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Investir dans les populations rurales

République du Kenya

Programme de commercialisation en faveur
des petits horticulteurs

Évaluation de l'impact

Note aux membres du Comité de l'évaluation

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Table des matières

Sigles et acronymes	ii
Carte de la zone du programme	iii
Résumé	iv
Appendice	
Main Report – Republic of Kenya Smallholder Horticulture Marketing Programme Evaluation of Impact	

Sigles et acronymes

IOE Bureau indépendant de l'évaluation du FIDA
S&E Suivi et évaluation
UGP Unité de gestion du programme

Carte de la zone du programme



Résumé

A. Généralités

1. Conformément à la décision du Conseil d'administration du FIDA, le Bureau indépendant de l'évaluation (IOE) du FIDA a procédé en 2017/2018 à une évaluation de l'impact du Programme de commercialisation en faveur des petits horticulteurs mis en œuvre au Kenya avec le concours du FIDA. La justification générale et le mandat de cette évaluation de l'impact sont exposés dans le document d'orientation¹.

B. Le programme

2. Le programme avait pour finalité de réduire la pauvreté des ménages ruraux pauvres en augmentant les revenus et en luttant contre le chômage et le sous-emploi dans des régions dotées d'un potentiel agricole moyen à élevé, où l'horticulture constitue une part importante des moyens d'existence. Pour y parvenir, le programme devait atténuer les obstacles à la commercialisation des intrants et de la production auxquels étaient confrontés les ménages de petits horticulteurs produisant pour le marché intérieur kényan. Les deux objectifs de développement poursuivis étaient les suivants: i) accroître les revenus et réduire la pauvreté parmi les ménages ruraux pauvres vivant dans des régions dotées d'un potentiel agricole moyen à élevé pour lesquels l'horticulture constitue une part importante des moyens d'existence, et ii) améliorer la santé et les conditions de vie des Kényans en augmentant la qualité et la quantité de produits horticoles consommés dans le pays.
3. Groupe cible. Dans le Rapport du Président, il était indiqué que ce programme s'adresserait directement à quelque 12 000 ménages de petits paysans, soit 60 000 personnes. Les bénéficiaires directs étaient des petits horticulteurs produisant principalement pour le marché intérieur, des fournisseurs d'intrants (distributeurs), des négociants en produits agricoles, des transporteurs et des transformateurs. En outre, 85 000 ménages bénéficieraient indirectement du programme, qui favoriserait la mobilité et la création d'emplois à toutes les étapes des chaînes de valeur. Un ciblage géographique a été utilisé pour sélectionner les sous-comtés en fonction des caractéristiques de la pauvreté, de la production horticole et de la présence d'autres initiatives pertinentes avec lesquelles il était possible d'envisager des synergies. Au stade de la conception, il était prévu que 36% des bénéficiaires soient des femmes.
4. Composantes du programme. Ce programme a été mis en œuvre dans le cadre de trois grandes composantes: composante A: analyse des circuits commerciaux kényans; composante B: renforcement institutionnel; et composante C: investissements en faveur des chaînes de valeur du secteur horticole kényan, auxquelles s'ajoutait un quatrième volet portant sur la gestion et la coordination du programme. Au titre de la composante A, il était prévu de mener un certain nombre d'études, à savoir deux analyses d'envergure nationale, l'une portant, en amont, sur les circuits d'approvisionnement en intrants, et l'autre étudiant, en aval, le commerce de gros et de détail des produits horticoles, et de procéder à 14 analyses de chaînes de valeur à l'échelle du district. La composante B comprenait: i) des activités de formation à l'intention de groupements de paysans pratiquant l'horticulture déjà constitués, sous une forme structurée ou informelle, de distributeurs d'intrants, de commerçants, de négociants, de responsables des marchés et de membres du personnel des ministères; ii) un appui aux agriculteurs et aux commerçants en ce qui concerne les informations sur les marchés, sous forme de textos envoyés sur les téléphones mobiles ou de messages diffusés à la radio; iii) un appui à l'amélioration des politiques et de la législation encadrant le

¹ <https://www.ifad.org/fr/web/ioe/evaluation/asset/40307169>

sous-secteur de l'horticulture. La composante C comprenait: i) des initiatives pilotes visant à venir en aide à des groupes de bénéficiaires au moyen de subventions attribuées par voie de concours; ii) des améliorations localisées de la voirie rurale afin de donner accès aux marchés; iii) la création ou l'amélioration d'infrastructures de marché en aval.

5. Coût et financement du programme. Le coût du programme tel qu'il s'établissait à son achèvement a été financé comme suit: i) prêt du FIDA de 23,03 millions d'USD (71,6% du budget total); don du FIDA de 0,50 million d'USD (1,6%); iii) fonds de contrepartie du Gouvernement kényan à hauteur de 7,23 millions d'USD (22,5%), et contribution des bénéficiaires de 1,39 million d'USD (4,3%).
6. Calendrier. Le Conseil d'administration du FIDA a approuvé ce programme le 18 avril 2007, et l'accord de prêt a été signé le 10 juillet 2007. Il était prévu que le programme débute en juin 2007 et s'achève en décembre 2013 et que le prêt soit clos le 30 juin 2014. Cependant, le programme a bénéficié d'une prorogation de un an à coût constant, de sorte que l'achèvement a en réalité eu lieu le 31 décembre 2014, et la clôture du prêt le 30 juin 2015.
7. Modalités d'exécution. Le programme a été mis en œuvre par le Ministère de l'agriculture, de l'élevage et de la pêche. L'unité de gestion du projet (UGP) a été chargée d'en faciliter l'exécution. Dans chaque district ou sous-comté participant, les services de l'agriculture ont établi des plans de travail et budgets annuels et assuré la coordination de la mise en œuvre du programme sur le territoire relevant de leur compétence. En outre, des assemblées de parties prenantes constituées à l'échelle des districts ou des sous-comtés ont été chargées d'analyser le potentiel de commercialisation des produits horticoles et les obstacles à surmonter et de valider les propositions reçues concernant la construction de marchés en dur.

C. Objectifs, méthode et procédure d'évaluation

8. Objectifs. Cette évaluation de l'impact du Programme de commercialisation en faveur des petits horticulteurs avait pour finalité d'analyser les caractéristiques de la performance du programme et d'en cerner les facteurs fondamentaux, ce qui permettrait du même coup de proposer des informations utiles à la conception et à l'exécution de projets bénéficiant du concours du FIDA. Les principaux objectifs de cette évaluation étaient les suivants: i) déterminer dans quelle mesure les interventions menées au titre du programme ont eu un effet sur la situation économique des ménages bénéficiaires, et si les effets observés pouvaient être attribués à ces interventions; ii) rechercher quels facteurs étaient à l'origine de la performance du programme, qu'elle soit bonne ou mauvaise; iii) fournir des éléments factuels utiles de nature à apporter une contribution essentielle à l'évaluation de la stratégie et du programme de pays concernant le Kenya.
9. Méthode et procédure Ce programme a été évalué au regard des critères énoncés dans la deuxième édition du Manuel de l'évaluation publié par IOE en 2015, qui distingue quatre domaines d'impact au titre du critère concernant l'impact sur la pauvreté rurale: i) revenu et avoirs des ménages; ii) capital humain et social et autonomisation; iii) sécurité alimentaire et productivité agricole; iv) institutions et politiques. En outre, les critères suivants ont été utilisés pour évaluer la performance: pertinence, efficacité, efficience, durabilité des avantages, égalité entre les sexes et autonomisation des femmes, innovation et reproduction à plus grande échelle, gestion de l'environnement et des ressources naturelles, adaptation aux changements climatiques, résultats globaux du programme, et enfin performance des partenaires. Ces critères ont été notés sur une échelle de 1 à 6, la meilleure note étant 6 et la plus faible 1.
10. La théorie du changement définie pour ce programme était le point de départ de cette évaluation d'impact (voir l'annexe IV). L'équipe d'évaluation s'est appuyée sur une méthode quasi-expérimentale afin d'attribuer ou non les effets observés

aux interventions du programme. Pour déterminer l'impact, elle a utilisé un scénario contrefactuel reposant sur la comparaison avec un groupe témoin (ou groupe de référence).

11. Les évaluateurs ont associé des techniques qualitatives et quantitatives. Un exposé détaillé de la méthodologie suivie et une analyse des résultats sont présentés à l'annexe VI. Le principal outil d'évaluation, l'enquête auprès des ménages, a servi à recueillir les données quantitatives primaires. Le questionnaire d'enquête a été soumis à 1 522 ménages, dont 825 appartenaient au groupe témoin et 697 au groupe de traitement (ménages ayant participé au programme). Une fois conçu, le questionnaire a été administré au groupe participant et au groupe témoin à l'aide d'entretiens individuels assistés par ordinateur. Pour compléter ce volet quantitatif de l'évaluation, les évaluateurs ont employé une série de méthodes qualitatives qui ont permis d'appréhender les mécanismes de causalité par lesquels l'intervention a atteint ou non ses objectifs. Des entretiens avec des informateurs clés et des discussions de groupe ont servi à recueillir les informations de nature qualitative. Les entretiens individuels ont permis d'obtenir le point de vue de distributeurs d'intrants et de négociants ou transporteurs. Au total, 48 entretiens de ce type, répartis équitablement entre les 14 districts, ont été menés. Toutes les catégories de bénéficiaires et les informateurs clés les plus importants sont représentés. En outre, 17 discussions de groupe ont été organisées afin de prendre connaissance du point de vue des détaillants qui vendent leurs produits sur les marchés construits dans le cadre du programme, des participants aux initiatives pilotes et aux "villages commerciaux", et des comités de gestion (ponts et marchés).
12. Les évaluateurs ont utilisé la méthode de l'appariement sur les scores de propension pour estimer l'impact des activités du programme sur la situation économique des ménages. Certaines caractéristiques (covariables) qui auraient pu influencer sur la probabilité qu'un bénéficiaire participe au programme ont été utilisées dans un modèle probit standard pour calculer les scores de propension. La procédure d'appariement sur le plus proche voisin (avec remise) a été utilisée pour calculer les scores. Après pondération sur le score de propension, les covariables étaient équilibrées entre le groupe de traitement et le groupe témoin. Pour apprécier la qualité de l'appariement entre le groupe bénéficiaire et le groupe témoin, on a appliqué la méthode du biais standardisé, qui consiste à comparer le biais avant et après appariement. La qualité de l'appariement a contribué à établir que la distribution des variables était équilibrée aussi bien dans le groupe de traitement que dans le groupe témoin, c'est-à-dire que la correspondance entre ces deux groupes était satisfaisante.
13. L'impact a été évalué à l'aide d'une analyse comparative "avec et sans" visant à estimer les effets du programme. Il s'agissait de comparer les valeurs des variables d'effet direct obtenues dans le groupe de traitement et dans le groupe témoin à la même date, postérieure à l'achèvement du programme (2017 en l'occurrence).
14. Compte tenu de l'importance que le Gouvernement kényan attache à la sécurité alimentaire du pays, on a employé dans cette évaluation d'impact une approche pluridimensionnelle pour mesurer les effets du programme sur la sécurité alimentaire des bénéficiaires. Deux indicateurs – l'échelle d'insécurité alimentaire au niveau des ménages et le score de diversité du régime alimentaire des ménages – ont été utilisés pour mesurer deux dimensions, à savoir l'accès de chaque ménage à l'alimentation et la qualité de son régime alimentaire. Le premier indicateur évalue la manière dont les ménages perçoivent leur situation sur le plan de la sécurité alimentaire et s'adaptent en conséquence, tandis que le second mesure la qualité nutritionnelle ou l'adéquation des apports en micronutriments du régime alimentaire des personnes interrogées.

D. Principales constatations de l'évaluation

15. Impact sur la pauvreté rurale. Sur la base de cette évaluation, l'impact du programme sur la situation économique des bénéficiaires est jugé modérément positif. Afin d'apprécier les avantages économiques pour les ménages, trois paramètres ont été mesurés: le revenu agricole, les dépenses alimentaires et l'indice des biens des ménages. Les données empiriques ont montré que les revenus agricoles des bénéficiaires avaient plus progressé que ceux du groupe de référence et que les écarts étaient statistiquement significatifs. De même, les bénéficiaires ont fait état de dépenses alimentaires plus importantes, mais les résultats n'étaient pas statistiquement significatifs, et par conséquent il n'est pas possible d'affirmer avec un certain degré de fiabilité statistique qu'il existe une forte probabilité que ce soit effectivement le cas. En ce qui concerne les actifs agricoles, les résultats ont montré que les actifs des bénéficiaires étaient supérieurs à ceux des ménages qui n'avaient pas participé au programme. Toutefois, ces résultats ne sont pas statistiquement significatifs. En ce qui concerne les effets hétérogènes du programme, les ménages dirigés par une femme ayant bénéficié du programme ont fait état de revenus plus élevés que les ménages dirigés par une femme du groupe de référence. En revanche, la participation au programme n'a pas conduit les ménages dirigés par une femme à obtenir des revenus supérieurs ou égaux à ceux des ménages dirigés par un homme.
16. Deux indicateurs ont été utilisés pour mesurer l'évolution de la situation des bénéficiaires sur le plan de la sécurité alimentaire: l'échelle d'insécurité alimentaire au niveau des ménages et le score de diversité du régime alimentaire des ménages. L'objectif était d'aborder la question de la sécurité alimentaire dans une perspective plus globale en considérant la manière dont les ménages perçoivent leur situation sur le plan de la sécurité alimentaire et s'adaptent en conséquence, ainsi que la qualité nutritionnelle des aliments qu'ils consomment. Les résultats ont montré que les bénéficiaires du programme avaient plus largement accès à la nourriture et consommaient des produits alimentaires plus variés que ceux appartenant au groupe témoin (écarts statistiquement significatifs de -0,43 pour l'échelle d'insécurité alimentaire au niveau des ménages et de 0,24 pour le score de diversité du régime alimentaire des ménages).
17. Les ménages bénéficiaires obtenaient des rendements plus élevés pour la banane et la pomme de terre, et ces résultats étaient statistiquement significatifs. Pour la patate douce, les ménages du groupe témoin obtenaient des rendements supérieurs, mais les résultats n'étaient pas statistiquement significatifs. Les résultats ont également montré que les ménages ayant participé au programme obtenaient une marge brute par acre supérieure à celle des bénéficiaires du groupe témoin pour chacune de ces quatre cultures. Toutefois, les résultats n'étaient statistiquement significatifs que pour la banane et la patate douce. Ces résultats sont importants parce que dans 12 des 14 sous-comtés dans lesquels des interventions ont été menées au titre du programme, la filière de la banane était l'une des chaînes de valeur retenues, ce qui souligne le rôle important que joue cette production.
18. En ce qui concerne le capital social, l'analyse quantitative menée pour les besoins de cette évaluation a montré que les membres appartenant aux ménages qui ont participé aux activités relevant du programme étaient plus susceptibles de constituer des groupements que les autres ménages. Toutefois, il est important de noter que la plupart étaient membres de groupements de production et non de commercialisation. Cet aspect a également été souligné dans le cadre des discussions de groupe; alors que les paysans se sont effectivement rassemblés au sein de groupements de producteurs (afin d'échanger leurs connaissances en matière de pratiques agricoles), lorsqu'il s'est agi de se regrouper pour commercialiser les produits, la plupart n'ont pas franchi le pas en raison de problèmes de confiance mutuelle et de choix des responsables. Par exemple, les

membres des groupements craignaient que les quelques membres chargés de vendre pour le compte du groupement dissimulent les prix de vente effectivement pratiqués ou qu'ils ne paient pas les autres en temps et en heure.

19. Dans le cadre du programme, les distributeurs d'intrants ont bénéficié de formations en matière de comptabilité, d'évolution du marché des intrants agricoles et d'utilisation de nouveaux produits, et ils ont appris à utiliser les produits en toute sécurité; par ailleurs, les paysans ont été épaulés afin d'améliorer la qualité de leur production et la qualité et la nature des intrants et de développer les ventes. Toutefois, il ressort des entretiens menés dans le cadre de cette évaluation que le temps consacré à ces formations était insuffisant et que les formateurs partageaient le principe que les bénéficiaires disposaient des connaissances de base sur ces questions, ce qui n'était pas toujours exact. Il n'a pas été procédé à une évaluation quantitative de l'impact des marchés en dur et des initiatives pilotes sur les bénéficiaires; cependant, les résultats d'observations, les discussions de groupe et les entretiens avec des informateurs clés révèlent que ces deux types d'intervention n'ont pas eu les résultats escomptés. Environ la moitié seulement des marchés en dur fonctionnaient bien lorsque la présente évaluation a été faite; le constat est le même pour les initiatives pilotes. Sur la base de cette évaluation, l'impact du programme sur la pauvreté rurale est jugé plutôt satisfaisant (4).
20. Pertinence. Les objectifs de développement retenus pour ce programme étaient conformes à la Vision 2030 pour le Kenya, au Plan stratégique arrêté par le Ministère de l'agriculture, de l'élevage et de la pêche pour la période 2013-2017, aux trois objectifs du Plan stratégique élaboré en 2009 par l'Agence de développement des cultures horticoles et à la stratégie de développement du secteur agricole pour la période 2009-2020 en ce qui concerne l'essor de la productivité, de la commercialisation et de la compétitivité des produits agricoles. Les objectifs du programme et les activités prévues étaient également pleinement conformes au Cadre stratégique du FIDA et au programme d'options stratégiques pour le Kenya adopté en 2007, qui était en vigueur à l'époque. L'accent mis sur la commercialisation des produits horticoles destinés aux marchés locaux se justifiait puisque dans toutes les zones à potentiel moyen ou élevé du Kenya, la proportion de ménages qui pratiquent l'horticulture est comprise entre 80% et 100%, et que moins de 2% des paysans produisent directement pour l'exportation. La plupart des activités relevant du programme ont été choisies à la faveur d'une démarche participative déterminée par la demande (c'est le cas par exemple pour les initiatives pilotes génératrices de revenus, la conception des marchés et l'amélioration des ponts et des routes).
21. Toutefois, un certain nombre de problèmes, aussi bien exogènes et qu'endogènes, ont remis en cause la pertinence de la conception du programme et de l'approche adoptée. L'évolution du cadre constitutionnel a compromis la pertinence du choix des partenaires chargés de mettre en œuvre la composante portant sur les infrastructures de marché en milieu rural. Avec la promulgation de la nouvelle constitution adoptée en 2010, un système de gouvernance décentralisé a été instauré, ce qui a entraîné des difficultés; par exemple, les crédits et les pouvoirs attribués par les comités aux comités de gestion des marchés étaient insuffisants. Par ailleurs, les chaînes de valeur ont été analysées dans le cadre des districts, en dépit du fait que la plupart des produits choisis sont également commercialisés en dehors des districts visés par le programme, de sorte qu'il n'a pas été possible de s'inscrire dans une optique de chaîne de valeur intégrée. Enfin, la conception du programme n'a pas tenu compte des capacités nécessaires pour mettre en œuvre un programme ambitieux qui s'étendait sur 14 districts, consistait en une multitude d'activités diverses associant des interventions immatérielles et matérielles, et ciblait des bénéficiaires dont les besoins étaient hétérogènes. La pertinence du programme est jugée plutôt satisfaisante (4).

22. Efficacité. La plupart des objectifs du programme ont été atteints. Pour entrer dans le détail, l'accès aux marchés était le principal objectif au regard de la part du budget du programme qui lui était affectée. À cet égard, les améliorations localisées (routes et ponts) se sont avérées efficaces puisqu'elles ont permis d'accéder plus facilement aux marchés et aux négociants. Cependant, pour l'intervention à laquelle plus de 60% des crédits du programme ont été consacrés – c'est-à-dire la construction ou l'amélioration des marchés – les résultats ont été insuffisants. Lorsque la présente évaluation a été faite, la moitié seulement des marchés étaient pleinement utilisés. En ce qui concerne la rationalisation des marchés d'intrants et de produits, le succès est en demi-teinte. Les formations organisées à l'intention des distributeurs d'intrants ont été utiles, car elles leur ont permis d'enrichir leurs connaissances (qu'ils ont transmises aux paysans) et de mieux appréhender la conduite de leur activité. Toutefois, ces progrès n'ont pas eu d'incidence économique sur les paysans, car les distributeurs n'ont pas transféré les gains d'efficacité obtenus sous forme de baisse des prix de vente des intrants.
23. Les villages commerciaux (des groupements villageois de vente des produits) ont obtenu un succès mitigé sur le plan de l'accès aux marchés. Les dispositifs d'information sur les prix prévus au stade de la préévaluation du programme n'ont pas été mis en place (textos), n'ont pas été tenus à jour après l'achèvement du programme (panneaux d'affichage) ou ont été peu utilisés, semble-t-il. En ce qui concerne l'objectif de développement des productions à forte valeur ajoutée, le succès est également en demi-teinte. On a pu constater que certaines initiatives pilotes comme les serres à tomates fonctionnaient de manière satisfaisante; cependant, lors de la mission d'évaluation, dans la moitié des cas, les paysans ne tiraient aucun revenu des initiatives pilotes, soit parce que celles-ci n'avaient jamais démarré, soit parce qu'elles avaient capoté. Il est important de noter que les échecs concernent surtout les activités d'aval visant à créer une proposition de valeur pour les paysans en facilitant la vente collective. Ainsi, d'un côté, la plupart des produits prévus ont été réalisés mais, d'un autre côté, ils n'ont pas permis d'obtenir des effets directs qui soient à la hauteur des attentes. Sur la base de l'évaluation, l'efficacité est jugée plutôt insuffisante (3).
24. Efficacité. Le programme est entré en vigueur relativement peu de temps après l'approbation du prêt. Sept mois seulement se sont écoulés entre l'approbation du programme par le Conseil d'administration du FIDA et son démarrage effectif; ce délai est inférieur à la moyenne à l'échelle du FIDA, soit 12,3 mois, et à la moyenne régionale, soit 10,2 mois. Au départ, le rythme des décaissements était lent, mais à l'achèvement du programme, près de 98% des fonds accordés par le FIDA avaient été décaissés. Cela étant, le coût global du programme a dépassé de 21% le total prévu. Le montant élevé de l'enveloppe de dépenses s'explique par le fait que la contribution de l'État a dépassé d'environ 446% l'objectif prévu à la conception. Ces ressources supplémentaires ont principalement servi à financer des travaux de génie civil en prenant en charge les variations du coût d'aménagement des marchés résultant de dépassements de coûts ou de travaux qui ne figuraient pas sur la liste des aménagements approuvés. Les frais de gestion ont également dépassé de quelque 37% l'estimation retenue lors de la préévaluation. Ce surcoût s'explique par la nécessité d'externaliser des activités comme l'analyse des marchés, l'appui aux dispositifs de suivi et évaluation (S&E) et l'évaluation des plans des infrastructures de commercialisation, étant donné que l'UGP ne disposait pas des capacités indispensables pour s'en charger elle-même comme il avait été initialement prévu.
25. Il n'a pas été procédé à une analyse coûts/avantages à l'achèvement de ce programme, qui était axé sur la promotion des chaînes de valeur et dont plus de 70% du budget ont été affectés à des activités se rapportant aux infrastructures. Il ressort de l'analyse réalisée dans le cadre de la présente évaluation que certains aménagements comme les routes et les ponts ont produit des avantages qui en

justifiaient le coût; dans le cas des marchés en dur, les avantages ne justifient pas les coûts de construction, du moins tant que tous ces marchés ne sont pas pleinement opérationnels. Compte tenu des éléments ci-dessus, sur la base de cette évaluation de l'impact, l'efficacité du programme est jugée plutôt insuffisante (3).

