



Food and Agriculture
Organization of the
United Nations



INTERNATIONAL
FOOD POLICY
RESEARCH
INSTITUTE

MOTIVATING FARMERS' MARKET-ORIENTED PRODUCTION

SMALLHOLDER HORTICULTURE EMPOWERMENT AND PROMOTION APPROACH IN KENYA



FAO
INVESTMENT
CENTRE

COUNTRY
INVESTMENT
HIGHLIGHTS

MOTIVATING FARMERS' MARKET-ORIENTED PRODUCTION

**SMALLHOLDER HORTICULTURE EMPOWERMENT
AND PROMOTION APPROACH IN KENYA**

Maina Mwangi
Kumiko Shuto
Peter Mwangi
Mercy Mburu
Sylvia Mburugu

Published by
the Food and Agriculture Organization of the United Nations
and
the International Food Policy Research Institute
Rome, 2021

Required citation:

Mwangi, M., Shuto, K., Mwangi, P., Mburu, M. and Mburugu, S. 2021. *Motivating farmers' market-oriented production – Smallholder Horticulture Empowerment and Promotion approach in Kenya*. FAO Investment Centre Country Investment Highlights No. 6. Rome, FAO and IFPRI. <https://doi.org/10.4060/cb7026en>

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) or the International Food Policy Research Institute (IFPRI) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO or IFPRI in preference to others of a similar nature that are not mentioned.

The views expressed in this information product are those of the author(s) and do not necessarily reflect the views or policies of FAO or IFPRI. This publication has not undergone IFPRI's standard peer-review process.

ISBN 978-92-5-135044-7 [FAO]

© FAO, 2021



Some rights reserved. This work is made available under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 IGO licence (CC BY-NC-SA 3.0 IGO; <https://creativecommons.org/licenses/by-nc-sa/3.0/igo/legalcode>).

Under the terms of this licence, this work may be copied, redistributed and adapted for non-commercial purposes, provided that the work is appropriately cited. In any use of this work, there should be no suggestion that FAO endorses any specific organization, products or services. The use of the FAO logo is not permitted. If the work is adapted, then it must be licensed under the same or equivalent Creative Commons licence. If a translation of this work is created, it must include the following disclaimer along with the required citation: "This translation was not created by the Food and Agriculture Organization of the United Nations (FAO). FAO is not responsible for the content or accuracy of this translation. The original English edition shall be the authoritative edition."

Disputes arising under the licence that cannot be settled amicably will be resolved by mediation and arbitration as described in Article 8 of the licence except as otherwise provided herein. The applicable mediation rules will be the mediation rules of the World Intellectual Property Organization <http://www.wipo.int/amc/en/mediation/rules> and any arbitration will be conducted in accordance with the Arbitration Rules of the United Nations Commission on International Trade Law (UNCITRAL).

Third-party materials. Users wishing to reuse material from this work that is attributed to a third party, such as tables, figures or images, are responsible for determining whether permission is needed for that reuse and for obtaining permission from the copyright holder. The risk of claims resulting from infringement of any third-party-owned component in the work rests solely with the user.

Sales, rights and licensing. FAO information products are available on the FAO website (www.fao.org/publications) and can be purchased through publications-sales@fao.org. Requests for commercial use should be submitted via: www.fao.org/contact-us/licence-request. Queries regarding rights and licensing should be submitted to: copyright@fao.org.

Cover photograph:

©FAO/Luis Tato

Art Direction and design:

Karen Mata Luna and Naz Naddaf

Abstract

This report presents the findings of a study of the implementation of the Smallholder Horticulture Empowerment and Promotion (SHEP) approach and its contribution to human capital development in agriculture, particularly that of smallholder horticulture farmers in Kenya. The information is derived from a case study of the three phases of the SHEP approach implemented in Kenya between 2006 and 2020. Primary data were obtained through focus group discussions and key informant interviews with respondents representing funders, implementers at both national and county levels and smallholder farmers who participated directly in project activities. Respondents were purposively selected from among key funders and implementers and SHEP project officers in the counties and participating farmers' groups, and ensured the inclusion of male, female and youth farmers as well as farmers living with disabilities. Data were collected virtually using interview guides and were audio recorded. The audio recordings were transcribed and analysed using MAXQDA software. Secondary data were obtained from SHEP project documents, monitoring and evaluation reports and other literature.

The SHEP approach's contribution to human capital development was evaluated using the New World Kirkpatrick Model. The series of SHEP trainings, which addressed both technical and soft skills, were based on Self-Determination Theory (SDT) and were designed to create an optimal environment through which farmers acquired motivation towards market-oriented farming. In accordance with SDT, SHEP trainings emphasized supporting learners' psychological needs for autonomy, competence and relatedness. SHEP trainings in general horticultural and crop-specific production practises, farm business management and marketing were systematically organized and ordered to optimally raise farmers' motivation and desire for more knowledge, resulting in farmers acquiring knowledge as well as technical and soft skills. The results revealed a high level of satisfaction with the training delivery, organization and content. The training influenced farmers to change their mindset and behaviour towards market-oriented horticulture. In addition, a majority of farmers gained confidence in applying the skills acquired, which resulted in improved production and marketing and contributed to increased incomes. The SHEP approach was thus found to be effective in developing human capital and is therefore recommended for use in smallholder horticulture production systems or enterprises. Its flexibility, complementarity and adaptability to other extension programmes presents opportunities for scaling out and adoption by different organizations. This report can therefore be used to inform the technical design and development of policy on extension service delivery.

Contents

	Abstract	III
	Acknowledgements	VII
	Abbreviations and acronyms	VIII
	Introduction	1
CHAPTER 1	Background	5
CHAPTER 2	The SHEP approach	11
	Overview of case	11
	How human capital development occurs	13
	SHEP target groups	14
	Organization funding and implementing the SHEP projects	15
CHAPTER 3	Methodology	17
	Methodological approach and theoretical framework for the evaluation	17
	Data collection	18
	Data analysis	23
	Reliability and validity of data	23
CHAPTER 4	Evidence base for success of SHEP in human capital development	27
	Outputs	28
	Outcomes	28
	Impacts	30
	Empowerment of women, youth and persons living with disabilities	32
	How the SHEP approach succeeded in developing the skills and capabilities of farmers	34
	Innovations that stand out in the SHEP approach	37
	Demand for the model	38
	Costs of intervention	39
CHAPTER 5	Analysis of case and recommendations	43
	Success factors of the SHEP Approach	43
	Stakeholder management	44
	Feedback management	44
	Types of producers best served through the SHEP approach	45
	Agroecological considerations	45
	Necessary conditions for implementing the SHEP approach in different contexts	46
	Potential vulnerabilities and limitations of the SHEP approach	47
	References	51
	Annex	57

Tables and figures

TABLES

1	Key agricultural, human capital and enabling environment indicators in Kenya	8
2	SHEP's four essential steps of training implementation	13
3	Sampling and data collection methods for different respondent categories	22
4	Sampling criteria for counties implementing SHEP in Kenya	22
5	SHEP project training outputs	28
6	Analysis of SHEP approach contribution to human capital development using the New World Kirkpatrick Model	35

FIGURES

1	Two conceptual pillars of SHEP	12
2	Interlinkages between motivation and skills development	14
3	New World Kirkpatrick Model adapted to SHEP training evaluation	21
4	SHEP approach theory of change to human capital development in agriculture	27
5	Scale-up timeline of SHEP approach	39
6	Map of SHEP implementing countries	40

Acknowledgements

This case study report was written as part of the Agriculture Human Capital Investment Study (AHCI) funded by the Food and Agriculture Organization of the United Nations (FAO) Investment Centre and with the support of the International Food Policy Research Institute (IFPRI) and the CGIAR Research Programme on Policies, Institutions and Markets (PIM) and the FAO Research and Extension Unit. Please contact the corresponding authors for questionnaires, data or any other questions.

The authors are Maina Mwangi, from Kenyatta University and Forum for Agricultural Advisory Services – Kenya; Kumiko Shuto from IMG Inc. / Japan International Cooperation Agency (JICA); and Peter Mwangi, Mercy Mburu, Sylvia and Mburugu, from the Forum for Agricultural Advisory Services – Kenya.

The SHEP case study team would like to acknowledge FAO Investment Centre, IFPRI, the CGIAR Research Programme on Policies, Institutions and Markets (PIM) and the FAO Research and Extension Unit, which provided funding and technical support to undertake this study. The team also acknowledges with appreciation the IFPRI team for having organized capacity-building sessions on various aspects of the study, overall guidance on the study itself and for peer reviewing the study report. These highly thoughtful initiatives were helpful and appreciated. Furthermore, our appreciation extends to the JICA team in Japan for providing insights on the conceptualization of SHEP by the Japanese and Kenyan governments during the project's inception and subsequent phases. We are greatly indebted to the SHEP Coordinating Unit in Kenya for devoting time to providing information and documents and for the immense support it provided in linking the study team to various officers in the counties for the data collection exercise. The team is equally grateful to the County Government officers, including Directors of Agriculture, SHEP Desk Officers and Group Facilitators who provided valuable inputs on project implementation in their counties and linked the study team with beneficiaries for interviews to further enrich the case study. All the farmers in different groups and counties who provided information to facilitate this study are gratefully acknowledged. Finally, we thank the experts who transcribed and translated the questionnaire to enable analysis.

Abbreviations and acronyms

AHCI	Agriculture Human Capital Investment
ASAL	arid and semi-arid land
ASTI	Agricultural Science and Technology Indicator
CGIAR	Consortium of International Agricultural Research Centre
COVID-19	Coronavirus disease 2019
DSGD	Development Strategy and Governance Division
EVAP	Extension for Value-Added Agriculture in Palestine
EWILOF	Environment, Water and Irrigation, Livestock, Oceans and Fisheries
FABLIST	Farm Business Linkage Stakeholder
FAO	Food and Agriculture Organization of the United Nations
FGD	focus group discussion
GDP	gross domestic product
GNI	gross national income
GoK	Government of Kenya
HCDA	Horticultural Crops Development Authority
HCI	Human Capital Index
ICT	information and communication technology
IFPRI	International Food Policy Research Institute
IRB	Institutional Review Board
ISMAMP	Improving Small-Scale Farmers' Market-oriented Agriculture Project
JICA	Japan International Cooperation Agency
KII	key informant interview
KNBS	Kenya National Bureau of Statistics
MA-SHEP	Market-Oriented Smallholder Horticulture Empowerment and Promotion
MOA	Ministry of Agriculture
MOALF	Ministry of Agriculture, Livestock and Fisheries
NGO	non-governmental organization
PCU	project coordination unit
PIM	Policies, Institutions and Markets
PLUS	Project for Local and Up-Scaling
PPP	purchasing power parity
ReSAKSS	Regional Strategic Analysis and Knowledge Support System
SDT	Self-Determination Theory
SHEP	Smallholder Horticulture Empowerment and Promotion
SRC-CAP	Sindhuli Road Corridor Commercial Agriculture Promotion Project
UP	Unit Project



Introduction

Sustainable agricultural productivity, food security and poverty reduction remain top goals of governments and development institutions around the world. Progress is under threat from a variety of crises, including climate change and public health emergencies and their associated economic shocks. Along with a growing population and increased demand for agricultural goods for food, fuel and fibre, these concerns necessitate investments in agriculture, rural infrastructure, natural resource management and climate resilience.

Agricultural investments often emphasize the physical and financial capital of farming households – for example, land, fertilizers or credit. However, agriculture human capital investment is crucial for spurring innovation and farm management decisions and empowering smallholders. Human capital is an economic term encompassing assets that increase individual productivity, such as education and health. For the purposes of this study, human capital is defined as the stock of habits, knowledge, social and personality attributes (including creativity) embodied in the ability to perform labour so as to produce economic value (Goldin, 2016). Human capital allows people to effectively utilize other types of capital. For example, farmers' education and knowledge influence their ability to make decisions, adopt new technologies, evaluate risks and manage farm resources.

As part of a global study on promising AHCI initiatives, this case study presents evidence from the SHEP approach in Kenya. The global study, commissioned by FAO and led by IFPRI with support from the CGIAR Research Programme on Policies, Institutions, and Markets (PIM), examines opportunities for both public and private investment in human capital in agriculture. This study aims to fill knowledge gaps about promising investments in programmes that develop agriculture human capital, particularly across different target groups such as smallholders, women and youth.

Case studies were selected according to a set of criteria following a broad assessment using a literature review and expert input. Criteria included documentation of impact; scalability, replicability and institutionalization; inclusion and empowerment; holistic integration; and sustainability. Nine case studies were selected across various geographies and a typology of agricultural human capital was developed. The selection process involved a series of workshops during which technical experts discussed potential cases, case study selection and case study teams.¹ This case study adds perspectives on successful strategies for training and empowerment of smallholder farmers to implement market-oriented horticulture production in Kenya.

¹ For more information on this process and for a detailed description of the typology, please see (Davis *et al.*, 2020).





Chapter 1

Background

Kenya has a population of 47.6 million people, of whom 49.5 percent are male and 50.5 percent are female (KNBS, 2019a). Approximately half of Kenyans (50.6 percent) have attained primary school education and 27 percent secondary school, while 11.8 percent have either technical, vocational or university-level training.

Kenya's tropical climate, with diverse agroecological zones and a bimodal rainfall pattern, favours diverse agricultural production. This involves production of food and industrial crops, horticulture, livestock, fisheries and agro-forestry (GoK, 2019a). However, crop production is substantially limited by arid and semi-arid conditions that are dominant and cover an estimated 89 percent of the country (UNDP, 2020). It is practised on approximately 10.3 million hectares (18 percent of total land mass) by about 6.3 million households, of whom only an estimated 0.06 percent practise irrigation (KNBS, 2019b). Nevertheless, arid and semi-arid conditions support other agricultural enterprises including livestock meat production. Moreover, with availability of water, crop production is emerging in the arid and semi-arid areas.

The agriculture sector is important to the country's economy, contributing 29.3 percent of Kenya's gross domestic product (GDP) and an additional 27 percent through linkages to other sectors such as manufacturing, distribution and services (FAO, 2020a; GoK, 2019a). The sector employs more than 40 percent of the total population and about 70 percent of the rural population, and accounts for up to 65 percent of exports (World Bank, 2019). Kenya's agriculture sector is dominated by small-scale farmers, who account for up to 73 percent of marketed produce (World Bank, 2015). Importantly, agriculture sector growth accounted for the largest share of poverty reduction in Kenya between 2005 and 2015 (World Bank, 2018a; Birch, 2018). Yet despite the importance of the agriculture sector, only a small number of Kenyans have formal agriculture-related training (KNBS, 2019b).

