8%), while over 20% of the households share latrines in other areas. This privileged situation is also seen in the shorter walking time than in other areas. An exception, however, is the South West where 8.6% of the surveyed households reported to need more than 10 minutes to get to the place

[12] Note that the presence of only a small number of semi-urban communities, only slightly influences the figures on access to improved latrines because of the small number of households concerned.

of defecation, which could be related to the high proportion of households with traditional latrines that are located within the concession.

Looking at the geographical **variation** in more detail, there are strong differences between the regions, the share of households that have improved latrines or on the other hand have no latrine and therefore practice OD varies widely.

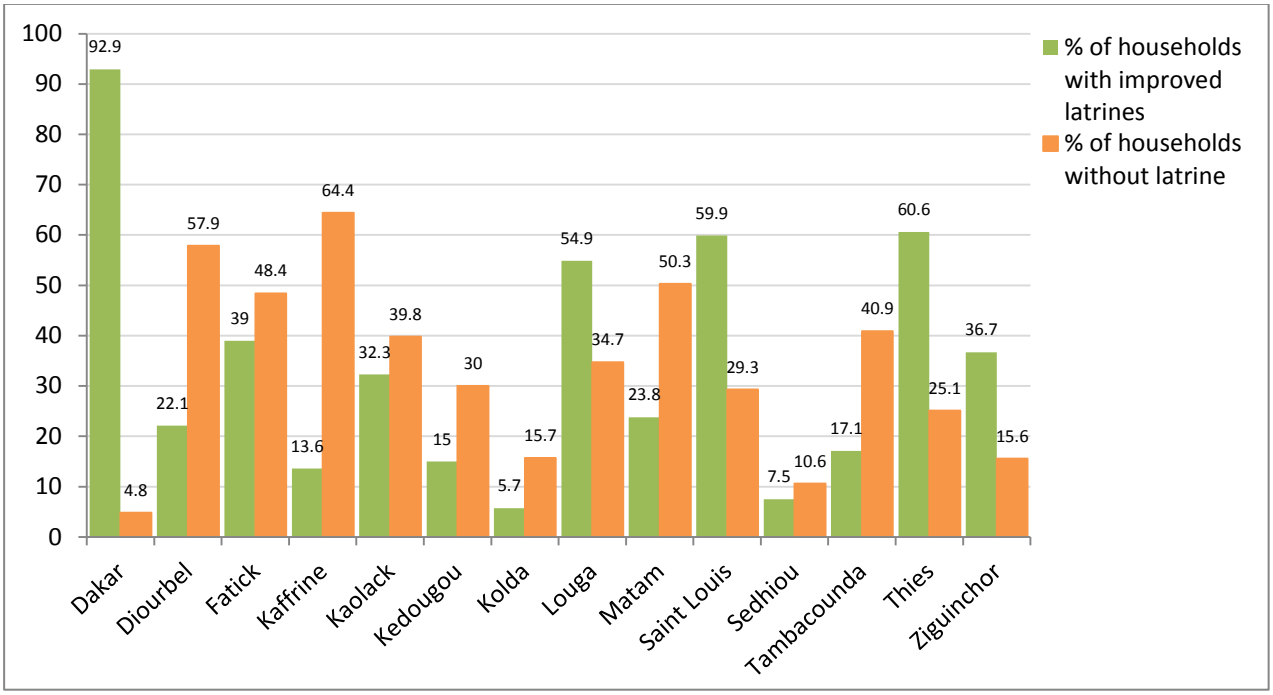

Figure 4. Percentage of households that have improved latrines and those who do not have latrines by region.

The coverage with improved latrines is highest in the Dakar region with nearly 93% of the households having one. Therefore, it is also in this region that the practice of OD is least common with less than 5% of households that have no latrine and are therefore forced to relief themselves in the open.

The 4 regions in the Center including Matam are the regions where the share of households without latrines is the highest, with peaks in Kaffrine (64.4%) and Diourbel (57.9%). In Diourbel, the share of rural households without latrines is clearly over-represented compared to estimates made in connection with other surveys because the CDs of Touba mosquée (11 in total) were excluded from the sample because of their more semi-urban rather than rural character. Access to unimproveds latrines is particularly high in Sedhiou (81.9%) and Kolda (78.6%).

More generally, it appears that access to improved latrines is related to the distribution of the socio-economic status: thus, the households surveyed in the West, where the share of improved latrines is highest, fall more often in the least poor category (62.9%). This is also true to a lesser extent in the North (36.4% of respondents belonging to the least poor). In contrast, in the South East and South West where the share of improved latrines is lowest (16.6% and 15.1% respectively), we find the smallest share of the population belonging to the richest fraction (14.4% and 16.7%).

The figure below confirms that at a lower level (regions), the percentages of households with improved latrines and those belonging to the least poor category are often very close, suggesting that households that it is the best-off households that have latrines. The similarity is particularly striking in Dakar, Fatick, Kaolack, Kolda, Saint Louis and Thies.

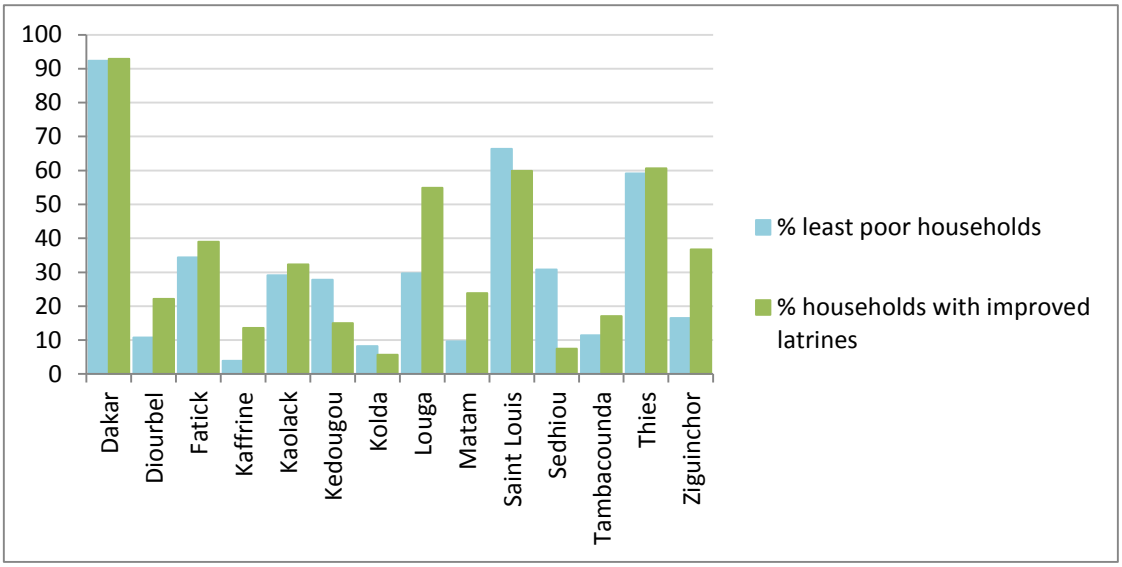

Figure 5. Percentage of less poor households and households with improved latrines by region.

The **socio-economic score** is thus an important explanatory factor of access to sanitation: it is obvious that the poorer the households are, the less they have access to improved latrines and the higher is the chance of a households to have no latrine at all. Thus, just over 10% of the poorest households have access to improved latrines against more than 65% of the least poor households. It follows that the poorest households have mostly access to traditional latrines while less poor households often have access to VIP and especially to pour-flush toilets. Similarly, the poorer a household is, the more likely it is to share latrines with other households and the more time they need to get to their place of defecation, which is certainly linked to the fact that they practice more OD.

Box 2. Factors associated with ownership of improved latrines

Multivariate logistic regression models were constructed to identify the determinants or factors associated with the possession of improved latrines in households. The successful model has incorporated the following variables based on their significance or relevance: socio-economic score, region, level of education of the household head and the existence of a hand washing station near the latrines (see Appendix F).

The odds ratio (OR) confirms previous observations:

- The link between having improved latrines and **socio-economic score** is very important and significant: households belonging to the middle category were 2.03 times more likely to have improved latrines than poorer (OR = 2.03, CI 1.37-2.99, p <0.001) and those belonging to the less poor category were 6.40 times more likely to have improved latrines (OR = 6.40, CI 4.17-9.75, p <0.001). This clearly confirms that the richer households are, the more likely they are to have improved latrines.
- The **region** remains an important variable to explain differences in the possession of improved latrines after taking into account the effect of the socio-economic variable, particularly for households in the South East (OR = 0.11; CI = 0.06-0.19; p <0.001) and in the South West (OR = 0.08: CI = 0.05-0.14; p <0.001), which are much less likely to have improved latrines than the households in the West, which are better off in terms of sanitation infrastructure.
- The fact that households have **hand washing stations near their latrines** is also strongly associated with having improved latrines with the odds of having an improved latrine being 2.27 (OR = 2.27; CI = 1.58-3.26, p <0.001). Households with improved latrines therefore more often have a hand washing station near the latrines.
- The impact of the level of **education** of the head of household emerges from the model but is not significant which suggests that it is surpassed by the effect of the socio-economic score, the more educated households are also those belonging to the less poor socio-economic group.

Box 3. Factors associated with latrine ownership in the Center region

Due to the low rate of households with latrines, improved or not, multivariate logistic regression models were

constructed to identify the determinants of latrine ownership in households in the Center region, and subsequently it was investigated to what extent these determinants differ from those in other regions. The usual variables such as education, socio-economic status and the main activity of the household head were tested and all variables on the information channels and the norms, values and beliefs.

In the end, only three variables emerged as being significantly associated with owning a latrine or not: socio-economic status, the fact that the household has enough water to meet all the needs of the household and values stipulating that "established people have latrines in their homes" (see Appendix F).

- The link between having latrines and the **socio-economic status** is very significant and in this sense, the Center region does not differ from other regions: households belonging to the middle category were 1.82 times more likely to have latrines than poorer ones (OR = 1.82, CI 1.21-2.73, p <0.004) and those belonging to the least poor category were 6.40 times more likely to have an improved latrine (OR = 6.40; CI: 3.67-11.16; p = 0.000). This clearly confirms that the better off households are, the more likely they are to have latrines.
- The fact that the **household has enough water to meet the household needs** is another variable related to having latrines: when the household has enough water, it is 2.14 times more likely to have a latrine (OR = 2.14, CI: 2.15-3.17, p = 0.000).
- Finally, the belief that "**established people have latrines at home**" is strongly related to having latrines: when the respondent agreed with this statement, they are 4.2 times more likely to have latrines (OR = 4.52, CI = 2.61-7.83, p <0.000). The link between ownership and latrines is particularly strong in the Center region. Thus, if we apply exactly the same logistic regression model to other regions than Center, the OR is only 1.80 (CI: 1.20-2.71, p <0.004).

In summary, the data collected in the household survey provide limited information why this area is different from others. Nevertheless, one can add that for other regions, owning latrines was significantly related to several standards: respondents from other regions agreeing with the fact that OD disturbs the neighbors and poses environmental problems were 3.2 (OR = 3.20, CI: 2.12-4.83, p = 0.000) and 2.31 (OR = 2.31, CI: 1.51-3.54, p = 0.000) times more likely to have latrines while agreeing with these standards makes no difference in the Center region.

With regard to key ways to stay informed, it also appears that respondents from regions other than the Center are more likely to have latrines when the main means of information is the **newspaper** (OR = 3.0, CI: 1.42-6.34 , p = 0.004) and the **mosque** (OR = 2.04, CI: 1.34-3.13, p = 0.001) which do not stand out in the Center region.

This could therefore suggest that efforts in terms of awareness and communication are still needed in the Center.

Qualitative study results

In general, the focus group discussions and key informant interviews revealed that there was a wide availability of latrines in households, however, their quality is poor. Indeed, a small proportion of households has improved latrines and most households have traditional latrines or makeshift ones made with used tires, mainly when there was no subsidy from programs. For example, at Ndiakhar, the PEPAM has installed only three latrines in the village, and even if people try to get latrines, they are mostly of low quality.

> *«No one here has received a latrine from a project. The latrines that we have, we built them ourselves».*
>
> *«My first latrine was made of tires; I took 10 tires to make a latrine. But it fills quickly and I was forced to dig another».*
>
> *«The tire latrine requires no expense. I just picked up the tires at the bus station, which is not difficult and after I dug myself my tank and I did my makeshift latrine until we get a better one. At least I will not go to the bush any longer, where everyone can see you, which is not respectful».* (**focus group discussion 4_Louga_Coky_Ndiakhar, men owning latrines).**

Others, on the contrary, have spent their own money to build latrines in their homes.

Also in Bandafassi (village of Indar), latrine ownership remains low despite several ongoing interventions aimed at installing a water source, a hand pump in the village, hand washing

stations in all concessions and to provide the villagers with hygiene kits (2 bottles of bleach, 15 pieces of soap and a bucket of 25 liters with a lid).

In contrast, some regions have particularly benefited from the intervention of several actors. This is the case in the Matam region where PEPAM/IDA, JICA, WHEPSA and Yaajendé had CLTS projects. These interventions have led to a good penetration with latrines at household level and a large number of localities that have reached ODF status. Thus, the town of Ouro Mollo (Oréfondé, Matam) that is certified ODF by WHEPSA, has a wide availability of sanitation facilities. The few houses that do not have latrines are either very poor families who have not benefited from the subsidy, or new homes.

This shows that access to sanitation remains dependent on both interventions in the community and the financial means of the population. Since there are different stakeholders in the field of sanitation that value either the CLTS approach or subsidies, the type of latrines available depend on the approach promoted by the programs or the financial capacity of households to invest in the acquisition of a latrine (especially in CLTS areas).

The public toilets established through the various sanitation programs have been constructed in mosques, health centers and schools. Pits were also built at certain locations. In the Matam region, for example, projects of the NGO Action Contre la Faim helped to equip 82 health posts and health centers with public toilets (latrines, water points and garbage management systems). However, the health centers are not taken into account. UNICEF with support from the World Food Programme has also built public toilets in schools in most of the localities that were visited (latrines and water points). By contrast, markets and mosques are experiencing difficulties in terms of infrastructure. The "louma" or weekly markets which are common in these areas and where significant numbers of people from different backgrounds congregate do not have latrines. Yet, they are important waste production places, which also poses a management problem at the municipal level. Moreover, the lack of public toilets noted in these places with large gatherings causes unhygienic behaviors and even pushes people to defecate in the open.

> *«The markets I do not think, because it is not a market as important as the weekly market on Mondays that brings a lot of people, where there are large crowds. But if the market is daily and is near the mosque and I have not seen a latrine there. Because it is a space that we built for the market we built a tent out there but there is no latrine there».* ***(ICP, 45 years,*** **Matam).**

In addition, when public lavatories are available, many are not functional due to difficulties with maintenance. At Bayakh, for example, the toilets built closby the mosque are defective and some latrines are broken.

Main results

- 35% of the households in our sample have improved latrines; 28.7% have unimproved latrines and 35.5% have no toilets and it is therefore assumed that they practice OD. These figures are close to those found elsewhere in other surveys (DHS, JMP).
- Traditional latrines make up 44% of all latrines observed during the survey, while 23.9% were pour-flush toilets, 12.4% were simple VIP and 8.2% were double VIP latrines.
- The geographical variation in access to latrines is very strong: the West region has much higher rates of access to improved latrines; in contrast, OD is very common in the Center region (52% of households without latrine).
- The geographical inequalities follow socio-economic inequalities and it appears that more than the place it is the fraction of the population in the poorest or least poor category that determines the proportion of improved latrine or others.
- Access to latrines remains dependent on subsidy programs.
- If public toilets exist in most RCs visited as part of the qualitative survey, their use is hampered by the poor maintenance.

4.3.2 Latrine use

Household survey results

Systematic latrine use by respondents, whether they have improved latrines or not, is 78.3%, the holders of improved latrines using more systematically their latrine (81.7%) than holders of traditional latrines (75.3%). The more systematic use among holders of improved latrines is validated by an odds ratio of 1.47 [CI: 1.12-1.92] meaning that holders of improved latrines were 1.47 times more likely to consistently use their latrine than holders of unimproved latrines. Regarding inconsistent use, the rate was 18.3% of respondents among the holders improved latrines against 24.7% among those with traditional latrines.

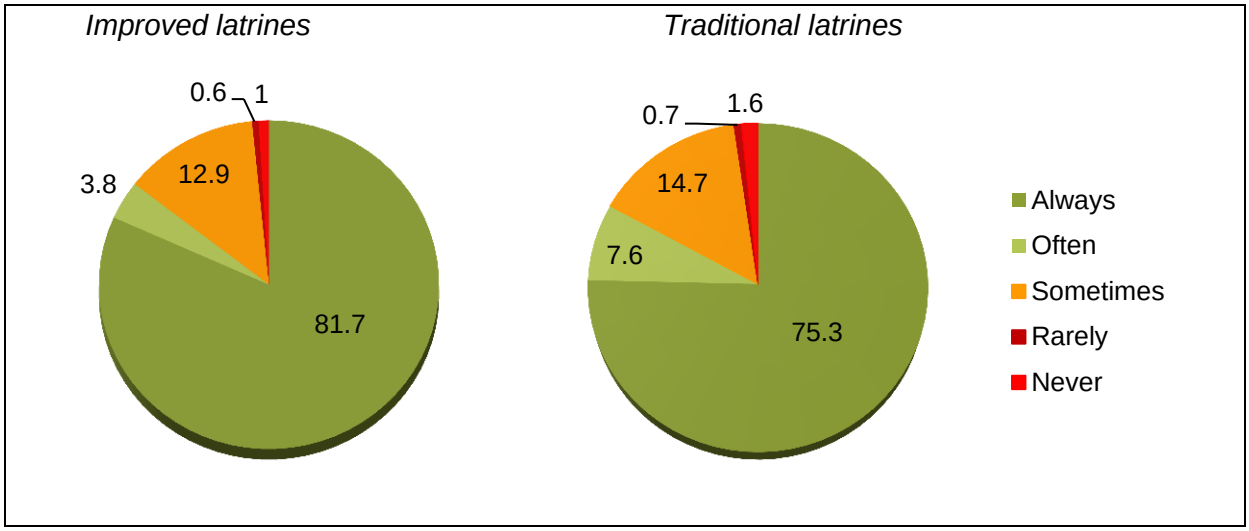

Figure 6. Frequency of use of latrines available in the household as declared by the respondent.

The table below indicates, however, that there are significant differences depending on the zone. In the West, 90.4% of the respondents have said they used their latrines consistently against 65.4% in the North, even as the proportion of households with improved latrines is one of the highest in that zone (47.5%). **It appears that respondents who have improved latrines do not systematically use their latrines** (only in 65.4% of cases) and 27.9% only use them occasionally. In contrast, in the South West where there is a high proportion of unimproved latrines (70.8%), more respondents reported always using available latrines (73.1%). It is therefore clear that sanitation practices do not only depend on the type of latrines available, and that the availability of improved latrines does not determine a systematic and more frequent use than traditional latrines.

Table 9. Latrine use among the holders of latrines, stratified by zone and type of latrine owned.

	Region					Type of latrine owned		Total
	West	Center	North	South East	South West	Improved	Tradition-al	
Number of respondents with latrines	271	283	315	141	279	714	571	1285
% who always use sanitary facilities available (Q3.9)	90.4	88.0	65.4	74.5	73.1	81.5	75.3	78.3
% of respondents who did not use their latrines the last time while they were at home (Q3.10)	**0.4**	1.1	4.8	2.2	1.5	2.4	1.6	2.0
% of respondents owning latrine who never practice OD (Q3.16)	77.5	56.2	21.6	29.9	42.3	51.7	39.8	46.4

Looking at the size of households, which in our sample is higher than what was found in other national surveys, it does not seem that it negatively affects the use of latrines. Indeed, the bigger the household size, the greater the share of households with latrines and the more respondents report using the latrines. Thus, among households with less than 6 members, 70% of the respondents said they always used their latrine, against 71.6%, 78.6% and 84.0% among households of 7 to 10, 11 to 15 and 16 members and more.

Another factor associated with the use of latrines is the educational level of the household head[13]: when the household head has no education, 74.6% of them always use the latrine and when the household head has reached an advanced level, the rate is 95.5%. Between these two levels, variations in the use are limited.

Finally, most respondents (98%) said they used the latrine at their disposition the last time they relieved themselves at home. Of the 2% of the respondents who reported not having used them (ie 26 respondents), the main reasons were: lack of privacy (34.6%), dirtiness (29.9%), smells (23.1%) and that the latrines were broken (19.2%). 42.3% went to the bush and 30.8% relieved themselves in the concession.

Finally, considering the different types of latrines that respondents have used at least once in their lives, whether they have or not a latrine at home, we find that 12.1% of the respondents said they had not used anything else than traditional latrines and/or practised OD, which means they have never had access to improved latrines. Again, significant regional variations exist: in the South East, 19.7% of the respondents have never used improved latrines, indicating the importance of targeting this category specifically, their lack of experience and ignorance of improved sanitation infrastructure causing specific behaviors in terms of sanitation and hygiene. In the regions West, Center, North and South West, these figures are respectively 4.3%, 15.1% 11.9% and 9.9%. Exposure to improved latrines is thus not systematic for everyone.

Box 4. Factors associated with systematic latrine use

As in the case of possession of improved latrines, multivariate logistic regression models were built and tested to identify the determinants and/or factors associated with the systematic use of latrines in households with latrines.

The successful model has incorporated the following variables because of their significance or relevance: the fact of having improved latrines, socio-economic status, household size, geographical area, the radio listening frequency and the fact that the household has a hand washing station near the latrine (see Appendix F).

- The fact that the household has **an improved latrine does not influence significantly the systematic use**, although the OR is 1.36 (CI: 0.92-2.00; p=0.123). Other more important factors intervene to explain whether that latrine use is systematic or not.
- The **socio-economic score** always plays a role in the use of latrines: when respondents belong to the intermediate category, the results are significant and indicate that they are more likely to consistently use their latrine than the most poor respondents (OR=1.73, CI: 1.16-2.56, p=0.007). When households are less poor, they are also more likely to systematically use their latrine but the results are not significant (OR=1.48, CI 0.95-2.29, p=0.082).
- The **household size is significant** only when the household is large (16 members or more) even if the use of improved latrines is increasing with household size. Thus, when the household has at least 16 members, households are 2.06 times more likely to consistently use their latrine than when the household is small (OR=2.06, CI: 1.22-3.50, p= 0.007.
- The **geographical area** remains an important variable to the extent that respondents in the zone North (OR=0.24, CI = 1.14-0.40, p<0.001), South East (OR=0.46, CI: 0.24-0.89, p=0.021) and South West (OR=0.52, CI: 0.29-0.94, p=0.031) are significantly less likely to use their latrine systematically and therefore have less favorable health practices than those in the West region.
- The **frequency of radio listening** is very strongly linked with the systematic use of latrines, respondents listening to the radio almost every day are more systematically using their latrine than respondents who listen to the radio at least once a week (OR=0.30, CI: 0.20-0.45, p<0.001), less than

[13] Data not shown in the table

once per week (OR=0.39, CI: 0.24-0.62, p<0.001) and never (OR=0.29, CI: 0.16-0.53, p<0.001).

- Finally, the fact that households have a **hand washing station** near their latrine is also linked to the systematic use of latrines but not significantly so, the systematic use of latrines being 1.35 times higher when the household has a hand washing station (OR=1.35, CI: 0.91-2.01, p=0.136).

Note that satisfaction of the respondents with their latrine is not related to their systematic use.

Qualitative study results

The results of this study show that in general, the use of sanitation facilities is often determined by three factors: availability, functionality and configuration of the latrine.

However, the fact that a household has no latrine is not always a determinant of non-use of latrines to the extent that non-owners can go to the neighbors. Nevertheless, it was observed that in rural areas, this perspective is less and less considered because of the embarrassment. Furthermore, when the household has only one latrine, it is reserved for seniors, others preferring to defecate in the bush or around houses (North, Center, South East). This situation is even more common as in the visited villages, households have a large size.

The **functionality of the latrines desired by the users** is determining their use. It depends on the convenience and safety that are desired. It may also be related to the availability of water in the case of pour-flush toilets because water is an important element of the device. Thus, the lack of access to water poses real health and sanitation problems (RC Ndoga Babacar). This results in a neglect of these types of improved latrines in favor of traditional ones called "direct-pit" and requiring little water.