26. Durabilité des avantages. Il ressort de cette évaluation que le bilan est mitigé sur le plan des chances de pérennisation des activités des villages commerciaux et des initiatives pilotes. On peut s'attendre à ce que les améliorations localisées de la voirie soient plus durables, étant donné que des comités de bénéficiaires ont été constitués et que les administrations des comtés contribuent au financement. La pérennité à long terme des marchés en dur n'est pas assurée, alors que ce volet du programme s'est taillé la part du lion en termes de financement. Des obstacles demeurent, notamment en ce qui concerne l'apport de capitaux par les autorités des comtés pour terminer tous les travaux et l'aptitude des comtés et des comités de gestion des marchés à en assurer le bon fonctionnement. Il est possible que ces écueils soient dus aux difficultés initiales de la décentralisation, et qu'à terme, les marchés fonctionnent comme prévu. Sur la base de cette évaluation, la durabilité est jugée plutôt satisfaisante (4).
27. Innovation. La conception du programme comportait un certain nombre d'innovations destinées à favoriser les pratiques optimales et à assurer la qualité de son exécution. Ces innovations méritent d'être notées. Néanmoins, certaines d'entre elles: a) n'ont pas été mises en place du tout (deux études à l'échelle nationale), b) n'étaient pas à la hauteur des attentes sur le plan de la qualité (analyse des chaînes de valeur), ou c) ont donné des résultats mitigés (villages commerciaux et initiatives pilotes). Sur la base de cette évaluation, la performance en matière d'innovation est jugée plutôt insuffisante (3).
28. Reproduction à plus grande échelle. Parmi les nombreuses activités réalisées dans le cadre du programme, on trouve des exemples de reproduction à plus grande échelle dans un cas, celui du développement des chaînes de valeur. Ainsi, les autorités du comté de Bungoma avaient réservé des crédits destinés à favoriser l'accroissement de la valeur ajoutée dans les filières de la banane et de la tomate. Autre exemple, dans le comté de Nyandarua, les autorités avaient adopté l'approche axée sur les chaînes de valeur et avaient élaboré une stratégie de promotion des filières de la pomme de terre et de la carotte. Plus précisément, les autorités du comté de Nyandarua avaient affecté des agents au développement des chaînes de valeur et de l'accès aux marchés pour assurer le succès des initiatives de soutien aux chaînes de valeurs qu'elles avaient mises en place. Dans le comté de Kericho, l'approche axée sur l'analyse des chaînes de valeur retenue dans le cadre du programme a inspiré l'élaboration du Programme de développement de l'horticulture adopté par le comté. Les autorités ont affecté 160 millions de shillings kényans à la promotion de l'horticulture irriguée, au développement de la filière de l'ananas et à l'appui au développement de l'artisanat dans le sous-secteur horticole. Sur la base de cette évaluation, la performance du programme en ce qui concerne la reproduction à plus grande échelle est jugée plutôt satisfaisante (4).
29. Égalité des sexes et autonomisation des femmes. Dans le cadre de ce programme, les femmes et les hommes ont participé aux activités sur un pied d'égalité. De même, la plupart des objectifs chiffrés arrêtés pour les femmes ont été atteints. Le système de S&E du projet a permis de recueillir des données ventilées par sexe. Par ailleurs, le programme a eu un impact positif sur les femmes: la proportion de ménages dans lesquels les femmes étaient associées aux prises de décisions était plus forte dans le groupe de ménages bénéficiaires que dans le groupe témoin. L'analyse quantitative a permis de constater que les revenus des femmes chefs de famille étaient plus élevés dans le groupe de ménages bénéficiaires que dans le groupe témoin. En revanche, il est regrettable que le programme n'ait pas disposé d'un spécialiste de la problématique femmes-

hommes à temps plein, d'autant que la moitié des bénéficiaires étaient des femmes. Sur la base de cette évaluation, la performance du programme en matière d'égalité entre les sexes et d'autonomisation des femmes est jugée satisfaisante (5).

30. Gestion de l'environnement et des ressources naturelles. Un très grand nombre d'activités menées dans le cadre de ce programme avaient pour objet de protéger et de régénérer l'environnement et les ressources naturelles. Les activités de formation ont contribué à mieux faire comprendre aux communautés comment faire face aux risques environnementaux. L'obligation de procéder à une évaluation environnementale et la mise en œuvre de mesures d'atténuation ont permis d'éviter de financer l'aménagement de marchés dont l'incidence sur l'environnement aurait été préjudiciable et de faire en sorte que les activités soient exécutées d'une manière acceptable sur le plan de l'environnement. En ce qui concerne les marchés en dur, plusieurs fonctionnalités et équipements respectueux de l'environnement ont été mis en place à la faveur du programme. Des dispositions ont été prises pour éliminer les déchets produits dans les marchés. L'amélioration indispensable de la fertilité à long terme des terres des petits paysans et d'autres pratiques agricoles durables, comme la diversification des assolements, vont probablement permettre d'enrayer la dégradation des terres et la pression sur les terres moins fertiles. Cependant, le risque existe que des engrais de contrefaçon soient utilisés pour augmenter la production, et que certaines des activités visant à éviter la dégradation de l'environnement, comme l'élimination des déchets, ne soient pas exécutées, ce qui pourrait réduire à néant ou limiter certains des effets recherchés en ce qui concerne l'environnement. Sur la base de cette évaluation, la gestion des ressources naturelles et de l'environnement est jugée satisfaisante (5).
31. Adaptation aux changements climatiques. Bien qu'à l'époque de la mise en œuvre de ce programme, le FIDA ait pris toute la mesure de l'importance de la question des changements climatiques et de leurs répercussions sur les moyens d'existence des petits paysans, aucune stratégie concernant les changements climatiques n'avait été expressément formulée. Toutefois, certaines des 80 initiatives pilotes étaient en rapport avec l'adaptation aux changements climatiques. Par exemple, 16 d'entre elles portaient sur la culture sous serre (notamment le projet du groupement de jeunes de Nakewa, dans le sous-district de Bungoma East, dans le cadre duquel l'eau de pluie est récupérée pour les besoins de la culture sous serre). La culture sous serre a été utilisée afin de maîtriser l'environnement dans lequel les cultures se développent, quelles que soient les conditions météorologiques. De plus, certaines propositions avaient trait à l'utilisation de l'irrigation au goutte à goutte pour la production (par exemple, le groupe d'entraide des producteurs de Miruriiri, dans le sous-comté de Imenti South). Sur la base de la présente évaluation, la performance en matière d'adaptation aux changements climatiques est jugée plutôt satisfaisante (4).
32. Performance des partenaires: Gouvernement. Du fait de l'envergure relativement large du programme, de l'ampleur de la collaboration nécessaire entre différents organismes et des problèmes de personnel, notamment le taux élevé de renouvellement des effectifs, l'UGP s'est trouvée vulnérable à plusieurs titres. Elle n'a pas arrangé sa situation en tardant à mettre en place un dispositif de S&E. Toutefois, le gouvernement a montré sa détermination, puisqu'il a apporté des fonds supplémentaires pour financer l'achèvement des marchés et accéléré l'exécution du programme après l'examen à mi-parcours. Le S&E était un point faible, mais l'attention portée à la gestion des savoirs mérite d'être notée. La décentralisation intervenue à mi-chemin du cycle de vie du programme a incontestablement perturbé les plans d'exécution, en particulier pour les marchés. Les autorités nationales, pour leur part, ont élaboré et signé des mémorandums d'accord avec les autorités des comtés afin de faire en sorte qu'elles mettent en

œuvre l'intégralité des plans d'exécution et financent le fonctionnement et l'entretien des marchés. Sur la base de cette évaluation, la performance du gouvernement est jugée plutôt satisfaisante (4).

33. Performance des partenaires: FIDA Le programme a été supervisé directement par le FIDA et, lors des entretiens avec l'équipe d'évaluation, le personnel chargé du programme a estimé que la supervision et l'appui à l'exécution étaient adéquats. Le FIDA a envoyé sur le terrain 11 missions de supervision et d'appui au cours des sept années qu'a duré le programme, qui ont été utiles pour les agents chargés de l'exécuter. En outre, le FIDA a su apporter des conseils et assurer la coordination en temps opportun, ce qui a facilité le décaissement du prêt et du don du FIDA à hauteur de respectivement 96% et 100%. Étant donné que l'achèvement des activités du programme relatives aux infrastructures posait problème, en particulier pour les marchés, le FIDA a accepté de proroger le programme de un an, à coût constant, afin d'achever les projets relatifs aux infrastructures des marchés. Les audits annuels ont été effectués conformément aux normes internationales prescrites, et le FIDA a accepté les rapports établis.
34. En revanche, le FIDA aurait pu faire plus en ce qui concerne l'absence de dispositif de S&E, au lieu de se contenter d'évoquer cette question dans les rapports de supervision, d'autant que l'institution attache une grande importance à la mesure des résultats. Il existait un décalage ne serait-ce qu'entre l'ampleur de ce programme (dispersion géographique et nombre d'activités) et les moyens disponibles sur le terrain pour le mettre en œuvre. Le FIDA aurait pu repérer cet écueil plus tôt. S'agissant des initiatives pilotes, certaines des propositions approuvées, qui ne reposaient pas sur des éléments suffisamment solides pour assurer la pérennité à long terme, n'auraient pas dû être approuvées. Il aurait fallu que le FIDA s'attache avec plus de vigueur à obtenir la réalisation des deux études d'envergure nationale et l'achèvement de l'analyse des chaînes de valeur dans les délais prévus. Sur la base de cette évaluation, la performance du FIDA est jugée plutôt satisfaisante (4).

E. Conclusions

35. L'impact sur les revenus et la sécurité alimentaire des horticulteurs a principalement été obtenu, dans le cadre des chaînes de valeur, à l'étape de la production. La formation dispensée, au titre du programme, était surtout axée sur les groupements de vente et la commercialisation (mise en place de circuits de commercialisation). Quelques activités de formation ont été consacrées aux pratiques agronomiques. Cependant, la formation dispensée au titre du programme aux groupements des villages commerciaux a eu plus d'effets sur les pratiques agronomiques, au détriment des connaissances en matière de commercialisation. Si les revenus étaient plus élevés dans le groupe de traitement que dans le groupe témoin, c'est parce que les marges brutes étaient plus importantes dans ce premier groupe, principalement en raison de différences de rendement pour certaines des productions horticoles soutenues au titre du programme, comme la banane ou la pomme de terre.
36. Les activités de développement des chaînes de valeur relevant du programme portaient sur plusieurs éléments, à juste titre, mais l'absence d'approche intégrée s'est avérée préjudiciable. Le programme ciblait plusieurs aspects concernant les chaînes de valeur: analyse des marchés, amélioration des marchés d'intrants, développement des capacités des agriculteurs à participer aux chaînes de valeur, mise en place de relations commerciales structurées et durables et investissements dans les infrastructures. Cependant, il était prévu de s'attaquer aux problèmes rencontrés dans une chaîne de valeur dans le cadre des districts, au lieu d'appliquer une approche globale qui aurait permis de sortir du carcan du découpage administratif. Même les études de chaînes de valeur à l'échelle de chaque district – qui devaient constituer le principal outil de conception des interventions portant sur les initiatives pilotes et les groupements de producteurs –

ont été menées avec du retard, et plusieurs activités qui devaient découler de cette analyse, comme la sélection des groupements, ont été effectuées avant d'en disposer. En outre, l'analyse des marchés dans le cadre de deux études d'envergure nationale, qui aurait dû constituer le point de départ des activités portant sur les chaînes de valeur, n'a pas été faite du tout.

37. En ce qui concerne les groupes de commercialisation, les mauvaises relations entre les membres ont compromis le succès du programme. Le manque de confiance est le dénominateur commun qui explique les résultats inférieurs aux attentes des villages commerciaux. Les problèmes de manque de transparence et la médiocrité de la gouvernance et de la gestion n'ont pas permis aux groupements de fonctionner de manière fructueuse. Du fait du démarrage tardif des activités centrales du programme, le temps a manqué pour remédier à la situation en apportant un appui supplémentaire aux groupements.
38. C'est pour les infrastructures des marchés que les répercussions de la décentralisation ont été les plus sensibles. Les différentes parties prenantes ne se faisaient pas la même idée du cadre de responsabilité, de propriété et de gestion des installations après le transfert des marchés aux administrations des comtés. Bien que les mémorandums d'accord conclus entre les autorités nationales, les comités chargés des marchés horticoles et les autorités des comtés aient été utiles, ils n'apportaient pas une armature juridique suffisante, d'autant que les comités n'étaient pas dotés de la personnalité juridique.
39. Les initiatives pilotes axées sur la production sont celles qui ont le mieux réussi. Près des deux tiers des initiatives portaient sur la valorisation et la transformation (produits à base de banane par exemple), or la plupart n'ont pas donné les résultats escomptés. En revanche, les initiatives axées sur la production (comme les serres) ont beaucoup mieux fonctionné. La plupart des projets que l'équipe d'évaluation a visités manquaient de capitaux, étaient mal gérées et ne reposaient pas sur une stratégie claire en matière de croissance et d'intégration aux circuits commerciaux. En outre, du fait du faible montant des subventions accordées aux groupements, nombre d'entre eux ont considéré que la situation n'était pas tenable et ont fini par capoter.
40. Le programme a produit des effets contrastés sur le plan de l'amélioration des rapports de pouvoir entre les différentes parties prenantes des chaînes de valeur. Dans certains cas, comme la construction de routes, les paysans et les commerçants ont tiré avantage des interventions menées dans le cadre du programme. Ainsi, par exemple, les routes ont permis aux commerçants d'accéder plus facilement aux zones de production, et parallèlement les producteurs ont obtenu de meilleurs prix. Dans d'autres cas, comme les villages commerciaux, au regard de l'objectif visant à rééquilibrer les rapports de force dans les relations commerciales en faveur des petits producteurs, le programme n'a pas été aussi efficace qu'escompté; en effet, tous les villages commerciaux n'ont pas été en mesure d'accroître les volumes de production, et l'accès aux informations sur les marchés n'a pas fonctionné efficacement. Enfin, si des efforts ont été déployés dans le cadre du programme pour mettre les villages commerciaux en relation avec les fédérations d'organisations paysannes constituées autour d'un produit, le programme n'est pas allé jusqu'à encourager les liens entre ces fédérations et les marchés.

F. Recommandations

41. Recommandation 1: Pour les interventions relatives aux chaînes de valeur, adopter une approche intégrée et prévoir un enchaînement approprié des activités. La réussite du développement d'une chaîne de valeur nécessite une conception intégrée et un enchaînement approprié des éléments ou activités qui la constituent. L'approche intégrée suppose de considérer la filière dans son ensemble, sans s'arrêter au découpage territorial du pays, et d'accorder une égale

importance aux activités d'amont, de production et d'aval. Elle suppose en outre un enchaînement approprié des interventions portant sur une chaîne de valeur.

Compte tenu de la durée limitée des projets soutenus par le FIDA, lorsque le détail des activités doit être défini après le démarrage du programme, il est d'autant plus important de procéder à une planification méticuleuse et de fixer un calendrier strict pour obtenir les résultats escomptés.

42. Recommandation 2: Afin de resserrer les liens entre les acteurs de la chaîne de valeur, consacrer assez de temps et prévoir un appui suffisant pour que le développement des capacités et l'évolution des comportements se concrétisent. Il existe des relations entre différents groupes d'acteurs (par exemple les producteurs et les commerçants) et au sein d'un même groupe d'acteurs (par exemple, entre paysans). Renforcer et favoriser des relations mieux coordonnées peut être très profitable à l'efficacité du fonctionnement des chaînes de valeur. Cependant, pour susciter une évolution de l'attitude des différents acteurs, il faut consacrer assez de temps et apporter sans relâche un soutien suffisant en particulier dans les situations où l'instauration d'un climat de confiance entre les membres d'un groupement de commercialisation est susceptible de prendre plus de temps. À cet égard, il conviendrait d'inscrire en tête des priorités des programmes de formation la sensibilisation et la formation aux démarches collectives et à la dynamique des groupes.
43. Recommandation 3: Miser sur les entrepreneurs individuels ou les plus petites entreprises pour les activités de transformation, le rôle des paysans étant de fournir les matières premières. Les résultats quantitatifs et qualitatifs de la présente évaluation mettent clairement en évidence trois faits: premièrement, le fait d'agir dans le cadre de groupements n'a pas eu le succès escompté; deuxièmement, les initiatives pilotes visant à accroître la valeur ajoutée n'ont pas fonctionné comme prévu; troisièmement, l'augmentation des revenus découlait principalement de l'essor de la production de matières premières agricoles non transformées. Compte tenu de ce constat, il serait plus efficace de se concentrer sur quelques entrepreneurs individuels, microentreprises ou petites et moyennes entreprises et de leur apporter un soutien, pour les activités d'amont comme pour les activités d'aval, étant donné que les groupements paysans ne disposent pas toujours des capitaux et de l'esprit d'entreprise nécessaires pour assurer la viabilité de petites entreprises de transformation. Les résultats de cette évaluation corroborent ce constat, puisqu'il a été démontré que la production horticole primaire était une activité rentable pour les paysans.
44. Recommandation 4: Pour les interventions relatives aux infrastructures, mettre en place des mécanismes de collaboration entre les parties prenantes dans le cadre de la stratégie de retrait arrêtée pour le programme. La viabilité à long terme des infrastructures d'intérêt collectif comme les marchés suppose des mécanismes efficaces qui établissent des règles claires pour régir les relations entre les parties prenantes et contribuent à susciter un sentiment d'appropriation. Le point de départ pour mettre en place ce type de mécanismes devrait consister à définir par la négociation les rôles et les responsabilités de chacune des parties prenantes; dans ce domaine, les programmes du FIDA peuvent jouer un rôle important en contribuant à trouver un accord. La collaboration devrait également porter sur la gouvernance; à ce titre, il conviendrait de mettre en place un mécanisme de règlement des différends et des mesures d'atténuation des risques, ainsi qu'un mécanisme de partage des recettes clair et transparent. Pour que ces mécanismes soient appliqués correctement, il convient qu'ils soient formalisés dans un cadre juridique.

Republic of Kenya Smallholder Horticulture Marketing Programme Impact Evaluation

Main report

Contents

Abbreviations and acronyms	i
Map of the programme area	ii
Executive summary	iii
I. Background, evaluation objectives, methodology and process	2
A. The context	7
B. Programme design and implementation arrangements	10
II. Main Evaluation Findings	13
A. Project performance and rural poverty impact	13
B. Other performance criteria	34
C. Overall Project Achievement	38
D. Performance of partners	39
E. Assessment of the quality of the Project Completion Report	41
III. Conclusions and recommendations	42
A. Conclusions	42
B. Recommendations	43
Annexes	
I. Basic project data	44
II. Definition and rating of the evaluation criteria used by IOE	45
III. Rating comparison ^a	47
IV. Reconstructed Project Theory of Change	48
V. Project Log Frame	49
VI. Methodology used for undertaking the quantitative and qualitative analyses	51
VII. Variable descriptions	58
VIII. Match Balance statistics	60
IX. List of persons met	63
X. Bibliography	64

Republic of Kenya

Smallholder Horticulture Marketing Programme

Impact Evaluation

I. Background, evaluation objectives, methodology and process

1. Background. In line with the IFAD Evaluation Policy and as decided by the Executive Board, the Independent Office of Evaluation of IFAD (IOE) undertakes one impact evaluation every year. Given their scope, the impact evaluations rely on extensive data collection and robust data analysis methods in order to gather attributable evidence on the effects of a project on its beneficiaries. In 2017-2018, the office undertook its fifth impact evaluation. The project selected for the impact evaluation is the Smallholder Horticulture Marketing Programme (SHOMAP) in Kenya. The project was selected using a comprehensive selectivity framework.¹
2. Objectives. The overall goal of the impact evaluation for SHOMAP was to assess how the programme performed, and articulate the reasons for its performance, and in doing so provide relevant information for the design and implementation of future IFAD-supported projects. The main objectives of the evaluation were:
 - i) To measure, and in doing so, establish if the programme interventions had an economic effect on beneficiary households, and whether the effects can be attributed to the programme's interventions.
 - ii) To identify which factors were responsible for the performance – both successful and unsuccessful - of the programme.
 - iii) To provide useful evidence for and to be used as a critical input towards the Kenya country strategy and programme evaluation (CSPE).
3. Process. The process for undertaking the impact evaluation was an elaborate process, as outlined below.
 - i) A preliminary assessment of the programme that involved making a data inventory and evaluating the methodology of the impact assessment conducted by the programme was undertaken (see Annex VI). This was followed by a desk review of programme documentation at IFAD headquarters and discussions with the programme's ex-Country Programme Officer in Rome. A scoping mission was then undertaken to Kenya. This entailed meeting with IFAD's Country Programme Manager for Kenya, concerned IFAD staff in Nairobi and staff of the Programme Management Unit (PMU).
 - ii) A competitive bidding process was launched to select a company for undertaking the quantitative and qualitative data collection, and consequently, a Kenya-based organization was selected. The company undertook a household survey and conducted focus group discussions and key informant interviews, and the data collected was analysed in collaboration with the IOE team. The main mission was undertaken by the IOE lead evaluator along with the IOE consultant to finalize the sampling design and the questionnaire for the household survey and focus group discussions, to meet with programme officials and programme staff, and to

¹ Based largely on the selectivity framework, IOE undertakes impact evaluations of projects: (i) within three years of their completion date; (ii) that are not selected for impact evaluation by IFAD Management; (iii) that will also be included as part of the project portfolio analysis in forthcoming CSPEs, to enhance the latter's evidence base; (iv) that have innovative development approaches (e.g. institutional, social, technological) that merit deeper analysis and documentation; and (v) that offer enhanced opportunities for learning, on what works and what does not in promoting sustainable and inclusive rural transformation.

travel to selected areas² to meet beneficiaries and hold meetings with local officials. The mission used a variety of methods to collect information, such as interviews with key informants, focus group discussions (FGDs) and observations.

- iii) Based on the results obtained from the impact evaluation and findings of the main mission, the preliminary findings were shared with the government at a presentation in Nairobi, and feedback was gathered. Based on this, the first draft of the impact evaluation was prepared and internally peer-reviewed by IOE, subsequent to which the first draft was shared with IFAD Programme Management Department and with the Government of Kenya. A learning workshop will be held in Nairobi to discuss the evaluation's main findings and recommendations with key stakeholders and IFAD staff.
4. Methodology. The principal aim of this evaluation was to assess the impact of the programme on its beneficiaries. Following guidelines of the IOE Evaluation Manual Second Edition (2015), impact was evaluated using the four impact domains under rural poverty impact criterion: (i) household income and assets; (ii) human and social capital and empowerment; (iii) food security and agricultural productivity; (iv) institutions and policies. In addition, the other criteria evaluated included: relevance, effectiveness, efficiency and sustainability of benefits, gender equality and women's empowerment, innovation and scaling up, environment and natural resources management, adaptation to climate change, overall project achievement and performance of partners (IFAD and Government). In line with the Evaluation Manual, the above criteria were rated on a scale from 1 to 6, with 6 representing the highest and 1 the lowest score.
5. The theory of change was the point of departure for this impact evaluation (displayed in Annex IV). It demonstrates the causal pathway from outputs to outcomes (short and medium to long term) and finally to impact. Whilst the theory of change is also an extended expression of the log frame (see Annex V for log frame), the one presented in the Annex is reconstructed. In other words, it takes into account some of the main changes that occurred during the project implementation, especially with regards to activities and outputs. To this extent, it differs from the log frame that was developed at the appraisal stage and which was not modified to reflect the changes as they occurred.
6. The theory of change is cast in a value chain format, which was essentially the underlying premise of the programme. Thus, it shows both vertical and horizontal linkages, the former indicate forward and backward linkages between upstream and downstream actors resulting from programme interventions, and the latter indicate how activities and outputs related to the same actor result into outcomes (for that actor). As depicted by the figure in the annex, the interventions lead to common medium-long term outcomes such as increased value of production and improved food security. The impact or the goal of the programme is an increase in the incomes. One more objective of the intervention logic is to present the assumptions that underpin the transition along the causal path (shown by way of shaded boxes). The causal pathway illustrated in the theory was used to inform the reasons underlying the results of the impact evaluation (in the section on Rural Poverty Impact) later in this document.
7. The detailed methodology undertaken for this impact evaluation is presented in Annex VI. The impact assessment used a quasi-experimental design to attribute programme results to its interventions. The identification of impact was achieved through a counterfactual/control group, i.e. what would have happened to the treatment group in the absence of the treatment. The key evaluation question was: how does the easing of inefficiencies in inputs and in produce marketing constraints increase incomes in medium and high potential farming areas where horticulture is

² The IOE mission travelled to Embu, Meru, Kiisi, Kisumu, Kericho, Nakuru, Nyandurua and Eldoret.

an important source of livelihood? The specific sub-questions allowed the development of indicators for measuring impacts at household, community and institutional level and relevant study hypothesis. The indicators were to assess both intended and unintended benefits.

8. The impact evaluation used a mix of quantitative and qualitative methods in order to utilize the strengths and overcome the shortcomings of each method. The two methods were carried out contemporaneously for reasons of cost and time efficiency. The core instrument for the evaluation was the household survey which was used to collect primary quantitative data. The survey was administered to 1,522 households, with 825 interviews in control households and 697 in treatment households. A household questionnaire was designed and administered to both treated and control groups using Computer Assisted Personal Interviews (CAPI). The questionnaire gathered data on demographics, education, health, and variables of interest for the impact evaluation such as agricultural income, gross margin, household dietary diversity, yields, household food insecurity index, food consumption expenditure, frequency of group membership and asset index.
9. The quantitative part of the evaluation was complemented by a set of qualitative methods which provided an understanding of the causal mechanisms by which the intervention either achieved or failed to achieve its goals. Key Informant Interviews (KII) and Focus Group Discussions (FGD) were used as instruments for gathering qualitative information. The KIIs elicited individual perspectives from input stockists and traders /transporters. A total of 48 KIIs were collected, distributed across all the 14 districts. They represented all categories of beneficiaries and most important key informants. A total of 17 FGDs elicited perspectives from retailers who sell their produce in markets constructed by SHOMAP, members of pilot initiatives and commercial villages, and from management committees (bridges and markets). Table 1 displays the sub-questions and the tools used in this evaluation. Details of KIIs and FGDs are reported in Table 2.

Table 1
Evaluation tools used for the impact evaluation

<i>Sub-questions</i>	<i>Quantitative tools</i>	<i>Purpose</i>
What was the impact of SHOMAP on incomes, agricultural productivity, assets and food security of beneficiary households?	Structured impact survey	Administered to all the sampled households for the collection of primary quantitative data.
- To what extent were commercial villages and pilot initiatives successful and why? - To what extent did SHoMAP caused changes in the social and economic conditions of women? - Which was the main perceptions of hot-spot improvements?	Focus Group Discussions	Conducted separately for women and men by project component and sub-component to triangulate with quantitative information.
- To what extent did the different categories of beneficiaries participate in the programme's implementation? - To what extent were pilot initiatives successful and why? - What is the current	Key Informant Interviews	Conducted with different project partners to identify project successes and failures and with beneficiaries to triangulate with quantitative information.

state of use of market infrastructure and what are the main reasons for this?