The main products (by value) in the Kenyan horticulture industry are flowers 36.3 percent, vegetables 35.7 percent, fruits 25.7 percent, aromatic and medicinal plants 2.3 percent (GoK, 2019b). The sector has seen significant growth over the last three decades. The domestic value of horticulture production in 2017 was USD 2.19 billion, an increase of 11 percent over the 2016 value (GoK, 2019b). The cultivated area increased by 7 percent between 2016 and 2017, from an estimated 547 000 ha to 585 000 ha, while tonnage rose by 9 percent to 8.6 million metric tons in 2017 from 7.9 million metric tons in 2016. This was driven by improved production and increases in farm-gate prices (GoK, 2019b).

Horticulture production is mainly practised by smallholder farmers, who account for 80 percent of growers and 50-60 percent of producers (Kangai and Gwandeba, n.d.). While the Ministry of Agriculture, Livestock and Fisheries (MOALF) defines smallholder farmers to include those farming between 0.5 ha and 5 ha, the current national agricultural policy includes only farms between 0.2 ha and 3 ha (Africa Check, 2019). Despite the sub-sector's significance, it is faced with numerous challenges, including inadequate and often ineffective extension services. Notably, only a limited number of institutions offer specialized horticulture extension services and training (Match Maker Associates, 2017). Other challenges include limited market access, exploitation by market agents, fluctuation in prices, poor transportation networks and reducing land sizes, which make farming less viable (World Bank, 2019).

Over the years, the Government of Kenya (GoK) has collaborated in global and regional initiatives to advance agricultural development, including the Sustainable Development Goals, the Science, Technology and Innovation Strategy for Africa 2024, and the Malabo Declaration and Africa Agenda 2063. These initiatives acknowledge the importance of agriculture in national and Africa-wide development and identify the application of innovations, technology, knowledge and investments as key in achieving agricultural development. As a result, the GoK has developed and promoted various policies and strategies to align national development goals to these regional and global initiatives. Over the last decade, the key development blueprint has been Vision 2030 (GoK, 2007), which identifies agriculture as one of the key drivers in the realization of 10 percent annual economic growth. Recently, the government launched the Agricultural Sector Transformation and Growth Strategy 2019–2029, an ambitious ten-year plan to transform the sector (GoK, 2019a). The strategy outlines nine strategic (flagship) interventions that will contribute to 100 percent food and nutrition security and has an accompanying National Investment Plan over the period. The National Food Security and Nutrition Policy 2009 addresses the need for enhanced food and nutrition security, information management systems and coordination of the roles of various ministries and agencies to achieve food security. Other relevant policy instruments include the National Agricultural Sector Extension Policy; the Land Policy; the Environment, Water and Irrigation, Livestock, Oceans and Fisheries Policy (EWILOF Policy); and the arid and semi-arid lands (ASAL) policy, among others (FAO, n.d.).

Since 2013, Kenya has adopted a new governance system (Schedule IV of Kenya's Constitution) that assigns some agricultural development functions to the 47 county governments that form the level below the national government. On the one hand, the national government through MOALF as well as regulatory agencies including the Kenya Plant Health Inspectorate Service, the Kenya Bureau of Standards, the Agriculture and Food Authority, and the Kenya Export Promotion Council under the Ministry of Industrialization, Trade and Enterprise Development, among others, are charged with policy formulation, capacity building and coordination. On the other hand, the county governments working through the Agriculture, Livestock, Fisheries and Cooperatives Departments are charged with implementation of policies, offering extension services and agriculture promotion. High levels of mobile communications subscriptions (103.8 per 100 people) provide the opportunity to enable efficient extension service delivery, market information dissemination and financial services delivery (Table 1).

Despite the existence of elaborate policies and interventions in support of agricultural development, a substantial proportion (21 percent) of Kenya's population experience malnutrition, and the incidence of rural poverty is as high as 40 percent (Table 1). These statistics indicate the ineffectiveness of the agriculture sector at providing a viable pathway out of poverty for the majority of smallholder farmers. Over the years, investments in research, training, innovation and technology transfer have remained low at USD 222.4 million at purchasing power parity (PPP) (Table 1). Furthermore, the level of value addition and agro-industrial activity remains low relative to the importance of agriculture to the economy. Consequently, the full potential of Kenya's agriculture sector has not been exploited to contribute sustainably to national economic growth and food and nutrition security for all.

Table 1**Key agricultural, human capital and enabling environment indicators in Kenya**

Indicator category	Indicator name	Latest data available	Indicator value
General	Total population ^a	2019	47 564 296
	Rural population (% of total population)	2019	72.49
	Youth population (% of total population) ^a	2019	29
	Number (%) of smallholder/family farmers ^a	2019	5.6 million households
	Poverty headcount ratio at USD 1.90 (%)	2015	36.1
	Rural poverty headcount ratio (%)	2015	36.8
	Prevalence of undernourishment (%)	2017	29.4
Enabling environment: educational attainment	Human Capital Index (HCI) score	2018	0.542
	Expected years of schooling, male and female, disaggregated	2020	11.38 (F), 11.9 (M)
	Primary school completion rate, total	2016	99.68
Enabling environment: funding	Literacy rate, adult total (% of people ages 15 and above)	2018	81.5
	National agricultural research expenditure data as share of agricultural GDP (ASTI) ^b	2016	USD 222.7 million PPP
Enabling environment: ICT-related indicators	Agriculture expenditure (% of total spending) ^c	2018	1.92
	Mobile subscriptions (per 100 people)	2019	103.8
	Secure internet servers (per 1 million people)	2019	248 165
Enabling environment: policies	Access to electricity (% of population)	2018	75
	National Agriculture Investment Plan or Policy in place		Yes
Country-specific indicators	GDP (USD)	2019	95 503 billion
	Agriculture value-added growth rate ^c	2019	3.58%
	GNI	2015	1750
	Extension to farmer ratio ^d	2018	1:1000

NOTE: The Poverty headcount ratio indicates the percentage of the population living on less than USD 1.90 per person per day at 2011 PPP. The Agriculture Expenditure Indicator is taken from FAOSTAT Government Expenditure data (share of total outlays).

SOURCES: All statistics are taken from the World Bank website (World Bank, 2020) unless otherwise indicated by superscript letters: a KNBS (2019a); b Beintema et al. (2018); c Resnick et al. (2020) and Anonymous (undated); d Birch (2018).





Chapter 2

The SHEP approach

OVERVIEW OF CASE

The Smallholder Horticulture Empowerment and Promotion (SHEP) project - Phase 1 was initiated in 2006 through collaboration between the GoK's Ministry of Agriculture (MOA), the Horticultural Crops Development Authority (HCDA) and JICA (Japan International Cooperation Agency, 2019a). The initiative was needed because small-scale horticulture farmers were not making progress in improving their livelihoods despite significant efforts in their daily farming activities. Farmers were poorly linked to markets and therefore engaged in production without a good understanding of what buyers and consumers needed. Due to lack of skills and knowledge, farmers' production was low and losses before and after harvest were high, estimated at 50 percent (Match Maker Associates, 2017; Ridolfi *et al.*, 2018). In addition, farmers were not sufficiently well organized and coordinated to take advantage of market opportunities.

During SHEP Phase 1, an effective extension method was developed through collaborative discussions among the project implementers, consisting of GoK officials through MOA, HCDA and project experts from JICA. The extension method developed was the SHEP approach, which was designed to provide farmers with systematic training within a framework of government extension services. The approach specifically targeted groups of farmers with basic skills and experience in horticulture who were interested in acquiring new knowledge and skills to improve their production for business purposes. SHEP training therefore aimed to enhance the knowledge and range of technical and soft skills needed by smallholder horticulture farmers to successfully grow and market their produce and effectively manage their farm businesses.

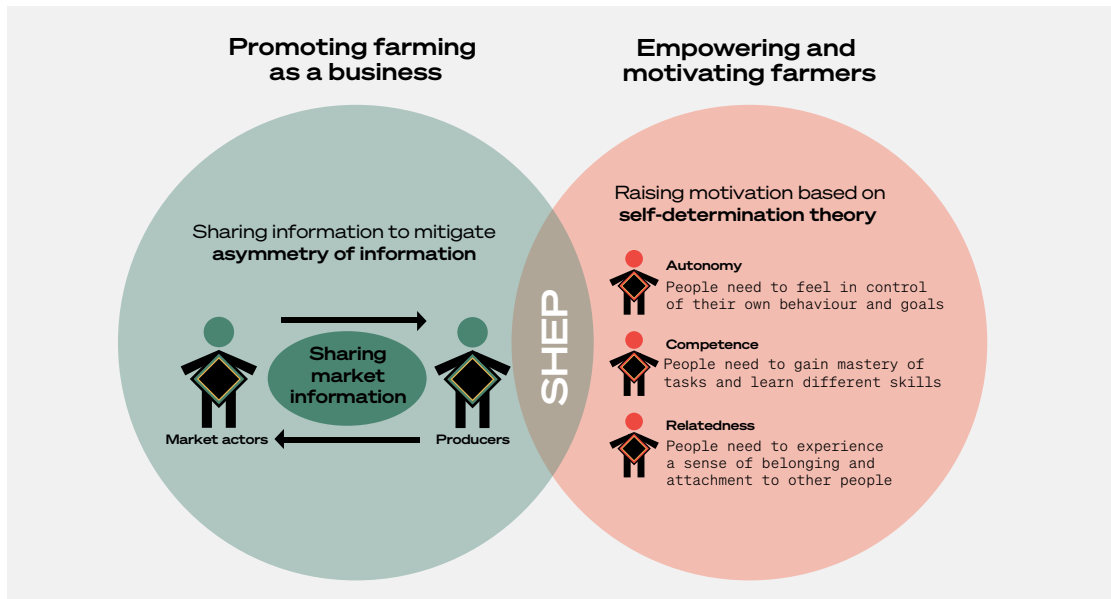


Figure 1
Two conceptual pillars of SHEP

SOURCE: Adapted from Japan International Cooperation Agency (2018a).

The SHEP approach is based on two conceptual pillars (see figure 1) that address two key issues: promoting farming as a business, and empowering and motivating farmers (Japan International Cooperation Agency, 2014). One pillar – promoting farming as a business – is based on what economic theory refers to as the market failure of asymmetric information, in which active information sharing among different market players is discussed as an effective means to alleviate inefficiency in local economies (Akerlof, 1970; Spence, 1973; Stiglitz, 1975). In particular, SHEP aims to improve farmers’ knowledge of what products are in high demand in different periods of the year and build their capacity to act and benefit from available market opportunities. Based on this theory, SHEP engages farmers in information sharing with market stakeholders such as farm input suppliers, traders, intermediaries, wholesalers, and retailers (among others) to promote market-oriented (as opposed to subsistence-oriented) agriculture (Japan International Cooperation Agency, 2016a).

The other pillar – empowering and motivating farmers – is guided by a psychological theory called Self-Determination Theory (SDT) (Deci and Ryan, 1985; Deci and Flaste, 1995) and it is organized around the important distinction between whether a behaviour is autonomous or controlled. The theory recognizes that raising people’s motivation increases their likelihood of continuing with implementation of intervention activities on their own (Japan International Cooperation Agency, 2016b).

ORGANIZATION FUNDING AND IMPLEMENTING THE SHEP PROJECTS

The SHEP approach is designed to ensure engagement of the diverse types of actors and agencies that play critical roles in supporting the shift towards market-oriented horticulture. Roles vary by organization. For example, the government has the important role of mobilizing the relevant ministries and departments charged with implementation, as well as in allocating crucial resources such as personnel and part of the financing to support a national

Table 2
SHEP's four essential steps of training implementation

Essential Four Steps	Activities
Share goal with farmers	Sensitization Workshop
Farmers' awareness is raised	Participatory Baseline Survey Farm Business Linkage Stakeholder (FABLIST) Forum Market Survey Conducted by Farmers
Farmers make decisions	Target Crop Selection Crop Calendar Making
Farmers acquire skills	In-field Training
Follow-up and monitoring (including Participatory Endline Survey)	

SOURCE: Japan International Cooperation Agency, 2018a.

HOW HUMAN CAPITAL DEVELOPMENT OCCURS

The SDT underpinning the SHEP approach underscores the importance of supporting farmers' psychological needs for autonomy, competence and relatedness for raising motivation. Extrinsic motivation is often dominant whereby people are motivated to act by external rewards such as financial or material rewards or fame, among others. As this is inadequate in generating the changes required to improve the condition of smallholder farmers, the SHEP approach adopted a four-step approach, as illustrated in Table 2, consisting of series of training activities that were systematic and sequenced for raising farmers' motivation.

In view of SDT, SHEP empowered farmers through holistic competence development by raising their motivation and improving their technical and managerial skills. SHEP considered interlinkages between farmers' motivation and skills development as critical for human capital development (see Figure 2). Farmers were thus motivated through multiple opportunities to make choices and informed decisions. As their motivation rose, they were trained in technical and managerial skills including production, farm management, post-harvest management and marketing. Skills acquisition sustained farmers' intrinsic and autonomous motivation, i.e., the feeling that one is self-determinedly engaging in market-oriented farming while acknowledging the importance of practicing farming as a business (Sayanagi and Aikawa, 2016).