Similarly, an important aspect to be integrated in the construction of latrines is their **configuration**, if it is not suitable, it discourages people from using them. The location of the latrine, the orientation of the entrance and the fact that, for traditional latrines, there is a fence or not are important factors for use:

> *«…When you build a latrine of 1 square meter, but no one will go there, people will prefer to go under the tree with the air and all and not go shut himself up in a box. So there are these questions in sociology, often the location of the latrine is in the house, you see the father who runs through the house to go to the latrine and is visible to the whole family, the guy will prefer not to go. He will wait for the night and then go defecate elsewhere. There are all those questions, I think that apart from that there is a culture that is, in a certain section of the population which did not use latrines at all until then, even if you build them the people do not use them and this must be accompanied by an increased awareness of these people».* **Key informant interview 6_Louga_Coky, district chief physician.**

Thus, at the surveyed households, the location of the latrine can be a problem because subsidy programs have not always considered the needs of beneficiaries: project technicians have instructions on where the latrine must be installed but they do not always take into account the needs expressed by the population:

> *«I, I asked that my latrine is made next to my room. I am old and my husband also and we would like to go easily. But when the people came from the project, they placed it as they wish and I do not like it»* (**key informant interview, Matam_Oréfondé_Ngulum, beneficiary).**

It may also be the case that some collective latrine construction programs do not take into account these elements: thus, at the college Sylla Counda Diakha (Bandafassi), latrines constructed for students and teachers are not used and are abandoned because their position does not ensure privacy.

«Imagine you cross the entire school ground with your kettle to go to the latrine, students will see you and if you need a bit time, they will say 'ah madam went to toilet' and as that, everyone will know. This is why so many students as well as us, nobody uses them. Students prefer to go home and we wait to return to use our own latrines» **(key informant interview 15_Kédougou_Bandafassi_Sylla Counda Diakha, college teacher).**

The use of public latrines depends on the context. Thus, in Nioro Alassane Tall (Fatick) the latrines of schools and halth posts are used both by students, patients and surrounding communities. This favorable behavior has even pushed the chief nurse to build two other blocks when the PEPAM/BA was active in the zone. And according to the interviewed actors, the desire to use these latrines is influenced by a greater awareness due to the awareness raising campaigns. Similarly, other activities carried out in the locality such as interpersonal communication, supervision in the frame of CLTS help to raise awareness and encourage them to use latrines.

In contrast, in Djambaty where there is a very limited number of latrines, school latrines are unusable because the people who come to use them without much maintenance.

Main results

- The systematic use of latrines by respondents is 78.3% or 81.7% when it comes to improved latrines and 75.3% when it comes to traditional latrines.
- 12.1% of the respondents have never used anything other than traditional latrines or OD, this percentage reaching 19.7% in the South East.
- There are significant geographic variations with systematic use of available latrines ranging from 90.4% in the West to 65.4% in the North.
- The large size of the household does not reduce the systematic use, the higher the household, the more routinely latrines are used.
- The use of latrines depends on their configuration, which must provide privacy to the users to be useful, which is valid, both for latrines at household level and at the level of public lavatories.

4.3.3 Open defecation practice

Household survey results

The high percentage of respondents reporting systematic use of their latrine (78.3%) must be put into perspective by looking at owners of latrines who report **never practicing OD**, since this applies to only 46.4% of the respondents. And even if those who report to practice OD do so only rarely, OD remains a common practice in the population (Figure 7), including among the holders of Improved latrines.

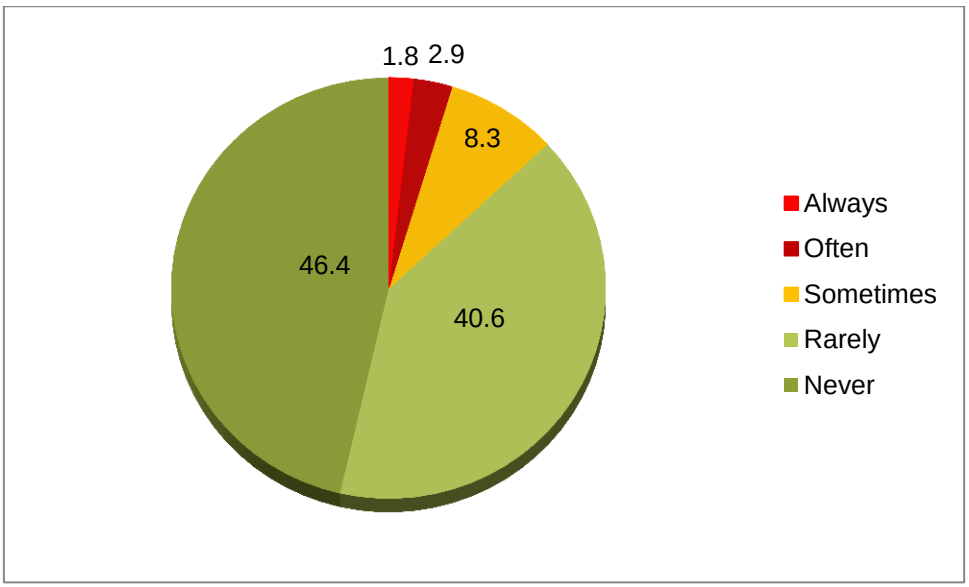

Figure 7. Open defecation frequency of respondents owning latrines.

What is more, there are significant variations by region with OD practices being less favorable in the North and the South East. Thus, in the North, over 78% of the respondents reported practicing OD occasionally or more regularly, against 22.5% in the West where the share of households with latrines, including improved latrines, is highest .

When respondents are away from home (Q3.14), most of them use latrines (76.0%), mainly traditional latrines (56.2% of the respondents), pour-flush toilets (32.3%) and single VIP (16.7%). For respondents who do not have access to latrines when they are not in the concession, the principal place of defecation is the bush (91.6%).

Box 5. Factors associated with OD

As in previous cases, multivariate logistic regression models were built and tested to identify the determinants of OD practiced occasionally/regularly/rarely or never **by latrine owners**.

The retained model incorporated the following variables because of their significance or relevance: having an improved latrine, the socio-economic score, sharing a latrine with other households, geographical area and frequency of listening to the radio (see Appendix F).

- Having an **improved latrines does not significantly influence the OD practice** although those with improved latrines practice OD a little less often than others (OR=0.91, CI: 0.66-1.25, p=0.554). This implies that the entire population is concerned by this practice, although the frequency of OD may vary.
- The **socio-economic score** is significantly related to the OD practice, intermediate and least poor being less likely to practice OD than the poorest category (OR=0.5, CI = 0.35-0.72, p=0.000 and OR=0.37, CI = 0.25-0.56, p=0.000).
- The **sharing of latrines** also significantly and negatively influences OD, respondents who share their latrine with other households are 1.83 more likely to practice OD than others (CI: 1.31-2.56; p=0.000).
- The **geographical area** remains an important variable; whatever the area, chances to practice OD are significantly stronger than in the West region. This is particularly strong in the North where respondents are over 9.23 times more likely to practice OD than in the West (OR=9.23, CI: 5.94-14.34 p=0.000) and in the Southeast (OR=5.62, CI: 3.24-9.78, p=0.000).
- Finally, **not listening to the radio every day** is also linked to adverse health practices: when respondents listen to the radio at least once a week and less than once a week, they were 1.63 times (OR=1.63, CI = 1.09-2.44, p=0.018) and 2.04 times (OR=2.04, CI = 1.28-3.26, p=0.003) more likely to practice OD than those who listen to the radio every day.

Note that the practice of OD is not related to whether the latrine was subsidized by a program or not (OR=1.09, CI: 0.79-1.51, p=0.592). Section 4.5.2 provides further details regarding the qualitative survey which showed a certain dissatisfaction of the beneficiaries of subsidy programs in some areas, with some focus group discussion participants reporting to go back to practice OD because of their dissatisfaction.

Qualitative study results

The focus group discussions have shown that when the available latrines become unusable, people can return to the practice of OD. This was observed in particular at Ndiakhar, Ouro Mollo. And, if OD is still common in areas without interventions (Kanapé Kotto) where no latrines are available in the concessions, the practice also remains common in some communities declared ODF (Boustane Mouride).

> *«Me what I have noticed is that most homes have latrines at least but this does not prevent the problems of faecal contamination which remains, that's the observation»* **(key informant interview 4_Louga_Louga_Coky, project responsible ONG Plan).**

Nevertheless, it appears that there is a clear decline in the practice of OD in certain areas (eg Kédougou). Interventions developed at state and non-state level have allowed these developments, particularly CLTS, although efforts remain to be made. In the various places where the approach has been implemented, people began to build latrines on their own. While they are traditional latrines, this still has the advantage of limiting the OD.

Moreover, according to the men met in the focus group discussions, the practice of OD is declining because of several contextual situations: the retreat of the forest in several villages with advancing construction (Darou Salam Cissé, Médiégue ...) and deforestation making access to wood more difficult: one must walk at least 1 km to find shelter and relief oneself.

Women also emphasize that men without latrines prefer to defecate in their own fields to enrich the soil and not to encroach on the territory of anothers. OD is practiced at the border of the village with the fields during the day but when night falls, adults are forced to use the back of the houses as do children. In Ndiakhar for example, adults defecate in the bushes "tolu Salane yi" that are behind the houses to shelter from view ("suturlu"). This situation is identical at Indar (Bandafassi). A Ouro Mollo (Oréfondé), women defecate behind the houses at 1 km distance from the village if it is in daylight and 500 meters away of houses at night because of darkness.

In Sindian, not having latrines is not necessarily synonymous with OD in the sense that some adults can use the latrines of other families through mutual aid system in force in the localities. In Déré Mbaye (Thies), experiences during migation that encourage migrants to discover and use latrines and impose them once back home, as well as organizing religious ceremonies push households to invest in latrines and abandon the practice of OD.

Main results

- The practice of OD remains common with nearly 54% of the respondents declaring practicing it on a more or less regular basis.
- Available but unusable latrines push the population to practice OD. This practice remains widespread even in areas declared ODF. In the absence of latrines, households can still use latrines of neighbors.
- OD can become less common with the decline of the forest that removes areas available for OD.

4.3.4 Management of child feces

Household survey results

Child feces management is an important sanitation issue given the large population of children. In our sample, 89.7% of the respondents reported having at least one child less than 5 years.

The stools of children under the age of 5 years are most often dumped in latrines (58.4%) and to a lesser extent, they are thrown into the household waste (17.8%) or are left in the

open air (10.5%). In households that have latrines, children either use latrines (1.5%) or the stool are discharged there (86.3%).

When the children are older (between 5 and 14 years) and the household has a latrine, the child usually uses latrines (97.9%) which is in contrary to results found in other studies where it emerged that children practiced OD more frequently (Diallo et al, 2007; Faye et al, 2011). When children/adolescents do not use latrines to relief themselves, either because they do not have or because they go elsewhere, they go mainly into the bush (84.0%) or to a defecation site (12.0%).

Finally, in terms of sanitation practices concerning children, including children over 5 years, it seems that these are seen as satisfactory, and when latrines exist in the household, they are used.

Qualitative study results

The qualitative survey informs us that in the case of children, OD is mainly practiced by children who are aged between 5 and 12 years. Indeed, mothers believe that this category cannot use latrines, because of the risk of falling into the holes that are often too large (simple latrine). However, some women believe that these risks depend on the type of latrines: improved latrines with a squat hole at are not expanded can be used by children. In Médjek (Sindian), a woman tells us also that she had to rescue her barely 3 years old when he went to the latrine without her knowledge.

In response, local strategies are deployed. Thus, in Darou Salam Cissé (Djambaty) for example, there is a squat hole for children over 5 years behind every house next to where one throws the garbage.

In the case that children defecate in a "chamber pot", the excreta management methods of women are not adequate and resemble OD: the mother or the grandmother bring them behind the house to empty them. In cases where children defecate in their nappies, it is taken and thrown into the dustbin of the house or in the dump behind the house. If, however, the child defecates in the yard, the stool is collected by the mother or by an elder of the child with a piece of cardboard or paper, and thrown out of the house.

> *«At home when the children finish defecating, we take a box to collect the stool and throw them right behind the house ».*
>
> *«If the child has diarrhea it defecates in the house, either in the courtyard or in its own clothes, if it is liquid, we cover it with sand. Otherwise it is thrown behind the house or sometimes it is brought out of town but not too far»* ***(focus group discussion 5_Matam_Oréfondé_Ngulum, women without latrines).***

Main results

- Regarding feces of children aged less than 5 years, the household survey shows that it is mainly dumped in latrines (58.4%), thrown into the garbage (17.8%) or left in the open (10.5%).
- Older children mainly use the latrines that are available in the household (97.9%).
- The results of the qualitative survey indicate less favorable outcomes for children aged 5-12 years who mainly practice OD.

4.3.5 Water supply

Household survey results

Overall, nearly 60% of the respondents said they had enough water to satisfy all their needs, with a less favorable situation in the South East. This means that for nearly 40% of the respondents, there is insufficient water to satisfy all daily household needs.

The supply with drinking water is strongly linked to the socio-economic status of the household as shown in the figure below: the better off the household is, the more likely it is to get water from a safe source. Similarly, the supply to the home of piped water is more common in richer households: it is 8.9%, 12.7% and 43.9% for respondents belonging to the poorest, poor and least poor households. This supply method is still limited, less than 25%, which is confirmed by data from the Livre Bleu of 2009 (under 22%).

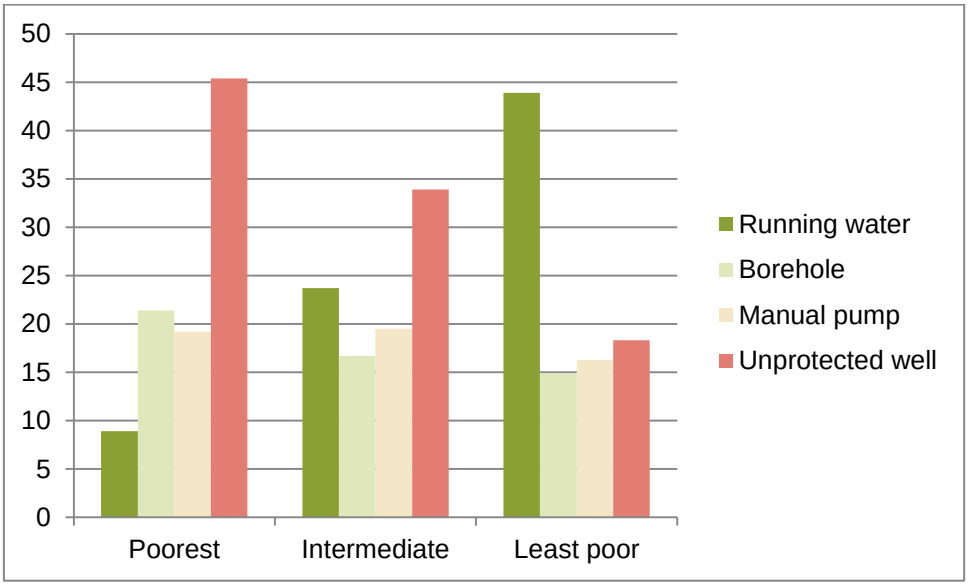

Figure 8. Main sources of drinking water according to the socio-economic score of the household.

In contrast, the more the household is poor, the more it uses unreliable drinking water sources: 45.4%, 33.9% and 18.3% of households are supplied by an unprotected well as they belong to the poorest, intermediate or least poor category.

The main drinking water sources also vary depending on the area but remember that more than the regions, the level of poverty influences water supply: for example, unprotected wells, considered as unsafe sources, are widely used in the South West (76%) where a pocket of poverty is seen with almost 56% of the surveyed households belonging to the poorest fraction; running water from a household tap is more common in the West where it has the highest share in the richest population (62.9%).

Finally, the average time to fetch water and return may more than triple depending on the area (14.8 minutes in the Center to 47 minutes in the South West). It seems that more generally in the South West, the water supply situation is less favorable, as supply from an unprotected water source and at a large distance are very common.

In general, a better supply with drinking water is associated with improved latrines and better socio-economic status. Thus, holders of improved latrines usually have enough water in the household to meet their needs, are less likely to use unprotected water sources and often have running water from a tap in the household.

Table 10. Water supply, stratified by geographic area and type of latrine owned.

	Region					Type of latrine owned			Total
	West	Center	North	South East	South West	Improved	Traditional	No latrine	
% of households having enough water to meet the needs (Q2.19)	60.0	64.0	58.4	49.6	56.5	71.4	63.1	42.5	58.8
% of households with the following sources of drinking water (Q2.20a)									
- Unprotected well	16.9	14.6	22.2	54.9	75.9	17.4	45.0	35.3	31.7
- Running water in the household	42.8	37.9	21.7	1.8	5.3	42.0	14.4	16.1	24.9
- Borehole	10.7	13.9	36.8	27.0	6.2	19.1	20.3	18.8	19.3
- Manual pump	22.5	31.5	14.3	7.5	0.3	15.4	12.8	24.3	17.8
Average time for round trip to fetch water (min.) (Q2.21)	18	14.8	29.5	25.2	47.0	21.4	20.5	32.2	25.0

Qualitative study results

It appears from focus group discussions and key informant interviews that while significant progress has been made with regard to access to water, it is still difficult to access for some communities in rural areas. Water shortages in particular prevent the use of pour-flush toilets that require a lot of water for their maintenance. Without enough water, the villagers can then choose to return to the practice of OD.

More broadly, it is obvious that water as an essential resource for everyday life may be lacking or difficult to access. This poses in effect the question of water supply which remains the major problem in many villages, especially in Darou Salam Cissé (municipality of Djambaty). In this locality, the three wells reach depths varying between 40 and 50m.

Only in Bayakh (North Central zone) the issue of water has not been put forward.

Main results

- 40% of the respondents reported not having enough water to meet all household needs.
- The supply with drinking water is strongly linked to the socio-economic status of the household: the higher it is the safer its supply.
- We find significant regional disparities with 76% of the households in the South West that access unprotected wells against 16.9% in the West, which is related to socio-economic inequalities.
- Lack of water is a daily problem mentioned in almost all the visited municipalities.

4.3.6 Hand washing

Household survey results

Hand washing with soap, both after relieving oneself and before a meal, is far from systematic: only about a third of the respondents do it systematically. Moreover, almost 29% of the respondents reported to rarely or never wash their hands with soap after relieving themselves against 33.1% who wash hands before meals.

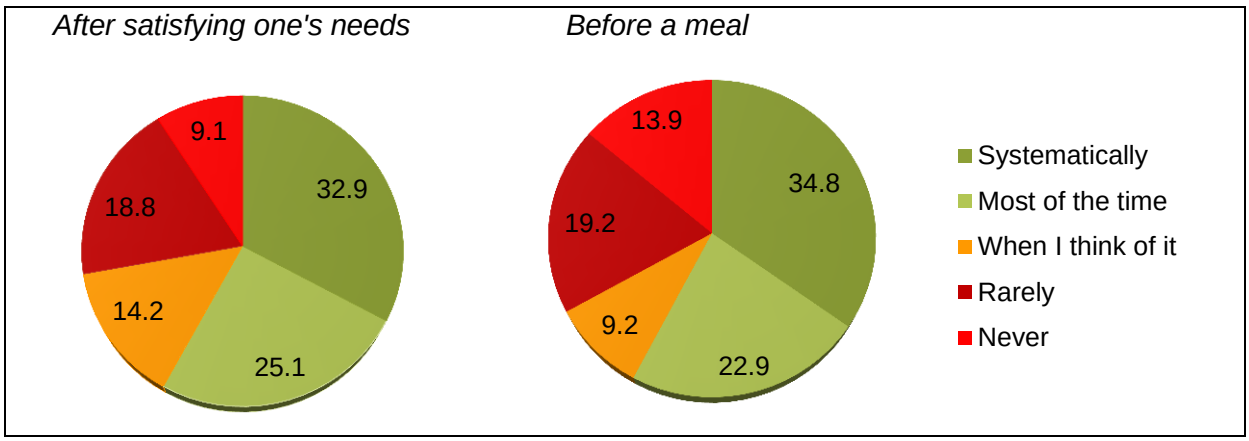

Figure 9. Frequency of handwashing with soap after satisfying one's needs and before a meal.

Table 11 provides information on the main indicators related to hand washing with soap and/or detergent. In general, the percentage of households with a hand washing station near the latrine (within 5 meters) as observed by investigators is low, less than a quarter of households, but households with improved latrines are more likely to have a hand washing station near their latrine (30.1%).

There are also regional disparities – especially in the Center where just over 15% of the households have a hand washing station – and according to the socio-economic status since the poorest are less likely to have a place to wash their hands near their latrine (15.7%).

In the Center, the hand washing with soap before meals is particularly rare with 48.2% of the households reporting not washing hands before meals; it is also in the Center that hand washing stations and the presence of soap/detergent are much less frequent than in other regions, which suggests that the infrequency of hand washing can be related to the low presence of a dedicated area for washing hands near the place of defecation

The majority of the households have water and soap to wash hands (63.3%) but strong inequalities were observed in the Center where only 20.9% of the respondents have water and soap against 88.4% and 78.0% of the households in the South East and the North. In the Center, households mainly have water to wash their hands (63.8%).

Note that households with traditional latrines use more often water and soap in their place for washing hands compared to households with improved latrines. We also see that it is the poorest households that are the least likely to have neither water nor soap: it suggests that the presence of a hand washing station with water and soap is not strictly related to the socio-economic conditions or even the fact of having improved latrines.

Table 11. Percentage of households where a place for handwashing was observed, and among these households, availability of water and soap (in %).[1]

	% of households where place for hand washing was observed near the latrines (Q5.15)	Among households where a place for hand washing was observed (Q5.16 and Q5.17)				Absolute number of households where a place for hand washing was observed near the latrine
		Soap and water	Water only	Soap but no water	No water, no soap	
Region						
- West	22.9	54.8	21.0	0.0	24.2	62
- Center	15.2	20.9	63.8	2.3	14.0	43
- North	31.8	78.0	6.0	5.0	11.0	100
- South East	31.4	88.4	7.0	2.3	2.3	43
- South West	24.4	60.3	23.5	5.9	10.3	68
Type of latrine						
- Improved	30.1	60.0	22.3	2.3	15.3	215
- Traditional	17.7	70.3	16.8	5.9	6.9	101
Socio-economic score						
- Poorer	15.7	58.5	26.8	7.3	7.3	41
- Intermediate	25.2	55.7	25.5	3.8	15.1	106
- Less poor	25.3	63.2	21.9	1.8	13.1	114
Total	**24.6**	**63.3**	**20.6**	**3.5**	**12.7**	**316**

[1] Also includes detergents other than soap.

Box 6. Factors associated with systematic hand washing

Multivariate logistic regression models were built and tested to identify the determinants and/or factors associated with systematic hand washing after relieving oneself.

The retained model incorporates the following variables because of their significance or relevance: having improved latrines, the existence of a hand washing station close to the latrine, socio-economic status, level of education of the household head and geographical area (see Appendix F).

- Systematic hand washing with soap is **not related to having an improved latrine** (OR=1.01, IC: 0.73-1.40, p=0.948).
- In contrast, systematic hand washing with soap after relieving oneself is strongly linked to **having nearby the latrine a hand washing station** which itself is strongly linked to the fact of having an improved latrine (see box 2). So when respondents have a hand washing station nearby their latrine, they are 3.77 times more likely to always wash their hands (OR=3.77, CI: 2.77-5.14, p <0.001), which seems logic.
- The **socio-economic status** is also related to handwashing since the higher the score, the greater the chance of consistently washing hands with soap. When respondents belong to the intermediate category, they are 1.64 times more likely to consistently wash their hands with soap (OR=1.64, CI: 1.14-2.36, p=0.008) and they are 2.14 times more likely to do so when respondents belong to the least poor category (OR=2.14, IC: 1.42-3.20, p<0.001).
- The **level of education of the household head** also is an important determinant, mainly when he has reached the **secondary or higher level**. In these cases, respondents are 2.07 times (OR=2.07, CI: 1.16-30719, p=0.014) or 4.89 times (OR=4.89, CI: 1.34-17.84, p=0.016) more likely to systematically wash hands after relieving themselves.
- Finally, the **geographical area** remains important for explaining differences in terms of washing hands after taking into account other variables: respondents in the Center and South East zones are 1.85 times (OR=1.85, CI: 1.23-2.78, p=0.003) and 2.35 times (OR=2.35, CI: 1.38-4.00, p=0.002) more likely to consistently wash their hands with soap after relieving themselves than in the West zone. In contrast, respondents in the North region are 47% less likely to wash their hands with soap (OR=0.53, CI: 0.35-0.82, p=0.004).

Qualitative study results

The interviewed people were aware of the importance of hand washing. They could also define the important moments: return from the fields especially for adults, return from playing outside of the house for the children, before meals, when leaving latrines. However, the emphasis was on washing hands before meals. The women, in different localities, stress that

they make available to household members two containers: one containing water and liquid soap and the other only water to rinse hands. However, they recognize that this is not an established habit: when no soap is available at home, hand washing is done with water only. At Médiegue, Tippi-Tappa handwashing devices were made available together with sensitization by an NGOs, but they deteriorated under the effect of the sun (the cans stiffen and break). Now users get tired of having to renew them every about three to six months. In addition, the repetition of the act of washing hands with soap is time intensive (Focus Group Médiégue).

Ultimately, the prevailing practice is hand washing with water. In the visited latrines, the presence of a hand washing station, and soap or detergent was not recorded. The hand washing practice thus suffers from a number of limitations related to the availability of water and soap, but above all it is not regular and wash times that are known by the population are not respected in practice. This has the effect of promoting diseases like diarrhea or conjunctivitis directly related to the lack of hand washing.