- To what extent did SHOMAP cause changes in the distribution of agricultural inputs?

What is the current state of market infrastructures and hot spot improvements?

Observations

Conducted by the IOE team to assess the status of market infrastructures and of hot spot improvements

Table 2

Details of KIIs and FGDs

Categories of KII	Number
PMU	3
Beneficiaries - stockists	10
Beneficiaries - committee members	3
Beneficiaries - representatives of PI	2
Beneficiaries - transporters	4
Beneficiaries - traders	5
Service providers	2
MoA at county level	15
County government	3
Categories of FGDs	
Pilot initiatives	4
Commercial villages	5
Market management committees	2
Bridge committees	1
Retailers	4
Women	1

10. The sample size was calculated using the following parameter values: $\alpha=0.05$, $\beta=0.2$, a Minimum Detectable Effect of 0.20 for income variable (assumption based on the programme endline survey), an intra-cluster correlation value of 0.1 and adjusting for possible non-response (5 per cent). A sample size of 1,522 households was obtained, with 697 in the treated group and 825 in the control group. The oversampling of the control group was in order to find the best quality matches possible for the treated group and to confront the issue of the control group sampling units dropping out due to lack of adequate matching.
11. The sampling strategy involved creating the sampling frame. The Kenya National Bureau of Statistics (KNBS) using the Kenya Population and Housing Census Survey database, developed the Enumeration Areas (EAs) for the sampling frame for this study. The selection of the EAs was done using the probability proportional to size using the total number of households in each EA as the measure of size. From each selected EA, a uniform sample of 13 households was selected systematically, with a random start. The systematic random sampling method was adopted as it enables the distribution of the sample across the EA evenly and yields good estimates for the population parameters. The households were selected after the listing process was completed in each EA.
12. Similarly, the EAs for the sampling frame for the treated villages was selected from the national sample frame. Consequently, the treated villages were selected on the basis of the listing from IFAD. From a listing of all the villages that benefited from the SHOMaP, commercial producer groups were systematically selected with a random start based on interval of five. The number of households to be interviewed in each village was then proportionately determined using the population of treated households in that village. The selection of villages for the control group was determined by the agro-ecological zones in which the treated households belong. Only villages in high and medium potential zones (these were the same

characteristics that were also used to select the intervention areas) and those that grew similar crops as the treated groups were selected. The control villages did not benefit from any of the SHOMAP interventions. Households were selected from the Census sampling frame managed by the KNBS. Based on the total number of non-treated households, the number of households interviewed for each selected village was proportionate to the number of treated households selected in final sample within the same district.

45. Quantitative data analysis methods. The impact evaluation relied on propensity score matching method to estimate the impact of the programme's activities on the households' economic wellbeing. Selected characteristics (covariates) that could have influenced the probability of a beneficiary being treated by the programme were used in a standard probit model to calculate propensity scores. The nearest neighbour matching procedure (with replacement) was used to calculate the scores. The covariates were balanced between the treatment and control groups after weighting by the propensity score. The quality of matching between the beneficiary and control groups was assessed using the standardized bias approach, which compared the bias before and after matching. The quality of matching helped to establish that the distribution of variables was balanced in both the treatment and control groups i.e. that there was good matching between these two groups.
13. The impact evaluation made use of with and without comparison analysis for estimating programme effects. The former involved comparing the values of outcome variables at the same post-programme time point i.e. 2017 in this case, for both treatment and control groups.
14. The impact evaluation used a multi-dimensional approach to assessing the effects of the programme on the food security of the beneficiaries. Two indicators - the Household Food Insecurity Assessment Scale (HFIAS) and the Household Dietary Diversity Score (HDDS) – were used to assess the household's access to food dimension and the household's quality of diet dimension, respectively. The HFIAS assesses the households' perception of food security and its response to it, and the HDDS assesses the nutritional quality aspect or the micronutrient adequacy of the respondents' diet.
15. Limitations. The direct target beneficiaries of the programme included smallholder horticultural farmers primarily producing for the domestic market; produce traders; input suppliers (stockists); produce transporters; horticultural processors; while indirect target beneficiaries included horticultural consumers; rural underemployed and unemployed men and women.
16. The impact evaluation questionnaire was administered only to the beneficiaries of training support (farmers) and hot spot improvements (roads and bridges); beneficiaries of pilot initiatives and market structures (traders) and consumers were not included. Smallholders were supposed to benefit from almost all interventions: training on best agricultural practices and group selling; rehabilitation of roads (via better prices and market connectivity) market structures (via the traders, who sold in these markets, passing on better prices to them) and training of stockists (via improved use of inputs). The farmers also formed the majority of the beneficiaries. Hence the quantitative survey was posed to this group of beneficiaries. Other beneficiaries such as input stockists, traders and transporters were included through the qualitative method i.e. focus group discussions. Therefore, to an extent, the average (quantitative) effects do not take into the account the positive or negative effects emanating from the pilot initiatives and the market structures, and to that extent, the effects may be over- or understated. Further, the indirect effects of the programme through employment generation were not evaluated.

17. With regard to the methodology, the attempt at recreating baseline values through recall did not succeed because the quality of recall values was found to be unreliable. Hence, the plan to use difference-in-difference approach was dropped and programme effects were instead calculated using the with and without approach. Since good matching of treatment and control groups' characteristics was achieved, the with and without approach can be considered as yielding reliable results. Although, it's possible that some bias due to unobservable differences between the treatment and the control groups could remain.
18. Although matching in various forms is widely used, the technique also has some limitations. The most obvious is that the pairing of households with and without programme can only be done based on observable characteristics. While multivariate matching minimizes bias on observables, it cannot control for unobserved confounding covariates.

A. The context

19. Kenya has made significant political, structural and economic reforms that have largely driven sustained economic growth, social development and political gains over the past decade. However, its key development challenges still include poverty, inequality, climate change and the vulnerability of the economy to internal and external shocks. Kenya's recent political reform stemmed from the passage of a new constitution in 2010 that introduced a bicameral legislative house, devolved county government, a constitutionally tenured judiciary and electoral body. Devolution ushered in a new political and economic governance system.
20. According to the latest data available, Kenya's population stands at 48.46 million, growing at the rate of 2.8 per cent per annum. The poverty headcount ratio at national poverty lines (per cent of population) is 36 per cent.³ While economic activity faltered following the 2008 global economic recession, growth resumed in the last three years reaching 5.8 per cent in 2016 placing Kenya as one of the fastest growing economies in sub-Saharan Africa. The economic expansion has been boosted by a stable macroeconomic environment, low oil prices, rebound in tourism, strong remittance inflows and a government led infrastructure development initiative. Looking ahead, in the short-term GDP growth is expected to decelerate because of ongoing drought, weak credit growth, security concerns and the pick-up in oil prices. Medium-term GDP growth is expected to rebound (dependent on completion of ongoing infrastructure projects, resolution of slow credit growth, strengthening of the global economy and tourism).⁴
21. In addition to aligning economic development through the country's development agenda to the long-term development plan, Vision 2030, the President of Kenya in December 2017 outlined the "Big Four" development priority areas for his final term as President. The Big Four will prioritize manufacturing, universal healthcare, affordable housing and food security.
22. Kenya has the potential to be one of Africa's success stories from its growing youthful population, a dynamic private sector, highly skilled workforce, improved infrastructure, a new constitution, and its pivotal role in East Africa. Addressing the challenges of poverty, inequality, governance, the skills gap between market requirements and the education curriculum, climate change, low investment and low firm productivity to achieve rapid, sustained growth rates that will transform lives of ordinary citizens, will be a major goal for Kenya
23. Agricultural and rural development sector context. In Kenya, agricultural production accounts for one third of the country's GDP, with recent annual growth pegged at 4 per cent and it is the primary source of livelihood for the majority of rural households. Agriculture employs 38 per cent of the total labour force and 73

³ World Development Indicators. Accessed in May 2018.

⁴ World Bank, <http://www.worldbank.org/en/country/kenya>

per cent of the rural population. Agriculture supplies the manufacturing sector with about 75 per cent of industrial raw materials and generates tax revenue and foreign exchange that supports other economic activities. Over the last few decades, horticulture has emerged as one of the leading sub-sectors in the agricultural sector in terms of foreign exchange earnings, food security, employment creation, and poverty alleviation.

24. The majority of rural households located in arable areas, in addition to some staple crops, also grow fruits and vegetables for home consumption and sale of small seasonal surpluses is a major source of income for many. About four per cent of the horticultural production is exported. A significant portion of fruits and vegetables are produced and consumed by members of the rural households themselves. Farm households with a surplus may sell to deficit households, over-the-fence to neighbours or to other households within walking distance. Farm families may transport produce to a roadside sales point or a local retail market where they sell it themselves. Alternatively, farmers may sell to small local traders who transport the produce and in turn sell it along the road or in a retail market to travellers and local consumers. The most common forms of fresh produce retailing in rural areas are roadside vending and sale in open-air market areas. In larger villages and rural centres, there may be a permanent market facility operated by the county council, with stalls specifically for the sale of produce.
25. Production for the domestic market is particularly important for low-income farmers, most of whom lack the resources and organizational capability necessary to produce for export. However, the domestic horticulture sub sector value chains in Kenya face a number of challenges. Some of these challenges are complex and require systematic approach to address them. The main challenges include lack of commercialization, low production and productivity and weak market linkages. Lack of infrastructure and limited support services (i.e. financial services, extension services, insurance services) further constrain the sector growth.
26. Insofar as input markets are concerned, since liberalization of the seed market, fake seed, uncertified seed, underweight packages and false packaging have increasingly affected the industry. Overall fertilizer use intensity is estimated at around 30 kg/ha, well above the average for sub-Saharan Africa but low compared to other parts of the world. The retail price of fertilizer in Kenya continues to be high, partly due to high costs incurred in domestic distribution, and more intensive use of fertilizers will require a more cost-effective distribution system. For a long time, the government has encouraged the use of pesticides as a panacea to pest problems, which has resulted in increasing use of chemical pesticides.
27. Programme objectives. The overall goal of SHOMAP was to reduce poverty among poor rural households by increasing incomes and reducing unemployment and underemployment in medium and high potential farming areas where horticultural production was an important source of livelihood by easing input and produce marketing constraints faced by small-scale farm households who produced horticultural crops for the domestic market. Towards this end, the two programme development goals were: i) to increase incomes and reduce poverty among poor rural households in medium-high potential farming areas for which horticulture was a source of livelihood; and, ii) to increase the health and welfare of Kenyans by improving the quality and increasing the quantity of horticultural produce consumed within the country.
28. The programme sought to address inefficiencies and constraints in input supply and horticultural marketing in target areas with the ultimate aim of: i) reducing farm unit cost of inputs among smallholder horticultural farmers; ii) improving the quality of inputs and services provided by input suppliers (stockists) to smallholder horticultural farmers; iii) raising the quality of horticultural produce traded in the

- domestic market; iv) increasing and stabilizing farm-gate prices for smallholder horticultural producers.
29. Programme Components. SHOMAP was implemented through four components:
Component A: Domestic Market Systems Analysis
Component B: Institutional Strengthening
Component C: Investment in Domestic Horticultural Value Chains
Component D: Programme Management and Coordination.
 30. Component A: Domestic Market Systems Analysis. The objective of this component was to identify constraints faced by smallholder horticultural farmers in the acquisition of inputs and marketing of horticultural produce. In order to inform programme interventions, the Programme was expected to carry out a set of studies during the start-up phase. These included: i) selection of three priority horticultural commodities to be targeted in each of the 14 programme districts; ii) two nation-wide studies (on upstream inputs supply systems study and on downstream horticultural produce wholesale and retail marketing); iii) 14 district-based (VCA) studies (one in each of the programme districts); and, iv) a district-wide stockists mapping study.
 31. Component B: Institutional Strengthening. The main objective of this component was to support demand-driven capacity strengthening needs of both service providers and farmers. The component comprised of training, provision of market information and policy support, to be achieved through the following five sub-components: i) support to existing formal and informal farmer groups involved in horticultural through training focusing on improving group cohesion and planning and managing group-based marketing activities and investments; ii) training of horticultural input stockists, traders, brokers and market managers to increase their efficiency and, in the case of traders, improve the quality of the produce that they supply to domestic consumers; iii) "on-the-job training" of MoA staff in marketing and business management; iv) support to evolving systems that provide market information to farmers and traders by mobile phone short-text messaging (STM) and by radio; v) support to the development of improved horticultural sub-sector policy and legislation framework.
 32. Component C: Investment in Domestic Horticulture Value Chains. This component aimed to support cost effective investments and innovative initiatives to break constraints facing the domestic horticulture value chain, add value to produce, reduce marketing costs, and enhance efficiency and equity with which marketing chains moved commodities from farms to markets. The programme pursued these aims under the following three subcomponents: i) Pilot Initiatives which aimed at supporting innovative pilot investments for groups of beneficiaries through competitive grants. These were related to agricultural production (such as greenhouses, seed bulking, warehousing, water harvesting for irrigation), value addition (banana ripening) and agro-processing (juice-making, banana and potato crisp-making). Where found economically feasible, such innovative pilot investments could then be replicated using loan funding obtained by groups from microfinance institutions, savings and credit cooperatives or through community-based financing arrangements; ii) Spot improvement of rural access roads to provide accessibility and open up marketing functions in horticultural production clusters in the target districts; iii) Development or improvement of downstream physical market infrastructure aimed at providing appropriate and demand-driven marketing facilities, and in addition to promote effective, efficient and transparent business practices in the domestic horticulture value chain.
 33. Component D: Programme Management and Coordination. The Programme's management and organisational arrangements were designed to make use of the potential for partnerships between the public sector, the private sector and civil

society organizations, both in Programme implementation and in the marketing mechanisms which the Programme would support. A Programme Steering Committee was established at the national level to provide guidance with the aim of ensuring that activities undertaken were in line with national policies, strategies and procedures. The programme management unit (PMU) was responsible for co-ordinating Programme activities and facilitating the implementation of Programme interventions using existing District (sub-county) planning, management, and coordination and supervision structures in place.

34. Programme area. As per Programme design, the target areas comprised eight (8) horticultural producing districts (i.e. Kisii and Gucha in Nyanza Province; Bureti and Nandi South in Rift Valley Province; Bungoma in Western Province; Nyandarua in Central Province; and Embu and Meru Central in Eastern Province). By the time the Programme started, the 8 original target districts had further been subdivided into 14 districts which were maintained as the administrative units of the Programme. The 14 districts were: Bungoma North, East, South and West in Bungoma County; Nandi South in Nandi County; Bureti district in Bomet County; Kisii and Gucha districts in Kisii County; Nyandarua North and South districts in Nyandarua County; Embu district in Embu County; Meru Central, Imenti South and North districts in Meru County. These districts were further been subdivided resulting in the total of 32 administrative districts which are nevertheless, within the original target geographical coverage of the Programme.
 35. Target Beneficiaries. The President's Report states that the programme would directly reach some 12,000 smallholder farm households or 60,000 individuals, mostly members of 600 supported producers' and marketing groups. Direct target beneficiaries of the programme included smallholder horticultural farmers producing primarily for the domestic market, input suppliers (stockists), produce traders, transporters, and processors. An additional 85,000 households would benefit indirectly from the programme through increased mobility and new employment opportunities along the value chains. Geographic targeting came down to the selection of sub-counties, which was based on their poverty profile, horticulture production, and the presence of other relevant initiatives for possible synergies. Social targeting was applied by ways of membership to the supported producers' and marketing groups. At the design stage it was expected that 36 per cent of beneficiaries would be women.
 36. Target commodities: The programme focused on three horticultural commodities in each target district which were selected through a participatory process involving relevant stakeholders. Selected commodities comprised bananas in 12 districts; tomato in 9 districts; Irish potatoes in 4 districts; onions in 4 districts; mango in 3 districts; passion fruits in 3 districts; cabbage in 2 districts; local/traditional vegetables in 2 districts; garden peas in 2 districts; and pineapple in 1 district.
 37. Programme costs and financing. The Programme budget at appraisal was US\$26.59 million with contributions as follows: IFAD loan of US\$ 23.43 million (88.1 per cent of the total programme costs) and a grant of US\$ 0.50 million (1.9 per cent of the total programme costs), Government of Kenya counterpart funds of US\$ 1.62 million (6.1 per cent of total programme budget) and beneficiaries contribution of US\$ 1.04 million (3.9 per cent of total programme budget). At completion, following was the composition as per disbursements: IFAD loan of US\$ 23.03 (71.6 per cent of total budget), IFAD grant of US\$ 0.50 million (1.6 per cent), GOK counterpart funds of US\$ 7.23 million (22.5 per cent of total programme budget) and beneficiaries contribution of US\$ 1.39 million (4.3 per cent of total programme budget).
- B. Programme design and implementation arrangements**
38. Timeframe. The SHOMAP initiative was formulated in 2006, approved by the IFAD Executive Board on 18th April 2007 and Programme loan signed between the GOK

- and IFAD on 10th July 2007 (Loan No. 720-KE, Grant No. 951-KE). It was to be a seven-year programme which was scheduled to start in June 2007, complete in December 2013 and close on June 30th 2014. The loan was declared effective on 23rd November 2007 but the Programme did not actually start until April 2008 when most of the Programme implementation team members were on board. Further, owing to the delays in completion of market infrastructure, the programme was granted a one year no-cost extension. The actual completion and closing dates were 31 December 2014 and 30 June 2015 respectively.
39. Changes during the programme's life. Three changes occurred during the programme's implementation. One, at appraisal it was planned that nation-wide upstream input supply and downstream produce marketing studies would be conducted prior to carrying out district-based value chains studies. However, eventually the two nation-wide studies were not undertaken. Two, due to delay in completion of market structures a one-year no cost extension was requested by the programme authorities and was granted by IFAD. Three, there was a reallocation of funds amongst the components with funds being moved from components A and B to components C (mainly, market structures) and D (programme management).
 40. Implementation arrangements. The programme was implemented by the Ministry of Agriculture, Livestock and Fisheries. A Programme Management Unit (PMU) was set-up in Nakuru which was centrally located among the seven distinct programme territories. The PMU was tasked with the facilitation of programme implementation and with the capacity building of district staff who held direct implementation, monitoring and evaluation functions. In each participating district or sub-county, the agricultural office established annual work plans and budgets and coordinated the implementation of SHOMAP in its jurisdiction.
 41. In addition, district or sub-county stakeholder fora were entrusted with the analysis of horticultural marketing potentials and constraints and with the vetting of incoming proposals for market structures. District (Sub-County) Smallholder Horticultural Sub-Committees were formed from the already existing District Stakeholder Forum (DSF) in each Programme District. These fora were convened by the District (Sub-County) Agriculture Officer (DAO). The roles of these subcommittees was to discuss marketing issues relating to horticultural produce grown in the districts and provide guidance to the Programme, vet proposals from the community for subsequent support by the Programme and monitor Programme implementation.
 42. Programme implementation progress. The programme was slow to start with. The MTR (April 2012) noted several targets that had been under-achieved up to the mid-point in the programme life cycle. For example, there was a delay in the preparation and completion of the fourteen district-focused VCAs. These studies were supposed to be completed within six months of Programme start-up but the first six reports were completed in the year 2011, while the other eight reports were completed in 2012. Further, until MTR, only 5 out of the 50 proposals approved for market structures were under construction (but not completed). Markets were the reason why the programme completion was extended by one year.
 43. Similarly, by MTR, the programme had reached 215 marketing groups by way of establishment and training, which was only 36 per cent of Programme target population of six hundred (600) farmer and or trader groups. There was a stark lag in terms of targets achieved for meetings: 17 per cent for District Horticulture Stakeholder meetings, 26 per cent for District Stakeholder Fora meetings, 23 per cent for Divisional Stakeholder Fora meetings and 8 per cent for Divisional Horticulture Subcommittees meetings had been attained at the end of half the life span of the programme.

44. Programme monitoring and evaluation. The M&E system was put in place four years after programme effectiveness. In the meantime, monitoring and evaluation information was collected through various mechanisms including through community-based monitoring; Divisional and District agricultural staff in the form of asset register, training register, contract register, infrastructure register, groups register, and physical outputs in general. However, this was done without a proper M&E Systems Guide. Further, high turnover of divisional and district staff required frequent re-training efforts.
45. The original programme logframe included 30 indicators between output and goal level. These were increased to close to 50 at the mid-term review in 2012. SHOMAP did not have a comprehensive and well-integrated programme Performance Monitoring and Evaluation Results Systems (PMES) or Monitoring and Evaluation framework with clear and practical linkages between activities, planned outputs, outcomes and impact. Further, according to the programme Mid-Term Review (MTR), indicators in the logframe were poorly defined. Thus, while the three outputs under programme purposes and the five indicators were to a large extent specific and to some extent measurable and realistic, they were neither attributable nor time bound. At the same time, both the outputs and indicators under the development goals were not realistic, attributable and time bound. About 30 per cent and 50 per cent of the total number indicators in components C and D respectively were not time-bound. These aspects were eventually added after programme mid-term.

II. Main Evaluation Findings

A. Project performance and rural poverty impact

Relevance

46. IOE defines relevance as the extent to which the objectives of a development intervention are consistent with beneficiaries' requirements, country needs, institutional priorities and partner and donor policies. It also entails an assessment of programme design and coherence in achieving its objectives.
47. Relevance of objectives. SHOMAP's objectives were to increase the output of and the net margins earned by poor smallholders from horticultural production, to increase employment opportunities arising from an expanded capacity of horticultural smallholders to produce for the market and to reduce the cost to domestic consumers and increase the quality of horticulture products. The focus on commercialisation of horticultural produce for local markets was relevant since throughout the medium and high-potential areas in Kenya, the percentage of households that grow horticultural crops ranges from 80-100 per cent and less than 2 per cent of farmers produce directly for export. The focus on increased productivity and addressing inefficiencies and constraints in input supply and horticultural marketing rightfully formed the basis for fostering domestic market-oriented production.
48. Alignment with national policies. SHOMAP's development objectives were consistent with the 2030 Kenya Vision. One of the key five strategies for the agricultural sector in the Vision is the inclusion of market access through value addition in the processing, packaging and branding of the bulk of agricultural products; another is the increase in productivity through provision of widely accessible inputs and services to farmers and pastoralists.⁵ Similarly, SHOMAP objectives were fully consistent with Kenya's Agricultural Sector Development Strategy (2009-2020) whose strategic mission for the agricultural sector goal is an "innovative, commercially-oriented, competitive and modern agricultural sector" and its "strategic thrust: increased productivity, commercialization and competitiveness of agricultural commodities".⁶
49. The programme objectives were also in line with three overall objectives of the Ministry of Agriculture (MoA) Strategic Plan 2013-2017: i) create an enabling environment for agricultural development, ii) increase productivity and output in the agricultural sector, and iii) improve market access and trade.⁷ Finally, SHOMAP's objectives were coherent with three strategic objectives of the Strategic Plan of the Horticultural Crop Development Authority 2009: i) "to facilitate the implementation of the National Horticultural Policy and the enactment of a legal framework to facilitate continued growth, development and sustainability of the horticultural subsector, ii) to facilitate and coordinate the implementation of comprehensive development marketing strategies at the national and county level for the horticultural subsector, and iii) to build adequate capacity to provide quality, efficiency and effective services to the sub-sector at national and county level".⁸
50. Coherence with other donor projects. The programme was coherent with other projects funded by JICA, UNWOMEN and USAID. More specifically, JICA provided training to stakeholder committees to maintain the roads improved by SHOMAP in Gucha. UNWOMEN funded the establishment of greenhouses for ten women groups, while SHOMAP assisted UNWOMEN in vetting the greenhouse proposals and in training the beneficiaries of the UNWOMEN funded greenhouses. SHOMAP, with USAID, also contributed to funding the National Horticulture Marketing

⁵ Government of Kenya (2007) Kenya Vision 2030: A global Competitive and Prosperous Kenya.

⁶ Government of Kenya (2009) Agricultural Sector Development Strategy: 2009-2020.

⁷ Ministry of Agriculture, Livestock and Fishery. Strategic Plan 2013-2017.

⁸ Horticultural Crops Development Authority. Strategic Plan 2009-2013.

Information System (NaHMIS), which is a platform that intends to provide all value chain players with access to reliable horticultural data (including prices).