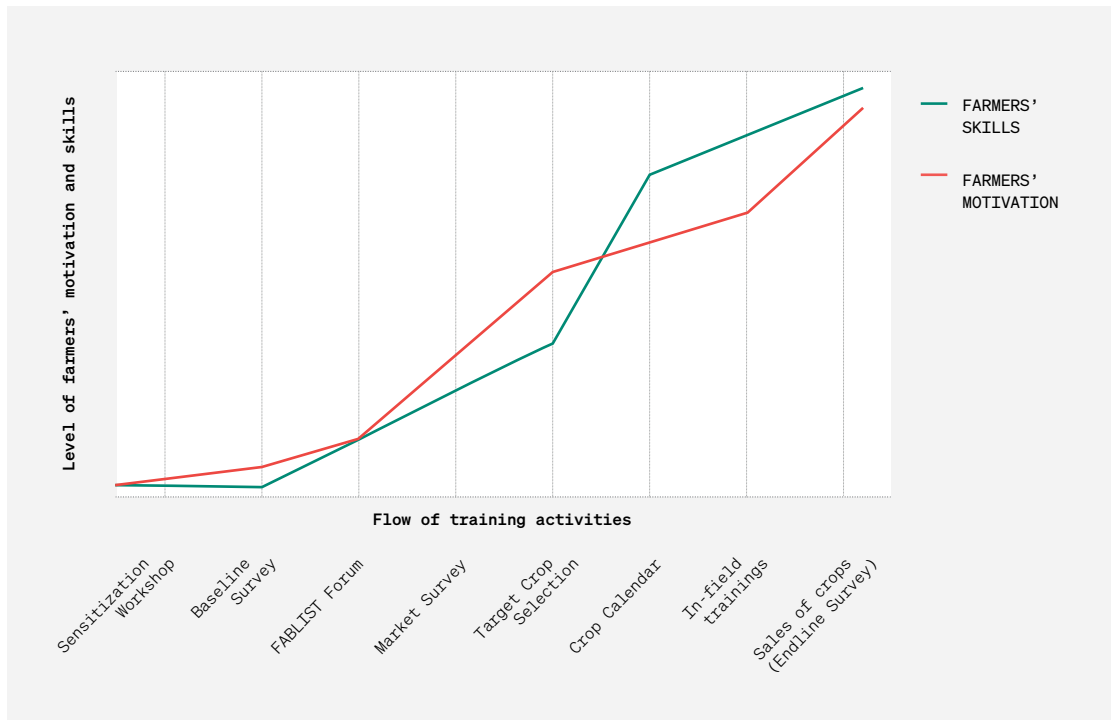


Figure 2
Interlinkages between motivation and skills development

SOURCE: Adapted from Japan International Cooperation Agency (2018).

SHEP TARGET GROUPS

SHEP primarily targets male and female smallholder farmers producing and marketing horticultural crops. It targets farmers who are already members of common interest groups. The groups have 15–30 members who are 18 years old and above. The groups vary widely in composition, comprising mixed genders, men or women only, youth or people living with disability. While production may be done individually, all members are expected to coordinate production and conduct marketing collectively so that they can achieve economies of scale and adequate volumes so as to attract buyers and other market actors.

SHEP aims to address specific challenges that may be uniquely experienced by smallholder horticultural farmers. Smallholder farmers typically produce small volumes which are costly to aggregate increasing marketing costs. In addition, due to their small scale, they are faced with high costs of production; unlike commercial farms, smallholder farmers are likely to depend more on family labour. They have the least power in the food value chain and therefore are more vulnerable in value chains linkages.

ORGANIZATION FUNDING AND IMPLEMENTING THE SHEP PROJECTS

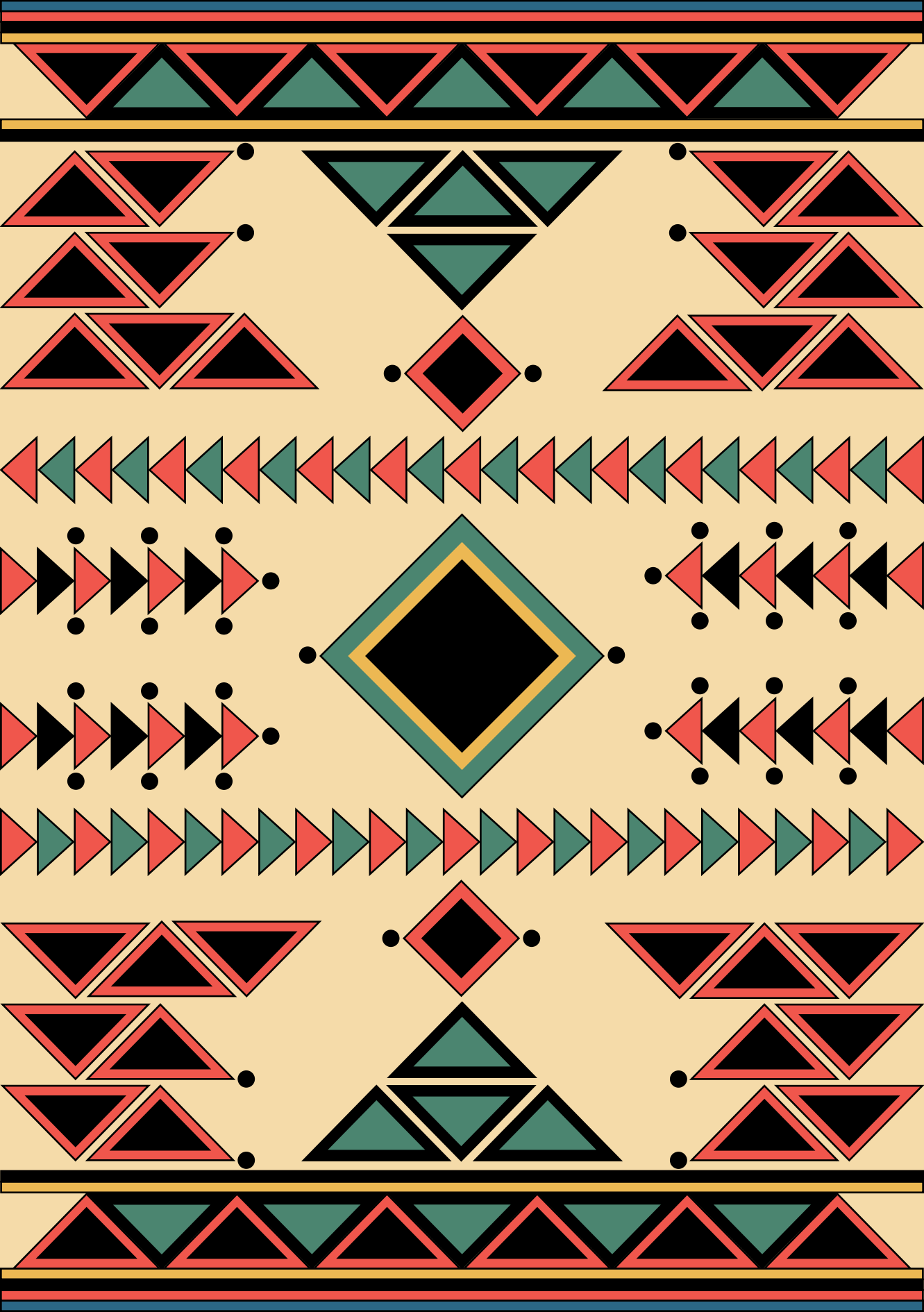
The SHEP approach is designed to ensure engagement of the diverse types of actors and agencies that play critical roles supporting the shift towards market-oriented horticulture. Roles vary by organization. For example, the government has the important role of mobilizing the relevant ministries and departments charged with implementation, as well as in allocating crucial resources such as personnel and part of the financing to support a national coordinating mechanism. At the local level, the government oversees the extension personnel that support SHEP implementation, formalizes registration of farmer groups, licenses other market actors such as buyers and input suppliers, and allocates resources to support training and monitoring. The private sector is also important in providing market outlets and input supplies and in supporting extension services to farmers.

Implementation of SHEP activities in Kenya has been funded jointly by JICA and GoK. JICA contributes mainly through technical personnel who provide technical input in the design of the approach and its implementation as well as financing resources for implementation. Meanwhile, working at both the national and county levels, GoK provides personnel and financing, especially in upscaling the approach to other non-targeted areas, and creates an enabling environment for the implementation of the approach. SHEP utilizes existing personnel from MOALF for coordination, management and training, and existing extension personnel in the counties to support farmer-level training and extension delivery.

The SHEP approach does not involve transfer of financial or material resources to groups or individual members. The major contribution of SHEP is in developing knowledge and skills which growers can use on their own and continue applying after the project ends. Sustainability is thus integrated into project design. Moreover, the approach emphasizes reliance on locally available resources and the application of new knowledge and skills to implement market-oriented farming.







Chapter 3

Methodology

Given the expansive universe of initiatives and programmes that incorporate aspects of human capital development in their approach to agricultural development, it is difficult to comprehensively assess these types of investments across similar models (such as farmer field schools) or even in a single country. However, case studies can facilitate a deep understanding of the complexity of an initiative that seeks to develop human capital, and elucidate processes and phenomena in a given context (Baxter and Jack, 2008). This case study incorporates both secondary data sources and primary qualitative data to elucidate the opportunities and challenges SHEP faced in developing human capital among smallholder horticultural crops growers in Kenya.

METHODOLOGICAL APPROACH AND THEORETICAL FRAMEWORK FOR THE EVALUATION

The study employed a descriptive case study design and aimed to document the contribution of the SHEP approach to human capital development. The New World Kirkpatrick Model (Kirkpatrick and Kirkpatrick, 2019) was adapted to evaluate the effectiveness of SHEP trainings. The model provides a framework for measuring the trainings' contribution to human capital development through four levels (Kirkpatrick and Kirkpatrick, 2006).

Level 1 (Reaction) and Level 2 (Learning) are concerned with trainees' response during the training. Level 1 evaluates the extent to which trainees find the training favourable, engaging and relevant to their work. Level 2 examines how much trainees acquire knowledge, skills, attitude, confidence and commitment through their participation in the training. Level 3 (Behaviour) and Level 4 (Results) investigate how trainees have changed following the training. Level 3 looks at the degree to which trainees actually apply what they learned during training in their daily work. Level 4 explores to what extent targeted outcomes occur as a result of the learning event.

Figure 3 illustrates how the New World Kirkpatrick Model was adapted to suit the context of SHEP training evaluation. As a key change in behaviour in Level 3, the farmers' adoption of "Grow to Sell" practise is identified. Furthermore, "Sustainable and self-reliant market-oriented agriculture" is recognized as the desired result of the SHEP trainings in Level 4.

DATA COLLECTION

Secondary data sources

General demographic human capital indicators for Kenya were extracted from a variety of secondary data sources to contextualize the approach environment. Demographic indicators, information and communication technology (ICT) and educational attainment indicators were compiled from the World Bank's Human Capital Index and Open Data website (World Bank, 2018b, 2020). Agricultural research investment indicators were compiled from the Agricultural Science and Technology Indicators (ASTI) database, which houses datasets on agricultural research expenditures and human resource capacity in low- and middle-income countries (IFPRI, 2020). Information on agriculture expenditure was also downloaded from FAOSTAT (FAO, 2020a). Other secondary data were collected from published materials documenting the SHEP approach and implementation design, SHEP implementation monitoring and evaluation reports, baseline and endline data, capacity development assessments, training materials, training schedules and programmes and attendance lists, policy documents and published literature on (AHCI).

Primary data collection

Primary data were collected from implementers at the national level through focus group discussions (FGD) while key informant interviews were conducted with implementers at the county level, funders and beneficiaries. The categories of respondents and method of data collection are shown in Table 3. Semi-structured interview guides were prepared for each category of respondent, taking into consideration their involvement and roles in SHEP implementation. The interviews were administered by four members of the study team virtually for all respondents due to Coronavirus disease (COVID-19) related travel restrictions, and each interview lasted 60 minutes on average. Interviews were conducted in English for implementers and funders, while the interview guide for beneficiaries was translated and administered in Swahili. All interviews were audio-recorded, and notes were taken during the interview after obtaining consent from the interviewees. The FGDs and key informant interviews with funders and implementers were conducted using the Google Meet platform, which is capable of recording video, however only the audio recordings were retained. Interviews with beneficiaries were done by phone only.

Sampling

The study adopted a mix of sampling techniques depending on the respondent category. Given that data collection would not be feasible in all the 33 counties that participated in SHEP due to time and resource constraints, sampling criteria were developed to purposively select counties for data collection. The selection took into consideration the SHEP phases the county was involved in: SHEP Phase 1 (2006–2009) or the Smallholder Horticulture Empowerment and Promotion Unit Project (SHEP UP) phase (2010–2015) and the Smallholder Horticulture Empowerment and Promotion Project for Local and Up-scaling (SHEP PLUS) phase (2016–2019). Sampling also considered diversity of agroecological zones (high potential, medium, arid and semi-arid), simple rating of success in SHEP implementation (low, medium or high) by the project coordination unit (PCU), adoption of the SHEP approach in other projects implemented by non-state actors or private sector, and diversity of groups (mixed gender, women, youth, socially disadvantaged persons including the elderly and those living with disability). The method used by the PCU to rate success of SHEP implementation

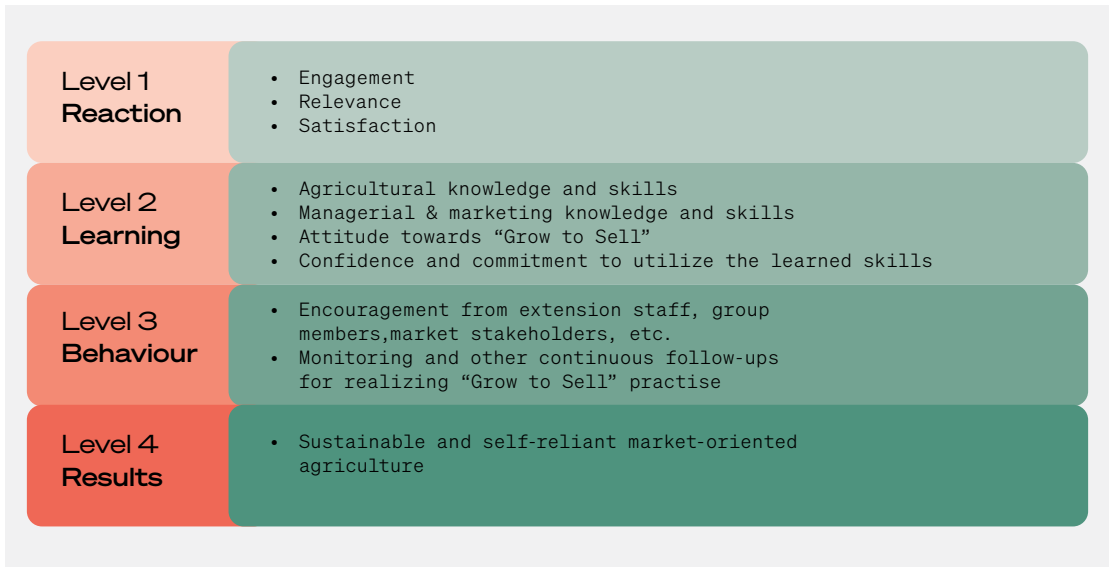


Figure 3
New World Kirkpatrick Model adapted to SHEP training evaluation

SOURCE: Adapted from Kirkpatrick and Kirkpatrick (2006).

in the counties principally considered the average income increase of target farmers for the entire county (as a ratio of the baseline) and the motivation of extension staff in implementing the SHEP approach. The criteria aimed to include at least one county that had invested financial and human resources to support SHEP upscaling. Based on these criteria, the counties selected were Bungoma, Nakuru, Kiambu, Makueni and Kwale (Table 4).