> *«…It is the consequences of not washing hands what we receive in our structures. We have repeated diarrheal disease and conjunctivitis. So diarrheal diseases represent one of the main diseases at the district level. So often people do not follow the right technique of handwashing but the product may not exist i.e. soap, soap may not exist in the house but also the periods when the person should wash hands e.g. before eating, after going out of the toilet, after a long stay at work, all this is currently not observed. So disease transmitted by feces still persists»* **(key informant interview 6_Louga_Coky, district chief physician).**

The simple question about the availability of soap in a precarious context observed in the majority of households in the rural areas has favored the proposed alternatives. Thus, ash was selected as an alternative to soap for washing hands. This alternative, however, is used with certain socio-cultural limitations that challenge even that use. Indeed, the origin of the ash residue is either dead wood for cooking or dried cow dung, used in many localities with a view to reducing the use of wood and slow down deforestation. In both cases, ash refers to waste, impurity, which limits its use to wash hands in many cases.

> *«The white color left by ashes on their hands after use makes it that some people do not like to use it; they also say that you can not use dirt to get clean because it mostly comes from the ashes of cow dung »* (**key informant interview, Louga_Coordonateur PRN ONG Plan).**

In terms of hygiene activities in schools, there are natural science lessons taught by the masters to teach students the moments when to wash hands and how to do it. Teachers also organize school cleaning activities (courtyard, classrooms and latrines) with students daily or twice a week. These activities start with the tidying up of the courtyard and classrooms, cleaning of the toilet blocks (girls and boys are involved), weeding the paths leading to the school and the main squares of the village after the rainy season (before school starts in Médiégue).

Specifically in Keur Maba Diakhou Ba (Kaolack), the school administration, supported by the NGO Plan, initiated hygiene measures since the announcement of the Ebola epidemic: liquid soap is available permanently next to the tap so that students wash their hands systematically when they enter the school and after using latrines. The activities undertaken also relate to the hygiene awareness through sketches, initiation activities to oral, body and clothing hygiene. Each year, Plan grants material for a film screening on the most salient issues of students such as hygiene, latrine use but also early marriages or the effect of the overload of housework on school performance.

Main results

- 32.9% of the respondents reported washing hands with soap systematically after relieving themselves.
- 24.6% of the households have a hand washing station near their latrine which would explain the low share of respondents washing hands routinely after relieving themselves.
- Strong inequalities are observed by region, particularly with regard to availability of soap; this does not appear to be adversely linked with the socio-economic score.
- The qualitative approach confirmed that the lack of soap often means that hands are washed essentially with water.
- The critical moments when hand washing should take place are known by the public but it is the washing of hands before meals that is preferred.

4.4 Characteristics of latrines in households with latrines

4.4.1 Technical characteristics of latrines and superstructures

Household survey results

In general, it appears that during the survey, nearly all latrines (97.8%) were in working condition with very few variations between the regions. In the last six months, 10.8% of the household latrines had operational problems, essentially due to the fact that the pit was full (54.9%) or had collapsed (13.4%). However, on the day of data collection, the vast majority of the latrines was functional again (82.5%), after the household had worked to find a solution (87.0% of the cases). Note that when the toilets were not functioning, respondents reported still using them even if they were not completely functional (59.0%); in such situations 16.3% practised OD and 15.1% went to neighbors or the family.

The technical specifications of latrines and their superstructures are presented in the following table. Generally, they are variable but are directly related to the presence or not of improved latrines.

Thus, in areas where there are more improved latrines and where the proportion of less poor households is highest, i.e. mostly in the West and to a lesser extent the North, the superstructure is more developed: the floor is more often improved, there is generally a roof, a door, a light, a bowl and a ventilation system. And overall, the characteristics of the superstructures of improved latrines are significantly better than those of traditional latrines. Note in particular that traditional latrines have no roof, no doors and no ventilation system in 67.9%, 64.5% and 91.6% of the cases.

Table 12. Percentage of households with latrines having specific characteristics, stratified by region, type of latrine and socio-economic score.

	Specifications and superstructure of latrines					
	Improved soil (brick, ceramic, concrete / cement) (Q5.4)	**No roof (Q5.5)**	**No door (Q5.6)**	**No light (Q5.12)**	**No bowl (Q5.7)**	**No ventilation system (Q5.13)**
Region						
- West	96.3	12.9	9.2	13.3	4.4	32.1
- Center	72.2	46.5	43.1	100.0	13.4	60.4
- North	85.6	23.0	17.5	77.5	6.0	42.9
- South East	68.7	61.2	62.8	84.6	18.3	85.4
- South West	48.3	61.7	55.2	96.3	34.4	87.5
Type of latrines						
- Improved	95.1	14.8	10.4	70.5	3.4	32.4
- Traditional	49.6	67.9	64.5	99.3	29.1	91.6
Socio-economic score						
- Poorer	46.3	70.4	59.4	100.0	28.7	83.9
- Intermediate	68.5	45.3	45.5	100.0	18.3	68.1
- Less poor	94.0	19.4	15.1	67.8	6.9	39.3
Total	**75.2**	**38.3**	**34.4**	**87.3**	**14.8**	**58.7**

The importance of the superstructure should not be underestimated because it is important for the utilization of latrines albeit to a lesser extent compared to the infrastructure of latrines. The latrines that have a solid floor and a finished wall are more systematically used compared to latrines without floor and without improved walls. For example, 80.6% of the respondents who have a cement floor in their latrine systematically use it against 70.8% for those who do not have a cement floor. In contrast, the presence of a door or roof does not seem to make much difference to the systematic use of latrines (e.g., respondents with a door in front of their latrine use it 1.06 times more often than those who have no door) even though other studies have identified the importance of the presence of a door, and more generally of a suitable superstructure, to increase the use of latrines (Barnard et al, 2013 ;- Yimam Tadesse et al, 2014).

Not surprisingly, it was also found that the better off the household is, the characteristics of household latrines improves, the latter investing more in the superstructure of latrines. In particular, the most poor households have 3.6 times more often a latrine without roof that less poor households.

Main results

- 97.8% of the latrines were functional at the time of the survey.
- The more latrines are improved, the more their technical characteristics and superstructure are developed.
- The characteristics of latrines improve when households are richer, meaning that there are also regional disparities with the best features and superstructures in the richest regions, namely the West and North.

4.4.2 Participation in latrine construction

Household survey results

In most of the surveyed households, the latrines had been built by the respondent (97.0%). However, in response to the question «who had built the household latrine», the «builders» of the latrines varied with socio-demographic characteristics of the respondents.

Table 13. Percentage of households where specific persons participated in the construction of the latrine, stratified by geographic area, type of latrine and socio-economic score.

	Households in which one of the following persons participated in the construction of latrines [14] (Q4.14)			
	Head of household	**Family**	**Qualified mason**	**Latrine construction program**
Region (%)				
- West	56.4	3.9	54.1	19.7
- Center	41.7	17.8	35.1	9.1
- North	44.1	5.1	45.0	19.9
- South East	55.4	13.9	20.0	6.9
- South West	65.4	24.6	13.0	4.7
Type de latrines (%)				
- Improved	41.8	6.7	50.7	20.0
- Traditional	64.4	20.4	16.0	3.9
Socio-economic score (%)				
- Poorer	65.6	21.6	15.4	10.8
- Intermediate	49.9	15.7	28.2	14.2
- Less poor	49.9	6.9	49.9	12.1
Total	**51.7**	**12.9**	**35.0**	**12.8**

In more than half of the households, the head of household had built the latrine, alone or with help. This is even more the case when it comes to traditional latrines (64.4%) and when the household is part of the poorest population segment (65.6%). Having traditional latrines and belonging to the poorest category is also negatively related to the use of a qualified mason, which, although less common, also shows significant regional variations. It is in the West that skilled masons usually built latrines (alone or helped by someone else) (54.1%) while in the South West their participation rate is lowest (13.0%). This must be related to the type of latrines in the households, the more latrines are "sophisticated", the more the expertise of qualified personnel is required. Thus, in the West where nearly 75% of the latrines are VIP or pour-flush latrines, the contribution of qualified personnel is more important. In contrast, in the South West where traditional latrines are very common (70.8%), a skilled mason is not required because the head of household built the latrines often alone (in 52.4% of the visited households).

With regard to latrine construction programs, they built 12.8% of the surveyed latrines but it seems they are unevenly distributed across regions, with a significant concentration in the West and North (20%) and the lowest number in the South West (less than 5%). Note that the contribution could be to build an entire latrine or only some part, in which case the household has taken charge of the rest of the construction. Thus, in the South West, 3.3% of the latrines were entirely built in the frame of a latrine construction program while the fraction was 10.9% in the North and 7.3% in the West. In the North, in about 9% of all cases, the latrine construction programs contributed together with the participation of other actors such as the respondent himself or a skilled mason, etc.

Subsidy programs have built (partially or fully) 20% of all improved latrines against less than 4% of the traditional latrines, the latter mainly through CLTS. As shown in the figure below, the types of latrines that programs have built are pour-flush (26.9%), double VIP (21.3%), single VIP (18.1%), the SanPlat (13.8%) and traditional latrines (13.8%).

[14] Latrine construction could involve several people. For example, the respondent to the questionnaire reported to be involved in the construction of latrines in 51.7% of the households and in 36.7% of the cases, he was alone in building the latrine.

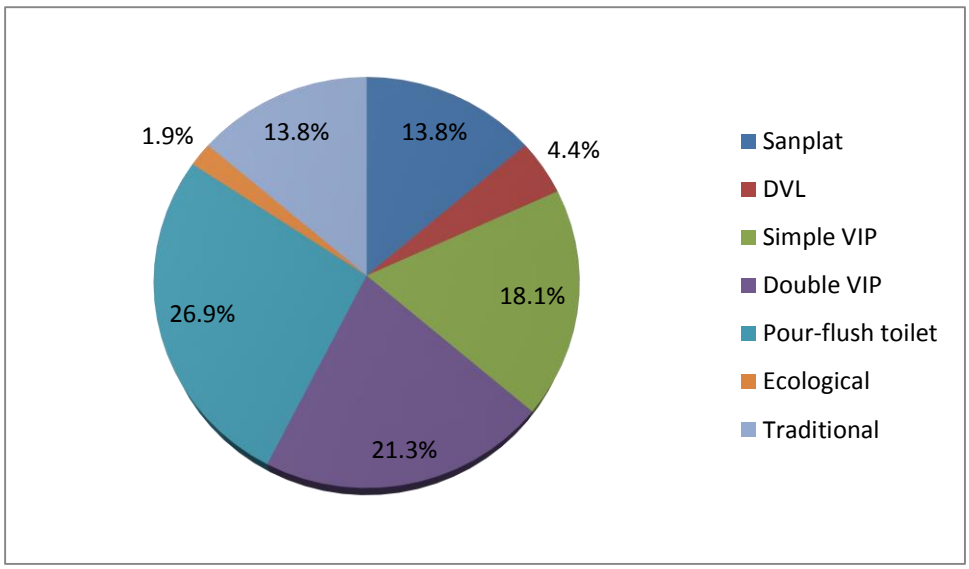

Figure 10. Types of latrines constructed by latrine construction programs.

Among the improved latrines, 53.9% of the DVL, 42.9% of ecological toilets, 32.1% of double VIP, 19.7% of SanPlat, 18.4% of the simple VIP and 14.7% of the pour-flush toilets benefited from the participation of a latrines construction program.

Regarding the use of latrines according to actors in their construction, use is more frequently systematic when a skilled worker participated in the construction of latrines (85.2%) and less frequently systematic when family members participated (65.6%). When programs supported latrine construction, almost 77% of the respondents reported that they always used their latrines, the rest of the respondents stating essentially that they use them occasionally (18.8%) or often (3.8%). The contribution of a latrine construction program does not guarantee a systematic use of latrines. For comparison, the participation of a skilled mason seems to be a motivation to use the latrine: qualified masons were mainly involved in the construction of improved latrines, so this must also be seen in relation to the type of latrine that was built.

Table 14. Latrine use and key contribotors to the construction of the latrine.

	Frequency of use of the latrines available in households (improved or traditional latrines) (Q3.9)				
	Always	**Often**	**Sometimes**	**Rarely**	**Never**
Key contributors to the construction of the latrine (% Q4.14)					
- Respondent	71.1	5.3	20.4	1.1	2.2
- Family	65.6	11.2	22.5	0.6	0.0
- Skilled worker	85.2	3.2	11.4	0.2	0.0
- Latrine construction program	76.9	3.8	18.8	0.0	0.6
Total	**78.7**	**5.3**	**14.1**	**0.6**	**1.3**

Main results

- 51.7% of the heads of household have built their latrine, either alone or with the help of somebody; the rate is 64.4% for traditional latrines and 65% among the poorest households.
- The higher the rate of improved latrines, the more important is the support by a qualified mason. Thus, a qualified mason was involved in 54.1% of all latrine construction in the West where the fraction of improved latrines is highest.
- Latrine construction programs have contributed to the construction of 12.8% of all latrines, with a higher rate in the West and North.
- Construction programs have supported the construction of 20.0% of the improved latrines, especially pour-flush toilets (26.9%), double VIP (21.3%) and simple VIP (18.1%).
- The participation of a qualified mason appears to support the use of the latrine.

4.4.3 Maintenance and cleaning of latrines

Household survey results

The cleaning of latrines primarily falls into the responsibility of female household members, regardless of socio-economic status or type of latrine owned, similar to what was found in other studies (Diallo et al, 2007). Note that in the poorest households 12% said "nobody" was responsible for the cleanup, a fraction that decreases as the socio-economic status improves. It is also in households where there are traditional latrines that respondents most often declare that nobody is responsible for cleaning.

In general, it appears that cleaning is best in the least poor households and among those that have improved latrines which therefore probably are also easier to clean: the use of cleaning products as well as the average number of weekly cleanings increase with socio-economic score and when latrines are improved.

Note that the average number of weekly cleanings is 5.1, which is much higher than what was found in Niger where 2.7 weekly cleanings were reported (Diallo et al, 2007) or Ethiopia where 79.5% of the households clean their latrines when they are dirty, which is still very subjective (Tadesse-Yimam et al, 2014).

Table 15. Main indicators of cleaning and emptying latrines, stratified by socio-economic score and the type of latrine; frequencies reported by respondents (%)

	Socio-economic score			Type of latrine owned		Total
	Poorer	Intermediate	Less poor	Improved	Traditional	
Person usually responsible for cleaning latrines (Q4.9)						
- Head of household	3.9	5.0	2.4	2.7	4.6	3.5
- Female(s) of the household	76.5	78.0	83.8	82.4	78.4	80.6
- Child / Children of the household	4.6	6.7	6.0	6.7	4.9	5.9
- No one	12.0	6.0	1.1	1.1	9.3	4.8
- Taking turns	1.9	3.4	5.6	5.8	1.6	3.9
Average number of weekly latrine cleanings	4.0	4.8	5.8	5.8	4.2	5.1
Products typically used to clean the latrines (Q4.11)						
- Water	82.8	93.9	98.4	98.2	87.7	93.7
- Disinfectant	26.7	40.7	65.4	56.9	39.9	49.7
- Deodorant	8.6	8.9	14.1	17.3	7.3	13.1
- Detergent	56.9	64.9	75.2	72.8	56.7	66.0
Person usually responsible for the latrine						

	Socio-economic score			Type of latrine owned		Total
	Poorer	Intermediate	Less poor	Improved	Traditional	
(Q4.12)						
- Head of household						
- Female(s) of the household	37.6	52.9	56.8	55.2	43.1	50.9
- Child / Children of the	3.5	2.1	3.6	3.5	3.0	3.0
household	0.8	4.5	5.8	5.5	1.8	4.2
- No one	48.7	27.9	14.6	11.3	44.5	27.4
- Employee	3.5	4.3	6.9	9.7	6.1	5.1
- Provider	0.4	1.4	4.7	5.6	0.7	2.5

In terms of latrine emptying, it mainly is the responsibility of the heads of household, and all the more so when the household is rich. Conversely, for the poorest households and those with traditional latrines, respectively 48.7% and 44.5% of respondents said that nobody is responsible for emptying the pits. This implies that when the pit is full, it is abandoned and a second pit is dug. The use of employees or companies is still low (5.1% and 2.5% respectively) but increases linearly with increasing socio-economic score and latrine improvement.

Qualitative study results

Draining and fecal sludge management are rare in rural areas. The usual practices in the visited places are to bury the full latrine and construct another one.

> *«Well here even before our birth, there were latrines, but if they are full, we will be asked to dig another one, here it is like that, but even before our birth there were always latrines here because that's what the parents liked. Our home is over there like that, the other is filled last year, this year we have dug two latrines another is not finished yet, we finished digging it but it we have not yet cemented it; here it is that if it is filled we are told to dig another one»* ***(focus group discussion*****, Kédougou_Bandafassi_Sylla Counda Diakha, men with latrines).**

For those who have basic latrines, emptying is not possible, so that when the pit is filled, it is closed and a new pit is dug. And pour-flush toilets for VIP latrines, the novelty of the construction has not yet allowed to experience the draining. Ultimately, even if new types of latrines are installed in communities, the habit to empty them still needs to be established in the population.

Main results

- Cleaning is better when households are better off and have improved latrines.
- In the poorest households and those with traditional latrines, respectively 48.7% and 44.5% of the respondents said that nobody is responsible for emptying the pit. This implies that when the pit is full, it is abandoned and a second pit is dug.
- The practice of pit emptying is still not established in rural areas.

4.4.4 Financing of latrines

Household survey results

Table 16 shows the average expenditure on the acquisition of latrines. This amount varies by region since it can be up to 4 times higher depending on the area. Not surprisingly, the amount is higher in the West, where the share of improved latrines is also higher. Conversely, it is in the South East and South West, where there are fewer improved latrines, that the total average expenditure is lowest. The association between the expenditure and

the type of latrines is also clearly apparent: the average total expense for improved latrines is almost 100'000 FCFA against nearly 25,000 FCFA for traditional latrines.

In the West, more than 29% of the respondents spent more than 120,000 FCFA for their latrines, against less than 10% in the Center. Conversely, in areas where there are more traditional latrines, there are more households reporting zero expenditures to acquire latrines, suggesting that unimproved latrines are made from locally found materials (eg branches, stones ...).

Inequalities in terms of total expenditure allocated to latrines thus follow the distribution of latrines, whether they are improved or not, which is itself closely linked to the share of the least poor population. In the West region where the proportion of the least poor population is highest (62.9%) and more improved latrines exist, the total average household expenditure for latrines is nearly 112,000 FCFA. And more generally, if we look at the spending on latrines by socio-economic score, the link between spending for latrines and poverty is clear: the less poor households are, the more they spend to acquire latrines, with expenditures on average of 18'251 FCFA for the poorest, of 54'817 FCFA for poor and 89'390 FCFA for the least poor households.

Table 16. Average household expenditures for latrines, stratified by region, type of latrine owned and socio-economic score.

	% of households spending any amount in the following ranges to acquire their latrine						Average total expenses (FCFA) (Q4.15)
	0 FCFA	1 to 15'000 FCFA	15'001 to 50'000 FCFA	50'001 to 120'000 FCFA	More than 120'000 FCFA	Don't know	
Region							
- West (n=259)	5.4	9.7	16.6	5.8	29.3	33.2	111'789
- Center (n=276)	9.1	26.5	13.4	5.4	9.8	35.9	54'224
- North (n=311)	17.4	7.7	10.9	18.3	11.9	33.8	67'350
- South East (n=130)	20.8	20.0	23.9	10.0	6.2	19.2	42'641
- South West (n=270)	25.2	24.1	22.2	6.7	3.0	18.9	26'453
Type de latrines							
- Improved	8.3	9.5	13.2	11.6	21.1	36.4	97'385
- Traditional	23.3	26.3	20.5	7.0	2.1	20.8	24'088
Socio-economic score							
- Poorer	27.8	32.4	13.5	7.0	1.9	17.4	18'251
- Intermediate	15.6	19.0	20.4	7.5	10.5	27.0	54'817
- Less poor	7.4	9.7	15.2	10.1	19.1	38.5	89'390
Total/ Average	**15.1**	**17.1**	**16.5**	**9.5**	**12.5**	**29.4**	**60'320**

Note that a significant proportion of households (29.4%) does not know the amount of money spent to acquire latrines.

In terms of funding sources to acquire latrines, Table 17 shows that household income remains the main source of funding for latrines (82.3%), followed to a lesser extent by subsidies from NGOs or the government (13.8 %). Note that the financing of latrines through the household income does not imply that the household did not receive a subsidy and vice versa, the two sources of funding could be combined; only the most important source was declared. Note that the sources of funding that are tontines, solidarity funds or credits emerged as marginal responses; therefore, they do not appear in the table. It nevertheless indicates that these sources are negligible in terms of latrine funding.

Table 17. Sources of funding and in-kind support for the acquisition of latrines, stratified by region, type of latrine owned and socio-economic score.

	Funding sources for the acquisition of latrines (Q.4.16)			% of house-holds that received nonfinancial sup-port from an NGO or the governme nt	Main types of non-financial assistance received by beneficiaries from NGOs or the government		
	Household income	NGO support to the government	No money required		Technical support	Supply of building materials	Logistical support for the transport of materials
Region							
- West (n=259)	87.3	20.1	1.2	28.6	82.4	90.54	73.0
- Center (n=276)	88.8	6.5	4.4	14.2	94.4	94.4	63.9
- North (n=311)	81.0	23.8	2.3	30.6	94.7	89.5	53.7
- South East (n=130)	76.9	10.8	10.0	17.7	81.8	72.7	50.0
- South West (n=270)	74.7	5.0	18.4	9.8	68.2	36.4	27.3
Type de latrines							
- Improved	85.7	20.8	0.9	30.0	89.6	88.1	66.8
- Traditional	78.1	5.2	13.9	9.3	78.7	68.1	21.3
Socio-economic score							
- Poorer	72.9	11.6	15.9	16.7	86.1	74.4	44.2
- Intermediate	80.5	14.9	7.6	22.3	81.8	78.4	48.9
- Less poor	88.3	12.9	2.1	22.4	91.4	91.4	65.6
Total	**82.3**	**13.8**	**6.7**	**20.7**	**87.6**	**84.3**	**58.2**

Subsidies are more common in the West and North, where improved latrines are the most common but also where the population is richer, which may seem paradoxical since the poorest require more subsidies. Poorer households reported more often that they do not require financing for the acquisition of their latrines, mainly because they have traditional latrines built from local materials that cost nothing.

To the financial support should also be added the non-financial support (technical support, supply of materials, transport of materials) that is also higher in the North and West. These two areas seem therefore to benefit from more support, financial and non-financial, from NGOs and/or the government even though the share of households with a higher socio-economic score is higher than in other areas.

Qualitative study results

Traditional latrines are often the norm in the absence of subsidy programs: most often, basic latrines are constructed by the household from local materials such as in Nioro Alassane Tall. They are often very common in areas with CLTS and are inexpensive (about 10,000 FCFA) requiring more human than financial investments. They are a temporary solution for the villagers wishing to acquire latrines without having the financial, material or technical means to do so. The cost is limited, this suggests a weak community involvement in the financing of sanitation services in the observed communities.

In fact, the building of modern latrines often is very expensive if we listen to the people. For example, at Ndiop Ndienguen, Keur Gallo, those who tried the experience, claim to have spent between 100,000 and 250,000 FCFA, costs vary according to the type of infrastructure and superstructure installed. Often, household resources are either insufficient or are not primarily destined to latrine funding. The priorities remain family responsibilities namely food, health and the promotion of income-generating activities and in some cases, the construction or completion of buildings.

> *«bay rek ga am, la ca topa kus neew danga koy dëkké* (we only have agricultural resources, the rest is to survive)». **Key informant interview 5_Louga_Coky_Ndiakhar_ASC.**

The cost of modern latrines in time, money and material is such that even when the need is felt, the acquisition of latrines remains conditional on the availability of a subsidy or support from a third party. Lack of funding and their unequal distribution are also highlighted during the focus group discussions and key informant interviews. The issue of limited quotas in grant programs and the problems of politicization and patronage in the selection of beneficiaries are particularly emphasized. Indeed, subsidies target a limited number of people who can benefit from it, which is not enough considering the extent of sanitation needs expressed in different focus groups. This poses even more problems as the choice of beneficiaries is often based, in the opinion of stakeholders, on clientelist considerations: it has been reported in the South East region, the Center and the North that some villagers were denied access to these programs because of their political affiliation, different from that of their local promotors.

When the household acquires a latrine, whether traditional or improved, it is often the household head who makes available the construction costs or the amount of the contribution in case of subsidies. However, this should not overshadow the collective dimension in financing and decision making for the acquisition of latrines. Indeed, the expenses for the co-payment or construction costs are not only made available by the head of household, but there is also a significant contribution of emigrated family members (Matam, village Oréfondé). Thus, young people who have migrated to the city or who went abroad insist on the need to build a family latrine and even indoor bathrooms for elderly parents when they return: in addition to initiating the discussion about latrines, they finance them and build them at their expense. Similarly, focus groups reveal that women, in addition to their role in the daily maintenance of latrines, increasingly contribute to their financing. The man is no longer the only player in the financing of latrines.