51. Relevance to the COSOP and IFAD Strategies. SHOMAP's objectives and activities were also fully compliant with IFAD's Corporate Strategic Framework and with the relevant 2007 Country Strategic Opportunities Programme (COSOP). More specifically, the SHOMAP capacity building activities for the MoA staff, stockists and traders was relevant to the COSOP Strategic Objective 1: improving the delivery of services to the rural poor by strengthening the capacity of the public and private sector and civil society organizations. The infrastructure component of SHOMAP and the supported pilot initiatives were in line with the COSOP Strategic Objective 2: increasing incomes for the rural poor through improved access to and utilization of appropriate technologies, markets and community-owned productive and social infrastructure. Within Component B of the Programme, SHOMAP envisaged to improve access to financial services by providing a USD 2.5 million credit guarantee, which was in line with the COSOP Strategic Objective 3: "Increased opportunities for the rural poor through improved access to rural financial services".⁹
52. Relevance of approach. Focusing on value addition and domestic markets was considered to be very relevant to the needs of the poor by the programme staff and by interviewed beneficiaries. This is because domestic consumption accounts for the bulk of national production but it has received far less policy analysis and support from the government and development partners than the horticultural market for export. Also, unlike the horticultural export market, production for domestic consumption is dominated by low-income farmers. Adding value was deemed very relevant in order to facilitate diversification of incomes and to avoid the production of raw material products with few market outlets and low income generation potential. The programme used a participatory approach in several of its activities. It helped form local committees at divisional and district levels such as the Horticulture Committees, Market Management Committees and Road Management Committees to involve locals in the design and implementation of its activities.
53. Crucial changes in the country context affected the relevance of the approach. With the promulgation of the new constitution in 2010 a devolved system of governance was adopted (the devolution came into force in 2013). With the new constitutional structure the responsibility to manage rural market infrastructure was moved from the MoA (at national level) to counties' Departments of Trade. Memoranda of Understanding were signed between national government and county governments. The understanding was that while the overall management of the markets lay vested with the county governments, they could appoint a body or committee to delegate some functions. This was to be achieved through market management committees, established under the programme, which would consist of horticulture producers, traders and input stockists. According to a wide range of respondents interviewed by the evaluation (including programme staff, MoA staff at local level and county staff of the Department of Trade), there were issues of lack of empowerment of the market management committees. Counties did not delegate power to the committees and equip them with funds needed to manage the day-to-day affairs of the market.

⁹ SHOMAP also promoted and supported the linkage of value chain players with financial institutions with the purpose of facilitating marketing and producer groups to access loans, credit facilities and financial literacy information. Through a guarantee risk sharing fund, GoK, AGRA and Equity Bank had entered into a framework partnership guarantee agreement. The terms of this credit guarantee agreement were that a fund of USD 5 million shared equally between SHOMAP and AGRA, would be deposited into an interest bearing account opened at Equity Bank in the names of 'AGRA-GoK loss sharing fund'. This was done, and IFAD transferred the sum of USD 2.5 million to Equity Bank. However, since no losses were incurred by Equity Bank (i.e. there were no defaults by the borrowers), the amount of USD 2.5 million was not used and was reinstated to IFAD. Therefore, no assessment of the credit guarantee aspect was undertaken by this evaluation.

54. Relevance of design. The logframe in the appraisal document included assumptions and supporting pre-conditions necessary to achieve the programme objectives. Those assumptions that were related to the political context and the market (stability of the political and economic conditions, and MoA and subsidiary institutions maintaining support for market-led development in the sub-sector) proved to be correct; however, some assumptions were unrealistic. For instance, the case of assumed reduction in the selling price of agricultural inputs as a result of trainings for stockists and of improved marketing systems.
55. The definition of a great part of the programme activities was based on participatory and demand-driven approach (this was the case of income generating pilot initiatives, design of markets and implementation of hot spot improvements like bridges and roads), which requires good implementation-readiness. However, interviews with MoA and PMU staff revealed that consultations with local stakeholders, although considered important, was also the origin of delays.
56. The selection of the value chains to be supported was to be done on the basis of the results of VCA studies conducted at district level. However, there were a number of issues with these studies. Given that most commodities are traded both within and outside target programme districts, the requirement that VCAs be district-focused in the Programme Appraisal report was an ill-informed strategy and was a weakness attributable to programme design. The wrong geographical focus of the VCA studies was also confirmed by PMU staff during the impact evaluation. Additionally, there was considerable delay in the preparation of these value chain reports which reduced their usefulness in the identification of specific interventions. The programme design did not take into account the capacity required for implementing a programme that spanned 14 districts, undertook a host of activities that were diverse i.e. covering both 'soft' and 'hard' interventions, and targeted beneficiaries with heterogeneous needs.
57. To summarise relevance, the programme was rightly premised on the needs of the rural poor smallholders engaged in horticultural production in Kenya and was also relevant to the national policy and agricultural strategy. It was in coherence with other donor projects and initiatives in Kenya. However, a number of issues, both exogenous and endogenous, challenged the relevance of the design. Changes in the context affected the relevance of the chosen partners to implement the rural market infrastructure component. Some of the design assumptions were questionable and the delay and the subsequent failure to use the envisaged VCA studies was an important deviation from the envisaged appraisal approach. The relevance of the programme is assessed as moderately satisfactory (4).

Effectiveness

58. In assessing effectiveness, this evaluation aims to determine the extent to which the programme's objectives were achieved. This is in line with the definition of effectiveness provided by the IOE Evaluation Manual which states that it is "the extent to which the development intervention's objectives were achieved or are likely to be achieved taking into account their relative importance". Before doing this though, the evaluation provides an assessment of the effectiveness in the outreach and the programme's targeted approach.
59. It is important to highlight that the findings in this section were determined based on the triangulation of several data and information sources that go beyond the careful review of programme documents, data collected using the indicators in the Results and Impact Monitoring System (RIMS) and M&E data. These include quantitative and qualitative primary data collected by IOE during this impact evaluation, site visits and inspection of various programme activities, and interviews with key informants including government officials, programme beneficiaries, and institutions.

60. Delivery of outputs and outreach. SHOMAP reached 152,304 people (21,311 households) when compared to appraisal target of 60,000 people (or, 12,000 households); of this, 77,293 were females and 75,011 were males. These beneficiaries had been mainly reached through 704 groups compared to the appraisal target of 600. The difference between the number of groups at appraisal and the actual was due to the formation of beneficiary committees such as horticulture marketing committees, market management committees, etc. in the number of groups. However, a beneficiary could have been part of more than one group; therefore, the total beneficiary outreach number mentioned above had an element of over-estimation.
61. Overall, the programme delivered a majority of planned outputs under component B (Institutional Strengthening), while for component A (Domestic Market System Analysis) and C (Investment in Domestic Horticultural Value Chain), the delivery of outputs was not complete. For component A, a VCA study was delivered for each target district. The VCA studies were supposed to be completed during the first six months of programme implementation. However, the PCR noted that six VCA studies were completed in 2011 and the remaining eight studies were completed in 2012. The programme also intended to conduct two nation-wide studies: an upstream input supply system study and a downstream produce wholesale and retail marketing study. None of these two studies was eventually conducted.
62. Under component B, the programme's plan was to develop a system of price information through mobile short-text message (SMS) and radio broadcasts. The Programme also planned to install billboards with price information in 15 markets. The billboards were erected during the programme implementation but these were not in operation soon after the programme start (and neither at the time of the IOE mission), while the SMS and radio message system was not implemented. SHOMAP also contributed funds to the National Horticulture Management Information System (NaHMIS), which includes price information for horticultural produces. Under component B, the programme contributed to the drafting of the National Horticultural Policy. Some other achievements under the component B are shown in Table 3. It is noteworthy that the majority of targets were achieved, and even over-achieved.

Table 3

Selected outputs under Component B

<i>Activity</i>	<i>Target</i>	<i>Achieved</i>
- Formation of farmer/producer groups	600	704
- Trainings for : input stockists	1400	1044
: farmer groups	500	530
: produce traders	950	1091
: transporters	550	585
: marketing agents	400	577
: agri-processors	920	752
: government staff	2000	2522

Note: i) data compiled at the time of IOE mission.

ii) The unit of measurement for the outputs is *number of persons*, except for the first and third outputs which are *number of groups*.

63. Targeting. As reported in the programme appraisal document, the districts where the programme was implemented were selected using a ranking procedure based on a weighted set of indicators relating to poverty, horticultural production and the presence of a long-term (12 years at the time of the programme formulation)

World Bank supported project, named Kenya Agricultural Productivity Project. The highest weights were related to poverty (the extent of poverty had a 45 per cent weight and the depth of poverty had a 15 per cent weight).

64. In order to empirically evaluate the programme's targeting approach, a probit model was used which derives from the analysis of primary data in the impact survey. The analysis offers an indication of the effectiveness of targeting approach by matching the treatment and comparison groups on a set of salient characteristics that influence the participation of households in the programme using the propensity score method.
65. The probit results show that the most important factors that determined whether a household participated in the programme or not were: age of the household head, household size, primary education, whether a household cultivated horticultural crops and whether the crop cultivated was promoted by SHOMAP (Table 4).
66. In addition, households who practiced freehold and lease hold land tenure systems and those growing fruit crops were more likely to participate while households growing staple crops were less likely to participate in SHOMAP. These were significantly and positively associated with participation in the programme. Specifically, the propensity score index can be interpreted as follows: the propensity score index was positively influenced by age of the household head, and was statistically significant. Thus, an additional member in the household increases the propensity score index (i.e. the benefits of participation as perceived by the household). These results also allowed the evaluation to define common support.¹⁰
67. The results indicate that households that were cultivating horticulture crops, and further, those who were cultivating crops promoted by SHOMAP, participated in the programme as beneficiaries. This supports the targeting strategy of SHOMAP which was to work with existing horticulture producers of selected value chains. The fact that beneficiaries were likely to have had primary education was important for the programme's activities especially those directed at training beneficiaries on technical and management skills (book-keeping, etc.) which presupposed a certain level of literacy amongst participants. However, being a female-headed household did not increase the likelihood of a household participating in the programme. This demonstrates that no specific targeting was directed towards including female-headed households in the programme.¹¹

¹⁰ In order for the matching to be valid, it is essential to compare 'observed values' for participants and non-participants with the same range of characteristics. Observations in the comparison group with a propensity score lower than the lowest observed value in the treatment group are discarded. Similarly, observations in the treatment group with a propensity score higher than the highest observed value in the comparison group are also discarded. What remains is known as 'the region of common support'.

¹¹ No mention of a strategy, approach or activities for targeting female-headed households are made in the project documents reviewed by the IOE team.

Table 4
Probit estimates for participating in SHOMAP programme

<i>Variable</i>	<i>Coefficient</i>
Age of household head	0.0101* (0.00463)
Female headed HH	0.112 (0.0876)
Average age of HH members	0.00895 (0.00493)
Household size	0.0620** (0.0211)
Average age of adults in HH (18 and above)	0.000604 (0.00509)
Primary education	0.313*** (0.0815)
Land used for agricultural purposes	-0.00141 (0.0181)
Land tenure system of the land owned	0.181* (0.0786)
Land owned at baseline	0.00104 (0.0136)
Total livestock owned in 2007	0.00188 (0.00114)
Horticultural crops	0.289***(0.0759)
Staple food crops	-0.207* (0.0862)
Permanent cash crops	0 (.)
Fruit crops	0.261** (0.0973)
Tuber food crops	-0.0867 (0.0840)
Annual cash crops	0 (.)
Crop was promoted	0.410*** (0.103)
Constant	-1.929*** (0.220)
Sample Size	1,522
Pseudo R-squared	0.102
Log likelihood	-942.5

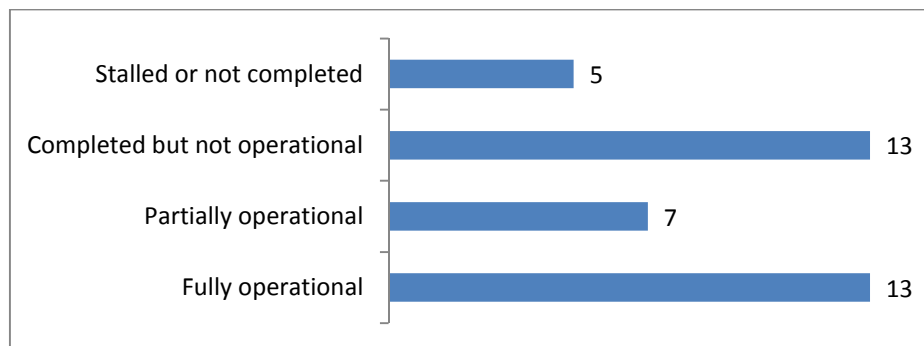
*** significant at 1%; ** significant at 5%; *significant at 10%; standard errors in parenthesis.

68. Effectiveness in meeting the development objectives (DOs). The DOs had three main foci: horticultural productivity, input system and marketing system. The following section analyzes the effectiveness in meeting the DOs for each of these three areas individually.
69. Objective 1. Improving physical access of rural households to markets. The construction and improvement of market structures was the most important intervention of the programme in terms of financial allocation, amounting to 61 per cent of the programme budget. SHOMAP had 40 construction contracts in 38 markets.¹² The status of the 38 markets was assessed by the IOE team by visiting markets and interviewing county government officers. Results are reported in Figure 1. On the basis of the information collected on each market, the IOE team developed four categories of market status, and assigned the markets to these:
- Fully operational: main market areas (e.g. retailers and wholesalers' areas in markets where both are built) are used for at least twice days per week.
 - Partially operational: only a part of the market is currently used, while a substantial part is not used (e.g. the retailers or the wholesalers' part), or the whole market is used less than two days per week.

¹² Two markets had four contracts: 1) Miruriiri (in Meuru), which had a market development contract and a perimeter construction wall contract, 2) Nkubu (in Meru), which had a market development contract and market shades contract.

- (c) Completed but not operational: the construction of the market was completed but the market is not used.
- (d) Stalled or not completed: the construction of the market stalled, the construction is not complete and the market is not used.
70. The figure shows that 13 of the 38 markets (or 34 per cent of the total) built by the programme are fully operational; the majority are either partially operational or not in use.

Figure 1

Status of market structures (numbers)

71. Common characteristics of the markets that are fully operational are: the markets were built on areas where previously there was an open air market, or where the contract consisted of improvement of already existing structures including construction of roofs and hard floors and installation of basic facilities such as toilets, piped water, and waste disposal systems.
72. Regarding the stalled or non-operational markets, there were three main reasons for this state. One, lack of vendors in the market. Some vendors refused to move to the newly-constructed markets and continued to sell on the street or at bus stops because the buyers travelling on the street found it convenient to buy from such locations. Consequently, the market was abandoned as all vendors moved closer together on the main thoroughfares. A lack of compliance-enforcement on the part of county governments meant that this situation continued unabated. In at least two markets the evaluation team found the roads leading to the market had been left unpaved, making it difficult for the produce to move to the market. In some other cases, the market was constructed at a distance that was considered far from the main road by traders and hence was not used. One reason for this is that both the site and the size of land allocated for the development of market facilities were dictated by the availability of land within the county council and may not necessarily have been ideal for the intended purpose.
73. Two, unfinished market structures. In some cases electricity and water connections had not been established and some other minor works remained to be completed. Mainly due to issues with the contractors, work in such markets was very shoddy (structures were falling apart); one market structure was not completed because the Ministry Tender Committee's approval had not been provided.
74. Third, the constitutional reforms caused misunderstanding about responsibilities on market completion. For instance, in interviews with the Ministry of Agriculture it was revealed to the IOE team that the Memoranda of Understanding on the transfer of the market structures signed between the county and national governments had specified that all responsibility lay in the hands of the former, including finishing any unfinished works. However, officials of two counties visited by the team were unaware of this arrangement, showing communication issues. Further, the aim of the programme was to ensure that traders and other market users through the market management committees would share responsibilities for development, management and maintenance of market infrastructure and services

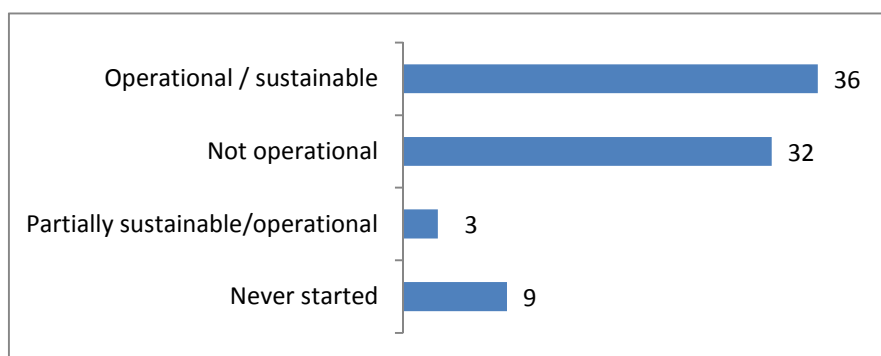
- with the county governments. In some cases though, these committees had been side-lined after the handing-over of markets to local authorities through lack of funds and authority needed to run the day-to-day operations. There was a lack of clear and common understanding among the various stakeholders regarding ownership and management framework of market facilities after completion.
75. Whilst the programme made efforts to develop a vetting criterion for proposals to ensure ownership by the community and the horticulture committee, through using a participatory approach, and to ensure that public resources were utilized prudently, the MTR found little evidence of the market facilities having undergone any rigorous economic and financial feasibility assessment. This could have been based on, among other parameters, existing and/or projected produce turnover, development and maintenance costs and existing as well as projected market prices.
 76. Spot improvement of rural access roads and paths to provide accessibility. The programme opened 547 Km of roads and paths through spot improvement against a target of 230 Km, an achievement of 238 per cent. FGDs with stakeholder committees for spot improvements reported good benefits from this type of intervention. More specifically, traders had started to buy agricultural produce like banana or mango as a result of the newly constructed bridges. Participants of FGDs reported that before the bridges were constructed, a great part of their banana and mango production was unsold because of lack of market outlet, while currently, new buyers were coming. In addition, farmers could now fetch better prices since the prices offered by traders were higher than the prices they could fetch in the local market. In addition, as a result of the improvement of road conditions, participants of FGDs reported that traders no longer applied a price reduction for transport. Thus, prices received for some vegetables (banana, potato, cabbage and tomato) and milk by some of the interviewed beneficiaries had increased in general after the spot improvement, with some beneficiaries reporting increase of up to 2 and 4 times.¹³ Beneficiaries also reported that the walking distance for children going to school had been reduced thanks to the bridges.
 77. Objective 2. Improving efficiency of agricultural input and produce markets. This was to be achieved through: i) training to existing formal and informal farmer groups on group cohesion and planning and managing group-based marketing activities; ii) training of horticultural input stockists, traders and brokers to increase their efficiency and, in the case of traders, improve the quality of the produce that they supply to domestic consumers; iii) training of MoA staff in marketing and business management; and, iv) support to evolving systems that provide market information to farmers and traders by mobile phone short-text messaging and by radio.
 78. The programme provided trainings to stockists on product handling and storage, pests and pesticides, products certified by the Kenya Plant Health Inspectorate Service (KePHIS), recordkeeping, business planning and management and safe use of products. Four stockists interviewed by the evaluation team reported increase in sales since 2008. This might be due to the fact that SHOMAP field staff advised farmers to buy agricultural inputs from stockists trained by the programme. They all reported satisfaction regarding quality of trainings. In addition, the interviewed stockists reported to regularly advice farmers on how to apply the products they sell and which product to apply to deal with a given problem.
 79. None of the interviewed stockists reported offering reduction in sales price to farmers. However, one stockist reported a reduction in his mark-up price, due to an increased competition. Some of the shop owners interviewed reported that their employees attended the trainings but not the owners. As a consequence,

¹³ The evaluation could not however confirm the information pertaining to price increases by 2 to 4 times.

- knowledge learnt during training was not retained; the issue of staff turnover was quite prevalent in the stockists' shops visited by the evaluation team.
80. The Commercial Villages model was a market-led commercialization process through which horticulture groups in villages were commercialized and trained to increase participation along value chains through training on agri-business, group dynamics and leadership skills. The aim was to enable members were able to bulk high volumes of produce and attract more lucrative markets and prices because they could engage in bulk selling or contractual farming.
 81. FGDs with farmers and commercial villages revealed poor evidence of the use of group sales and market scouting method taught during trainings. It was noted by the evaluation team that the trained farmer groups were grappling with various governance issues marked by poor attendance of meetings, time management, rumour-mongering among members, conflict among members, lack of transparency and accountability, and poor leadership. These often lead to mismanagement and disintegration of the groups, and as a result, the marketing groups did not perform as expected, and many beneficiaries continued selling individually to the market intermediaries. Thus, adoption of training for group marketing was below expectations.
 82. Training was also provided to local agricultural extension staff on value chain approach to sector development, agribusiness management and marketing. Most respondents interviewed indicated that they were able to carry out their work with greater understanding and confidence. However, turnover of staff who were trained was an issue wherein knowledge gained was not necessarily used.
 83. The importance of market information for both the efficiency of horticultural marketing and the fairness with which marketing systems operate was recognized by the programme. Almost all VC studies conducted by the programme pointed to lack of market information as one of the key constraints identified by farmers. As a result, billboards with price information of agricultural commodities were erected in 15 rural markets. In addition, the programme contributed funds to an online price information system called NaPHIS. The evaluation team however found no evidence of the use of NaPHIS in the FGDs and the price of the billboards erected by the programme had not been updated after SHOMAP's end. As mentioned, the SMS and radio message system for prices was not developed. The programme was not fully successful in undertaking the activity related to market information.
 84. Objective 3. Raising value added between the point of harvest and the consumer. As part of this objective, the programme supported pilot initiatives that demonstrated innovative marketing approaches and or adoption of technology that had the potential of improving the agribusiness initiatives by beneficiaries. Through interviews with sub-country agricultural officers and previous MoA officers at ward level, the IOE team reconstructed the current state of the 80 pilot initiatives. Results are reported in Figure 2. Pilot initiatives are classified by IOE into four main categories:
 - A. Operational/sustainable: the funded pilot initiatives is still operational or is not but is has been replicated by the group members individually.¹⁴
 - B. Not operational: the funded pilot initiatives is no longer operational.
 - C. Partially sustainable/operational: the group only uses part of the equipment that was funded or conducts only part of the planned operations
 - D. Never started: the group was funded but planned operations never started.
 85. The figure shows that 36 of the 80 pilot initiatives (or 45 per cent of the total), are currently fully operational, while the remaining 44 are either not operational or partially operational.

¹⁴ SHOMAP intended to promote replication as an objective of pilot initiatives.

Figure 2
Status of pilot initiatives (numbers)



86. By analyzing answers from KIIs, a list of common characteristics of the successful and unsuccessful pilot initiative groups was prepared by the evaluation and is presented in Table 5.

Table 5
Common characteristics of pilot initiative groups

Successful	Never started/not operational/not sustainable
i. motivated group leaders	i. negative group dynamics resulting in lack of trust amongst members
ii. low level technology in transformation (e.g. banana hardening, banana solar dryers, banana ripening chambers, water harvesting)	ii. technicalities in the installation and operation of the equipment (e.g. equipment bought for a 3-phase electricity, while only the 2-phase electricity was available)
iii. market scouting (a technique learnt during SHOMAP trainings)	iii. poor quality of proposals approved (e.g. establishment of greenhouse with no access to water or of equipment requiring electricity with no access to electricity)
iv. market linkages developed with buyers	iv. no market outlet for products,
v. access to credit for working capital from banks	v. rejection of food standard certification by KeBS.
vi. certification on food quality from the Kenya Bureau of Standards (KeBS)	vi. mismanagement of funds by group members
	vii. increase in raw material price for processed foods
	viii. lack of group enthusiasm (group lacking young members)
	ix. pests affecting production of the produce to be transformed (tomato and passion fruit).

87. To summarise the analysis with regards to programme's effectiveness, access to markets was the most important objective in terms of funds allocated by the programme. In this regard, spot improvements (roads and bridges) were successful, with access to markets and traders improved. However, where more than 60 per cent of the programme funds were spent i.e. on building or improving markets, the outcomes were disappointing. Only half the markets were in complete use at the time of this evaluation. Although, it could be argued that the teething problems associated with the devolution played an important role in the issues associated with the markets.
88. On the other hand, the aim to improve efficiency of input and output markets was a mixed success. Training to stockists were useful in increasing their knowledge (which they passed on to the farmers) and their sense of conducting business. There was however no economic impact of this on the farmers in terms of the stockists having passed-on the efficiency savings to farmers through reduced input prices. Commercial villages showed mixed success in accessing markets. The price information systems planned at programme appraisal had either not been developed (text messaging), or were not maintained after the programme ended (billboards) or showed little evidence of use (NaPHIS). The objective to raise value added production was also a mixed success. Some pilot initiatives such as

greenhouses for tomatoes displayed evidence of functioning well, but at the time of the evaluation mission, half of the pilot initiatives were not producing income for farmers either because they never started or because they collapsed.

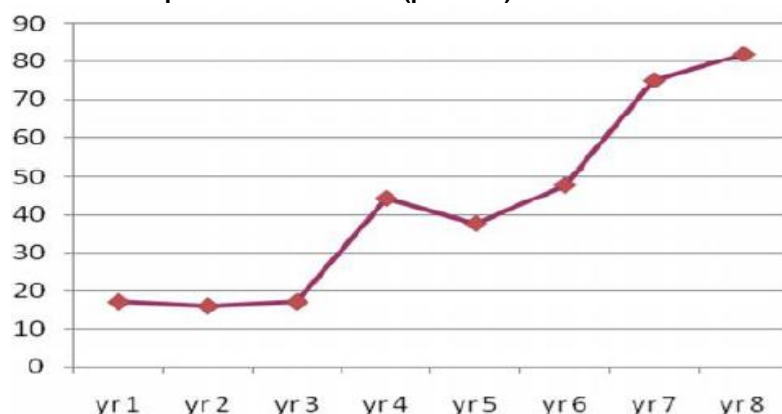
89. Importantly, the programme was mainly unsuccessful in downstream activities related to creating value proposition for farmers by facilitating group selling. Thus, although the great majority of planned outputs were delivered, the evidence collected by the evaluation suggests that this did not culminate into outcomes to the desired effect. The evaluation rates effectiveness as moderately unsatisfactory (3).