In selecting funders, purposive and snowball sampling were applied. Purposive sampling was used to select national and county level implementers. At the county level, those involved with implementation of SHEP through coordination of activities or direct implementation were interviewed. For the beneficiaries, lists of all farmers groups in each county and their composition were used to purposively select groups to represent different wards (areas within a sub-county) and purposively select respondents to represent men, women, youth and socially disadvantaged persons, including the elderly and persons living with a disability.

Table 3

Sampling and data collection methods for different respondent categories

County/ Region	Funders			Method	Implementers			Method	Beneficiaries					Method
	M	F	T		M	F	T		M	F	T	Y	SD	
International*	2		2	KII										
National					3	3	6	FGD						
Nakuru	1	1	2	KII	1	1	2	KII	6	3	9	2M1F		KII
Bungoma	1		1	KII		1	1	KII	2	2	4	1M	1F	KII
Kwale					1		1	KII	2	2	4	1F	1F	KII
Kiambu					1	2	3	KII	3	2	5	1M		KII

Key: KII, key informant interview; FGD, focus group discussion; M, male; F, female; SD, people living with disabilities; Y, youth, T, total.

*Two key informants from JICA were interviewed at the same time. They provided information on JICA's role as both funder and implementer.

Table 4

Sampling criteria for counties implementing SHEP in Kenya

Criteria		Selected counties				
		Kiambu	Makueni	Bungoma	Kwale	Nakuru
SHEP phases involved in	SHEP Phase 1	No	No	No	Yes	No
	SHEP UP	Yes	Yes	Yes	Yes	Yes
	SHEP PLUS	Yes	Yes	Yes	Yes	Yes
Performance in implementation	SHEP Phase 1	N/A	N/A	N/A	High	N/A
	SHEP UP	Medium	High	High	High	Medium
	SHEP PLUS	High	Low	High	High	Medium
Crops selected by groups	Potato, Cabbage, Carrot	Spinach, Tomato, Capsicum	French Beans, Kale, Green maize	Kale, Tomato, Black Nightshade	Amaranth, Okra, Capsicum, Passion fruit	
No. of groups	10	10	10	10	10	
No. of beneficiaries	T=266 M=95 F=171	T=170 M=71 F=99	T=308 M=139 F=169	T=216 M=77 F=139	T=198 M=68 F=130	
Vulnerable/Disabled*	0	0	0	0	5M & 10 F	
Youth**	30M & 23F	0	0	5M & 38F	0	
County government funding SHEP	No	Yes	No	No	No	
Other projects adopting SHEP	None	None	None	None	Projects by Aga Khan Foundation & Caritas	

Key: T, total; F, female; M, male

*Only Kwale county had a group of vulnerable persons living with a disability; ten were female and five were male.

**Nakuru and Bungoma counties had two youth groups each. In addition, in both counties, there were youths who were members in other groups. Data in the table shows the total number of youths in all groups per county.

Sample size (including non-participation & refusals)

The study ensured sample size sufficiency guided by quality of information from target respondents and the principle of saturation. Based on this, the study reached 36 respondents, as shown in Table 3. According to Boddy (2016), a sample size of 12 is sufficient for a homogenous group while Green and Thorogood (2004) note that for an interview with fairly specific research questions and a specific category of respondents, no new information is generated after the 20th interview.

DATA ANALYSIS

Audio recordings were transcribed and translated, if in Swahili, by a professional service provider using recommended guidelines for verbatim transcription. The study team reviewed each transcript against the audio to confirm accuracy of the transcription and translation. For purposes of analysis and based on the relatedness of the information provided by the different categories of respondents, the transcripts were categorized into two groups, with funders and implementers placed in one category and beneficiaries in the other. Primary themes for analysis were generated based on the objectives of the study, while additional secondary themes were generated as they emerged during data analysis. Data was coded and analysed using MAXQDA software.

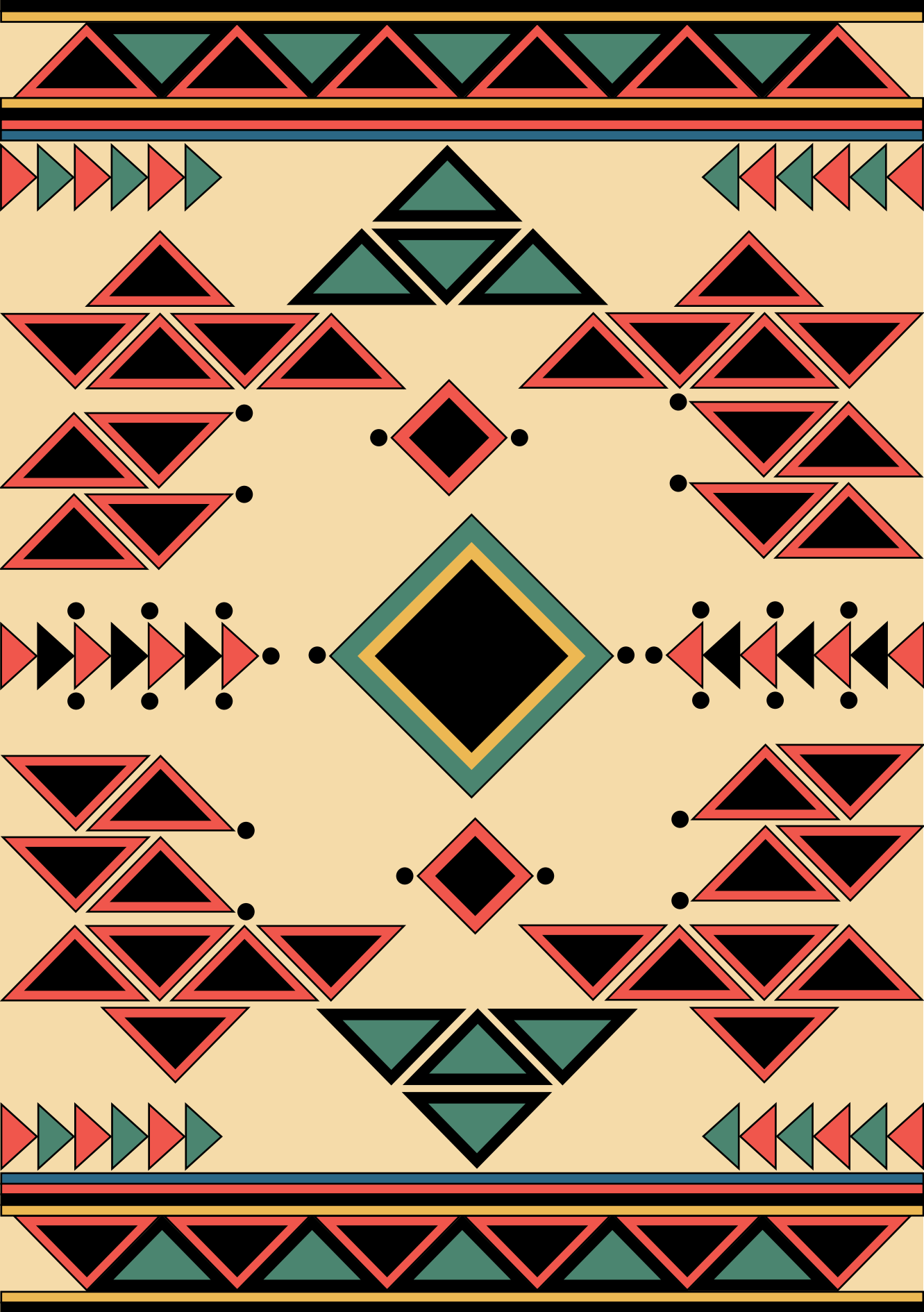
RELIABILITY AND VALIDITY OF DATA

The interview guides for implementers and beneficiaries were pre-tested in a county that participated in implementation of SHEP approach but was not sampled for the current study. For data from the FGDs, group members checked and supplemented each other's contribution, thus enhancing reliability. For all data, triangulation of information from multiple sources was performed.

Ethical approval: The International Food Policy Research Institute Institutional Review Board (IRB) for Social, Behavioural, and Educational Research approved the methods of data collection (IRB Approval Number: DSGD-20-0621).







Chapter 4

Evidence base for success of SHEP in human capital development

To understand the contribution of the SHEP approach to human capital development, a theory of change was developed through review of project documents and from the study results. Figure 4 illustrates the outputs, outcomes and impacts of the SHEP approach to human capital development in agriculture.

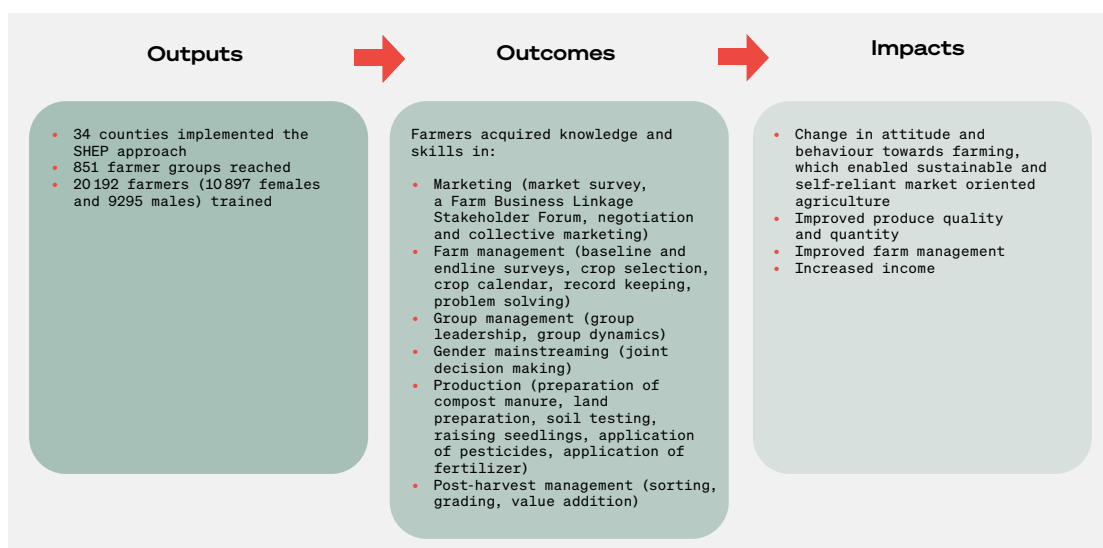


Figure 4
SHEP approach theory of change to human capital development in agriculture

SOURCE: Authors.

Table 5**SHEP project training outputs**

	SHEP Phase 1	SHEP UP	SHEP PLUS
Counties	4	33	18
No. of farmers' groups	113	550	188
Total number of farmers	2030	13 809	4353
Females	969	7348	2580
Males	1061	6461	1773

OUTPUTS**Trainings conducted**

The goal of SHEP was to empower farmers to practise sustainable and self-reliant market-oriented agriculture, which in turn would improve their livelihoods through increased incomes.

As of February 2020, the SHEP approach had been used in 34 out of 47 counties in Kenya and reached over 20 000 smallholder farmers (MOALF and JICA, 2020). Table 5 presents data on the number of counties where the SHEP approach was implemented, the number of farmers groups and individual men and women farmers trained in the three phases of project implementation.

Value chains and commodities in SHEP

A key aspect of the SHEP approach was that farmers retained independence to choose the commodities to produce, with a recommended maximum of two types of crops in any one season. Every season, group members conducted a market survey and used the findings to identify and agree on the target commodities to produce. However, farmers were free to grow other food crops alongside the crops selected for the market. By allowing farmers to make choices on crops to grow, their psychological need for autonomy, as prescribed in SDT, was met.

During SHEP PLUS implementation, farmers in different regions grew 35 different types of crops, depending on market demand and suitability of agroecological conditions. This diversity of crops, with unique production requirements and targeting a specific market, demonstrated the versatility of the SHEP approach. The diversity of crops grown in the five counties sampled for this study is shown in Table 4.

OUTCOMES

The SHEP trainings covered a wide range of topics to improve the ability of farmers to implement market-oriented horticulture farming. First, SHEP empowered farmers to conduct market surveys to determine what was in high demand. Farmers also interacted with a wide range of market actors through the Farm Business Linkage Stakeholder (FABLIST) Forum, where they established links with farm input suppliers, horticultural traders, financial institutions, non-governmental organizations (NGOs), research institutions and so forth.

Initially, I never went out to look for market; I was dependent on farm-gate buyers and they would dictate the price. I acquired knowledge on how to look for market for my produce, ... I profited from that and I got increased income by selling our crops directly to the market.

Farmers also acquired a range of farm management and other skills that enabled them to select appropriate crops to grow and market and track expenses and incomes and thus were able to know whether they were making profits or losses.

I have learnt on how to make a budget; initially I used to plant without one. Now I use the budget to track how much fertilizer I have used and through the records I can see my profits or losses. We never used to do soil testing and we were trained on the importance of soil testing. Also on labour saving, for instance how to work together by supporting each other to reduce labour through group rotational labour. So you are taught how to identify and solve problems.

Technical skills in the area of crop production that farmers were trained in included soil testing, preparation of compost manure, land preparation, use of certified seeds, raising seedlings, application of pesticides, fertilizer use and postharvest handling of produce.

We would not have known how to use manure – to dig a hole and to keep the manure without having to go to the shop to buy. So if you do not have money to buy fertilizer, you can use the manure. We are taught how to prepare it. They have taught us a lot of things. I highly commend you.

SHEP also empowered farmers with post-harvest handling skills and raised awareness of gender and group management.

As a result of the SHEP training, farmers' food supply and nutrition improved. This reduced the cost of buying food. In addition, they were able to cater for other domestic financial needs through income thus generated.

I was cooking with firewood. I'm now cooking with gas. I had no water storage, I have water storage. I was buying green vegetables from other people; now I don't buy green vegetables; I'm planting them on my farm, so it had changed my life.