Regarding the banking sector, it appears that banks are not yet sufficiently convinced of the profitability of the sector as it is an investment that has no guarantees to bring in more, because of its informal nature. Strengthening credit initiatives not only in the banking sector, but also on the principle of village solidarity appear as positive experience. One of the successful examples is to be found in the GSF/Senegal which through its implementing agencies supports tontines and revolving loans to sanitation and health committees (CAH) to improve the funding strategies for improved latrines for households.

Moreover, the solidarity funds traditionally conceived as mutual aid system is implemented in some villages of the North. The solidarity fund to finance sanitation works only exists in WHEPSA[15] areas that is to say Dabia, Agnam Civol and Oréfondé. In Dabia Odedji (capital of the municipality of Dabia), the noted problems are the weakness of the contributions as the fund works for 2 years and has not yet managed to raise enough money. The interviewed population found this model relevant as it was based on community solidarity, however its feasibility, efficiency and effectiveness are problematic. Indeed, membership is based on voluntary participation and contributions are still low.

In the Center, the alternative model of the community field is promoted. Indeed, it is a collective field that is specially cultivated by all the villagers. The product is then sold and the money obtained is dedicated to community actions, that is to say, to mosque construction, warehouses, Madrasa etc. People think that money could be used to make interest-free loans to households who wish to acquire a latrine. This model is considered by the people as being relevant to the financing of toilets.

Another example of the successful promotion of the sanitation market and the willingness to pay is that of **ACCRA**: this structure is trying to market latrines with a new marketing method. The NGO has established an innovation center which includes fifteen local construction companies trained in construction techniques for different prototype latrines designed by the project engineer based on the soil type. A prototype was built in each intervention locality and mass communication events were held to launch the product and get people to buy a latrine. Then relays were recruited to conduct interpersonal communication with householders to generate demand. ACCRA is working on this project in collaboration with

[15] Women's Health Education and Prevention Strategies Alliance

the mutual URMECS where customers open an account and pay the deposit of 10'000FCFA. The Service Régional de l'Assainissement (SRA) validates the site planned for the construction of the latrines and work begins. Once completed, the owner gets used to the the latrine for a month and if there are no recorded problems, regular payments begin (8,000 - 10'000 FCFA according to the financial capacity of the household) over a period of 17 months to reach the total cost of the latrine which is 140'000 FCFA. This approach is a new experience of a bank with investments in sanitation. ACCRA, which had set a target of 50 latrines built before the 2015 rainy season, currently has 56 applications under consideration. It thus exceeded the target construction but decided to limit that number to observe customer behavior in order to secure the funds invested by the bank and by the organization itself.

Main results

- The total average expenditure for improved latrines is about 98,000 FCFA against less than 25,000 FCFA for traditional latrines.
- There are wide regional disparities in average expenditure for latrines that are in relation to the type of latrines available and the share of the least poor population.
- The least poor households spent an average of 89'390 FCFA against 18'251 FCFA spent by the poorest.
- Funding sources for latrines are household income (82.3%) and to a lesser extent subsidies by NGOs or the government (13.8%), both of which can be combined.
- According to the qualitative survey, it seems that households are frequently waiting for subsidies to acquire improved latrines. Pending the acquisition of improved latrines, households are opting for traditional latrines at low cost.
- Several innovative experiences in latrine funding were successful and could be more widely applied in rural areas to increase the demand for latrines.

4.5 Opportunities, abilities and motivations to acquire latrines

4.5.1 Perceived availability of professionals and building materials

Household survey results

The share of respondents stating that there are professionals who can build latrines is generally very large, albeit with significant variations between areas: in the West, almost all respondents report that professionals capable of building latrines exist while in the South East, 68.3% say they exist, a difference of nearly 30%. It is the same for latrines construction material which, as reported by respondents, is less easily available in the South East. The lack of professionals and the unavailability of latrine construction materials could therefore help to explain the low share of improved latrines in this area.

In terms of socio-economic score (not shown in the table), of the most poor 76% said that there are professionals who can build latrines in the village or nearby, against 89.8% for the intermediate category and 90.2% of the least poor, which could suggest that either the poor have less access to professionals or they even do not know about their existence.

And indeed, in addition to the perceived problems of availability in terms of professionals and materials at the time of the survey, there are also some misunderstanding about whether professionals able to build latrines exist or if the necessary material is available, even if it represents only a small share of respondents: in the South East and South West respectively 3.6% and 4.7% do not know if professionals are available close to home and 6.2% and 5% do not know if building material is available close to home (not shown here). Looking at the socio-economic score, respectively 3.3% and 6.6% of the most poor do not know where professionals and equipment close to home are to be found, against 1.3 and 1.1%

respectively among the less poor. Also, it seems that not the entire population has access to the same information and that the poorest are particularly disadvantaged.

Table 18. Perceived availability of professionals and materials, stratified by region.

	Geographic area					Type latrine owned			Total
	West	Center	North	South East	South West	Improved	Traditional	No latrine	
Number of respondents with latrine	350	591	505	223	323	714	571	706	1991
% of respondents say that there are professionals who can build latrines nearby (Q6.1)	99.1	89.2	81.2	68.2	82.0	90.9	86.3	79.0	85.4
% of respondents stating that there are professionals who can build improved latrines nearby (Q6.2)	100	94.4	93.0	91.3	89.5	96.8	93.8	91.2	94.1
% of respondents reporting that the latrine facilities are available nearby (Q6.3)	84.9	72.3	81.4	67.3	80.9	83.0	80.9	69.6	77.6

Qualitative study results

The results of the qualitative survey shows that beyond the type of intervention approach used in the community, access to sanitation services also depends on the geographical accessibility of products and construction material suppliers. Even when people have the will, latrine acquisition capabilities may be affected by difficulties in access to goods and construction materials.

Thus, in the rural communities of Sindian and Diambaty, for access to building materials and other services, you must usually go to the capital. In Sindian, the conflict status is also a barrier to access to services, to the extent that investors are not motivated to offer their services in unstable or isolated areas. For other places visited, sanitation and hygiene services providers come spontaneously to households or are linked to funding availability.

Main results

- 85.4% of the respondents say that professionals able to build latrines exist close to home but there are significant regional variations for this answer.
- 77.6% say that the construction material is available.
- Some areas are affected by a lack of access to construction materials. The areas of instability or insecurity are particularly affected.

4.5.2 Satisfaction with the current place for defecation

Household survey results

The satisfaction with the place of defecation is largely related to the type of latrines available or not, it appears that respondents with improved latrines are less often dissatisfied (14%) (that is to say not very satisfied or not satisfied at all), than those who have unimproved latrines (46.9%) and those who have no latrines, the latter being massively dissatisfied (92.9%). This is similar to results of other studies showing that the majority of all respondents practicing OD were not satisfied with this practice (Sara et al, 2014). As for latrine owners, people who are very satisfied also use them more systematically than those who are not at all satisfied (84.3% vs. 76.7%).

Looking at satisfaction by geographic area, it is also clear that where the share of improved latrine owners is highest, satisfaction is greater: thus, respectively, 68.8% and 50.5% of the respondents are fairly or very satisfied with the place of defecation in the West and in the North where the share of households with improved latrines is highest, which is higher than in other areas. However, we also see that the fact of having improved latrines is far from ensuring full satisfaction, suggesting that improved latrines still have limitations.

For latrine owners, the main weaknesses of their latrines are **dirtiness**, **odors** and **discomfort** that stand out as significant limitations of latrines, even when latrines are improved. This suggests that the lack of hygiene and maintenance in general remains a significant problem. We should bear in mind that in terms of maintenance and cleaning, holders of improved latrines were better off with an average of 5.8 cleanings per week and use of water, disinfectant and detergent in 98.2%, 56.9% and 72.8% of all households. However, pit emptying undoubtedly remains a problem because for over 11% of households with improved latrines, nobody is responsible for emptying. The reasons for dissatisfaction are even more common among holders of traditional latrines where cleaning and maintenance are less frequent and are made with fewer cleaning products. Note that the dirtiness and smell are also disadvantages that were mentioned by non-owners, together with distance (57.7%) and lack of privacy (44%).

Table 19. Satisfaction with place of defecation and features of favorite / least preferred latrines, stratified by type of latrine owned and geographic area.

	Geographic area					Type of latrine owned			Total
	West	Center	North	South East	South West	Improved	Traditional	No latrine	
Number of respondents with latrines	134	139	412	114	165	714	571	691	1976
% of respondents not very or not at all satisfied with the place of defecation (Q6.9)	31.4	60.0	50.5	57.9	57.77	14.0	46.9	92.9	51.5
Frequency of the least preferred characteristics of the usual place of defecation (% Q6.5)									
- Dirt	19.4	32.9	86.3	64.1	67.6	50.1	58.1	52.3	53.2
- Smell	17.7	19.2	41.0	43.5	45.1	29.7	46.8	20.7	31.4
- Discomfort	28.0	19.7	17.0	20.2	21.9	24.1	28.0	11.9	20.9
- Distance	16.0	38.6	27.7	29.6	17.0	10.5	10.9	57.7	27.4
- Lack of privacy	21.1	36.6	28.1	25.1	27.2	18.9	22.8	44.0	28.9
Frequency of the preferred characteristics of the usual place of defecation (%; (Q6.4)									
- Cleanliness	38.5	23.6	83.2	51.6	51.2	64.0	50.8	31.4	48.8
- Privacy	48.6	36.3	28.2	40.3	52.8	63.3	59.7	19.8	47.1
- Accessibility	23.0	23.6	15.7	24.0	21.1	25.4	30.3	9.4	21.2
- None	19.3	41.4	5.9	19.5	8.7	0.7	2.45	56.7	20.8

It is interesting to note that almost 19% of the owners of improved latrines have also cited the **lack of privacy** as one of the aspects they liked the least about their latrines.

With regard to the preferred characteristics of the place of defecation, it is also interesting to note that **cleanliness** and **privacy** are commonly mentioned even though these two aspects (dirtiness and lack of privacy) also emerged as disadvantages of available latrines, be they improved are or not. These seemingly contradictory responses should likely be seen in the context of respondents and in their reference as to what are proper latrines or is ensuring privacy. The intimacy remains one of the main benefits sought from the construction of latrines, which had also been highlighted a study in Tanzania, where it was mentioned by 57% of all households (Sara et al, 2014).

Cleanliness and privacy are also reported as advantages of OD, although to a lesser extent, what suggests first, that latrines are not routinely used to ensure both privacy and cleanliness: one can for example imagine that when the latrines are situated in the middle of

the concession or near the center of life of members of the household, OD offers more privacy. Secondly, it also suggests that these respondents prefer not to have latrines rather than "bad" latrine, that is to say dirty ones and those not allowing privacy. A majority (56.7%) of those without latrines, however, find no advantage in the fact of not having latrines and therefore having to practice OD.

Qualitative study results

The qualitative survey focused mainly on latrines acquired in the frame of subsidy programs. Although the population greatly appreciates the availability of subsidy programs, it is nevertheless clear that the appreciation of the types of latrines proposed by subsidy programs in the visited areas depends on the adequacy of the proposed technology and the demands expressed by their user. In focus group discussions, participants discussed their low satisfaction with the proposed latrines, which in their view do not take into sufficient account the people's needs, their contexts or environmental constraints (access to water) and have not sufficiently involved different populations in the decision which types of latrines to promote. Indeed, the participants reported that the intervention programs and projects are often based on defined templates and thus beneficiaries feel constrained by the grant, which does not encourage ownership of the latrine.

In the visited areas, types of latrines that have been most heavily promoted by the projects are SanPlat, the pour-flush toilet with single or single or double pit and VIP latrines with direct pit (by PEPAM).

The focus group discussions also reveal that the pour-flush model is globally appreciated by the population and is generally desired by women who want to acquire improved latrines. In their view, this type allows them to clean with plenty of water and cleaning products. It also presents more comfort compared to other models (VIP, SanPlat or traditional). According to the recipients, this model emits less odor, offers more security because the pit is not directly related, and does not present any risk of subsidence. However, pour-flush toilets have the disadvantage of requiring a lot of water even as the rural areas there are difficulties of access to water (Médjek (Sindian), Darou Salam Cissé (Djambaty), Keur Momar Mbayang and Ndiop Ndianguene (Nioro Alassane Tall), Gollam (Bayakh), Ndere (Mbaye)). When the water becomes scarce, a return or persistence of OD is observed.

As for the VIP latrine with direct pit that are promoted, they do not necessarily comply with the request and needs expressed by the population of the five study areas, even if people want improved latrines. For example, VIP latrines with direct pit are not very popular even if beneficiaries admit they are designed to solve a specific problem. The reasons are related to some discomfort inherent in the design of the infrastructure: narrowness, heat from the direct pit, that they do not completely seal odors. Furthermore, the depth of the pits was deemed small and not to take into account the household size and level of use of the toilets. Due to this dissatisfaction, in some regions such as Matam a trend has been observed that beneficiaries change these structures once delivered (eg with the execution of connection works to evacuate the excreta towards the VIP pit). These practices are also carried out with the aim of annihilating the need to empty pits as the latter practice is not common.

Also in Thies, the program has built latrines with an S-bend when the preference was for direct latrines because of problems with water supply. Furthermore, the surveyed population regretted the rigid approach that rendered communication not sufficiently developed: technical choices were made and imposed as if they were self-evident, without explanation (eg dimensions of the pit).

Another aspect that was also raised in many discussions is the configuration of the latrine, which does not provide sufficient privacy. This may be related to the location of the latrine, the orientation of its entrance, and the type of superstructure. For example in Bandafassi (college Sylla Counda Diakha), latrines built for the students and teachers are abandoned because their location does not offer privacy:

> *«Imagine you cross the entire school ground with your kettle to go to the latrine, students will see you and if you need a bit time, they will say 'ah madam went to toilet' and as that, everyone will know. This is why so many students as well as us, nobody uses them. Students prefer to go home and we wait to return to use our own latrines*» **(key informant interview, 15_Kédougou_Bandafassi_Sylla Counda Diakha, college teacher).**

At the individual household level, the interviewed people have reported that the location of the latrines could be a problem because for its identification, grant programs do not always take into consideration the needs of beneficiaries. Project technicians take the decision of where the toilet will be installed (a decision based on scientific evidence) but they do not take sufficient account of the social needs of household members:

> *«Well I think one of the areas of intervention must first be access to clean water that people have access to water, the second area of intervention is that there is a communication before, during and after the sanitation infrastructure construction with the full participation of the people. That is to say that they should not draw up a model and come to impose this but ask them what the architectural model they want for latrines is, people will decide. But if they decide on a fix solution that is implemented in the village, people are not going to use it. People are like that, it is necessary to discuss with them, decide something and build it and then they will use it»* **(key informant interview 6_Louga_Coky, district chief physician).**

Many beneficiaries of subsidy programs in different regions also consider that although these facilitate the acquisition of latrines, their quality is sometimes a problem, particularly at the infrastructure level. The complaints focus on several points: shallow pits, no separation between the pit and the latrine, iron of poor quality and lack of cement, poorly constructed or absent superstructures (without iron support).

It turns out that the approach to execute the work via free entrepreneurs or companies sometimes poses problems, as is the case in Ziguinchor. Indeed, many issues were raised in subsidy programs that were related to companies entrusted with the implementation: unskilled workers mobilized for the implementation – for example, in Gollam, drivers and known individuals were coopted as masons when they are not qualified (Focus group discussions, men with and without latrines) – weak enforcement of building standards, poor quality of work. If it turns out like that, it is because these actors, in the opinion of the agents of decentralized technical services, have not been sufficiently monitored, both by donors as by their local communities. The lack of involvement of the latter in the selection of contractors and masons (Niakhène, Bayakh) or monitoring of their work is considered the main cause of this situation.

This also raises the issue of the training of workers whose practices are different: if the NGOs are directly involved, the approach with contracts with local workers is promoted and the workers are often trained before being sent into the field. If it is businesses or self-employed workers that are involved, masons are often not trained and are not local.

It is also noteworthy that more and more, programs have offered the construction of the infrastructure of the latrine, but the superstructure is left to the household. If this approach is to reduce construction costs while making households to contribute, this has led to dissatisfaction. The fact that there is no superstructure lowers the quality of the latrine in the eyes of program beneficiaries. Finally, another drawback of subsidy programs is linked to the sometimes very long delay between membership, contribution and achievement of work (sometimes over a year).

Regarding OD that remains a widespread practice, the statements of the interview partners identify more disadvantages than advantages of this practice. It is seen as a necessity in the absence of latrine in the household.

«It is unfortunate because many of those who do so feel some discomfort. In villages that are a bit more developed, people are embarrassed by the idea of doing so. It's a remark I made as villagers, I know something»

The sense of freedom offered by OD as opposed to the sensation of containment in a latrine, the smells or even the heat, reflects more a sense of dissatisfaction with latrines than a benefit of OD. In addition, OD has the disadvantage of violating the privacy of women in particular. In addition, the environmental conditions are not always conducive and expose more people who practice OD to risks of insecurity (snakebites) or environmental factors (rain, wind, sun):

« Anyway, we do it, but it's because we have no choice. There were no latrines that's why we do it, because nobody wants to be seen by her parents-in-law or her children».

«Sometimes, too, we did not even finish the OD when people pass by and that's why we get up without having finished. If the need is still there, you wait until they passed and go back to OD. And this is linked to shame that goes with it, because the people know what you're doing».

«There is no advantage of OD because sometimes it is hot and walking to the bush is very difficult».

«Sometimes there also is rain and if you want to do OD, you will be obliged to go out in the rain so really there is no benefit to OD ».

«For a disabled, it is not easy because there is a distance to go to practice OD and that just because we have no latrine at home. Sometimes even I stumble when coming back» ***(focus group discussion 5_Matam_Oréfondé_Ngulum, women without latrines).***

Main results

- The more improved latrines are, the more their owners are satisfied with them.
- 92% of the respondents without latrine and therefore practice OD are dissatisfied and 56.7% of the respondents without latrine find no advantage in practice OD.
- The qualitative survey confirms that OD is seen as a necessity and persistent practice reflects more a sense of dissatisfaction vis-à-vis existing latrines than a benefit of OD.
- Having improved latrines does not imply that respondents are consistently satisfied, particularly because of the dirtiness, odors and discomfort of latrines. These weaknesses are particularly strong for traditional latrines.
- Respondents without latrines also deplore the dirtiness of their defecation place, the distance and the lack of privacy.
- The lack of privacy is also mentioned as a limitation of improved latrine.
- Latrines that were installed with the help of subsidies may also be a source of dissatisfaction as households feel they have not been sufficiently involved in choosing the type, their technical specifications and installation.
- The quality of the latrines built in the frame of subsidy programs is not always satisfactory, especially because of the lack of monitoring of their construction and of the qualification of workers which may be insufficient.

4.5.3 Ideal latrines

Household survey results

In terms of the preferred sanitation **infrastructure**, the double VIP emerges as the first choice for 38.6% of the respondents, followed by the pour-flush toilet (19.8%) and single VIP (19.6%). These preferences in terms of sanitation facilities vary by region and whether the respondents had improved latrines. Thus, pour-flush latrines are particularly popular among the holders of improved latrines, mainly located in the West. In this region specifically, over 15% of the respondents cited the 'English chairs "as their favorite latrine, this very "European" latrine being particularly popular. Also note that for non-owners of latrines, traditional latrines are the preferred type of latrines for nearly 5% of all respondents.

The main expected characteristics of the **superstructure** of latrines that were reported by respondents are that they have walls of at least one and a half meters as mentioned by over 83% of the respondents and a door by 84.5% of respondents, which is linked to the desire to preserve privacy as mentioned above. The presence of a roof is also an important feature for 67.5% of the respondents with differences by geographic area and type of available latrines. This feature seems to be less important in the West (44.9%) and for holders of improved latrines (59.2%). The presence or absence of a roof is less directly related to privacy but also emerges as important as it allows individuals to protect themselves from the rain and sun.

In general, it appears that respondents who have a door or a roof over their latrine are more satisfied than those who do not: respondents whose latrines have a roof are 1.57 times more satisfied or very satisfied with their latrine than those who have no roof over their latrines (87.6% vs 55.6%). As for respondents latrines with a door, they are 1.43 times more satisfied or very satisfied than respondents whose latrines have no door (79.6% vs 55.7%).

As for other features such as a covered pit, a cemented floor, lighting, ventilation, etc., which are more related to comfort, they finally appear to be secondary.

Table 20. Attributes expected of the superstructure of the favorite latrines, stratified by type of latrine owned and region.

	Region					Type of latrine owned			Total
	West	Center	North	South East	South West	Improved	Traditional	No latrine	
% of respondents reporting the following type of preferred latrines (Q6.8) [16] (Q6.8)									
- Double VIP	24.3	46.1	43.8	34.5	35.1	35.0	43.6	38.6	38.7
- Simple VIP	7.1	25.4	14.9	30.5	22.5	9.9	22.4	27.1	19.6
- Pour-flush	26.9	9.8	26.9	13.0	23.7	27.3	17.2	14.3	19.8
- DVL	15.4	11.2	2.4	2.7	7.4	11.3	6.7	6.1	8.1
- Traditional	0.0	2.4	3.6	5.8	1.9	1.0	1.6	4.9	2.6
- SanPlat	4.3	1.0	1.6	6.7	4.3	2.7	3.0	3.1	2.9
- English chair	15.1	0.2	0.0	1.4	0.3	0.3	2.0	4.7	2.9
- Ecological	0.6	0.3	1.2	0.9	2.5	0.7	1.4	1.0	1.0
- Public Latrines	0.9	3.1	5.0	4.5	2.2	3.5	2.6	3.3	3.2
- Open defecation	0.0	0.0	0.6	0.0	0.0	0.0	0.2	0.3	0.2
Frequency of the expected attributes of latrines (% Q6.7)									
- Walls + 1.5 m	95.7	86.3	78.2	74.4	77.5	85.4	79.5	83.8	83.1
- Door	92.3	75.1	89.7	85.7	84.0	84.3	83.5	85.3	84.5
- Roof	44.9	65.8	77.4	81.6	70.2	59.2	75.3	69.6	67.5
- Covered pit	24.0	12.2	12.7	3.6	10.2	15.8	9.5	13.3	13.1
- Hard floor	11.7	22.2	2.4	9.9	13.9	8.8	12.8	16.2	12.6
- Lighting	19.7	13.4	21.0	22.9	24.3	19.8	23.5	15.4	19.3
- Ventilation	10.6	20.0	9.3	12.6	11.4	16.3	10.7	12.7	13.4
- Fly screen	0.9	3.9	7.3	2.2	1.9	7.1	2.6	1.1	3.7

[16] Seules les latrines dont l'association avec le type de latrines détenues est la plus significative sont présentées dans le tableau

Qualitative study results

The pour-flush model is globally appreciated and in general desired by women who want to acquire improved latrines. For women, the pour-flush latrines allow to wash with plenty of water and cleaning products. It also offers more comfort compared to other models (VIP, SanPlat or traditional). According to the recipients, this model emits less odor, offers more security because the pit is not directly connected, and presents less risk of subsidence.

It is important that the pit of the latrines is not too narrow, manages to remove odors and is sufficiently deep.

Preserving privacy is very important and where this criterion is not met, user satisfaction is lower. This means that the place where latrines are installed should be selected based on this criterion.

Main results

- Double VIP latrines are preferred by 38.6% of the respondents followed by pour-flush and simple VIP (19.8%) latrines.
- The main characteristics expected of the superstructure of latrines are the presence of walls of at least 1.5m height (83%) and of a gate (84.5%), which is linked to the desire to preserve privacy, and also of a roof (67.5%).
- The pour-flush toilets are among the most favorite latrines of female respondents, especially because they allow ensuring improved maintenance and cleaning and therefore bettering hygiene.
- Ideal latrines guarantee the protection of privacy.

4.5.4 Decision taking

Household survey results

The issue of decision-making is important but the response to the question is highly dependent on the person interviewed in the frame of the study as the respondent has a natural tendency to declare to be the person who makes the decision, which may be a bias in case this obscures the role of other household members[17]. As part of the study, those targeted were the head of household or, in his absence his wife, provided that she is able to answer questions on sanitation and willingness to pay. The vast majority of the respondents were heads of households (74.1%) of which 7.2% were women. The remaining respondents were mostly the wives (18.8%) or other men, mainly the son of the household head (7.0%).

Table 21 provides an overview over who makes the decisions in the household across all respondents. It is noted that the head of household is the key person who makes the decisions, whether in relation to important household expenses or to the issues related to latrines since it is he who makes the decisions in more 80% of cases. The key role of the male head of household in decision-making was also found in other studies, including that of Diallo et al (2007) in rural Niger. When households have traditional latrines, the role of the head of household in the decision making is even more pronounced, which means that this is also the case in the South West and South East where households with traditional latrines are more numerous.