Efficiency

90. Expenditures. The assessment of efficiency examines how economically resources and inputs are converted into results. There was a seven month's effectiveness lag between IFAD board approval and the actual commencement of the programme. This was lower than the IFAD average of 12.3 months and of the regional IFAD average of 10.2 months.¹⁵ On the other hand, while the IFAD loan was eventually disbursed to the tune of 98 per cent¹⁶, the Programme started slow; only 28 per cent of IFAD funds had been disbursed until MTR, thus delaying the immediate benefits to the beneficiaries. Given that the disbursement by the time of the MTR was largely the initial advance and some non-core investment costs, SHOMAP's core investments took place in the post-MTR period. By the time the implementation capacity was at its peak the programme was due for closure.
91. The principal factors affecting management in SHOMAP were the conceptual challenges on value chains necessitating outsourcing, understaffing, weak contract management, and long distances for supervision. The MTR noted that SHOMAP's value chain approach put considerable managerial and coordination strain on PMU and its co-implementers many of whom were not familiar with this subject. Further, owing to the delays in completion of market infrastructure projects the programme was granted a one year no-cost extension. To compound matters, the PMU experienced high staff turnover during programme implementation, which also slowed the implementation.
92. When viewing disbursements from the standpoint of the absorption of the Annual Work and Plan Budget (AWPB), it is observed that up until year six of the programme, this percentage was below 50. Figure 3 demonstrates the annual absorption rates of the AWPB.

Figure 3

Annual absorption rates of AWPB (per cent)



¹⁵ For a meaningful comparison, only those IFAD investment projects that were approved in 2007, the same year of approval as SHOMAP, were considered in the analysis.

¹⁶ The PCR argues that loan disbursement could have attained the 100 per cent mark if the defect liability period of contractors amounting to SDR 0.27 had occurred within the loan closure period.

93. The above pre- and post-MTR percentages relate to only the IFAD funding. When the beneficiary and GoK counterpart funds are included in the analysis, cumulative expenditure was 121 per cent of the total cost envisaged at design (Table 6). The high overall level of expenditure was a result of the government contribution that exceeded the original design target by an equivalent of USD 5.6 million, reaching USD 7.2 million by June 2015 or about 446 per cent of the total amount foreseen at design. The GoK's additional resources went mainly towards civil works under Component C (market structures). This was done to cover the variations in the cost of market structures caused by issues of cost overruns or unapproved additional works such as in the cases of markets at Oleriondo, Matisi and Murungaru.¹⁷ In addition, there were other contributions that were not quantified such as land for market infrastructure that was provided by the county governments.

Table 6
Disbursement by sources of financing (USD million)

<i>Financier</i>	<i>Allocated at appraisal</i>	<i>Disbursed</i>	<i>Disbursed /allocated (ratio)</i>
IFAD loan	23.43	23.03	0.98
IFAD grant	0.50	0.50	1.00
GoK	1.62	7.23	4.46
Beneficiaries	1.04	1.39	1.34
Total	26.59	32.15	1.21

94. There was a reallocation of funds amongst components during implementation which was markedly different from the one envisaged at appraisal. Table 7 shows that funds from components A and B were reallocated to components C and D. These increases were quite substantial from the costs planned at appraisal - thirty per cent increase for component C and more than one-third increase in allocation for programme management. The reasons given for the increases for component C included increased costs of inputs for market construction. In the case of component A, one reason for lower actual costs was because of the two nation-wide studies on upstream and downstream activities that were not carried out. Similarly, in the case of component B, the lower actual costs were derived from trainings whose costs were lower than anticipated at the time of programme design.
95. In terms of the higher management costs, the MTR had noted that SHOMAP's value chain approach put considerable managerial and coordination strain on PMU and its co-implementers many of whom were not familiar with this subject. IFAD hence recommended that PMU strategically undertake competitive out-sourcing of services to tackle the matter, especially regarding market analysis, support for M&E systems and evaluation of marketing infrastructure designs.¹⁸

¹⁷ Supervision mission report 2014 (page 5).

¹⁸ SHOMAP MTR. Paras. 86-87

Table 7
Expenditure by component (in percentage)

<i>Component</i>	<i>Actual over appraisal (%)</i>	<i>Proportion of actual (%)</i>
A Domestic market system analysis	26.07	0.74
B Institutional strengthening	47.21	7.46
C Investment in support of domestic value chains	130.56	72.60
D Programme management	137.45	19.2
Total	113.35	100

96. Cost per beneficiary. The President's report states that in addition to the 12,000 households (60,000 individuals assuming five members per household) as direct beneficiaries, there would be 85,000 households of indirect beneficiaries, thereby making a total of 97,000. Based on the programme's M&E records, the PCR states that the programme managed to directly reach 152,304 people out of which 77,293 were female and 75,011 were male. This, when compared to appraisal target of 60,000 people gives a 254 per cent achievement. These beneficiaries were reached through 704 groups compared to the appraisal target of 600. The higher outreach number results in the actual cost per beneficiary (USD\$ 211) being lower than the cost per beneficiary at the time of the programme design (US\$ 443). However, as mentioned earlier in this document, although the increase in total outreach number was related to additional groups being formed (mainly committees), most of these additional groups or committees had the same beneficiaries who were part of the horticulture groups trained by the programme. Thus, the outreach number is saddled with issues of double-counting of beneficiary numbers and hence the cost per beneficiary figure presented here should be interpreted with extreme caution.
97. Economic Internal Rate of Return. To demonstrate the programme's potential to yield high returns, farm models and crop budgets for the key horticultural crops grown by poor smallholders in the programme area were simulated at programme formulation to show that interventions at farm level were financially viable and make good business sense, and would therefore be likely to be adopted by farmers. The Economic Internal Rate of Return (EIRR) at design worked out at 22 per cent. Unfortunately, this was not validated nor recalculated at completion. In a value-chain promotion programme, this is a missed opportunity. There is no reason provided for this omission. However, as per the analysis of this evaluation, in case of certain investments such as roads and bridges, there were clear benefits that justified their costs (for e.g. positive impacts on incomes, as derived from the qualitative information collected by this evaluation). On the other hand, in the case of market structures the benefits have not justified the costs of their construction at least unless all the market structures are fully functioning.
98. To summarise the analysis presented above, the programme came into effect after the loan approval in a relatively short time. The absence of a final cost-benefit analysis however is a flaw in a value chain promotion programme with more than 70 per cent of funds allocated to infrastructure-related activities. The over-shooting of counterpart funding (government), the extension required to complete the programme and the overall higher total actual programme costs are factors that adversely affected the efficiency of operations. The fact that almost half of the market structures were not working at the time of programme closure has negative implications in the cost versus benefit analysis. Considering the above factors, the impact evaluation rates the efficiency of the programme as moderately unsatisfactory (3).

Rural Poverty impact

99. IOE defines impact as the changes that have occurred – as perceived at the time of evaluation – in the lives of rural people (whether positive or negative, direct or indirect, intended or unintended) as a result of IFAD-funded interventions. In order to measure the changes and improvements in the quality of life of the population in the programme areas, the evaluation carried out a quantitative and qualitative assessment focusing on the four impact domains described in the IOE evaluation manual, as appropriate to the present programme. These include: (i) household income and assets; (ii) food security and agricultural productivity; (iii) human and social capital and empowerment; and (iv) institutions and policies.
100. The results presented in this section show changes in variables of interest after implementation of the SHOMAP using average treatment effects on the treated (ATT) i.e. average changes in values for programme participants only.¹⁹ The variables of interest include: agricultural income, gross margin, household dietary diversity, yields, household food insecurity access scale, food consumption expenditure, frequency of group membership and asset index. As mentioned in the section on methodology earlier, the evaluation uses a with-without comparison. This approach compares the outcomes of the two groups - participants and non-participants - at the same post-programme time point (in 2017, in this case) and the results pertain to the matched observations only.

Household income and assets

101. The evaluation in this section assessed the flow of economic benefits accruing to a household through three measures: agricultural incomes, food expenditure and asset ownership index.
102. Agricultural income here is an economic measure that takes into account incomes from livestock and every crop that the household cultivated during the year.²⁰ Table 8 presents the results related to agricultural income per year per household. The results show that incomes for beneficiaries relative to non-beneficiaries were greater (by Ksh 14,917), and the results are statistically significant.

Table 8

Agricultural income effects (in local currency) (annual income per household)

<i>Variable</i>		<i>All crops</i>
Agricultural	ATT	14,917.55**
income	standard error	(6,490.41)

Significance levels: *** p<0.01, ** p<0.05, * p<0.1

103. In terms of heterogeneous programme effects, quantitative analysis was conducted on income differentials between male- and female-headed households. The results show that SHOMAP-supported female-headed households recorded higher incomes than female-headed households in control group (up to 50 per cent more). However, in comparison to male-headed households, the programme did not lead to higher or equal incomes of female-headed households. Incomes of female-headed households were at least 30 per cent lower than incomes of their male counterparts. However, the above results with regards to female-headed households were not found to be statistically significant.

¹⁹ ATT is the average gain from the programme for programme participants and is denoted as:

$$E[Y_1 - Y_0 | P = 1] = E[Y | P = 1]$$

where: Y_0 = value of Y if person is *not* treated; Y_1 = value of Y if person *is* treated; $P = 1$: Individual was treated.

²⁰ Agricultural income was calculated as income from sale of crops and livestock minus input costs (fertilizers, pesticides and seeds) and cost of hiring labour.

104. The second measure of economic status looked at food consumption expenditure. It is the value of income a household spends on food. This includes both money spent on purchased food and the value of consumption of own production (the price for consumption of own production was assumed to be the same as the price of actual purchases). The respondents were asked to report the expenditure on food in the last seven days preceding the survey. The results show that on average, food expenditure for SHOMAP beneficiary households was greater by Ksh 116.20 relative to control group households, although the results are not statistically significant.

Table 9

Food consumption expenditure effects (local currency)

Variable		Effects
Food consumption	ATT	116.24
	standard error	(119.00)

Significance levels: *** p<0.01, ** p<0.05, * p<0.1

105. Asset index. An alternative measure of measuring economic effects is the asset index. In this case, the aim is to collect data on several household assets and combine this information into a proxy indicator such as the wealth index, which is created using principal component analysis (PCA). Asset ownership gives an indication of the longer-term economic status of a household and is less dependent on short-term economic changes compared with other wealth or poverty measures.
106. Thus, in order to assess whether the programme had an impact on a household's physical assets, principal components analysis was carried out to create an asset index.²¹ The first component was used as the wealth index as it accounts for the largest proportion of the variance. The first component of the calculated asset index is also the component that is most highly correlated with the sum of assets purchased after programme start (after 2007). The first component was then extracted and regression analysis was used to test whether the programme had an impact on household assets. The questionnaires asked what the households owned, based on an extensive list of assets. A greater number of assets can increase the predictability of the model,²² and this principle was followed in the questionnaire.
107. The questionnaire included both farm (including livestock) and non-farm assets and questions were related to both whether or not a household owned an asset and the numbers of each asset. The first principal component was positively correlated with the sum of items owned by households. Hence, an increase in this indicator suggests greater assets.
108. Results related to farm assets show that SHOMAP beneficiaries had greater assets relative to non-beneficiaries. However, the results are not statistically significant and hence it cannot be said with a certain level of statistical confidence that there is a strong likelihood of this having occurred.

Table 10

Asset index score for farm assets

Variable		Score
Asset index	ATT	0.02
	standard error	(0.11)

²¹ PCA is a 'data reduction' procedure. It involves replacing *many* correlated variables with a set of *principal* uncorrelated 'principal components' which can explain much of the variance and represent unobserved characteristics of the population. The objectives of a PCA are: i) to discover or reduce the dimensionality of the data set and ii) to identify new meaningful underlying variables. The first principal component explains the largest proportion of the total variance and it is used as the wealth index to represent the household's wealth.

²² VAM, WFP.

Food security and agricultural productivity

109. The assessment of food security and agricultural productivity entails the assessment of changes in food security related access to food, as well as changes in agricultural productivity, which are measured in terms of yields. The values for these outcomes of interest are presented in this section.
110. Food security. The evaluation used two measures to assess changes in the food security situation of beneficiaries emanating from the programme's interventions – the Household Food Insecurity Access Scale and the Household Dietary Diversity Score. The aim was to approach the issue of food security from a more comprehensive perspective that looked at both the perceptions of respondents to food security, and their responses to it, and the nutritional quality of the food consumed by them. A brief description of the two measures and the results obtained from the use of their methodology are presented under.
111. Household Food Insecurity Access Scale (HFIAS). The HFIAS is based on the concept that the experience of food insecurity causes predictable reactions and responses that can be quantified through a survey on a scale.²³ The original questionnaire developed by Coates consists of nine occurrence questions that represent a generally increasing level of severity of food insecurity (access) over a past period (30 days), and nine "frequency-of-occurrence" questions that are asked as a follow-up to each occurrence question to determine how often the condition occurred. These questions are formulated under three domains: anxiety and uncertainty about the household food supply; insufficient quality; and insufficient food intake and its physical consequences. The higher the score, the greater is the severity of food insecurity. Each of the nine questions is scored between 0-3, with 3 being the highest frequency-of-occurrence (often). The score for each is then added together. This evaluation readapted the HFIAS developed by Coates to reflect the local context. Thus, eight of the nine questions were retained. As a consequence, the HFIAS used in this evaluation can range from 0 to 24 indicating the degree of insecure food access.
112. The results displayed in Table 11 demonstrate that food insecurity of beneficiary households was only marginally lower than that of non-beneficiary households in the surveyed areas. There are two plausible explanations for this: one, since the surveyed areas, especially the high-potential areas, witness two harvest periods, access to food may not be an issue, and two, there is a social desirability bias against hunger in that respondents are less likely to socially report on issues related to hunger. Comparing the two groups shows that beneficiary households attained lower scores than control households, and these results were statistically significant at the 5 per cent level. In other words, it is likely that SHOMAP beneficiaries had slightly greater access to food.

Table 11

Average treatment effects related to access to food

Variable	Score
HFIAS	ATT
	standard error
	(0.18)

Significance levels: *** p<0.01, ** p<0.05, * p<0.1

113. Household Dietary Diversity Score (HDDS). The HDDS represents a measure of household access to a variety of foods as well as shows whether the household can achieve sufficient nutritional intake. To measure it, the evaluation team used the data collected through the household questionnaire using a list of food items consumed by the household, and grouped the items in the 16 categories of food that underlie the HDDS developed by the Food and Agricultural Organization (FAO).

²³ Coates, et al. FANTA.

The questions were recoded into a 12 point scale as suggested by the methodology. The results of analysis estimate that the HDDS was 0.24 points higher on a 12 point scale in beneficiary households and the effect was statistically significant at the 5 per cent level (Table 12).

Table 12
Average treatment effects for HDDS

Variable		Score
HDDS	ATT	0.24**
	standard error	(0.10)

Significance levels: *** p<0.01, ** p<0.05, * p<0.1

114. Agricultural Yields. SHOMAP expected agricultural productivity to increase through training on better crop practices and use of better quality farm inputs (fertilisers, pesticides and improved seeds). This evaluation used two measures of agricultural productivity: gross margin and yields. Gross margin per acre refers to total income from crops less the variable cost per acre of land under cultivation. Gross margin is different from agricultural income in that it is calculated at the level of land as opposed to agricultural income which is calculated at the level of a household. Yield is calculated as total production per acre (in kgs).
115. Results are presented for four selected crops that were promoted by SHOMAP: banana, sweet potatoes, Irish potato and cabbage.²⁴ Results show that gross margin per acre for SHOMAP households was greater than the control group beneficiaries for all four crops. From a statistical perspective though, results were significant for bananas and sweet potatoes only. These results are important because in 12 of the 14 sub-counties in which the programme intervened, banana was one of the value chains selected by the programme, thereby underlining its important role.

Table 13
Average effects related to gross margin (in local currency)

Variable		Banana	Sweet potato	Irish potato	Cabbage
Gross margin per acre	ATT	34,576.32***	15,441.25*	10,474.10	14,313.83
	standard error	(8,578.02)	(8,965.53)	(8,749.21)	(19,070.89)

Significance levels: *** p<0.01, ** p<0.05, * p<0.1

116. In terms of individual crop yields, results are presented for the four same crops promoted by SHOMAP as above. Table 14 shows that yields were greater in beneficiary households for bananas and Irish potatoes and the results are statistically significant. For sweet potatoes, yields in control households were greater but the results are not statistically significant.

Table 14
Average effects for yields (kg/acre) of individual crops

	Banana	Sweet potato	Irish potato	Cabbage
ATT	4,040.39**	-315.94	2,220.93**	1,411.68
standard error	(1,969.96)	(230.57)	(1,058.71)	(8,590.84)

Significance levels: *** p<0.01, ** p<0.05, * p<0.1

117. Causal pathway for the economic impact on beneficiaries. The programme's intervention logic was that beneficiary farmers would increase their incomes and food security through enhanced pro-poor linkages to value chains brought about through increased productivity, higher prices, better market connectivity and

²⁴ Although the impact evaluation questionnaire included all crops promoted by SHOMAP, only these four crops were retained for analysis due to low number of observations for others.

improved linkages with upstream and downstream value chain actors. Specifically, increased incomes would be affected through the following: 1) increased productivity engendered through training received from the programme on better agricultural practices; 2) input stockists providing more and better quality farm inputs; 3) input stockists passing on discounts to farmers as cost benefits attained through streamlined business processes; 4) reduced transportation costs for suppliers/buyers of farm produce, higher prices for produce and increased marketing of produce due to spot improvements (roads and bridges); 5) better terms of sales due to improved bargaining power of farmers (operating as groups) with traders; 6) market structures contributing to better prices for traders (less spoilage, more customers, etc.) which would be passed on to farmers; and, 7) better prices for farmers due to enhanced access to market information.

118. With regards to increased productivity, as demonstrated earlier, the quantitative analysis showed increased yields for beneficiaries producing SHOMAP-promoted products. FGDs revealed that most likely this was a result of training on better agricultural practices received by beneficiaries of SHOMAP, including use of better variety of seeds or planting materials, soil preparation, use of certified fertilisers, crop rotation and improved small scale irrigation. FGDs held with beneficiaries where banana cultivation was promoted reported an increase in productivity which was due to the introduction of varieties produced through tissue culture, for example. The new variety has a lower production cycle (18 months) than traditional bananas (24 months), it is less prone to pest attack, and what is considered more important by farmers, it can be stored for about two weeks after harvest (while traditional varieties are more perishable).
119. With regard to input stockists providing farmers with better inputs, the training provided to input stockists helped them distinguish between certified and non-certified inputs and in turn, they supplied certified products to farmers. The programme also encouraged farmers to buy inputs from recognised input stockists, who had been trained by SHOMAP. Interviews with input stockists reported increased sales and increased range of technical services offered to farmers after 2010. They attributed their increased sales to training provided by SHOMAP.²⁵ It was expected that stockists would pass-on some of the gains from increased sales of the inputs to the farmers in the form of reduced prices or discounts. However, interviews with stockists and farmers revealed that this had not occurred.
120. There was evidence of lower transport costs incurred by beneficiaries of SHOMAP. Table 15 shows that on average, as compared to control group, beneficiaries were likely to pay less per trip to the nearest selling point for transporting their produce, using a motorised form of transport. The results of FGDs further allude to this point.²⁶

Table 15

Transport cost effects (local currency)

<i>Variable</i>	<i>Value</i>
Transport cost ATT	-64.86
standard error	(58.51)

Significance levels: *** p<0.01, ** p<0.05, * p<0.1

²⁵ For instance, an input trader from Nandi County said: "After training I could balance my books. Also after farmers were trained, they came in large numbers to buy our products."

²⁶ A trader from Chwele market noted that "before 2008 especially in 1990s, the road had not been constructed. We used donkeys as a means of transport. We would buy our produce, leave it with them, and the journey would start at 3 pm till 5 am the next morning. We used to pay around 80 shillings per sack but nowadays we pay 60 shillings per sack. Furthermore, we used to go with bicycles then walk into the river and get another bicycle on the other side but nowadays we just spend 40 shillings for the same journey by car". Similarly, an FGD participant in Maara market said: "That time (in 2010), the road network was not good. Transport by motorbike used to cost 50 shillings. Because of the improved roads at present, the transport costs have reduced to 20 shillings. So, if we purchase produce for say 200 shillings, we are now able to make more profit. It is now easy to transport produce from my farm because the market is near the road. This has helped to reduce the transport cost".

121. One of the expected outcomes that would have led to impact was better terms of sales for farmers from traders due to their improved bargaining power after being trained by SHOMAP to sell in bulk as a group. However, the group formation activity was not a complete success. The majority of FGDs and interviews conducted under this evaluation showed that mostly horticulture groups had not been a success.²⁷ This was mainly down to negative group dynamics. In terms of outcomes related to market structures, these were not realised as expected because of the state of markets, as outlined in detail in the section on effectiveness. Finally, the absence of billboards and messaging system meant that benefits of informed decision-making could not be realised in the form of increased incomes through better prices.

Key points summary points related to economic impact

- Positive effects on incomes and assets:
 - Agricultural incomes were greater for beneficiaries than non-beneficiaries. These were derived chiefly from bananas following yield improvements, resulting from training and planting material, and to an extent due to spot improvements.
 - Income greater for female-headed households in treatment areas, although lower than male-headed households; results not statistically significant.
 - Assets also greater in beneficiary households, but results not statistically significant.
 - Income increases for some input stockists.
 - No clear evidence of income increases for traders from the construction of market structures.
- Agricultural productivity increases for selected three programme-supported crops; results statistically significant for banana and Irish potato only.
- Improvement in farm gate prices mainly for beneficiaries of roads and bridges.
- Greater food security condition for beneficiaries relative to non-beneficiaries for both food security indicators; results statistically significant.

Human and social capital and empowerment

122. Human and social capital and empowerment entails assessment of the changes that have occurred in the empowerment of individuals, quality of grass-roots organizations and institutions, and the poor's individual and collective capacity.
123. Human capital. Several activities conducted by SHOMAP were aimed at improving individual skills and fostering group cohesion. For instance, training on better agricultural practices helped several farmers, in particular, farmers producing bananas and Irish potatoes, to improve their productivity (although yield results for banana are not statistically significant). SHOMAP-conducted training for input stockists on book-keeping, farm input dynamics and use of new products, safe use of products, and supporting farmers to improve quality of outputs and quality and nature of inputs, helped them improve their sales.²⁸ Although, most interviews conducted showed that the training time was far too short and was based on the assumption that beneficiaries had a certain level of knowledge to start with, which was not always true.
124. Social capital. SHOMAP activities included training farmer groups on improving group cohesion and planning and managing group-based marketing activities and

²⁷ "The groups were useful by all means but failed to allow group sales. We do not have any plans of selling as a group. We formed groups in order to work together but where we are we have no help to be able to sell as a group". Matulo Banana Group in Bungoma. "Farmers in a group is hard because these people have not been educated, many people fear planting in groups they think they can take their money or they can take their hard work and not get what they want but in business they are some who are in groups they are some in the market they work together they are two or three that work together" - Nalondo agrovet.

²⁸ A SHOMAP-trained stockist from Embu told the evaluation team: "I totally attribute the change in my sales to Shomap. This is because after the training I am now able to stock commodities and farm inputs that are directly demanded by farmers."

investments. Quantitative analysis conducted by this evaluation shows that household members belonging to households that participated in SHOMAP's activities were more likely to form groups than non-SHOMAP households. As per Table 16 below, in 2017, 86 per cent of beneficiaries belonged to a group as compared to 58 per cent of control group households. More than 20 per cent of the membership of beneficiaries belonged to a horticulture-related group; however, an important caveat here is that the majority of these 20 per cent belonged to producer groups as opposed to marketing groups.

125. This aspect was also highlighted in FGDs; whilst farmers did come together to form producer groups (in order to learn farming practices from each other), when it came to marketing in a group, most shied away from it due to issues of trust. The approach related to marketing in a group was that group members would aggregate the produce and a few members would approach market intermediaries and traders to sell on behalf of the entire group. However, group members did not trust the fact that designated few members would be transparent with others about the actual price received, or, they would not pay the others on time.

Table 16

Group membership

Variable	Value
Member of household belonging to a group	ATT 0.28***
	standard error (0.03)

Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

126. Participation of the beneficiaries in development: A feature of SHOMAP was the participatory approach to design and implementation. For instance, diagnostic value chain analysis used participatory approach involving farmers, traders and other stakeholders along the specific product value chain in each district to come up with interventions and priorities for each district. Similarly, the formation of local committees at divisional and district levels such as the Horticulture Committees, Market Management Committees and Road Management Committees was an effective strategy towards involvement of locals in Programme activities. Finally, beneficiaries played a significant role in the design of market structures.

Institutions and policies.