I don't buy vegetables. I don't go to the kiosk to buy kales or tomatoes. I grow my own. I know how to prepare compost. Maybe just buying cooking oil and salt from the shop. I have my own kales, I have capsicum, peppers, and tomatoes all at home. I just pick them from the farm and bring them home. When it is hot and dry weather, I still do not buy from the shop because I water my vegetables and they survive.

Some farmers reported being able to access high-quality inputs such as seeds, fertilizers and pesticides at affordable costs by negotiating with suppliers to get discounted prices for bulk purchases as a group. In addition, as a result of increased awareness regarding market conditions, some groups were able to sell produce by weight (using scales) rather than through estimation and adopted the practise of grading produce by size and other quality attributes to secure better prices. Furthermore, farmers appreciated the importance of coordinating production and collective marketing to secure better prices.

The group members realized that there would be no hand-outs. A number of them dropped out, but the ones who realized that there was something positive about that stayed on and through capacity building managed to increase their productivity. Through training they got market linkages and they were able to know how to increase or expand the area under production. The group of fewer members became stronger, so they worked together. Even at market, they would aggregate their produce and send. They actually got a market at a potato processing firm. When they realized they could not satisfy the demand, they started buying from the neighbours who also benefitted through getting higher prices for their produce.

IMPACTS

As a result of farmers applying the skills and knowledge acquired through SHEP training, farm-level impacts were evident. For instance, farmers were able to change their attitude and behaviour towards farming and thus embraced farming as a business. This facilitated sustainable and self-reliant agriculture. Moreover, they achieved improved farm management, quality and quantity, which all culminated in increased income from their horticultural farming activities.

Now I know how to do farming as a business; I will never go back to my old way of farming.

My relationship with my husband has changed. We now work together as a joint decision maker of our farm. We work together for our farming business.

After SHEP, we always start with market. We never plant vegetables without knowing the market.

Since we can make money from selling vegetables, we continue re-investing the profit for the next season. Our farming business is expanding.

As a result of participating in SHEP project training, farmers' income from horticulture increased substantially. During SHEP Phase 1 (2006–2009), average horticultural net income per farmer increased from USD 227.9 at baseline (May 2007) to USD 471.3 at project end (October 2009) (JICA and MOA, 2009). In SHEPUP (Phase 2), average horticultural net income per farmer who implemented SHEP UP increased by 80 percent from USD 341.8 at baseline to USD 613.2 at project end (JICA and MOALF, 2015). The average net incomes of the SHEP PLUS (Phase 3) farmers increased by 133.2 percent (nominal basis) and 104.1 percent (real basis) by the end of the project period (JICA and MOALF, 2020).

From the income acquired after SHEP training, farmers invested in their agricultural enterprises, household-level investments and diverse off-farm income generating activities. This included accumulation of diverse types of assets such as additional plots, livestock, water tanks, machinery, motorcycles and pickup trucks. Some farmers were also able to send their children to better schools and improve their housing. Through investments in water harvesting and storage tanks farmers were able to farm even when weather conditions were not favourable.

You know we do not have piped water currently and so even if your timing for the peak is right, it is difficult to produce for that peak. Since we are currently practicing farming as a business, we have been able to buy tanks which help us to collect water for farming.

Okay, the change I noticed is that now I have more cash compared to the past. Then my child would be chased from school due to lack of fees. Now I am living, I now earn a better living from the training.

EMPOWERMENT OF WOMEN, YOUTH AND PERSONS LIVING WITH DISABILITIES

The SHEP approach recognized gender as a cross-cutting issue and paid significant attention to gender throughout the training activities. The approach provided equal opportunities to both male and female members of farmer groups and advocated participation of the members' spouses where possible. SHEP's gender awareness training contributed to strengthening relationships between couples as equal partners in managing the family farming business. In doing so, SHEP applied a family budgeting concept whereby couples were trained to share responsibilities, plan and make decisions jointly in farm production, marketing and on use of the income generated, as well as on other family matters. After participating in SHEP training, couples worked more closely in planning and sharing roles both on the farm and at home.

The results of the study demonstrated that the selection of groups to participate in SHEP training considered representation of diverse groups such as women, youth, and persons living with disabilities, who were often excluded from previous development initiatives. Women were also able to save and explore new business opportunities as a result of participating in SHEP training. Youth participation in SHEP introduced additional pathways to economic empowerment. As a result, SHEP attracted young people to venture into agribusiness and facilitated mindset changes regarding agriculture, which were important in rejuvenating the sector.

In our group we have a table banking system. This enables any woman in financial need to access funds from the group kitty. As I told you, as a group, we also aim to start our own agrovet business; this hopefully will also help women get farm inputs without complete payment, alleviating their financial constraints when starting their farming.

I can say truthfully, when SHEP invites us or even comes, they treat us as women who are project leaders living with a disability. They treated us very well.

When we joined SHEP, we were trained, and the importance of supporting each other was emphasized such that one can assist with some duties of his/her spouse. When I am doing one thing, he is doing the other. now we are able to work together. We have really benefited, now we are able to rest.

I am seeing women and youth groups performing better. Especially the youth, who have decided to make farming their occupation. They have really picked up well and have progressed. Women have also been empowered. They are able to look for market and produce. All of them have come up.

In the human capital investment model typology the SHEP approach was categorized as non-formal, as it did not occur in formal learning environments such as agricultural or vocational schools (Davis et al., 2020). Using the SHEP

approach, farmers were trained in various technical skills and knowledge in production (good agricultural practises, including spacing, preparation of farmyard manure, soil testing, fertilizer and chemical applications, quality management and harvesting), farm business management (farm record keeping, conducting baseline and endline surveys, crop selection, developing crop calendars, developing a crop- and farm-specific action plan, problem solving), post-harvest handling (grading, sorting, cleaning, packaging and home-based processing), marketing (conducting market surveys, collective marketing) and group management (leadership, group dynamics). Further, the SHEP approach trained farmers in soft skills, including gender awareness and family budgeting, negotiation, communication and networking.

Some of the groups have also become stronger because of the group empowerment component of the project. They are able to function as a group in collective marketing, collective acquisition of input, having group representation in forums and also getting feedback to the group. They are more enlightened. It also becomes a very fulfilling activity because they become motivated because they are not just doing things blindly but with a reason. They have identified what to produce for the market, what time and the prices at those particular times. They know when the prices are better.

When offering training to farmers, SHEP adopted mixed-methods techniques involving classroom theory sessions complemented by in-field practical sessions, where demonstration occurred. To facilitate learning, the training was designed to occur in multiple set-ups such as classroom sessions, community-based meetings, group exercises, visits to markets, dialogues with food value-chain stakeholders and on-farm demonstration and practises.

First, we had the freedom to ask the trainer for clarification as we went along. We also gave our views and we had group discussions too. The group discussions were organized in about three groups of between seven and five people. There we would discuss questions and come up with solutions, then a representative would present to the class their views for further discussions. We participated fully. The trainers would then contribute and we would also seek clarification where we did not understand. Further, we also went for practical training outside the class during the market survey. We were issued with questionnaires which we administered. One of us asked the questions with reference to what we had been trained on, while the other recorded and the trainers guided us. We actually administered the questionnaire on different customers in the market. So we were allowed to participate fully.

SHEP also contributed to the development of human capital indirectly through the transfer of knowledge and skills to members of the community who were initially not within groups participating in the training. Importantly, the SHEP approach found applications to other value chains beyond horticulture, such as dairy and poultry production, which attested to its versatility as a method for developing human capital in agriculture.

HOW THE SHEP APPROACH SUCCEEDED IN DEVELOPING THE SKILLS AND CAPABILITIES OF FARMERS

The New World Kirkpatrick Model was applied to evaluate human capital development based on information from the interviews with smallholder farmers participating in SHEP training. The results are presented in Table 6.

During the training, farmers showed high levels of satisfaction since content comprehension as well as training arrangements such as locations, schedule and teaching methods were deemed appropriate by most of the learners. Perhaps most importantly, the training contents were found to address the farmers' needs. This was particularly so for crop production training that was aligned to crops chosen during the market survey and delivered through appropriate techniques. Owing to the effective training methodology, farmers were able to learn diverse technical and soft skills. This not only enhanced their production capacity but also their managerial and marketing abilities. Farmers also made suggestions such as wider coverage of training topics and better arrangement of training venues for improved training. In general, Level 1 (Reaction) and Level 2 (Learning), which were concerned with farmers' response during the trainings, were successfully fulfilled.

As for Level 3 (Behaviour) and Level 4 (Results), which looked at farmers' changes after the training, most of the farmers confirmed that they were applying what they learned during the training in order to practise the "Grow to Sell" concept. Interestingly, many farmers had begun contacting the market stakeholders they met during the market surveys or FABLIS forums on their own to obtain advice on production and marketing. Moreover, farmers changed their attitude toward the continuous practise of "Farming as a Business" after realising availability of market opportunities. Such changes occurred not only at the personal level but also at the household and group levels because SHEP addressed issues of gender equality and group management. However, farmers living with disabilities experienced challenges in terms of insufficient resources or unavailability of compatible production infrastructure or machinery, thus limiting their application of the skills and knowledge acquired. Overall, it is fair to say that SHEP training helped the farmers move forward towards materialising sustainable and self-reliant market-oriented agriculture.

Table 6

Analysis of SHEP approach contribution to human capital development using the New World Kirkpatrick Model

Level	Attribute	Farmers' comments	Challenges faced by farmers ²
Reaction	Satisfaction with training (content)	Farmers indicated that they were satisfied with the training content as it was comprehensive and easy to understand. <i>They were easy to understand.</i>	Some farmers felt that the training materials were a little too standardized to accommodate their training needs for diverse crops. These farmers also felt that manuals for some topics were not available.
	Satisfaction with delivery method	Farmers said training sessions were provided in convenient and comfortable locations. The training schedule was appropriate. Trainers encouraged questions and used good illustrations and demonstrations. <i>The trainers trained us well because we were able to understand very well. Even the examples and illustrations used were easy to understand. The approach was good.</i>	In some instances, training was arranged abruptly and content was covered in a short time. Some training rooms were small and others were far from farmers' homes. In some cases, use of visual aids, more on-farm training and more consistent follow-up was desirable. <i>They may take about two months between their visits, they should take time to visit us a lot more. They should visit us more frequently so that if there is something that needs to be corrected it is fixed early enough.</i>
	Engagement in training	Farmers reported that trainers allowed interactions during group discussions, demonstrations, and questions and answer sessions. These enabled clarification and better learning. <i>We would participate because the officer would ask us to choose target crops. One after the other we would discuss the advantages and disadvantages of each of the crops. That is why we chose to grow pepper. We said pepper was not affected by the sun and was not affected by pests. It will be sprayed with pesticides, but it is not as costly as kale and tomatoes. When you water them in the evening you will water them again the next evening, not like kales that you water in the morning and evening. We are happy because we share ideas with the trainers and amongst ourselves until we exhaust the issue.</i>	In some areas more consultation on the timing of the training was preferred.
	Relevance of training	The trainings were relevant as they focused on needs of farmers and expectations, which included gaining skills such as record keeping, marketing and the use of technology in agriculture. <i>It was according to our expectation We realized things were easy if you planted with timing, looking at the demand in the market. We learnt you can grow vegetables in the hot dry season and get money. Now, we did not know that you could make money and we are grateful because we did not know someone could help us this way.</i>	In some instances, it would have been important to understand farmers' unique circumstances as well their knowledge and skills gaps to inform the training content and design. <i>So we expected to be advised on innovative technologies and mechanisms that we, as people practicing farming in urban centres, can try without feeling disadvantaged by our small land size. We also expected to be provided with materials for our kitchen gardens. But all in all, we appreciate what the training did for us, because it has helped us to grow up to where we are up to now.</i>
Learning	Technical and soft skills and knowledge gained	Farmers indicated that they acquired diverse skills and knowledge in production, farm management, marketing, post-harvest handling, group management and gender. Those considered new were on conducting market survey, preparation of farmyard manure, proper application of fertilizers, farming as a business, crop timing, soil testing, value addition, crop calendar and problem solving.	A need was indicated for more training on pest and disease control, food and nutrition, soil testing and preparation of compost manure. <i>I also wish to have more hours of training on soil testing and compost making.</i>

² The challenges experienced by farmers included those beyond the scope of the SHEP approach which would require policy interventions and/ or partnerships with other organizations.

Level	Attribute	Farmers' comments	Challenges faced by farmers ²
Behaviour	Daily application of what was learned	<p>In general farmers indicated that they were able to apply the skills and knowledge gained in their farming practise.</p> <p><i>You know I am now applying these skills with confidence. I now know about pests such as aphids and how to control them. I also have contacts of stakeholders that collaborated with SHEP. I am able to contact people at a pesticide company. Whenever I have a problem, I am able to contact them. So I do not experience any problems since we were linked to the seed and chemical companies. Also we buy farm chemicals together and we get better price for bulk buying.</i></p>	<p>Some farmers encountered challenges that hindered application of the skills and knowledge gained. These included lack of capital, unpredictable weather patterns, theft of farm equipment, destruction of their crops by birds and wildlife, inadequate extension follow up and support, lack of equipment for people with disabilities, COVID-19 restrictions on travel and marketing, poor road network, group disintegration, poor quality agro-inputs, among others.</p> <p><i>In our farming, we wish if we could get tractors that use hands. It (tractor that uses hands) can help the handicapped to farm easily.</i></p>
	Support and motivation for using the new skills	<p>Farmers indicated they got support and motivation to apply learnt skills and knowledge from extension personnel, input suppliers (offer credit), family members and SHEP project personnel.</p> <p><i>We get support because the agriculture extension officers listen to us. Sometimes when they hear we have a problem or disease we ask them.</i></p>	<p>Farmers living with disability needed support to get appropriate equipment to make work easier while youth needed capital to utilize the skills learnt effectively.</p> <p><i>They should incorporate something empowering ... because we are coming from a low-income area and you know the youth do not have money and face a lot of challenges, that small support will help and give us motivation.</i></p>
Results	Changes experienced due to application of skills and knowledge gained from SHEP	<p>Farmers identified various changes and impacts as a result of SHEP training. These included change in attitude towards farming as a business, increased productivity and produce quality, ability to implement good agricultural practises and improved access to markets. Farmers were also able to manage their farming business better, leading to increased incomes.</p> <p><i>First, after attending the training, my attitude towards farming has improved. My attitude towards farming has been strengthened and broadened by attending the SHEP training. Secondly, my income has improved. Before the training I did not make any profits but rather lost because of bad marketing. In fact, I suffered losses for lack of good marketing. But now I have income that is catering for various issues at home like school fees. And the third thing is that the expense of hawking my produce has been eliminated all I need is to make a phone call. My other produce is moving like the French beans which has a ready market. When my produce is ready, they call and we agree on a date when they can come and we harvest for them. So this has been of great value to us.</i></p>	<p>Respondents expressed need for measures to sustain some of the reported changes such as strengthening group cohesion, follow up by extension personnel, and adoption of digital technology for extension service delivery, such as, radio, social media platforms, among others.</p>
	Changes in income and progress towards personal or group goals	<p>At the household level, farmers reported changes including improved collaboration of couples in planning, budgeting and decision making and sharing roles. This led to better relationships within households. At the group level, changes reported included improved group management, better coordination of production and collective marketing, among others.</p>	

INNOVATIONS THAT STAND OUT IN THE SHEP APPROACH

An important feature of the SHEP approach was that training was systematically designed to enhance farmers' motivation and willingness to acquire new knowledge and skills.