In almost 11% of all cases, it is, however, the spouse of the household head who decides although this varies by region: the role of the partners is most important in the West and in

[17] Of note, if the respondent is the head of household, in almost 98% of all cases, he confirms to be the decision maker on financial aspects. If the respondent is the spouse, that one confirms being the decision maker in 65.7% of all cases, and the head of household is only mentioned in 28.2% of all cases. Last, if the respondent is another person, he declares in almost 51% of the cases to be the decision maker, and the head of household is named by only 40.8% of all respondents in the category "other".

the Center. Finally, in the case of decision-makers classified as "other", it will often be a son or a brother.

Table 21. Decision to renovate or build latrines, stratified by type of latrine used and region (percentage of respondents).

	Region					Type of latrine owned			Total
	West	Center	North	South East	South West	Improved	Traditional	No latrine	
Decision on financial matters (major expenses; Q6.11)									
- Head of household	78.3	77.0	82.4	87.4	85.5	77.7	84.6	81.8	81.1
- Spouse	14.3	14.8	9.3	7.6	7.4	12.9	9.3	11.3	11.3
- Head of household and spouse	2.0	0.2	0.4	0.0	1.5	0.8	0.5	0.9	0.8
- Other	5.43	8.1	7.9	4.9	5.5	8.5	5.6	6.1	6.8
Decision for acquisition of latrines (Q6.13)									
- Head of household	78.6	77.0	82.6	87.0	84.6	78.0	84.1	81.6	81.0
- Spouse	13.7	14.6	8.9	7.6	7.7	12.3	9.5	11.2	11.1
- Head of household and spouse	2.3	0.3	0.4	0.0	1.5	1.0	0.7	0.9	0.9
- Other	5.4	8.1	8.1	5.4	6.2	8.7	5.8	6.4	7.0
Decision for improvement or renovation of latrines (Q6.14)									
- Head of household	77.5	74.9	82.5	85.4	84.3	77.9	84.2	71.4	80.6
- Spouse	15.5	13.8	9.8	9.5	7.0	12.5	9.3	19.1	11.2
- Head of household and spouse	1.5	0.4	0.0	0.0	2.0	0.9	0.7	4.8	0.8
- Other	5.5	11.0	7.6	5.1	6.7	8.8	5.8	4.8	7.4

Qualitative study results

Heads of household are considered to be the key decision makers by subsidy programs: they are virtually the only ones to be approached in a latrine construction process and to mobilize the contribution asked in terms of financial and human investment.

However, this individualistic vision (head of household) should not obscure the collective dimension in the decision to acquire latrines. If a man is the head of household, the decision to build the latrine can also come from any member of the family, while depending only on the financial feasibility.

Women have a greater responsibility for the management and maintenance of latrines. However, beyond this role, they contribute ever more to the financing of latrines. We must therefore revise the classical approach that considers the man as the central actor in the process of decision making and financing of latrines and take into account recent developments that enable women to play a role in this field. To deny it may mean that only men are consulted upon introduction of the program, as has been the case in several localities. Women are those who attend certain awareness raising sessions on sanitation and hygiene, and can influence their spouses or relatives towards the construction of latrines.

Main results

- The head of household is the main person who takes the decisions.
- When being introduced, subsidy programs mainly approach men who are seen as key decision makers.
- The role of women in decision making should not be obscured insofar as they also contribute more and more to the financing of latrines.
- Participation in decision making is linked to participation in the financing of latrines.

4.5.5 Willingness and capacity to pay

Household survey results

If respondents are asked whether or not they think that one day they will acquire the latrines of their choice, there is a small majority that thinks that this were possible (53.1%). And if one considers the type of latrine they want to get, there remains a majority thinking that this is only possible if this is the VIP double (61.5%) and the DVL (59.5%). Note that only 30% of the respondents whose latrines of choice are traditional latrines think they can one day get it, which may suggest that respondents who aspire to traditional latrines are part of the poorest population category.

Table 22. Opinion on the opportunity to one day acquire the latrine of choice, stratified by latrine of choice and socio-economic score (percentage of respondents).

Expecting to acquire the latrine of their choice one day	Type of latrine of choice							Socio-economic score		
	SanPlat	DVL	Simple VIP	Double VIP	Pour-flush	Ecosan	Traditional	Poorer	Intermediate	Less poor
Number of Respondents	59	163	401	782	402	21	52	611	674	546
Yes	44.1	59.5	44.9	61.5	47.8	33.3	30.8	41.4	53.6	59.0
No	55.9	40.5	55.1	38.5	52.2	66.7	69.3	58.6	46.4	41.0

And indeed, we see that the poorer the household is, the less they thinks they will one day be able to acquire the latrine of their choice: 41.4% of the poorest against 59.0% for the less poor. Similarly, with regard to the question "Would you acquire the DVL for 120,000 FCFA," we find that the higher the household is poor, the less they responds affirmatively to the question, 28.6% of them respond positively, against 46.9 % of intermediate categories and 51.6% of the richest. Price is probably the main problem but we must also consider that preference in terms of latrines does not necessarily relates to the type of latrine. Thus, if we put the same question to acquire VIP double latrines to 80,000 FCFA, the differences between socio-economic categories become blurred, 45.6% of the poorest declaring they want to buy it against 53.2% for the richest. Thus, the double VIP latrines are among the favorites, even for the poorest.

In the household survey, 18.6% of all respondents said they could not pay anything towards the cost of the latrines of their choice and only 11.6% of the respondents claimed being able to pay the full price of their latrines with is a low capacity to pay directly. This percentage is 10.1% among owners of improved latrines, 10.4% for owners of traditional latrines and 14.3% for respondents declaring practicing OD.

If we now consider the average contribution to acquire latrines of choice if unable to pay these latrines in their entirety, we see that the amount of the contribution according to the socio-economic score does not vary much whether respondents are among the poorest or least poor category: the average amount of the contribution to purchase preferred latrines in case of inability to pay in full is 24'154 FCFA for the poorest against 26'804 FCFA for the

least poor. Geographical variations are somewhat more marked especially for the West where the average amount of the contribution is lowest, 19'256 FCFA. This is surprising since this area has a larger share of the population corresponding to the least poor category; this is also where there are more households with improved latrines. In fact, this figure is influenced by the large share of people who said they could pay nothing (39.1%), and one wonders if it is not a matter of understanding the problem in some way, as many households already have improved latrines, they do not consider investing extra money in their latrines and therefore said they would not provide any additional contribution.

Varitation is also limited depending on whether the household has a latrine or not, or they have an improved one or not: their contribution is then between 23'534 and 27'189 FCFA.

The average contribution to acquire one's favorite latrines is interesting insofar as it approximately represents the cost of a traditional latrine. This suggests that most households are able to pay for at least traditional latrines. Also, if one refers to the average expenditure declared to acquire latrines (about 60,000 FCFA), they are far superior to the cost of a traditional latrine and suggest a real potential in terms of acquisition of latrines although the poorest households have real difficulties to acquire latrines.

Looking at the average monthly payments envisaged in the event of payment by installments, the differences are limited is respondents are stratified by socio-economic score, between 4'789 and 6'338FCFA even though one might think that the wealthiest respondents who often already have improved latrines (65.9%) would have significantly more money and a greater ability to invest in the latrines of their choice compared to those who have unimproved latrines and even more so compared to those who have no latrine.

Table 23. Ability to pay, stratified by the socio-economic score and the region.

	Region					Socio-economic score			Total
	West	Center	North	South East	South West	Poorer	Intermediate	Less poor	
Average amount of the contribution to purchase preferred latrines if unable to pay in total (in FCFA; Q 6.28)	19.256	27.960	28.846	23.149	24.555	24.154	26.943	26.804	25.564
Average monthly amount of the contribution to purchase preferred latrines in case of payment by installments (in FCFA; Q 6.29)	4.164	5.783	6.350	5.071	5.851	4.789	5.673	6.338	5.573
% of households that rarely or never borrow for basic needs (Q6.32)	54.0	60.7	29.1	61.9	71.7	57.3	52.1	54.4	53.4
% of households that rarely or never borrow for special occasions (% Q6.33)	64.0	79.3	30.3	69.51	75.4	65.9	64.1	61.4	62.5
% of households with debt at the time of the survey (Q6.34)	42.6	42.5	55.3	38.6	31.1	41.9	44.6	42.3	43.5
Frequency of the main reason for the debt encountered (Q6.35)									
- Food	81.9	65.7	93.6	77.9	71.3	80.6	80.1	76.8	79.3
- Investment in concession	6.7	13.9	0.7	4.7	8.9	6.3	6.1	9.4	6.9
- Health	2.7	4.4	1.4	3.5	5.9	4.4	2.4	3.1	3.2
- Refund	3.4	6.8	1.4	1.2	2.0	2.4	4.0	4.0	3.4
- Agricultural expenditure	0.7	3.2	1.8	4.7	1.0	2.0	2.0	2.2	3.9
- Other	4.6	6.0	1.1	8.0	10.9	4.3	5.4	4.5	3.3

	Region					Socio-economic score			Total
	West	Center	North	South East	South West	Poorer	Intermediate	Less poor	
% of households reporting to borrow money for the latrines from the following main sources (Q6.31)									
- Family	27.1	36.8	50.5	41.7	31.4	41.9	39.0	37.8	38.2
- Friends	16.0	7.5	37.0	32.7	25.9	23.2	21.8	23.1	22.3
- No one	38.0	41.0	19.6	31.8	39.1	35.4	34.7	29.7	33.7
- No need to borrow	25.4	11.7	16.6	11.7	13.2	12.1	13.7	19.7	15.6

Also if one considers the share of households that rarely or never borrow, whether for basic needs or for special occasions, we note that there is no big difference between the least poor and poorest: nearly 55% of households rarely or never borrow to cover their nutritional needs, which means that nearly 45% regularly or occasionally borrow. Also note that at the time of the survey, over 43% of respondents had a debt, with few differences between socio-economic strata. In general, these results suggest the possibility of using the financial system to support households in acquiring latrines.

Furthermore, 15.6% of all respondents said they did not need to borrow to build or renovate latrines which is a limited number and tends to confirm a reduced ability to pay for latrines for most respondents. This is supported by the fact that nearly 34% of the respondents report having no one from whom to borrow money. The least poor households are slightly more likely to have no need to make a loan to renovate their latrines (19.7% against 12.1% and 13.7% for the poorest households and those belonging to the middle category). They are also slightly less likely to have no one from whom to borrow money to renovate their latrines (29.7% against 35.4% and 34.7% respectively), but if you consider the ability to pay of households by socio-economic score it does not seem to be fundamentally better among the least poor households.

Qualitative study results

The low capacity to pay is also apparent from the qualitative survey where focus group discussions have highlighted the weak financial capacity of households to justify the non-acquisition of latrines. This has prevented some households to participate in subsidy programs that required a relatively appropriate contribution (8,500 FCFA for a refundable deposit for example). Although there are households that undertook the construction work with their own resources, the quality and the durability of structures are inadequate. Indeed, in areas where only a CLTS intervention took place, the majority of the traditional latrines are built with a very limited life span and risk collapse during the rainy season. And when the construction of latrines must be done without subsidy, households often opt for the traditional basic latrine built with tires (Thies) or wooden stakes (South). This kind of work is inexpensive (10,000 FCFA maximum, including all expenses according to men in focus group discussions).

Women without latrines argue that it is the lack of resources that forces members of their households to use the latrines of their neighbors or practicing OD. Therefore, the basic willingness to pay is present but the feasibility is a challenge. They also lean more to relying on subsidies as their neighbors have already benefited and now have latrines that were acquired cheaply.

According to men in focus group discussions, people are very reluctant to pay the full cost of a latrine. Nevertheless, they agree to contribute, within the framework of co-payments and material contributions (water+sand+digging) rather than financial ones. Furthermore, the level of co-payment also depends on the overall cost of the latrine. They propose that latrine promoters negotiate with recipients and propose latrines. Depending on the overall cost, the beneficiary will be asked to provide the amount he is willing to pay and the desired payment terms.

The acquisition of traditional latrines thus is an alternative until a construction or subsidy project is implemented to provide sustainable and modern latrines, and for the population, the most appropriate financing modality remains a subsidy approach without which it seems difficult to achieve universal coverage with sanitation infrastructure. The interventions without subsidy (CLTS only), beyond their appropriateness, are not sufficiently taken up by people accustomed to co-payments. The latter think they are not able to undertake themselves the construction of the work as they face financial, social, cultural and geographical barriers.

There is therefore a positive view towards co-payment that shows a willingness to invest and in general, the co-payment model is well received. Asking a contribution from households avoids claims and disputes related to the fact that some households are not targeted as is the case when free latrines are provided. The positive view towards co-payments indicates that the willingness to pay and household resources are real and in the focus group discussions, some men without latrines even came with their contribution because they thought it was a census for the construction of latrines (FGD Keur Maba). In Keur Maba, a man who already owns a latrine said during the focus group discussion that they had sold their livestock to acquire a latrine. This means that people are willing to pay, but not much because of their financial limitations.

Women stressed the need to end quotas that limit the number of beneficiaries, which can help to resolve issues related to the availability of latrines. For men, there is also a strong preference for the subsidy approach. Through these programs, several concessions have benefited from at least one latrine per concession in some villages. Even in places where the quality of the work is reportedly not good (Bayakh and Gollam, Keur Gallo, Keur Maba ...), people are always enthusiastic about joining the programs because they believe it is the only way to end OD and this is the best way to acquire an improved or modern latrine.

Co-payments are also considered as a clear evidence that the household is willing to acquire the latrine, has an interest and thus agrees to invest in kind or in cash, and has the intention to maintain it well because of the investment that it has contributed.

The amounts requested or contributions in kind (digging, accommodation for masons, water..) are perceived as acceptable compared to the total cost of the work. Indeed, the population sees the cost of a latrine in its entirety, that is to say taking into account the cost of the superstructure and the infrastructure, in terms of money, time and materials:

> *«soo xoolé li nu ci def ci simaa ak feer, ak li nu fay mason bi, nga xamni ndimbël la…». (If you become aware what we put in in terms of cement and iron and what we we paid to the mason, you realize that this is considerable support).* **(focus group discussion, Gollam, men with and without latrines)**

People insist that a latrine costs no less than 100,000 FCFA and contributions between 10,000 and 25,000 FCFA is a symbolic participation in their construction. They also think that this is a support offered to them because if they had to build their latrines themselves, it would be more expensive. In Sindian, women think that if a household head is contributing, he will become more aware of the need to properly maintain it. These results indicate that some financial or in kind contrbution is considered the best guarantee for awareness of the need to properly maintain these structures.

If the low capacity to pay has been put forward to justify the need for subsidy programs, this may also suggest somehow a lack of willingness to pay for latrines in the sense that the acquisition of latrines is imperatively linked to the availability of a subsidy. Indeed, one of the top constraints to the acquisition of latrines raised by participants was the lack of funding, especially in areas where no interventions took place. Households are not willing to fully finance latrines with their own means but are rather waiting for subsidy projects. It seems that the willingness to invest financial resources in household sanitation infrastructure is not well developed. The positive assessment of co-payment indicates a willingness to invest, which depends on the existence of the contribution of others. We realize that households have access to resources, but there is a problem in prioritizing investment of financial resources of the household into sanitation.

Also, it seems that the subsidy policy has created dependency, and a "**wait-and-see attitude**" among the population. It is true that the benefits of these subsidies are the increased access to sanitation facilities, and the disadvantages in terms of responsibilities are negligible for households. However, this makes it difficult to convince the people and develop a consumer position as stipulated in the new sector policy: the subsidy approach could be the main obstacle to the adoption of "client" behavior as advocated by the new sanitation sector policy because the subsidy policies eliminated self-financing (SRA Thies).

For some institutional actors (SRA Matam), it is premature to talk about "clients" when people are still struggling to mobilize inputs required by the subsidy programs. The project supervisor of the NGO Eau et Assainissement pour l'Afrique (EAA) points out that even with a subsidy, the programs fail to enlist all the heads of household because many people withdraw when they understand the need to provide a co-payment. This is due to the fact that households are accustomed to subsidies. Working without the co-payment model does not seem feasible in the Senegalese rural context.

> «Well, the subsidy approach is a necessary evil. Personally, as a technician and with the little experience I have in rural sanitation, based on some visits we did to some villages, well we realize that project people still tend to see the rate of access to sanitation go crescendo that's a fact. Now it's true that you can try to adopt the CLTS strategy to try to get people to pay their own latrines. But in my humble opinion, currently this requires that the project continues to accompany people as I said earlier, it is a necessary evil» **(key informant interview 20_Tambacounda_Tambacounda_JICA).**

Besides, there are the constraints linked to the context, the intervention periods often coincide with the lean season which does not facilitate the implementation of co-payments:

> *«danuy bayi ba nit ni du nu am benn dërëum nu doora fé nëw» (they wait until the lean season when the heads of family do not have anything to offer ».* **(village head, Thilla Keur Momar Mbayang).**

The timing of the intervention is considered very unsuitable so that not everyone who wants to use their services are actually enrolled. They suggest instead to intervene after the harvest, in the period of "lolli", or "barigo bu taxaw" (availability of crops such as peanuts) as they say in the Saloum.

Similarly, the time limit to raise the sum poses problems for the population. In this regard, in focus group discussions, men not already owning latrines made much of the fact that even for the disposition of taxes and duties, village leaders are warning the population early and leave them six months at least mobilize the funds. However, programs that leave them three months and in circumstances where spending priorities are food and agriculture, it is difficult to get everything aligned. In this respect, possibilities for extension are discussed: monthly payments, a longer period, access to credit...

Main results

- 53.1% of all respondents believe that one day they can acquire the latrines of their choice but the poorer the household is, the less likely it judges the possibility this will ever be possible.
- The average contribution to acquire the favorite latrine in case of inability to pay in full is 24'154 FCFA for the poorest against 26'804 FCFA for the least poor, representing the approximate cost of traditional latrines but well below the average cost to acquire latrines (60,000 FCFA).
- The estimated average monthly contributions in the event of payment in installments ranges from 4'789 to 6'338 FCFA and is linked to the socio-economic score.
- Although the ability to pay seems to be relatively limited, it is, however, real.
- Nearly 45% of the households regularly or occasionally borrow, and more than 43% of the respondents had a debt at the time of the survey.

- Households are reluctant to pay the full price of latrines and favor co-payments. This indicates a certain willingness to pay by households, however, the amount of the contribution is minimal.
- Traditional latrines are an alternative until the implementation of subsidy programs that provide Improved and sustainable latrines. Households are waiting for such programs to acquire latrines suggesting a certain dependence on external supply.
- The customer approach proposed by the sanitation sector policy does not seem realistic at this time, considering that the population often fails to mobilize the necessary amount for its contribution as part of the co-payment scheme.
- The timing of the subsidy programs should be carefully aligned with the availability of resources of the rural population.

4.5.6 Barriers to build/renovate latrines

Household survey results

The main obstacles to the installation or renovation of latrines that were reported by respondents are related to their ability to pay: it is firstly the cost of latrines that is considered too high for nearly 59% of the respondents, and secondly, insufficient savings and/or difficulties in obtaining a credit. Similar barriers have been found in Tanzania and Ghana (Sara et al, 2014; Jenkins and Scott, 2007). This suggests that households are unable to meet the full cost of a latrine, which is also supported by the fact that 18.6% of the respondents said they can not pay anything at all to acquire the latrine of their choice.

Tableau 24. Main obstacles to the installation / rehabilitation of latrines, stratified by region and type of latrine owned.

	Region					Type of latrine owned			Total
	West	Center	North	South East	South West	Improved	Traditional	No latrine	
Number of respondents	350	590	505	223	212	714	571	708	1993
% of respondents reporting the following major constraints (Q6.36)									
- Cost	62.7	33.2	83.6	59.7	65.3	55.2	61.1	62.0	59.3
- Problem with savings / credit	37.4	22.5	52.7	28.5	26.5	34.6	29.6	37.2	34.1
- Competing priorities	18.9	33.2	26.5	16.6	15.7	21.7	22.8	28.1	24.3
- No constraint	26.0	12.0	11.1	12.6	18.5	24.2	21.7	1.3	15.4

If one looks at the geographical inequalities, the cost is often a barrier in the North where also the difficulties to save and/or to obtain credit for the construction or renovation of latrines are high. Together with the West, this area is one of those with the lowest share of the poorest socio-economic status, and thus the response can not be directly linked to the socio-economic situation. Moreover, we see that in general, the cost as a main obstacle is not particularly often mentioned by the poorest households (Table 25). This could suggest that the costs of latrines are actually higher in the North.

Table 25. Main obstacles to the installation / rehabilitation of latrines, stratified by socio-economic score.

	Socio-economic score			Total
	Poorer	Intermediate	Less poor	
Number of respondents	604	666	529	1799
% of respondents reporting the following major constraints (Q6.36)				
- Cost	56.0	61.0	56.1	57.9
- Problem with savings / credit	29.1	33.2	39.5	33.7
- Competing priorities	23.7	26.0	25.7	25.1
- No constraint	13.1	12.0	21.6	15.2

Least poor households declare more often (21.6%) not to face any obstacle to acquire a latrine.

The household survey also reveals that for almost 24% of the respondent, the construction/renovation of latrines is not a priority, suggesting that other expenditure categories are more important than latrine construction or renovation.

Looking more closely at priority expenses once basic needs have been covered, the 4 main areas are: acquisition of agricultural supplies (35.5%), building/renovating latrines (31.6%), buying buffaloes, cows or sheep (31.2%) and fixing/renovating the house (30.4%). The construction/renovation of latrines thus is in strong competition with other priorities.

If the socio-economic status is considered, it becomes apparent that the priorities remain similar across classes. With regard to latrine construction or improvement, it seems a priority for the poorest as 38.4% of these respondents prioritize it. In contrast, it is a less urgent task for the least poor, who often already have a latrine at home.

Table 26. Major expenses reported by respondents when money is available by socio-economic score.

	Socio-economic score			Total
	Poorer	Intermediate	Less poor	
Number of respondents	604	666	529	1799
% of respondents declare the following priority expenses if money is available (Q6.18)				
- Agricultural inputs	38.6	37.8	34.0	37.0
- Construct / improve latrines	38.4	37.7	24.4	34.0
- Bulls, cows, sheep	33.3	31.1	29.7	31.4
- Repair / construct house	28.0	32.7	33.8	31.5

In general, it appears that the main priorities revolve on one hand side around the home improvements, including the construction of latrines, and on the other hand around the consolidation of agricultural assets required for supplementing or providing the household income given that nearly 56% of households heads report principally being engaged in agriculture, livestock and fisheries.

Qualitative study results

Specifically in parts of the South East and the North, geographical and environmental constraints make it difficult to acquire latrines. Indeed, in Kédougou and Matam, the rocky nature of the soil does not favor the building of latrines: the digging requires to employ professionals and the cost is not always acceptable for households. In case it can be born by the household, the work may last longer than expected because of not having adequate material for efficient digging.

Another problem faced by some households, especially in the project areas, is the lack of manpower to dig or carry out some work left to the household in the grant framework. This situation occurs more among pastoralist communities where people often migrate in search of pasture for cattle. Moreover, it is an issue in high-emigration areas where young people are lacking and where only women, children and men of advanced age remain. The availability of labor for digging, fetching bricks, and transporting water is therefore limited.

Above all, the qualitative survey shows that financial limitations, and more generally the lack of resources, are put forward to justify the non-acquisition of improved latrines. We learn that in many households, parents who say they do not have the financial means to build improved latrines build traditional latrines from products found locally and that are free.

The population does not seem to have a wrong perception of the cost of latrines. They mention a improved latrine costs no less than 100,000 FCFA, which is consistent with the allocated amount indicated by the household survey respondents. Furthermore, people are fully aware that the contributions requested in the framework of co-payments are very minimal compared to what they would pay in the absence of subsidy programs. Indeed, they assess the overall cost of a latrine by considering the cost of the infrastructure and the superstructure with all that this implies in terms of material costs and labor; not counting the time and effort it demands.

However, the wait and see attitude of the population already mentioned above could be an obstacle to the acquisition of latrines: communities often expect that projects focus on the acquisition of latrines and maintain that they do not use sanitation because the projects did not provide a sufficient number of latrines. This view could be reinforced by the succession of subsidy programs, especially in Matam where this view has been most often observed, but also by the promises made at the time of the withdrawal of programs when the masons who built then latrins say that they will return.

Moreover, the qualitative survey shows that households have access to resources, but there is a problem with prioritizing the investment of financial resources of the household for sanitation. Even if people express the need to have sanitation facilities, a lack of latrines is not seen as a priority problem. In general, hygiene and sanitation issues are relegated far behind the need for food, access to seeds and agricultural infrastructure and access to water and electricity. At Keur Maba (Kaolack) and Sindian (Ziguinchor), specifically the issue of connectivity is a real concern for the people, which comes before the remediation issues. In focus group discussions, though non-owners of latrines evoke the interest they might have to purchase a latrine, this issue is not a priority because of their opinion tlhat they must first address the issue of access to water, a necessity for the maintenance of latrines.