127. This domain assesses the changes in the quality and performance of institutions, policies, and the regulatory framework that influence the lives of the poor.
128. Institutions. SHOMAP supported the capacity strengthening needs of service providers (including PMU, Government staff of collaborating ministries). For instance, the programme facilitated training of GoK staff in counties on effective agricultural practices, agri-business, value chains, business management and entrepreneurship. While the trainings were useful in building capacities, beneficiary farmer groups lamented the lack of adequate and timely support from the local extension offices.
129. In terms of grass root level institutions, SHOMAP's activities aimed at supporting the formation of enterprise based producer groups/associations and marketing networking structures. For example, the programme initiated the formation of potato council, banana producers associations, mango producers associations, input stockists association and marketing forums. The groupings were developed to help farmers to bulk enough volumes for accessing bigger markets and also to provide avenues for networking and sharing information. However, as has been mentioned earlier in the document, the marketing groups activities did not bear the desired fruit.
130. Policies. One of the activities undertaken by SHOMAP was to support the development of an improved horticultural sub-sector policy and legislation

framework through a grant to the Agricultural Sector Coordination Unit (ASCU), Kenya Plant Health Inspectorate Service (KEPHIS) and Pest Control Products Board (PCPB). The Programme was expected to support the development of improved horticultural policy through the ASCU as well as support to improved regulatory services through KEPHIS and PCPB. Accordingly, the programme provided for a grant of US\$500,000 towards these envisaged support functions to the ASCU and a draft "National Horticultural Policy" document was developed through a participatory process involving a wide range of stakeholders. The Policy, which provides a framework for the horticultural sub-sector and improved regulation of the sector, was eventually promulgated.

Overall assessment of impact on rural poverty

131. The evaluation considers the overall assessment of SHOMAP's impact on its beneficiaries as modestly positive. Empirical evidence collected through the quasi-experimental approach to impact evaluation showed differences in agricultural incomes for farmer beneficiaries which were statistically significant. These were caused by yield increases, as shown by statistically significant results. The training on crop production imparted by the programme had helped build human capital of both GoK staff and beneficiary farmers. Gross margins for some SHOMAP-promoted crops increased. Incomes of female-headed households were greater than in control households. There is also evidence that there was a food security-related improvement for beneficiaries. Farm gate prices increased for beneficiaries of spot improvements. Finally, the programme helped support the draft policy formulation of the government related to horticulture sector.
132. An analysis of gross margin effects by type of crop however showed that the increases were affected mainly through a few products. Incomes of female-headed households although greater than in control households were less than those of male-headed households. The programme's thrust on creating pro-poor linkages, by training farmers on organising themselves into marketing groups and selling in bulk, did not bear the desired fruit. The evaluation did not quantitatively assess the impact on beneficiaries of market structures and pilot initiatives, but as mentioned previously in this document, the results of observations and interviews point that these two interventions have not worked as expected. The evaluation rates the rural poverty impact criterion as moderately satisfactory (4).

Sustainability of benefits

133. IOE defines sustainability as "the likely continuation of net benefits from a development intervention beyond the phase of external funding support. It also includes an assessment of the likelihood that actual and anticipated results will be resilient to risks beyond the programmes' life."
134. Commercial Villages. To ensure sustainability of programme initiatives the programme supported the formation of enterprise-based producer groups/associations and marketing networking structures. For example the Programme initiated the formation of potato council, banana producers associations, mango producers associations, input stockists association and marketing forums. However, the evaluation found mixed chances of their sustainability given deeply-ingrained governance issues in groups that has afflicted several groups visited by the evaluation team, and the lack of adequate county staff²⁹ and resources to provide continuous support to these groups.
135. Market structures. The physical structures implemented were of high quality, as observed by the evaluation mission, and are expected to last. However, as

²⁹ For instance, in an FGD with a commercial village group in Nyandarua, members of the group narrated thus: " agriculture officers are demotivated, have no adequate facilitation such as transport, have no vehicles, no motorcycles; and are rarely replaced after retirement. Agriculture officers have not us for any extension services in 2017 while input stockists are in contact when we go to purchase farm inputs."

mentioned earlier, several of them are not functioning, awaiting engagement from the newly-formed county governments. Further, different categories of market users/beneficiaries including farmers and consumers were identified beforehand alongside their market needs and other considerations. These were used as basis for developing market specifications, design as well as development of a market management system that recognised and allowed beneficiaries to be an integral part of the management team. The Programme thinking was that it was more productive for traders and other market users to share responsibilities for development, management and maintenance of market infrastructure and services, and thus to ensure sustainability.

136. However, there are some doubts about the capacity of these groups. It was noted that the communities have no capacity to develop comprehensive market business plans³⁰ to guide them to manage these markets efficiently and sustainably. Further, the memorandum of understanding (MoU) between the local counties and Horticulture Market Committees does not provide adequate legal backing, especially recognizing that the Committees are not themselves legal entities.
137. Roads and bridge maintenance. The quality of the spot improvements (roads) construction of bridges carried out by SHOMAP was good, as observed by the evaluation team. To ensure that the benefits are sustained, during the programme exit phase the programme had established Division and District Horticulture Sub Committees for lobbying and advocacy to enable beneficiaries access funding from the county governments and Constituency Development Fund (CDF) for their maintenance. Continuous stream of benefits will depend on the level of engagement of the horticulture sub-committees with respective counties.
138. Pilot initiatives: As outlined earlier, several pilot initiatives were not functioning at the time of this impact evaluation, including some that had never started, thus mirroring the lack of sustainability of this activity. As per the analysis of the evaluation, factors that will undermine the sustainability of the pilot initiatives that are working include their under-capitalization which will affect their resilience and competitiveness, lack of effective management structures with no clear business growth and vertical linkage strategy and the lack of availability of continuous training. On the other hand, some of the initiatives such as greenhouses have good prospects for the future.
139. To summarise, the evaluation notes mixed success on the sustainability of commercial villages and pilot initiatives. The spot improvements can be expected to sustain longer given the formation of committees and funding from the county governments. The sustainability of market structures, where the lion's share of the programme funds were invested, is delicately poised. Roadblocks remain in the way of sustainability, notably, injection of capital by county governments to complete all works and the preparedness of both these entities to ensure smooth functioning of the markets. It is possible that these are due to the teething problems associated with devolution and, mutadis mutandis, the markets will function as expected. The county officials who were interviewed were quietly confident of the county governments owning-up these markets once the dust of devolution has settled down. The evaluation rates sustainability as moderately satisfactory (4).

B. Other performance criteria

Innovation

140. IOE defines innovation as the extent to which IFAD development interventions have introduced innovative approaches to rural poverty reduction.

³⁰ Market business plans to inform the community on the quantities of produce required to be traded in those markets and strategies of how to produce them, the levels of income and expenditure expected from the markets and what percentage of revenue should be retained for market maintenance.

141. The programme's activities related to domestic market system analysis – two nation-wide studies, an upstream inputs supply systems study and a downstream horticultural produce wholesale and retail marketing study, and the 14 district-focused value chain analysis studies – were innovative in the context of value chain projects in the horticulture sector of Kenya. However the two nation-wide studies were not carried out.
142. The aims of the VCA studies were to help in determining the most productive ways in which the Programme would support value adding activities that were beneficial to poor households. However, this innovative approach was not as effective. In the first instance, there was a delay in the preparation and completion of all the 14 district-focused VCAs. These studies were to be completed within six months of programme start-up (i.e. during the second half of 2007 and first half of 2008), but the first six VCA reports were completed in the year 2011, while the other eight VCA reports were completed in 2012, at programme mid-term.³¹ Another issue was the low quality of reports produced. They omitted important aspects such as production trends and underlying factors, identification of key production clusters, overlays (quantification) relating to number of players and volumes handled, as well as subsector dynamics including driving forces and leverage points.
143. Another innovation promoted by the Programme was the formation of commercial villages. This consisted of bringing together and training a number of groups of commercial producers with common interest in the farming of similar horticultural commodities. In essence, within one village, several commercial producer groups would come together to form one bigger group which was named commercial village. The aim was to increase farm productivity, bulk their produce and access bigger and more lucrative markets, engage in contract farming, and access group credit. As articulated by the evaluation earlier in the analysis, commercial villages were a mixed success due to a number of reasons inter alia negative group dynamics and a lack of the necessary market conditions (such as contract farming, etc.).
144. The pilot initiatives were supposed to foster innovation as one of its central tenets. A total of 80 pilot initiatives were implemented of which 26 were in agriculture production and 50 in value addition and agri-processing and 4 included both agriculture production and value addition. However, an analysis of these initiatives shows that most of the production-oriented initiatives such as greenhouses were not expressly innovative. Further, as stated in the effectiveness section of this report, the pilot initiatives produced mixed outcomes with more than half failing.
145. In summary, the SHOMAP Programme was designed with a number of innovations to promote best practices and to ensure effective programme implementation and which the evaluation finds this noteworthy. On the other hand, it is also clear that of these innovations, some: (a) were not implemented at all (two nation-wide studies), (b) were not produced in the intended quality (VCA studies), and (c) gave mixed results (commercial villages and pilot initiatives). This evaluation rates innovation as moderately unsatisfactory (3).

Scaling up

146. IOE defines this as the extent to which IFAD development interventions are likely to be replicated and scaled up by government authorities, donor organizations, the private sector and other agencies.
147. Of the numerous activities carried out by SHOMAP, there are instances of one activity i.e. value chain that was scaled-up. In Bungoma county, for instance, the county government had set aside funding to promote value addition in the banana

³¹ The reasons for the delay were related to procurement delays and the fact that a cluster of VCA studies to be prepared by one of the consultancy firms did not meet the desired standard and subsequently the contract was re-issued to another firm.

and tomato value chains. In Nyandarua, the county had adopted the value chain approach and had come up with a strategy for promoting the potato and carrots value chains. More specifically, the Nyandarua County Government had posted officers in-charge of value chain development and market access to ensure success of its value chain support initiatives. In Kericho county, the SHOMAP VCA approach had influenced the development of the County Horticulture Development Programme. The County Government had allocated Ksh 160 million towards promotion of irrigated horticulture, development of the pineapple value chain and support towards development of cottage industries in the horticulture sub-sector. The evaluation rates scaling up as moderately successful (4).

Gender equality and women's empowerment

148. IFAD's women's empowerment objectives include: (1) expanding women's access to and control over fundamental assets – capital, land, knowledge and technologies; (2) strengthening women's agencies – their decision-making role in community affairs and representation in local institutions; and (3) improving women's well-being and easing their workloads by facilitating access to basic rural services and infrastructures. In this section, an evaluation of the SHOMAP programme's achievement on gender related objectives is provided.
149. Gender participation. As per PCR, the targets for women participation were achieved for the majority of beneficiary groups, such as female members of marketing groups (173 per cent of the target), of pilot initiatives (119 per cent), of producer groups (108 per cent), produce traders (126 per cent), marketing agents (179 per cent), and for trained government officers on programme implementation (153 per cent) and on business and entrepreneurship (109 per cent). The programme monitoring system also revealed some minor achievements regarding female participation of trainings for agro-processors (72 per cent). The number of trained women in agro-processing was much higher than the number of trained men (750 vs 170). The number of trained input stockists achieved 75 per cent the target for both men and women. Overall, 50.7 per cent of the programme beneficiaries were women.
150. Programme management. A framework for mainstreaming gender issues in SHOMAP was part the programme implementation manual. In addition, a training module on gender sensitization was delivered. Sex-disaggregated data were collected by the programme management and used to inform the RIMS.
151. The PCR states as one of the elements of the gender strategy that women would be encouraged to take part in programme planning and particularly in decision-making relating to the use of programme finance. Female and male candidates would be treated equally during the recruitment of PMU staff and service providers. However, the programme implementation structure was male-dominated both at central and at district levels. Only one woman (out of seven staff) was part of the PMU. At the district level, at the programme start, 10 of the 14 sub-country agricultural officers (SCAO) were men (during the programme life two men SCAO were replaced by women). In addition, 11 of the 14 desk officers were men. Similarly, there was no gender specialist in the PMU; the M&E staff were asked to assume the role of gender specialist.
152. Decision-making roles. The evaluation explored the programme impact on household decision making. As part of the household survey, information was collected on a variable regarding who in the household participates in making decisions about how to spend income received crop and livestock activities. The questions allowed respondents to choose from five options about who makes the decision: household male, household female, joint household (male and female), non-household member, and other.
153. The results show a positive effect of the programme on the probability of making a decision relative to the comparison group. Treated households were five

percentage points more likely to have a female managing the cash from both crop and livestock activities relative to non-SHOMAP households. Also, SHOMAP households were 9 and 18 percentage points more likely than the comparison group to have joint-decision making (male and female) for crop and livestock activities respectively (the results were statistically significant). FGDs with women-only groups also revealed that decisions on how to use money earned were generally taken together by the wife and the husband.

154. Women's work burden. FGDs and interviews with beneficiaries revealed that the programme generated employment opportunities and incomes for both men and women. During FGDs and KIIs, women also reported increased levels of work since the programme started considering their engagement in the pilot initiatives, though they were satisfied with this increased work considering it led to increased incomes.
155. The SHOMAP UN Women Partnership was conceived with a view to promoting gender equality through supporting women's groups in food insecure areas of selected SHOMAP sub-counties. Under this, drip irrigation kits were supplied to each of the ten women's groups, capacity building use of drip agriculture, soil sampling and testing was undertaken.
156. In summary, the programme elicited an equal participation of women and men. Similarly, most targets set for women were achieved. The programme M&E collected sex-disaggregated data. Further, SHOMAP had a positive impact on women; beneficiary households had more women involved in household decision-making than control group households. Incomes of women-headed beneficiary households were found to be greater than in the control group by the quantitative analysis. On the other hand, the programme lacked a gender specialist; this was a missed opportunity especially when half the programme's beneficiaries were women. The evaluation rates gender equality and women's empowerment as satisfactory (5).

Environment and natural resources management

157. This impact domain involves assessing the extent to which the programme contributed to changes in the protection, rehabilitation or depletion of natural resources and the environment.
158. The President's Report classifies the Programme in Category B, i.e. being unlikely to cause significant negative environmental impact. While a focus of the programme was on increasing production, some of its activities were directed to avoid over exploitation of natural resources and to contribute to their restoration. For instance, the programme provided training on the safe and efficient use of pesticides and fertilisers to reduce risk of soil and water degradation. The trained input stockists found these to be particularly important for their trade. Given the issue of spurious fertilisers in Kenya however, some negative impact of their increased use on the soil is likely. Training of farmers on sustainable agricultural practices through, for example, crop rotation, will help reduce land degradation in the near future. Several farmers reported using these better practices now. As reported by the beneficiaries, training on risk management, including risks emanating from the environment, developed the community's capacity to understand and manage environmental risks, and reduce their vulnerability.
159. Some of the activities of SHOMAP were geared towards environmental risk assessment. For instance, the programme undertook environmental impact assessments for every market structure which outlined the positive and negative impacts emanating from construction of markets. Environmental impact assessments licenses were mandatory for contractors to whom contracts for construction of markets were issued. Consequently, mitigation measures were proposed for each negative impact and were implemented, and an attendant

Environmental Management Plan (EMP) was developed for each market to monitor implementation and act as a reference for Environmental Audit (EA).

160. The programme also introduced several environment-friendly features and equipment with regard to the market structures. For instance, some markets had roof water catchment systems for harvesting rainwater for use in toilets and in cold rooms. Provisions were made for disposal of waste generated in the markets (for both organic and non-organic waste). Guidelines had been established for safe and environmental-friendly disposal of rubble left behind after the construction of market structures. However, in several of the markets which the evaluation team visited the above measures were not in use. In addition, some of the pilot initiatives that the evaluation team visited had installed solar dryers to harness renewable energy.
161. Thus, a considerable number of activities undertaken by the programme were to protect and restore environment and natural resources. The evaluation team observed several of these in use. Training helped increase the community's understanding of how to manage environmental risks. The compulsory use of environmental assessment and the implementation of mitigation measures ensured that markets with negative environmental impact were not financed, and that they are implemented in an environmentally acceptable manner. However, there is chance that the likely use of spurious fertilisers to augment production and the fact that some of the activities meant to protect against environmental degradation, such as waste disposal, are not in use, could negate or hinder some of the outcomes with regards to environment. The evaluation rates environment and natural resources management as satisfactory (5).

Adaptation to climate change

162. The extent of the threat of climate change in Kenya is mirrored in the fact that the Government of Kenya developed the National Climate Change Response Strategy (NCCRS) in April 2010 to address vulnerability in the country and potential future responses. The NCCRS concluded that "the evidence of climate change in Kenya is unmistakable: in many areas, rainfall has become irregular and unpredictable; extreme and harsh weather is now the norm; and some regions experience frequent droughts during the long rainy season while others experience severe floods during the short rains." Further, IFAD's approach to climate change was rooted in its Strategic Framework 2007-2010; it was focused exclusively on climate change issues as they affect poor rural people in developing countries.
163. The programme did not have an explicit strategy related to climate change although at the time of SHOMAP's implementation climate change had been recognised by IFAD as an issue affecting livelihoods of smallholders. However, some of the pilot initiatives were proposals with relation to adaptation to climate change. For instance, 16 out of the 80 initiatives were for greenhouse farming (including the Nakewa youth group initiative in Bungoma East that used rainwater harvesting for greenhouse farming). The use of greenhouse farming was intended to provide a controlled environment for crop growth with little regard to the weather conditions. In addition, one proposal was for drip irrigation for production (the Miruriiri Growers Self Help Group in Imenti South). The evaluation rates adaptation to climate change as moderately satisfactory (4).

C. Overall Project Achievement

164. SHOMAP's overall achievement can be described as mixed. The programme's objectives aimed at improving both the efficiency and the effectiveness of selected value chains, and at supporting value addition. Given the value chain focus, its activities rightfully targeted the different actors along the chain. However, the fact that the value chain activities were district-based meant that the scope was kept restricted to geographic boundaries and did not encompass an entire chain which can go beyond administrative boundaries.

165. Some of the programme objectives were not fully attained, while others produced mixed results. For instance, income effects were positive while fostering group formation for enabling better terms of trade for producers did not succeed as expected. The programme reached an equal number of men and women, and incomes of the latter were found to be greater than those of control group, but were lower than male beneficiaries.
166. Cost-benefit analysis was lacking, but at the time of the evaluation, the costs for the most-funded activity i.e. market structures out-weighed the benefits emanating from it (which were yet to fructify). Given this, the sustainability of market structures will depend on a host of factors, not in the least, the political will of the county governments and the extent of ownership that they will award to the market management committees. The programme introduced some innovations and some of its activities have been scaled-up. Several of the activities were cast in good environment and natural resource management. The evaluation rates overall programme achievement as moderately satisfactory (4).

D. Performance of partners

Government of Kenya

167. Programme management. The Programme's key implementing agencies comprised the MoA (as the Lead Agency), collaborating ministries of public works, roads and local Government, steered by the Programme Steering Committee (PSC), and including the PMU, Programme districts staff and the beneficiary communities. The role of PSC was important to provide guidance to the Programme to ensure compliance with national policy goals and consistency with activities of the line ministries in order to minimize duplication. However, the PSC did not convene as expected and was even inactive from 2012 to 2014. It was also established that due to lack of oversight provided by the PSC to the PMU, the programme management did not perform effectively in all areas. For example, the delay in completion of construction of market infrastructure projects was also attributable to poor contract management by the PMU.
168. Emphasis of the value chain approach in the Programme put considerable managerial and coordination strain on PMU and its co-implementers many of whom were not familiar with this approach. As per the MTR, the PMU relied on its district level co-implementers especially for management and coordination of actual implementation at the grassroots level, which was itself besotted with issues of staff transfers. The wide geographic span of the programme districts also exerted considerable strain on PMU staff especially in terms of travel time. Although, to its credit, the PMU eventually strengthened its working relations with the district-based implementing agencies, which was a challenge given that the latter too experienced challenges such as low technical capacity and a multiplicity of other time consuming projects that were running concurrently with SHOMAP.
169. There were issues of staffing in the PMU – lack of key staff for several periods at a stretch, high turnover of staff without appropriate and timely replacement affected Programme performance, and staff conflict that affected the team morale, and importantly, the timely implementation of programme activities. For example, the Agribusiness & Marketing Officer left the Programme in July 2014 and this position was not filled, the Infrastructure Officer also left at the same time and the duties were performed by an Engineer (deployed from the MOA headquarters); the Monitoring & Evaluation Officer left in January 2013 and an Officer was deployed from MOA headquarters in July 2013, the Assistant M&E/ICT left in November 2011 and an officer was eventually deployed from MOA headquarters to perform the duties. There is also evidence of lack of adequate communication initially between districts and the PMU.
170. Monitoring and Evaluation. According to the Programme Appraisal Report, SHOMAP was supposed to develop properly integrated planning, monitoring and

evaluation (M&E) systems within twelve months of the loan effectiveness date. However, up until four years, there was no formal M&E structure in place. This meant that reliable, timely information on output delivery and initial outcomes for a large part of the programme did not occur, and if they occurred, they were in the absence of a proper and systematic M&E framework. The baseline survey was not conducted until four years into programme implementation, which meant that basic technical and socio-economic data did not accurately reflect a "before-project status". To its credit though, the programme commissioned an internal impact evaluation study towards the end of the programme.

171. On the other hand, the government displayed active commitment to the programme by injecting additional funds for a total of USD 7.2 million, reflecting an increase of 440 per cent over its commitment at appraisal. Although the M&E was a sticking point, the Programme aptly promoted knowledge management. This was done through documentation of best practices (both in print and video) concerning programme activities successes and challenges. This information was shared with clients, community members and development partners and agents.
172. Thus, to summarise, the sheer scale of the programme, the extent of collaboration required amongst collaborating agencies and the issues related with staff left the PMU exposed on several fronts. The PMU did not help its cause by delaying the establishment of an M&E system. However, the government showed its commitment by providing extra funds to complete the market structures and by accelerating implementation post-MTR. Although, M&E was a weak point, the attention to knowledge management was noteworthy. Admittedly, the devolution process that occurred mid-way of the programme life-cycle affected the implementation plans, especially for market structures. The national government on its part developed and signed MoUs with the county governments to ensure the completion and upkeep of the markets by the latter. The evaluation rates government performance as moderately satisfactory (4).

IFAD

173. The programme was directly supervised by IFAD and its supervision and implementation support was deemed adequate by the programme staff interviewed by the evaluation team. IFAD fielded eleven supervision and support missions during the seven years of the programme, which were of use to the programme implementers. The MTR was rightfully critical of the programme's progress and raised some pertinent questions. The evaluation found the recommendations in the supervision mission reports to be of sound quality.
174. Further, IFAD's timely guidance and coordination facilitated the achievement of 96 per cent cumulative disbursement of the IFAD loan and 100 per cent grant. Since the programme faced difficulties of completing the infrastructure activities especially the markets, IFAD provided the Programme with a one-year no-cost extension to complete the market infrastructure projects. Annual audits were carried out by abiding to required international audit standards, and reports were accepted by IFAD.
175. On the other hand, IFAD could have done more about the lack of M&E system apart from solely raising the issue in the supervision reports, especially given the corporate emphasis on measuring results (through RIMS). There was some disconnect between the sheer scale of the programme (geographic spread and number of activities) and the capacity on the ground to implement it, and IFAD could have been more proactive to assess this gap. Some of the proposals that were approved for the pilot initiatives did not have the basis for long-term sustainability and these should not have been approved. The matter of undertaking the two nation-wide studies and completing the value chain assessment studies in time should have been more vigorously pursued by IFAD. The evaluation rates IFAD's performance as moderately satisfactory (4).

E. Assessment of the quality of the Project Completion Report Scope

176. The PCR for SHOMAP contains all the sections that are mandatory as stated in the Guidelines for Project Completion, including vital annexes showing costs and disbursements, and achievements against targets. The calculation of EIRR was omitted, and environmental resource management and the programme's adaptability to climate change have not been addressed. When considering the length of the PCR, it is much over the stipulated guidelines of being between 19-25 pages as the PCR is 42 pages in length. Considering these factors, the Scope of the PCR is rated moderately satisfactory (4).

Quality

177. The quality of PCR is compromised by the poor data collection and analysis over the course of the programme. The baseline survey was delayed by four years, and the programme lost vital information that should have been available at inception. It also had a weak M&E system and depended on the physical data collected by the stakeholders including the local government institutions. Instead, the programme made annual assessment surveys but did not methodically illustrate the results allowing to infer conclusions on impact. Another notable feature is that the PCR is a document without bibliography, thereby suggesting that the work was not verifiably evidence-based. Considering the above factors, the evaluation assigns a rating of moderately unsatisfactory (3).

Candour

178. Along with examples and supporting evidence from the baseline data, the PCR is not conveying an impression of critical distance. It hardly ever asks the why-question, thus omitting shedding light into facts and figures that would have deserved additional insight. One example is the apparent contrast between low government performance in the first years of the programme and the surprising overachievement in government funding. The beneficiaries also contributed more than estimated at appraisal, a positive feature that would have deserved some explanation. However, for some aspects such as pilot initiatives and market structures, the PCR rightfully acknowledges the associated critical failures. The evaluation rates this section moderately satisfactory (4).