Before we train farmers, we want them to agree and see the same vision and be aware of the reality of the market. We also want them to make their own plan and decisions. This kind of process should be maintained when anybody uses SHEP approach.

Moreover, training sessions were implemented in a deliberately set order, timing and sequence. The training emphasized starting with the market survey, upon which the subsequent training was anchored.

For me, what was outstanding in SHEP is the issue of starting with the market. Growing to sell rather than growing and sell. In most of the other approaches, a project would concentrate on increasing productivity, would train farmers on better agronomy practises or sometimes even give them some things to increase production. In SHEP it was first the market. I think that was quite a deal changer because now farmers grow knowing exactly where to take the produce.

The SHEP approach was found to be farmer-centred and emphasized farmer participation throughout. For instance, market surveys were conducted by farmers themselves and not by marketing experts. This fulfilled farmers' psychological needs for autonomy. During the market survey exercise, an extension officer accompanied and supported farmer representatives so that farmers felt confident about talking to various market actors. This action supported farmers' psychological need for relatedness and competence.

So if we look at the entire SHEP approach, we are looking at an approach that puts the farmer at the centre; it's farmer-focused such that when we are addressing the challenges that are facing horticulture, we are trying to address these challenges with the farmer at the centre, so that now this farmer is empowered to be able to stand on their own even after this particular support has wound up.

As a result of the unique SHEP approach design, holistic competence development was realized. This encompassed the spectrum of technical, managerial and soft skills and knowledge that are important in farmers' human capital development.

SHEP is all-round inclusive. Not only talking about the market, we are talking about production also, good agricultural practises, we are talking about cost-cutting issues, we're empowering farmers to make decisions. It is actually farmer-driven. You empower the farmers collectively and then once they have the knowledge, they do things, almost everything by themselves. The motivation of the farmer comes from within, not the way where the technical officer of the ministry would tell the farmer what to do.

Notably, the gendered approach to capacity development implemented by the SHEP approach enabled the participation of both men and women as a family unit in market-oriented horticulture.

We consider the issues of gender and how it affects the farming community in terms of the income generated and how farming is affected by the family setup.

DEMAND FOR THE MODEL

Upscaling in Kenya

Following successful piloting of the SHEP approach in Phase 1 (2006–2009), GoK established the SHEP Unit in MOALF that implemented the successor project (SHEP UP) to upscale and reach 33 counties. At the end of SHEP UP, GoK decided to further promote the SHEP approach, which led to SHEP PLUS (2015–2020), targeting 18 counties. The SHEP PLUS terminal evaluation report in September 2019 (JICA and MOALF, 2020) showed that demand for the model increased substantially and that 14 out of the 18 upscaling counties adapted and then adopted SHEP (see Figure 5). This study determined that several counties had mainstreamed the SHEP approach as the preferred extension service delivery model in different value chains beside horticulture, as was the case for Makueni County.

In recognition of the potential of SHEP approach in Kenya, some counties where SHEP PLUS was implemented mainstreamed the approach in implementing other national projects such as the National Agricultural and Rural Inclusive Growth Project, funded by the World Bank³. In addition, some projects implemented by non-governmental organizations, for example, one by Aga Khan Foundation in Kwale County adopted SHEP for the project's extension delivery⁴.

³ Under the devolved system of governance in Kenya, the roles of the two governments, i.e. national and county governments, are differentiated. The national government is to coordinate the projects covering multiple counties and develop staff capacity, while the county governments are responsible for activity implementation. In this case, the county governments, not the national government, made the decision to adopt the SHEP approach in the National Agricultural and Rural Inclusive Growth Project during their activity implementation.

⁴ This was also a decision made by Kwale County, not by Aga Khan Foundation.

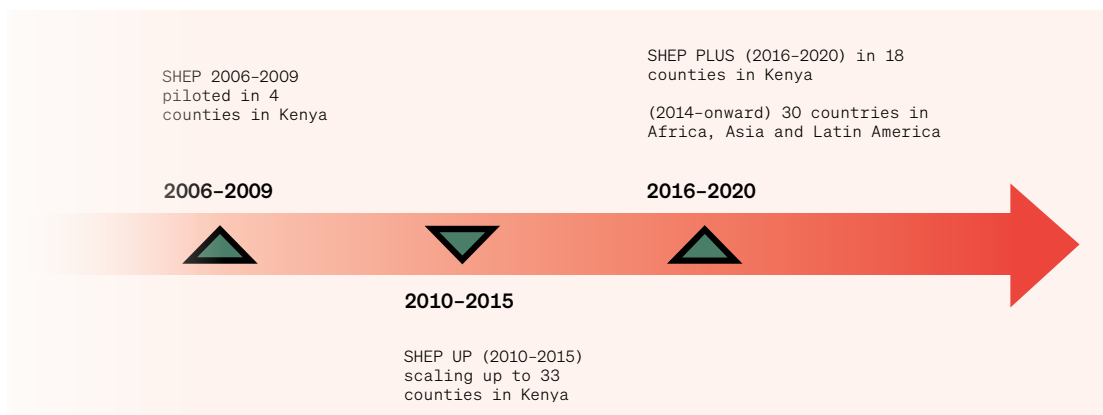


Figure 5
Scale-up timeline of SHEP approach

SOURCE: Authors.

Upscaling beyond Kenya

In 2014, the collaborative initiative of JICA and GoK embarked upon organizing capacity-development training for prospective SHEP implementers outside Kenya. While the main participants in the training were from Africa, more and more agricultural officers from Asia, Latin America and the Middle East were adopting the approach. Through international, regional and national training on understanding the SHEP approach, 16 663 agricultural staff, including 1218 from Kenya, were trained in implementing SHEP activities on the ground. As a result of their efforts, 186 427 farmers in 30 countries⁵ had been reached through the SHEP approach in efforts to improve their skills and knowledge on small-scale commercial farming. Figure 6 shows the map of countries currently implementing the SHEP approach. Furthermore, a total of 16 countries (seven in Latin America, six in Asia, and three in Africa) were in the process of designing implementation of SHEP. Annex 1 shows the results of SHEP implementation in selected countries for which data were available.

COSTS OF INTERVENTION

Successful implementation of the SHEP approach required various inputs that included human resources, training materials, equipment and operational expenses. The contribution of the JICA included dispatching experts on a long- or short-term basis. JICA also provided equipment for office activities, including photocopiers, desktop computers and vehicles, as well contributing to operational cost-sharing to cater for project staff employment, training materials production, transportation, communication and costs of meetings. JICA also funded overseas training of selected key personnel in the agriculture sector as well as those responsible for decision making in extension service delivery. According to the terminal evaluation reports,⁶ JICA contributions totalled USD 2 179 123 in SHEP Phase 1 (JICA and MOA, 2009), USD 1 062 882 in SHEP UP (Phase 2) (JICA and MOALF, 2015), and USD 2 494 814 in SHEP PLUS (Phase 3) (JICA and MOALF, 2020).

⁵ The breakdown of the countries is 26 African countries, 2 Latin American countries, 1 Middle Eastern country, and 1 Asian country.

⁶ The terminal evaluation studies were conducted approximately six months before the closing of the projects. Thus, the actual total costs for each project are estimated to be higher than the figures shown here. However, the data on the actual total costs were not available.

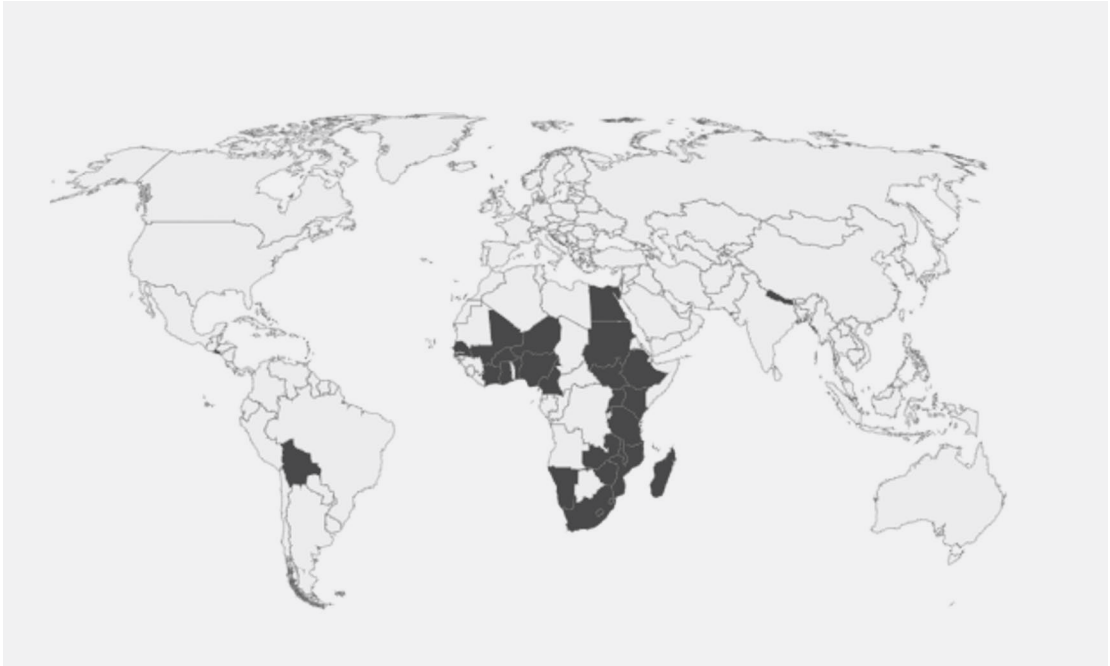


Figure 6
Map of SHEP implementing countries

NOTE: The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of FAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries. Dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

SOURCE: Authors.

GoK contributed through provision of personnel for project coordination and experts to implement training, monitoring and evaluation. The government also provided office space and additional equipment and contributed to operational cost-sharing to cater for training costs, fuel, staff allowances, documentation and hiring training venues. The contributions of the national government of Kenya totalled approximately USD 46 000⁷ in SHEP Phase 1, USD 2 108 000 in SHEP UP (Phase 2) and USD 730 000⁸ in SHEP PLUS (Phase 3).

⁷ The contribution from the Kenyan side for SHEP Phase 1 was small since its coverage area was limited as a pilot trial of the SHEP approach. Recognizing the success of Phase 1, the national government of Kenya increased its investment in Phase 2.

⁸ This amount excludes county governments' financial contributions to SHEP PLUS.





Chapter 5

Analysis of case and recommendations

SUCCESS FACTORS OF THE SHEP APPROACH

The uniqueness of the SHEP approach, especially in terms of human capital development, was anchored on the use of the SDT, which emphasized supporting the psychological needs for autonomy of growers to make informed and well thought-out choices. Farmers' psychological needs for competence were also supported through acquisition and mastery of the necessary skills, both technical and soft, and knowledge to profitably engage in horticulture. The need for relatedness was realized through support to farmers in establishing linkages with a range of market actors. Above all, a major factor of success was in enabling farmers to first understand the market opportunities and then utilize the knowledge to independently choose what action to take to maximize market opportunities.

As noted by Cameron (2008), information is important and can provide a powerful competitive edge. The World Bank (2018c) observes that smallholders can improve their livelihoods by reaching consumers beyond their local markets, but they first need to know where the markets are in order to target them better. In particular, participation in markets for certified products can represent a good income generation opportunity for smallholder farmers (FAO, 2011).

Many of the funders and implementers interviewed described how farmers were not able to apply the skills they learned during various training programmes before SHEP. This was mainly due to their limited awareness of marketing potential. The SHEP approach, on the other hand, succeeded in opening their eyes to changing their mindset and behaviour because it was able to effectively raise their motivation by showing market opportunities first and supporting their independence in decision-making thereafter. This motivational implementation mechanism of SHEP was crucial for human capital development.

A notable strength of the SHEP approach that enabled its expansion to wider areas so far afield was its flexibility and adaptability. Furthermore, the approach could work as a complementary intervention to existing extension services or other agricultural projects and programmes. Although the SHEP approach was implemented as a stand-alone approach in the initial phases of SHEP Phase 1 and SHEP UP, it was effectively implemented as an intervention that complemented or adapted other agricultural activities as manifested in some counties during SHEP PLUS. Such counties utilized the essence of SHEP, that is, the two conceptual pillars and four essential steps of activity implementation, to motivate farmers. Therefore, farmers were provided with ample opportunities to raise their awareness of the market. In addition, some countries outside Kenya integrated the SHEP approach with irrigation or livestock development projects. In both cases, the SHEP approach was simplified and made less resource-demanding to allow for necessary adaptation, but without losing the value of SHEP as a motivation promoter. It was thus evident that the SHEP approach of flexibility, complementarity and adaptability contributed to accelerated scaling out to wider areas and scaling up to different institutions in and outside Kenya.

STAKEHOLDER MANAGEMENT

The SHEP approach paid particular attention to building trust among different levels of implementers and beneficiaries. This was achieved through transparency in actions such as information sharing and creating opportunities for interaction and linkages of different strata of participants through FABLIS forums (government officials, extension officers, farmers, market actors). In addition, clear and transparent criteria were established for selecting target areas and groups which avoided bias, subjectivity or political interference in the selection process. Therefore, it was imperative that SHEP also enhanced social and human capital among stakeholders for sustained project outcomes and impact.