The various discussions also allowed to note that the food supply is a real concern in rural areas: lower agricultural and lifestock yields were observed due to the reduction in rainfall, reduction of arable land and soil degradation, which have had effects on agricultural production which mainly is to cover food needs, and on the financial income from agricultural activity. The reduction in household financial resources induces a particular prioritization in their allocation: when agricultural products are sold, one must first pay the debts incurred during lean periods and acquire seed and agricultural equipment. Then one must ensure food for all family members. Then invest in the building, because of population growth. In this scheme, the acquisition of sanitation becomes secondary, people waiting for the projects that are investing in the construction of these works. In addition, there are many who believe that the acquisition of modern latrines is very expensive (minimum 100,000 FCFA) while the income from harvests rarely reaches such amounts.

Note that the acquisition of latrines emerges as a more urgent priority for women than men. For these, the acquisition of modern latrines is not an investment priority even if people are aware of their importance. This is understandable since they are responsible for all expenses and are required to prioritize, based on their financial resources. Women on the other hand are more sensitive to the need for investment in health and sanitation issues and are sometimes called upon to invest the resources they have. The latter more readily link health issues with improved hygiene derived via latrines.

Main results

- The main declared obstacles are the cost of latrines (59.3%) and a lack of savings and/or the difficulty of obtaining a credit (34.1%).
- It seems that in the North, the cost of latrines is a real obstacle to the acquisition of latrines.
- For 24% of the respondents, the construction/renovation of latrines is not the first priority; other expenditures compete directly, including the purchase of agricultural inputs (35.5%), bulls, cows or sheep (31.2%) and repairing/construction of the house (30.4%). The results of the focus group discussions confirm these observations.
- Environmental constraints are real in certain surveyed areas where the soil is not conducive to excavations.
- The wait-and-see attitude of households already mentioned vis-à-vis subsidy programs encourages households to build traditional latrines pending the arrival of such programs.

4.5.7 Motivations to acquire latrines

Household survey results

According to the household survey, the main benefits that respondents are seeing in having latrines are 1) the privacy they provide (82.9%); 2) the benefits they provide for guests (50.6%); 3) the security they provide for women and children (31.3%); 4) the fact that they are more convenient (27.5%); 5) the fact that they are cleaner (26.7%), and 6) that they are better for health (22.4%). These reasons thus do or could motivate them to acquire latrines.

Note that improving the social status and the fact that it avoids embarrassment appear to be less important (respectively 8.7 and 15.2% of responses cited them).

Table 27. Motivation for the construction and benefits of having a latrine, stratified by region, type of latrine owned and socio-economic score.

	Main motivations declared by the holders of latrines to acquire their latrine (%) (Q4.20)					Benefits to having a latrine in his concession reported by respondents (with and without latrines) (Q6.10)					
	Intimacy	Guests	Health	Convenient	Safety	Intimacy	Convenient	Safety	Cleanliness	Guest	Health
Region											
- West											
- Center	57.9	41.0	26.4	7.7	21.2	69.7	9.4	36.6	33.7	58.3	22.3
- North	72.0	58.3	15.1	7.8	29.2	84.2	12.0	36.1	15.4	70.9	12.7
- South East	89.2	20.0	40.8	47.6	21.4	88.9	48.7	24.4	35.5	39.4	28.3
- South West	80.7	25.6	26.9	34.5	25.1	86.1	35.0	29.6	28.3	39.0	28.7
	66.5	15.8	17.4	24.5	13.6	83.1	36.9	28.6	25.5	31.1	26.8
Type of latrine											
- Improved	71.6	31.8	31.5	23.8	21.2	79.7	29.1	29.7	30.7	51.8	23.5
- Traditional	75.2	28.1	23.4	26.9	18.5	85.8	31.2	28.0	28.4	42.9	25.0
- No latrine						83.8	22.9	35.4	21.6	55.7	19.2
Socio-economic score											
- Poorer	73.7	40.3	21.8	21.3	22.7	82.6	26.7	29.8	19.5	56.1	21.2
- Intermediate	73.8	37.0	25.0	20.9	23.7	84.1	23.9	31.4	26.7	49.7	23.0
- Less poor	71.9	31.4	30.2	26.1	21.1	79.8	29.9	32.0	30.3	49.3	25.0
Total	**74.0**	**35.1**	**25.3**	**22.5**	**22.9**	**82.9**	**27.5**	**31.3**	**26.8**	**50.6**	**22.4**

In connection with the benefits of having a latrine, it actually appears that the main reason to have latrines is the intimacy they provide (74.0%). This main motivation is followed by the desire to provide latrines for guests which is even stronger for the poorest households

(40.3%). Being able to offer its guests latrines and thus avoid the embarrassment of sending them to neighbors or in the bush was also reported from Benin (Jenkins and Curtis, 2005).

With regard to the events that may encourage respondents to build or renovate their latrines, the 4 main events are: the receipt of money (58.6%), a celebration such as a wedding, funeral, etc. (40.7%), support by a latrine project (40.0%) and the occurrence of a happy or family event (e.g. the birth of a baby; 24.7%). Note that for 9.5% of the respondents, no event could encourage them to build or renovate a latrine.

Considering the type of latrines in households observed, there are some nuances in the main events that may encourage respondents to acquire or improve their latrine. Thus, for non-latrine owners, the receipt of money is an incentive for nearly 63% of them. Celebrations are less important for respondents who already have improved latrines but more important for respondents who have traditional latrines. As a consequence, for the latter, the support by a project seems less important than for those who do not have latrines and those who already have improved latrines.

Table 28. Main events prompting the construction or renovation of latrines, stratified by type of latrine in the household.

	Type of latrine			Total (n=1993)
	Improved (n=714)	Traditional (n=571)	No latrine (n=708)	
% of respondents declare the following preferred spending if money is available (Q6.18)				
- Return money	56.4	56.2	62.7	58.6
- Celebration	33.5	50.4	40.1	40.7
- Support a project	42.9	30.5	44.9	40.0
- Happy event (baby born)	20.3	31.7	23.5	24.7

Qualitative study results

The results from the focus group discussions confirm that privacy, improved hygiene and thus its effects on health, dignity and better security are important factors that encourage the community to acquire household latrines. Moreover, it allows the sick or elderly to benefit from more comfort, discretion and accessibility.

> *«Latrines are a necessity because here there is no more bush and the privacy that is provided by a latrine makes that everyone here expresses the desire to have one. It is the means that are lacking, but we no longer want to go to the bush, besides there is not even any more of it left because we have cut all the trees and the forest is gone»* **(key informant interview, Matam_Oréfondé_Ngulum, Imam).**

Frequent visits by guests (during religious ceremonies), the presence of guests in the house or the possibility of hosting a foreigner are also important factors motivating the acquisition of latrines. In reality, when a stranger comes to the house and asks to go to the bathroom, there is a feeling of shame to bring him to the neighbor. This discomfort, often raised during focus group discussions, created the trigger and put the household before the urgent need to have a latrine, so as not to lose face and thus gain self-esteem.

The positive experiences with the acquisition of household latrines and the experience of their positive effects on personal and social factors motivate their owners to continue using them:

> *«It changed my life because if I have guests, ah I am free because everything they need, when they need to go to the latrine, I have one, if they have the need to do anything, if they want to wash themselves, and they will go there. So yes, it changed something in my life»* (**focus group discussion 9_Kédougou_Bandafassi_Sylla Counda Diakha, men with latrines).**

The possession of a latrine increases self-esteem. This positive experience also influences those who have not yet built latrines and push them to want one when they see a possibility.

Furthermore, the implementation of subsidy or behavior change communication program in different localities has improved the level of knowledge and awareness for the need to invest in latrines. These programs, through their sensitization for the importance of acquiring a latrine, diseases related to OD and the danger of fecal matters, sparked a desire to acquire and use such infrastructure. If people do not always have the means to build stable structures, they acquire traditional latrines, while waiting to have the resources or a subsidy to move to a more modern structure. This attitude is the assets of the CLTS strategy that is mobilized through awareness raising activities. In Matam, the massive presence of stakeholders since 2013 has greatly increased awareness for the health dangers associated with OD, notably with CLTS which is conducted by several partners. Increasingly, people in the intervention areas (subsidy or CLTS) realize that if the latrines are poorly maintained, they become a source of discomfort (stench) and diseases (breeding ground for cockroaches and flies that infest the house).

In the North, deforestation and changes in the living environment no longer offer the right conditions for OD (disappearance of the forest), forcing households to acquire latrines. There are no more groves to hide or offer privacy to the person when the urge to defecate presents itself. Indeed, with demographic pressure and deforestation, it becomes difficult to find a place to do one's business in private. These situations are discouraging and are a sufficient reason for the acquisition of latrines.

A final factor mentioned as a motivation for building latrines is travel and migration experiences that contribute to a a certain enlightenment and an improved awareness: primarily in Kédougou and Matam, a member of the household who stays outside the village or returns from emigration becomes a carrier of new ideas. In particular, the fact that the household has within it an emigrant is an opportunity to decide on the construction of a latrine and facilitates its funding. Even in households without an emigrant, possession of latrines by a neighbor influences the acquisition of such works.

Main results

- The main motivation to have latrines is the privacy it offers (74.0%) and the desire to offer latrines to guests (35.1%).
- The main events that may encourage respondents to build or renovate their latrines are: the receipt of money (58.6%), a celebration (40.7%), subsidy by a latrine project (40.0%) and the occurrence of a happy event (24.7%).
- The expansion of the villages and the disappearance of forests, awareness raising campaigns and subsidy programs (creating demand) and the knowledge resulting from migrants within the family are all factors that positively influence the demand for latrines.

4.5.8 Improvements and acquisition plans

Household survey results

Of all latrine owners, 27.6% have improved their latrine since it had been built; the share of latrine improvements was slightly higher for improved latrines than for traditional latrines (28.3% against 26.7%).

Improvements are also more frequent in the least poor households (28.8%) than in the poorest households (17.2%). The main improvements consisted of putting cement, tiles or bricks on the ground (43.8%), addition of a door (11.9%) and building brick walls (8.5%).

65.5% of the respondents said they planned to do additional work over the next 12 months, including owners of traditional latrines (77.6% against 56.4% for holders of improved latrines) who therefore mostly belong to the poorest households (69.2% reported improvement plans against 60.0% of respondents in the least poor households). This intention is validated when

respondents were asked how likely they were to build or renovate their latrines within 12 months: 62.2% said that this probability was high or very high.

The improvements that respondents intend to make cover most responses proposed in the questionnaire, with a peak for the improvement of the floor (50.0%) and frequencies between 30 and 40% for most items, suggesting a possible over-reporting by respondents.

Indeed, if one refers to the various steps leading to a decision mentioned by Jenkins and Scott (2007), the intention which implies that change is planned, does not mean that the opportunities and capacity of the household are all met for the construction or improvement of their latrine. If we compare the share of respondents who say they intend to improve or build latrines in the next 12 months (65.5%) with the share of respondents who actually made improvements since their latrine was built (under 28%), there is little chance that all these intentions result in concrete projects that are executed.

Qualitative study results

In general, it appears from the focus group discussions that although the intention to acquire latrines one day, including improved latrines, is real, the concrete desire to invest for the realization of the need is low, because people are aware of their low financial capacity. The only alternative seen by non-latrine owners is to benefit from a subsidy program.

From the focus group discussions of men and women not owning latrines it appears that if subject to the investment of their own resources, they will return to or continue to practise OD. One has the impression that there is an expectation with regard to the responsibility of donors to provide latrines. This expectation is reinforced by the succession of grant programs especially in Matam.

Main results

- In households with latrines, since their construction, 27.6% of the latrines were improved.
- Improvements were more frequent in the least poor households (28.8%) than in the poorest households (17.2%) and have included the improvement of the floor and the installation of a door.
- 65.5% of the respondents said they planned to do additional work over the next 12 months.
- This percentage must be seen in perspective, particularly as the focus group discussions suggest that willingness to invest in latrines remains limited.

4.5.9 Social norms, values and beliefs

Household survey results

Table 29 presents the percentage of respondents who agree with statements on a number of norms, values and beliefs, holding which is important for improving sanitation. Results are presented according to the type of latrine owned and systematic use of latrines or not, which are the most important elements that influence changes in sanitation behaviour.

Regarding adherence to certain **norms** according to the type of latrine owned, it can be noted that there are only a limited number of statements for which there are differences depending on latrine ownership, and that this difference is mainly strong between respondents who do not have latrines and those who have latrines, be they improved or not. Thus, respondents without a latrine do more often agree with certain standards validating OD, namely that most people they know relief themself in the open and that it is natural to do so.

It can also be noted that there are relatively few respondents, with or without a latrine, who agree with the statement that to relief oneself in the open is the norm in rural areas (42.5%).

For most other statements stating that OD can be a source of problems, the vast majority of respondents say yes, suggesting that all are aware of the problems caused by OD.

When comparing adherence to norms according to latrine use frequency, the differences are more marked in the sense that systematic latrine users are less likely to agree with the statements validating OD. This is particularly the case for the assertion stating that "it is the norm to practise open defecation in rural areas" for which the unsystematic users are 1.7 times more likely to agree than systematic users, and statements saying that OD is natural; it was approved by nearly 2 times more unsystematic users.

In terms of adherence to **values**, we do not note significant differences by type of latrine owned and globally, the majority of respondents agree with the statements valuing the possession of latrines.

In addition, less than 15% think that latrines are essentially built for people who have difficulties getting around, which suggests that all feel concerned about having latrines. Unsystematic latrine users are even fewer to think like that (8.6%).

Finally, in terms of **beliefs**, the majority of the respondents agree that the use of latrines reduces diseases and to a lesser extent that children's faeces are harmful, irrespective of the type of latrine used and being a systematic user or not. By contrast, it can be seen that respondents who do not always use their latrines are 2 times more likely to think they can not do anything to improve the sanitation conditions in their home. This belief is also more likely among those who do not have a latrine at home. This suggests that the belief that there is not much that can be done about sanitation is associated with inconsistent use.

Tableau 29. Percentage of respondents who agreed with certain standards, values and beliefs, stratified by the type of latrine owned and frequency of latrine use (among the holders of latrines).

Affirmations linked to norms, values and beliefs	Type of latrine owned			Frequency of latrine use		Total (including respondents without latrine)
	Improved	Traditional	No latrine	Systematic	Not Systematic	
Most people I know defecate in the open	30.2	41.9	**74.7**	33.1	**44.2**	49.4
Open defecation is natural, everyone does it	28.2	27.5	**46.9**	23.2	**45.7**	34.6
It is acceptable to defecate in the open only if it is not possible to access a latrines	91.6	84.1	92.9	85.9	**97.0**	89.9
It bothers the neighbors if we defecate in the open	91.0	93.5	85.6	91.7	94.1	89.8
Open defecation poses an environmental problem	94.3	94.6	90.7	93.8	96.3	93.1
It causes problems if children make defecate in the open	89.9	88.6	**83.1**	87.8	94.8	87.1
Open defecation is the norm in rural areas	43.0	38.3	45.5	35.6	**61.0**	42.5
Modern households have latrines in their homes	98.3	96.2	95.3	97.3	97.4	96.6
Building latrines increases the value of the home	99.2	99.1	98.2	99.0	99.6	98.8
Latrines are mainly built for people who cannot walk long distances to defecate in the open	12.3	16.8	16.0	15.8	**8.6**	14.9
Latrines in the home increases the status of the family	98.5	99.3	96.3	98.7	99.3	98.7
Having latrines at home allows us to better accommodate our guests	99.6	99.8	99.3	99.7	99.6	99.6
Neat people own latrines	90.1	92.3	**80.5**	98.1	89.1	87.3
Educated people have latrines	84.9	89.1	83.9	97.0	**84.0**	85.8
Good parents have latrines at home	89.4	88.8	84.0	87.2	**96.7**	87.3

Affirmations linked to norms, values and beliefs	Type of latrine owned			Frequency of latrine use		Total (including respondents without latrine)
	Improved	Traditional	No latrine	Systematic	Not Systematic	
Having latrines helps to protect ones family	99.2	98.8	98.7	99.0	98.9	98.9
There is nothing I can do to improve health conditions at home	20.6	22.5	**29.2**	17.6	**35.4**	24.2
Using latrines reduces disease	97.9	99.1	97.9	98.4	98.9	98.2
Children's feces are harmful	85.9	82.8	81.6	82.7	90.7	83.5

To better describe the category that could be described as "fatalistic", the main factors associated with approval of statements that there is not much that can be done to improve sanitation conditions at home are summarized in Box 7.

Box 7. Factors associated with the belief that nothing can be done to improve sanitation conditions.
Multivariate logistic regression models were constructed to identify factors associated with the belief that nothing can be done to improve sanitation conditions at home. Many variables were tested (education, socio-economic score, preferences in terms of latrines, etc.) to help better identify those that might be described as "fatalistic". In the end, the following variables were selected because of their significance or relevance, and were included in a multivariate model: the geographical area, preference in terms of latrines, owning latrines, the fact of having a debt at the time of the survey, having already participated in a community projects and the decision-maker to acquire latrines (see Appendix F).

The Odds ratio (OR) allow to identify the following observations:

- The **geographical area** is an important variable, respondents in the Center, North, South East and South West zone being more likely to think they can do nothing to improve the sanitation conditions at home than respondents from the West zone. This is particularly the case in the North area where respondents are 10.7 times more likely to adhere to this belief (OR=10.67, CI: 6.44-17.65, p=0.000). In general, this suggests that the fact of living in the West region would protect from some form of fatalism. This may be related to the generally more favorable sanitation environment that is encouraging people to have a more positive attitude.
- **Latrine preference** is also associated with this belief, mainly when the favorite latrines are traditional (very few respondents expressed a preference for OD, meaning that this modality was omitted from the model): respondents declaring to prefer traditional latrines are 2.04 times more likely (OR=2.04, CI: 1.11-3.77) to think that nothing can be done to improve sanitation conditions than those who say they prefer improved latrines.
- **Owning a latrine**, whether improved or not, is associated with a lower adherence (34% less chance) to this belief (OR=0.66, CI: 0.52-0.85, p=0.001), suggesting that the fact of thinking that nothing can be done to improve one's sanitary conditions is an obstacle to the acquisition of latrines.
- **Having a debt at the time of the survey** also emerges as a protective factor in the sense that the indebted respondents are less likely to adhere to the idea that nothing can be done to improve sanitation conditions (OR=0.38, CI: 0.30-0.49, p=0.000) than those who have no debts. This could mean that those who go into debts and therefore take more risks from a financial point of view, are more enterprising and thereby less fatalistic than others.
- It is also clear that the fact that respondents have already **participated in a community project** brings them less often to think that nothing can be done, and this very significantly (OR=0.34, CI: 0.24-0.49). Those involved in projects related to community life are therefore in a participatory process stimulating them to think more positively and in a less fatalistic way. This also suggests that community projects in general can be a useful vector to change the beliefs of the people and lead them towards change.
- Finally, it seems important to stress that when the **person who takes decisions** (in connection with sanitation but also more generally) is not the head of household, there is a negative association with the belief that nothing can be done to improve health conditions. In other words, when people who decide in the household are the spouse and even more so "another" person (essentially a son or brother) and thus the role of the household head is reduced, it would seem that respondents develop a more positive outlook and think more often that sanitation improvements are feasible. When the decision maker is an "another" person, the OR is 0.26 which means the person is 74% less likely to adhere to the belief, with a significant relationship (OR=0.26, CI: 0.13-0.49, p=0.000). Where the spouse decides, we find the same link, but it is not statistically significant. This suggests more broadly that those 'others' as well as spouses of household heads can be agents of change on which education programs can draw.

Qualitative study results

At community level, even though the practice of OD is perceived as outdated because of the intrusion of modernity, it is believed that it can not be abandoned because not all households have latrines. This commonly follows from the qualitative survey which indicates that even if the population is aware of the harms and risks of OD, it remains common, probably because some particularly poor households do not have any alternatives.

However, OD can still be a popular practice for some people, first because they are accustomed to it, and second because for them latrines are synonymous with discomfort, for example when the latrines are small and poorly ventilated.

> *«There is first and foremost the financial problem, the social problem. [...] The social problem is related to behaviors, e.g. certain rural people feel more comfortable when they defecate in the open than when they use latrines with small spaces. There are also customs [...] but in the conversations we hear some say that they are more comfortable when they defecate in the nature than in the latrines because usually they go in groups and discuss among themselves»* **(key informant interview 7_Matam_Matam_SRH).**

> *«... They do not understand the usefulness of latrines. They think that the traditional practice of defecation in the open is always appreciated and that nobody minds. Do they know it's a source of contamination with diseases? No, they do not know so we must try to ... Perhaps what I could do about it is to list the entire population, even if it should take 7 days or 10 days, I prefer to do it and to identify all the people and to identify all the houses that do not have a latrine [...]» (***key informant interview 9_Matam_Oréfondé_ICP).**

Thus, the provision of latrines alone is not enough to ensure behavior change and an end to harmful sanitation practices. This point was raised in Thies (SRA) where, although the benefits of subsidy programs have been recognized in terms of access, it was also noted that these programs do not necessarily solve the problem of behavior change. Therefore, they do not guarantee the end of OD.

In addition, certain beliefs may also limit the use of latrines and therefore encourage the practice of OD. At Médiégue for example, it is thought that heat from the latrines can make you sick and that the use of the latrine by a sick person can cause contamination of healthy users. Such perceptions about the health risks of using a latrine do not facilitate their use and must be corrected by better interpersonal communication.

Some sub-populations are also more "tight" to the use of latrines: in the North and the South East, mainly pastoral areas, the nomadic lifestyle of the people does not facilitate the acquisition and use of latrines:

> *«In small villages now as those inhabited by Fulani who are herders and nomads, there is not much emphasis to latrines because they spend most of their time in the forest»* **(key informant interview 17_Tambacounda_Ndoga Babacar, maire).**

> *«So the other important constraint is linked to their lifestyle, when I take some Fulani villages where everybody is practically nomadic the people basically close the village. So on their way will they look for latrines, this is far from sure»* **(key informant interview 6_Louga_Coky, district chief physician).**

Furthermore, the practice of OD is also reinforced by the need for privacy and shame of having to "unveil" by going to use the latrines of neighbors, suggesting that the usual strategies to bypass OD, such as using the latrines of neighbors, have significant limitations.

> *«The people have "Kersa", here is not our custom to go to others to defecate, and we prefer to go to the bush. At least there it is sure that you are not going to use*

something that is not yours» **(focus group discussion 5_Matam_Oréfondé_Ngouloum, women with latrines).**

«You cannot always go to those who own one; otherwise you risk crossing them. And they will know each time what we came to do, which is to use their latrine. Therefore, we prefer to go to the bush, at least there is less risk of being seen» **(Focus group discussion 12_Kédougou_Bandafassi_Indar_Women without latrines).**

Finally, the focus group discussions also indicate that if sanitation is not among the priorities identified at the community level, contextual changes are going to make it one, which could shake up the standards and get them to evolve to less "adherence" to OD: the expansion of concessions (in size or number of people), new construction designs which provide for the integration of a latrine, expansion of villages and thus the retreat of forests which were important places for defecation, long migrations that make them having new experiences in terms of latrines, awareness raising campaigns and grant programs that create demand, mean that the acquisition of latrines is becoming increasingly a necessity that could become in the shorter or longer term become the norm.

Main results

- Respondents without latrines are more often in agreement with certain standards validating OD while systematic latrine users are less likely to agree with those standards.
- Most respondents agree with the statements stipulating that OD is at the source of problems, suggesting that all are aware of the limitations of OD.
- Overall, the vast majority of all respondents agreed with the statements valuing the possession of latrines.
- Non-systematic latrine users and those who have no latrine at home are more likely to think they cannot do anything to improve the sanitation conditions in their home, which suggests a certain fatalism with regard to sanitation among these groups.
- OD remains an important and valued practice for a section of the population which is more comfortable with it than when using latrines. Paradoxically, OD reportedly ensures greater privacy by avoiding using latrines in the neighborhood.
- Contextual changes could eventually push the rural population to make ODF status a priority that could become the new standard.

4.6 Information channels

4.6.1 Frequency of media consumption and information channels

Household survey results

Reading newspapers or magazines at least once a week remains an infrequent practice in Senegal (4.5%), regardless of the geographical area, the type of latrine owned or the socio-economic score. In contrast, listening to the radio at least once a week is very common (82.9%), but the most popular stations vary by area. National stations (RTS and RSI) are most commonly listened, especially in the South East (67.3%) and in the South West (54.9%) and community stations are listened by more than one fifth of respondents in the North, the South East and South West. In the Center it is the Walf radio which is most listened (38.4%). Community radio is also most listened to by the most poor and poor categories.

Television also emerges as an important information channel with nearly one third of the respondents who watch TV at least once a week. This information channel is more common in the West and more generally among the least poor households of which over 62% watch TV at least once a week.

Finally, to stay informed of what is happening in the community, respondents widely use the radio that really stands out as a key information medium. Community gatherings and the phone also emerge as preferred means of communication.