Lessons

179. The PCR points to some noteworthy points but fails to give them weight in the form of lessons to be learned for other similar operations. One of these points refers to the implementation of pilot actions that then entailed local replication in the sub-counties covered by the programme. Another positive point mentioned in the PCR is the formation of Horticulture, Market Management and Road Management Committees. But it only indirectly infers that the lack of properly preparing and training such committees resulted in their failure of becoming operational at programme completion. Likewise, the PCR does recognize that the scattered programme intervention area and the overcomplicated design of decentralized market infrastructure made it difficult to follow up all the required activities, but does not conclude that there would have been a lesson to learn on simplicity of design. Therefore, the evaluation rates lessons as moderately satisfactory (4).

III. Conclusions and recommendations

A. Conclusions

180. The impact on horticulture producers' incomes and food security was primarily realised through the production node of the value chains. The focus of the training provided by the programme was primarily on selling in groups and marketing (creating marketing linkages) and some on agronomic practices. However, training given by the programme to commercial village groups impacted more on agronomic practices at the cost of marketing knowledge. The greater incomes in treatment group compared to control group were a result of greater gross margins for the former, driven mainly by differences in yields in some of the programme-promoted horticultural commodities such as bananas and Irish potatoes.
181. The programme's proposition to value chain development rightfully targeted several building blocks but an integrated approach was lacking. The programme targeted several activities associated with a value chain: market analysis, improvement of input markets, increased capacities of farmers to engage with value chains, formalised sustainable trade linkages and investments in infrastructure. However, issues in a commodity value chain were to be addressed using districts as the basis as opposed to using a holistic approach which can transcend administrative boundaries. Even the district-based value chain studies itself, which were to be the core tool for design of interventions for pilot initiatives and commodity producer groups, were conducted late, while several activities which would have followed from this analysis, such as selection of groups, were conducted before. Further, market analysis through two nation-wide studies that was to be the starting point for the value chain activities was not undertaken at all.
182. The negative relationship dynamics within groups led to limited success of the programme with marketing groups. Lack of trust among group members was the most common denominator in explaining the less-than-desired outcomes of commercial villages. Issues of lack of accountability and poor governance and management acted as a barrier to successful group working. The delayed start of the programme with respect to its core activities meant that there was no adequate time to remedy the situation by providing additional support to groups.
183. The effects of the devolution process were most visible for the market infrastructure aspect. There was a lack of common understanding among the various stakeholders regarding responsibility, ownership and management framework of market facilities after the handing-over of the markets to the county governments. While the existence of Memoranda of Understanding between national government, Horticulture Market Committees and county governments was useful, it did not provide adequate legal backing, especially considering that the Committees were not legal entities.
184. The success of pilot initiatives was mostly driven by those that were production-oriented. Almost two-third of the initiatives were for value-addition and agro-processing (such as making banana-based products), and most of them did not perform as expected. On the other hand, initiatives that were production oriented (such as greenhouses) performed far better. Most initiatives that the evaluation team met were under-capitalized, poorly managed and had no clear business growth and linkage strategy. Also, the small grant size received by groups meant that many groups found it unsustainable and collapsed.
185. The programme produced mixed outcomes in terms of improving power relations along the value chains. In some cases, such as construction of roads, the programme interventions benefitted both farmers and traders. Thus, for instance, roads made access to production areas easier for traders and at the same time provided better prices to the producers. In other cases, such as commercial

villages, the programme's aim to shift the balance of power in trade relations in favour of smallholder growers was not as effective as desired because not all commercial villages were able to enhance their capacity to bulk-produce, and access to market information was not effective. Further, while the programme attempted to link commercial villages to commodity-specific apex farmers organisations, it stopped short of fostering market linkages for the apex organisations.

B. Recommendations

186. Recommendation 1: In value chain-related interventions, adopt an integrated approach and a proper sequencing of activities. The successful development of a value chain requires both an integrated design and a proper sequencing among its building blocks or activities. The former entails considering the chain in its entirety, not restricted by internal geographic boundaries, and placing emphasis on upstream, production and downstream activities. Further, an integrated approach also requires proper sequencing of value chain interventions. Given the limited duration of IFAD-supported projects, when detailed design of activities are to occur after programme start then meticulous planning and strict timelines become even more important for realising the intended results.
187. Recommendation 2: When strengthening relationships among value chain actors, allocate sufficient time and support for capacity development and behavioural shifts to take shape. Relationships exist between different groups of actors (e.g. producer and trader) and within the same group of actors (e.g. farmer to farmer). Enhancing and helping coordinate stronger relationships can potentially achieve a number of benefits to make the value chains work more effectively. However, programmes need to factor-in sufficient time and constant support for attitudinal shifts amongst actors to take effect, especially in contexts where trust amongst marketing group members can take longer to build. In this regard, training programs should accord priority to sensitization and training on group approaches and dynamics.
188. Recommendation 3: Target individual entrepreneurs or smaller enterprises for agro-processing while positioning farmers as suppliers of raw materials. The quantitative and qualitative results of this evaluation clearly underline three facts: one, working in groups did not succeed as desired; two, the pilot initiatives for value addition did not work as expected; and three, increases in incomes were mainly from increased production of commodities in primary form. Thus, focusing on a few, individual entrepreneurs or micro, small and medium enterprises and providing them with support for both upstream and downstream activities would be more impactful, since farmer groups usually lack the necessary capital and entrepreneurial attitude to make small agro-processing enterprises sustainable. This is supported by the results of the evaluation that demonstrated that production of primary horticultural products was a gainful activity for farmers.
189. Recommendation 4: For infrastructure-related interventions, establish mechanisms for collaboration among stakeholders as part of the programme exit strategy. Long-term sustainability of social infrastructure such as markets requires effective mechanisms that establish clear rules of engagement amongst stakeholders and help imbibe ownership. The point of departure for establishing such mechanisms should be a negotiation of the respective roles and responsibilities of the stakeholders, an area where IFAD programmes can play an important role to facilitate agreement. The collaboration should also encompass governance, including a dispute-settlement mechanism and risk mitigation measures, and a clear and transparent revenue-sharing mechanism. For mechanisms to be appropriately enforced, it is pertinent that they are institutionalised through a legal framework.

Basic project data

			Approval (US\$ m)		Actual (US\$ m)	
Region	East and Southern Africa	Total project costs	26.59		32.15	
Country	Kenya	IFAD loan and percentage of total	23.43	88.1per cent	23.03	71.6
Loan number	KE 720	Borrower	1.62	6.1per cent	7.23	22.5
Type of project (subsector)	Agricultural Development	IFAD Grant	0.50	1.9per cent	0.50	1.6
Financing type	Loan/Grant	Cofinancier 2				
Lending terms*	HC	Cofinancier 3				
Date of approval	18 th April 2007	Cofinancier 4				
Date of loan signature	10 th July 2007	Beneficiaries	1.04	3.9per cent	1.39	4.3
Date of effectiveness	23 rd November 2007	Other sources				
Loan amendments	0	Number of beneficiaries (if appropriate, specify if direct or indirect)	<i>Direct</i> :12,000 smallholder farm households or 60,000 individuals.		<i>Direct</i> : 21,311 households or 152,304 individuals.	
Loan closure extensions	1		30 Dec 2013		30 June 2015	
Country programme managers	Samuel Eremie; Robson Mutandi; Henrik Franklin; Salem Hani Abdelkader Elsadani	Loan closing date			30 June 2015	
Regional director(s)	Jatta Sana	Mid-term review			08 April 2012	
Project completion report reviewer	Ernst Schaltegger	IFAD loan disbursement at project completion (per cent)			96	
Project completion report quality control panel	Avraam Louca Michael Carbon	Date of the project completion report			30 June 2015	
[Provide comments, if required]						

Source: Project Completion Report, IFAD President's Report, EB 2007/90/R.15/Rev.1

* There are four types of lending terms. The loan portion of IFAD financing was a special loan on highly concessional terms, free of interest but bearing a service charge of three fourths of one per cent (0.75per cent) per annum and having a maturity period of 40 years, including a grace period of 10 years.

Definition and rating of the evaluation criteria used by IOE

Criteria	Definition *	Mandatory	To be rated
Rural poverty impact	Impact is defined as the changes that have occurred or are expected to occur in the lives of the rural poor (whether positive or negative, direct or indirect, intended or unintended) as a result of development interventions. <i>Four impact domains</i>	X	Yes
	<ul style="list-style-type: none"> Household income and net assets: Household income provides a means of assessing the flow of economic benefits accruing to an individual or group, whereas assets relate to a stock of accumulated items of economic value. The analysis must include an assessment of trends in equality over time. 		No
	<ul style="list-style-type: none"> Human and social capital and empowerment: Human and social capital and empowerment include an assessment of the changes that have occurred in the empowerment of individuals, the quality of grass-roots organizations and institutions, the poor's individual and collective capacity, and in particular, the extent to which specific groups such as youth are included or excluded from the development process. 		No
	<ul style="list-style-type: none"> Food security and agricultural productivity: Changes in food security relate to availability, stability, affordability and access to food and stability of access, whereas changes in agricultural productivity are measured in terms of yields; nutrition relates to the nutritional value of food and child malnutrition. 		No
	<ul style="list-style-type: none"> Institutions and policies: The criterion relating to institutions and policies is designed to assess changes in the quality and performance of institutions, policies and the regulatory framework that influence the lives of the poor. 		No
Project performance	Project performance is an average of the ratings for relevance, effectiveness, efficiency and sustainability of benefits.	X	Yes
Relevance	The extent to which the objectives of a development intervention are consistent with beneficiaries' requirements, country needs, institutional priorities and partner and donor policies. It also entails an assessment of project design and coherence in achieving its objectives. An assessment should also be made of whether objectives and design address inequality, for example, by assessing the relevance of targeting strategies adopted.	X	Yes
Effectiveness	The extent to which the development intervention's objectives were achieved, or are expected to be achieved, taking into account their relative importance.	X	Yes
Efficiency	A measure of how economically resources/inputs (funds, expertise, time, etc.) are converted into results.	X	Yes
Sustainability of benefits	The likely continuation of net benefits from a development intervention beyond the phase of external funding support. It also includes an assessment of the likelihood that actual and anticipated results will be resilient to risks beyond the project's life.	X	Yes
Other performance criteria			
Gender equality and women's empowerment	The extent to which IFAD interventions have contributed to better gender equality and women's empowerment, for example, in terms of women's access to and ownership of assets, resources and services; participation in decision making; work load balance and impact on women's incomes, nutrition and livelihoods.	X	Yes
Innovation and scaling up	The extent to which IFAD development interventions: <ul style="list-style-type: none"> (i) have introduced innovative approaches to rural poverty reduction; and (ii) have been (or are likely to be) scaled up by government authorities, donor organizations, the private sector and others agencies. 	X	Yes
Environment and natural resources management	The extent to which IFAD development interventions contribute to resilient livelihoods and ecosystems. The focus is on the use and management of the natural environment, including natural resources defined as raw materials used for socio-economic and cultural purposes, and ecosystems and biodiversity - with the goods and services they provide.	X	Yes
Adaptation to climate change	The contribution of the project to reducing the negative impacts of climate change through dedicated adaptation or risk reduction measures	X	Yes

<i>Criteria</i>	<i>Definition</i> *	<i>Mandatory</i>	<i>To be rated</i>
Overall project achievement	This provides an overarching assessment of the intervention, drawing upon the analysis and ratings for rural poverty impact, relevance, effectiveness, efficiency, sustainability of benefits, gender equality and women's empowerment, innovation and scaling up, as well as environment and natural resources management, and adaptation to climate change.	X	Yes
Performance of partners			
• IFAD	This criterion assesses the contribution of partners to project design, execution, monitoring and reporting, supervision and implementation support, and evaluation. The performance of each partner will be assessed on an individual basis with a view to the partner's expected role and responsibility in the project life cycle.	X	Yes
• Government		X	Yes

* These definitions build on the Organisation for Economic Co-operation and Development/Development Assistance Committee (OECD/DAC) Glossary of Key Terms in Evaluation and Results-Based Management; the Methodological Framework for Project Evaluation agreed with the Evaluation Committee in September 2003; the first edition of the Evaluation Manual discussed with the Evaluation Committee in December 2008; and further discussions with the Evaluation Committee in November 2010 on IOE's evaluation criteria and key questions.

Rating comparison^a

<i>Criteria</i>	<i>Programme Management Department (PMD) rating</i>	<i>Impact Evaluation rating</i>	<i>Rating disconnect</i>
Rural poverty impact	4	4	0
Project performance			
Relevance	5	4	-1
Effectiveness	4	3	-1
Efficiency	4	3	-1
Sustainability of benefits	4	4	0
Project performance^b	4.25	3.5	-0.75
Other performance criteria			
Gender equality and women's empowerment	5	5	0
Innovation	5	3	-2
Scaling up	4	4	0
Environment and natural resources management	n.a.	5	
Adaptation to climate change	n.a.	4	
Overall project achievement^c	4	4	0
Performance of partners^d			
IFAD	5	4	-1
Government	4	4	0
Average net disconnect			-6/10 = -0.6

^a Rating scale: 1 = highly unsatisfactory; 2 = unsatisfactory; 3 = moderately unsatisfactory; 4 = moderately satisfactory; 5 = satisfactory; 6 = highly satisfactory; n.p. = not provided; n.a. = not applicable.

^b Arithmetic average of ratings for relevance, effectiveness, efficiency and sustainability of benefits.

^c This is not an average of ratings of individual evaluation criteria but an overarching assessment of the project, drawing upon the rating for relevance, effectiveness, efficiency, sustainability of benefits, rural poverty impact, gender, innovation and scaling up, environment and natural resources management, and adaptation to climate change.

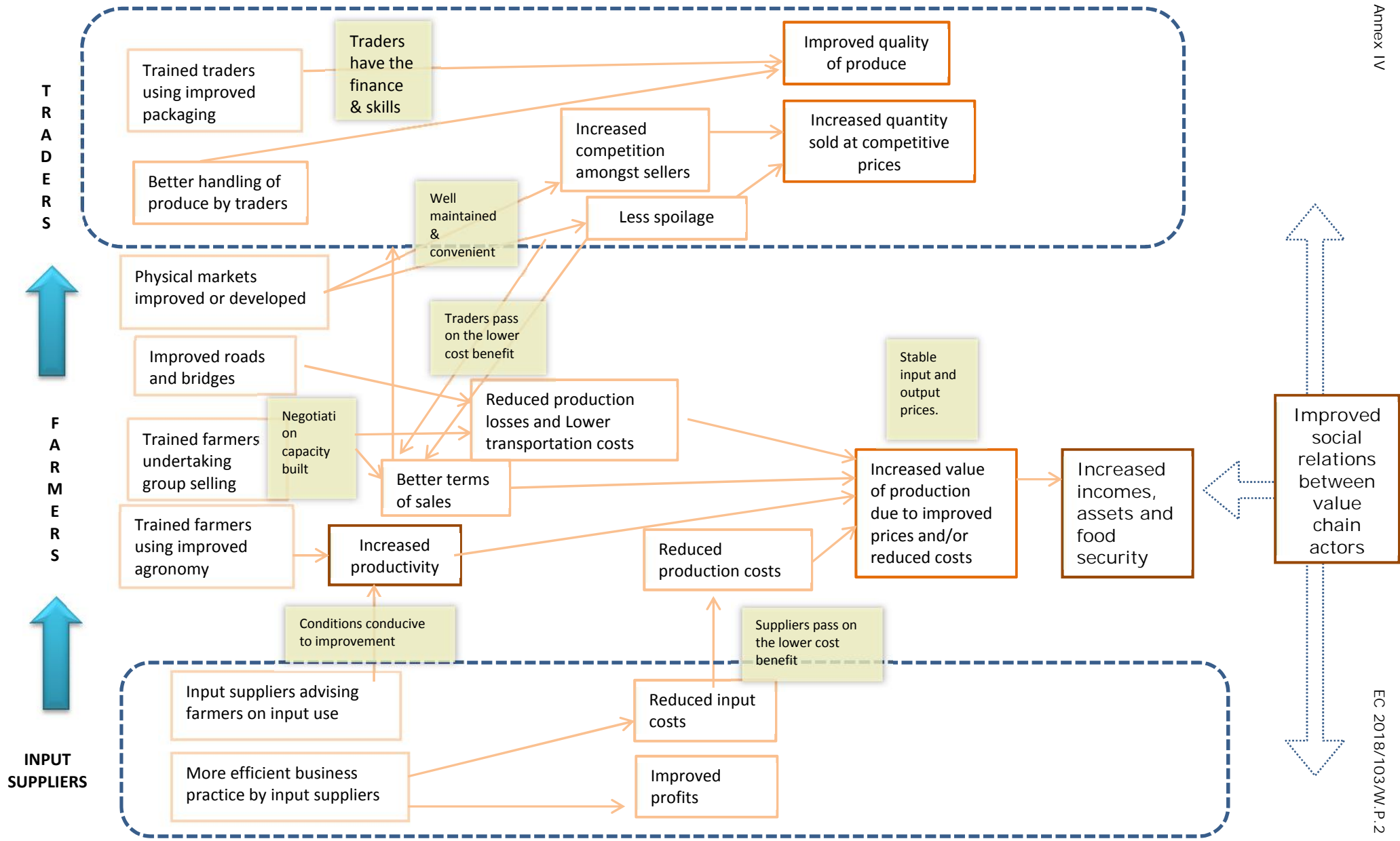
^d The rating for partners' performance is not a component of the overall project achievement rating.

Ratings of the Project Completion Report quality

	<i>PMD rating</i>	<i>IOE rating</i>	<i>Net disconnect</i>
Scope	n/a	4	n/a
Quality (methods, data, participatory process)	n/a	3	n/a
Lessons	n/a	4	n/a
Candour	n/a	4	n/a

Rating scale: 1 = highly unsatisfactory; 2 = unsatisfactory; 3 = moderately unsatisfactory; 4 = moderately satisfactory; 5 = satisfactory; 6 = highly satisfactory; n.a. = not applicable.

Reconstructed Project Theory of Change



Project Log Frame

Results Hierarchy	Indicators a/	Means of Verification
Goal: Contribute to reduced Poverty and improved health among poor rural households in medium-high potential horticultural farming areas	<ul style="list-style-type: none"> • 10% reduction of poverty prevalence rate among 12,000 households participating in the project by Year 7 (Baseline 35% in 2003)RIMS3 • 3% reduction in malnutrition prevalence (weight for age of children under 5) in project area by Year 7 (reduction in chronic malnutrition – 36% in 2003, underweight 17% in 2003 and wasting 6% in 2003) • 5% increase in inventory of household assets among 12,000 participating households in project area by Year 7 (Baseline 35% in 2003) 	<ul style="list-style-type: none"> • Household income and expenditure surveys. • RIMS impact survey questionnaire (baseline and final) • Demographic and health surveys conducted by Kenya National Bureau of Statistics • Annual household asset surveys by M&E
Development Objectives: Increased domestic horticulture productivity and improved functional input and produce marketing system	<ul style="list-style-type: none"> • 10% increase in average real incomes for 12,000 households engaged in Sustainable domestic horticulture enterprises by Year 7 (Baseline to be determined). • 10% increase in value of marketed horticultural produce by year 7 (Baseline). • 10 % Increase yield per ha (Baseline to be determined). • 10 %Net margin per unit area (Baseline to be determined). • 5% Increase in unit price for producers (<i>Baseline for unit price for producers to be determined</i>). • 10% decrease in price of inputs (suppliers and producers) (Baseline for input prices to be determined). 	<ul style="list-style-type: none"> • Baseline and annual production and income surveys in Project area by M&E and during impact survey in Year 5. • Specific evaluation studies
Outcome A1: Informed Investment Decision	<ul style="list-style-type: none"> • Number of community projects implemented (RIMS2) ,(Baseline 0 in 2007) target 80 in year 7 implemented (RIMS2) 	<ul style="list-style-type: none"> • Annual Project reports. • infrastructure registers • PMU Assessment
Output A1.1 Analytical Studies conducted	<ul style="list-style-type: none"> • 14 No. VCA studies conducted ,(Baseline 0 in 2007) target 14 in year 7 • Upstream/downstream/Price stability study conducted,(Baseline 0 in 2007) target 1 in year 7 • Number of community action plans included in local government plans ,(Baseline 0 in 2007) target 80 in year 7 implemented (RIMS2) • Number of community action plans formulated and implemented(RIMS1), target of 80 in year 7, Baseline 0 in 2008 	<ul style="list-style-type: none"> • Contract register • study reports
Outcome B 1: Empowered Horticulture System Actors	<ul style="list-style-type: none"> • 10 % increase of market actors benefiting from improved market access. (Baseline to be determined). • 10 % increase Volume of business per unit enterprise (Baseline to be determined). 	<ul style="list-style-type: none"> - Impact assessment survey report - Baseline survey reports
Output B1.1 Capacity of GoK Staff in marketing systems improved	<ul style="list-style-type: none"> • Government officials trained (RIMS) Baseline of 0 in 2007 (target of 2000 by Year 7). 	<ul style="list-style-type: none"> • DAO Progress report • Infrastructure register • group register
Output B1.2 Capacity of value chain players in marketing service provision Improved	<ul style="list-style-type: none"> • No. of value chain players trained by category:- • People trained in post-production, processing and marketing (RIMS1) (target of 12,000) 	<ul style="list-style-type: none"> • DAO Progress report • Infrastructure register

Results Hierarchy	Indicators a/	Means of Verification
	<ul style="list-style-type: none"> Marketing groups formed and/or strengthened (RIMS1) (target of 600 by Year 7) Marketing groups with women in leadership positions (RIMS1)(target of 200 by Year 7) 	<ul style="list-style-type: none"> group register
Output B1.3 Existing Marketing Information Systems improved	<ul style="list-style-type: none"> Percentage of value chain players accessing timely and reliable market information (60% compared to a baseline of 12% in year 2007) 	individual enterprise report
Output B1.4 Access to affordable financial services supported	<ul style="list-style-type: none"> Enterprises accessing facilitated financial services (RIMS 1) (baseline of 0, target of 5,000 by year 7) Value of gross loan portfolio (RIMS 1) (target of KES 1 billion by Year 7) 	<ul style="list-style-type: none"> District Reports Equity Bank
Output B1.5 Development of legal and regulatory environment for input and produce (policy Developed) facilitated	<ul style="list-style-type: none"> National Horticulture Policy developed(baseline of 0 in 2007, target of 1 by year 7) Number of pro-poor legislation and regulations enforced at the local or central level (RIMS 2) ,(baseline of 0 in 2012, target 2 of by year 7) 	<ul style="list-style-type: none"> ASCU report Sub-County reports
Outcome C1. Developed sustainable marketing Support Systems	<ul style="list-style-type: none"> Number of functioning infrastructure (RIMS2) (target 60 by Year 7). 	<ul style="list-style-type: none"> DAO Progress report Infrastructure register group register
Output C1.1 Innovations in value addition and market oriented production technologies enhanced	<ul style="list-style-type: none"> Number of pilot initiatives supported by category (Baseline of 0 in 2007, target of 80 by year 7) Numbers of innovations adopted/replicated (RIMS2) (Baseline of 0 in 2007) 	<ul style="list-style-type: none"> DAO Progress report Infrastructure register group register
Output C1.2 Rural access roads improved	<ul style="list-style-type: none"> Number of roads improved (target of 92 by Year 7). Baseline 0 in 2008) Length of rural roads opened up through spot repairs (target of 230 km by year 7) baseline of 0 in 2007 	<ul style="list-style-type: none"> Infrastructure register Baseline survey
Output C1.3 Physical market infrastructure improved	<ul style="list-style-type: none"> Number of market facilities developed/improved(RIMS) (target of 50 by year 7, baseline of 0 in 2008) Volumes of priority crops traded ,(baseline of --in 2007, target of -- by year 7) Environmental management plan formulated (RIMS 1)(baseline of 0 in 2008, target of 72 by year 7) 	<ul style="list-style-type: none"> EIA report Infrastructure register Local authority records Infrastructure register
Outcome D 1: Effective and efficiently managed Programme	<ul style="list-style-type: none"> Project activities fully integrated in mainstream GoK systems and institutions with functional management, monitoring and reporting (target of --- by Year 7) 	<ul style="list-style-type: none"> NIMES M&E reports
Output D 1.1: Fully functional governance, management, monitoring and reporting systems.	<ul style="list-style-type: none"> Project implemented on schedule with performance ratings of satisfactory or better. Increasing measures of institutional capacity. 	<ul style="list-style-type: none"> Supervision and implementation support mission reports, and audit reports. Formal institutional capacity assessments
Output D 1.2: Knowledge about NRM effectively managed and disseminated to stakeholders.	<ul style="list-style-type: none"> Increasing dissemination and use by stakeholders of knowledge generated by Project. Regional knowledge centres effectively networked. 	<ul style="list-style-type: none"> Number of information materials produced and distributed project-wide as monitored by M&E. Reports of regional knowledge networks. Surveys on awareness of sustainable NRM.

Methodology used for undertaking the quantitative and qualitative analyses

1. As part of the impact evaluation process, an evaluability assessment of the impact assessment study conducted by the programme at the time of programme completion was undertaken. The motivation behind it was to assess the strengths and weaknesses of the study in order to utilise data or information contained therein for the purpose of IOE's own impact evaluation. The following box shows results of the analysis.

Box 1

Preliminary evaluability assessment of the programme

In addition to the selectivity framework that assists in selecting projects for the impact evaluation, an evaluability assessment was undertaken with the aim to give priority to projects that have an adequate amount of usable self-evaluation data to ensure that impact evaluations by IOE can be done in an effective and efficient manner. Availability of data helps reduce the costs and time taken for IOE to undertake impact evaluations. An evaluability assessment was accordingly undertaken for SHOMAP which revealed the following.