FEEDBACK MANAGEMENT

An important feature of the SHEP approach was continuous improvement and updating so that the implementation mechanism was optimized as circumstances and conditions necessitated. Action was taken based on feedback from local implementers and other sources. For example, training curriculums and materials were revised for specific courses depending on feedback from participants or observations during monitoring and evaluation activities as shown in the Essential Four Steps. Therefore, SHEP accumulated the most relevant and current information and created new knowledge based on experiences in the field (Japan International Cooperation Agency, 2014).

Ousman (2007) recommended a participatory process in identifying training needs to ensure that content addresses farmers' needs. Notably, the SHEP approach aligned with the FAO recommended practise of flexibility and allowed incorporation of feedback and adjustments of training activities as implementation continued (Oakley and Garforth, 1985). Therefore, implementation of SHEP approach was not static and changed as it was adapted to suit the needs of the target recipients of the training. While there was a guiding template, the SHEP approach was a departure from the traditional one-size-fits-all approaches. A unique feature of SHEP was that it did not transfer monetary or other material resources to the target groups. Rather, the emphasis was on transferring skills and knowledge, while the community used the existing resources at their disposal.

TYPES OF PRODUCERS BEST SERVED THROUGH THE SHEP APPROACH

The SHEP approach was implemented for small-scale horticulture producers, with whom it had demonstrated a high level of success. As evidenced by the study's findings, application of the SHEP approach to smallholder horticultural producers was particularly effective since it addressed issues and challenges pertinent to them. Notably, it was relevant to horticultural production given the high perishability of produce, which necessitates timely market access. However, its application in areas with extremely poor road access could be hampered, even though the SHEP approach addresses this need by using *do-nou*⁹ technology in spot road improvements.

Uniquely, the crop production cycle of vegetables is usually much shorter than that of other crops, enabling farmers to see the results of their endeavours, such as application of new farming techniques, in just a few months' time. Given their circumstances and the focus of SHEP on horticultural crops, farmers quickly became convinced of the validity of the skills and knowledge they had acquired through SHEP training and were motivated by the tangible results, such as increased quality and quantity of crops or higher prices and profits. Therefore, the SHEP approach could easily be applied to commodities with similarly short duration from planting to marketing.

As explained earlier in this report, the SHEP approach is based on a universal psychological theory and economic theory, both of which can be applied to various situations involving human behaviour. Creating an environment in which farmers can raise their motivation and mitigating information asymmetry among market actors for developing an efficient local economy are important not only for smallholder horticulture farmers but more widely for other farmers also.

So long as the intervention is intended to promote sustainable market-oriented agriculture, the SHEP approach can be applied to other commodities such as livestock or to other farmers such as medium-scale or semi-commercialized farmers. Nevertheless, some modifications or adjustments may be needed in details of the training design. While SHEP was piloted and largely upscaled in horticulture in Kenya, some members who received training also applied it in other value chains such as dairy, poultry, fisheries and cereals production. Some counties in Kenya, such as Makueni, also adopted the SHEP approach as the extension service delivery model for other value chains beside horticulture. In different upscaling countries, SHEP focused on different commodities such as livestock and aquaculture, which proved its versatility and adaptability to different value chains.

AGROECOLOGICAL CONSIDERATIONS

Agroecological zones are characterized by differences in rain intensity, thermal regimes, topography, and soil characteristics. These characteristics are key in agribusiness as they influence what can be successfully and profitably produced. Implementation of the SHEP approach was not limited by agroecological conditions. However, because different crops are adapted to specific agroecological zones, the success of the SHEP approach was to some extent dependent on farmers' abilities to adapt production practises to surmount challenges of unpredictable weather, climate change or other obstacles related to agroecological conditions. The SHEP projects conducted training on technologies including water harvesting and irrigation that could be used to

⁹ Do-Nou is a low-cost and easy-to-use road maintenance technology. It uses sand or murram (gravel) delivered in bags, to be manually compacted and then covered with soil or other material to create a road base capable of supporting traffic. It has minimal costs and requires no advanced machinery.

overcome agroecological limitations. Moreover, the SHEP approach first focused on production in line with market needs and emphasized the utilization of locally available resources.

It is fair to say that the SHEP approach was particularly suited to small-scale horticulture producers, be they men, women, youths, or persons living with disabilities. However, because participation in SHEP required engaging in manual or physical labour, it may have disadvantaged persons living with disabilities, as they may not be able to undertake some tasks or had to work at a slower pace. It is therefore important to address the needs of persons with disabilities so as to provide them with the necessary equipment or other support.

NECESSARY CONDITIONS FOR IMPLEMENTING THE SHEP APPROACH IN DIFFERENT CONTEXTS

At the country level, the commitment of the leadership of the implementing agencies was an important prerequisite for success of the SHEP approach. The agencies, whether national or local, should prioritize training or other types of capacity development targeting farmers, extension service providers or other market actors, rather than the provision of material support such as inputs, equipment or finances. Being able to mobilize enough staff to implement the necessary training activities and at the same time building staff capacity are required to make the intervention successful. While the SHEP approach could be implemented without direct government participation, support by governments at national and local levels was deemed necessary to ensure that issues requiring policy or legislative interventions are acted upon.

Part of the focus area of the SHEP training was record keeping and using data for decision making. In addition, SHEP training utilized and disseminated diverse types of written materials, manuals, and guidebooks to the farmers for future reference, individually or in a group setting. At the group level, for the SHEP approach to achieve the desired results, some members, especially group representatives, should have a minimum level of literacy. However, although SHEP did not emphasize or require any minimum educational qualifications at the farmer level, the approach was successfully implemented with non-literate members of a group being supported by literate group members or their literate family members.

In addition, the SHEP approach worked well if farmers in the same or nearby communities were organized into cohesive groups working towards a common goal. Other underlying factors influencing agricultural production and marketing, including availability of infrastructure and financial resources, should be considered as lack of them is identified as hindering effective application of the skills and knowledge acquired.

At the individual level and specifically for horticulture, access to the resources needed to engage in agricultural production was necessary. These include capital, land and water, among others. Since the SHEP approach does not involve transfer of financial or material resources, individuals should have the means to raise the capital needed to invest in production. Therefore, unless other forms of support are made available,¹⁰ the SHEP approach may not be an effective strategy for ultra-poor farmers or purely subsistence farmers.

¹⁰ SHEP in Uganda targets economically disadvantaged subsistence farmers by combining other activities such as nutrition and family welfare improvement.

POTENTIAL VULNERABILITIES AND LIMITATIONS OF THE SHEP APPROACH

All agricultural undertakings are highly vulnerable to unpredictable climate change and dynamic consumer preferences that can significantly disrupt production and destabilize value-chain activities. Changes in climate can trigger droughts, floods, pests and diseases, thereby affecting agriculture. Floods can cut off transport routes to market. Value-chain disruptions can occur through policy changes, such as quality standards, packaging requirements, regional and global trade agreements and so forth. The recent global lockdowns following the COVID-19 outbreak are a perfect example of unexpected disruptions to the value chain, where producers can find themselves stranded without market outlets for their produce.

While the SHEP training was acknowledged as highly beneficial, some individuals or groups were not able to utilize the skills and knowledge acquired, because, for example, they did not have access to water to produce crops off-season when markets are most favourable. In FABLIST forums or before disengaging agencies implementing SHEP, it is crucial to strategically consider linking the farmer groups to financial services, input providers, or other development projects and programmes that address issues of physical improvements to agricultural facilities.

In the counties, the success of SHEP depended on effective functioning of public extension services funded by budgets allocated by the local assembly. This made SHEP vulnerable to local political developments, with the possibility of being influenced by regime changes following elections. This could be addressed by embedding the SHEP approach in County Integrated Development Plans used to allocate budgets to extension and other services provisions. Appropriate monitoring and follow-up should also be undertaken to ensure timely disbursement of allocated funds.







References

- Africa Check.** 2019. Are nearly 80% of Kenya's farmers smallholders? No data shows this. *Polity*, [online] South Africa [Cited 31 August 2020]. <https://www.polity.org.za/article/are-nearly-80-of-kenyas-farmers-smallholders-no-data-shows-this-2019-06-06>.
- Akerlof, G.A.** 1970. The market for "lemons": quality uncertainty and the market mechanism. *The Quarterly Journal of Economics*, 84(3): 488–500.
- Anonymous.** undated. ReSAKSS [online]. [Cited 5 November 2020]. <https://www.resakss.org/>.
- Baxter, P. & Jack, S.** 2008. Qualitative case study methodology: study design and implementation for novice researchers. *The Qualitative Report*, 13(4): 544–559. <https://doi.org/10.46743/2160-3715/2008.1573>. (Also online at <http://www.nova.edu/ssss/QR/QR13-4/baxter.pdf>).
- Beintema, N., Mose, L., Kibet, T., Emongor, R., Murithi, F., Kimani, I., Ndungu, V. & Mwangi, P.** 2018. *Kenya Agricultural R & D indicators*. IFPRI & KALRO. [Cited 7 November 2020]. <https://www.asti.cgiar.org/sites/default/files/pdf/Kenya-Factsheet-2018.pdf>.
- Birch, I.** 2018. *Agricultural productivity in Kenya: barriers and opportunities*. K4D Helpdesk Report [Online] Institute of Development Studies, Brighton, UK [Accessed March 2021] <https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/14211>.
- Boddy, C.R.** 2016. Sample size for qualitative research. *Qualitative Market Research: An International Journal*, 19(4): 426–432. <https://doi.org/10.1108/QMR-06-2016-0053>.
- Cameron, H.M.G.** 2008. Trends in agriculture and agribusiness. *Journal of Business & Finance Librarianship*, 12(1): 3–32. https://doi.org/10.1300/J109v12n01_02.
- Davis, K.E., Babu, S.C. & Ragasa, C. (eds)** 2020. *Agricultural Extension: Global status and performance in selected countries*, Washington DC, IFPRI. 380pp. [Available online] <https://ebrary.ifpri.org/digital/collection/p15738coll2/id/133965>.
- Deci, E.L. & Flaste, R.** 1995. *Why We Do What We Do: the dynamics of personal autonomy*. New York, Putnam, 230 pp.
- Deci, E.L. & Ryan, R.M.** 1985. *Intrinsic Motivation and Self-Determination in Human Behaviour*. New York, Plenum, 371 pp.
- FAO.** n.d. *Agricultural Policy Frameworks in Kenya Kenya-Policy_Report.pdf* [online]. [Cited 31 August 2020]. http://www.fao.org/fileadmin/templates/fapda/Kenya-Policy_Report.pdf.
- FAO.** 2011. *Enhancing farmers' access to markets for certified products: a comparative analysis using a business model approach* [online]. Rome [Cited 31 August 2020]. <http://www.fao.org/3/k9849e/k9849e.pdf>.
- FAO.** 2020a. Government Expenditure. In: FAOSTAT [online]. Rome [Cited 18 August 2020]. <http://www.fao.org/faostat/en/#data>.
- FAO.** 2020b. *Kenya at a glance | FAO in Kenya | Food and Agriculture Organization of the United Nations* [online]. FAO, Rome [Cited 31 August 2020]. <http://www.fao.org/kenya/fao-in-kenya/kenya-at-a-glance/en/>.

- GoK.** 2007. *Vision-2030-Popular-Version.pdf* [online]. Nairobi, National Economic and Social Council of Kenya [Cited 21 September 2020]. <http://www.vision2030.go.ke/wp-content/uploads/2018/05/Vision-2030-Popular-Version.pdf>.
- GoK.** 2019a. *Agricultural sector transformation and growth strategy*. [online] Nairobi, Government of Kenya [Cited 31 August 2020]. <http://extwprlegs1.fao.org/docs/pdf/ken189053.pdf>.
- GoK,** 2019. 2019b. *Horticulture Validated Report 2016–2017, Kenya* [online]. Nairobi, Horticultural Crops Directorate [Cited 29 September 2020]. <http://kilimodata.developlocal.org/dataset/3534b0b9-e49e-4c72-a90a-e423844a83a2/resource/c7758a80-9102-481e-a6c2-fa983081221d/download/horticulture-validated-data-2016-2017.pdf>.
- Goldin, C.D.** 2016. Human Capital. In C. Diebolt & M. Hauptert, eds. *Handbook of Cliometrics*, pp. 55–86. Heidelberg, Germany, Springer. (Also available at <https://dash.harvard.edu/handle/1/34309590>).
- Green, J. & Thorogood, N.** 2004. *Qualitative Methods for Health Research*. London, Sage. 262 pp.
- IFPRI.** 2020. *Data download* [online]. [Cited 18 August 2020]. <https://www.asti.cgiar.org/data>.
- Japan International Cooperation Agency.** 2014. Keniya Kyowakoku Shoukibo Engei Noumin Soshiki Kyouka Purojekuto wo Jirei to shita Shijou Shikougata Nougyou Kaihatsu Purojekuto Jisshi ni kakaru Jouhou Shuushuu Kakunin Chousa Houkokusho (Study Report on the Implementation of Smallholder Horticulture Empowerment and Promotion (SHEP) Projects in Kenya). Tokyo, JICA. (also available at <https://libopac.jica.go.jp/images/report/12247334.pdf>).
- Japan International Cooperation Agency.** 2016a. Jouhou no Hitaishousei Kanwa ni kakaru Chousa Houkokusho (A Report on Mitigation of Information Asymmetry: The SHEP Approach in Kenya). Tokyo, JICA. (also available at <https://openjicareport.jica.go.jp/pdf/12270104.pdf> [In Japanese]).
- Japan International Cooperation Agency.** 2016b. *Introduction to the psychology of international cooperation: seventeen motivation case studies collected from the field*. Tokyo, JICA. (also available at <https://libopac.jica.go.jp/images/report/12092193.pdf>).
- Japan International Cooperation Agency.** 2018a. *SHEP Handbook for Extension Staff*. Tokyo, JICA. (also available at https://www.jica.go.jp/english/our_work/thematic_issues/agricultural/shep/c8h0vm0000bm5ayp-att/handbook.pdf).
- Japan International Cooperation Agency.** 2018b. Summary of Terminal Evaluation Report “Improving Small-scale Farmers’ Market-oriented Agriculture Project”. Tokyo, JICA. (also available at https://www2.jica.go.jp/en/evaluation/pdf/2018_1200411_3_f.pdf).
- Japan International Cooperation Agency.** 2019a. *SHEP Approach and Its Expansion: History* [online]. Tokyo, JICA [Cited 30 September 2020]. https://www.jica.go.jp/english/our_work/thematic_issues/agricultural/shep/history.html.
- Japan International Cooperation Agency.** 2019b. Ethio-SHEP Summary Report for the 1st-year Target Group, Tokyo, JICA.
- Japan International Cooperation Agency.** 2019c. Agricultural Techniques Information on the Project for Market-Oriented Smallholder Horticulture Empowerment and Promotion (MA-SHEP) Tokyo, JICA.