Note that in the North, mass campaigns (during vaccination campaigns or awareness raising, for example) were cited by 39.8% of respondents as one of the main ways to stay informed of what is happening at the community level, which is much higher than in other areas (16.1% in the Center to 24.7% in the South East). This is also where community gatherings are most frequently mentioned and it could suggest that in general, gatherings are key opportunities to share and disseminate information.

Table 30. Media consumption frequency and main sources of information, stratified by region, type of latrine owned and socio-economic score.

	% reading news-papers / magazines at least once a week (Q7.1)	% listening to the radio at least once a week (Q7.2)	% of households who say they prefer the following radio stations (Q7.3)				% watching TV at least once a week (Q7.4)	% of households reporting the following key information resources in the community (Q7.8)		
			National radio	RFM	Walf	Com-munity radio		Radio	Community gathering	Phone
Region										
- West	9.1	81.7	28.7	24.0	18.1	9.5	43.7	86.9	21.7	32.9
- Center	1.9	87.5	32.3	7.2	38.4	13.9	25.6	73.7	32.2	29.0
- North	3.6	82.4	48.5	15.7	10.2	20.8	34.9	72.3	51.5	31.5
- South East	4.0	78.03	67.3	2.4	3.9	20.5	24.7	78.9	39.9	22.4
- South West	6.2	80.0	54.7	6.7	3.0	20.5	32.9	79.1	36.3	18.2
Type of latrine										
- Improved	7.7	86.6	33.4	19.7	20.2	13.8	48.9	79.0	34.3	33.5
- Traditional	3.9	82.5	50.9	6.9	12.2	19.5	29.8	82.1	36.3	22.6
- No latrine	1.8	79.5	46.9	7.5	20.9	17.1	14.4	71.2	39.7	26.3
Socio-economic score										
- Poorer	2.0	78.81	50.5	7.1	18.8	16.1	11.4	73.7	38.7	21.2
- Intermediate	2.4	82.7	43.6	8.7	17.3	21.5	19.2	78.1	35.9	26.0
- Less poor	7.6	87.7	36.6	19.0	20.0	10.1	62.6	80.9	35.5	32.9
Total	**4.5**	**82.9**	**43.2**	**11.8**	**18.2**	**16.6**	**32.2**	**77.1**	**36.8**	**27.8**

Qualitative study results

In the different rural communities where interventions have taken place, the actors of the local community are aware of the program, the details of the implementation modalities and activities. Furthermore, the relays that were selected and involved in its implementation are also aware of the objectives and implementation modalties of the different programs.

However, the population which is the main beneficiary of these interventions does not have that same level of information, despite the awareness raising activities that are supposed to be implement by the donors. Indeed, most programs are not known by the population because the practical arrangements are not sufficiently clarified. Indeed, if they are analyzed in depth, it is clear that in reality, people do not know the program names or associate intervention with the person who was responsible for its implementation. The communities have no direct relationship with the programs but with relays that facilitate the implementation in their locality. That there is an individual dimension of the project, which comes down to one person, can also lead to a lack of interest as soon as the person is no longer involved. In most areas, people are more in touch with the relays, but also with the masons who carry out their work without much explanation. They stick to the instructions and do not provide additional information. Also, some local actors (families, heads of households, etc.) did not understand why two types of latrines are offered, one with superstructure and another without (as in Gollam where finishing the superstructure is left to the people).

This has an influence on the perception that people have of projects and interventions: the activities are limited to the construction of latrines (and pits in some localities) and not sanitation in general. These activities are seen as relevant, because they meet a need of the communities, and effective in helping to acquire modern latrines. However, awareness how to use the facilities is sometimes sidelined in the discussion with the people.

Moreover, when people are informed about a project, information is focused more on men than women, which is a result of the approach used by donors when introducing projects: only men know the general outline and specificities of the project and this is reflected in the discussions. Indeed, women are excluded because communication projects and programs are usually directed at the heads of household, expected to be the decision makers and responsible for the funding. They know the amount to contribute, the number of cement bags and materials distributed, the latrine types and the dimensions (especialhly pits). Women are just involved in home visits, once after the work has been completed. This means that they do not know the name of the project or how to access it.

However, this situation is less acute in the village of Ndoga Babacar (Tambacounda) where the Groupement de Promotion Féminine (GPF) was involved. The exception of Bignona could also be highlighted where due to the participatory approach used during the introduction, people have a good knowledge of the project (ACCRA), its objectives and implementation modalities. As part of its latrine marketing program, awareness raising focusing on the danger of OD and the need to have a latrine are organized. Moreover, their relays make interpersonal communication on the same themes in addition to the quality of the works they propose to apply for. This approach is a model of success because of its strong community roots.

Main results

- The radio is an important information channel for 82.9% of the respondents.
- To be informed about what is happening in the community, respondents use the radio, community gatherings and the telephone.
- There are significant variations in the choice of media or preferred information channels depending on the area.
- The level of knowledge about programs in the sanitation sector varies: relays, councilors and local government stakeholders are more informed about the projects than the communities. At the community level, men are more informed and more aware of the existence of ongoing projects or interventions in their localities than women.

4.6.2 Preferred information channels and community participation

Household survey results

Preferences in terms of information channel focus on the radio (77.9%), which is relevant in as far as the radio is the most used media to stay informed. The better off a household is, the more it prefers the radio but the difference remains limited, radio emerging as the preferred vector of information for all respondents.

Community gatherings are also among the preferred options of respondents, particularly in the North (36.0%). Finally, the community health workers appear to be important links to information about sanitation and hygiene, with 48.5% of the respondents identifying this as the preferred information channel. This is particularly true in the North where nearly 67% say they prefer community health workers. Their involvement in information and communication strategies regarding hygiene and sanitation could thus be beneficial, possibly because of their proximity to the population and the trust that they derive from their status.

Note that in terms of information and communication, the West region stands out again since TV is the favorite media of 63.5% of all respondents. Also note that mosques or churches are

among the preferences of only 10% of all respondents, suggesting that imams or priests are not part of the key players for information on sanitation and hygiene.

Regarding the preferred **communication tools** of the respondents, there are variations across zones, most certainly related to the traditions and habits that prevail in the areas. In general, audio/video messages are supported by the majority of the respondents, but also posters (particularly appreciated in the North, 54.7%), awareness raising caravans and discussions are well liked. In the North, the theater, again implying a gathering movement, is also a favorite communication tools (over 42% of respondents).

Finally, with regard to **community projects**, over 1/5 of the respondents have already participated in one and the vast majority agree to be involved in a project related to sanitation. It is in the North, where in general community participation seems to be strongest, that more respondents would be willing to invest themselves (93.9%), whereas there would be far fewer in the West (62.6 %).

Table 31. Preferences in terms of information channel and community participation, stratified by geographic area, type of latrine owned and socio-economic score.

	% reporting to prefer the following information sources on hygiene and sanitation (Q7.9)			% reporting to prefer the following communication tools for health information (Q7.10)				% who have already participated in a com-munity project (Q7.11)	% who would agree to be involved in a community project related to sanitation (Q7.14)
	Radio	Community gathering	Com-munity health agent	Poster	Audio / video message	Sensitization	Discussion		
Region									
- West	90.9	15.7	32.3	16.6	94.6	51.7	47.4	23.4	62.9
- Center	67.6	28.3	47.0	33.9	76.1	41.4	34.4	17.5	80.9
- North	80.2	36.0	66.9	54.7	56.8	57.0	23.0	22.0	93.9
- South East	78.0	27.8	46.6	41.7	68.6	42.6	26.0	25.1	81.6
- South West	79.1	22.2	41.5	40.3	71.4	39.1	23.4	24.3	73.9
Type of latrine									
- Improved	80.0	24.8	51.0	36.3	75.8	53.9	33.3	27.3	76.8
- Traditional	81.3	24.3	47.3	39.6	74.8	39.9	27.5	23.3	80.4
- No latrine	73.2	31.4	47.0	38.6	68.4	45.5	31.6	14.6	82.8
Socio-economic score									
- Poorer	75.2	25.0	50.2	40.1	72.9	38.4	28.2	17.4	80.8
- Intermediate	77.9	30.3	45.4	34.8	73.1	49.0	32.0	23.4	79.6
- Less poor	79.2	24.8	47.1	39.9	75.2	47.5	30.4	24.8	80.0
Total	**77.9**	**27.0**	**48.5**	**38.0**	**72.9**	**46.9**	**31.1**	**21.6**	**79.9**

Qualitative study results

At the village level, few community activities promoting access and use of latrines are organized. However, in the vast majority of the visited places, initiatives concern more generally the field of sanitation, although their frequency is variable. Indeed, in some villages, community sanitation (in the form of set-setal[18] and weeding of the main squares and lanes) is done every week or after each winter. These initiatives exist in the North and South East areas, particularly associated with women's groups organized with the support of partners (NGOs or local authorities) for the implementation of sanitation actions. Moreover, youth associations begin to become more and more interested in the field.

> *«Well, I know at least that in Coky center, in the neighborhoods there are sanitation associations, there are women who gather every week and go through the neighborhood, gather and clean, burn waste etc. In any case in all large villages,*

[18] An activity that involves a part of the population to clean the environment, sweep the streets, collect and burn rubbish etc. Such activities are sometimes supported by local collectives that provide materials: shovels, pushcarts, rake etc.

there are these associations then and they are supported by Plan which had this in one of their projects that was funded by KHP; so even after the project stopped people continued to clean» **(key informant interview 6_Louga_Coky chief physician)**.

In some villages in the Louga region, there is a fairly innovative community scheme to assess themselves and to monitor concessions in terms of hygiene and sanitation. Any offender is registered in a book and is sentenced to a fine of 100 FCFA.

The health staff also supports these activities to promote good hygiene and sanitation practices. Indeed, in all communication activities in general, health professionals emphasize the link between hygiene, sanitation and the health status of communities.

«I think it is even part of our statutory obligations. In the community, there are talks that are conducted by the relays, there are home visits so there is also information in the media. We had to do a show on handwashing which aired on cable networks in the area but also the treatment of diseases somehow related to fecal contamination at all levels, in health houses, in health posts, in the health centers» **(key informant interview 6_Louga_Coky district chief physician)**.

Further, the local authorities were for a long time viewed as players who invest little in the sanitation sector, there now is a clear desire to become involved in the management and improvement of hygiene issues and sanitation. They carry out activities to promote good hygiene and sanitation. However, they see themselves limited in their initiatives by constraints, both institutional (hygiene and sanitation not being transferred powers) and financial.

«All this is due to a lack of awareness rising, if we had at the city council people who come to train councilors on the usefulness of hygiene and sanitation that would be really good. Here at the municipality of Ndoga we respect the balance, there are 25 men and 25 women who were informed about the importance of sanitation with the help of bajenu gox, the awareness raising went really well. That's why I planned to allocate part of my budget that is 400,000 for maintenance of each of the infrastructures that the government has built. Also, I made a commitment to establish a hygiene and sanitation commission to sensitize the people» **(key informant interview 17_Tambacounda_Ndoga Babacar, maire).**

Main results

- The radio is the preferred information channel of 77.9% of all respondents, followed by community gatherings and community health workers.
- Regional variations exist in terms of preferred information channels and communication tools.
- Almost 20% of the respondents have already participated in a community projects.
- Although at the individual level, investment in hygiene and sanitation issues is sometimes lacking, community dynamics are important considerations.

5 Discussion and course of action

5.1 The relevance of the socio-economic status for access to sanitation

Key message # 1: The socio-economic status is the most important variable determining latrine ownership.

The level of access to improved latrines is 35%, while that for traditional latrines is 28.7%; 35.5% have no latrines and are therefore considered practicing OD. Universal access to latrines is far from guaranteed and important efforts are to be maintained to increase improved latrine coverage and sanitary practices in general.

However, it is clear that the socio-economic factor is paramount to explain the differences in access to latrines, the differences in access to improved latrines, and the quality of water supply. However, the regional disparities that have been observed and that emerge strongly hide wider socio-economic inequalities that are very pronounced between regions.

There are well developed regions with a significant proportion of households belonging to the richest category of people and where the majority of all households have improved latrines and improved water supply. This is the case for Dakar, Saint Louis and Thies. In contrast, there are regions where the majority of the population belongs to the poorest fraction and where households with improved latrines and a satisfactory water supply are uncommon; this is particularly the case for Diourbel, Kaffrine or Tambacounda.

☞ *This implies that in regions where pockets of poverty exist, efforts must be undertaken to provide better access to sanitation, to limit OD, but also to reduce regional inequalities. However, the household survey results have shown that this is not always the case: for example, intervention programs have mostly targeted the North and Western regions that are already most advantaged, and thus may reinforce these inequalities.*

5.2 The relevance of taking into account the geographic location

Key message # 2: The sanitation situation in Senegal varies between regions.

In connection with the previous point, it is important to note that large regional inequalities exist, even though they are mostly explained by socio-economic inequalities.

Indeed, on the ground, these regional inequalities are reflected in very concrete ways by differences in the availability of sanitation facilities but also hygiene practices. For example, the number of respondents having improved latrines ranges from 62% in the West to 13.5% in the South West, while the number of respondents without latrines and assumed to practice OD ranges from 17.9% in the South West to 52% in the Center.

Hand washing practices also strongly vary between regions: for example, the percentage of households having soap and / or detergent for hand washing ranges from 20.9% in the Centre to 88.4% in the South East.

Similarly, the main obstacles to the installation or renovation of latrines areas are not similarly relevant in all areas: for example, the costs seem to be a real constraint for 82.7% of the respondents in the North compared to only 33.2% in the Center.

Information channels to reach the people also vary depending on the area; community gatherings being particularly frequent and appreciated in the North. The preference for obtaining information about sanitation from a community health worker is also highest in this region (67% against 32.2% in the West). Similarly, preferences for health information

channels are different between areas, awareness raising campaigns are much more successful in the North than in the South East.

☞ *Interventions to improve access to adequate sanitation should take into account the local situation and be directed to the areas most in need in order to increase health equity between regions.*

☞ *Communication and exchange of information strategies should be adapted to regional contexts and habits, in order to reach the maximum of people by the different communication activities. A communication strategy at national level seems to have little chance of reaching all target audiences.*

5.3 Necessary efforts to reduce OD and increase latrine use

Key message # 3: The characteristics of the latrines are important.

Among latrines owners, it was found that overall, the use of latrines is satisfactory but the practice of OD continues, including in the areas declared ODF.

OD can be practiced because of the absence of latrines available at the household level, but also because the conditions of existing latrines are not satisfactory. This may be the case when pour-flush toilets are installed in areas where water is scarce, making their use impossible and encouraging people to resume practicing OD. Therefore, the persistence of OD would rather result from a feeling of dissatisfaction with the latrines than from a benefit of OD.

Also, having improved latrines increases their use only in a limited way, which brings into focus the characteristics of latrines that do not fully meet the needs of the population. It emerges from the household survey, as well as from the focus groups discussions, that the main limitations of latrines, including improved ones, are dirtiness, odors, lack of privacy and discomfort.

Regarding latrines installed in the frame of grant programs, it emerged from the focus group discussions and key informant interviews, that they are not always satisfactory for the beneficiaries. This is because the population believes that these programs have not sufficiently taken into account their expectations and needs, whether in relation to the configuration or the functionality of latrines. Also there are quality problems that affect the durability and functionality of the facilities.

Finally, when considering the characteristics of ideal latrines, they must help ensure cleanliness, privacy and accessibility. In terms of infrastructure, the most popular are pour-flush latrines and double and single VIP. For the superstructure, the fact that there are walls of more than 1.5 meters height, a door and a roof emerge as important assets for the majority of respondents.

☞ *The characteristics and attributes of latrines must meet the expectations of the people for systemic use and discontinuation of OD. This includes aspects related to the superstructure and infrastructure but also to the perception that the population has about the benefits from having latrines.*

☞ *An approach based on market demand should focus on the aspects on which the interests of latrine "users" are focused. This implies a dialogue with the population to ensure that the expectations and needs of the population are properly understood.*

5.4 The need to install hand washing stations

Key message # 4: Hand washing after defecation and before eating is not common.

The survey population is aware of the importance of hand washing and clearly indicates the relevant timing. However, washing hands after relieving oneself is commonly practiced by 32.9% of the respondents and prior to meals by 34.1% of the respondents, which is low and insufficient for the reduction of diarrhea or conjunctivitis.

The utilisation of soap is not systematic. In some areas, hand washing is mainly done using water and the utilisation of soap is not well established, because of a lack of soap.

For those who have latrines, systematic hand washing is strongly related to hand washing stations being available nearby the latrines.

☞ *Intervention programs should incorporate hand washing stations nearby the latrines. In addition, for households with water supply but no soap, distribution of soap and / or detergents should be considered, especially as it appears to be inexpensive.*

☞ *It is likely that the increase in hand washing stations is not sufficient to make hand washing after defecation and before eating a routine. Awareness raising activities should be planned, even if the population knows the critical moments when hand washing is essential.*

5.5 Maintenance and cleaning of latrines

Key message # 5: Improved cleanliness and maintenance of latrines can be achieved by upgrading latrines.

Cleanliness is an important feature that latrines should have, dirtiness combined with odors are the main reasons for dissatisfaction with defecation places commonly used by respondents.

The average number of latrine cleanings per week is 5.1. Water is almost always used (93.7%) and cleaning products are often employed (66% of households use detergents and / or 49.7% use disinfectants). This suggests that cleaning latrines is a widespread and important practice for women. The fact that women preferred pour-flush latrines also tends to confirm that the cleanliness of latrines is considered important; the advantage of pour-flush latrines is that they facilitate the cleaning of the latrine with plenty of water and cleaning products.

However, we see that the cleaning is less common and is done with fewer cleaning products in the poorest households where there are traditional latrines. In addition to the lack of means to buy detergents or disinfectants, the very characteristics of traditional latrines make cleaning difficult.

Similarly, latrine emptying remains scarce and in many cases, when a pit is full, it is abandoned and a second is created. Thus, for 44.5% of households with traditional latrines, no one is responsible for emptying. Since there are few improved latrines, emptying is not widespread.

☞ *Better cleanliness of latrines is associated with improved characteristics of latrines that facilitate cleaning. Traditional latrines do not satisfy this requirement.*

☞ *The promotion of latrines should emphasize those types of latrines permitting households to maintain them clean. Women should be particularly targeted insofar as they can be a*

vector of change with respect to choosing latrines easier to clean and thus providing improved hygiene.

5.6 Capacity and willingness to pay

Key message # 6: The expected financial contributions of the rural population need to be aligned with their financing capacity.

The capacity of the rural population to pay is limited: 18.6% of the respondents said they could not afford to contribute anything to the price of a latrine of their choice and only 11.6% of the respondents indicated they were in a position to pay the full price of the product of their choice. Not surprisingly, the acquisition of latrines seems particularly difficult for the poorest rural households. The main obstacles to the installation or renovation of latrines expressed are linked to the financing capacity: latrine costs are considered too high compared to the low savings and / or credit opportunities.

Household income remains the main source of funding for financing latrines in the absence of intervention programs. The banking sector and to a wider extent the use of tontines, solidarity funds or credits are marginal for latrine funding. 46.4% of respondents, however, noted that they make loans regularly or occasionally to meet basic needs which could mean that a demand for credits exists, but in the case of access to the sanitation, it is not developed.

Even if the average contribution to acquire the latrine of one's choice, for those unable to pay the entire amount, remains low (about FCFA 25,500), this represents the approximate cost of a traditional latrine and indicates that there is some ability to pay for latrines.

In addition, the system of co-payment in the frame of grant programs has been well received and appreciated by the population that is willing to contribute modestly to latrines. The difficulty, however, lies in the passive attitude of the population awaiting the implementation of intervention programs to engage in the acquisition of improved latrines and it seems that the implementation of such programs is for many the sine qua non condition for the consideration of acquiring latrines.

☞ *Given the limited financial capacity of the rural population and the high expectations from intervention programs, it seems difficult to expand access to sanitation without co-payments.*

☞ *To maximize the support of the population, donors must remain realistic with regard to the demanded contributions. Moreover, it is better to wait for the time of the year when household incomes are highest - i.e. after the harvest and not during the lean season - and solicit households early enough to allow them to mobilize the requested amount.*

☞ *To develop the financing strategies and therefore to expand the capacity to pay of the rural population, it would be appropriate to consider a system of credit for the acquisition of sanitation facilities. Several success stories of such initiatives exist (ACCRA project, GSF / Senegal, solidarity fund ...).*

5.7 Increase the involvement of the population

Key message # 7: Increased involvement of the population is important to improve sanitation in rural areas.

The sectoral policy on sanitation in Senegal aims to promote a customer approach, in which rural households are customers willing to invest part of their financial resources in the acquisition of latrines.

However, focus group discussions and key informant interviews have highlighted the high expectations towards public grant programs, which in some ways disengage the population

from its role in improving sanitation. The financial contingencies are obviously involved in this disempowerment but generally people are very reluctant to pay the full cost of a latrine.

The CLTS that managed to mobilize the population was satisfactory and successful in some areas but it has mainly allowed the acquisition of traditional latrines.

☞ *Mixed activities incorporating the benefits of CLTS and intervention programs would have to be considered, especially on the basis of positive experiences that have already occurred.*

☞ *Public awareness activities seem important to encourage the public to increase its enterprising attitude.*

Key message # 8: Men are not the only actors involved in the financing of latrines.

The qualitative survey revealed that women have an important responsibility in the cleaning and maintenance of latrines and seem to play an increasingly important role in the field of sanitation, to the extent that they are more involved in the financing of latrines. Their role in decision making, although it is still minor, tends to grow and they can influence their spouses or parents in latrine construction.

Currently, the intervention programs totally bypass women, since they are focused primarily on male heads of households being approached in the context of these grant programs.

☞ *Grant programs which mainly target male heads of household must take into account developments that are underway in society, and should therefore target the entire community.*

5.8 Norms, values and beliefs

Key message # 9: The norms, values and beliefs related to OD and latrine ownership suggest that most respondents value the ownership of latrines.

Most respondents agree with the norms stipulating that OD is a source of problems. Similarly, the vast majority of respondents agreed with the statements valuing the possession of latrines. However, OD is considered indispensable because not all households have latrines and many therefore lack an alternative.

However, it is noted that respondents who have no latrine often agree with certain standards indicating a degree of acceptance of OD while systematic latrine users are less likely to agree with them. Unsystematic latrine users are also nearly twice more likely to think they cannot do anything to improve health conditions at home compared to systematic users.

Almost all respondents believe having a latrine at home helps to better accommodate guests. Similarly, almost all respondents believe that having a latrine in the home increases the value of the home and the family status.

☞ *The appreciation of latrines as an essential element for the reception of visitors, to increase the status of the family and the value of the house are important aspects to be integrated into the latrine promotion strategies.*

6 Conclusions

We can conclude that sanitation and hygiene practices in rural Senegal are very dependent on the socio-economic status of the household to which one belongs. Hygiene and sanitation conditions are thus different between the socio-economic strata, but also between regions which amplify the socio-economic inequalities. This implies that real inequalities persist, with particularly disadvantaged pockets of poverty.

However, there are encouraging signs of good sanitation and hygiene practices (satisfactory use of latrines, good knowledge of the limits of OD, appreciation of latrine ownership ...) although there are persistent weaknesses (persistence of OD and inadequate hand washing at critical times).

It appears that the main obstacles to the acquisition of latrines, including improved latrines, are of different natures: one observes environmental barriers such as the nature of the soil; obstacles related to the lack of manpower due to the migration of the male population. But the main obstacle highlighted by the survey population is the lack of financial means, the population felt too poor to invest in latrines, especially improved latrines.

By reviewing the average expenditures for latrine acquisition, it appears that there is a certain financing capacity: even if it is limited for the most poor households, the poor and least poor ones reported to have spent on average nearly 55,000 respectively 89,000 FCFA. As for the amount the respondents were prepared to contribute as co-payment, it was around 25,000 CFA francs, or the average cost of a traditional latrine. Thus, even if payment capacity is weak, it nevertheless exists.

Both the household survey as well as the qualitative survey indicated clearly that household expenditure priorities may not include the installation or improvement of latrines. More so, focus group discussions and key informant interviews highlighted that to acquire latrines, especially improved latrines, households were largely waiting for subsidy programs which either initiate the construction of latrines or contribute financially or materially to their construction. In the absence of such programs, they tend to build, sometimes for free, traditional latrines but they do not engage in the construction of improved latrines.

Finally, several possible courses of action appear possible to improve access to sanitation, especially improved latrines: the consideration of socio-economic and geographic inequalities, particularly in the implementation of intervention programs, would make them more equitable; taking better into account the expectations of the population in terms of preferred latrine characteristics is necessary when implementing intervention programs; improved latrines that allow easy cleaning and regular maintenance should be particularly promoted; the terms of the contributions of households in the case of co-payments must be appropriate to their ability to pay; more active participation of the rural population should be considered to empower them; finally, latrine promotion campaigns should focus on key values and standards that will resonate with the public. Communication strategies should however take into account local conditions and adapt their communication means to reach as many people as possible.