The list of all sub-counties where the programme was implemented was available, and so was the list of all commercial villages (villages where producer groups were trained by the programme). In addition, annual monitoring reports (in terms of outputs achieved), monitoring and evaluation (M&E) and value chain analysis reports were available. The programme undertook both baseline and endline studies. However, the baseline study was prepared in 2011, late into programme implementation (during the mid-point year of the programme's life span). Furthermore, one baseline was conducted in each of the 14 sub-counties of programme area. Thus, there were 14 separate baseline studies instead of one comprehensive baseline. Also, a fixed number of 150 respondents were sampled in each sub-county rather than having a proportional sample. The baseline study was conducted using only beneficiaries as respondents; there was no control group. As a consequence, the baseline studies could not be used by this impact evaluation.

The programme had conducted an impact assessment at the time of programme completion; it was conducted using quasi-experimental method with a comparison group using mixed methods. A total sample of 2,852 households, out of the total estimated 12,000 households, was interviewed. This included 2,187 beneficiaries and 665 non-beneficiaries for comparison group. The recall method was used to construct some of the baseline indicator values. However, the formal method used for selecting the comparison group, which is a key requirement for establishing internal validity and therefore for attributing programme effects, is missing in the methodology. The majority of outcome indicators of the impact assessment were estimated by comparing average values of the beneficiaries with those of non-beneficiaries, but no matching procedure was applied. In addition, the size of control group was far lower than the beneficiary group. Finally, at the time of its conducting the evaluation, some of the programme activities such as physical market structures were still not completed, and hence the expected impact of the programme in its entirety could not be ascertained.

2. The impact assessment used a quasi-experimental design to attribute programme results to the programme interventions. The identification of impact was achieved through a counterfactual, i.e. what would have happened to the treatment group in the absence of the treatment. The key evaluation question was: how does the easing of inefficiencies in inputs and produce marketing constraints increase incomes in medium high potential farming areas where horticultural is an important source of livelihood? The specific sub questions allowed the development of indicators for measuring impacts at household, community and institutional level and relevant study hypothesis. The indicators were to assess both intended and unintended benefits, and spill-over effects of intervention.
3. The impact evaluation used a mix of quantitative and qualitative methods in order to utilize the strengths and overcome the shortcomings of each. The two

methods were carried out contemporaneously for reasons of cost and time efficiency. The core instrument for the evaluation was the household survey which was used to collect primary quantitative data. A household questionnaire was designed and administered to both treated and control groups using Computer Assisted Personal Interviews (CAPI). The questionnaire gathered data on socio-demographic information, education, health, and other characteristics.

Sampling frame

4. The sampling strategy involved creating the sampling frame. The Kenya National Bureau of Statistics (KNBS) using the Kenya Population and Housing Census Survey database, developed the Enumeration Areas (EAs) for the sampling frame for this study. Prior to the promulgation of the current constitution in 2010, the country was administratively divided into provinces which were further divided into districts. Each district was divided into several divisions, and each division into locations; and locations into sub-locations. In addition to these administrative units, each sub-location was subdivided into census enumeration areas (EAs) i.e. small geographic units with clearly defined boundaries.
5. A total of 96,251 EAs were developed during the 2009 Census cartographic mapping. Therefore, the primary sampling units (PSUs) for this survey were the Enumeration Areas (EAs) based on the 2009 Kenya Population and Housing Census. To prepare the sampling frame a listing process was undertaken in the selected EAs. This entailed household listing and structure numbering to get a complete list of all the households in each of the selected EAs.
6. The selection of the households was implemented by the KNBS. The selection of the Enumeration Areas was done using the probability proportional to size using the total number of households in each EA as the measure of size. From each selected EA, a uniform sample of 13 households was selected systematically, with a random start. The systematic random sampling method was adopted as it enables the distribution of the sample across the EA evenly and yields good estimates for the population parameters. The households were selected after the listing process was completed in each EA.
7. The selection of treated villages was based on the listing from IFAD. From a listing of all the villages that benefited from the SHOMAP, commercial producer groups were systematically selected with a random start based on interval of 5. The number of households to be interviewed in each village was then proportionately determined using the population of treated households in that village.
8. Sample size. The sample size was calculated using the following parameter values: $\alpha=0.05$, $\beta=0.2$, a Minimum Detectable Effect of 0.20 for income variable (assumption based on the programme endline survey), an intra-cluster correlation value of 0.1 and adjusting for possible non-response (5 per cent), a sample size of 1522 households will be obtained, with 697 in the treated group and 825 in the control group. The oversampling of the control group was in order to find the best quality matches possible for the treated group and to confront the issue of the control group sampling units dropping out due to lack of adequate matching.

Sampling

<i>County</i>	<i>No. of Commercial Producer Groups</i>	<i>No of treated farmers</i>	<i>No. of untreated farmers</i>	<i>Total No. of households</i>
Bungoma	34	220	251	471
Kisii	17	114	130	244
Nyandarua	21	135	154	289
Nandi	9	63	72	135
Kericho	7	40	46	86
Meru	13	88	101	189
Embu	6	40	46	86
Target	107	700	800	1,500
Achieved		697	825	1,522

9. Similarly, the selection of villages for the control group was determined by the agro-ecological zones in which the treated households belong. Only villages in high and medium potential zones and those that grew similar crops as the treated groups were selected. The control villages did not benefit from any of the SHOMAP interventions. The households were selected enumeration areas within the same agro-ecological zone as treatment groups. The households were selected from the Census sampling frame managed by the Kenya National Bureau of Statistics (KNBS). Based on the total number of non-treated households, the number of households interviewed for each selected village was proportionate to the number of treated households selected in final sample within the same district. The construction of both the treatment and control group took advantage of a national sample conducted by the KNBS at the start of the programme in 2009. Data were collected on the same outcomes and characteristics (plus additional others) on treatment and control groups of households in 2017.
190. The quantitative part of the evaluation was complemented by a set of qualitative methods which provided an understanding of the causal mechanisms by which the intervention either achieved or failed to achieve its goals. Key Informant Interviews and Focus Group Discussions (FGD) were used as instruments for qualitative data collection. The KIIs elicited individual perspectives from input stockists and traders /transporters. A total of 48 KIIs were collected, distributed across all the 14 districts. They represented all categories of beneficiaries and most important key informants. A total of 17 FGDs elicited perspectives from retailers who sell their produce in markets constructed by SHOMAP, members of pilot initiatives and commercial villages, and from management committees (bridges and markets). Table 1 displays the sub-questions and the tools used in this evaluation. Details of KIIs and FGDs are reported in Table 2.

Table 1

Evaluation tools used for the impact evaluation

<i>Sub-questions</i>	<i>Quantitative tools</i>	<i>Purpose</i>
What was the impact of SHOMAP on incomes, agricultural productivity, assets and food security of beneficiary households?	Structured impact survey	Administered to all the sampled households for the collection of primary quantitative data.
- To what extent were commercial villages and pilot initiatives successful and why?	Focus Group Discussions	Conducted separately for women and men by project component and sub-component to triangulate with quantitative information.

- To what extent did SHoMAP caused changes in the social and economic conditions of women?		
- Which was the main perceptions of hot-spot improvements?		
- To what extent did the different categories of beneficiaries participate in the programme's implementation?		
- To what extent were pilot initiatives successful and why?		
- What is the current state of use of market infrastructure and what are the main reasons for this?		
- To what extent did SHOMAP cause changes in the distribution of agricultural inputs?	Key Informant Interviews	Conducted with different project partners to identify project successes and failures and with beneficiaries to triangulate with quantitative information.
What is the current state of market infrastructures and hot spot improvements?	Observations	Conducted by the IOE team to assess the status of market infrastructures and of hot spot improvements

Table 2
Details of KIIs and FGDs

Categories of KII	Number
PMU	3
Beneficiaries - stockists	10
Beneficiaries -committee members	3
Beneficiaries - representatives of PI	2
Beneficiaries - transporters	4
Beneficiaries - traders	5
Service providers	2
MoA at county level	15
County government	3
Categories of FGs	
Pilot initiatives	4
Commercial villages	5
Market management committees	2
Bridge committees	1
Retailers	4
Women	1

Table 3
Participants of Key Informant Interviews

<i>Position</i>	<i>Category</i>	<i>Venue</i>
M&E	PMU	Nairobi
Sub-county agricultural officer	MoA / county government	Embu
Bridge committee chairmain	Beneficiary	Embu
Stakeholder committee member	Beneficiary	Meru
Chairman Market management committee	Beneficiary	Meru
Sub-county agricultural officer	MoA / county government	Meru
Former desk officer Imenti South	MoA / county government	Meru
Chairmen of county markets	County government	Meru
County director of agriculture	MoA / county government	Kericho
Director of trade department in Kericho	County government	Kericho
Agricultural officer	MoA / county government	Kericho
Sub-county agricultural officer	MoA / county government	Kericho
Shop owner / stockist	Beneficiary	Kericho
Deputy director of agriculture	MoA / county government	Kisii
Sub-county agricultural officer	MoA / county government	Kisii
Shop owner / stockist	Beneficiary	Kisii
Deputy director of agriculture	MoA / county government	Bungoma
Assistant director agriculture	MoA / county government	Bungoma
Assistant director Trade development	County government	Bungoma
Sub-county crop officer	MoA / county government	Bungoma
Agribusiness officer	MoA / county government	Imenti North (interviewed on the phone)
County deputy director	MoA / county government	Nandi
Secretary of the Kamobon women group	Beneficiary	Nandi
Assistant director of agriculture	MoA / county government	Kalao
Ward agricultural officer	MoA / county government	Kanjouri
Stockist	Beneficiary	Kinangop
Chairman of the road committee	Beneficiary	Wendi Muega
Secretary of Jersey SHG	Beneficiary	Nyandarua
Agribusiness and marketing officer	PMU	Nairobi
Ex programme accountant	PMU	Nairobi
Head business development Kibit	Service provider	Nairobi

Table 3
Participants of focus group discussions

<i>Name of the group</i>	<i>Group type</i>	<i>Place</i>
Kiagoro Star	Banana value addition group	Embu
Kibugu PMC	Market management committee	Embu
Kipkerieny hort. Community group	Tomato processing group	Kericho

Nyaburumbasi	Vegetable cleaning, sorting and marketing group	Kisii
Buyonge commercial village	Commercial village	Kisii
Indivisi farmers marketing federation	Commercial village	Bungoma
Hequendo Enterprise	Pilot initiative	Bungoma
Kaptumo market management committee	Market management committee	Nandi
Kihoto bridget committee	Stakeholder committee for bridge	Nyandarua
Kipospar	Commercial village	Nyandarua South
Not applicable	Retailers	Kisii
Webuye bananas	Commercial village	Bungoma
Not applicable	Retailers	Bungoma
Not applicable	Retailers	Bureti
Not applicable	Retailers	Nandi South
Nkathano women group	Women	Embu

Note: Not applicable refers to participants that were not part of a common group.

10. Quantitative data analysis methods. The impact evaluation of the SHOMAP activities relied on propensity score matching method to estimate the impact of the programme activities on various household wellbeing. Propensity scores predicting the likelihood of receiving treatment were obtained for each household based on cross-sectional data collected in 2017. Selected pre-programme characteristics hypothesized to influence probability of treatment and relevant wellbeing and other outcomes of interest were used in a standard probit³³ model to calculate propensity scores for each participant and the control group. The nearest neighbor matching procedure (with replacement) was used. All covariates used to predict the likelihood of treatment were balanced between the treatment and control groups after weighting by the propensity score. The quality of matching was assessed using the standardized bias approach, which compared the bias before and after matching. The quality of matching helped to establish whether the distribution of variables was balanced in both the treatment and control groups.
11. The impact evaluation made use of with and without comparison analysis for estimating programme effects. The former involved comparing the values of outcome variables at the same post-programme time point i.e. 2017 in this case, for both treatment and control groups.
12. Data utilized in this study was collected during the month of December 2017. About 20 research assistants were contracted to administer questionnaires to the selected households. A total of 1522 questionnaires were administered to both control and treatment group.
13. The impact evaluation of the SHOMAP activities relied on propensity score matching method to estimate the impact of the programme activities on various household wellbeing. While a control group was determined upfront, the selection was not randomized. Propensity scores predicting the likelihood of receiving treatment were obtained for each household based on cross-sectional data collected in 2017. Selected pre-programme characteristics hypothesized to influence probability of treatment and relevant wellbeing and other outcomes of interest were used in a standard probit model to calculate propensity scores for

³³ A probit model (also called probit regression), is a way to perform regression for binary outcome variables. Binary outcome variables are dependent variables with only two possibilities (for e.g. yes/no or positive /negative). The probit model estimates the probability a value will fall into one of the two possible binary (i.e. unit) outcomes.

Variable descriptions

This annex presents descriptions of the variables used in the impact evaluation.

Table 1

Descriptions of the variables: dependent, covariate and outcome variables

Name	Label	Type and definition	Measurement	
Dependent Variables				
1	treat	Treatment	Dummy variable representing SHOMAP participation	1 if participated on SHOMAP, 0 if non-SHOMAP participant
Covariates				
1	AHH	Age of household head	Continuous, age of household head	Years
2	FHH	Female headed HH	Dummy, representing gender of head	1 if female, 0 if male
3	AAM	Average age of HH members	Continuous, average age of all household members	Years
4	HSZ	Household size	Continuous, number of members in the household	Number of members
5	AAA	Average age of adults in HH	Continuous, average age of adults (18 and above) in the household	Years
6	PEO	Primary education and above	Dummy, representing level of education of HH member	0 if no education, 1 otherwise
7	LAP	Land used for agricultural purposes	Continuous, land used for agricultural purposes	Acres
8	LTS	Land Tenure System	Dummy, land tenure system of the land owned	1 if freehold, 0 otherwise
9	LOB	Land owned at baseline	Continuous, land owned at baseline	Acres
10	LO7	Total livestock owned at baseline	Continuous, total number of livestock owned at baseline	Number of livestock
11	HRT	Horticultural crops	Dummy, if household cultivated horticultural crops	1 if household cultivated horticultural crops, 0 otherwise.
12	STP	Staple food crops	Dummy, if household cultivated staple food crops	1 if household cultivated staple food crops, 0 otherwise.
13	PCC	Permanent cash crops	Dummy, if household cultivated permanent cash crops	1 if household cultivated permanent cash crops, 0 otherwise.
14	FRT	Fruit crops	Dummy, if household cultivated fruit crops	1 if household cultivated fruit crops, 0 otherwise.
15	TBC	Tuber crops	Dummy, if household cultivated tuber crops	1 if household cultivated tuber crops, 0 otherwise.
16	ACC	Annual cash crops	Dummy, if household cultivated annual cash crops	1 if household cultivated annual cash crops, 0 otherwise.
17	CRP	Crop was promoted	Dummy, if crop was promoted by SHOMAP in the district	1 if crop was promoted by SHOMAP in the district, 0 otherwise

Definitions of selected indicators and variables

1) Gross margin per acre.

$$G_i = \frac{V_i \times (T_i - L_i) - (I_i)}{C_i} \quad [\text{Eq. 1}]$$

Where:

G_i: Gross margin for crop i

V_i: value of sales for crop i

Q_i: quantity sold for crop i

T_i: total production for crop i

L_i: losses for crop i

I_i: Value of purchased cash input costs for crop i

In Eq. 1 production for self-consumption is implicitly priced as sold production.

2) Agricultural income.

$$A = \sum \left[\frac{V_i}{Q_i} x (T_i - L_i) - (I_i + H_i + I_i) \right] - P \quad [\text{Eq. 3}]$$

Where:

- AI: Agricultural income
- VSi: value of sales for crop i or livestock product i
- QSi: quantity sold for crop I of livestock product i
- TPi: total production for crop I of livestock i
- Li: losses for crop i
- ICi: Value of purchased cash input costs for crop I or livestock i
- IPI: value of in-kind payment for unpaid labour for crop i
- HLi: Money spent on causal hired labour for crop i
- PL: paid wage for permanent labour

As in the case of the gross margin, production for self-consumption is implicitly priced as sold production.

- 3) Transport costs. It refers to the transport cost paid on average in a month by the respondent of the household questionnaire.
- 4) Household Food Insecurity Assessment Scale (HFIAS). The respondents were asked to consider whether any of the listed nine food insecurity related conditions had happened in the past 30 days. If the response was affirmative, the frequency for each was recorded. The options for the frequency was rarely (once or twice), sometimes (three to ten times) or often (more than ten times) over the past 30 days. A value was assigned for each response per condition (never = 0; rarely = 1; sometimes = 2 and often = 3). The HFIAS was calculated by summing the frequency for the nine food insecurity related conditions. The maximum possible score for a household is 27 (answered often for all nine conditions) and lowest possible score is zero (answered never for all nine conditions). Therefore the higher the score, the more food insecurity the household experienced (in terms of access to food).
- 5) Household dietary diversity score (HDDS). The respondents were asked to recall the foods that they, their spouse or anyone else in the household ate the day before. This data was used to construct HDDS as an indicator of the nutritional quality of the household's diet, using the food groupings described by Steyn et al. (2006), namely:
 - 1 grains, roots and tubers
 - 2 vitamin A rich fruit and vegetables
 - 3 fruit other than vitamin A rich
 - 4 vegetables other than vitamin A rich
 - 5 meat, poultry and fish
 - 6 eggs
 - 7 legumes, nuts and seeds
 - 8 dairy products
 - 9 oils and fats.

The lowest possible HDDS therefore is zero and the highest possible HDDS is nine. Sugars and beverages were not considered when calculating the HDDS as these foods do not add to the nutritional quality of the diet. The respondents were also asked how many days during the past seven days the household ate foods from the various food groups. The main source where the foods were obtained was also recorded.
- 6) Yield. Crop yields were calculated as the number of kilograms grown per hectare of land for each crop.

Match Balance statistics

1. This section presents the balance between treatment and control groups for each group analysis that was carried out.

Estimation of propensity scores and matching procedure

2. The propensity scores for treatment and control groups range between:

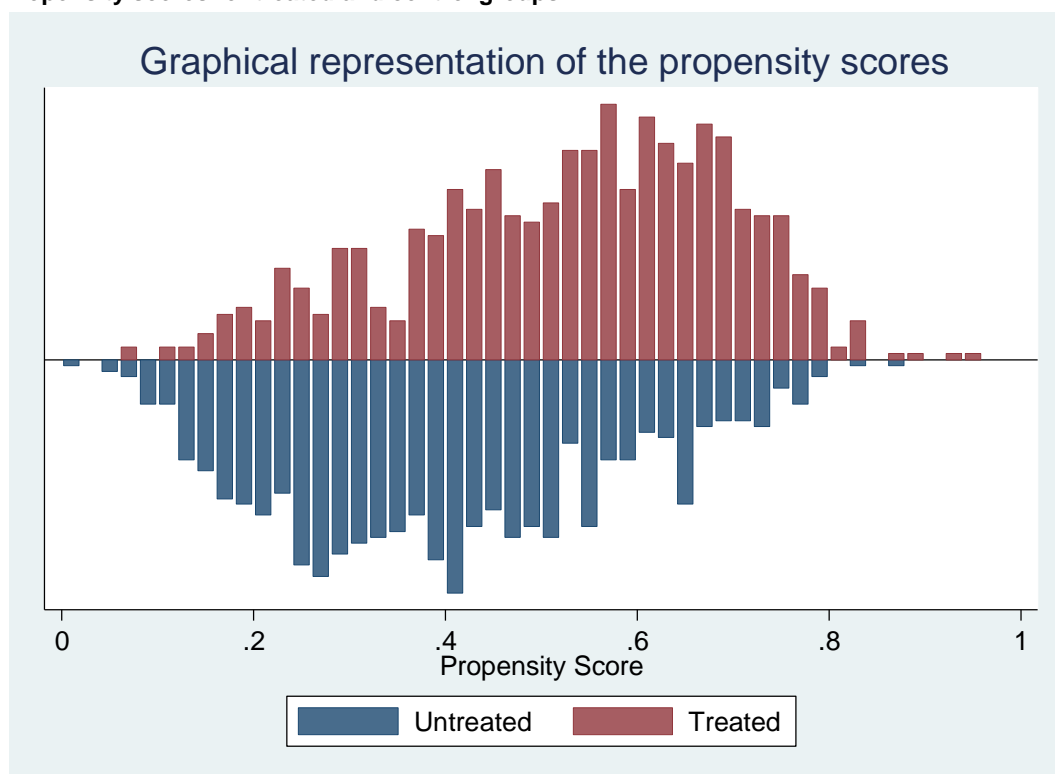
Treatment: $0.0744795 \leq \text{pscore} \leq 0.9437173$

Control: $0.00002 \leq \text{pscore} \leq 0.8694403$

3. Invoking the common support (using the minima and maxima comparison condition) results in both treatment and control group being on common support. This means that the common support assumption is well satisfied.
4. The matching procedure was implemented using the psmatch2 command in STATA, as developed by Leuven and Sianesi (2003). After matching and testing for matching quality, the results indicate that there is a significant reduction in the mean bias, from 21.4 (before matching) to 2.2 (after matching), representing 89.7 per cent reduction. In addition, there is a significant reduction in the standard deviation and variance after matching. Based on these results, we conclude that the matching was successful.

Graph 1

Propensity scores for treated and control groups



Test of significance of the difference of means between SHOMAP and non-SHOMAP households

Variable	Mean			t-test	
	Treated	Control	Average % absolute bias	t	p> t
Age of household head	54.78	54.79	0	-0.0100	0.995
Female headed HH	0.207	0.219	-3.100	-0.560	0.574
Average age of HH members	32.37	32.76	-2.900	-0.520	0.605
Household size	5.301	5.182	5	0.880	0.381
Average age of adults in HH	43.40	43.60	-1.800	-0.330	0.743
Primary education and above	0.782	0.767	3.400	0.670	0.505
Land used for agricultural purposes	1.833	1.605	0	1.060	0.290
Land Tenure System of	0.756	0.754	0.400	0.0900	0.931
Land owned at baseline	2.532	2.326	0	0.760	0.446
Total Livestock owned at baseline	13.86	12.98	2.300	0.380	0.701
Horticultural crops	0.415	0.426	-2.400	-0.430	0.665
Staple food crops	0.779	0.767	3	0.550	0.583
permanent cash crops	0	0	.	.	.
Fruit crops	0.504	0.494	2.100	0.370	0.708
Tuber crops	0.396	0.417	-4.300	-0.800	0.426
Annual cash crops	0	0	.	.	.
Crop was promoted	0.782	0.790	-1.800	-0.370	0.715

SHOMAP promoted crops and counties

	<i>Bungoma East</i>	<i>Bungoma North</i>	<i>Bungoma South</i>	<i>Bungoma West</i>	<i>Bureti</i>	<i>Embu</i>	<i>Gucha</i>	<i>Imenti North</i>	<i>Imenti South</i>	<i>Kisii Central</i>	<i>Meru Central</i>	<i>Nandi south</i>	<i>Nyandarua North</i>	<i>Nyandarua South</i>
Amaranth	✓	✓			✓		✓			✓				
Banana	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Cabbage				✓									✓	✓
Carrots													✓	✓
Chillies			✓											
Garden peas													✓	✓
Irish potato					✓			✓					✓	✓
Managu	✓	✓			✓		✓			✓				
Mango						✓			✓		✓			
Melon			✓											
Onion	✓	✓	✓	✓	✓									
Passion fruit		✓				✓			✓			✓	✓	
Pineapple					✓		✓			✓				
Saga	✓	✓			✓		✓			✓				
Sweet potato	✓			✓	✓			✓						
Tomato	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	

List of persons met

Samson Nguta	Ministry of Agriculture/State Dept of Agriculture
Seraphline Atambo	Ministry of Agriculture/State Dept of Agriculture
Jacqueline Kii	Ministry of Agriculture/State Dept of Agriculture
Hani Elsadani	IFAD Country Director
Eng Gitonga Mbijiwe	Ministry of Works and Infrastructure
Wafula M Mathias	Ministry of Agriculture/State Dept of Agriculture
Patrick Kibaya	Ministry of Agriculture/State Dept of Agriculture
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Jackson N. Kinyanjui	The National Treasury
Emma Mburu	The National Treasury
Moses Kamau	Ministry of Agriculture/State Dept of Agriculture
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Denis Ombaso	MoA / county government (Meru)
Albat	MoA / county government (Meru)
Rono Johnstene	MoA / county government (Kericho)
Michail Wairoma	County government (Kericho)
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Olm Gacob	MoA / county government (Kericho)
Mulei Mutiso	MoA / county government (Kisii)
Joel Angasa	MoA / county government (Kisii)
Teresia Ndiago	MoA / county government (Bungoma)
Susan Ngera	MoA / county government (Bungoma)
Moses Nyagers	MoA / county government (Bungoma)
Immanuel Kisebe	MoA / county government (Bungoma)
Mary Mbrugo	MoA / county government (Imenti North)
Simon Mutai	MoA / county government (Nandi)
Nelso Kibet	MoA / county government (Kalao)
Joseph Kimuoto	MoA / county government (Kanjouri)

The evaluation mission also met numerous beneficiaries of SHOMAP.

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