- Japan International Cooperation Agency.** 2019d. Progress Report on the Project on Improved Extension for Value-Added Agriculture in Palestine (EVAP-2) Tokyo, JICA.
- Japan International Cooperation Agency.** 2020. Mid-term Review on the Project for Market-Oriented Smallholder Horticulture Empowerment and Promotion (MA-SHEP) Tokyo, JICA.
- Japan International Cooperation Agency, Earth and Human Corporation, IC Net Limited & Nippon Koei Co., Ltd.** 2020. Senegal Shoukibo Engei Nouka Nouryoku Kyouka Purojekuto Jigyuu Sinchoku Houkokusho Dai Niki (Project Progress Report for the Second Phase on Project for Capacity Development of Small-scale Horticulture Farmers) Tokyo, JICA.
- Japan International Cooperation Agency, Kaihatsu Management Consulting Inc. & CDC International Corporation.** 2018. El Salvador Toubu Chiiki Yasai Nouka Shuueki Koujou Purojekuto (Dai Ni Nenji) Gyoumu Kanryo Houkokusho (The Second Year Project Completion Report on The Horticultural Farmer's Profitability Improvement Project in the Eastern Region of El Salvador). Tokyo, JICA (also available at <https://openjicareport.jica.go.jp/pdf/12319513.pdf> [in Japanese]).
- Japan International Cooperation Agency, Sanyu Consultants Inc. & Nippon Koei Co.,Ltd.** 2019. Smallholder Market-oriented Agriculture Project in Rwanda: Project Completion Report, Tokyo, JICA.
- Japan International Cooperation Agency & The Federal Democratic Republic of Nepal.** 2020. Joint Terminal Evaluation Report on Sindhuli Road Corridor Commercial Agriculture Promotion Project (SRC-CAP), Tokyo, JICA.
- JICA & MOALF.** 2009. Smallholder Horticulture Empowerment and Promotion project Phase 1, Terminal Evaluation Report. Japan International Cooperation Agency (JICA) and Ministry of Agriculture, Livestock and Fisheries, Kenya. (also available at <https://libopac.jica.go.jp/images/report/12111290.pdf>).
- JICA & MOALF.** 2015. Smallholder Horticulture Empowerment and Promotion Unit Project (SHEP-UP) Joint Terminal Evaluation Report. Japan International Cooperation Agency (JICA) and Ministry of Agriculture, Livestock and Fisheries, Kenya.
- JICA & MOALF.** 2020. Project Completion Report on Smallholder Horticulture Empowerment and Promotion Project for Local and Up-Scaling (SHEP PLUS). Japan International Cooperation Agency (JICA) and Ministry of Agriculture, Livestock and Fisheries, Kenya. (also available at <https://openjicareport.jica.go.jp/pdf/1000043526.pdf>).
- Kangai, E. & Gwandeba, G.** n.d. *Creating employment in horticulture sector in Kenya: productivity, contracting and marketing policies.* [online] Center for African Bio-Entrepreneurship. [Accessed 30 September 2020]. <https://includeplatform.net/wp-content/uploads/2019/08/Creating-employment-in-horticulture-sector-in-Kenya-Productivity-contracting-and-marketing-policies.pdf>.
- Kirkpatrick, D. & Kirkpatrick, J.** 2006. *Evaluating Training Programs: The Four Levels.* Oakland, CA, USA, Berrett-Koehler.
- Kirkpatrick, J. & Kirkpatrick, W.** 2019. *An Introduction to the New World Kirkpatrick Model.* Newnan, GA, USA, Kirkpatrick Partners, LLC. Also available at: <http://www.kirkpatrickpartners.com/Portals/0/Resources/White%20Papers/Introduction%20to%20the%20Kirkpatrick%20New%20World%20Model.pdf>.

- KNBS.** 2019. *2019 Kenya population and housing census*. Nairobi, Kenya National Bureau of Statistics.
- KNBS Vol. IV.** 2019. *2019 Kenya Population and Housing Census Volume IV: Distribution of Population by Socio-Economic Characteristics*. [online] KNBS, Nairobi [Accessed March 2021] <https://www.knbs.or.ke/?wpdmpo=2019-kenya-population-and-housing-census-volume-iv-distribution-of-population-by-socio-economic-characteristics>.
- Match Maker Associates.** 2017. *Horticulture Study: Mapping Production of Fruits and Vegetables in Kenya*. Match Maker Associates, Dar Es Salaam, 37pp.
- MOALF & JICA.** 2020. *The SHEP Approach: Implementation guidebook for extension officers*. Nairobi, GoK.
- Oakley, P. & Garforth, C.** 1985. *Guide to Extension Training*. FAO training series no. 11. Rome, FAO. 144 pp.
- Ousman, S.O.** 2007. *Effectiveness of agricultural development training program: the cases of teff and livestock farmers of Alaba Woreda, Southern Ethiopia*. Department of Rural Development and Agricultural Extension, Haramaya University, Ethiopia. [MSc Thesis] (also available at https://cgspace.cgiar.org/bitstream/handle/10568/687/Thesis_SururEffectiveness.pdf?sequence=1).
- Resnick, D., Diao, X. & Tadesse, G.** 2020. *Sustaining Africa's Agrifood System Transformation: The Role of Public Policies*. ReSAKSS 2020 Annual Trends and Outlook Report. Washington, DC, and Kigali, International Food Policy Research Institute (IFPRI) and AKADEMIYA2063. (Also available at <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKewjm8PaorvDsAhXbTxUIHUo9CYEQFjAJegQlChAC&url=https%3A%2F%2Ffebruary.ifpri.org%2Fdigital%2Fapi%2Fcollection%2Fp15738coll2%2Fid%2F134069%2Fdownload&usq=A0vVaw2h9Z0qh3a1dlVeWWMoWDRf>).
- Ridolfi, C., Hoffmann, V. & Baral, S.** 2018. *Post-harvest losses in fruits and vegetables: the Kenyan context*, IFPRI Working Paper. Washington D.C., IFPRI, 15pp. (Available at: <http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/132325>).
- Sayanagi, N. & Aikawa, J.** 2016. The motivation of participants in successful development aid projects: a self-determination theory analysis of reasons for participating. *JICA Research Institute Working Paper 121*, (March 2016). Tokyo, JICA-RI, 22pp. (also available at https://www.jica.go.jp/jica-ri/publication/workingpaper/wp_121.html).
- Spence, M.** 1973. Job market signaling. *The Quarterly Journal of Economics*, 87(3): 355–374.
- Stiglitz, J.E.** 1975. The theory of “screening,” education, and the distribution of income. *The American Economic Review*, 65(3): 283–300.
- UNDP.** 2020. *Unlocking the potential of arid and semi arid lands of Kenya*. UNDP in Kenya, Press Release, 10 December 2018. [online] Nairobi, UNDP. [Cited 31 August 2020]. <https://www.ke.undp.org/content/kenya/en/home/presscenter/pressreleases/2018/unlocking-the-potential-of-arid-and-semi-arid-lands-of-kenya-.html>.
- World Bank.** 2015. *Climate-Smart Agriculture in Kenya*. (also available at <https://cgspace.cgiar.org/handle/10568/69545>).

- World Bank.** 2018a. *Kenya Economic Update, April 2018, No. 17 : Policy Options to Advance the Big 4* [online] Washington, DC, World Bank. [Cited 31 August 2020]. <https://openknowledge.worldbank.org/handle/10986/29676>.
- World Bank.** 2018b. Building human capital. *World Development Report 2019: The Changing Nature of Work*. pp. 49–68. Washington, DC, World Bank. (Available at https://doi.org/10.1596/978-1-4648-1328-3_ch3).
- World Bank.** 2018c. *Agribusiness and Value Chains*. [online] Washington, DC, World Bank. [Cited 31 August 2020]. <https://www.worldbank.org/en/topic/agribusiness>.
- World Bank.** 2019. *Kenya Economic Update: Transforming Agricultural Productivity to Achieve Food Security for All*. [online] Washington, DC, World Bank. [Cited 31 August 2020]. <https://www.worldbank.org/en/country/kenya/publication/kenya-economic-update-transforming-agricultural-productivity-to-achieve-food-security-for-all>.
- World Bank.** 2020. *World Bank Open Data | Data*. [online] Washington, DC, World Bank. [Cited 18 August 2020]. <https://data.worldbank.org/>.



Annex

Results of SHEP implementation in selected countries

Region	Country	Improvements of farmers' agricultural and managerial skills	Improvements of farmers' average net income from horticulture
Africa	Egypt ¹	87 percent of target farmers changed their farming style to market-based agriculture by continuously formulating and implementing farming plans as recommended by the project.	Annual net income per farmer increased from USD 654 to USD 1010 (54 percent increase) in one target Governorate and from USD 592 to USD 1136 (92 percent increase) in the other target Governorate in two years.
	Ethiopia ²	The average agricultural techniques adoption rate ³ increased from 62 percent to 83 percent (34 percent increase) in one year.	Net income per farmer of one cropping season increased from USD 376 to USD 440 (37 percent increase) in two years.
	Malawi ⁴	Out of 21 agricultural techniques, the average number of techniques adopted by the target farmers increased from 8.6 to 16.5 (92 percent increase) in two years.	Net income per farmer of one cropping season increased from USD 131 to USD 179 (39 percent increase) in one year.
	Rwanda ⁵	Out of 77 target cooperatives, 73 (95 percent) adopted more than 70 percent of the 32 techniques recommended by the project.	The target cooperatives increased their net group income by 112 percent on average during the project period.
	Senegal ⁶	Out of 410 target farmers, 180 (44 percent) formulated and implemented a crop calendar and 246 (60 percent) formulated and implemented a marketing plan after the training.	Annual net income per farmer increased from USD 2574 to USD 3618 (41 percent increase) in one year.
Middle East	Palestine ⁷	88 percent of target farmers applied new production and farm management techniques introduced by the project to their farming activities.	Annual net income per farmer increased from USD 3622 to USD 5295 (46 percent increase) in two years.
Asia	Nepal ⁸	93 percent of the target farmers adopted at least one of the following new farming practises; (1) changing the kind of crop; (2) changing the timing of planting; (3) increasing the farm area; and (4) changing the farm management system.	Annual net income per farmer increased from USD 3426 to USD 5809 (70 percent increase) in 1.5 years.
Latin America	El Salvador ⁹	Out of 26 target farmer groups, 23 groups (88 percent) adopted at least one of the following new farming practises: (1) bookkeeping and accounting; (2) market surveys; (3) annual cultivation plans; and (4) crop diversification.	Annual net income per farmer group increased from minus USD 637 to USD 3817 on average in two years.

1 Based on data for 425 target farmers in two Governorates who participated in the Improving Small-scale Farmers' Market-oriented Agriculture Project (ISMAP) from 2014 to 2019 (Japan International Cooperation Agency, 2018b).

2 Based on data for 79 target farmers (65 males and 14 females) provided by the Smallholder Horticulture Farmer Empowerment through Promotion of Market-Oriented Agriculture (Ethio-SHEP) project implemented from 2017 to 2020 (Japan International Cooperation Agency, 2019b).

3 Based on 24 general production and managerial skills.

4 Based on data for 1489 target farmers (765 males and 724 females) provided by the Market-Oriented Smallholder Horticulture Empowerment and Promotion (MA-SHEP) project implemented from 2017 to 2020 (Japan International Cooperation Agency, 2019c, 2020).

5 Based on data for 77 target cooperatives (for the skills data) and 63 target farmers (for the income data) provided by the Smallholder Market-oriented Agriculture Project in Rwanda project implemented from 2014 to 2019 (Japan International Cooperation Agency, Sanyu Consultants Inc. & Nippon Koei Co., Ltd., 2019).

6 Based on data for 410 target farmers (for the skills data) and 432 (baseline) and 392 (endline) target farmers (for the income data) provided by the Project for Capacity Development of Small-scale Horticulture Farmers implemented from 2017 to 2022 (Japan International Cooperation Agency, Earth and Human Corporation, IC Net Ltd. and Nippon Koei Co., Ltd., 2020).

7 Based on data for 59 target farmers provided by the project on Improved Extension for Value-Added Agriculture in Palestine (EVAP-2) implemented from 2016 to 2021 (Japan International Cooperation Agency, 2019d).

8 Based on data from 1203 target farmers (410 males and 793 females) provided by The Sindhuli Road Corridor Commercial Agriculture Promotion (SRC-CAP) project implemented from 2015 to 2020 (Japan International Cooperation Agency and The Federal Democratic Republic of Nepal, 2020).

9 Based on data for 26 target farmer groups (for the skills data) and 21 target farmer groups (for the income data) provided by the Horticultural Farmers' Profitability Improvement Project in the Eastern Region of El Salvador (Horti Oriente Project) implemented from 2014 to 2018 (Japan International Cooperation Agency, Kaihatsu Management Consulting Inc. and CDC International Corporation, 2018).



Investing in farmers – or agriculture human capital – is crucial to addressing challenges in our agri-food systems. A global study carried out by the FAO Investment Centre and the International Food Policy Research Institute, with support from the CGIAR Research Programme on Policies, Institutions and Markets and the FAO Research and Extension Unit, looks at agriculture human capital investments, from trends to promising initiatives. One of the nine featured case studies is Kenya’s Smallholder Horticulture Empowerment and Promotion Approach, which provides technical and soft skills based on the theory of self-determination. The training has influenced farmers to change their mindsets and behaviour towards market-oriented horticulture. In addition, most farmers gained confidence in applying the skills acquired, which resulted in improved production and marketing and increased incomes. The approach was found to be effective in developing human capital and is therefore recommended for use in smallholder horticulture production systems or enterprises. This publication is part of the Country Investment Highlights series under the FAO Investment Centre's Knowledge for Investment (K4I) programme.

ISBN 978-92-5-135044-7



9 789251 350447

CB7026EN/1/10.21