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Appendix A: Study protocol

(See attached document)

Appendix B: List of selected CDs

NUM	Num_DR	Region	Departement	ARROND	CR	Total menage	Probabilité d'inclusion
1	013201030018	DAKAR	RUFISQUE	BAMBYLOR	TIVAOUANE PEULH-NIAGHA	97	0.014192699
2	013201020025	DAKAR	RUFISQUE	BAMBYLOR	BAMBYLOR	59	0.008632672
3	021201030011	ZIGUINCHOR	BIGNONA	SINDIAN	SINDIAN	107	0.01293927
4	021203040012	ZIGUINCHOR	BIGNONA	TENGHORY	TENGHORY	75	0.009069582
5	021204020036	ZIGUINCHOR	BIGNONA	KATABA I	KAFOUNTINE	81	0.009795148
6	022202010016	ZIGUINCHOR	OUSSOUYE	LOUDIA OUOLOF	MLOMP	137	0.016567103
7	022202020013	ZIGUINCHOR	OUSSOUYE	LOUDIA OUOLOF	OUKOUT	138	0.016688031
8	031201010011	DIOURBEL	BAMBEY	BABA GARAGE	BABA GARAGE	53	0.008136143
9	031202030007	DIOURBEL	BAMBEY	LAMBAYE	N'GOGOM	140	0.021491699
10	031203020002	DIOURBEL	BAMBEY	N'GOYE	N'DONDOL	115	0.017653896
11	032201010009	DIOURBEL	DIOURBEL	N'DINDY	DANKH SENE	54	0.008289655
12	032202020030	DIOURBEL	DIOURBEL	N'DOULO	N'GOHE	112	0.01719336
13	033201060010	DIOURBEL	M'BACKE	KAEL	TOUBA M'BOUL	73	0.011206386
14	033201080001	DIOURBEL	M'BACKE	KAEL	TAIBA TIECKENE	83	0.012741507
15	041202010006	SAINT-LOUIS	DAGANA	NDIAYE	DIAMA	104	0.014092857
16	041202030023	SAINT-LOUIS	DAGANA	NDIAYE	RONKH	103	0.013957349
17	042201030002	SAINT-LOUIS	PODOR	CAS-CAS	MERY	64	0.008672527
18	042203010008	SAINT-LOUIS	PODOR	THILLE BOUBACAR	FANAYE	93	0.012602266
19	042204010020	SAINT-LOUIS	PODOR	GAMADJI SARE	DODEL	72	0.009756593
20	042204030039	SAINT-LOUIS	PODOR	GAMADJI SARE	GUEDE VILLAGE	131	0.01775158
21	043201030007	SAINT-LOUIS	SAINT LOUIS	RAO	N'DIEBENE GANDIOLE	102	0.013821841
22	043201010028	SAINT-LOUIS	SAINT LOUIS	RAO	GANDON	71	0.009621085
23	051201010001	TAMBACOUNDA	BAKEL	KENIEBA	GATHIARY	37	0.006798138
24	051203020024	TAMBACOUNDA	BAKEL	MOUDERY	GABOU	68	0.012493876
25	052201020010	TAMBACOUNDA	TAMBACOUNDA	KOUSSANAR	SINTHIOU MALEM	66	0.012126409
26	052202020024	TAMBACOUNDA	TAMBACOUNDA	MAKACOULIBANTANG	N'DOGA BABACAR	68	0.012493876
27	052203020027	TAMBACOUNDA	TAMBACOUNDA	MISSIRAH	MISSIRAH	104	0.01910828
28	053202020003	TAMBACOUNDA	GOUDIRY	BOYNGUEL BAMBA	BOYNGUEL BAMBA	85	0.015617344
29	054201010004	TAMBACOUNDA	KOUPENTOUM	BAMBA THIALENE	BAMBA THIALENE	67	0.012310142
30	054202010013	TAMBACOUNDA	KOUPENTOUM	KOUTHIABA WOLOF	KOUTHIA GAYDI	78	0.01433121
31	054202020006	TAMBACOUNDA	KOUPENTOUM	KOUTHIABA WOLOF	KOUTHIABA WOLOF	141	0.025906418
32	061201020045	KAOLACK	KAOLACK	NDIEDIENG	NDIAFFATE	92	0.01334881
33	061202020020	KAOLACK	KAOLACK	KOUMBAL	THIARE	61	0.008850842
34	062201010006	KAOLACK	NIORO	MEDINA-SABAKH	KAYEMOR	81	0.011752757
35	062201030024	KAOLACK	NIORO	MEDINA-SABAKH	NGAYENE	77	0.011172374
36	062202030031	KAOLACK	NIORO	PAOSKOTO	POROKHANE	64	0.009286129
37	062203010016	KAOLACK	NIORO	WACK-NGOUNA	KEUR MABA DIAKHOU	61	0.008850842
38	063201010007	KAOLACK	GUINGUINEO	MBADAKHOUNE	MBADAKHOUNE	93	0.013493906
39	063202030010	KAOLACK	GUINGUINEO	NGUELOU	OUROUR	81	0.011752757
40	071201010028	THIES	M'BOUR	FISSEL	FISSEL	84	0.014242921
41	071202010001	THIES	M'BOUR	SESSENE	N'GUENIENE	106	0.01797321
42	071202020029	THIES	M'BOUR	SESSENE	SANDIARA	144	0.024416436
43	071203010054	THIES	M'BOUR	SINDIA	MALICOUNDA	52	0.008817046
44	071203020018	THIES	M'BOUR	SINDIA	DIASS	148	0.02509467
45	072201010009	THIES	THIES	NOTTO	NOTTO	124	0.021025264
46	072202010009	THIES	THIES	THIENABA	N'DIEYENE SIRAKH	95	0.016108065
47	072202040005	THIES	THIES	THIENABA	TOUBA TOUL	80	0.013564687
48	072203010026	THIES	THIES	KEUR MOUSSA	DIENDER GUEDJI	108	0.018312327
49	072203030020	THIES	THIES	KEUR MOUSSA	KEUR MOUSSA	92	0.01559939
50	073201020007	THIES	TIVAOUANE	MEOUANE	TAIBA N'DIAYE	76	0.012886452

NUM	Num_DR	Region	Departement	ARROND	CR	Total menage	Probabilité d'inclusion
51	073201030050	THIES	TIVAOUANE	MEOUANE	DAROU KHOUDOSS	87	0.014751597
52	073202020032	THIES	TIVAOUANE	MERINA-DAKHAR	MERINA DAKHAR	85	0.01441248
53	073203030009	THIES	TIVAOUANE	NIAKHENE	NIAKHENE	92	0.01559939
54	073204030016	THIES	TIVAOUANE	PAMBAL	NOTTO GOUYE DIAMA	138	0.023399084
55	081201050002	LOUGA	KEBEMER	DAROU MOUSTY	SAM YABAL	79	0.01048371
56	081202050001	LOUGA	KEBEMER	NDANDE	THIEPPE	194	0.025744808
57	081203050003	LOUGA	KEBEMER	SAGATTA GUETH	NGOURANE OUOLOF	162	0.021498242
58	082202010010	LOUGA	LINGUERE	DODJI	DODJI	52	0.00690067
59	082203030022	LOUGA	LINGUERE	YANG YANG	TESSEKRE FORAGE	63	0.008360427
60	083201010004	LOUGA	LOUGA	COKI	COKI	112	0.014862982
61	083202020013	LOUGA	LOUGA	K EUR MOMAR SARR	K.MOMAR SARR	66	0.008758543
62	083203030014	LOUGA	LOUGA	MBEDIENE	NGUIDILE	106	0.014066751
63	083204030011	LOUGA	LOUGA	SAKAL	SAKAL	98	0.013005109
64	083204010008	LOUGA	LOUGA	SAKAL	LEONA	161	0.021365536
65	091201030017	FATICK	FATICK	NDIOB	NDIOB	58	0.007835588
66	091202030004	FATICK	FATICK	FIMELA	PALMARIN FACAO	88	0.011888478
67	091203030012	FATICK	FATICK	NIAKHAR	PATAR	95	0.012834152
68	091204030014	FATICK	FATICK	TATTAGUINE	TATTAGUINE	97	0.013104345
69	092201050017	FATICK	FOUNDIOUGNE	DJILOR	NIASSENE	62	0.008375973
70	092203030017	FATICK	FOUNDIOUGNE	TOUBACOUTA	NIORO ALASSANE TALL	103	0.013914923
71	093201020028	FATICK	GOSSAS	COLOBANE	MBAR	87	0.011753382
72	093202010002	FATICK	GOSSAS	OUADIOUR	NDIENE LAGANE	57	0.007700491
73	101201020010	KOLDA	KOLDA	DIOULACOLON	MEDINA EL HADJI	59	0.008549663
74	101202040012	KOLDA	KOLDA	MAMPATIM	DIALAMBERE	63	0.009129301
75	102201030014	KOLDA	VELINGARA	BONCONTO	MEDINA GOUNASS	127	0.018403511
76	102202010014	KOLDA	VELINGARA	PAKOUR	OUASSADOU	45	0.006520929
77	102203030009	KOLDA	VELINGARA	SARE COLY SALLE	NEMATABA	59	0.008549663
78	103203010001	KOLDA	MEDINA YORO FOULAH	NIAMING	DINGUIRAYE	82	0.011882582
79	103202030003	KOLDA	MEDINA YORO FOULAH	AR.NDORNA	BOUROUCO	95	0.013766406
80	111201020016	MATAM	MATAM	AGNAM-CIVOL	OREFONDE	87	0.014242616
81	111202010044	MATAM	MATAM	OGO	BOKIDIAWE	51	0.008349119
82	111202030013	MATAM	MATAM	OGO	OGO	46	0.007530578
83	112201020024	MATAM	KANEL	ORKADIERE	ORKADIERE	86	0.014078907
84	112202010035	MATAM	KANEL	OURO SIDY	NDENDORY	125	0.020463528
85	113201030006	MATAM	RANEROU	VELINGARA	OUDALAYE	64	0.010477326
86	113201020009	MATAM	RANEROU	VELINGARA	VELINGARA	117	0.019153862
87	121202010012	KAFFRINE	KAFFRINE	KATAKEL	DIOKOUL M'BELBOUCK	103	0.016052901
88	122201010003	KAFFRINE	BIRKELANE	KEUR M'BOUKI	KEUR M'BOUKI	99	0.015429487
89	122202020026	KAFFRINE	BIRKELANE	MABO	N'DIOGNICK	128	0.019949236
90	123202010010	KAFFRINE	KOUNGHEUL	LOUR ESCALE	LOUR ESCALE	124	0.019325823
91	123203030016	KAFFRINE	KOUNGHEUL	MISSIRAH WADENE	MISSIRAH WADENE	87	0.013559247
92	124202020028	KAFFRINE	MALEM HODDAR	SAGNA	SAGNA	80	0.012468273
93	124201020012	KAFFRINE	MALEM HODDAR	DAROU MINAM II	N'DIOUM N'GAINTH	75	0.011689006
94	131201010002	KEDOUGOU	KEDOUGOU	BANDAFASSI	BANDAFASSI	133	0.019470063
95	132201020002	KEDOUGOU	SALEMATA	DAKATELI	KEVOYE	140	0.020494803
96	141201040009	SEDHIOU	SEDHIOU	DIENDE	KOUSSY	91	0.014097599
97	142201020001	SEDHIOU	BOUNKILING	BOGHAL	TANKON	78	0.012083656
98	142203020006	SEDHIOU	BOUNKILING	DIAROUME	DIAMBATY	65	0.010069713
99	143202010007	SEDHIOU	GOUDOMP	KARANTABA	KARANTABA	80	0.012393493
100	143203030009	SEDHIOU	GOUDOMP	SIMBANDI BRASSOU	BAGHERE	140	0.021688613

Appendix C: Household questionnaire

(See attached document)

Appendix D: Key informant interview guides

(See attached document)

Appendix E: Focus group interview guides

(See attached document)

Appendix F: Results of multivariate logistic regression models

Model Box 2: Dependent variable «Owning improved latrine»

xi: logistic LatrineAméliorée i.Q2_7_Education Q2_19_AssezEau i.Socio-economicStatus i.axe Q5_15_LavageMainProche if LatrinesObs!=96 i.Q2_7_Educat~n _IQ2_7_Educ_0-4 (naturally coded; _IQ2_7_Educ_0 omitted) i.SocioEconom~s _ISocioEcon_1-3 (naturally coded; _ISocioEcon_1 omitted) i.axe_Iaxe_1-5 (naturally coded; _Iaxe_1 omitted)

Logistic regression Number of obs = 1,133
LR chi2(12) = 447.03
Prob > chi2 = 0.0000
Log likelihood = -560.1754 Pseudo R2 = 0.2852

LatrineAméliorée	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_IQ2_7_Educ_1	1.165724	.2996957	0.60	0.551	.704305	1.929439
_IQ2_7_Educ_2	1.351714	.4882667	0.83	0.404	.6659068	2.743824
_IQ2_7_Educ_3	2.01454	1.484508	0.95	0.342	.4752567	8.539323
_IQ2_7_Educ_4	1.041389	.1744697	0.24	0.809	.7499049	1.44617
Q2_19_AssezEau	.9857624	.1595147	-0.09	0.929	.7178472	1.353669
_ISocioEcon_2	2.027099	.4047495	3.54	0.000	1.370617	2.998015
_ISocioEcon_3	6.394554	1.397062	8.49	0.000	4.167182	9.812463
_Iaxe_2	.6073997	.1397409	-2.17	0.030	.38694	.9534667
_Iaxe_3	1.100636	.2655096	0.40	0.691	.6859714	1.765963
_Iaxe_4	.1075643	.0326385	-7.35	0.000	.0593453	.1949621
_Iaxe_5	.0819536	.0209611	-9.78	0.000	.049643	.135294
Q5_15_LavageMainProche	2.26847	.4202854	4.42	0.000	1.577715	3.26165
_cons	.8029578	.2303348	-0.77	0.444	.4576346	1.408856

Model Box 3: Dependent variable «Owning improved latrine region Center»

xi:logistic Q3_1_Latrines i.Socio-economicStatus i.Q2_19_AssezEau i.Q6_38_6_Propre if LatrinesObs!=96 & axe ==2 i.SocioEconom~s _ISocioEcon_1-3 (naturally coded; _ISocioEcon_1 omitted) i.Q2_19_Assez~u _IQ2_19_Ass_0-1 (naturally coded; _IQ2_19_Ass_0 omitted) i.Q6_38_6_Pro~e _IQ6_38_6_P_0-1 (naturally coded; _IQ6_38_6_P_0 omitted)

Logistic regression Number of obs = 571
LR chi2(4) = 126.20
Prob > chi2 = 0.0000
Log likelihood = -332.14156 Pseudo R2 = 0.1596

Q3_1_Latrines	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_ISocioEcon_2	1.816386	.3769366	2.88	0.004	1.209391	2.728032
_ISocioEcon_3	6.395577	1.816135	6.53	0.000	3.665779	11.15818
_IQ2_19_Ass_1	2.141821	.4282089	3.81	0.000	1.447453	3.169288
_IQ6_38_6_P_1	4.520856	1.267579	5.38	0.000	2.609496	7.832215
_cons	.086485	.0265858	-7.96	0.000	.0473455	.1579803

Model Box 4: Dependent variable «Systematic latrine use»

xi: logistic Q3_9_UtiliseSystematic i.LatrineAméliorée i.Socio-economicStatus i.Q2_5_TailleHH i.axe i.Q7_2_Fréquenceradio i.Q5_15_LavageMainProche if LatrinesObs!=96 & LatrinesObs!=3 i.LatrineAmél~e _ILatrineAm_0-1 (naturally coded; _ILatrineAm_0 omitted) i.SocioEconom~s _ISocioEcon_1-3 (naturally coded; _ISocioEcon_1 omitted) i.Q2_5_TailleHH _IQ2_5_Tail_1-4 (naturally coded; _IQ2_5_Tail_1 omitted) i.axe _Iaxe_1-5 (naturally coded; _Iaxe_1 omitted) i.Q7_2_Fréque~o _IQ7_2_Fré_1-4 (naturally coded; _IQ7_2_Fré_1 omitted) i.Q5_15_Lavag~e _IQ5_15_Lav_0-1 (naturally coded; _IQ5_15_Lav_0 omitted)

Logistic regression Number of obs = 1,122
LR chi2(14) = 144.91
Prob > chi2 = 0.0000
Log likelihood = -511.25565 Pseudo R2 = 0.1241

Q3_9_UtiliseSystematic	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_ILatrineAm_1	1.35696	.2688131	1.54	0.123	.9203314	2.000735
_ISocioEcon_2	1.725441	.3471815	2.71	0.007	1.163127	2.559606
_ISocioEcon_3	1.476498	.3304214	1.74	0.082	.9522366	2.289396
_IQ2_5_Tail_2	1.130926	.3252865	0.43	0.669	.6435824	1.987302
_IQ2_5_Tail_3	1.559102	.457091	1.51	0.130	.8776527	2.769658
_IQ2_5_Tail_4	2.063074	.5571449	2.68	0.007	1.215187	3.502569
_Iaxe_2	1.159262	.3553916	0.48	0.630	.6356689	2.114131
_Iaxe_3	.2360869	.0625938	-5.44	0.000	.1404083	.396964
_Iaxe_4	.4577539	.1546133	-2.31	0.021	.2361162	.8874385
_Iaxe_5	.522668	.1572601	-2.16	0.031	.2898122	.9426166
_IQ7_2_Fré_2	.2998522	.0637504	-5.67	0.000	.1976681	.4548602
_IQ7_2_Fré_3	.385865	.0937164	-3.92	0.000	.2397183	.6211117
_IQ7_2_Fré_4	.2948411	.0879812	-4.09	0.000	.1642811	.5291617
_IQ5_15_Lav_1	1.353268	.2743559	1.49	0.136	.909525	2.013506
_cons	3.66398	1.482871	3.21	0.001	1.657518	8.099307

Model Box 5: Dependent variable «OD practice»

xi: logistic PratiqueDAL i.LatrineAméliorée i.Socio-economicStatus i.axe i.Q3_3_Partagees i.Q7_2_Fréquenceradio if LatrinesObs!=96 & LatrinesObs!=3 i.LatrineAmél~e _ILatrineAm_0-1 (naturally coded; _ILatrineAm_0 omitted) i.SocioEconom~s _ISocioEcon_1-3 (naturally coded; _ISocioEcon_1 omitted) i.axe _Iaxe_1-5 (naturally coded; _Iaxe_1 omitted) i.Q3_3_Partag~s _IQ3_3_Part_0-1 (naturally coded; _IQ3_3_Part_0 omitted) i.Q7_2_Fréque~o _IQ7_2_Fré_1-4 (naturally coded; _IQ7_2_Fré_1 omitted)

Logistic regression Number of obs = 1,129
LR chi2(11) = 234.84
Prob > chi2 = 0.0000
Log likelihood = -661.47426 Pseudo R2 = 0.1507

PratiqueDAL	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_ILatrineAm_1	.9081983	.1477161	-0.59	0.554	.6602904	1.249184
_ISocioEcon_2	.5025892	.0930554	-3.72	0.000	.3496323	.7224616
_ISocioEcon_3	.3747442	.0762129	-4.83	0.000	.2515495	.5582727
_Iaxe_2	1.817615	.3929141	2.76	0.006	1.189864	2.776555
_Iaxe_3	9.225782	2.07525	9.88	0.000	5.936544	14.33748
_Iaxe_4	5.624885	1.586935	6.12	0.000	3.235685	9.778248
_Iaxe_5	2.896895	.6811457	4.52	0.000	1.827217	4.592777
_IQ3_3_Part_1	1.830723	.3120795	3.55	0.000	1.31075	2.556967
_IQ7_2_Fré_2	1.627121	.3353498	2.36	0.018	1.086393	2.436983
_IQ7_2_Fré_3	2.035985	.4882093	2.97	0.003	1.27252	3.2575
_IQ7_2_Fré_4	1.067277	.3115124	0.22	0.823	.6023269	1.891134
_cons	.6447951	.1660392	-1.70	0.088	.3892526	1.0681

Model Box 6: Dependent variable «Systematic hand washing»

xi: logistic LavageMainsSystBesoins i.LatrineAméliorée i.Socio-economicStatus i.Q2_7_Education i.Q5_15_LavageMainProche if LatrinesObs!=96 i.LatrineAmél~e _ILatrineAm_0-1 (naturally coded; _ILatrineAm_0 omitted) i.SocioEconom~s _ISocioEcon_1-3 (naturally coded; _ISocioEcon_1 omitted) i.Q2_7_Educat~n _IQ2_7_Educ_0-4 (naturally coded; _IQ2_7_Educ_0 omitted) i.axe _Iaxe_1-5 (naturally coded; _Iaxe_1 omitted) i.Q5_15_Lavag~e _IQ5_15_Lav_0-1 (naturally coded; _IQ5_15_Lav_0 omitted)

Logistic regression Number of obs = 1,133
LR chi2(12) = 153.60
Prob > chi2 = 0.0000
Log likelihood = -666.97119 Pseudo R2 = 0.1033

LavageMainsSystBesoins	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_ILatrineAm_1	1.010702	.1662667	0.06	0.948	.7321416	1.395247
_ISocioEcon_2	1.636824	.3054913	2.64	0.008	1.135368	2.359757
_ISocioEcon_3	2.135102	.440905	3.67	0.000	1.424436	3.200327
_IQ2_7_Educ_1	1.531055	.3456905	1.89	0.059	.9835621	2.383307
_IQ2_7_Educ_2	2.070306	.6154988	2.45	0.014	1.156042	3.707622
_IQ2_7_Educ_3	4.894132	3.230139	2.41	0.016	1.342396	17.84312
_IQ2_7_Educ_4	1.362715	.2112623	2.00	0.046	1.005641	1.846576
_Iaxe_2	1.849814	.3834055	2.97	0.003	1.232259	2.776861
_Iaxe_3	.5362513	.1169775	-2.86	0.004	.3496938	.8223352
_Iaxe_4	2.348705	.6372123	3.15	0.002	1.380049	3.997262
_Iaxe_5	1.196845	.2772309	0.78	0.438	.7600987	1.884542
_IQ5_15_Lav_1	3.775839	.5948264	8.43	0.000	2.772806	5.141708
_cons	.163083	.0434584	-6.81	0.000	.0967342	.2749396

Model Box 7: Dependent variable «There is nothing I could do to improve the sanitation situation at home»

xi:logistic Q6_39_1_Rien i.axe i.WCPrefere i.Q3_1_Latrines i.Q6_34_Dette i.Q7_11_ParticipCommu i.Q6_13_DecideLatrines if LatrinesObs!=96 i.axe _Iaxe_1-5 (naturally coded; _Iaxe_1 omitted) i.WCPrefere _IWCPrefere_1-4 (naturally coded; _IWCPrefere_1 omitted) i.Q3_1_Latrines _IQ3_1_Latr_0-1 (naturally coded; _IQ3_1_Latr_0 omitted) i.Q6_34_Dette _IQ6_34_Det_0-1 (naturally coded; _IQ6_34_Det_0 omitted) i.Q7_11_Parti~u _IQ7_11_Par_0-1 (naturally coded; _IQ7_11_Par_0 omitted) i.Q6_13_Decid~s _IQ6_13_Dec_1-96 (naturally coded; _IQ6_13_Dec_1 omitted) note: _IWCPrefere_4 != 0 predicts failure perfectly _IWCPrefere_4 dropped and 3 obs not used

Logistic regression Number of obs = 1,910
LR chi2(12) = 320.35
Prob > chi2 = 0.0000
Log likelihood = -911.12979 Pseudo R2 = 0.1495

Q6_39_1_Rien	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_Iaxe_2	2.311196	.6100489	3.17	0.002	1.377713	3.877168
_Iaxe_3	10.66139	2.743224	9.20	0.000	6.438664	17.65354
_Iaxe_4	4.297939	1.230563	5.09	0.000	2.45216	7.533064
_Iaxe_5	5.180644	1.395851	6.11	0.000	3.0552	8.78472
_IWCPrefere_2	1.722497	.5623654	1.67	0.096	.908356	3.266338
_IWCPrefere_3	2.042403	.6395433	2.28	0.023	1.105611	3.772945
_IWCPrefere_4	1 (omitted)					
_IQ3_1_Latr_1	.6643236	.0831346	-3.27	0.001	.519827	.8489859
_IQ6_34_Det_1	.3791874	.0485593	-7.57	0.000	.2950175	.4873713
_IQ7_11_Par_1	.3449316	.0603573	-6.08	0.000	.2447861	.486048
_IQ6_13_Dec_2	.770008	.1518519	-1.33	0.185	.5231561	1.133337
_IQ6_13_Dec_3	.3317095	.3546617	-1.03	0.302	.0407999	2.696853
_IQ6_13_Dec_96	.258355	.0856418	-4.08	0.000	.1349127	.4947441
_cons	.1808263	.0457855	-6.75	0.000	.110087	.297021